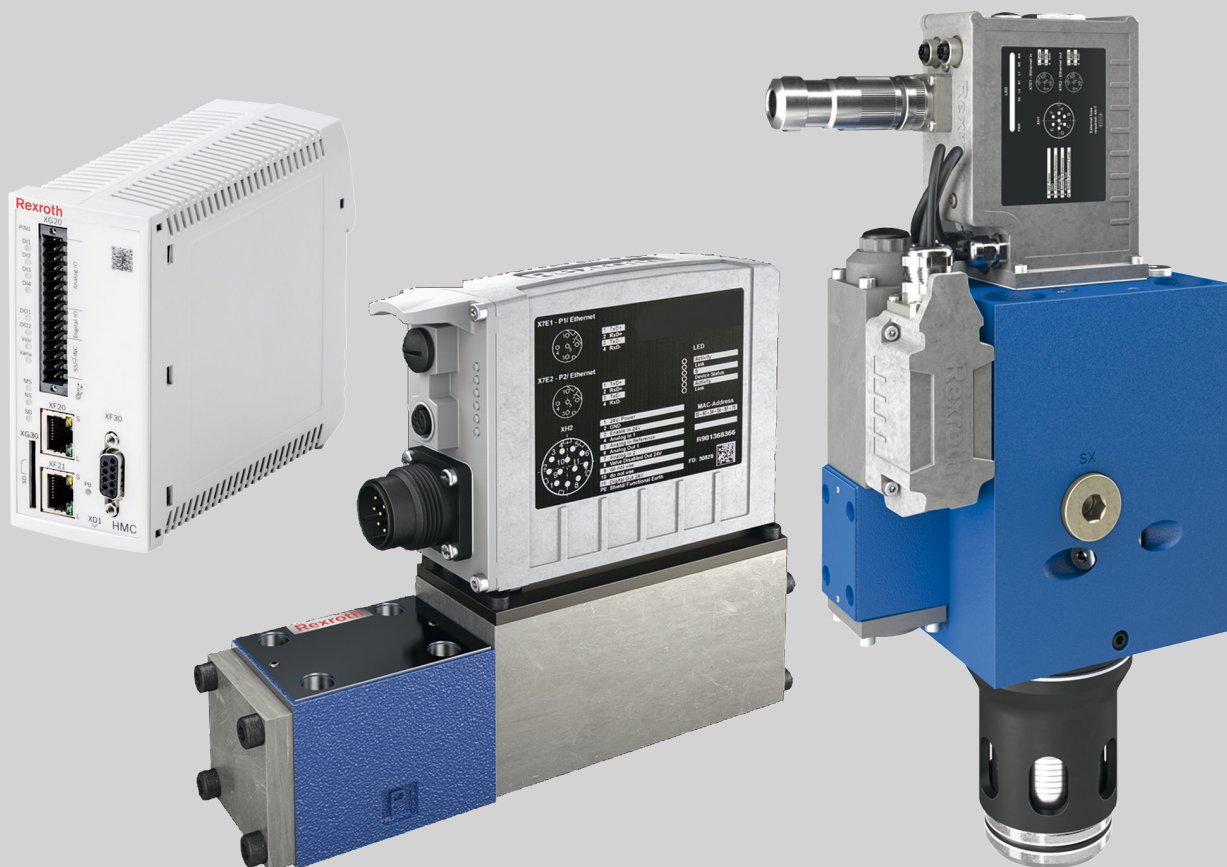


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Firmware for drive controllers

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1 General

1.1 Releases

Firmware designation	Release date	Change of version
FWA-HYDRV*-HD*-20V04-D5	2015-10-19	First edition
FWA-HYDRV*-HD*-20V06-D5	2016-04-26	2nd edition
FWA-HYDRV*-HD*-20V08-D5	2016-06-10	3rd edition
FWA-HYDRV*-HD*-20V10-D5	2016-11-16	4th edition
FWA-HYDRV*-HD*-20V12-D5	2017-05-16	5th edition
FWA-HYDRV*-HD*-20V12.10-D5	2017-08-21	6th edition
FWA-HYDRV*-HD*-20V12.30-D5	2017-12-18	7th edition
FWA-HYDRV*-HD*-20V16-D5	2018-08-21	8th edition
FWA-HYDRV*-HD*-20V16.10-D5	2018-09-19	9th edition
FWA-HYDRV*-HD*-20V16.20-D5	2019-01-08	10th edition
FWA-HYDRV*-HD*-20V16.30-D5	2019-02-21	11th edition
FWA-HYDRV*-HD*-20V18-D5	2019-05-13	12th edition
FWA-HYDRV*-HD*-20V18.10-D5	2020-05-29	13th edition
FWA-HYDRV*-HD*-20V20-D5	2020-05-25	13th edition
FWA-HYDRV*-HD*-20V20.10-D5	2020-09-24	13th edition
FWA-HYDRV*-HD*-20V20.20-D5	2021-05-20	13th edition
FWA-HYDRV*-HD*-20V20.30-D5	2021-07-22	13th edition
FWA-HYDRV*-HD*-20V20.40-D5	2022-04-28	13th edition
FWA-HYDRV*-HD*-20V22-D5	2022-06-07	13th edition
FWA-HYDRV*-HD*-20V24-D5	2022-12-16	13th edition
FWA-HYDRV*-HD*-20V24.10-D5	2023-04-05	13th edition
FWA-HYDRV*-HD*-20V24.20-D5	2024-03-06	14th edition
FWA-HYDRV*-HD*-20V24.30-D5	2024-03-26	14th edition
FWA-HYDRV*-HD*-20V26-D5	2024-08-01	15th edition
FWA-HYDRV*-HD*-20V26.10-D5	2025-05-27	16th edition

Tab. 1-1: Record of revisions of firmware FWA-HYDRV*-HD*-20VRS

1.2 Firmware derivatives

1.2.1 General information

The functionality available for the HydraulicDrive is basically defined by the following:

- The basic hardware characteristic as well as hardware options
- The firmware derivative used
- The functional packages activated for the firmware used

1.2.2 Overview of firmware derivatives

Model variants The basic characteristic of the firmware version **HDx** means:

HD: "HydraulicDrive": Drives for general automation (including machine tool applications) with Multi-Ethernet interface (Sercos III, EtherCAT®, PROFINET®, EtherNet/IP, VARAN, Ethernet POWERLINK), field bus interface (e.g. PROFIBUS DP) and Analog Interface

"x" stands for the various derivatives.

At present, the following firmware derivatives are available:

- **HDE** devices with Multi-Ethernet interface without axis control for IFB devices (Integrated Field Bus), which are mounted directly to the hydraulic actuator.
Compatible devices: High-response valves of series WRxF..., WRxQ... and variable displacement pumps of type SY(H)DFEF
- **HDB**: Single-axis function for IAC devices (Integrated Axis Control) in IP67 design, which are mounted directly to the hydraulic actuator.
Compatible devices: High-response valves of series WRxD... and variable displacement pumps of type SY(H)DFED and A4V..HS5E systems
- **HDP**: Single-axis function for IAC devices (Integrated Axis Control) in IP67 protection class, which are mounted directly to the hydraulic actuator, with PLC function integrated in the drive (MLD).
Compatible devices: High-response valves of series WRxD... and variable displacement pumps of type SY(H)DFEDn
- **HDC**: Single-axis function for hydraulic controllers in IP20 design for control cabinet installation.
Compatible devices: VT-HMC... and VT-HPC...
- **HDM**: Double-axis function for hydraulic controllers in IP20 design for control cabinet installation.
Compatible devices: VT-HMC



The designation **HDS** is used for the central hydraulic controller in the MLC control unit (HydrControl library).

This results in the following firmware derivative designations

- • FWA-HYDRV*-HDE-20VRS
- • FWA-HYDRV*-HDB-20VRS
- • FWA-HYDRV*-HDP-20VRS
- • FWA-HYDRV*-HDC-20VRS
- • FWA-HYDRV*-HDM-20VRS



The firmware designation can also be read via parameter S-0-1300.0.9 or S-0-0030.

Functionality of firmware derivatives

The scope of functions of the individual firmware derivatives is determined by the definition of "derivative-specific firmware projects" from the entirety of the HydraulicDrive firmware functionality ("module library") at the time of compilation.

When booting a firmware derivative, the finally available functionality is first determined at runtime by identification of existing hardware and the functional package selection (P-0-2003).

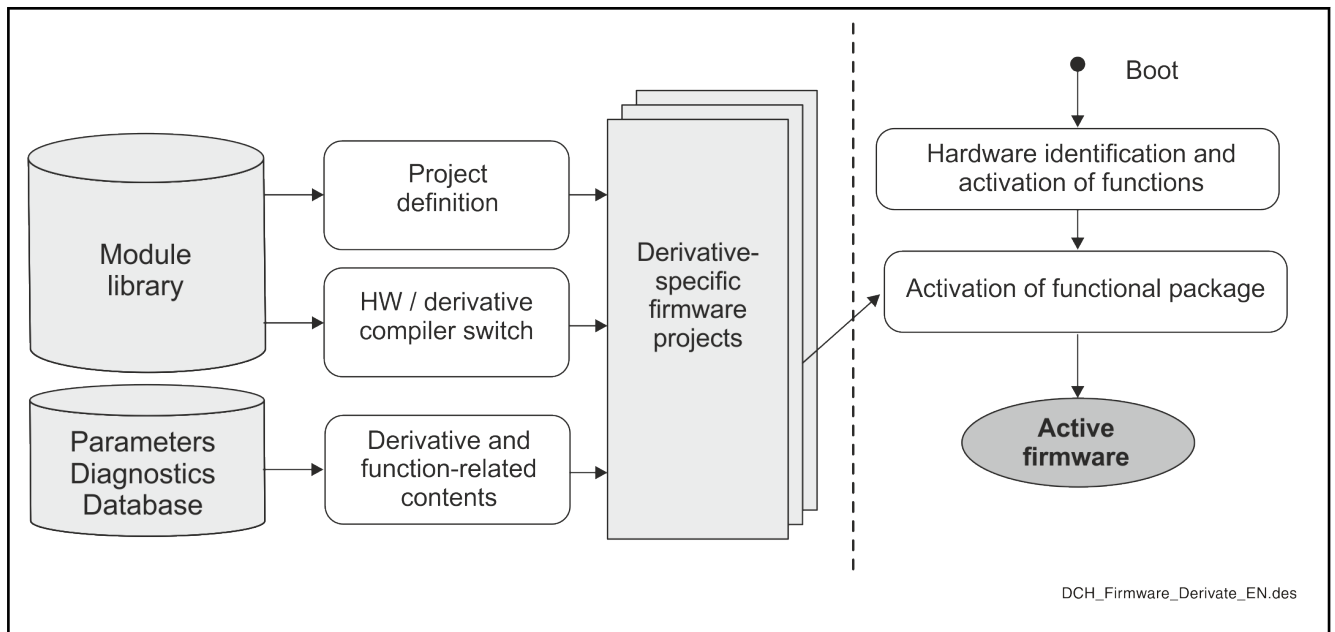


Fig. 1-1: Functionality in firmware variants

See also Hardware enabling, [functional packages](#)

1.3 Functional packages

1.3.1 Overview

Overview of functional packages

With the help of functional packages it is possible to extend the scope of functions of the firmware to suit your individual requirements and, if necessary, also to reduce the complexity.

The scope of functionality of the HydraulicDrive firmware depends on:

- available device function
- activated functional packages

The following functional packages are currently supported:

	Bus valve	p/Q function	Pump control	Axis controller Open Loop	Axis controller Closed Loop
Base package	IFB	p/Q	DFE	AXR OL	AXR CL
Alternative functional packages (only 1 possible out of n)	--	--	--	--	SRV (Servo)
Additive functional packages	--	--	TF (DFEn)	ML (IndraMotion MLD)	ML (IndraMotion MLD)

Tab. 1-2: Overview of base package, alternative and additive functional packages

Description of the functional packages

Base package IFB bus valve

The base package "bus valve" merely provides the functionality for direct valve control.

The available basic functionality consists of:

- Basic functions of device control (operation mode handling, error reactions, ...)
- Functions for valve activation
- Active damping (optional)
- Master communication with all associated functions
- Monitoring and limitation functions
- Scaling settings
- Diagnostic functions (oscilloscope, generation of diagnostic messages, diagnostic classes, error memory)
- Commissioning functions (easy startup mode, command value generator)

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-0-IFB-NN

Base package p/Q function

The base package "p/Q function" provides the functionality for closed-loop flow control with outer-loop pressure or force control.

The available basic functionality consists of:

- Basic functions of device control (operation mode handling, error reactions, etc.)
- Functions for valve activation, closed-loop control of pressure, flow and force
- Master communication with all associated functions
- Monitoring and limitation functions
- Scaling settings (except for position scaling)
- Diagnostic functions (oscilloscope, generation of diagnostic messages, diagnostic classes, error memory)
- Commissioning functions (easy startup mode, command value generator)

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-0-p_Q-NN

Base package DFE pump control

The base package "pump control" provides the functionality for closed-loop flow control (swivel angle) with outer-loop pressure control and power limitation.

The available basic functionality consists of:

- Basic functions of device control (operation mode handling, error reactions, etc.)
- Functions for closed-loop pressure/swivel angle control
- Master communication with all associated functions
- Monitoring and limitation functions
- Scaling setting (except for position and force scaling)
- Diagnostic functions (oscilloscope, generation of diagnostic messages, diagnostic classes, error memory)
- Commissioning functions (easy startup mode, command value generator)

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-0-DFE-NN

Base package AXR OL - Axis Control Open Loop

The base package "Axis Controller Open Loop" provides the minimal basic functionality for traversing an axis. With this package, only open-loop controlled operation is possible, there is no position encoder provided.

The available basic functionality consists of:

- Basic functions of device control (operation mode handling, error reactions, etc.)
- Functions for valve activation, closed-loop pressure and force control
- Master communication with all associated functions
- Monitoring and limitation functions
- Scaling settings
- Diagnostic functions (oscilloscope, generation of diagnostic messages, diagnostic classes, error memory)
- Commissioning functions (easy startup mode, command value generator)



With regard to encoder evaluation, the functional package merely contains the Encoder Basic profile (raw data), but no complete encoder evaluation. As a consequence, no position control modes are provided.

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-0-AXR-NN

Base package AXR CL - Axis Controller Closed Loop

In addition to "Axis Control Open Loop" the base package "Axis Controller Closed Loop" provides encoder evaluation and thus position evaluation as well as related functions and operation modes.

The available basic functionality consists of:

- Basic functions of device control (operation mode handling, error reactions, etc.)
- Functions for valve activation, closed-loop position, velocity, pressure and force control
- Master communication with all associated functions
- Monitoring and limitation functions
- Scaling settings
- Diagnostic functions (oscilloscope, generation of diagnostic messages, diagnostic classes, error memory)
- Commissioning functions (easy startup, command value generator, initial commissioning wizard, axis optimization)

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-1-AXR-NN



The overview of operation modes supported by the individual base packages is shown in Supported devices, general

Alternative functional packages (only one package may be selected):

- SRV - servo package

In addition to the scope of the base package, the following functions are provided:

- Error reaction return movement
- Axis error correction
- Quadrant error correction

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-1-SRV-NN

Additive functional packages:

- ML - IndraMotion MLD

In addition to the base package, functions are provided for the integrated Motion Logic Control MLD (PLC function).



This functional package may be selected additionally depending on the device characteristic.

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-x-xxx-ML

- TF - technology function

In addition to the base package, functions with a fixed functionality are provided on the basis of the integrated PLC

DFEn: Variable-speed pump control

Representation in firmware string: FWA-HYDRV*-HDx20-Vxx-D5-x-xxx-TF

1.4 Overview of firmware string

Firmware	Derivative	Version	Release	Language	OL/CL	Base package including alternative functional package	Additive functional package
FWA-HYDRV*	-xxx-	20	Vxx-	D5-	x-	xxx-	xx
Example: Axis Controller Closed Loop with servo package for device WRxD							
FWA-HYDRV*	-HDB-	20	V06-	D5-	1-	SRV-	NN
Example: Axis Controller Open Loop with MLD for device HMC							
FWA-HYDRV*	-HDC-	20	V06-	D5-	0-	AXR-	ML
Example: Field bus for device WRxF							
FWA-HYDRV*	-HDE-	20	V06-	D5-	0-	IFB-	NN
Example: Axis Controller Closed Loop with MLD for device WRxD							
FWA-HYDRV*	-HDP-	20	V10-	D5-	1-	AXR-	ML

Tab. 1-3: Overview of firmware string



The firmware string is always valid per axis!

1.5 Software

For engineering or servicing we recommend the following software:

Software	Application	Properties
SWA-IWORKS-DS* ⁽¹⁾	Drive commissioning tool	- No offline setting of parameters - No project administration - View for single devices - Without MLD programming
SWA-IWORKS-MLD* ⁽¹⁾	Drive engineering	- Including offline setting of parameters - Including project administration - Including MLD programming

(1) It is generally recommended that a version index ≥ 13 be used; the HDx20 firmware is only supported by version index 14 or higher

Tab. 1-4: Software for engineering or servicing

1.6 Incompatible modifications

The following modifications are incompatible with the predecessor versions HDx-18 and HDx-19.

	HDx-18 / HDx-19	HDx-20
Positive and negative force limit value	S-0-0083, Torque/force limit value positive (data length: 2 bytes)	S-0-0550, Torque/force command value, positive (data length: 4 bytes)
	S-0-0083, Torque/force limit value negative (data length: 2 bytes)	S-0-0551, Torque/force command value, negative (data length: 4 bytes)
Alternating control, control word	P-0-2854	Allotment of bits to 2 control words: P-0-2853, Alternating control, status word 1 P-0-2854, Alternating control, status word 2

Encoder selection and setting, complete revision	P-0-0074, Encoder type	S-0-0602.x.1, Phys. encoder type P-0-0077, Interface selection
	P-0-0910, SSI control parameter	S-0-0602.x.7, Phys. encoder protocol configuration
	P-0-2997.0.2, EnDat 2.2: clock frequency	S-0-0602.x.7, Phys. encoder protocol configuration
	S-0-0116, Resolution of feedback 1	S-0-0602.x.4, Phys. encoder resolution
	P-0-0343, Encoder 1, cosine signal	S-0-0603.x.3, Phys. encoder input signal B
	P-0-0344, Encoder 1, sine signal	S-0-0603.x.4, Phys. encoder signal B
	P-0-2997.0.1, EnDat 2.2: encoder data	No longer available
	S-0-0256, Multiplication 1	No longer available
State feedback		Function renamed "active damping". The parameters are identical

Tab. 1-5: Overview of incompatible modifications



When upgrading, the parameters should be backed up, since the memory layout was changed within the device. See also "Firmware version upgrade"

2 HDx20V04

2.1 Functional extensions

2.1.1 Activation of acceleration feedforward

CQ-ID: Defdb00179399

Description: Acceleration feedforward was not available in the past.

Extension: Acceleration feedforward can now be utilized.

2.1.2 Activation of backup and restore functionality

CQ-ID: Defdb00181189

Extension: The backup and restore functionality is available for controllers with memory card.

2.1.3 Activating a non-return valve

CQ-ID: Defdb00181182

Extension: Parameterizable delay for switching the controller enable on or off in order to accommodate for the switching time of a non-return valve.

2.1.4 Operating the device state machine without master communication

CQ-ID: Defdb00181196

Extension: The device state machine can also be operated without a master communication being present.

2.1.5 CoDeSys 3.5

CQ-ID: Defdb00181181

Extension: Changeover of MLD function to CoDeSys version 3.5

2.1.6 Diagnostic trace

CQ-ID: Defdb00181193

Extension: Changeover of diagnostic system to Diagnostic Trace. Introduction of a new system time. Integration of the log function.

2.1.7 Extended output of the serial number

CQ-ID: Defdb00176736

Description: So far, only a simple serial number has been issued.

Extension: Now, a clear serial number is generated on the basis of the production data entered.

2.1.8 Extension of function block MB_SetPositionControlMode

CQ-ID: Defdb00181151

Extension: Extension of the function block by a mode input.

2.1.9 Adding a filter for the actual position value

CQ-ID: Defdb00179403

Description: Filter (low pass) available for the actual position value!

2.1.10 Support of functional package "IFB"

CQ-ID: Defdb00181191

Extension: The functional package "IFB" (bus valve) can now be activated.

2.1.11 Activating the velocity filter

CQ-ID: Defdb00179401

Description: No velocity filter was available.

Extension: Velocity filters can be configured by means of P-0-1120 to P-0-1123 and P-0-1140 to P-0-1143.

2.1.12 Allowing velocity control in OL

CQ-ID: Defdb00181363

Extension: The velocity control mode can now be selected in Open Loop.

2.1.13 Base cycle time 400 µs

CQ-ID: Defdb00181186

Extension: A base cycle time of 400 µs can now be set for functional packages IFB, p/Q, and axis controller OL. At present, the application for this setting is the use of the bus system POWERLINK with a B-and-R control, which operates with this base cycle time.

2.1.14 Implementation of POWERLINK

CQ-ID: Defdb00175351

Extension: Implementation of support of POWERLINK communication

2.1.15 Implementation of POWERLINK

CQ-ID: Defdb00181197

Extension: POWERLINK is available as further master communication.

2.1.16 No more limitation to Min/Max with analog assignment

CQ-ID: Defdb00181188

Extension: So far, with analog assignment, the value has been limited to the min. and max. values of the value range. This limitation is no longer valid.

2.1.17 New force command values

CQ-ID: Defdb00181187

Extension: Introduction of new force command values and actual force values with a greater range of values in addition to existing parameters.

2.1.18 Activating the offline server

CQ-ID: Defdb00181149

Extension: Activating the offline server for the HDx platform

2.1.19 Extending the parameters for cyclic parameter access (pump control)

CQ-ID: Defdb00180402

Description: Various pump parameters were not MDT-capable!

2.1.20 Porting REQ-00044681: MLC-H: Model error (parameters and filters) for HDx

CQ-ID: Defdb00172981

Description: So far, it has not been possible to select whether the model error or the following distance were to be monitored.

Extension: The selection with regard to monitoring can now be made in P-0-2820.

2.1.21 Pump control, HPC and cascade control

CQ-ID: Defdb00181184

Extension: Support of HPC hardware as pump controller for cabinet mounting. Apart from parallel structure, cascade structure was introduced for swivel angle/pressure control.

2.1.22 Monitoring of following distance alternatively to the model error

CQ-ID: Defdb00181185

Extension: Alternatively to model error monitoring, the following distance can now be monitored via a configuration bit.

2.1.23 Control password for HDx

CQ-ID: Defdb00174757

Description: For the HDx derivatives, a specific control password was missing.

2.1.24 Recording the temperature profile

CQ-ID: Defdb00180273

Description: Temperature profiles could not be recorded.

Extension: Now, it is possible to record temperature profiles in 10 °C-increments.

2.1.25 Revision of encoder acquisition and evaluation

CQ-ID: Defdb00181183

Extension: Revision of encoder acquisition and evaluation. New parameter model in conformity with Sercos.

2.1.26 Support of operation of non-synchronous operation modes over EtherCAT, without distributed clocks

CQ-ID: Defdb00175352

Extension: Extension of the implemented solution of EtherCAT, which only supports synchronization via distributed clocks, by non-synchronous operation.

2.1.27 Support of axis interface

CQ-ID: Defdb00181150

Extension: Activation of the axis interface in the HMC as prerequisite for the future use of GAT compact.

2.1.28 Fading the valve standard velocity over a ramp

CQ-ID: Defdb00175350

Extension: The parameter "valve standard velocity" is changed to a new value over a ramp.

2.2 Fixed bugs

2.2.1 It should be possible to switch off monitoring of the model error/following error.

CQ-ID: Defdb00178357

Troubleshooting The function is deactivated by entering zero.

Interim solution: Set the value for monitoring so that error monitoring is not active.

2.2.2 Activation of parameters in order that the initial commissioning wizard works properly

CQ-ID: Defdb00174384

Description: When the initial commissioning wizard was executed in IndraWorks, exceptions occurred, since the following parameters that are required for the initial commissioning wizard were missing:

- P-0-2906 (system pressure 2)
- P-0-2919 (inclination angle of axis)
- P-0-2925 (natural frequency of valve)

Troubleshooting The following parameters were activated in the firmware in order that the initial commissioning wizard functions in IndraWorks:

- P-0-2906 (system pressure 2)
- P-0-2919 (inclination angle of axis)
- P-0-2925 (natural frequency of valve)

2.2.3 Analog assignment - assignment is also calculated when disabled

CQ-ID: Defdb00176356

Description: If a previously configured assignment was disabled by setting the analog input to "none", the assignment continued to be calculated and also continued to be connected to the analog input selected before. The write protection was still active, too.

Bug fixing: Now, if a previously configured assignment is disabled by setting the analog input to "none", the assignment is no longer calculated. The write protection is disabled.

2.2.4 Torque limitation active (P-0-2951, bit 2) is not correctly displayed

CQ-ID: Defdb00176650

Description: Bit 2 in the pump controller status word (P-0-2951, Status of torque limitation) was also set in pressure control, although torque limitation had not been active.

Bug fixing: Bit 2 in the pump controller status word (P-0-2951, Status of torque limitation) is only set in swivel angle control, when torque limitation is active, too.

2.2.5 With Drive Halt in OL (Open Loop) the additive valve command value (S-0-0861) is active.

CQ-ID: Defdb00178616

Description: With Drive Halt in an open loop operation mode, the additive valve command value (S-0-0861) is also active.

Bug fixing: The bug was fixed.

2.2.6 With cyclic PROFIBUS communication, error F4009 is triggered when the trend mode of the oscilloscope is started.

CQ-ID: Defdb00174382

Description: Due to an internal timing problem while processing PROFIBUS-DP communication, error F4009 - bus failure - was triggered under certain circumstances. This error was observed in particular during the changeover PM/OM and when the trend mode was started.

Bug fixing: Processing of PROFIBUS-DP communication was modified so that the timing problem can no longer occur.

2.2.7 When P-0-2999.0.3 is written, settings in output adjustment are changed as well!

CQ-ID: Defdb00180611

Description: When valve controller parameters P-0-2999.0.3 are written, settings in output adjustment are changed as well!

Bug fixing: The bug was fixed.

2.2.8 Operation mode “force control / direct valve control”

CQ-ID: Defdb00174562

Description: In the operation mode “force control / direct valve control”, alternating control functioned only in the positive direction. In the negative direction, the change-over to force control was not executed.

Bug fixing: Alternating control now functions in both directions.

2.2.9 Bug fix for exception from incorrect PLC program

CQ-ID: Defdb00177036

Description: The PLC program can trigger an exception, which results in the fact that the device can no longer be addressed. This bug fix prevents restarting of the PLC program when an exception was triggered before. The device can therefore be accessed again.

Bug fixing: The bug was fixed.

2.2.10 Executing commands via digital inputs did not work.

CQ-ID: Defdb00180905

Description: Executing commands via digital inputs did not work correctly. For example, if bit 0 of command S-0-0216 (-> C4100 Switch parameter set command) is assigned to an input, it is not command S-0-0216, which is executed when the digital input is set, but command S-0-0099 (-> C0500 Reset class 1 diagnostics). The bug was fixed.

Bug fixing: The bug was fixed.

2.2.11 Default value of command value feedforward

CQ-ID: Defdb00176748

Description: Command value feedforward is not required for most of the applications. Command value feedforward was activated by default.

Bug fixing: The bug was fixed.

2.2.12 The default values for scaling with CiA 402 objects are incorrect

CQ-ID: Defdb00181492

Description: The default values for objects 0x60A8, 0x60A9 and 0x60AA had been pre-configured to rotary. This resulted in the fact that scaling default values were overwritten in the drive upon switching to OM.

Bug fixing: The bug was fixed.

2.2.13 The PLC functions SysSockCreate and CheckPointer can trigger an F6010 for no reason.

CQ-ID: Defdb00175738

Description: When SysSockCreate was called in a PLC program, a PLC exception due to AccessViolation could be triggered.

The function CheckPointer from library MY_CheckRTV could show the same behavior.

Bug fixing: The bug was fixed.

2.2.14 Pressure controller acceptance thresholds are not properly converted

CQ-ID: Defdb00176684

Description: The set acceptance thresholds acted differently than expected (the internal units were wrong)!

Bug fixing: The bug was fixed.

2.2.15 F2270 Analog input, wire break cannot be acknowledged

CQ-ID: Defdb00181818

Description: If a wire break (F2270) occurred at an analog input, the error could not be acknowledged after the respective assignment was switched off. Rebooting was necessary.

Bug fixing: The bug was fixed.

2.2.16 Travel range limit and direct valve control

CQ-ID: Defdb00172356

Description: When the travel range limit is exceeded, error F6029 is triggered depending on the setting.

In the "direct valve control" mode it was possible that, following an error acknowledgement and re-enabling of the controller, the travel range limit could be exceeded without triggering a further error.

Bug fixing: Now, when an error is acknowledged and the controller is again enabled, a new error message is issued when the travel range limit is exceeded in the "direct valve control" mode.

2.2.17 Warnings missing for command value via limit value for pressure and flow

CQ-ID: Defdb00178775

Description: If the command value exceeded the pressure or flow limit value, no warning (E2065 + E2066) was generated!

Bug fixing: The bug was fixed.

2.2.18 Error F6010 is displayed, when no PLC program is loaded and the PLC program is not stored on the SD card

CQ-ID: Defdb00180906

Description: With the HMC, error F6010 was displayed when no PLC program was loaded and the PLC program was not stored on the SD card. As a result of this error, the customer had to acknowledge F6010 after booting.

Bug fixing: The bug was fixed.

2.2.19 Error in the ramp of the valve standard velocity

CQ-ID: Defdb00182025

Description: If a ramp was entered for the valve standard velocity, it was also calculated in the PM. As a result of this, the valve standard velocity reached the set value

only slowly after the device was switched on or rebooted and then switched to OM. During this time, closed-loop controlling did not work correctly.

Bug fixing: Now, the ramp of the valve standard velocity is calculated only in OM; in PM, the value is accepted immediately.

2.2.20 Incorrect default operation mode with open loop axis controller

CQ-ID: Defdb00173724

Description: After loading of basic parameters, torque control instead of direct valve control was entered as default operation mode in open loop.

2.2.21 Error reaction of drive - best possible deceleration

CQ-ID: Defdb00180477

Description: Best possible deceleration could not be parameterized correctly.

Bug fixing: Best possible deceleration can now be parameterized correctly.

2.2.22 No return movement is to be performed as error reaction when the drive is disabled

CQ-ID: Defdb00177271

Description: When the drive was disabled, the return movement was executed if set in P-0-0119.

Bug fixing: Now, when the drive is disabled and a return movement is set in P-0-0119, the error reaction set for an F6xxx error is executed instead.

2.2.23 Filter times are not correctly converted!

CQ-ID: Defdb00171199

Description: The filter time conversion is not accurate!

Bug fixing: The bug was fixed.

2.2.24 Firmware update via loader is impossible, if the SD card is plugged in

CQ-ID: Defdb00175898

Description: The firmware cannot be updated via the firmware loader when the SD card is plugged in.

Bug fixing: The bug was fixed.

2.2.25 Function MMX_IECTaskGetLoad()

CQ-ID: Defdb00175163

Description: The function block MMX_IECTaskGetLoad() did not show the task load properly, if the performance of the HMC was set via parameter P-0-0556 to Economy Performance (-> PLC runs every 2 ms) or Low Performance (-> PLC runs every 4 ms).

Bug fixing: The bug was fixed.

2.2.26 Activating main spindle package for the HMC

CQ-ID: Defdb00178208

Description: Activating main spindle package for the HMC

Bug fixing: Main spindle package for the HMC activated

2.2.27 The actual value of the simulation encoder jumps when switching to OM takes place

CQ-ID: Defdb00178130

Description: When the simulation encoder was used, the actual position value was re-initialized and not restarted at the last actual position value when the drive was switched to "OM". This resulted in a jump in the actual value.

Bug fixing: The bug was fixed.

2.2.28 Removing calibration values for the pump controller from the list of parameters to be saved (S-0-0192)

CQ-ID: Defdb00179059

Description: In the past, the calibration values for the pump controller (P-0-2980, P-0-2981, P-0-2982, P-0-2994, P-0-2995, and P-0-2996) were overwritten with default values when the command "load basic parameters" was executed. In addition, these parameters were contained in the list of parameters to be saved. This resulted in the fact that when a parameter backup was transmitted, the calibration values were overwritten as well.

Bug fixing: Now, the calibration values are no longer overwritten with the command "load basic parameters" or with a parameter backup of parameters to be saved. To reset the calibration values to their default values, the respective command can be used.

Note: In the case of a release change from HDx20V02 to HDx20V04 the value for calibration values is not accepted, and after the change, the calibration values have to be set valid once. For this reason, it is recommended that the calibration values be noted before the change and then entered again.

Interim solution: With firmware version HDB20V02 the calibration values have to be noted before starting the command "load basic parameters" and then have to be entered again.

2.2.29 Force controller - jerk-free activation via I-component

CQ-ID: Defdb00178744

Description: At the moment when switching from position to force control, the output of the velocity controller (P-0-2826) minus P-component is copied to the force controller integrator (P-0-2846.0.2). So far, the sum from the force controller integrator and the P-component (P-2846.0.1) has been output at the force controller output (P-0-2843) with a delay of one clock cycle. In the first clock cycle, merely the P-component of the force controller was output and hence the control variable broke down for one cycle.

Bug fixing: The sum of the force controller integrator and the P-component is now correctly issued at the output in the first clock cycle after the changeover. The control variable no longer breaks down.

2.2.30 Force controller: Enable condition for I-component can be switched on/off

CQ-ID: Defdb00175587

Description: The force change threshold is always evaluated.

Bug fixing: The evaluation of the change threshold for the force controller I-component can now be deactivated by means of bit 0 in the control word P-0-2840. All the other conditions for activating the I-component in the force controller are still valid!

2.2.31 The position command value is changed in the case of Drive Halt and change of operation mode

CQ-ID: Defdb00181707

Description: When changing the operation mode or triggering a drive halt, a jump in the position command value was generated when the fine positioner was active.

Bug fixing: The bug was fixed.

2.2.32 Incorrect updating of P-0-2930.0.1 in velocity control

CQ-ID: Defdb00180349

Description: The parameters P-0-2930.0.1 and P-0-2930.0.2 were not updated correctly, if no position controller was active.

Bug fixing: The bug was fixed.

2.2.33 P-0-0556, Config word of axis controller allows invalid entries

CQ-ID: Defdb00179779

Description: Parameter P-0-0556, Config word of axis controller allowed invalid entries. It was possible to set non-defined bits.

Bugfix: Parameter P-0-0556, Config word of axis controller now accepts defined bits only. See parameter description.

2.2.34 P-0-2832.0.10, "State controller force normalization" is incorrectly converted

CQ-ID: Defdb00175098

Description: State feedback by means of the actual force value was only effective, if the mass was entered in parameter P-0-2832.0.10 with a reduction by a factor of 1000!

Bugfix: The bug was fixed.

2.2.35 Parameter "Max. flow" missing for DFE

CQ-ID: Defdb00174461

Description: Parameter P-0-2875.0.3 was not available for the pump controller (functional package DFE).

Bugfix: Parameter P-0-2875.0.3 is now available.

2.2.36 Parameter "moved mass"

CQ-ID: Defdb00181282

Description: So far, 2 parameters have been available for the moved mass.

P-0-2917.0.7 for simulation and P-0-2832.0.10 for calculation in the force feedback of position control.

Bugfix: P-0-2917.0.7 was removed. P-0-2832.0.10 is now also used for simulation.

2.2.37 Applying & activating parameters for quadrant correction feedforward

CQ-ID: Defdb00170040

Description: P-0-0432 can now also be used to display the current quadrant error value (also in the oscilloscope)

Bugfix: The bug was fixed.

2.2.38 Change of parameter names with "nx" or "n_..."

CQ-ID: Defdb00178424

Description: For parameters S-0-0125, S-0-0330, S-0-0330, S-0-0331, S-0-0332, and S-0-0335 hydraulics-specific parameter names were introduced.

2.2.39 PROFINET: An impermissible device name can be entered in parameter P-0-4089.0.2.

CQ-ID: Defdb00178952

Description: If a double buffer is used, the status word for the buffer control may have been changed => the checksum calculation has to be suppressed.

Bugfix: The bug was fixed.

2.2.40 Reaction in the case of fatal warning

CQ-ID: Defdb00180890

Description: When travel range monitoring was activated (software) and "warning" was selected as reaction, the axis did not stop in direct valve control. Moreover, it was possible that a jump occurred at the controller output.

Bugfix: Now, when travel range monitoring is activated (software) and "warning" is selected as reaction, the axis stops in every operation mode. The axis movement can be restarted by reversing the direction in the command value.

Interim solution: If an error is activated instead of a warning, the axis performs the defined reaction.

2.2.41 Simulation encoder default values for pos. and neg. limit stop

CQ-ID: Defdb00177038

Description: The default value for the positive and THE negative limit stop of the simulation encoder was 0!

Bugfix: The default value was set to a reasonable starting value.

2.2.42 Sporadic F2100 (incorrect access to command value memory)

CQ-ID: Defdb00181140

Description: With high system loading, it could happen that error F2100 was sporadically triggered.

Bugfix: The bug was fixed.

2.2.43 With SoE/SoV the control/status word is not automatically activated after a profile change

CQ-ID: Defdb00181168

Description: For bus systems with ServoDrive profile (SoE, SoV) the control word and the status word were only set correctly when basic parameters were loaded.

Bugfix: The bug was fixed.

2.2.44 TFTP GET did not work

CQ-ID: Defdb00177504

Description: With TFTP GET the firmware could not be loaded from the drive.

Bugfix: The bug was fixed.

2.2.45 TTL encoder: No cable break is reported when no encoder is connected while the HMC is starting up.

CQ-ID: Defdb00176250

Description: A TTL encoder is set as encoder for the HMC. If, while the HMC is starting up, no TTL encoder is connected and switching to OM mode takes place after starting up, a cable break is recognized.

Bugfix: The bug was fixed.

2.2.46 Superfluous limit value queries in the force and valve generator

CQ-ID: Defdb00173307

Description: Presetting a valve command value or a force command value in the individual operation modes was always restricted by the respective limit values. This resulted in complicated commanding, e.g. when using alternating control with subsequent changeover to the force control mode.

Bugfix: Now, presetting a valve command value or a force command value in the individual operation modes is no longer restricted.

2.2.47 The valve characteristic curve did not work properly

CQ-ID: Defdb00181686

Description: When the valve characteristic curve was to be used, it was only taken into account if 3 points were specified.

Moreover, values outside the defined characteristic curve were not limited.

Bugfix: Now, the characteristic curves becomes valid with 2 points.

Outside the defined characteristic curve the curve is now limited.

2.2.48 Scaling of pressure and flow: No reaction to a change in the resolution

CQ-ID: Defdb00178416

Description: The pressure and flow scaling resolution was not re-calculated/updated immediately when the factor or exponent was changed.

Bugfix: The bug was fixed.

3 HDx20V06

3.1 Functional extensions

3.1.1 Analog encoder input

CQ-ID: Defdb00185581

Extension: An analog encoder may be used as actual position value

3.1.2 DT1 derivative mode for force controller

CQ-ID: Defdb00185585

Extension: Extension of the DT1-element in the force controller

3.1.3 Extension of SSI encoder with binary coding

CQ-ID: Defdb00185586

Extension: For the use of SSI encoders it is possible to select between Gray and binary coding.

3.1.4 Extension of output adjustment by second valve standard velocity

CQ-ID: Defdb00185584

Extension: Optionally, a second valve standard velocity can be used for the negative direction.

3.1.5 Hydraulic libraries for HMC

CQ-ID: Defdb00185580

Extension: New extension library for the hydraulic function with the following function blocks:

Force limit, specific motion profiles and valve activation

3.1.6 Implementation of POWERLINK

CQ-ID: Defdb00185590

Extension: Support of the POWERLINK bus system

3.1.7 No wire break for analog assignment

CQ-ID: Defdb00185589

Extension: For the analog assignment, wire break monitoring can be switched off irrespective of the selected value range.

3.1.8 No MDT-capability of valve standard velocity and servicing command value

CQ-ID: Defdb00185181

Description: So far, valve standard velocity and the servicing command value had not been MDT-capable

Extension: The valve standard velocity and the servicing command value are now MDT-capable

3.1.9 Configurable valve characteristic curve (compensation characteristic curve, valve characteristic curve)

CQ-ID: Defdb00185588

Extension: The valve characteristic curve can optionally be entered as compensation characteristic curve (as calculated in firmware) or as valve characteristic curve (as given in the valve data sheet).

3.1.10 New force limit values

CQ-ID: Defdb00185583

Extension: Substitution of the previous force limitation values S-0-0082 and S-0-0083 by new parameters S-0-0550 and S-0-0551 with an extended value range. Introduction of a ramp time S-0-0553.

3.1.11 Offline server

CQ-ID: Defdb00185579

Extension: Offline server is available for all HDx derivatives.

3.1.12 Support of position controller time of 400 µs

CQ-ID: Defdb00185582

Extension: Base cycle time and position controller cycle can be set to 400 µs. Restriction: For firmware derivative HDB, not possible with functional package "closed loop".

3.1.13 State controller / active damping for open-loop devices

CQ-ID: Defdb00185587

Extension: "State control" renamed "active damping" and activation of this function also for the functional package "open loop"

3.2 Fixed bugs

3.2.1 1Vpp encoder: Position feedback value freezes

CQ-ID: Defdb00184576

Description: The internal position resolution and corrective factors based on it were incorrectly calculated, which resulted in the generation of too high a position feedback value due to a corrective factor outside the valid value range.

Bug fixing: Internal position resolution as well as corrective factors are now correctly calculated.

3.2.2 In the case of an encoder error, no OM possible

CQ-ID: Defdb00184407

Description: Switching to OM despite an encoder error was not provided in the new encoder concept.

Bug fixing: Switching to OM despite an encoder error is now possible again to achieve the same behavior as in HDx18.

3.2.3 In the event of a cable break of the incremental encoder, error F2201 (quadrant error of encoder signals) is triggered

CQ-ID: Defdb00184126

Description: Diagnostic messages F220x should generally not be triggered, since they are a remainder of the original ENCB implementation. In the evaluation of the TTL encoders, the diagnostic message was issued by mistake instead of merely signaling detailed diagnostics.

Bug fixing: Diagnostic message F2201 is no longer documented. Instead, only detailed diagnostics are signaled.

3.2.4 In the case of rotary scaling, it must not be possible to activate alternating control and operation modes using force control

CQ-ID: Defdb00185100

Description: In conjunction with rotary systems it was possible to activate the operation modes of torque/force control or alternating control.

Bug fixing: In conjunction with rotary systems it is now no longer possible to activate the operation mode of torque/force control or alternating control.

3.2.5 Binary SSI encoder: Reference for the encoder is lost when the encoder is switched off

CQ-ID: Defdb00184650

Description: This erroneous behavior can have various causes: Under certain circumstances the reference information was not correctly saved or restored. Moreover, a run-up phase of the encoder electronics is required after switching on, but this was not considered.

Bug fixing: Saving and loading behavior of the reference information was corrected. Now, a run-up phase of measuring system electronics after switching on is provided.

3.2.6 The bus cycle time is not adopted for Servodrive-based bus systems

CQ-ID: Defdb00185161

Description: In the case of Servodrive-based bus systems (VARAN, EtherCAT), the bus cycle time was not correctly adopted so that internally a bus cycle time of 2 ms was assumed for calculations.

Bug fixing: The bug was fixed.

3.2.7 Default value of P-0-2853.0.0 (Alternating control, control word) is not correct

CQ-ID: Defdb00185030

Description: The default setting for the behavior of the position interpolator with alternating control was CONTINUE

Bug fixing: Now, the default setting for the behavior of the position interpolator with alternating control is BREAK

3.2.8 Default value for P-0-4084 in dependence on the set field bus profile type

CQ-ID: Defdb00178090

Description: When loading basic parameters, depending on the selected master communication, a profile was activated in the drive, which contains a position operation mode (especially v-control).

Bug fixing: When basic parameters are loaded, the suitable default profile is now determined and, depending on this profile, the correct default operation mode is set. Here, the specialties of the present HW is taken into account. The operation mode thus configured is therefore always valid.

Interim solution: After loading of basic parameters, the operation modes have to be set manually to a suitable operation mode.

3.2.9 Reading the default value for displacement (P-0-2943) from the HW data

CQ-ID: Defdb00181176

Description: So far a value of 100 cm³ has been taken as default value for the displacement.

Bug fixing: As of HDx20V04, the value from the hardware data, which was entered during production of the SY(H)DFED system, is taken as default value for the displacement of the SY(H)DFED system.

Interim solution: After basic parameters were loaded, the displacement value (P-0-2943) has to be entered manually.

3.2.10 The setting "direct command value output to valve" may only be effective in direct valve control

CQ-ID: Defdb00182498

Description: The selection "direct command value output to valve" in the operation mode dialog of "direct valve control" has effects in both, the operation mode "direct valve control" and in the "(open/closed-loop) flow control" mode. However, it should only have an influence on direct valve control.

The reason for this is that with both operation modes the same valve activation controller function is called.

Bug fixing: For the "(open/closed-loop) flow control" mode, calling the function "valve activation controller function" has now been substituted by a logic, which no longer queries the status of the selection "direct command value output to the valve".

3.2.11 With VARAN, F4002 can only be cleared by rebooting the drive

CQ-ID: Defdb00185487

Description: If the telegram fails twice while the drive is in closed-loop control, an F4002 error is generated. The error could not be cleared and could only be acknowledged by switching the drive off and on.

Bug fixing: The bug was fixed.

3.2.12 F8079 with simulation encoder

CQ-ID: Defdb00181109

Description: When the simulation encoder was incorrectly configured in the HDx18 firmware, an internal overflow could occur in velocity calculations. With the HDx20 firmware, this can no longer take place due to a changed calculation process and a determined resolution.

Bug fixing: The bug was fixed.

3.2.13 Missing units in the parameter file

CQ-ID: Defdb00180575

Description: The parameter had to be read once, then the unit was correct.

Bug fixing: The bug was fixed.

3.2.14 Error in the drive error reaction with the HPC

CQ-ID: Defdb00185352

Description: The following bugs were fixed:

1. In the past, the selection "best possible deceleration" allowed only one common behavior for F2/F4 and F6 errors. As a result of this, it was impossible to change best possible deceleration via the drop-down menu in IndraWorks.

2. It was no longer possible to clear an F2280 error after the error reaction of immediate shutdown.

Bug fixing: Re 1: The error reaction for F2/F4 and F6 errors can now be selected independently of one another in IndraWorks

Re 2.: The F2280 error can now be cleared.

Interim solution: Re 1: To change the reaction of "best possible deceleration", P-0-0119 has to be modified manually in the parameter editor.

Re 2.: The error can only be cleared by a voltage reset.

3.2.15 Incorrect output adjustment (valve characteristic curve + overlap)

CQ-ID: Defdb00178826

Description: When overlap and characteristic curve were active, a jump occurred in the control variable at the overlap when the overlap threshold was reached.

Bug fixing: Now, when overlap and characteristic curve are active, overlap is active only within the overlap; outside the overlap, only the characteristic curve is active. At the transition, no jump takes place. If the characteristic curve does not run through the point of overlap, the characteristic curve is shifted to this point and re-scaled.

3.2.16 Incorrect cycle time adoption with EtherCAT SoE

CQ-ID: Defdb00185516

Description: When the drive steps up, the bus cycle time is adopted internally by parameter P-0-4076. Since it is hardware-covered, the bus cycle time was not accepted internally, which could lead to an error message F2067.

Bug fixing: The bug was fixed.

3.2.17 In the analog mode of "automatic startup" the state AF is exited accidentally

CQ-ID: Defdb00185653

Description: Monitoring of cyclic writing of P-0-4028 must not always be activated.

Bug fixing: Monitoring of cyclic writing of P-0-4028 was activated in dependence on P-0-2945.

3.2.18 Incremental encoder: Error F8022 has to be acknowledged twice, if the encoder supply voltage is overloaded.

CQ-ID: Defdb00184253

Description: After the supply voltage was switched on, the switch-on time was not allowed to elapse, which is necessary to ensure that encoder signals are valid.

Bug fixing: After switching on of the supply voltage, the specified switch-on time is now allowed to elapse, and only then are the encoder signals valid.

3.2.19 Command for clearing the reference does not work correctly

CQ-ID: Defdb00184255

Description: There were general errors when saving and restoring reference information from the absolute encoder memory (P-0-0177). For example, when switching

to OM, saved reference information was never evaluated, and a valid absolute encoder memory alone was sufficient to “establish” the reference.

Bug fixing: Saving and restoring reference information from the absolute encoder memory (P-0-0177) was corrected.

3.2.20 The loader uses the wrong MAC address

CQ-ID: Defdb00184651

Description: The loader uses a firmly coded emergency MAC address.

Bug fixing: The correct MAC address is loaded and used by the loader.

3.2.21 After a cable break error with EnDat, switching to OM is no longer reliably possible

CQ-ID: Defdb00175900

Description: The eTPU function for the EnDat 2.2 encoder had been incompletely initialized in some constellations. This resulted in the fact that the eTPU function could no longer be carried out properly, if the states in the eTPU had been influenced before by the preceding execution.

Bug fixing: The initialization of the eTPU function for EnDat 2.2 was revised.

3.2.22 P-0-0059 requires a hydraulic enable

CQ-ID: Defdb00182524

Description: Parameter P-0-0059 was visible in all functional packages.

Bug fixing: Parameter P-0-0059 is now only visible with position control.

3.2.23 Activating parameter P-0-0250.0.10 (-> IndraWorks Views manager)

CQ-ID: Defdb00182138

Description: The parameter was activated and functioned exactly as with the MPx derivatives.

3.2.24 The parameter suggested by the initial parameterization wizard is incorrect, if the IAC-2x has not yet been switched to OM

CQ-ID: Defdb00184223

Description: With an IAC-ME, the relevant parameters with regard to nominal pressure and nominal flow were not converted immediately.

Bug fixing: With every change in scaling of pressure and flow the parameters are shown correctly.

3.2.25 PROFIBUS: The MDT data of the master may be incorrectly read in

CQ-ID: Defdb00184112

Description: Under certain conditions it could happen that the MDT data had not been updated in the device for several milliseconds. The occurrence of the error depended on the clock cycle ratio of the position controller clock cycle to the PROFIBUS bus cycle time.

Bug fixing: The cause of error was eliminated so that the MDT data of the master are now read in and updated correctly.

Interim solution: By increasing the position controller clock cycle and/or reducing the PROFIBUS bus cycle time in the master, the occurrence of the error situation can be avoided. The error occurred primarily when a position controller clock cycle of less than 1 ms was used.

3.2.26 Rotary encoders do not work

- CQ-ID:** Defdb00184630
- Description:** In the current version of 20T05 and 20T07 the error can no longer be reproduced. Tested with various encoder types (analog, SSI, EnDat 2.2, TTL).
Consequently, no activities required.
- Bug fixing:** The bug was fixed.

3.2.27 S-0-0824 is not generated in alternating control

- CQ-ID:** Defdb00184895
- Description:** Bit 0 was not generated in parameter S-0-0824 in alternating control
- Bug fixing:** Bit 0 is now generated in parameter S-0-0824 in alternating control

3.2.28 S-0-0900 and S-0-0901 are limited to 2 bytes

- CQ-ID:** Defdb00184893
- Description:** Parameters S-0-0900 and S-0-0901 were limited to 2 bytes.
- Bug fixing:** Parameters S-0-0900 and S-0-0901 are no longer limited to 2 bytes.
The maximum value is S-0-0534.

3.2.29 Writing files to the SD-card via the SysFile... libraries does not work

- CQ-ID:** Defdb00184638
- Description:** With the HMC, writing files to the SD-card via the SysFile... libraries did not work correctly. The files were created with the correct sizes on the SD-card, but the contents were wrong (-> they did not contain the written characters).
- Bug fixing:** The bug was fixed.

3.2.30 SSI encoder: Changeover to OM is not possible in the event of an encoder error

- CQ-ID:** Defdb00184609
- Description:** Switching to OM despite an encoder error was not provided in the new encoder concept.
- Bug fixing:** Switching to OM despite an encoder error is now possible again to achieve the same behavior as in HDx18.

3.2.31 Switching to standard Ethernet may be permanently requested under certain conditions

- CQ-ID:** Defdb00177278
- Description:** Switching to standard Ethernet with changeover frame resulted in an event to the acyclic task at any time. This could have a negative effect on the performance of the drive.
- Bug fixing:** The event for switching is now generated only once. Subsequent changeover frames no longer result in an event to the task.

3.2.32 VARAN: After drive restart, sporadically no IP communication active

- CQ-ID:** Defdb00185451
- Description:** With active VARAN master communication and after rebooting the drive, the IP communication sporadically failed as long as the drive was in the INIT bus state.
- Bug fixing:** The bug was fixed.

3.2.33 Flow operation modes do not work with the HMC

CQ-ID: Defdb00182221

Description: In the "(open/closed-loop) flow control" mode, the HMC did not correctly convert the flow command value into a valve control variable.

Bug fixing: In the "(open/closed-loop) flow control" mode, the HMC now correctly translates the flow command value into a valve control variable.

3.2.34 Increment count of 1Vpp encoders is no longer read

CQ-ID: Defdb00183904

Description: The initialization of the DMA for copying the increment count could fail, without this being noticed by the calling program code. The increment count was therefore no longer copied and was no longer available for evaluation.

Bug fixing: The initialization of the 1Vpp encoder is now more resistant. When the initialization fails, error messages are generated.

3.2.35 Diagnostic system issues F6001 due to incorrect diagnostics

CQ-ID: Defdb00182229

Description: While booting, the diagnostic system issues error F6001 due to incorrect diagnostics.

3.2.36 Double velocity when starting the position controller with a clock cycle ratio of 1:1

CQ-ID: Defdb00182463

Description: At a clock cycle ratio of 1:1 (NC clock cycle : position clock cycle) a delay cycle was erroneously considered when starting at the actual position. This resulted in doubling of the calculated command velocity.

Operation modes: Drive-controlled positioning, positioning block

3.2.37 EPL: Free_Run: The content of object 1006 does not correspond to the bus cycle time

CQ-ID: Defdb00182108

Description: The content of object 0x1006 did not correspond to the bus cycle time, but contained the datum of "P-0-4076".

3.2.38 F9005 during PLC download while project information is displayed

CQ-ID: Defdb00183558

Description: If a new/another PLC project was loaded and, at the same time, "P-0-1363" was called in order to display the project information, an exception could occur. (In the dialog "MLD project info", "P-0-1363" is cyclically read. If this dialog is open while downloading, this error could occur.)

Interim solution: Do not open project info dialog while downloading.

3.2.39 Velocity scaling in mm/s incorrect

CQ-ID: Defdb00182414

Description: With mixed scaling (position rotary, velocity linear) the velocity values were incorrectly converted; the feed constant was not considered in the calculation.

3.2.40 Combination check of 0x60C2 may prevent changeover

CQ-ID: Defdb00182838

Description: The limit values of object 0x60C2 and their check were incorrect.

3.2.41 Maximum value of S-0-0113/P-0-0113 for linear motors incorrect

CQ-ID: Defdb00182671

Description: For linear motors, the maximum value of parameters S-0-0113/P-0-0113 was incorrectly indicated.

3.2.42 After the 2nd reset (via S-0-1350) parameter values are lost

CQ-ID: Defdb00183612

Description: If, during the reboot command, a parameter backup was run, parameters could get lost; F2009 was generated.

3.2.43 Problems in the MLD project while loading the parameter file

CQ-ID: Defdb00183641

Description: When a loaded MLD project is deleted in the PLC dialog, no restart is executed and the MLD project is subsequently loaded by means of a parameter file, the MLD project is not automatically active after switching from PM->OM took place.

To achieve this, either switching off and on is required or bit 7 of P-0-1350 has to be set to load the boot project. This is started automatically by IndraWorks via the dialog "Project Information" and "Load project".

3.2.44 S/IP: PlcVarAccess, F9005, if MLD is not configured as functional package

CQ-ID: Defdb00182797

Description: In the case of requests via "PLC Browse Requests" the device generated error F9005 when the MLD functional package was not active.

3.2.45 S-0-0602.x.136 is not reset when loading default values

CQ-ID: Defdb00183626

Description: When default values were being loaded, "S-0-0602.x.136, Phys. encoder evaluation configuration" was not reset.

3.2.46 Feed constant (S-0-0123) has no longer a unit

CQ-ID: Defdb00182435

Description: With rotary scaling, the unit of the feed constant (S-0-0123) was set to "not available".

The feed constant is subject to position scaling. With rotary scaling, degree/rev should therefore be displayed. This does, however, not make sense, because the feed constant refers to the feed screw.

Bug fixing: For reasons of compatibility, the feed constant is shown in mm/rev also in the case of a rotary position. The decimal places refer to rotary position scaling.

4 HDx20V08

4.1 Functional extensions

4.1.1 Automatic measurement of the valve characteristic curve

CQ-ID: Defdb00187075

Extension: The valve characteristic curve of a hydraulic valve can be precisely measured with the help of a command.

4.1.2 Closed-loop force/flow control mode for pressure compensators

CQ-ID: Defdb00187076

Extension: New operation mode of closed loop torque/force control/(open/closed loop) flow control possible for devices with functional package p/Q.

4.1.3 On the VT-HPC, digital output 4 can be configured as supply voltage for pressure transducers

CQ-ID: Defdb00187077

Extension: The digital output of the VT-HPC can be configured so that it always outputs 24 V and can therefore be used as supply voltage for connected sensors.

4.1.4 Extension of the VARAN info page

CQ-ID: Defdb00187078

Extension: Extension of the VARAN info page by the following data:
MAC address, IP address, firmware version

4.1.5 Additional pressure filter for integrator calculation in pump control

CQ-ID: Defdb00187079

Extension: For the I-component in the cascade structure, the derivative of the pressure feedback value can now be additionally filtered.

4.2 Fixed bugs

4.2.1 Alias for P-0-2806.0.2 missing!

CQ-ID: Defdb00186993

Description: No alias available for P-0-2806.0.2!

Bug fixing: Alias P-0-3729 for P-0-2806.0.2 now available !!!

4.2.2 The AxisData structure still contains the old force feedback value (S-0-0084)

CQ-ID: Defdb00185787

Description: In the AxisData structure (-> component rActualTorqueForce_i) the old force feedback value (S-0-0084), which has a size of 2 bytes and can hence only display a maximum value of +/-32767 kN and limits the force to this maximum value in case of larger forces, was shown for the HydraulicDrive. The new 4-byte force feedback value (S-0-0552) was not displayed.

Bug fixing: The AxisData structure (-> component rActualTorqueForce_i) now shows the new force feedback value (S-0-0552).

4.2.3 Handling of incorrect checksums in HW data

CQ-ID: Defdb00183911

Description: Incorrect checksums in the HW data were not copied to the datum address and were therefore not available to the firmware at runtime. Moreover, an invalid HW datum 1 prevented booting of the FPGA, which resulted in the fact that no Ethernet communication was possible.

Bug fixing: The HW data are now re-copied also in the case of incorrect checksums to allow the firmware to start up. In addition, the FPGA is started to activate Ethernet communication. It is, however, ensured that the drive cannot run up by issuing a non-deletable error "control section defective".

4.2.4 When loading parameters, not all of the parameters are written correctly the first time.

CQ-ID: Defdb00186487

Description: Loading of a parameter file for configuring an analog assignment did not work correctly, if the analog input was reconfigured as well. The input is reconfigured, the signal type is set to the default value of the old signal type.

Bug fixing: Loading of a parameter file for configuring an analog assignment now functions correctly.

4.2.5 The bus cycle time is not adopted for Servo Drive-based bus systems

CQ-ID: Defdb00185453

Description: In the case of Servo Drive-based bus systems (VARAN, EtherCAT), the bus cycle time was not correctly adopted so that internally a bus cycle time of 2 ms was assumed for calculations.

Bug fixing: The bug was fixed.

4.2.6 A ramp time of 0 ms does not deactivate flow ramps

CQ-ID: Defdb00184955

Bug fixing: The flow ramp can now be deactivated by entering a ramp time of 0 ms.

4.2.7 Pressure ramp active despite a ramp time of 0 ms

CQ-ID: Defdb00183346

Description: With a ramp time of 0 ms the pressure command value ramp was nevertheless calculated in every sampling step using the value entered for "Pressure ramp reference" (S-0-0811).

Bug fixing: With a ramp time of 0 ms, the ramp is deactivated irrespective of the "pressure ramp reference" value.

Interim solution: Set parameter "pressure reference" (S-0-0811) to maximum pressure.

4.2.8 Error of analog input cannot be acknowledged in PM

CQ-ID: Defdb00184722

Description: The assignments are no longer calculated in PM, which results in the fact that the status bits are no longer updated. These status bits are, however, still evaluated in PM to signal errors or warnings. It was therefore no longer possible to reset the errors or warnings.

Bug fixing: Status bits of the assignments are no longer evaluated in PM.

4.2.9 Error with acyclic data transmission over VARAN

- CQ-ID:** Defdb00184111
- Description:** When transmitting lists of a length of more than one VARAN frame over the acyclic VARAN service channel, the individual segments were not correctly acknowledged by the drive and hence the transmission was interrupted.
- Bug fixing:** The bug was fixed.

4.2.10 Valve error message F2281 is also issued in PM

- CQ-ID:** Defdb00184950
- Description:** Under certain conditions, diagnostic messages E2280, F2280, F2281, and E2282 were triggered in the parameter mode.
- Bug fixing:** The relevant diagnostic messages are now only triggered in the operating mode.

4.2.11 IAC-2x with 8+4 connector is no longer accessible, if PROFINET or EtherNet/IP is set

- CQ-ID:** Defdb00178956
- Description:** Problem in conjunction with devices with only 1 Ethernet port and PROFINET or EtherNet/IP.
- Bug fixing:** Evaluation, whether device is provided with 11+PE connector (then 2 Ethernet ports) or 8+4 connector (then only 1 Ethernet port). If only 1 Ethernet port is available, neither PROFINET nor EtherNet/IP can be set.

4.2.12 IndraWorks timeout when firmware is downloaded over VARAN/ EtherCAT

- CQ-ID:** Defdb00182622
- Description:** When firmware was downloaded over the VARAN or EtherCAT bus, the drive did not acknowledge the last data package. This resulted in an error message via IndraWorks at the end of the download, although downloading was completed successfully.
- Bug fixing:** The bug was fixed.

4.2.13 Loading basic parameters for the HPC in offline parameterization provides an incorrect value for the type of swivel angle sensor

- CQ-ID:** Defdb00183891
- Description:** When the basic parameters for the HPC were loaded in offline parameterization in IndraWorks, the correct default type for the swivel angle sensor (-> AWAX voltage) was not set in parameter P-0-2948 = 3, but an impermissible type was entered in P-0-2948 = 768.
- Bug fixing:** The bug was fixed.

4.2.14 Issuing of diagnostic message F4011, if the internal communication with the PROFIBUS interface is overloaded or disturbed

- CQ-ID:** Defdb00184114
- Description:** If the internal communication interface to the PROFIBUS interface connection was overloaded or disturbed, error message F4009 was issued. In this case, the cause for this error message was not obvious, since several sources of errors could be possible.

Bug fixing: If the internal communication interface to the PROFIBUS interface connection is overloaded or disturbed, diagnostic message F4011 will be issued in the future. This diagnostic message is triggered for PROFIBUS only in this special case. This simplifies the distinction between internal and external errors that affect the bus interface.

4.2.15 Message E2004 after reboot

CQ-ID: Defdb00186379

Description: Warning E2004 (->performance load prewarning threshold exceeded) was entered in the diagnostic memory after each rebooting.

Bug fixing: The bug was fixed by initializing performance monitoring correctly.

4.2.16 Min. value for P-0-2976, Swivel angle command value (without RF) does not allow negative values

CQ-ID: Defdb00185345

Description: So far, it has not been possible to enter negative values in P-0-2976.

Bug fixing: It is now possible to enter also negative values in P-0-2976.

4.2.17 No default value written to P-0-2996 (pressure command value for leakage calibration)

CQ-ID: Defdb00185510

Description: When the call "write default values to calibration values" is started in pump calibration, the default values are not written to P-0-2996.

Bug fixing: Now, default values are written to P-0-2996.

Interim solution: The value for P-0-2996 must be entered manually.

4.2.18 Parameter P-0-4084 is ignored while loading default values

CQ-ID: Defdb00180719

Description: When default values were loaded, parameter P-0-4084 was not set to the corresponding default value, but the last value of P-0-4084 was retained.

Bug fixing: The bug was fixed.

4.2.19 Parameters S-0-0550 and S-0-0551 do not take account of the inversion of force scaling

CQ-ID: Defdb00186677

Description: Parameters S-0-0550 and S-0-0551 did not take account of the inversion of force scaling in parameter S-0-0085, bit 0.

Bug fixing: Parameters S-0-0550 and S-0-0551 now take account of the inversion of force scaling in parameter S-0-0085, bit 0.

4.2.20 POWERLINK - synchronizing the PLL did not work

CQ-ID: Defdb00186515

Description: In conjunction with POWERLINK, synchronizing the PLL did not work correctly in the following case:

- The POWERLINK master operated with a Sync pulse within a time base of 2 ms.
- The PLL could not synchronize with the Sync pulse, since the POWERLINK master sent the Sync pulse with a tolerance greater than 0.05 %.
- This resulted in error messages C0251 or F2067.

Bug fixing: Permissible tolerance was increased from 0.05 % to 0.5 %.

4.2.21 Problem with scaling in case of analog assignments

CQ-ID: Defdb00184745

Description: For scaling and offset, the content of the parameter attribute was copied, which resulted in the fact that changes in "variable" attributes, such as in scalings, had no effect on the scaling and offset of the assignment.

Bug fixing: Instead of the content of the attribute, the pointer of the attributes is now copied. Due to this, scalings and offsets directly receive any changes, which result e.g. from scaling settings.

4.2.22 Status word of device control is generated incorrectly

CQ-ID: Defdb00186228

Description: The control word was not correctly generated in various constellations of progressing and switching back.

Bug fixing: The control word is now correctly generated.

4.2.23 Changing over from parallel structure to cascade structure in pump control results in a pressure peak

CQ-ID: Defdb00184998

Description: When switching between parallel structure and cascade structure in the pump controller, a pressure peak could occur under certain conditions.

4.2.24 Invalid parameter S-0-0217 or no default value for S-0-0217

CQ-ID: Defdb00184911

Description: The parameter block preselection was not automatically reduced to the set preselection range.

Bug fixing: The bug was fixed.

4.2.25 Varan_Parameter_Transmission_IAC

CQ-ID: Defdb00186623

Description: With 16-bit bus systems, parameters P-0-2915.0.1 and P-0-2915.0.6 could not be cyclically transmitted over the bus, since these parameters were not created as 16-bit alias parameters.

Bug fixing: The bug was fixed.

4.2.26 Interrelationships between P-0-4084 and P-0-4089.0.1 when loading a parameter

CQ-ID: Defdb00183844

Description: When a parameter file was loaded, writing to P-0-4084 might have been impossible, because the master communication protocol P-0-4089.0.1 did not match.

Bug fixing: No dependency of order. Validity is checked only later at changeover PM->OM (C02).

4.2.27 With DS402, switching from "ready to switch on" to "switched on" without power on is prevented

CQ-ID: Defdb00182443

Description: With DS402, switching from "ready to switch on" to "switched on" without power on was prevented. No diagnostic message was generated.

With Sercos 3 (P-0-4089.0.1 == 6), profile CiA402 (P-0-4084 == 0x402) was not included in the list of available profiles (P-0-4084.0.1) and could therefore not be configured.

Bug fixing: With DS402, switching from "ready to switch on" to "switched on" without power on is not prevented.

With Sercos 3, the configuration of profile CiA402 is accepted again for testing purposes (but is not contained in the list of available profiles - profile not listed in the selection combo box).

4.2.28 Digital inputs and outputs incorrect after OnlineChange

CQ-ID: Defdb00185864

Description: Digital inputs and outputs behave faultily after an OnlineChange or remain "Off".

The error occurs as of MPx-18VRS to MPx20VRS in conjunction with the compiler/IW versions 3.4.5.120/IW13V16 and above.

Interim solution: Do not carry out OnlineChange or set compiler version <= 3.4.5.120/IW13V16.

4.2.29 F9005 while reading via ADS

CQ-ID: Defdb00184242

Description: Reading string parameters via interfaces without UTF8 support (example: ADS) can cause an F9005.

4.2.30 Error in the case of FB "MC_ReadStatus" in connection with MC_TorqueControl

CQ-ID: Defdb00184013

Description: In the torque control operation mode (function block MC_TorqueControl) the following error is generated when function block MC_ReadStatus is called:

ErrorIdent.Table = MLD_TABLE

ErrorIdent.Additional1 = 16#00000199

ErrorIdent.Additional2 = 16#00000001

Function block MC_TorqueControl was not assigned to a PLCopen state.

Bug fixing: When called with enable = TRUE, function block "MC_ReadStatus" now sets the "ContinuousMotion" output.

4.2.31 With falling execute edge, error outputs ErrorID and ErrorIdent are re-set

CQ-ID: Defdb00185047

Description: If, with motion function blocks of the MLD and in the event of a function block error, the Execute input was set to FALSE, the outputs ErrorID and ErrorIdent were reset.

Bug fixing: If, with a function block error present (outputs Error, ErrorID and ErrorIdent are set) the Execute input is set to FALSE, then only output Error is reset. At outputs ErrorID and ErrorIdent, the information remains present.

With a rising execute edge, the information at outputs ErrorID and ErrorIdent is then reset as well.

Generally, the information at outputs ErrorID and ErrorIdent should only be evaluated in conjunction with output Error = TRUE.

4.2.32 List parameters included in the oscilloscope signal selection

CQ-ID: Defdb00184750

Description: The following list parameters were contained in the oscilloscope signal selection:

- P-0-0173, List of configurable axis-specific monitoring functions
- P-0-0175, List of configurable device-specific monitoring functions
- P-0-0705, List of master axis initial positions, set 0
- P-0-0706, List of motion laws, set 0
- P-0-0707, List of distances, set 0
- P-0-0708, List of slave axis velocities, set 0

List parameters cannot be usefully recorded with the drive oscilloscope function, since the list element cannot be selected in the oscilloscope. Only element 0 can be recorded.

Bug fixing: List parameters P-0-0173, P-0-0175, P-0-0705, P-0-0706, P-0-0707, and P-0-0708 are now no longer enabled for the oscilloscope function and can therefore no longer be selected in the signal selection list for the oscilloscope function.

4.2.33 P-0-4089.0.1 - misleading min./max. values

CQ-ID: Defdb00184415

Description: P-0-4089.0.1 had the min. value "0" and, depending on the derivative, the max. value "19" or "22". These values were misleading because they could not be set by the user.

4.2.34 Problems while downloading parameters, e.g. via IW

CQ-ID: Defdb00185637

Description: Exception while writing parameter P-0-0320.

5 HDx20V10

5.1 Functional extensions

5.1.1 Analog encoder for position control extended for imperial scaling

CQ-ID: Defdb00190126

Extension: The analog encoder now also supports imperial scaling (-> entries in inch). In the past, the analog encoder had firmly been parameterized in "mm".

5.1.2 Modification of the characteristic curve course in the valve overlap

CQ-ID: Defdb00190134

Extension: The valve overlap is always calculated through the zero point; also in the case of asymmetrically set overlaps.

5.1.3 Extension of pump control for variable-speed variant

CQ-ID: Defdb00190128

Extension: Extension of the pump controller for preparing the realization of the variable-speed variant.

5.1.4 Extension of the changeover logic

CQ-ID: Defdb00190138

Extension: The changeover logic was extended by 2 further modes for switching back from pressure to flow control or direct valve control.

5.1.5 Extension of flow control for low-frequency systems

CQ-ID: Defdb00190136

Extension: Extension of the acquisition of chamber pressures A and B by calculated chamber pressures (P-0-2828 and P-0-2829) instead of measured pressures.

5.1.6 Enabling of the MLD function by means of an SD card

CQ-ID: Defdb00190124

Extension: For HPC devices the drive-internal PLC (MLD function) can be enabled by means of a special SD card.

5.1.7 Changed behavior when the hardware enable is withdrawn

CQ-ID: Defdb00190139

Extension: The behavior upon withdrawing the hardware enable can now be configured by means of P-0-2819.

5.1.8 New parameter for the input to output adjustment

CQ-ID: Defdb00190137

Extension: Introduction of a new parameter (P-0-2873.0.12) for the input value to output adjustment in the unit "velocity".

5.1.9 WRxD valves and SYDFED with MLD function

CQ-ID: Defdb00190123

Extension: Activation of the drive-internal PLC (MLD function) for the device families of WRxD and SYDFED (firmware derivative HDP).

The function is optionally available with the functional package "ML".

5.2 Fixed bugs

5.2.1 "Drive Ready" is not reset in case of drive error

CQ-ID: Defdb00188735

Description: The indication of "Drive Ready" (P-0-0115, bit 1) did not disappear in certain cases, when the enable was withdrawn due to a drive error.

Bug fixing: "Drive Ready" is now correctly reset when the enable is withdrawn due to a drive error.

5.2.2 "Valve control variable reached" is not generated for the HMC

CQ-ID: Defdb00189407

Description: Bit 0 of parameter S-0-0867, Valve status word, was not generated with the HMC.

Bug fixing: Bit 0 of parameter S-0-0867, Valve status word, is now also correctly generated with the HMC.

5.2.3 Alternating control with negative position scaling

CQ-ID: Defdb00190247

Description: When alternating control was active and negative position scaling was set, it could happen that when a new position value for reversing the direction was provided, no new movement was started.

Bug fixing: The provision of a new position value for reversing the direction now works properly also with negative position scaling.

5.2.4 Reading the firmware via TFTP gets stuck in an endless loop.

CQ-ID: Defdb00190049

Description: Reading of the current firmware HDC20V10 via TFTP did not work, since the reading process got stuck in an endless loop.

Consequently, the backup command also got stuck in an endless loop, since the command reads the firmware via TFTP.

Bug fixing: The bug was fixed.

5.2.5 Automatic measuring: Activation of the characteristic curve is not saved

CQ-ID: Defdb00189855

Description: During automatic measuring, the characteristic curve in output adjustment is activated among others.

This change has, however, not been saved so far.

If a reboot was executed at a later point in time, the characteristic curve was again deactivated.

Bug fixing: The activation of the characteristic curve during measuring is now correctly saved. After a reboot the characteristic curve continues to be active.

5.2.6 With a p/Q valve the P-0-2874.0.5 may be incorrectly generated in direct valve control

CQ-ID: Defdb00187691

Description: P-0-2874.0.5 might under certain circumstances (e.g. operation mode with pressure controller had been active before) have displayed a wrong value!

Bug fixing: P-0-2874.0.5 now shows the correct value irrespective of the previous operation mode!

5.2.7 In the case of an exception in the firmware, FPGA is not reset

CQ-ID: Defdb00188330

Description: If an exception occurred in the firmware, no reset was triggered on the FPGA assigned to bus communication so that the communication over the bus system (e.g. EtherCAT) remains active for the time being. The user can therefore not see directly that the firmware is no longer running.

Bug fixing: The bug was fixed. In the case of an exception, a reset of the FPGA is now triggered for the bus communication.

5.2.8 If the permissible velocity was too low, measuring was interrupted and an error generated

CQ-ID: Defdb00187318

Description: Measuring was interrupted with an error, if the velocity was too low.

Bug fixing: Measuring can now also be carried out at low max. velocities (e.g. ≤ 5000 mm/min) without any difficulties.

5.2.9 Change the default value for P-0-1367 so that the PLC is always started during booting

CQ-ID: Defdb00188134

Description: The default value for P-0-1367 (PLC configuration) was not set so that the PLC is always started during booting.

Bug fixing: The default value for P-0-1367 (PLC configuration) is now set so that the PLC is always starts during booting.

This offers the following advantage:

If an exception occurs in the PLC program, the PLC changes to STOP. A reboot now always starts the PLC. This allows "simple clearing" of the error by turning the power supply off and on, which often is the case with machines that run 24 hours a day -> no operators available at night.

5.2.10 Default value of control word of drive-controlled positioning

CQ-ID: Defdb00188814

Description: In the easy startup mode, the default setting of the operation mode "drive-controlled positioning" for the new travel range was "sequential block with halt".

Bug fixing: In the easy startup mode, the default setting of the operation mode "drive-controlled positioning" for the new travel range is now "direct acceptance".

5.2.11 In the operation mode "direct valve control", the delta-P (P-0-2874.0.5) is incorrectly calculated in the case of a negative valve command value

CQ-ID: Defdb00190067

Bug fixing: The delta-P is now correctly calculated for p/Q valves in the direct valve control operation mode when a negative valve command value is provided.

5.2.12 In the operation mode of pressure/flow control the pressure controller is activated directly after the controller enable was granted

CQ-ID: Defdb00189867

Description: In the operation mode of pressure/flow control, after the controller enable was granted, the pressure controller was accidentally active and therefore caused difficulties when flow control was to be reactivated!

Bug fixing: Now it is the flow controller which is always active first when the controller enable is granted in the operation mode of pressure/flow control. When the switching conditions are fulfilled changing over to pressure control takes place.

5.2.13 Entries for P-0-0119 lead to invalid operating data during the initialization

CQ-ID: Defdb00190112

Description: The error occurred when the value 0x0015 or 0x0051 was entered in P-0-0119 "best possible deceleration". (0x0015 => F2/F4 error: Switching to internal command values, F6 error: Immediate shutdown; 0x0051 => F2/F4 error: Immediate shutdown, F6 error: Switching to internal command values). During next rebooting P-0-0119 was recognized as invalid and the default values were loaded for the parameters.

Bug fixing: The two entries for P-0-0119 are now no longer recognized as invalid values.

Interim solution: Best possible deceleration for F2/F4 and F6 errors has to be set to the same value.

5.2.14 Incorrect behavior in the case of a cable break of the main stage position transducer

CQ-ID: Defdb00187767

Description: Triggering of error F8281 (cable break of main stage position transducer) in conjunction with a 3WRC resulted in the fact that the pilot valve attempted to control the main stage on the basis of the standstill value. It is, however, necessary to change to the failsafe position.

Bug fixing: When error F8281 is triggered, switching to the failsafe position now takes place.

5.2.15 Error in the assignments of analog inputs

CQ-ID: Defdb00188699

Description: In firmware HDx20V08 the assignment of analog inputs worked only with target parameters having a size of 4 bytes.

Bug fixing: The bug was fixed.

5.2.16 Error with characteristic curve type "symmetric" and negative input values

CQ-ID: Defdb00188321

Description: So far it has been possible to set "symmetric" as characteristic curve type and, at the same time, enter negative input values for the characteristic curve. This results in an undefined behavior.

Bug fixing: The characteristic curve is now set to "invalid" as soon as negative input values are set in conjunction with the characteristic curve type "symmetric". In such a case, a 1:1 characteristic curve is activated and the message "characteristic curve invalid" is issued. If the input values are corrected and/or the

characteristic curve type is changed, the characteristic curve becomes valid again.

5.2.17 Error with automatic measuring

CQ-ID: Defdb00188607

Description: In some cases it was very difficult to set a correct combination of stroke, velocity and acceleration so that automatic measuring worked in an optimum manner.

This could result in incorrect settings and the measuring process was interrupted.

Bug fixing: Now, the optimum acceleration is automatically calculated for all velocity levels, wherever possible.

5.2.18 Error in the 4-quadrant ramp with flow and direct valve control

CQ-ID: Defdb00186692

Description: When the 4-quadrant ramp was used for the valve or the flow command value, and a value of 0.0 ms was entered for a ramp time, the possibly resulting valid ramp time was ignored.

Example: When a positive command value was to be ramped to a negative command value, and 0.0 ms was entered for the ramp time positive, deceleration, and for the ramp time negative, acceleration, a ramp time > 0.0 was selected, a direct jump to the new, negative command value took place.

The correct sequence would be that a jump to command value 0 would take place first, and then the command value should be ramped to the actual new command value via the second ramp.

Bug fixing: The behavior was changed so that with a command value course via a 4-quadrant ramp, in which the command value changes its sign, all ramp times are now considered irrespective of their value.

5.2.19 Incorrect activation of counter-clockwise rotating pump with HS control

CQ-ID: Defdb00189229

Description: For a counter-clockwise rotating pump, apart from the signal for the actual swivel angle value, the signal for the valve command value used to be inverted as well. This incorrect inversion resulted in improper operation of the control.

Bug fixing: For a counter-clockwise rotating pump the valve command value is no longer inverted.

Interim solution: Parameter P-0-2873.0.3 has to be set to the value -1 to set aside the inversion of the valve command value.

5.2.20 Removing the enable of parameters for pump control

CQ-ID: Defdb00187651

Description: The parameters listed in the following were active irrespective of the functional package or, in the case of incorrect functional packages, were active, but had no function. This could lead to mixing up with the parameters actually required in the respective functional packages.

P-0-2800

P-0-2801

P-0-2857

P-0-1120

P-0-1121

P-0-1122

P-0-1123

P-0-1140

P-0-1141

P-0-1142

P-0-1143

Bug fixing: The relation of the respective parameters to the functional package was checked. Enabled functions that are not required were deleted. Thus, parameters, which would not have a function in functional packages, are no longer active or no longer present.

5.2.21 HMC: Cable break monitoring with SSI encoder (binary) and incremental encoder does not work

CQ-ID: Defdb00189555

Description: With 1:1 timing the error bit in the encoder status was not evaluated and encoder error F8022 therefore not triggered.

Bug fixing: The error bit in the encoder status is now also evaluated with 1:1 timing.

5.2.22 The I-component limitation has to be effective also with frozen integrator

CQ-ID: Defdb00187058

Description: With various controllers (position, velocity, force, and pressure) the limitation of the I-component was ignored when the integrator was frozen.

Bug fixing: The I-component limitation is now also considered when the integrator is frozen.

5.2.23 In the easy startup mode with velocity control mode, diagnostic message E2063 is not issued after the enable was set

CQ-ID: Defdb00189158

Description: When warning E2063 (velocity control) is present and after a change of the operation mode or removal of the controller enable and subsequent reactivation of the velocity control mode the warning was no longer displayed.

Bug fixing: When warning E2063 (velocity control) is present and after a change of the operation mode or removal of the controller enable and subsequent reactivation of the velocity control mode the warning is now displayed again.

5.2.24 In slave operation and with the cascade structure, swivel angle control is not activated

CQ-ID: Defdb00188534

Description: In slave operation and with the cascade structure, swivel angle control is not activated. Alternating control remains active.

Bug fixing: If slave operation is activated in the cascade structure, then only swivel angle control is active.

Interim solution: The slave has to be operated with the parallel structure.

5.2.25 Offset calibration of the pressure transducer is not completed when the assignment is missing

CQ-ID: Defdb00189010

Description: When offset calibration for the pressure transducer was started while no assignment to an actual pressure value was available, then calibrating could be started, but had never been completed or was interrupted with an error message.

Bug fixing: If no assignment for a pressure command value is available when calibrating is started, command error C7915 "No assignment of pressure command value available" is issued.

Interim solution: Calibrating has to be interrupted manually by writing the value "0" to P-0-2990.

5.2.26 Correction with regard to the behavior of alternating control

CQ-ID: Defdb00187264

Description: When alternating control was switched off in the operation mode of drive-controlled positioning while force control was active, the position command value was provided and the axis came to a standstill at this position.

Bug fixing: Now, when alternating control is switched off in the operation mode of drive-controlled positioning while force control is active, the position command value is provided and the axis comes to a standstill at this position if it had already reached the given target position. Otherwise, the system attempts to position at the target position.

5.2.27 Following a download of a PLC project with a task in synchronism with master communication, a PLC error message is issued in the case of a position control clock cycle of 2 ms.

CQ-ID: Defdb00189351

Description: If the PLC program of the HMC contained a task synchronized with master communication and a position controller clock cycle of 2 ms had been set in P-0-0556, error message F6010 was issued after the PLC program was downloaded. Parameter P-0-1365 then contained the error message: "MLD-ERROR" The motion task cycle time does not match nc cycle time task".

Bug fixing: The bug was fixed.

5.2.28 Offline server: Error while loading and saving the parameter file

CQ-ID: Defdb00189522

Description: With the offline server, the following errors were present while loading and saving the parameter file:

- Compact parameters were neither loaded nor saved
- Reading of the parameter file was interrupted when P-0-3915.0.2 was read, since it has a string length of 1024 bytes, but in the past, a maximum string length of only 512 bytes had been supported
- An address greater than 127 was incorrectly written to the header of the parameter file

As a result, parameter settings of the customer (e.g. encoder settings) were lost when the offline mode was started in IndraWorks.

Bug fixing: These bugs were fixed.

5.2.29 Offline server: PROFIBUS-DP cannot be set for HMC and HPC

CQ-ID: Defdb00188934

Description: In conjunction with the offline server it was impossible to set PROFIBUS-DP as master communication (-> P-0-4089.0.1) for HMC and HPC.

Bug fixing: The bug was fixed.

5.2.30 Offline server: Current/voltage changeover of analog I/Os did not work

CQ-ID: Defdb00185072

Description: With the offline server, the changeover of current/voltage of analog inputs and outputs did not work correctly.

The settings for the analog inputs and outputs made in the hardware control word (-> P-0-2918.0.1 or P-0-2918.0.2) were not checked for correctness in the offline server.

Moreover, the current/voltage changeover of analog inputs and outputs was not passed on to the pertinent parameters (-> P-0-0210, P-0-0211, P-0-0228, P-0-0229, and P-0-0139, P-0-0140). Thus, the unit "volt" was always displayed for these parameters.

Bug fixing: These bugs were fixed.

5.2.31 Parameter P-0-2906 (system pressure 2) was not enabled in functional package IFB

CQ-ID: Defdb00189030

Description: So far, parameter P-0-2906 (system pressure 2) has not been included in functional package IFB. The parameter was therefore shown as "invalid" in the system dialog in IndraWorks.

Bug fixing: Parameter P-0-2906 is now included in functional package IFB.

5.2.32 Parameter P-0-2937.0.3 (-> input of force feedback value) has to be activated for functional package IFB

CQ-ID: Defdb00187316

Description: P-0-2937.0.3 "input of force feedback value" was not enabled for functional package IFB.

Bug fixing: The bug was fixed.

5.2.33 Parameters S-0-0123 and S-0-0316 were not enabled in Open Loop

CQ-ID: Defdb00187378

Bug fixing: The parameters S-0-0123 (feed constant) and S-0-0316 (inverse feed constant) are now also enabled in Open Loop.

5.2.34 Parameter S-0-0446 was not enabled in functional packages IFB and p/Q

CQ-ID: Defdb00189766

Description: So far, parameter S-0-0446 has not been available in functional packages IFB and p/Q. The parameter was therefore shown as "invalid" in the scaling dialog in IndraWorks.

Bug fixing: Parameter S-0-0446 is now available in functional packages IFB and p/Q.

5.2.35 Problems with oscilloscope trend

- CQ-ID:** Defdb00180317
- Description:** Occasionally, the trend buffer (P-0-0280) was not retrieved in due time by the oscilloscope from IndraWorks, which resulted in gaps in recording.
- Bug fixing:** The trend buffer was extended so that recording can be carried out over a longer time until the oscilloscope retrieves the buffer.

5.2.36 In pump control the control difference is not correctly calculated

- CQ-ID:** Defdb00189626
- Description:** If bit 1 was set in the valve command value control word (P-0-2928.0.1), the pressure control difference was also set to 0 in the pressure/swivel angle control or pressure/flow control mode. As a consequence, the pressure monitoring functions are not active when the pump controller is being calibrated, and no command errors are generated if the pressure is not achieved during calibrating.
- Bug fixing:** Bit 1 in the valve command value control word (P-0-2928.0.1) is now only effective in the operation mode of direct valve control.
- Interim solution:** When direct valve control is terminated, the bit has to be reset again to 0 if it was set before.

5.2.37 Restore function does not work when device is replaced

- CQ-ID:** Defdb00188686
- Description:** Automatic restoring during the startup (after a device change -> serial number in the machine archive and in parameter S-0-1300.0.12) did not work properly, if "automatic run-up in OM (operating mode)" was set in parameter P-0-4088.
- Bug fixing:** The bug was fixed.

5.2.38 Simulation encoder limit stop positive/negative

- CQ-ID:** Defdb00188647
- Description:** The default values of the limit stop (-> 1000 mm) in conjunction with common configurations of the cylinder stroke length resulted in limit value errors when stepping up to OM.
- Bug fixing:** Default values of the limit stop set to 0.

5.2.39 Output adjustment is incorrectly calculated with active overlap and characteristic curve

- CQ-ID:** Defdb00189822
- Description:** The calculation of output adjustment was incorrect when overlap and characteristic curve were active at the same time.
- Bug fixing:** The calculation of output adjustment now works properly when overlap and characteristic curve are active at the same time.

5.2.40 Trend mode does not work properly

- CQ-ID:** Defdb00184148
- Description:** The trend mode does not work reliably. Interruptions occurred time and again or the mode was not started at all.
- Bug fixing:** The bug was fixed.

5.2.41 Valve error F2281 cannot be reset for HS5 OBE valves

CQ-ID: Defdb00189379

Description: So far, it was only possible to clear the valve error when the cause of error had been eliminated. Since the output stage can be switched off as error reaction, it used to be impossible to reset the valve error in this state.

Bug fixing: Now it is possible to reset the valve error at all times. Should the erroneous state persist, the valve error is triggered again.

Interim solution: In the erroneous state a voltage reset of the valve has to be carried out.

5.2.42 Valve control variable limitation is not effective in "direct valve control"

CQ-ID: Defdb00188172

Description: If, in the operation mode "direct valve control", the option "direct command value output to valve" (P-0-2928.0.1, bit 1) was selected, the limitation of the valve control variable (S-0-0864.0.0, S-0-0865.0.0, S-0-0866.0.0) was no longer effective.

Bug fixing: Now, the limitation of the valve control variable (S-0-0864.0.0, S-0-0865.0.0, S-0-0866.0.0) is also effective, if the option "direct command value output to valve" (P-0-2928.0.1, bit 1) is selected in operation mode "direct valve control".

5.2.43 The actual flow value may be incorrectly calculated in conjunction with the axis controller

CQ-ID: Defdb00189421

Description: The back calculation of the output adjustment was incorrect. In addition, a back calculation was impossible, when overlap compensation and characteristic curve were active.

Bug fixing: The errors in the back calculation of output adjustment were corrected. The back calculation was also implemented in the case of overlap compensation and a characteristic curve being active at the same time.

5.2.44 Warning in the case of a characteristic curve with only one value pair

CQ-ID: Defdb00187800

Description: If a characteristic curve is entered in output adjustment, it has to consist of at least two pairs of value. If the characteristic curve consists of only one value pair, it is invalid.

In such a case, bit 0 of P-0-2871 did not signal that the characteristic curve is invalid.

Bug fixing: The invalidity is now also signaled via bit 0 of P-0-2871, if only one value pair is entered for the characteristic curve.

5.2.45 If the NC cycle time (S-0-0001) is less than the minimum PLC cycle time, it is no longer possible to access the HMC

CQ-ID: Defdb00188608

Description: If a task in synchronism with master communication was available in the PLC program of the HMC, and the NC cycle time in S-0-0001 (e.g. 1 ms) was less than the minimum PLC cycle time (e.g. 2 ms, if a position controller cycle of 1 ms was set in P-0-0556), it was no longer possible to access the HMC via the Ethernet interface after having switched to OM, since the changeover between PLC time slices and the drive background did no longer work. The HMC therefore seemed to be "defective" for the customer.

Bug fixing: The bug was fixed.

5.2.46 **Cyclically configured parameters are lost when default values are loaded**

CQ-ID: Defdb00187397

Bug fixing: Correction of default loading group

5.2.47 **In the drive-controlled positioning mode, the axis may incorrectly approach the target position!**

CQ-ID: Defdb00186735

Description: When operation mode "drive-controlled positioning" was used with modulo scaling and configuration of "relative positioning starting from the actual position" in "S-0-0346, Positioning control word" it could happen that the calculated target position was incorrectly approached.

In the event of an error, the actual travel distance was corrected by an additional travel distance by a modulo value (S-0-0103). This resulted in the fact that the target position was either approached with the wrong direction, or the target position was approached with the right direction, but with an additional distance by a modulo value.

The error case occurred when the actual velocity and the internally filtered velocity had different signs when the operation mode started at the actual position, and, in addition, the amount of the filtered actual velocity was greater than the "S-0-0124, Standstill window".

In this case, "S-0-0417, Positioning velocity threshold in modulo mode" had no influence on the incorrect behavior.

5.2.48 **The AxisData structure still contains the old force feedback value (S-0-0084) for the HydraulicDrive**

CQ-ID: Defdb00186858

Description: The new 4-byte force feedback value (S-0-0552) was not displayed.

5.2.49 **Backup&Restore: The firmware can be updated even when the MLD is in operation**

CQ-ID: Defdb00188153

Description: A firmware update with subsequent automatic reboot can even be executed when the MLD is running.

Bug fixing: A check to see whether an MLD is running was extended to all cases, in which a reboot is carried out. If an MLD is running, the command is interrupted and error C6706 output. If a reboot is required due to loading of parameters, because the function package was changed, the reboot is not executed and the command is interrupted with error C6706.

5.2.50 **Backup/Restore does not work, if PROFIBUS is set as master communication**

CQ-ID: Defdb00185813

Description: If PROFIBUS was set for the master communication of a device, the firmware version was not saved or restored (as *.ibf file) when a backup or restore was executed.

5.2.51 The backup/restore function detects a new device

CQ-ID: Defdb00186117

Description: The backup/restore function sporadically detected a new device, although nothing had changed. Background: The programming module identifier (P-0-1521.0.0, Elements 4) was read incorrectly.

Bug fixing: Reading the programming module identifier (P-0-1521.0.0) from the programming module is repeated, if the data are incorrect.

5.2.52 While loading basic parameters S-0-0007 becomes invalid

CQ-ID: Defdb00185658

Description: When loading basic parameters under EtherCAT in a phase > PreOp, parameter S-0-0007 becomes invalid, even if loading of master communication parameters was deactivated.

5.2.53 Coordinate system commands not changing the position display system of both the encoders

CQ-ID: Defdb00184447

Description: The "Set coordinate system procedure command" (S-0-0197) and "Shift coordinate system procedure command" (S-0-0199) are only effective for the encoder selected in the homing parameter (S-0-0147).

The other encoder was not adjusted.

This was an incompatible change with regard to MPx18 and was in contradiction to the specification.

Bug fixing: Shifting continues to be referred to the reference encoder, but both encoder positions are adjusted.

Encoder 2 encapsulated via OPT_GEB2.

5.2.54 Diagnostic messages C6601 and C6704 cannot be cleared

CQ-ID: Defdb00186051

Description: After having been triggered by, for example, command C0200, command errors C6601 and C6704 were not cleared automatically and could also not be deleted manually.

Bug fixing: Command errors C6601 and C6704, which are possibly triggered by command C0200, have been replaced by command errors C0206 and C0207, respectively. If these errors are triggered while C0200 is being executed, they are automatically cleared as soon as the command is terminated by the user.

5.2.55 E2004 during phase switching of Sercos

CQ-ID: Defdb00186401

Description: When stepping up or down the Sercos communication phase, re-parameterizing the logicware took too long. Depending on the firmware version, this resulted in warning E2004 (detailed diagnostics: Monitored section of the position controller interrupt interrupted by the velocity controller interrupt).

5.2.56 EtherCAT CoE: Drive address

CQ-ID: Defdb00178509

Description: In SafeOperational and Operational the EtherCAT address in P-0-4089.0.3 was write-protected.

5.2.57 Error while writing via EtherCAT with CoE to list parameter P-0-4042

CQ-ID: Defdb00183972

Description: For SDO writing to list parameters, writing of the individual list parameters used to be supported via subindex 11 (to subindex 18 for parameter sets). The list elements in P-0-4042 represented a characteristic curve. When a list element was written, the entire characteristic curve was checked for correctness while the other elements had to be written yet. This resulted in an SDO abort error.

Bug fixing: Now, subindex 1 is used for accessing the entire list datum for SDO accessing.

5.2.58 Handling problems with FTP

CQ-ID: Defdb00187065

Description:

1. With WinScp it was impossible to delete directories on the IndraDrive (command via FTP is, for example: "RMD/directory1/directory1").
2. The transmission of empty files (0 bytes long) was interrupted with an error.
3. Files on the drive were generally created by FTP in capital letters.

Interim solution: Use another FTP client. Do not process empty files.

5.2.59 No useful diagnostic messages in the case of engineering via ADS interface

CQ-ID: Defdb00187665

Description: In conjunction with engineering via ADS interface a problem occurred: S-0-0000 was displayed, if EIDN, for which no alias number had been defined, were entered in S-0-0423.

Bug fixing: A new parameter "P-0-0503, EIDN list of invalid parameters" was created. This parameter includes the content of "S-0-0423" in "HEX" representation, 32 bits. In "P-0-0503" the original EIDN are always contained and not substituted by "S-0-0000". IWD thus contains information about problematic EIDN and can also show them as EIDN even if ADS interface is used.

5.2.60 No IP communication due to incorrect recognition of duplicate IP

CQ-ID: Defdb00189792

Description: With MPx-20V10 the ARP probe mechanism wrongly recognized a duplicate IP when an IP telegram was received.

5.2.61 Parameter set switching incorrect

CQ-ID: Defdb00187069

Description: If no encoder switching or gear switching was active while changing over from PM to OM took place, parameter set 0 was always active, although set switching to the preselected set was initially carried out correctly and was also displayed as such in the current parameter set.

5.2.62 Sercos: Drive may swallow up telegrams after switching to CP3

CQ-ID: Defdb00187480

Description: Sercos FPGA may swallow up telegrams in a cycle after switching to CP3. This might cause errors with other slaves in the Sercos network.

5.2.63 Sercos encoder: No check of position value transmission in the changeover command

CQ-ID: Defdb00186602

Description: It was not checked whether there is a connection, in which S-0-0610.x.2 is transmitted. As a consequence, no error was entered. An error was only issued, if the encoder status was not transmitted or was "not ready for operation".

5.2.64 Command value generator switching between different target parameters does not work properly

CQ-ID: Defdb00184405

Description: If the target parameter in P-0-1152 is switched from the one of the command values to S-0-0000 (corresponds to the default setting), the attributes (decimal places, unit) of the command value generator output (P-0-1150), the amplitude (P-0-1155) and the offset (P-0-1154) are not reset to the default setting for the S-0-0000 (four decimal places, no unit). Instead, the attributes of the command value set last are retained.

Also, the datum values for amplitude and offset are not deleted by the firmware when the target parameter is changed. Due to changed decimal places, they are no longer plausible after a change of the target parameter.

Bug fixing: When the target parameter is switched to S-0-0000, this parameter is used to set the attributes to the default settings.

If the target parameters are changed, the firmware sets the amplitude and offset of the command value generator to zero.

6 HDx20V12

6.1 Fixed bugs

6.1.1 200_PLC Basic_System

F6010 when last 104 bytes of MLD retain data are used

CQ-ID: Defdb00192883

Description: If more than the last 104 bytes of PLC retain data were used, F6010 was generated after a reboot, and the PLC program was no longer started.

PLC tasks no longer start up after a watchdog

CQ-ID: Defdb00188769

Description: When a reset and a restart were executed following a task watchdog, it could happen that the tasks no longer started up.

6.1.2 240_PLC Parameter channel

PLC task watchdog gets stuck after re-download of a PLC project

CQ-ID: Defdb00189973

Description: If a PLC project was running with, for example, a 1-ms task, but the task had a runtime of several ms, a "F9005" crash could occur when a download was executed again in the PLC RUN state.

Interim solution: Set task time according to the required runtime or execute PLC Stop before downloading.

6.1.3 415_Measuring_systems

Non-documented diagnostic message C0270 appears

CQ-ID: Defdb00188176

Description: The firmware issued diagnostic message C0270, if, when switching from PM to OM, it was detected that the settings for the encoder were not correct. The diagnostic message was, however, not contained in the description of diagnostic messages.

Bugfix: Diagnostic message C0270 will be described in the next edition of the description of diagnostic messages.

6.1.4 418_Establishing the position reference

Drive-controlled homing procedure: Reference is not saved correctly

CQ-ID: Defdb00194318

Description: When absolute position measuring systems (e.g. SSI, EnDat) were used, drive-controlled homing did not take into account the actual position of the position measuring system. This caused a jump in the actual position value when switching from PM to OM.

Bugfix: The actual position of the position measuring system is now taken into account for establishing the reference position.

6.1.5 428_Pump control

In the case of F2xxx errors with error reaction "immediate shutdown", the valve output stage is not shut down in Ab

CQ-ID: Defdb00190494

Description: If, in conjunction with pump control, an immediate shutdown was set as error reaction for F2xxx errors, the valve output stage was not shut down when an F2xxx error occurred while the device was in the state "drive ready" (Ab).

Bugfix: Now, the valve output stage is shut down in this case.

Incorrect calculation of leakage compensation with negative swivel angle command value

CQ-ID: Defdb00190579

Description: If a negative swivel angle command value was provided, which was smaller than the offset value of leakage compensation, then the offset value for leakage was calculated with the wrong sign.

Bugfix: The offset value for leakage compensation is now always calculated with the correct sign.

Interim solution: Deactivate leakage compensation in this status.

Accuracy window for integrator in the pressure controller (P-0-2806.0.6) allows negative values

CQ-ID: Defdb00189762

Description: In the past it was possible to enter negative values for the "Pressure controller accuracy window integrator" (P-0-2806.0.6), although an absolute value is evaluated for the accuracy window.

Bugfix: Now you can enter only positive values for the "Pressure controller accuracy window integrator" (P-0-2806.0.6).

The command "write default values to calibration values" overwrites the nominal value in the actual pressure value assignment

CQ-ID: Defdb00192717

Description: The command "write default values to calibration values" is used for resetting the calibration values in the pump controller. In the past, this command also used to reset the nominal value, which was entered in the actual pressure value assignment, to its default value.

Bugfix: When the command is now called, the nominal value is no longer set to the default value.

Interim solution: The correct value has to be written to the nominal value after the command was called.

After completion of the pump controller calibration an incorrect pressure command value is approached briefly

CQ-ID: Defdb00194498

Description: When the calibration function in the pump controller was completed, the pressure command value was briefly set to the value of the current actual pressure value.

Bugfix: The bug was fixed so that now the currently valid pressure command value is applied at the end of calibrating.

The ramps for pressure ratings are not always active during calibration of the pump controller

CQ-ID: Defdb00189395

Description: For the calibration function of the pump controller various pressure ratings are sets. So far, these pressure ratings have only been applied via ramps during valve calibration. For the rest of the calibration functions and at the end of calibrating, this resulted in a jump in the pressure command value, since no ramps were used.

Bugfix: Now, all pressure ratings are applied via pressure ramps during calibration. In addition, at the end of calibrating a ramp is used for the original pressure command value.

Changeover logic of pump control (cascade structure) faulty

CQ-ID: Defdb00192496

Description: In the case of a positive valve error and the selection P-0-2827, Bit 2 = 0 (actual swivel angle value is used for calculating the initial value of the integrator), it could happen that the pressure controller was immediately deactivated again after a changeover from swivel angle control to pressure control and that the pump controller remained in swivel angle control.

Bugfix: For the calculation of the initial value of the integrator, the selection of actual swivel angle value was replaced by the selection of swivel angle command value according to model filter. As a result, the error does no longer occur after a changeover from swivel angle control to pressure control.

Interim solution: In firmware HDx20V10 use only the selection P-0-2827, Bit 2 = 1 for pump control in order that the changeover always works properly.

6.1.6 435_Axis_control

Upon a change of operation mode, alternating control remains in force control, in spite of alternating having been deactivated

CQ-ID: Defdb00193893

Description: Alternating control got stuck in force control in subsequent operation modes, if alternating control was deactivated while force control was active.

- Closed-loop torque/force control / (open/closed-loop) flow control
- Closed-loop torque/force control / direct valve control
- Positioning block mode
- Drive-internal interpolation
- Closed-loop position control
- Drive Halt

Bugfix: The bug was fixed.

Deactivation of alternating control and simultaneous starting of new movement

CQ-ID: Defdb00192613

Description: If alternating control was switched off and a new movement started at the same time, the new movement was not always carried out.

Bugfix: Commanding a new movement and switching off alternating control now works properly.

The axis must not move with fine positioning integrator

CQ-ID: Defdb00192399

Description: The I-component of the fine positioner was not charged when the controller enable was granted and the axis was at the end position.

Bugfix: The bug was fixed.

Active damping not taken into account when starting closed-loop position control

CQ-ID: Defdb00190389

Description: When position control was started, active damping was not considered.

Bugfix: The velocity component of active damping is not considered when position control is started.

Default value for P-0-2806.0.3 set to 4 ms

CQ-ID: Defdb00193207

Description: The default value of parameter P-0-2806.0.3, which determines the time coefficient of the low-pass filter of the differentiated actual pressure value, was 0 ms. Consequently, the filter is always deactivated by default.

Bugfix: The default value was increased to 4 ms. As a result, the filter is always active by default.

Interim solution: The value of parameter P-0-2806.0.3 had to be set to a value unequal to 0 ms in order that the low-pass filter was active.

Error with alternating control

CQ-ID: Defdb00192630

Description: If alternating control was switched off in an operation mode other than “drive-controlled positioning” while the force controller was active, force control remained active and could no longer be exited.

Bugfix: Now, when alternating control is switched off while the force controller is active, the current operation mode is restarted and force control is aborted.

Error with v-controller I-component while limitation was deactivated

CQ-ID: Defdb00194337

Description: With the velocity controller, in negative direction, the I-component was limited to an incorrect value.

Bugfix: The I-component of velocity control is now limited to the correct, settable value in both directions.

Incorrect controlling in operation modes combined with pressure and negative pressure scaling

CQ-ID: Defdb00191403

Description: In combined pressure operation modes, negative pressure scaling resulted in problems with pressure control

Bugfix: The bug was fixed.

With setting BREAK, in alternating control, the position generator did not stop when traveling from limit stop to limit stop

CQ-ID: Defdb00194613

Description: In alternating control, the position generator did not stop correctly with setting BREAK when traveling from limit stop to limit stop.

Bugfix: The bug was fixed.

P-0-2845.0.2 was not converted in the case of a change in scaling

CQ-ID: Defdb00192293

Description: When scaling was changed, the value of P-0-2845.0.2 was not adjusted accordingly.

Bugfix: The value of P-0-2845.0.2 is now displayed according to the scaling. Equally, the associated unit is shown in the parameter editor as set.

Status bits for alternating control are not cleared when the enable is withdrawn

CQ-ID: Defdb00193233

Description: The status bits for alternating control (-> parameter P-0-2855) were not cleared when the drive enable was removed.

Bugfix: The bug was fixed.

6.1.7 485_Compensation_functions, corrections

Wrong min./max. values of coordinate system parameters

CQ-ID: Defdb00186423

Description: The min./max. values of the coordinate system parameters (S-0-0198, S-0-0275) were not properly set.

6.1.8 510_Operating modes

The operation mode "(open/closed-loop) flow control" does not work with functional package "IFB"

CQ-ID: Defdb00190990

Description: The operation mode "(open/closed-loop) flow control" did not work with functional package "IFB". When the operation mode was activated, the error message "F6007 Switching to non-initialized operation mode" appeared.

Bugfix: The operation mode "(open/closed-loop) flow control" now also works with functional package "IFB".

Warning E2063 no longer issued after change of operation mode and change back

CQ-ID: Defdb00189424

Description: After the "velocity" operation mode was deselected with warning E2063 and then directly reselected (without withdrawal of the controller enable), the warning was not generated again although the velocity was by far higher than the limit value (S-0-0091).

The bug was stored internally. Merely the diagnostic message was deleted!

6.1.9 515_Operating modes single axis

Extended position command value (P-0-0100) in operation mode "cyclic position control" did not become active

CQ-ID: Defdb00187026

Description: The extended position command value (P-0-0100) was no longer taken over from the cyclic telegram. The full resolution P-0-0100 did not become effective. An improvement is only achieved, if the internal resolution is greater than the master communication resolution.

6.1.10 540_Positive stop command

Homing with positive stop with axis standstill

CQ-ID: Defdb00193485

Description: When detecting the positive stop during homing, the axis was not checked for standstill in the past. As a result of this, with an unfavorable configuration it could be possible that the positive stop was detected too early.

Bugfix: The bug was fixed.

6.1.11 550_Drive-internal_command_value_generator

Command value generator switching between different target parameters did not work properly

CQ-ID: Defdb00184405

Description: When the target parameter in P-0-1152 was switched from one of the command values to S-0-0000 (default), the attributes (decimal places, unit) of the command value generator output (P-0-1150), the amplitude (P-0-1155), and the offset (P-0-1154) were not reset to the default setting for the S-0-0000 (four decimal places, no unit). Instead, the attributes of the command value set last were retained.

Also, the datum values for amplitude and offset were not deleted by the firmware when the target parameter was changed. Due to changed decimal places, they were no longer plausible after a change of the target parameter.

Bugfix: When the target parameter is switched to S-0-0000, this parameter is used to set the attributes to the default settings.

When the target parameter is changed, the firmware sets the amplitude and offset of the command value generator to zero.

6.1.12 585_Digital inputs/outputs

8+4 connector: Incorrect connector/pin assignment of the digital output

CQ-ID: Defdb00190791

Description: Parameter P-0-0315 displayed an incorrect connector/pin assignment on the 8+4 connector for the digital output. Parameter P-0-0315 indicated that the digital output is located on connector XH2, pin 11, and not on the correct connector XH3, pin 5.

Bugfix: The bug was fixed.

6.1.13 620_Parameter_handling

Parameter set switching did not work with pressure controller and changeover logic

CQ-ID: Defdb00191194

Description: If a parameter set unequal to 0 was selected as active parameter set, the pressure controller did no longer work correctly.

Bugfix: If a parameter set 1-3 is activated, the pressure controller now calculates correctly with the corresponding parameterization.

6.1.14 625_Optional_memory_card

Date of change of files and directories on the SD card was not correct

CQ-ID: Defdb00194279

Description: When files or directories were created or changed on the SD card, the date of change and the time of change for these files or directories were not set according to the current system time (-> parameter S-0-1305.0.1).

Bugfix: The bug was fixed.

Backup&Restore: Upon every booting an update is executed

CQ-ID: Defdb00190968

Description: The command C6700 update of device data was executed upon every booting of the VT-HMC or VT-HPC, provided that update files were stored on the SD card in directory User\Update\Archive.

Bugfix: The up-to-dateness of update files is now verified on the SD card. Only when new update files are detected (i.e. no update has been carried out with these files) is the update command started upon booting.

6.1.15 630_Firmware handling

Increasing the delay for rebooting in the case of firmware update

- CQ-ID:** Defdb00194067
- Description:** If an update was executed simultaneously on several drives in a line topology, problems could occur.
- Bugfix:** The bug was fixed.

6.1.16 640_Diagnostic_system

Diagnostic texts for PLC errors and PLC warnings are not shown in S-0-0095

- CQ-ID:** Defdb00194323
- Description:** If a PLC error (F2011 - F2017) or a PLC warning (E2011 - E2017) was present, the error or warning was displayed in S-0-0390, but the diagnostic message was not shown in clear text in S-0-0095.
- Bugfix:** The bug was fixed.

6.1.17 660_Ethernet_engineering

No IP communication due to incorrect recognition of duplicate IP

- CQ-ID:** Defdb00189792
- Description:** With MPx-20V10 the ARP probe mechanism wrongly recognized a duplicate IP when an IP telegram was received.

6.1.18 688_Service functions

Backup&Restore: Compact parameters were not correctly saved

- CQ-ID:** Defdb00193440
- Description:** The content of compact parameters were not correctly saved during backup. Consequently, not all data could be restored.

6.1.19 690_Offline and simulation

Offline server: Limit value error of S-0-0850 when switching from PM to OM

- CQ-ID:** Defdb00193714
- Description:** When switching from PM to OM, a limit value error occurred on the VT-HPC and the VT-HMC when converting the parameters S-0-0850 (bipolar flow limit value). The cause of this error was that the maximum value for S-0-0850 was set to 9,999.999 l/min and the current value of the S-0-0850 was set to 10,000.000 l/min. The difference in the two values results from calculation inaccuracies in the firmware.
- Bugfix:** This error was rectified by reducing the default value for P-0-2875.0.3 (maximum flow) from 10,000.000 l/min to 8,000.000 l/min. Parameter P-0-2875.0.3 is used as maximum value and default value for S-0-0850. This reduction helps to avoid the calculation inaccuracies for a start.

6.1.20 710_Master_communication_basic_functions

Cyclically configured parameters are lost when default values are loaded

- CQ-ID:** Defdb00189903
- Description:** The default values for parameters P-0-4080 (Field bus: Config. list of cyclic actual value data ch) and P-0-4081 (Field bus: Config. list of cyclic command value data ch) were loaded. This was a mistake, since P-0-4090 (Configura-

tion for loading default values) was configured so that master communication parameters were excluded from loading default values.

6.1.21 720_Profile_adaptation

The profile "operation mode neutral" sets incorrect default operation modes

CQ-ID: Defdb00194238

Description: When the profile "operation mode neutral" had been set and then "set field bus-related parameters to default value" was selected for loading basic parameters (P-0-4090 = 0x4), not the current default operation modes were set in the operation mode parameters S-0-0032, S-0-0033, ... S-0-0287, but all operation mode parameters were loaded with "no operation mode defined".

Bugfix: The bug was fixed.

6.1.22 730_PROFINET

F4012 could be acknowledged, although an error was still present

CQ-ID: Defdb00189815

Description: Error F4012 (wrong I/O length) could be acknowledged, although the error was still present.

PROFINET IO: Acknowledgement of error after communication interruption

CQ-ID: Defdb00188775

Description: After a communication interruption (F4009) an error could only be acknowledged when the control was again in the RUN mode.

PROFINET: F4012 was signaled and could no longer be acknowledged

CQ-ID: Defdb00191201

Description: After the cause of error F4012 was eliminated, the error could not be acknowledged even after repeated booting of the bus.

6.1.23 735_EtherNet_IP

EtherNet/IP: Acknowledgement of error after communication interruption

CQ-ID: Defdb00188774

Description: After a communication interruption (F4009) an error could only be acknowledged when the control was again in the RUN mode.

6.1.24 745_SERCOS III

S-0-1601 was not always generated correctly for all device types of HydraulicDrive

CQ-ID: Defdb00180108

Description: With various device types of HydraulicDrive, parameter S-0-1601 (FSP drive classes) was not generated correctly or did not signal the correct, supported drive classes.

Bugfix: The bug was fixed.

Hotplug did not work when the device was switched on again

CQ-ID: Defdb00188902

Description: Due to synchronization problems, hotplug did not work when the device was switched on again.

At the beginning, CP4 is C-CON= 0x0, but CON.State = 2 instead of 1

- CQ-ID:** Defdb00188358
- Description:** Sercos III: At the beginning of communication phase 4, diagnosis parameter S-0-1050.x.9 briefly showed a wrong value (state).

6.1.25 750_EtherCAT

CoE: Runtime optimization

- CQ-ID:** Defdb00186070
- Description:** The performance for the EtherCAT CoE implementation was optimized to allow a bus cycle time of 250 µs.

EtherCat COE: PDOs (rx) are not mapped

- CQ-ID:** Defdb00192558
- Description:** When the drive changed from EtherCAT state Init to PreOp, it sent an EoE telegram from ARP. The control "DeltaTau POWER CLIPPER" did not support EoE and interpreted this as incorrect response.
- Bugfix:** The ARP only sends the EoE telegram after the master initialized the EoE in the drive.

EtherCAT COE: Drive remains in state PreOp

- CQ-ID:** Defdb00190939
- Description:** In the case of a 250 µs EtherCAT cycle in conjunction with Beckhoff Master TwinCAT2 it was observed that after an "activated configuration" in TwinCAT2, IndraDrive did not automatically change to Operational. IndraDrive had to be manually changed to Operational or had to be rebooted.

Ethernet over EtherCAT (EoE) processing was optimized

- CQ-ID:** Defdb00188706
- Description:** The handling of EoE data was optimized to accelerate firmware download via EtherCAT EoE.

Error while writing list parameter P-0-4042 via EtherCAT with CoE

- CQ-ID:** Defdb00183972
- Description:** For SDO writing to list parameters, writing of the individual list parameters used to be supported via subindex 11 (to subindex 18 for parameter sets). The list elements in P-0-4042 represented a characteristic curve. When a list element was written, the entire characteristic curve was checked for correctness while the other elements had to be written yet. This resulted in an SDO abort error.
- Bugfix:** Now, subindex 1 is used for accessing the entire list datum for SDO accessing.

S-0-0000 receives maximum value from P-0-4071 or P-0-4082

- CQ-ID:** Defdb00187066
- Description:** With bus systems, in which parameter P-0-4071 or P-0-4082 is hidden (EtherCAT CoE, VARAN), parameter S-0-0000 was wrongly written. It thus had a maximum value.

6.1.26 755_VARAN

FIFO configuration reset in the case of loss of link

- CQ-ID:** Defdb00189808

Description: If the network cable was plugged from the device while the VARAN bus was active, the Ethernet filter of the device was reset. The drive therefore processed also Ethernet telegrams, which were not addressed to this device. This effect caused connection problems with IndraWorks, if several devices were operated with this faulty firmware in the VARAN network.

Bugfix: The bug was fixed.

6.1.27 790_CCD_function

With profile type “analog”, S-0-0134 and S-0-0135 are not served

CQ-ID: Defdb00189764

Description: Parameters S-0-0134 and S-0-0135 were visible only with the profiles “FSP Drive” and “ServoDrive”.

Bugfix: The parameters were made visible for all profiles, but are active only with the profiles “FSP Drive” and “ServoDrive”

In the case of a node failure, the CCD slave could no longer be reached via a redundant Sercos line

CQ-ID: Defdb00188998

Description: In the case of a node failure, the CCD slave could no longer be reached via a redundant Sercos line.

6.1.28 801_Power_supply_general

P-0-0861/power supply status word cannot be accessed properly via master communication

CQ-ID: Defdb00192249

Description: So far, it has been possible to assign the P-0-0861/power supply status word cyclically only via digital inputs. An assignment via master communication was not provided.

Bugfix: P-0-0861/power supply status word can now also be cyclically assigned via the master communication.

6.2 Functional extensions

6.2.1 200_PLC Basic_System

Loading and storing of PLC program via parameters

CQ-ID: Defdb00194731

Extension: A PLC program can be read and written by means of parameter P-0-1349.

6.2.2 302_HW_Support_Control_Units

Multi-axis capability for HydraulicDrive devices

CQ-ID: Defdb00194732

Extension: The HMC is available in the variant as double-axis device.

Restrictions:

At present the MLD can only command the first axis.

No synchronization function available. See also application manual RE 30338-FK, edition 04, chapter 1.2.1.

Monitoring of solenoid current cables for faults

CQ-ID: Defdb00194733

Extension: In the case of devices, which activate solenoids for position control of a valve via external cables, these cables are monitored for both, cable break and short-circuit. See also application manual RE 30338-FK, edition 04, chapter 9.3.6.

6.2.3 415_Measuring_systems

Reading in position encoder via master communication

CQ-ID: Defdb00194734

Extension: The actual position value can be read via master communication with the Sercos encoder profile as an alternative to the physically connected encoder. See also application manual RE 30338-FK, edition 04, chapter 5.2.2, fig. 5-6.

Extension of position acquisition

CQ-ID: Defdb00194877

Extension: Extension of position acquisition by further mechanical axis systems. See also application manual RE 30338-FK, edition 04, chapter 5.2.

Position acquisition in Open Loop

CQ-ID: Defdb00194738

Extension: The actual position value can be acquired in open loop operation in order to transmit it via master communication, for example.

6.2.4 426_Valve_control

Valve monitoring

CQ-ID: Defdb00194745

Extension: Optional valve monitoring (comparison of valve command value and actual valve value). See also application manual RE 30338-FK, edition 04, chapter 8.5.5.

6.2.5 428_Pump control

Extension of actual value acquisition of pump controls for HS5E and HS5

CQ-ID: Defdb00194740

Extension: Inclusion of further sensors as well as setting options for direction of rotation of the pump. See also application manual RE 30338-FK, edition 04, chapter 5.6.

Extension of the pressure controller integrator for pressure control

CQ-ID: Defdb00194739

Extension: Extension of possibilities of limiting the integrator. See also application manual RE 30338-FK, edition 04, chapter 7.3.

6.2.6 435_Axis_control

D-component for pressure controller

CQ-ID: Defdb00194737

Extension: Addition of a D-component for the pressure controller See also application manual RE 30338-FK, edition 04, chapter 7.2.3.

Expansion of velocity controller by feedback of the integrator

CQ-ID: Defdb00194744

Extension: Expansion of velocity controller by the possibility of integrator feedback. For axes subject to friction, this function can result in a reduction/prevention of a stick-slip effect. See also application manual RE 30338-FK, edition 04, chapter 7.2.4 "Inner-loop velocity control".

New function "axis optimization"

CQ-ID: Defdb00194736

Extension: Automatic measuring of an axis in closed-loop position control. The following parameters are established: Valve standard velocity, direction-dependent gain, valve control variable offset, and valve characteristic curve See also application manual RE 30338-FK, edition 04, chapter 8.11.

6.2.7 485_Compensation_functions, corrections

Activation of axis error correction for HydraulicDrive

CQ-ID: Defdb00194741

Extension: Activation of axis error correction with the following functions: Backlash on reversal correction, axis error precision correction and control-side axis error correction See also application manual RE 30338-FK, edition 04, chapter 8.7.1.

6.2.8 540_Positive_stop_command

New parameter limitation for homing to positive stop

CQ-ID: Defdb00194742

Extension: Introduction of parameter S-0-0530 for additional limitation for homing to positive stop. See also application manual RE 30338-FK, edition 04, chapter 8.8.

6.2.9 590_Analog_inputs/outputs

Delay for cable break error/warning (analog inputs or swivel angle sensor)

CQ-ID: Defdb00194746

Extension: The cable break has to be present for at least 5 ms before an error or warning is signaled. See also application manual RE 30338-FK, edition 04, chapter 8.3.2 and 5.6.

6.2.10 755_VARAN

VARAN master communication: Direct access function

CQ-ID: Defdb00194747

Extension: Introduction of direct access function for VARAN master communication. See also application manual RE 30338-FK, edition 04, chapter 4.10.

7 HDx20V12.10

7.1 Fixed bugs

7.1.1 428_Pump control

Calibration of pump controller: Swivel angle offset for master/slave systems incorrect

CQ-ID: Defdb00196399

Description: The calibration function for the swivel angle offset only corrected half of the real error in master/slave systems.

Bugfix: The calibration function now also corrects the complete offset error in the case of master/slave systems.

Interim solution: Calibrating has to be started several times until the error is small enough.

Pump control changeover logic, error in special treatment of changeover condition in the case of pulling loads in the closed circuit

CQ-ID: Defdb00196934

Description: When "min/max value or switch-off threshold" was selected as changeover condition for pressure -> swivel angle, in the special case of pulling loads it could happen that the control did not switch to swivel angle control.

Bugfix: The bug was fixed. In the special case of pulling loads, switching to swivel angle control now takes places when required.

Interim solution: Select the option "min/max value" as changeover condition for pressure -> swivel angle.

7.1.2 435_Axis_control

Error F2037 is triggered while alternating control is active

CQ-ID: Defdb00197016

Description: When alternating control was active in conjunction with a cyclic position operation mode, error F2037 (excessive position command value difference) was triggered, if a jump occurred in the position command value, because monitoring of position command values was active.

Bugfix: Monitoring of position command values is no longer effective when alternating control is active. Consequently, error F2037 is no longer triggered.

7.1.3 688_Service functions

Backup/restore: Parameters specific to master communication were incompletely restored when the restore function was executed

CQ-ID: Defdb00196920

Description: When restoring was executed, in which the master communication was changed (e.g. from "no master communication" to PROFINET), master communication-specific parameters were not restored completely.

Bugfix: The bug was fixed.

Backup/restore: String parameters with an uneven number of characters were not correctly restored

CQ-ID: Defdb00196071

Description: When the restore function was executed, string parameters that have an uneven number of characters were not correctly restored. The last character was cut off.

Example:

When data were being backed up, parameter P-0-4089.0.2 contained the string "Schnell". After the restore, the string in the parameter was "Schnel". The last character, "l" was missing.

Bugfix: String parameters are now correctly restored up to their maximum possible length when the restore function is executed.

7.1.4 690_Offline_and_Simulation

Crash of the offline server during startup, if the PLC program was stored in a parameter

CQ-ID: Defdb00196899

Description: While starting up in IndraWorks, the offline server crashed with an exception, if function package ML (IndraMotion MLD) was active and a PLC program was stored in parameter P-0-1349.x.y.

Bugfix: The offline server was corrected in order to prevent crashes while starting up. In addition, the offline server was extended so that loading and saving of PLC parameters P-0-1349.x.y functions correctly within the context of the offline server.

7.1.5 725_Profibus

VT-HMC with 2 axes and PROFIBUS - endless loop when loading basic parameters

CQ-ID: Defdb00196829

Description: Due to a bug in the device-internal peripherals communication, inconsistencies in processing of the PROFIBUS interface could occur under certain circumstances, if basic parameters were loaded simultaneously. This bug finally resulted in the fact that the PROFIBUS interface got stuck in an endless loop. The VT-HMC could therefore no longer be addressed.

Bugfix: The bug was fixed.

7.1.6 730_PROFINET

PROFINET: Communication over Ethernet no longer possible, if IP settings are incorrect

CQ-ID: Defdb00196832

Description: It was possible to enter invalid IP settings in parameters P-0-4089.0.13, P-0-4089.0.14 and P-0-4089.0.15 which resulted in the fact that communicating over the Ethernet interface was no longer possible.

Bugfix: When IP settings are entered via parameters P-0-4089.0.13, P-0-4089.0.14 and P-0-4089.0.15 the settings are now checked for plausibility.

7.1.7 760_Powerlink

In the case of POWERLINK, it was impossible to write alias parameters via SDO

CQ-ID: Defdb00196836

Description: Upon an attempt to write an alias IDN via SDO with Ethernet POWERLINK, the error message "Data type does not match, length of service parameter does not match" was issued.

Bugfix: The bug was fixed.

8 HDx20V12.20

8.1 Fixed bugs

8.1.1 415_Measuring_systems

Parameter S-0-0600.x.136 cannot be assigned in the signal status word

- CQ-ID:** Defdb00197631
- Description:** Parameter S-0-0600.x.136 (-> extended encoder diagnostics) could not be assigned in signal status word S-0-0144.
- Bugfix:** The bug was fixed.

SSI encoder: It was possible that the actual position value changed abruptly in the event of a cable break

- CQ-ID:** Defdb00197833
- Description:** In the event of a partial cable break or incomplete disconnection of the SSI encoder, the actual position value could accidentally change abruptly, if bouncing occurred during the cable break or disconnection.
- Bugfix:** The establishment of the actual position value in the case of a cable break was improved.

With linear incremental encoders, quadruplication is not considered correctly

- CQ-ID:** Defdb00198152
- Description:** With linear incremental encoders, while the two incremental tracks were evaluated, the quadruplication of the resolution was not considered correctly in the internal resolution factors. This resulted in a resolution that was lower than possible.
- Bugfix:** Quadruplication is now correctly taken into account.

8.1.2 428_Pump control

Delay not active in calibration of swivel angle factor

- CQ-ID:** Defdb00197885
- Description:** When the calibration function of the swivel angle factor is started, a certain working point is approached. Before the measurement is started for evaluating the calibration function a delay should elapse. In the past, this delay time was not allowed to elapse.
- Bugfix:** The automatic calibration function now waits for the delay to elapse before starting the measurement for evaluation.
- Interim solution:** To keep the measurement error due to no delay as low as possible, the working point for the calibration can be approached manually before the calibration function is started.

8.1.3 510_Operating modes

Incorrect positioning block mode

- CQ-ID:** Defdb00197656
- Description:** In the positioning block mode, the set acceleration rates (P-0-4008, P-0-4063) were partially ineffective.

8.1.4 590_Analog_inputs_outputs

Extreme value checks of P-0-2900.x.8/9 (signal range, analog assignment) must not be carried out in PM

CQ-ID: Defdb00197827

Description: The signal range was always checked for extreme values, which resulted in the fact that the signal range was not set correctly when parameters were restored from a backup, if the analog inputs were switched from current to voltage via P-0-2918.x.1/2.

Bugfix: The signal range is now only checked for extreme values when switching to OM takes place.

8.1.5 730_PROFINET

Exception due to stack overflow of a task

CQ-ID: Defdb00197769

Description: With set PROFINET master communication, when the firmware was booting an exception could occur that was caused by a stack overflow in a communication task.

In the event of an exception, the MS LED was permanently on and it was no longer possible to access the device over PROFINET or Ethernet.

Bugfix: The bug was fixed.

9 HDx20V12.30

9.1 Fixed bugs

9.1.1 426_Valve_control

Drops in the actual valve value with valve controller (-> version 1)

CQ-ID: Defdb00198523

Description: As of firmware version HDx20V02, an error in the valve controller (-> version 1) resulted in regular drops of 1 - 2 % of the actual valve value in negative direction. When the valves are used in high-precision axes (-> machine tools), these drops caused unstable operation of the axes.

Remark: Whether the valve controller in a valve runs with version 1 can be established with the help of parameter P-0-2999.0.3, element 0. If it contains the value 0xA55A0100, the valve controller is active with version 1.

Oscillating of the valve controller (-> Version 2) during switching on

CQ-ID: Defdb00197965

Description: When the valve controller is switched on, which is triggered by setting the external hardware enable, the valve controller (-> version 2) could start to oscillate in rare cases.

Remark: Whether the valve controller in a valve runs with version 2 can be established with the help of parameter P-0-2999.0.3, element 0. If it contains the value 0xA55A0200, the valve controller is active with version 2.

9.1.2 428_Pump control

Incorrect calculation of leakage compensation in variable-speed operation

CQ-ID: Defdb00198709

Description: For variable-speed operation, leakage is split into a pressure-related and a into a speed-related share. The speed-related share was incorrectly calculated. This resulted in the calculation of too low leakage offset values.

Bugfix: The calculation of leakage was corrected.

10 HDx20V14

10.1 Functional extensions

10.1.1 415_Measuring_systems

Adjustable filter for actual velocity and actual acceleration

CQ-ID: Defdb00202021

Extension: The values of velocity S-0-0535 (active velocity feedback value) and acceleration S-0-0536 (active acceleration feedback value) are derived from the actual position value. These values are averaged by default. The filters can be adapted with the help of parameters P-0-2936.0.7 (actual velocity filter time) or P-0-2936.0.9 (actual acceleration filter time). A filter time of 0 deactivates the individual filters.

See also application manual RE 30338-FK/04.2018, chapter 5.3 - Position acquisition

10.1.2 418_Establish_position_data_reference

Set reference immediately with absolute position encoder

CQ-ID: Defdb00202018

Extension: By means of bit 1 in P-0-0188 (encoder 1 control word) the drive can be configured so that when switching to the operating mode (OM) the reference is always available, provided that absolute evaluation of position encoder is possible.

See also application manual RE 30338-FK/04.2018, chapter 5.3.3 - Establishing the position data reference

10.1.3 426_Valve_control

Pilot pressure-related valve monitoring for pilot operated valves

CQ-ID: Defdb00202024

Extension: Valve monitoring has been extended by pilot pressure-related monitoring of pilot operated valves.

See also application manual RE 30338-FK/04.2018, chapter 8.5.5 - Valve monitoring

10.1.4 428_Pump_control

Pump control calibration - reference pressure can be variably adjusted

CQ-ID: Defdb00202025

Extension: In the past, a fixed reference pressure of 20 bar was used for leakage or swivel angle offset calibration when the pump control was calibrated. This reference pressure can now be variably entered via parameter P-0-2947.0.16.

See also application manual RE 30338-FK/04.2018, chapter 5.8 - Calibration functions of pump

Changeover logic: new mode "min/max value principle with active integrator"

CQ-ID: Defdb00202055

Extension: The changeover logic (from swivel angle to pressure) was extended by the new mode "min/max value principle with active integrator".

See also application manual RE 30338-FK/04.2018, chapter 7.3.6 - Functions of the cascade structure

10.1.5 430_Axis_control

Acceptance of change of gain of active damping with ramp

CQ-ID: Defdb00202022

Extension: When gain parameters of active damping (P-0-2832.0.8 and P-0-2832.0.8) are changed, the active values are now adapted via the corresponding ramp times to the new parameters P-0-2832.0.15 (Active damping: acceleration gain ramp time) and P-0-2832.0.16, (Active damping: velocity gain ramp time). If the ramp time is set to 0, the adjustment is made abruptly.

See also application manual RE 30338-FK/04.2018, chapter 7.2.5 - Active damping

Changeover logic Q -> p: new mode "min value principle with active integrator"

CQ-ID: Defdb00202023

Extension: The changeover logic between (open/closed-loop) flow control and closed-loop pressure control or direct valve control and closed-loop pressure control was extended by the new mode "min value principle with active integrator" (-> P-0-2850 (p/Q changeover logic control word), bit 0-2 = 4).

See also application manual RE 30338-FK/04.2018, chapter 7.2.7 - Changeover logic

10.1.6 435_Axis_control

Alternating control - force command value ramp (S-0-0553)

CQ-ID: Defdb00202028

Extension: When a new force command value is entered, the value can be cross-faded with the help of S-0-0553 (torque/force command value ramp).

With a ramp of "0", the change takes place abruptly.

If the parameters S-0-0550 (torque/force command value, positive) and S-0-0551 (torque/force command value, negative) are cyclically assigned, internal fine interpolation of the command values can be activated by setting the ramp to 0.

This can be used for smoothing jumps with slow cycle times.

See also application manual RE 30338-FK/04.2018, chapter 7.2.8 - Alternating control

10.1.7 515_Operation_modes_single_axis

New operation mode of closed-loop pressure control

CQ-ID: Defdb00202026

Extension: The firmware was extended by the new operation of closed-loop pressure control.

See also application manual RE 30338-FK/04.2018, chapter 6.7 - Pressure control

New diagnostic message, swivel angle command value > limit value

CQ-ID: Defdb00202020

Extension: The new diagnostic message E2073 (swivel angle command value > limit value) was introduced.

See also application manual RE 30338-FK/04.2018, chapter 6.15 - Pressure/swivel angle control

10.1.8 760_Powerlink

Certification for POWERLINK

CQ-ID: Defdb00202027

Extension: Certification was obtained for the bus system POWERLINK.

10.2 Fixed bugs

10.2.1 200_PLC_basis_system

After a PLC warning (E2011 - E2017) was cleared, the text of the PLC warning continued to be displayed in S-0-0095

CQ-ID: Defdb00196440

Description: When a PLC warning (E2011 - E2017) was present and then cleared again, parameter S-0-0095 continued to show the text of the PLC warning although the warning was no longer existent.

Bugfix: The bug was fixed.

Communication aborted in the case of PLC exception

CQ-ID: Defdb00194016

Description: If the MLD had an exception (F6010) due to watchdog or division by zero etc., the communication with IW, etc. was sometimes aborted.

Besides, commands were sometimes delayed.

Long, adjusted diagnostic messages and errors of PLC are not displayed in S-0-0095

CQ-ID: Defdb00193586

Description: Functions such as MX_fSetDriveWarningText(), MX_fSetDriveErrorText(): If the transmitted warning or error texts had been longer than 25 characters, they were not displayed.

Bugfix: Transmitted warning or error texts are correctly displayed with up to 59 characters. Longer texts are cut off and thus limited to 59 characters.

PLC project prevents repeated program download

CQ-ID: Defdb00191115

Description: If a corrupt boot project had been loaded to the drive, it was impossible to load another project and to carry out reset origin.

With Codesys the message "Index was outside the bounds of the array" was generated, and when attempting with P-0-1350 there was no reaction.

Watchdog when accessing list/string parameters

CQ-ID: Defdb00191909

Description: In an MLD application, a string parameter (S-0-0030) was read in the first cycle (initialization clock). If this MLD application had been loaded to the drive in IndraWorks as a compiled PAR file and PM -> OM switching was carried out afterwards (without having started the PLC before), the error F6010 "EX-

CEPTION* OmittedCycle watchdog application 'Application' task 'Cyclic_S'" occurred sometimes.

Once this PLC runtime error occurred, it was necessary to switch the drive off and back on, since the error was generated over and over again.

10.2.2 220_PLC_Motion

MC_MoveAbsolute: CommandAborted and Done simultaneously

CQ-ID: Defdb00193022

Description: In some cases, the "CommandAborted" and "Done" outputs were simultaneously set to TRUE.

Programs: MoveAbsolute is started and then interrupted by MoveVelocity. If MoveVelocity immediately signals Done, because command velocity = actual velocity, the Done output is set in addition to CommandAborted for MoveAbsolute.

10.2.3 250_PLC_debug_interface

Parameter P-0-1365 does not contain code offset

CQ-ID: Defdb00193134

Description: In the case of a PLC exception, the parameter P-0-1365 did not contain any code offset. Therefore, it had been more difficult to find the affected code position in a technology function (without programming system), because this information could only be accessed with the PLC shell.

(Support functionality only!)

10.2.4 415_Measuring_systems

While loading basic parameters the default encoder is not correctly set, if the functional package OL had been active before.

CQ-ID: Defdb00188175

Description: Up to firmware version HDx20V12 the default value of parameter S-0-0602.x.1 was not generated in OpenLoop (-> OL). With the extension of the firmware for acquiring the encoder in OpenLoop the bug was already fixed within the framework of release HDx20V12 (see Defdb00194738).

The default value of parameter P-0-0077, too, was not correctly generated in OpenLoop.

Bugfix: The default values of S-0-0602.x.1 and P-0-0077 were corrected.

Encoder jump monitoring does not work

CQ-ID: Defdb00198677

Description: If an encoder jump occurs in a certain position, this encoder jump can be suppressed by P-0-2936.0.6 for a maximum of 10 base clock cycles. However, in firmware HDx20, this worked for a maximum of only 1 base clock cycle.

Cause of fault:

For interpolation, the encoder jump suppression function used the velocity value made available by the encoder in the form of a raw value. This value is, however, generated anew in every base clock cycle and therefore directly maps any error possibly present in the position feedback value.

Bugfix: The velocity value generated in the evaluation is used for interpolation purposes.

In the case of encoder error F8022, the position feedback value continues to be interpolated (TTL and 1Vpp)

- CQ-ID:** Defdb00198741
- Description:** In the event of encoder error F8022 in conjunction with incremental measuring systems TTL and 1Vpp, the position feedback value continued to be interpolated, even if the internal error tolerance threshold (-> encoder error has to be detected twice in succession) had already been reached. As a result, the position feedback value continued to be changed with the last velocity, although encoder error F8022 was already present.
- Bugfix:** The interpolation of the position feedback value is now stopped as soon as the internal error threshold is reached and error F8022 is issued.

Parameter S-0-0600.x.136 cannot be assigned in the signal status word

- CQ-ID:** Defdb00197634
- Description:** Parameter S-0-0600.x.136 (-> extended encoder diagnostics) could not be assigned in signal status word S-0-0144.
- Bugfix:** The bug was fixed.

SSI encoder: It was possible that the actual position value changed abruptly in the event of a cable break

- CQ-ID:** Defdb00197837
- Description:** In the event of a partial cable break or incomplete disconnection of the SSI encoder, the actual position value could accidentally change abruptly, if bouncing occurred during the cable break or disconnection.
- Bugfix:** The determination of the actual position value in the case of a cable break was improved.

With linear incremental encoders, quadruplication is not considered correctly

- CQ-ID:** Defdb00198033
- Description:** With linear incremental encoders, while the two incremental tracks were evaluated, quadruplication of the resolution was not considered correctly in the internal resolution factors. This resulted in a resolution that was lower than possible.
- Bugfix:** Quadruplication is now correctly taken into account.

The master communication encoder indicates a velocity twice as high as the encoder of the master axis

- CQ-ID:** Defdb00194066
- Description:** If an encoder signal had been transmitted to the drive via master communication, the velocity feedback value was incorrectly determined. The feedback velocity displayed twice the value of the actual velocity.

10.2.5 420_Drive_control

The output of the test value is terminated too early

- CQ-ID:** Defdb00195547
- Description:** The output of the test value (P-0-2873.0.17) was not automatically terminated after a timeout time of 200 ms as documented, but after a shorter timeout time (between 128 ms and 192 ms).
- Bugfix:** The bug was fixed.

Integrator: ignoring velocity threshold, acceleration threshold or change threshold in the case of value zero

CQ-ID: Defdb00193292

Description: So far, with the integrators of the individual controllers (position, velocity, force and pressure) the velocity threshold, the acceleration threshold and the change threshold were also active in case that the value zero was entered, which actually did not make sense.

Bugfix: If a value of zero is now entered for the velocity threshold, the acceleration threshold or the change threshold for the integrators of the individual controllers are, the threshold is no longer effective.

This applies to the following controller parameters.

- P-0-2830.0.5 (position controller integrator velocity threshold)
- P-0-2832.0.3 (velocity controller integrator acceleration threshold)
- P-0-2845.0.4 (force controller integrator force change threshold)
- P-0-2806.0.5 (pressure controller integrator pressure change threshold)

10.2.6 426_Valve_control

Drops in the actual valve value in the valve controller (-> version 1)

CQ-ID: Defdb00198540

Description: As of firmware version HDx20V02, an error in the valve controller (-> version 1) resulted in regular drops of 1 - 2 % of the actual valve value in negative direction. When the valves are used in high-precision axes (-> machine tools), these drops caused unstable operation of the axes.

Remark: Whether the valve controller in a valve runs with version 1 can be ascertained with the help of parameter P-0-2999.0.3, element 0. If it contains the value 0xA55A0100, the valve controller is active with version 1.

Oscillating of the valve controller (-> version 2) when being switched on

CQ-ID: Defdb00197964

Description: When the valve controller is switched on, which is triggered by setting the external hardware enable, the valve controller (-> version 2) could start to oscillate in rare cases.

Remark: Whether the valve controller in a valve runs with version 2 can be established with the help of parameter P-0-2999.0.3, element 0. If it contains the value 0xA55A0200, the valve controller is active with version 2.

10.2.7 428_Pump_control

Incorrect calculation of leakage compensation in variable-speed operation

CQ-ID: Defdb00198636

Description: For variable-speed operation, leakage is split into a pressure-related and a into a speed-related share. The speed-related share was incorrectly calculated. This resulted in the calculation of too low leakage offset values.

Bugfix: The calculation of leakage was corrected.

Incorrect calibration of pump controller, swivel angle offset with master/slave systems

CQ-ID: Defdb00196381

Description: The calibration function for the swivel angle offset only corrected half of the real error with master/slave systems.

Bugfix: The calibration function now compensates for complete offset error also with master/slave systems.

Pump control changeover logic, error in special treatment of changeover condition in the case of pulling loads in the closed circuit

CQ-ID: Defdb00195144

Description: When "min/max value or switch-off threshold" was selected as changeover condition for pressure -> swivel angle, in the special case of pulling loads it could happen that the control did not switch to swivel angle control.

Bugfix: The bug was fixed. In the special case of pulling loads, switching to swivel angle control now takes places as required.

Delay time with swivel angle factor calibration not active

CQ-ID: Defdb00197852

Description: When the calibration function of the swivel angle factor is started, a certain working point is approached. Before the measurement is started for evaluating the calibration function a delay should elapse. In the past, this delay time was not allowed to elapse.

Bugfix: The automatic calibration function now waits for the delay to elapse before starting the measurement for evaluation.

10.2.8 435_Axis_control

Axis optimization (determination of the valve characteristic curve): set valve overlap results in poorer control

CQ-ID: Defdb00197253

Description: If, within the framework of axis optimization, the valve characteristic curve was determined for a valve, for which valve overlap was activated in output adjustment, the control results were clearly poorer after the valve characteristic curve was automatically determined.

Bugfix: After the valve characteristic curve was determined via axis optimization, overlap is deactivated in output adjustment, since it is now considered in the valve characteristic curve.

Alias parameters for pressure controller were missing

CQ-ID: Defdb00199381

Description: For the following parameters of the pressure controller no alias parameters were defined.

- P-0-2806.0.21, Filter time of pressure feedback value
- P-0-2806.0.22, Derivative action time, actual pressure value DT1
- P-0-2806.0.23, Filter time of pressure feedback value DT1

Thus, it was impossible to transmit these parameters cyclically with 16-bit bus systems (e.g. VARAN).

Bugfix: The following parameters have now been assigned to these parameters:

- P-0-2806.0.21 -> P-0-3820
- P-0-2806.0.22 -> P-0-3821
- P-0-2806.0.23 -> P-0-3822

Calculated position command value is higher or lower than position target value

CQ-ID: Defdb00193761

Description: When position control was to be started, a command value was back-calculated from the current valve control variable to prevent a jump in the valve control variable.

In special cases (e.g. employment of PDP (-> position-dependent braking) in a PLC program) it might have happened that a position command value was calculated which exceeded or fell below the given position target value.

Bugfix: The calculated setpoint position is limited by the given target position. In this case, a jump in the valve control variable has to be accepted.

Error F2037 is triggered while alternating control is active

CQ-ID: Defdb00194853

Description: When alternating control was active in conjunction with a cyclic position operation mode, error F2037 (excessive position command value difference) was triggered, if a jump occurred in the position command value, because monitoring of position command values was active.

Bugfix: Monitoring of position command values is no longer effective when alternating control is active. Consequently, error F2037 is no longer triggered.

Ramp time for alternating control cannot be switched off

CQ-ID: Defdb00197454

Description: In spite of a value of 0 ms for the ramp time of alternating control (P-0-2856.0.5), a ramp was effective. In this case, the ramp time was equal to the cycle time of the position controller.

Bugfix: Entering the value 0 ms for the ramp time of alternating control (P-0-2856.0.5) now deactivates the ramp.

Status bits for alternating control (P-0-2855) are incorrect in the case of inverted scaling

CQ-ID: Defdb00198148

Description: If scaling of force, scaling of position and scaling of velocity was inverted, the direction, in which alternating control was to be effective, was incorrectly displayed in parameter P-0-2855 (bit 2 and 3).

Bugfix: Now the correct bit is shown in parameter P-0-2855 to indicate the direction in which alternating control is to be effective - irrespective of scaling settings.

10.2.9 510_Operation_modes

"Command value reached" is not signaled when 4-quadrant ramp is used

CQ-ID: Defdb00195387

Description: The bit "command value reached" (parameter P-0-0115, bit 12) was not set, if in the operation modes of direct valve control or (open/closed-loop) flow control the change of the command value was completed via the 4-quadrant ramp and the command value had reached the target value.

Incorrect positioning block mode

CQ-ID: Defdb00193799

Description: In the positioning block mode, the set acceleration rates (P-0-4008, P-0-4063) were partially ineffective.

10.2.10 530_Error_reactions

The standstill value is not immediately effective in the event of an F6xxx error (-> immediate shutdown set)

CQ-ID: Defdb00195397

Description: When an F6xxx error occurred, for which immediate shutdown was set as error reaction, the valve command value calculated last before the error occurred was still output to the valve for some controller cycles before the set standstill value (-> P-0-2873.0.14) became effective as valve command value.

Bugfix: Now, the set standstill value (-> P-0-2873.0.14) is output as valve command value immediately after the error reaction was executed.

10.2.11 590_Analog_inputs_and_outputs

Extreme value checks of P-0-2900.x.8/9 (signal range, analog assignment) must not be carried out in PM

CQ-ID: Defdb00197836

Description: The signal range was always checked for extreme values. This resulted in the fact that the signal range was not set correctly when parameters were restored from a backup, if the analog inputs were switched from current to voltage via P-0-2918.x.1/2.

Bugfix: The signal range is now only checked for extreme values when switching to OM takes place.

10.2.12 620_Parameter_handling

Various hydraulic parameter cannot be configured for oscilloscope recording

CQ-ID: Defdb00196706

Description: Various command, actual, control and status parameters could not be configured for oscilloscope recording.

Bugfix: The following parameters were added for oscilloscope recording:

P-0-2937.0.1, Force acquisition control word

S-0-0814, Tank pressure

S-0-0830, Pressure status word

S-0-0849, Flow status word

P-0-2827, Pump changeover logic control word

S-0-0600.x.136, Extended diagnostic message

S-0-0867, Spool status word

For valves on IFB hardware basis, compact parameters were not correctly generated

CQ-ID: Defdb00198383

Description: In the case of valves based on IFB hardware (P-0-1520 = "IFB...") the content of compact parameters (-> P-x-yyyy.z.130, S-x-yyyy.z.130, P-0-0660.x.1) was not correct.

In the content of compact parameters, bytes were interchanged.

On multi-axis devices, C0242 was issued sporadically without reason

CQ-ID: Defdb00195404

Description: On multi-axis devices it could sporadically happen that error message C0242 was output for no reason.

IP services blocked when P-0-4064.0.1, bit 1 is set, but no customer password is assigned

CQ-ID: Defdb00193770

Description: When P-0-4064.0.1, bit 1 is set, a given customer password is to be used for the login (ftp / telnet). However, if no customer password is assigned (007), a login is impossible.

Bugfix: In the case described before the standard password is now used.

Series commissioning impossible with customer password assigned

CQ-ID: Defdb00193522

Description: The customer password that had been assigned was not transmitted during series commissioning.

10.2.13 622_Scaling

Axis hangs up in transition command C0200 if scaling changed from mm to inch

CQ-ID: Defdb00193405

Description: If scaling had been set to inch, it was impossible to switch the axis to OM due to a conversion error.

10.2.14 688_Service_functions

Backup/restore: Parameters specific to master communication were incompletely restored when the restore function was executed

CQ-ID: Defdb00195638

Description: When restore was executed, in which the master communication was changed (e.g. from "no master communication" to PROFINET), master communication-specific parameters were not restored completely.

Bugfix: The bug was fixed.

Backup/restore: String parameters with an uneven number of characters were not correctly restored

CQ-ID: Defdb00195317

Description: When the restore function was executed, string parameters that have an uneven number of characters were not correctly restored. The last character was cut off.

Example:

When data were being backed up, parameter P-0-4089.0.2 contained the string "Schnell". After restore, the string in the parameter was "Schnel". The last 'l' character was missing.

Bugfix: String parameters are now correctly restored up to their maximum possible length when the restore function is executed.

Restore possible, if machine archive was created for another device type

CQ-ID: Defdb00197734

Description: While device data were being restored (-> command C6600), it was not checked whether the device data stored in the machine archive match the device type (VT-HMC or VT-HPC), for which the device data are to be restored.

Bugfix: Now, when command C6600 is started, a check is run to see whether the device data stored in the machine archive match the device for which the restore function is executed.

This means that a machine archive that was created for a VT-HMC can only be restored for a VT-HMC. By analogy, the same is valid for a VT-HPC.

If during a restore no suitable device is recognized, command C6600 is terminated, an error is issued and the file Restore.log contains the "ERROR The Archive is not valid for current Device"

Backup/restore: Compact parameters were not correctly saved

CQ-ID: Defdb00193440
Description: The content of compact parameters was not correctly saved during backup. Consequently, not all data could be restored.

10.2.15 690_Offline_and_simulation

Crash of the offline server during startup, if the PLC program was stored in a parameter

CQ-ID: Defdb00196092
Description: While starting up in IndraWorks, the offline server crashed with an exception, if function package ML (IndraMotion MLD) was active and a PLC program was stored in parameter P-0-1349.x.y.
Bugfix: The offline server was corrected in order to prevent crashes while starting up. In addition, the offline server was extended so that loading and saving of PLC parameters P-0-1349.x.y functions correctly within the context of the offline server.

10.2.16 720_Profile_adaptation

CoE: no check for maximum value 255 when writing byte values

CQ-ID: Defdb00182837
Description: If 1-byte CANopen objects had been written via IndraWorks, it was possible to write values outside the value range of the object.

CoE: only DS402 displayed as configurable profile

CQ-ID: Defdb00192543
Description: Only the DS402 profile was possible with CoE
Bugfix: Also Rexroth profiles are possible with CoE

10.2.17 725_Profibus

VT-HMC with 2 axes and PROFIBUS - endless loop when loading basic parameters

CQ-ID: Defdb00196711
Description: Due to a bug in the device-internal peripherals communication, inconsistencies in processing of the PROFIBUS interface could occur under certain circumstances, if basic parameters were loaded simultaneously. This bug finally resulted in the fact that the PROFIBUS interface got stuck in an infinite loop. The VT-HMC could therefore no longer be addressed.
Bugfix: The bug was fixed.

10.2.18 730_PROFINET

PROFINET: F2025 or AF after switching from PM to OM

CQ-ID: Defdb00193280
Description: If one of the Rexroth profiles "freely configurable mode", "freely configurable mode neutral operation modes" or "I/O mode" had been used and drive enable had been set in the control word (P-0-4068 or P-0-4077), the error F2025 occurred sometimes in the switching process to OM. In a few cases, the drive was switched directly to AF instead of the error occurring.

Bugfix: Drive enable is only set in the drive if a positive edge is input for the drive enable in the control word (P-0-4068 or P-0-4077).

PROFINET: exception in firmware, if IP settings are incorrect

CQ-ID: Defdb00196911

Description: It was possible to enter invalid IP settings (IP addresses, network mask, gateway), which resulted in an exception in the firmware so that Ethernet communication was no longer possible.

10.2.19 745_Sercos III

Sercos: Value 0 can be set for S1003

CQ-ID: Defdb00191441

Description: It had been possible to enter unusable values in parameter S-0-1003. The value 0 sometimes caused F4001 during phase switch to CP3.

Bugfix: If the entered value is smaller than the min. value, it is automatically set to the min. value. If the entered value is greater than the max. value, it is limited to the max. value.

10.2.20 750_EtherCAT

CoE: no AT data while switching from SafeOp to Operational

CQ-ID: Defdb00194353

Description: CAN over EtherCAT: The drive controller did not provide any process data during the switching process from SafeOp to Operational.

EtherCAT SoE: Toggle bit (bit 0) in drive status word (S-0-0135) does not work

CQ-ID: Defdb00192879

Description: If the parameter S-0-0135 drive status word had been read via the parameter channel, bit 0 (of S135) toggled too often.

10.2.21 755_VARAN

Timing problems with VARAN

CQ-ID: Defdb00199202

Description: Since the VARAN bus system had been extended by the DirectAccess functionality, which was implemented with firmware release HDx20V12, the command values received were in some cases processed prematurely. This resulted in incorrect message counts in the sent actual values.

10.2.22 760_Powerlink

EPL: MDT data are not applied by the drive, AT data are not transmitted.

CQ-ID: Defdb00192659

Description: If the drive had already been switched to OM during the Basic Ethernet mode, the configuration transmitted from the master to the drive was not applied, since it was impossible to write the corresponding parameters in this state.

Bugfix: If the drive had been in the Basic Ethernet mode and is then switched to Init or Per-Operational, the sub-device state machine is checked and switched to PM, if required (i.e. if the sub-device state machine is in OM).

11 HDx20V16

11.1 Functional extensions

11.1.1 200_PLC_basis_system

Extension of the PLC functionality of the VT-HMC with 2 axes

CQ-ID: Defdb00202177

Extension: The PLC functionality of the VT-HMC with 2 axes was extended by the support of AxisData for the second axis.

11.1.2 415_Measuring_systems

SSI encoders with a telegram length greater than 31 bits are not supported

CQ-ID: Defdb00200683

Description: In the case of SSI encoders the total telegram length (sum of position, status and check bits) is limited to 31 bits. This means that, for example, an SSI encoder with 30 data bits and 3 check bits could not be used, since the related total telegram length is 33 bits.

Extension: It is now possible to set a total telegram length of up to 45 bits, with the number of position bits being limited to 31 bits. The number of check and status bits is limited to 7 bits each.

11.1.3 428_Pump_control

Torque limitation for field-weakening operation of the motor

CQ-ID: Defdb00202181

Extension: The torque limitation was extended to cover field-weakening operation of the motor. For this a new parameter P-0-2958.0.8 (torque limitation for field-weakening).

In swivel angle command value processing the parameters P-0-2952 (torque limitation of pump, relative) and P-0-2958.0.8 are compared to each other and the smaller of the values is passed on as effective torque limit P-0-2958.0.9 (effective torque limitation).

Swivel angle calibration for slave pumps or pumps without pressure sensors

CQ-ID: Defdb00202179

Extension: The calibration of swivel angle sensors was extended so that it is now possible to calibrate slave pumps or pumps without pressure sensors.

See also application manual RE 30338-FK/04.2018, chapter 5.8 - Calibration functions of pump

11.1.4 430_Axis_control

Valve control variable limitation while pressure control is active

CQ-ID: Defdb00202180

Extension: If cylinder movements are to be avoided during pressure control in conjunction with certain valve types (e.g. Q5-spool), the valve command value has to be limited depending on the relevant valve characteristics. To this end, it is now possible to specify a limit value by means of the two parameters P-0-2873.0.24 (limitation of valve control variable, A-side) and P-0-2873.0.25 (limitation of valve control variable, B-side). The limitation is only effective, if it

was enabled via bit 2 in P-0-2800 (p/Q controller control word) and pressure control is active.

11.1.5 510_Operating_modes

Change of operation mode: starting value is command value

CQ-ID: Defdb00202182

Extension: As of firmware release HDx20V16, for a change of operation mode (e.g. from velocity to position) a selection can be made via bit 8 in P-0-0556 (axis controller configuration), whether the starting values after the transition are to be the actual values or the command values.

Bit 8 = 0: Actual values as starting values

Bit 8 = 1: Command values as starting values

In firmware releases before HDx20V16 this setting option was not provided, and in the case of a change of operation mode, the new mode always started on the basis of the actual values.

As of firmware version HDx20V16, the command values are active (bit 8 = 1) as starting values by default after basic parameters are loaded.

See also application manual RE 30338-FK/04.2018, chapter 6.1.3 - Starting value upon change of operation mode

11.1.6 710_Master_communication_basic_functions

Parameters with list of available bus systems

CQ-ID: Defdb00202184

Extension: Parameter P-0-4089.0.17 (master communication: List of available protocols) contains a list of bus systems, which are supported at present.

11.1.7 780_Analog_interface

Automatic acknowledgement of error F2270 (analog input, wire break)

CQ-ID: Defdb00202183

Extension: In the case of 2WRCE valves, for which exclusively analog command values can be provided, error F2270 (analog input, wire break) is automatically acknowledged as soon as the cause of error is no longer present. For acknowledging the error, command C0500 (reset class 1 diagnostics) is executed.

11.1.8 801_Power_supply_general

Setting the enable acknowledgement, when valve ports A and B are reliably disconnected

CQ-ID: Defdb00202178

Extension: In the case of valves of type WRPx with one solenoid and with 4th spool position, bit 11 of parameter P-0-2923 (configuration of system data) can be used to select whether the enable acknowledgement is to be set only when both valve port A and valve port B were reliably disconnected from the pump and the valve is hence in its failsafe position.

See also application manual RE 30338-FK/04.2018, chapter 7.5.2 - Enable acknowledgement

11.2 Fixed bugs

11.2.1 200_PLC_basis_system

MLD: Error during project download via parameters

CQ-ID: Defdb00200495

Description: If a PLC project with a task in synchronism with master communication or CCD had been deleted and afterwards loaded again by automatically creating the boot project, this sometimes resulted in a CRC error.

"MLD Error:Boot Project could not be loaded - check device version (P1365)"

The CRC error is displayed in the PLC logger.

11.2.2 240_PLC_parameter_channel

AxisData only works in PM if OM was reached before

CQ-ID: Defdb00192483

Description: The axis error status in parameter P-0-0115, device status word, was only generated if the axis had been switched to OM before. Directly after the control voltage had been switched on, the error bit was not served.

11.2.3 250_PLC_debug_interface

No detailed diagnostics if the same F6010 error occurs again

CQ-ID: Defdb00197696

Description: If an F6010 error had occurred, the appropriate detailed message was displayed in the diagnostic trace. If the same error had occurred again, this detailed message was not output anymore. Only if another F6010 had occurred was its new detailed message generated.

Exception when recording debug output for Telnet

CQ-ID: Defdb00199174

Description: If in parameter P-0-1367 (PLC configuration) bit 21 was activated for recording debug text for Telnet, an exception occurred while the firmware was booting and it was no longer possible to access the device.

11.2.4 300_System_overview_of_drive_controller_hydraulic

Active axes are not correctly shown in P-0-4030

CQ-ID: Defdb00201372

Description: Parameter P-0-4030 (Axis configuration for multi-axis device) did not correctly display the active axes in the case of VT-HMC with 2 axes. In parameter P-0-4030 the value 0 was shown although both axes of the VT-HMC are active. In this case the value in P-0-4030 should actually be 0b0000.0000.0000.0011.

This incorrect indication of active axes in P-0-4030 resulted in subsequent errors. When loading a parameter backup for the VT-HMC with 2 axes, which, due to this bug, contained value 0 for parameter P-0-4030, it was reported that P-0-4030 could not be written since the value 0 was smaller than the minimum input value required for P-0-4030.

11.2.5 302_HW_support_control_units

Valves on IFB hardware basis: Measured values for monitoring the supply voltages are not filtered

CQ-ID: Defdb00200248

Description: In the case of valves on IFB hardware basis (P-0-1520 = "IFB...") the values measured for the 24 V supply voltage (-> P-0-2885.0.3) and the +-13.5 V supply (-> P-0-2885.0.11), which are used for voltage monitoring, are not filtered. Under certain circumstances, this led to oversensitive responding of the relevant voltage monitor.

Triggering of error F8288 (fault in solenoid current cable) is not correct

CQ-ID: Defdb00204311

Description: As of firmware release HDx20V12, it was possible that under certain conditions (e.g. valve command value equal to 100 %) error F8288 (fault in solenoid current cable) was triggered by mistake.

11.2.6 415_Measuring_systems

Encoder parameters S-0-0611.1.2 and S-0-0611.1.6 without unit for the second axis

CQ-ID: Defdb00199922

Description: Both encoder parameters S-0-0611.1.2 and S-0-0611.1.6 never had a unit for the second axis.

SSI encoder: Error F2174 is displayed, if the resolution is changed, although bit 1 in P-0-0188 is set

CQ-ID: Defdb00199998

Description: A change in the settings for the encoder and the mechanical system (e.g. encoder resolution) still resulted in loss of reference and hence to error F2174, even if bit 1 was set in parameter P-0-0188 (encoder 1 control word), which meant that in the case of an absolute measuring system (e.g. SSI encoder) the reference should always be set automatically.

Bug fixing: Changes in the settings for the encoder and the mechanical system no longer generate a loss of reference, if the reference always is to be set automatically.

Exception: An absolute position offset is set, which will no longer be correct when mechanical settings are changed.

Parameter set switching of gearbox parameters

CQ-ID: Defdb00184923

Description: The load gears of the various parameter sets were not taken into account for switching. Thus, gear switching in OM was not possible!

11.2.7 426_Valve_control

HMC with 2 axes: When the error is cleared, the default value of P-0-2873.0.23 is overwritten

CQ-ID: Defdb00200024

Description: While executing command S-0-0099 (reset) in the case of an HMC with 2 axes, the default value of parameter P-0-2873.0.23 (selection of controller output) was overwritten with the value 0.

This resulted in the fact that when basic parameters were subsequently loaded for P-0-2873.0.23, analog output 1 was not set for axis 1, and analog

output 3 was not set for axis 2. Accordingly, no analog output was set for the axes.

11.2.8 428_Pump_control

Value displayed for P-0-2972 "swivel angle command value of controller" is sometimes incorrect

- CQ-ID:** Defdb00200193
- Description:** If converting of the swivel angle command value (P-0-2950, bit 4) was activated, it could happen that an incorrect value was displayed in parameter P-0-2972 "swivel angle command value of controller".
- Bug fixing:** Parameter P-0-2972 "swivel angle command value of controller" now shows the correct value.

Value range of P-0-2943 is not sufficient and extreme value check of P-0-2943 and P-0-2813

- CQ-ID:** Defdb00200101
- Description:** The value range of parameter P-0-2943 (pump displacement volume) was limited to a maximum value of 6,553.5 cm³. As a result it was impossible to enter a value of 10,000 cm³, which was, however, already required for one customer application.
- In addition, for parameters P-0-2943 (pump displacement volume) and P-0-2813 (pressure controller dead volume) the extreme value check was active (-> check of parameter value for min and max value when switching from PM to OM). It was therefore impossible to switch from PM to OM without any errors, if these parameters were cyclically transmitted over a bus system (e.g. PROFINET) and the cyclically transmitted parameter value was not greater than 0.
- Bug fixing:** Via parameter P-0-2989 (configuration of pump controller), bit 3, it is now possible to shift the decimal place for P-0-2943 (pump displacement volume). In this way it is possible to enter a maximum value of up to 65,535 cm³ for P-0-2943.
- The extreme value check is no longer carried out for the two parameters P-0-2943 (pump displacement volume) and P-0-2813 (pressure controller dead volume). Therefore, it is possible to switch from PM to OM without any errors with the value 0. It is ensured by firmware that the value 0 will not result in an invalid configuration for the pump control.

11.2.9 430_Axis_control

Changeover mode Q -> p "minimum value with active integrator" did not work

- CQ-ID:** Defdb00201418
- Description:** The changeover mode Q -> p "minimum value with active integrator" (P-0-2850, bit 0 - 2 = 0x4) did not work with firmware derivative HDE20 (-> firmware for valves based on IFB hardware).

11.2.10 435_Axis_control

Correction of the default value of P-0-2845 - alternating control active in positive direction of force

- CQ-ID:** Defdb00200140
- Description:** The default value of P-0-2845 (alternating control, control word 2) was corrected so that now, after basic parameters were loaded, alternating control is active in positive direction of force (-> bit 3).

Measuring of the valve characteristic curve is interrupted with error C1843, although the measuring conditions are sufficient

CQ-ID: Defdb00200685

Description: Measuring of the valve characteristic curve (-> axis optimization) was in some cases interrupted with error message "C1843 Axis optimization: calculation impossible. ARME: Calculation error, polygon cannot be adjusted!", although a sufficient travel distance was available for measuring and it was possible to open the valve to be measured to a sufficient extent (-> almost 100 %) while the actual velocity value was also all right.

Extreme value check of parameters S-0-0550 and S-0-0551 prevent switching to OM

CQ-ID: Defdb00200757

Description: An extreme value check was active for the two force command values S-0-0550 and S-0-0551. This means that the two force command values are checked for extreme values (min and max value) while being written, unless they are cyclically written over a bus system.

The min and max values for the two force command values were determined by S-0-0534 (maximum torque/force), the maximum value of which is ca. 4,000 kN at present. This means that it was impossible to enter force command values greater than 4,000 kN.

Note: The extreme value check was run for both force command values whenever switching from PM to OM took place.

If the two force command values were cyclically written over a bus system (e.g. Sercos) the following could happen:

- Since the force command values were cyclically written over a bus system, no extreme value check was carried out.
- This means that it was impossible to provide force command values greater than 4,000 kN.
- When switching to PM and back to OM took place, the changeover was aborted with an error, since the two force command values were checked for extreme values and an excessively high force command value was recognized.

Bug fixing: The extreme value check for the two parameters S-0-0550 and S-0-0551 was deactivated.

P-0-2845.0.2 takes the value 0, if position and velocity scaling are inverted

CQ-ID: Defdb00199220

Description: If velocity scaling was inverted, the value of P-0-2845.0.2, Scaling force to velocity, was no longer shown correctly. In this case, P-0-2845.0.2 contained the value 0.

Bug fixing: The value of P-0-2845.0.2 is now always displayed independently of the set scaling (inverted or not inverted).

Direction bits in P-0-2855 (alternating control, status word) are incorrectly generated

CQ-ID: Defdb00201176

Description: Direction bits 2 and 3 in P-0-2855 (alternating control, status word) were under certain conditions incorrectly generated, because apart from the polarity of scaling of velocity, the sign of P-0-0048 (velocity command value of controller) was considered.

Bug fixing: Direction bits 2 and 3 are now no longer dependent on P-0-0048 (velocity command value of controller), but merely on the set polarity of velocity scaling.

11.2.11 515_Operation_modes_single_axis

When switching to operation mode "drive-controlled positioning", F2028 may be triggered

CQ-ID: Defdb00200184

Description: If switching to operation mode "drive-controlled positioning" took place during a traversing movement and the target position was in the opposite direction to the current direction of movement, error F2028 (excessive control deviation) was sometimes triggered.

11.2.12 530_Error_reactions

"Monitoring travel range software" does not always work with active alternating control

CQ-ID: Defdb00199283

Description: In order that the error could occur, the following conditions had to be fulfilled:

- Position operation mode with alternating control active
- "Monitoring travel range software" active (S-0-0055, bit 4)
- An error was set as reaction to exceeding of the travel range (S-0-0532, bit 2)

If, after the travel range limit was passed and error F6029 or F6030 present was subsequently cleared, the enable for the axis was set again, it could happen that due to the active alternating control the axis continued to move beyond the travel range limits in the "wrong" direction without triggering a new error.

Bug fixing: Now, when the enable for the axis is set again after having exceeded the travel range limit and the axis would move in the "wrong" direction due to alternating control, the error for passing of the travel range limit is triggered again.

11.2.13 590_Analog_inputs_and_outputs

VT-HMC with 2 axes: Several parameters can be assigned for output to analog output

CQ-ID: Defdb00199811

Description: For the VT-HMC with 2 axes (firmware derivative HDM) several parameters could be assigned for output to an analog output on the 2nd axis.

11.2.14 620_Parameter_handling

Backup/restore: String parameters with an uneven number of characters were not correctly restored

CQ-ID: Defdb00197142

Description: String parameters that had an odd number of characters were not restored correctly with Restore. The last character was cut off.

Example:

When data were being backed up, parameter P-0-4089.0.2 contained the string "Schnell". After the restore, the string in the parameter was "Schnel". The last 'l' character was missing.

Sporadically, C0400 does not work in the case of double axes.

CQ-ID: Defdb00195816

Description: If the command "C0400 Activate parameterization level 1 procedure command" had been started simultaneously for both axes of a double axis, the command change bit sometimes was not set on one axis.

P-0-0013 contains parameters whose values were not changed by the customer

CQ-ID: Defdb00194937

Description: In the case of EtherCAT as master communication with CoE and DS402 profile, the default values for S-0-0032, S-0-0033 etc. were wrong. Thus, these parameters were always included in P-0-0013.

P-0-0013 does not show all affected parameters, when EtherCAT master communication is active

CQ-ID: Defdb00193749

Description:

1. With active EtherCAT master communication, instance parameters (*.130) were immediately listed in "P-0-0013, List of all IDNs not corresponding to default value" once they had been read via the service channel (e.g., P-0-0548.0.130).
2. If the value of a single parameter mapped to an instance parameter had differed from the default value, this was not displayed in P-0-0013.

Bug fixing: If a merely 16-bit-capable master communication is active (e.g., EtherCAT):

1. Reading an instance parameter no longer causes it to be entered in P-0-0013.
2. If the value of a parameter mapped via an instance parameter differs from its default value, its instance parameter is entered in P-0-0013.

Value read back of parameters with structure index 130 does not comply with written value

CQ-ID: Defdb00198687

Description: In the case of a parameter with structure index 130 (example: S-0-1300.x.130, Type plate, compact), the written value did not comply with the value that was read back. This caused problems with controls that had read back and checked the written value.

11.2.15 622_Scaling

Deg/s and Deg/min as new velocity unit

CQ-ID: Defdb00198271

Description: With rotary scaling, it was impossible to set Deg/s and Deg/min as unit for velocity scaling.

Bug fixing: If bit 4 in S-0-0044 is set, Deg/s and Deg/min can now be set as unit for velocity scaling.

Faulty torque scaling with pound force unit

CQ-ID: Defdb00193702

Description: A rotary actuator with linear pound force (lbf) scaling caused incorrect force values.

11.2.16 630_Firmware_handling

Valves on IFB hardware basis: Boot kernel might be unable to unpack firmware

CQ-ID: Defdb00199524

Description: With valves based on IFB hardware (P-0-1520 = "IFB...") on which boot kernel version 02V02 was loaded, it could happen that the boot kernel, while

downloading new firmware, was unable to correctly unpack the FWA file that contains the new firmware and is transmitted within the framework of downloading. Then, the valve was no longer provided with a valid firmware and thus the valve changed over to the firmware loader and the MS-LED started to flash green.

Bug fixing: This bug was fixed with boot kernel version 02V04.

11.2.17 640_Diagnostic_system

S-0-0390, bit 20 could not be configured in the signal status word

CQ-ID: Defdb00193494

Description: It had been impossible to configure parameter "S-0-0390, Diagnostic message number" in the signal status word.

Bug fixing: It is now possible to configure parameter "S-0-0390, Diagnostic message number" bitwise in the signal status word.

11.2.18 650_State_machine_subdevice

S-0-0425, bit 0, cannot be controlled via digital input

CQ-ID: Defdb00199137

Description: The parameter "S-0-0425, Sub-device state machine control" is not stored by the drive and had to be written again every time the control voltage had been switched off/on. It was impossible to control this coupling by setting a digital input.

Bug fixing: Parameter "S-0-0425" can be set via a digital input.

11.2.19 688_Service_functions

Automatic update with "loose update data" (without archive) does not start

CQ-ID: Defdb00201158

Description: If new update data were stored "loosely" in the update directory of the SD card, that is, they were not packed as an archive, command C67 (update) did not start automatically while booting. However, when started manually, updating worked.

Bug fixing: New update data are now recognized during booting, if they are stored loosely in the update directory of the SD card (without archive), and command C67 (update) is automatically started accordingly.

Backup/restore: PLC program is not restored when executing the restore function

CQ-ID: Defdb00193882

Description: If a restore was executed with a backup archive, which contained a PLC program, the PLC program was not restored correctly, if the functional package MLD was not active in parameter P-0-2003, bit 9, when the restore function was started.

Bug fixing: The bug was fixed.

Update command C67 did not work properly

CQ-ID: Defdb00200926

Description: When an update command C67 was started, it was not executed without errors, if the update data were stored in an update archive and, at the same time, no backup archive was available in the backup directory on the SD card.

Reason for this error:

While updating, a check is run to see whether the update archive comes from a device, the type of which corresponds to the current device. However, this information was erroneously retrieved from the backup archive (in the backup directory). If it was not available, the update command was aborted and the error "The archive is not valid for the current device" issued.

Bug fixing: Update command C67 is now executed, if an update archive is available in the update directory. The update archive must in any case contain the file "BackupInfo.txt".

CCD: Backup for hydraulic drives causes command error C6502

CQ-ID: Defdb00197872

Description: With hydraulic drives as CCD slaves, command C6500 caused error C6502.

Bug fixing: The device type is checked for CCD slaves in the group. If it is not an IndraDrive device, the parameter set defined by the hydraulic drives (P-0-1349.x.y) is saved.

Restore is possible if the archive was created on another device type

CQ-ID: Defdb00197871

Description: During a restore it was not checked whether the backup was created by the same device. Therefore, unsupported operation modes were entered during restore, for example.

11.2.20 690_Offline_and_simulation

Offline server: crash with master communication EtherCAT

CQ-ID: Defdb00192852

Description: With set EtherCAT master communication (SoE, P-0-4089.0.1 = 5 or CoE, P-0-4089.0.1 = 8) the offline server crashed, if the master communication dialog was opened in offline parameterization in IndraWorks.

Offline server: incorrect number of digital outputs of VT-HPC

CQ-ID: Defdb00200047

Description: In the offline server for the VT-HPC the number of digital outputs was not correct. Instead of the 4 digital outputs, which are also provided by the VT-HPC in terms of hardware, the offline server displayed only 2 digital outputs.

Offline server: individual operation mode of pressure control not available

CQ-ID: Defdb00199510

Description: In the offline server the individual operation mode of pressure control (0x0053) was not available.

Offline server: Addresses handed over in the command line are not accepted.

CQ-ID: Defdb00198067

Description: When offline parameterization is started in IndraWorks, an offline server is started, which receives the drive addresses, which are to be used for the SIS communication between the offline server and IndraWorks, in the command line.

In the offline server these drive addresses, which were handed over via the command line, were not entered in S-0-1040 of the relevant axis. As a consequence, no communication was possible with the offline server in IndraWorks, because it was not the handed-over addresses, which were used for communication, but the addresses saved last in parameter

S-0-1040. Offline parameterization was therefore not always possible with IndraWorks.

Offline server: No communication, if bit 9 of P-0-1535 (SIS server) is not set

CQ-ID: Defdb00199515

Description: By setting bit 9 of P-0-1535 the SIS server can be switched off. As a result, communicating with the offline server in IndraWorks was no longer possible, since the SIS server is the communication interface of the offline server. Consequently, offline parameterizing was also no longer possible with IndraWorks.

Bug fixing: With the offline server, the SIS server is always started independently of the state of bit 9 of P-0-1535 in order to allow communicating with the offline server in IndraWorks and thus offline parameterization.

Offline server: P-0-0077 is not set to default value when loading basic parameters

CQ-ID: Defdb00199554

Description: In the offline server, parameter P-0-0077 (assignment of encoder 1->interface) was not set to its default value when basic parameters were loaded, but retained the value last entered.

Offline server: switching over to OM not possible with active functional package p/Q

CQ-ID: Defdb00191159

Description: While functional package p/Q was active and switching over from PM to OM took place in the offline server, a conversion error of parameter P-0-2999.4 occurred that contains the p/Q valve characteristic curve, and changing over to OM was aborted.

Note: In this case, parameter P-0-2999.0.4 was shown in the list of invalid operating data (-> S-0-0423)

11.2.21 710_Master_communication_basic_functions

Overview of device addresses in P-0-4031 not correct for 2nd axis

CQ-ID: Defdb00199573

Description: For the HMC with 2 axes, parameter P-0-4031 (overview of device addresses) was not generated correctly for the 2nd axis, if a master communication other than Sercos was set in P-0-4089.0.1.

In this case, element 1 of P-0-4031 always contained the value 0 for the addresses of the 2nd axis instead of the values from parameters P-0-4089.0.3 and S-0-1040.

11.2.22 720_Profile_adaptation

Multiple configuration of P-0-4028 was not signaled in the case of profile type "analog"

CQ-ID: Defdb00200369

Description: It was not signaled that parameter P-0-4028 had multiple configurations, if the following parameter combination had been set:

- Profile type "analog" was selected in P-0-4084
- In P-0-4089.0.1 a bus system was set (e.g. PROFINET)
- P-0-4028 was written completely or bitwise (-> signal control word) over the bus system
- P-0-2945 (configuration of analog mode) contained a value between 2 and 5. This means, that bit 15 is set automatically in P-0-4028.

Error bit set in status word 0x6041

CQ-ID: Defdb00199135

Description: With DS402, the error bit was set in the status word 0x6041 although no error had been present in the drive. The drive did not display any error in parameter P-0-0115 or S-0-0390. This happened if errors had been cleared in the drive in other ways (e.g., via S-0-0099 or using IndraWorks) than via the DS402 control word 0x6040.

Bug fixing: If errors are cleared in the drive (via DS402 control word or directly via drive parameter), the error bit in the status word 0x6041 is cleared, too.

11.2.23 730_PROFINET

PROFINET: communication over Ethernet no longer possible, if IP settings are incorrect

CQ-ID: Defdb00196842

Description: The parameters P-0-4089.0.13, P-0-4089.0.14 and P-0-4089.0.15 were not checked for validity in the drive. This sometimes made communication via Ethernet (Engineering over IP) impossible.

11.2.24 745_Sercos III

Error F2067 occurs sporadically when switching from phase 4 to phase 0

CQ-ID: Defdb00195486

Description: With the bus clock cycle equaling the position clock cycle, error F2067 occurred sporadically when the drive had been switched from phase 4 to phase 0.

11.2.25 750_EtherCAT

CoE: Error F4009 is not signaled if bus connector is removed

CQ-ID: Defdb00198189

Description: In the case of a bus failure, error F4009 was not signaled with EtherCAT CoE. If the drive had been in drive enable, only error F4002 was signaled.

CoE: Process data configuration is not saved

CQ-ID: Defdb00195463

Description: With CANopen over EtherCAT (CoE) the process data configuration was not saved in the drive. However, this is required because there are CoE masters that do not write the configuration during run-up.

CoE: S-0-0014 and P4073 not always consistent

CQ-ID: Defdb00186334

Description: The EtherCAT communication state was not correctly mapped to S-0-0014.

The 0x1C00 01..04 objects are of the wrong data type

CQ-ID: Defdb00197798

Description: The 0x1C00 01..04 objects were of the wrong data type. They were of the UINT32 data type instead of UINT8.

EtherCat COE S1 is overwritten

CQ-ID: Defdb00199066

Description: When switching from PM to OM the master communication cycle time (object: 0x1006) was automatically entered in parameter S-0-0001. If the command values are written by the MLD, for example, the command value updating time of the MLD must be entered in S-0-0001. This was impossible.

Bug fixing: Depending on P-0-4088, bit 4, the value of S-0-0001 can be manually written by the customer or the master communication cycle time is set as the value of S-0-0001.

EtherCAT COE: F4009 : although cyclic communication is exited

CQ-ID: Defdb00196078

Description: The error F4009 was signaled during phase switch from Operational to Safe-Operational or to PreOperational. This happened if the EtherCAT SyncManager watchdog had been set to a low value (example: watchdog of 1 ms with bus cycle time of 1 ms).

Bug fixing: The SyncManager watchdog is not monitored during phase switch.

EtherCat COE: wrong max. AT and MDT length

CQ-ID: Defdb00199082

Description: Wrong minimum and maximum values had been stored in parameters P-0-4071 and P-0-4082.

Bug fixing: Minimum, maximum and default values are not stored anymore for parameters P-0-4071 and P-0-4082.

EtherCAT EoE: Invalid MAC address does not cause error

CQ-ID: Defdb00198344

Description: In the case of EtherCAT EoE, the EtherCAT master assigns a (virtual) MAC address to the drive. If the MAC address is invalid, the Engineering connection to the drive cannot be established. Previously, the customer had not been informed about the invalid MAC address.

Bug fixing: If the MAC address is invalid (e.g., if it is in the multicast range), the error message F4072 (EtherCAT: EoE error) is output.

Command errors (C0113) with EtherCAT in FreeRun mode

CQ-ID: Defdb00195566

Description: With EtherCAT, command errors (e.g. C0113, ...) occurred sporadically in the Free Run mode.

Switching from PM to OM takes a long time with a configured master communication encoder

CQ-ID: Defdb00199133

Description: With a configured master communication encoder, switching from PM to OM took a long time.

EtherCAT (CoE): P-0-4073 does not indicate profile diagnostics

CQ-ID: Defdb00200355

Description: With bus system EtherCAT, parameter P-0-4073 did not display the bus state "Operational" for HydraulicDrive devices.

Bug fixing: For HydraulicDrive devices in the "Operational" state, the status of the bus profile is shown in P-0-4073. If the current profile does not provide a status (currently only with the Fluid Power profile), "Operational" is now indicated.

HMC with 2 axes: EtherCAT (SoE) does not work

CQ-ID: Defdb00200078

Description: In conjunction with EtherCAT (SoE) it was impossible to address the 2nd axis of the VT-HMC via EtherCAT.

S-0-0029 (MDT error counter) counts in Free Run mode

CQ-ID: Defdb00199959

Description: With EtherCAT, in the Free Run mode the error counter was counted up in parameter S-0-0029.

Bug fixing: The error counter in S-0-0029 is now no longer processed with EtherCAT in the Free Run mode.

11.2.26 755_VARAN

In the event of a bus failure, E4001 is output instead of F4009

CQ-ID: Defdb00200908

Description: When the bus connector was unplugged while the controller enable was not set, only warning E4001 Sync telegram failure was issued; error F4009 (bus failure) was not shown.

Error counter S-0-0029 counts up sporadically with direct access telegrams

CQ-ID: Defdb00201159

Description: When receiving Direct Access telegrams while VARAN communication was activated, the error counter in S-0-0029 sporadically counted up.

11.2.27 760_Powerlink

Alias parameter cannot be written via SDO in the case of EPL

CQ-ID: Defdb00196843

Description: Acyclic access to alias parameters was not possible with Ethernet POWERLINK. The error message "SDO Transfer Abort: Data type does not match, length of service parameter does not match. (0x6070010)" was output.

Drive does not go online while product code check is active

CQ-ID: Defdb00191429

Description: If product code check was activated in Automation Studio, it was impossible to switch the drive to online.

Bug fixing: A new device description file (XDD) is required, since in the device description file, an incorrect produce code was entered in object 0x1018.

The value of P-0-4076 can be changed in the state "Data Exchange"

CQ-ID: Defdb00200010

Description: With Ethernet POWERLINK it was possible to change parameter P-0-4076, if the bus was in cyclic operation and in the synchronization mode.

Bug fixing: Parameter P-0-4076 can now only be changed, if the bus is not in cyclic operation and has not been synchronized.

DS402: Bit 9 not generated in status word 0x6041 (remote)

CQ-ID: Defdb00199155

Description: Bit 9 (remote) had not been generated in the status word DS402 (0x6041). Some controls evaluate this bit and therefore were not able to set the enable signal.

Engineering IP address remains unchanged

CQ-ID: Defdb00183964

Description: When switching the drive over to Ethernet POWERLINK the IP settings were not automatically adjusted to suit the Ethernet POWERLINK subnetwork 192.168.0.x.

EPL: "All" parameter backup via IP does not work

CQ-ID: Defdb00182328

Description: In the case of a backup of all drive parameters via Ethernet POWERLINK, the error message "Service channel not open" was output for some Ethernet POWERLINK parameters.

Object 0x1F8C must not be cyclically configurable

CQ-ID: Defdb00199646

Description: If a new version of Automation Studio was used in conjunction with the bus system Ethernet POWERLINK, a warning was issued when the Ethernet POWERLINK device description was imported, because the object 0x1F8C was cyclically configurable. This is caused by an incompatible change in the Ethernet POWERLINK specification (V1.2 to V1.3). This message could only be eliminated by adjusting the device description file.

In Automation Studio 4.3.x HydraulicDrive devices are recognized with only one port

CQ-ID: Defdb00200574

Description: When used with Ethernet POWERLINK, Automation Studio 4.3.x represented HydraulicDrive devices with only one port due to a fault in the POWERLINK device description file. As a result, no further device could be configured for the second port.

11.2.28 801_Power_supply_general

F8288 (fault in solenoid current cable) is triggered when the hardware enable is withdrawn

CQ-ID: Defdb00200228

Description: Under certain circumstances it could happen that error F8288 (fault in solenoid current cable) was triggered, when the hardware enable for the valve was removed.

Valves on IFB hardware basis: Incorrect error reaction in the case of a position transducer cable break

CQ-ID: Defdb00200728

Description: In the case of pilot operated valves based on IFB hardware (P-0-1520 = "IFB...") the output stage of the valve was not shut down in the event of a cable break of the position transducer for the actual valve value of the main stage or the intermediate stage. As a result the valve did not move to the fail-safe position, which is, however, defined as error reaction in the case of a position transducer cable break.

Valve output stage is not reliably switched off in the case of undervoltage

CQ-ID: Defdb00199540

Description: If too low a supply voltage was applied to the valve or to the VT-HPC, error F8072 was triggered due to undervoltage, but the valve output stage was not reliably switched off. This had the following consequence: If the supply voltage was exactly as high as the monitoring threshold for recognizing undervoltage, the valve output stage was constantly switched on and off.

Bug fixing: The valve output stage is now reliably switched off when undervoltage is detected and it is only switched on again, when the undervoltage was corrected and the error was cleared (-A S-0-0099).

12 HDx20V16.10

12.1 Fixed bugs

12.1.1 415_Measuring_systems

EnDat encoder on the second axis of the VT-HMC did not work

CQ-ID: Defdb00202246

Description: An EnDat encoder connected to the second axis of the VT-HMC (-> connector XG21) did not work. For the EnDat encoder of the second axis, the error message F8022 (Enc. 1: Enc. signals incorr.) was displayed.

12.1.2 430_Axis_control

Valve standard velocity (P-0-2873.0.1) not MDT-capable

CQ-ID: Defdb00202422

Description: Valve standard velocity (P-0-2873.0.1) was not MDT-capable. This means that it was impossible to configure the valve standard velocity cyclically as command value over a bus system (e.g. PROFINET).

12.1.3 650_Statemachine_Subdevice

Simultaneous changeover of the two axes of the VT-HMC from PM to OM was not possible

CQ-ID: Defdb00202312

Description: Switching both axes of a VT-HMC simultaneously from PM to OM was impossible, if SSI encoders or EnDat encoders were connected to the axes. Phase progression of the second axis was always interrupted with error message "C0270 Basic encoder evaluation not ready => encoder 1".

Bugfix: The bug was fixed.

12.1.4 725_Profibus

F4011 occurs in conjunction with VT-HMC with PROFIBUS when switching from PM to OM

CQ-ID: Defdb00202344

Description: Error F4011 (Communication watchdog: Overload of cyclic communication) may have occurred in conjunction with the VT-HMC with PROFIBUS when switching from PM to OM. This happened especially when parameters were saved at the same time.

13 HDx20V16.20

13.1 Fixed bugs

13.1.1 426_Valve_control

As of version HDx20V16 valve control is noisier (-> valve controller version 1)

CQ-ID: Defdb00203929

Description: As of firmware version HDx20V16, an error in the valve controller (-> version 1) resulted in a noisier valve control. The actual valve value showed "noise" of ca. +/- 0.5 %, if the valve was operated in open loop control in the direct valve control mode via the command value generator with sine signals having an amplitude of 20 %. This "noise" was less obvious with firmware HDx20V12.30.

Remark: Whether the valve controller in a valve runs with version 1 can be ascertained with the help of parameter P-0-2999.0.3, element 0. If it contains the value 0xA55A0100, the valve controller is active with version 1.

13.1.2 435_Axis_control

Velocity pre-control was not considered when starting closed-loop force control / actual force value filter cleared

CQ-ID: Defdb00202971

Description: When starting force control via the I-component, velocity pre-control of the force controller was not taken into account.

With alternating control, the actual force value filter was cleared at the moment of switching back to position control. This resulted in the fact that the filter was completely re-initialized the next time when switching to force control took place.

Bug fixing: When starting force control via the I-component, velocity pre-control of the force controller is now correctly taken into account.

With alternating control, the actual force value filter is no longer cleared at the moment when switching back to position control takes place. The filter is now only initialized with the current actual force value when a new operation mode is started.

13.1.3 725_Profibus

Running up to cyclic data exchange did sporadically not work

CQ-ID: Defdb00203678

Description: Since the last firmware release HDx20V12, running up to cyclic data exchange (-> P-0-4073 = "Data Exch ...") did no longer work reliably with VT-HMC and VT-HPC in conjunction with PROFIBUS. Sporadically, it could happen that the VT-HMC or VT-HPC got stuck in the state "Wait-Prm" (-> P-0-4073) or "Wait-Cfg" or even error F4011 (Watchdog communication: overload cyclic communication) was triggered.

This error was independent of the set bus timing of the PROFIBUS DP master. This means that the probability of occurrence and the frequency of the error was also determined by the communication time behavior of the PROFIBUS DP master.

14 HDx20V16.30

14.1 Fixed bugs

14.1.1 590_Analog_inputs_and_outputs

VT-HMC: Cable break at analog input on 2nd axis cannot be acknowledged

CQ-ID: Defdb00204877

Description: For the 2nd axis of the VT-HMC cable break monitoring for the assignment of analog inputs did not work properly. If a cable break occurred at an analog input, which was used in an assignment on the 2nd axis, this cable break could not be acknowledged, but a reboot had to be executed on the VT-HMC.

Warning E2302 (analog output overload) results in overflow of diagnostic trace

CQ-ID: Defdb00204312

Description: If an analog output of the VT-HMC is configured as current output and an error is detected at the analog current output (short-circuit or cable break), warning E2302 (analog output overload) is triggered.

For the VT-HMC with 2 axes, in the event of an error the warning E2302 (analog output overload) was cyclically entered in the diagnostic trace, which resulted in an overflow of the diagnostic trace and issuing of warning E2001 (Diagnostic trace S-0-1303.0.10 overflow warning).

15 HDx20V18

15.1 Notes on the firmware update to HDx20V18

15.1.1 VT-HMC with 2 axes - backup of parameters before updating

Description: When the firmware of the VT-HMC with 2 axes is updated from release HDM20V12 or HDM20V16 to release HDM20V18 the **parameter settings are lost** and **loading of basic parameters** is required.

When an update to release HDM20V18 is executed, the following points have to be carried out in the order given:

1. Save the parameters of the VT-HMC for both axes via IndraWorks
2. Download the firmware HDM20V18 to the VT-HMC
3. After rebooting, error message F2009 appears (->loading of default parameters required).
4. Load the default parameters for both axes of the VT-HMC
5. Load the parameters saved before for both axes via IndraWorks

Background: When updating to firmware release HDM20V18 the parameter settings are lost, since the firmware of the VT-HMC with 2 axes was extended by the synchronization functionality and the internal parameter memory layout had therefore to be changed to accommodate the newly added synchronization axis.

15.1.2 VT-HMC with 2 axes - device version 20.18.1422.32 for PLC program

Description: For creating a PLC program for the VT-HMC with 2 axes as of firmware release HDM20V18 **device version 20.18.1422.32** or higher is required. As of IndraWorks version 14V22 patch 2 or 14V24 patch 1 this version is included in the installation of IndraWorks.

If the firmware of the VT-HMC with 2 axes is updated to release HDM20V18, the PLC program has to be newly compiled with device version 20.18.1422.32 and re-loaded.

Background: As of device version 20.18.1422.32 the newly added synchronization axis can be addressed in the PLC program via **SyncAxis**.

15.2 Functional extensions

15.2.1 200_PLC_basis_system

Optimization of PLC for variable-speed pump control

CQ-ID: Defdb00205945

Description: The PLC functionality was optimized in terms of runtime so that a variable-speed pump control can be realized with valves on the basis of IAC hardware (P-0-1520 = "IACP3...").

Notes:

The PLC functionality is only available for valves on the basis of IAC hardware with firmware derivative HDP. In order that the HDP firmware can be uploaded in a valve, a valve electronics with extended memory continues to be required.

With firmware HDP20V18 the variable-speed pump control is available as prototype.

15.2.2 302_HW_support_control_units

Monitoring of 24 V for external pressure sensors

CQ-ID: Defdb00205946

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") implementation of monitoring of the voltage of 24 Volt, which is made available on connector X2N for supplying external pressure sensors.

If an error is detected on the 24 Volt supply, error F8069 (error in device-internal power supply) is triggered.

See also application manual RE 30338-FK/03.2019, chapter 9.3.6 Device monitoring

15.2.3 428_Pump_control

Pump control for SY(H)DFEF

CQ-ID: Defdb00205949

Description: A pump control was implemented for the pressure and flow control system of type SY(H)DFEF.

See also application manual RE 30338-FK/03.2019, chapter 7.4 Pressure/swivel angle controller (pump controller)

15.2.4 435_Axis_control

Fine interpolator for velocity controller

CQ-ID: Defdb00205951

Description: A fine interpolator was implemented for the velocity controller, which can be switched on via bit 0 of P-0-0556 (Config word of axis controller). By default, the fine interpolator is switched off.

See also application manual RE 30338-FK/03.2019, chapter 7.2.4 Position control

Closed-loop velocity control: additive command value

CQ-ID: Defdb00205948

Description: The velocity controller was extended by an additive velocity command value (P-0-2832.0.17), which is effective at the output of the controller.

See also application manual RE 30338-FK/03.2019, chapter 7.2.4 Position control

15.2.5 437_Synchroniization_control

Synchronization control (position) for VT-HMC with 2 axes

CQ-ID: Defdb00205950

Description: For the VT-HMC with 2 axes, firmware HDM20V18 offers synchronization control for position synchronization as prototype.

Synchronization can only be activated, if SD card VT-SD-HMC-SYNC-000-001-000-000 (R901512467) is inserted in the VT-HMC with 2 axes.

See also application manual RE 30338-FK/03.2019, chapter 7.3 Synchronization controller

15.2.6 530_Error_reactions

Redefining selected axis errors as warnings

CQ-ID: Defdb00205953

Description: The following axis errors can be redefined to become warnings:

- F2028 (excessive control deviation)
- F2037 (excessive position command difference)
- F8022 (enc. 1: Enc. signals incorr. (can be cleared phase 2))
- F8079 (velocity limit value exceeded)

See also application manual RE 30338-FK/03.2019, chapter 8.5.4 Error suppression

15.2.7 620_Parameter_handling

Adjustment of time between two flash backup processes

CQ-ID: Defdb00205954

Description: Due to continuous acyclic writing of parameters over the bus systems VAR-AN, Sercos, PROFINET, etc. it could happen that the data flash memory, in which parameters are stored, was destroyed by excessive overwriting. To prevent this the firmware was extended so that the time between two save processes to the data flash is adjusted in dependence on the frequency of writing parameters.

The implemented functionality is as follows:

1. As long as not more than 6 write cycles take place per minute, saving parameters to the data flash is not delayed.
2. If more than 6 write cycles are detected per minute, saving of parameters is delayed by 10 seconds.
3. If more than 100 write cycles are detected per hour, saving of parameters is delayed by 10 minutes and warning E2006 (excessive number of write accesses to flash) appears.

15.2.8 630_Firmware_handling

More robust firmware download for IFB valves

CQ-ID: Defdb00205955

Description: The firmware download for valves based on IFB hardware (P-0-1520 = "IFB...") was made more robust by introducing double buffering of the firmware.

So far, it has been possible that the following situation occurred while downloading firmware. If the firmware download failed (e.g. power supply was switched off while downloading firmware), the firmware loader was automatically started and the valve could only be addressed over standard Ethernet at the static IP address 192.168.0.1 via TFTP.

This can no longer take place due to double buffering, since the firmware last loaded successfully remains active until a new firmware was loaded flawlessly to the valve.

15.2.9 730_PROFINET

PROFINET for IFB valves

CQ-ID: Defdb00205958

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") the PROFINET bus system was implemented.

See also application manual RE 30338-FK/03.2019, chapter 4.8 PROFINET

15.2.10 735_EtherNet_IP

EtherNet/IP for IFB valves

CQ-ID: Defdb00205957

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") the EtherNet/IP bus system was implemented.

See also application manual RE 30338-FK/03.2019, chapter 4.7 EtherNet/IP

15.2.11 780_Analog_interface

Automatic error acknowledgement for "analog" 2WRCE valves

CQ-ID: Defdb00205956

Description: In the case of 2WRCE valves, for which exclusively analog command value provision is possible, error F2270 (analog input, wire break) and F8072 (control voltage failure) are automatically acknowledged as soon as the cause of error is no longer present.

For acknowledging the error, command C0500 (reset class 1 diagnostics) is executed automatically.

15.2.12 801_Power_supply_general

WRPxH valves: Setting of the enable acknowledgement, when valve connection B is also reliably disconnected

CQ-ID: Defdb00204380

Description: As of firmware release HDx20V16 it was possible to set valves of type WRPxH, which were not correctly calibrated during production, via bit 11 of parameter P-0-2923 so that the enable acknowledgement was to be set only, if valve connection B was also reliably disconnected from the pump. It could therefore not be reliably ensured that the enable acknowledgement was set only, if valve connection B was actually and reliably disconnected from the pump.

See also application manual RE 30338-FK/04.2018, chapter 7.5.2

Enable acknowledgement

Extension: Setting bit 11 in parameter P-0-2923 is now only allowed, if the valve was correctly calibrated during production.

15.3 Fixed bugs

15.3.1 200_PLC_basis_system

During login the error message "Download denied on Application from CM" appears

CQ-ID: Defdb00203384

Description: While attempting to log in on the HydraulicDrive using IndraWorks, the error message "Download denied on Application from CM" was issued, if the following conditions were fulfilled:

1. The boot project for the PLC program was saved in the internal flash (P-0-1367, bit 8 = 0).

2. A complete parameter backup (-> backup of all parameters) was loaded, which did not contain a PLC program in parameters P-0-1349.x.y.

Exception while switching to OM, if functional package ML was activated on one axis only

- CQ-ID:** Defdb00200918
- Description:** With the VT-HMC with 2 axes an exception could occur when switching from PM to OM, if functional package ML (IndraMotion MLD) was active on one axis, while it was not activated on the other axis.
- Bug fixing:** If functional package ML is activated on one axis, the PLC functionality (IndraMotion MLD) is automatically active for all axes, since the PLC functionality is independent of axes. S-0-0030 then indicates that the additive functional package ML is active for all axes.

After a parameter backup was loaded without PLC program, the lengths of P-0-1349.x.2 were not correct

- CQ-ID:** Defdb00203593
- Description:** Following loading of a parameter backup, which did not contain a PLC program (-> parameters P-0-1349.x.2 are empty), the lengths of parameters P-0-1349.x.2 were not correctly shown with the length 0, but retained their last value.

The PLC browser command "tasks" showed incorrect values for a free stack in user PLC task stacks

- CQ-ID:** Defdb00202378
- Description:** If the command "tasks" was entered in the PLC shell, a wrong percentage value was displayed for the free stack of the PLC task in column "FrSt", if the task was a user PLC task.

PLC program cannot be loaded via parameter file, if a PLC program is already available.

- CQ-ID:** Defdb00203931
- Description:** If a PLC program was already stored in the internal flash (P-0-1367, bit 8 = 0), error F6010 was triggered when a PLC program was loaded via a parameter file and the PLC program was not loaded successfully.
- In this case, the following error message was displayed in P-0-1365: *PARALOAD-ERROR* One parameter of P-0-1349 has wrong length".
- Interim solution:** This error can be worked around by loading the PLC program a second time via the parameter backup.

F6010 occurred during an MLD tech function update

- CQ-ID:** Defdb00201528
- Description:** If a technology function was updated via the IndraWorks project dialog, F6010 occurred and the retain data were initialized. In P-0-1365, the detailed error message "MLD-ERROR Retain data mismatch - Reboot or Reset cold necessary" was displayed. The pending error F6010 could not be reset using a PLC reset cold.
- Interim solution:** Load the parameter file to the drive using "Load parameter" (including or excluding P-0-1359) and reboot.

A deadlock occurred in MX_SetDeviceMode after having changed the OperationMode during processing

- CQ-ID:** Defdb00196864

Description: If operating mode (OperationMode = TRUE) was selected in the MX_SetDeviceMode and if during switching (before the operating mode was reached) the instruction was changed to parameterization mode (OperationMode = FALSE), a deadlock occurred: Instead of the parameterization mode, the operating mode was reached and neither the Done output nor the Error output were set.

Bug fixing: The MX_SetDeviceMode now detects if the specified mode (OperationMode input) has changed during a switching operation. If this is the case, switching to the specified mode according to the "OperationMode" input is started after the current switching operation has been completed. After the second switching operation has been completed, the Done output is set.

15.3.2 240_PLC_parameter_channel

RIL_SercosIII: Done output (Fb IL_SIIISvcWrite) is not set when deleting 1-byte list parameters

CQ-ID: Defdb00202933

Description: If the IL_SIIISvcWrite function block is to be used to delete a 1-byte list (list parameter is to contain 0 elements after having been written), the list had been deleted but the Done output of the function block was not set. Exception: The error did not occur with text parameters (ASCII format).

15.3.3 302_HW_support_control_units

Error F8288 (fault in solenoid current cable) is not unequivocal

CQ-ID: Defdb00203958

Description: When error F8288 (fault in solenoid current cable) occurred, it was not clear, which was the cause of the error (cable break or short-circuit).

Bug fixing: A detailed diagnostic message in S-0-0390.0.136 now indicates whether error F8288 was triggered by a short-circuit of the solenoid current cable (S-0-0390.0.136 = 0x00490004) or by a cable break of the solenoid current cable (S-0-0390.0.136 = 0x00490005).

P-0-2998.0.1 does not function correctly for PLC program

CQ-ID: Defdb00203693

Description: In parameter P-0-2998.0.1 (Maximum values of write counter, SPI flash memory) the write counter for the flash memory range, in which the PLC program is stored, was not correctly incremented when this range was written.

Moreover, when reading the P-0-2998.0.1 via IndraWorks, a communication interruption could occur.

P-0-2998.0.1 not correct for valves on IFB hardware basis

CQ-ID: Defdb00204473

Description: In the case of valves based on IFB hardware (P-0-1520 = "IFB...") the content of parameter P-0-2998.0.1 (Maximum values of write counter, SPI flash memory) was not correct. Also flash sectors that had not been used were shown.

Bug fixing: Parameter P-0-2998.0.1 now only displays flash sectors actually used.

15.3.4 415_Measuring_systems

EnDat encoder on the second axis of the VT-HMC did not work

CQ-ID: Defdb00202007

Description: An EnDat encoder connected to the second axis of the VT-HMC (-> connector XG21) did not work. For the EnDat encoder of the second axis, the error message F8022 (Enc. 1: Enc. signals incorr.) was always displayed.

Position jump with long TTL encoders

CQ-ID: Defdb00205763

Description: With linear TTL encoders a possible overflow of the range of numbers was not correctly treated internally. Thus, a position jump occurred in the case of an overflow in conjunction with "long TTL encoders".

15.3.5 426_Valve_control

Output of pilot controller (P-0-2915.0.5) not AT-capable

CQ-ID: Defdb00204547

Description: The parameter "output of pilot controller" (P-0-2915.0.5) was not AT-capable. This means that it was impossible to configure the parameter cyclically as actual value over a bus system (e.g. PROFINET).

As of version HDx20V16 the valve control is noisier (-> valve controller version 1)

CQ-ID: Defdb00203934

Description: As of firmware version HDx20V16, an error in the valve controller (-> version 1) resulted in a noisier valve control. The actual valve value showed "noise" of ca. +/- 0.5 %, if the valve was operated in open loop control in the direct valve control mode via the command value generator with sine signals having an amplitude of 20 %. This "noise" was not present in this form with firmware HDx20V12.30.

Remark: Whether the valve controller in a valve runs with version 1 can be ascertained with the help of parameter P-0-2999.0.3, element 0. If it contains the value 0xA55A0100, the valve controller is active with version 1.

15.3.6 428_Pump_control

Calibration values are not saved after command P-0-2990 was completed

CQ-ID: Defdb00204555

Description: Upon completion of the calibration functions of the pump controller (-> command P-0-2990) the calibration values are saved. If the calibration command was completed directly after the message "Command successfully completed" (P-0-2990 = 0), it could happen that the process of saving calibration values was not correctly completed.

Bug fixing: The message "Command successfully completed" is only output when it is ensured that the new calibration values were saved.

Interim solution: After the message "Command successfully completed" was issued a time of at least 50 ms has to elapse before the command is completed. Then the new calibration values are stored correctly.

15.3.7 430_Axis_control

Alias parameter missing for P-0-2806.0.24 (Pressure feedback value, filtered)

CQ-ID: Defdb00201516

Description: For the pressure controller parameter P-0-2806.0.24 (Pressure feedback value, filtered) no alias parameter had been defined.

Thus, it was impossible to transmit this parameter cyclically with 16-bit bus systems (e.g. VARAN).

Bug fixing: For the pressure controller parameter P-0-2806.0.24 (Pressure feedback value, filtered) alias parameter P-0-3859 was created.

Default values for limiting the valve control value for A-side and B-side were not correct

CQ-ID: Defdb00201546

Description: In the case of valves on IFB hardware basis (P-0-1520 = "IFB...") it was possible that when basic parameters were loaded, the default values for parameters P-0-2873.0.24 (Limitation of valve control variable, A-side) and P-0-2873.0.25 (Limitation of valve control variable, A-side) were not loaded correctly.

Valve standard velocity (P-0-2873.0.1) not MDT-capable

CQ-ID: Defdb00202000

Description: Valve standard velocity (P-0-2873.0.1) was not MDT-capable. This means that it was impossible to configure the valve standard velocity cyclically as command value over a bus system (e.g. PROFINET).

15.3.8 435_Axis_control

Extreme value check of parameters S-0-0550 and S-0-0551 prevents switching to OM

CQ-ID: Defdb00200758

Description: An extreme value check was active for the two force command values S-0-0550 and S-0-0551. This means that the two force command values were checked for extreme values (min and max value) while being written, unless they were cyclically written over a bus system.

The min and max values for the two force command values were determined by S-0-0534 (maximum torque/force), the maximum value of which is ca. 4,000 kN at present. This means that it was impossible to enter force command values greater than 4,000 kN.

Note: The extreme value check was run for both force command values whenever switching from PM to OM took place.

If the two force command values were cyclically written over a bus system (e.g. Sercos) the following could happen:

- Since the force command values were cyclically written over a bus system, no extreme value check was carried out.
- This means that it was impossible to provide force command values greater than 4,000 kN.
- When switching to PM and back to OM took place, the changeover was aborted with an error, since the two force command values were checked for extreme values and an excessively high force command value was recognized.

Bug fixing: The extreme value check for the two parameters S-0-0550 and S-0-0551 was deactivated.

Velocity pre-control not considered when starting closed-loop force control / actual force value filter cleared

CQ-ID: Defdb00203145

Description: When starting force control via the I-component, velocity pre-control of the force controller was not taken into account.

With alternating control, the actual force value filter was cleared at the moment of switching back to position control. This resulted in the fact that the

filter was completely re-initialized the next time when switching to force control took place.

Bug fixing: When starting force control via the I-component, velocity pre-control of the force controller is now correctly taken into account.

With alternating control, the actual force value filter is no longer cleared at the moment when switching back to position control takes place. The filter is now only initialized with the current actual force value when a new operation mode is started.

After successful axis optimization the axis did not return to its starting position

CQ-ID: Defdb00204068

Description: After successful axis optimization the axis did not return to the original starting position (position, at which axis optimization was started).

The error only occurred if the following conditions were fulfilled:

- The position data reference was set for the axis.
- Scaling for the position was inverted.

Bug fixing: The axis now returns to its starting position after axis optimization also with negative scaling of the position and set position data reference.

Differences at the output of the pressure controller (P-0-2805) between functional package p/Q and AXR

CQ-ID: Defdb00203455

Description: With identical input variables for the pressure controller (command value, actual value, etc.) as well as identical settings for the pressure controller, differences occurred at the output of the pressure controller (P-0-2805) between the operation mode closed-loop pressure control / (open/closed-loop) flow control with functional package p/Q and operation mode closed-loop pressure control / direct valve control with functional package AXR.

This was merely an indication error. The actual pressure control was not affected by this indication error and worked identical in both cases.

15.3.9 515_Operation_modes_single_axis

E2073 (swivel angle command value > limit value) is continuously signaled in the case of command value provision via analog input

CQ-ID: Defdb00204446

Description: When the maximum value of 100 % was provided for the swivel angle command value via an analog input, even little noise at the analog input resulted in the fact that warning E2073 (swivel angle command value > limit value) was continuously issued.

Bug fixing: If the swivel angle command value is now provided via an analog input, warning E2073 (swivel angle command value > limit value) is no longer output. Warning E2073 can now only appear, if the swivel angle command value is provided via a bus system.

Drive-controlled positioning: Positioning status incorrectly determined when using the positioning jerk (jerk limitation)

CQ-ID: Defdb00203294

Description: The positioning command acknowledge (S-0-0419) was output too early for the sequential block with halt, if the command value had been delayed via fil-

ter, e.g. average value filter, anti-vibration filter. The following block was started too early and the profile was smoothed.

Interim solution: The block advance is controlled using "target position reached" (S-0-0342) instead of S-0-0419.

15.3.10 590_Analog_inputs_and_outputs

VT-HMC: Cable break at analog input on 2nd axis cannot be acknowledged

CQ-ID: Defdb00204797

Description: For the 2nd axis of the VT-HMC, cable break monitoring for the assignment of analog inputs did not work properly. If a cable break occurred at an analog input, which was used in an assignment on the 2nd axis, this cable break could not be acknowledged, but a reboot had to be executed on the VT-HMC.

Warning E2302 (analog output overload) results in overflow of diagnostic trace

CQ-ID: Defdb00205044

Description: If an analog output of the VT-HMC is configured as current output and an error is detected at the analog current output (short-circuit or cable break), warning E2302 (analog output warning) is triggered.

For the VT-HMC with 2 axes, in the event of an error, warning E2302 (analog output overload) was cyclically entered in the diagnostic trace, which resulted in an overflow of the diagnostic trace and issuing of warning E2001 (Diagnostic trace S-0-1303.0.10 overflow warning).

15.3.11 620_Parameter_handling

Oscilloscope function changes parameter attributes of uninvolved parameters

CQ-ID: Defdb00203673

Description: If P-0-0485 or P-0-0481 (patch signal display value) had been active as a measuring signal or trigger signal in the oscilloscope, the display format of other parameters was sometimes manipulated upon rebooting. Uninvolved parameters became invalid.

Bug fixing: P-0-0485 and P-0-0481 (patch signal display value) may be used as measuring or trigger signals without any negative effects.

15.3.12 630_Firmware_handling

EtherCAT and VARAN: Firmware download aborted with error

CQ-ID: Defdb00204927

Description: In conjunction with the bus systems VARAN and EtherCAT a firmware download was in some cases acknowledged with the error message "Firmware download aborted with error" in IndraWorks, because the drive did not send the last ACK telegram of the firmware download.

Firmware download no longer possible

CQ-ID: Defdb00204675

Description: Under certain circumstances it could happen that firmware downloads were no longer possible, if after the successful download of a new firmware and subsequent automatic booting of the new firmware the device was switched off shortly afterwards.

15.3.13 640_Diagnostic_system

Deletion of retain data in case of oscilloscope measurement (8 channels)

- CQ-ID:** Defdb00202944
- Description:** If the number of oscilloscope channels had been increased from 4 (or less) to 5 (or more), the internal value for the size of memory in P-0-0032 was not adjusted downwards. Thereby, other memory ranges were sometimes overwritten when measured values were being recorded. The measured value lists were therefore incorrectly read (actual length > max length). Only the visible external value of P-0-0032 had been adjusted. Therefore, it was impossible to detect the error externally.

Initialization IndraDrive oscilloscope function

- CQ-ID:** Defdb00200476
- Description:** Changes in patch signals did not affect the oscilloscope configuration if a patch display value P-0-0485 or P-0-0491 was configured as signal. The old patch configuration was retained in the oscilloscope.
- Bug fixing:** The patch configuration is applied to the oscilloscope function in case of any changes. If the oscilloscope is active and if a patch display value P-0-0485 or P-0-0491 is configured as signal, the patch signal change is locked.

15.3.14 650_State_machine_subdevice

Simultaneous changeover of the two axes of the VT-HMC from PM to OM was not possible

- CQ-ID:** Defdb00201730
- Description:** Switching both axes of a VT-HMC simultaneously from PM to OM was impossible, if SSI encoders or EnDat encoders were connected to the axes. Phase progression of the second axis was always interrupted with error message "C0270 Basic encoder evaluation not ready => encoder 1".
- Bug fixing:** The bug was fixed.
- Interim solution:** It was possible to work around the error by switching the two axes of the VT-HMC one after the other from PM to OM.

15.3.15 688_Service_functions

Exception while firmware is booting, if the SD card is not inserted

- CQ-ID:** Defdb00205240
- Description:** When the firmware was booting, on the VT-HMC or VT-HPC an exception could sporadically occur, if no SD card was inserted in the slot. The exception was caused by the fact that an update archive was searched for on the SD card although no SD card was inserted.
- In the event of an exception, the MS LED was permanently on and it was no longer possible to access the VT-HMC or VT-HPC.
- Interim solution:** The exception could be eliminated by inserting an SD card in the VT-HMC or VT-HPC.

15.3.16 710_Master_communication_basic_functions

F2067 appears, if bus errors were reconfigured as warning

- CQ-ID:** Defdb00204489
- Description:** In parameter P-0-4088 (Master communication: Drive configuration) bus errors F4xxxx can be reconfigured as warnings E4xxx. In the case of synchro-

nous bus systems (e.g. EtherCAT) when a bus error occurred, error F2067 (Synchronization to master communication incorrect) continued to be shown although the error was reconfigured as warning.

Bug fixing: Now, warning E2067 (Synchronization to master communication incorrect) is generated, if the bus errors have been reconfigured as warnings in P-0-4088.

List of available bus systems not correct in P-0-4089.0.17

CQ-ID: Defdb00204701

Description: In parameter P-0-4089.0.17 the bus system "CANopen application layer over VARAN (CoV)" used to be shown as available bus system and could be selected. This selection is no longer available.

Bug fixing: The bus system "CANopen application layer over VARAN (CoV)" can no longer be activated, because its usage no longer makes sense. It is therefore no longer shown in the list of available bus systems in P-0-4089.0.17.

15.3.17 725_Profibus

F4011 occurs in conjunction with VT-HMC with PROFIBUS when switching from PM to OM

CQ-ID: Defdb00202343

Description: Error F4011 (Communication watchdog: Overload of cyclic communication) may have occurred in conjunction with the VT-HMC with PROFIBUS when switching from PM to OM. This happened especially when parameters were saved at the same time.

Running up to cyclic data exchange did sporadically not work

CQ-ID: Defdb00203691

Description: Since firmware release HDx20V12, running up to cyclic data exchange (-> P-0-4073 = "Data-Exch ...") has no longer worked reliably with VT-HMC and VT-HPC in conjunction with PROFIBUS. Sporadically, it could happen that the VT-HMC or VT-HPC got stuck in the state "Wait-Prm" (-> P-0-4073) or "Wait-Cfg" or even error F4011 (Watchdog communication: overload cyclic communication) was triggered.

This error was dependent on the set bus timing of the PROFIBUS DP master. This means that the probability of occurrence and the frequency of the error was also determined by the communication time behavior of the PROFIBUS DP master.

Interim solution: Since the error occurred only sporadically, a possible workaround was to reboot the VT-HMC or VT-HPC and then reboot the PROFIBUS.

15.3.18 730_PROFINET

VT-HMC with 2 axes: the maximum possible length of 96 bytes of cyclic data is not possible

CQ-ID: Defdb00202480

Description: For the VT-HMC with 2 axes it was not possible to define the possible overall length of 96 bytes for cyclic data (48 bytes per axis), because the GSDML permitted a maximum length of only 86 bytes.

Bug fixing: This bug was fixed with the current version of the GSDML file of 09/07/2018. It is now possible to define cyclic data of 48 bytes for every axis.

15.3.19 745_Sercos III

Parameter S-0-0001, NC cycle time is not correctly generated with Sercos

CQ-ID: Defdb00203495

Description: With Sercos master communication, the internal value of the parameter S-0-0001 is generated from the cycle time of the main consumer connection. However, this internally generated value had not been displayed in the datum or when reading. This had been the reason why, due to the automatic conversion in P2->P3, the wrong datum was temporarily contained in the active variable before the value was generated internally again. Therefore, functions accessing the active value of S-0-0001 in this space of time calculated with the wrong value.

15.3.20 750_EtherCAT

Vendor name in EtherCAT device description file different for HydraulicDrive and IndraDrive

CQ-ID: Defdb00203660

Description: In the EtherCAT device description file for the HydraulicDrive, "Bosch Rexroth" was used as vendor, whereas for IndraDrive "Bosch Rexroth AG" was entered. As a result, the HydraulicDrive and IndraDrive devices were not displayed in a common folder within the description files in IndraWorks.

Bug fixing: As of EtherCAT device description file "BoschRexroth_HydraulicDrive_ECAC_01V06.xml" "Bosch Rexroth AG" is now used as vendor name like for the IndraDrive devices.

SoE does not store the cyclic configuration for axis 2

CQ-ID: Defdb00203948

Description: With EtherCAT SoE, for a VT-HMC with 2 axes the cyclic bus configuration was stored only for the first axis

Bug fixing: The data are now changed correctly for all axes when changes are made.

Interim solution: Saving is possible by writing parameters P-0-4080 and P-0-4081 in PM after the configuration was completed by thy master. The current configuration is then stored in the device.

Cyclic configuration is reset to default during booting

CQ-ID: Defdb00202012

Description: In conjunction with the bus system EtherCAT SoE cyclic configuration was reset to the default configuration while booting. It was therefore impossible for the EtherCAT master to read the cyclic configuration in the device before the device had booted completely.

EtherCAT SOE: Datum applied in spite of error message 0x7003

CQ-ID: Defdb00202496

Description: If data of the wrong length had been acyclically written with EtherCAT SoE to a drive parameter, the drive provided an error message but nevertheless applied the transmitted value.

EtherCat COE: Watchdog trigger of SM 3 activated at drive --> drive goes online to OP

CQ-ID: Defdb00203812

Description: By default, the drive has a 3-buffer mode for transmitting the process data. With the watchdog trigger of SyncManager 3 activated, the drive nevertheless went online (Operational).

Bug fixing: The transition to Operational is prevented in the above-mentioned case.

15.3.21 755_VARAN

CRC error in VARAN info page with new VARAN Service Tool

CQ-ID: Defdb00202011

Description: With the latest version of the VARAN Service Tool, when the VARAN info page was displayed, VARAN devices showed a CRC error for the entry "device compatibility list", if this list was empty.

Bug fixing: Now, a value is always output in the "device compatibility list".

15.3.22 760_Powerlink

No message "Reboot required" when switching to OM

CQ-ID: Defdb00203935

Description: With Ethernet POWERLINK, after the configuration in P-0-4089.0.5 bit 0 was changed for synchronous operation, switching to OM was possible although the new configuration has not yet been active. There was no error message displayed that a reboot was required following the change in the configuration.

Bug fixing: Now, when the configuration has been changed after last booting and switching to OM takes place, an error message is displayed to indicate that rebooting is required.

16 HDx20V18.10

16.1 Functional enhancements

16.1.1 302_Control_sections

The firmware derivative HDP - Internal memory not used completely

CQ-ID: Defdb00208497

Description: In the case of firmware derivative HDP, the internal memory r (→ SRAM) of 80 kBytes made available by the valve electronics was not utilized. Only 64 kBytes of the internal memory used to be addressed.

Notice: The firmware derivative HDP is the firmware, which is used for the pressure and flow control systems of types SY(H)DFEDn and A4V..HS5En.

16.1.2 560_Probe_function

Probe functionality

CQ-ID: Defdb00208492

Description: The digital inputs can be used as probes. A probe is a contact element that, when activated, triggers a pulse which starts a measuring process. Measured values are position feedback values, points in time and time intervals.

16.2 Fixed bugs

16.2.1 302_Control_sections

Loading the boot kernel no longer works

CQ-ID: Defdb00207108

Description: In the case of valves based on IAC-2x hardware (P-0-1520 = "IAC...") as well as of control cabinet electronics VT-HMC and VT-HPC, since firmware release HDx20V08 up to and including firmware release HDx20V18 it was no longer possible to load the boot kernel correctly into the device, since the checksum of the boot kernel had not been saved. This caused an exception during next booting (→ MS-LED is solid red) and it was no longer possible to access the device.

In some situations, analog inputs could not be acquired any longer

CQ-ID: Defdb00208503

Description: In conjunction with the firmware derivative HDP the acquisition of the analog inputs could get impeded in certain situations and thus no longer worked properly.

Notice: The firmware derivative HDP is the firmware, which is used for the pressure and flow control systems of types SY(H)DFEn and A4V..HS5En.

Bug fixing: If functional package ML is activated on one axis, the PLC functionality (IndraMotion MLD) is automatically active for all axes, since the PLC functionality is independent of axes. S-0-0030 then indicates that the additive functional package ML is active for all axes.

16.2.2 415_Measuring_systems

With analog position encoder (4 - 20 mA) reference is lost after reboot

CQ-ID: Defdb00206504

Description: If an analog position encoder (4 - 20 mA) was used, error F2174 (loss of reference) occurred, if a filter time (→ P-0-2910.0.6) was set for the analog encoder and encoder monitoring (→ P-0-2910.0.1, bit 5) was active.

The error was caused by the fact that a value of 0 mA instead of the currently present current was applied to the filter of the analog input, to which the position encoder was connected. Therefore, a signal value outside the valid range was determined for the analog current input (4 - 20 mA) within the first sampling cycles. Consequently, an assumed encoder error was detected which led to loss of reference.

16.2.3 426_Valve_control

Valves on IFB hardware basis: Main stage offset compensation does not work

CQ-ID: Defdb00206741

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") the main stage offset compensation did not work.

16.2.4 428_Pump_control

Correct default value for P-0-2943 is not loaded for SY(H)DFEF

CQ-ID: Defdb00207745

Description: In the case of SY(H)DFEF systems, the command "Load basic parameters" always loaded the default value 100 cm³ as displacement for P-0-2943 (pump displacement).

Bug fixing: Now, the correct displacement is loaded for the SY(H)DFEF system delivered.

Calibration of swivel angle factor is aborted too late in the case of excessively high pressure

CQ-ID: Defdb00207746

Description: When the swivel angle factor is calibrated, the actual pressure value is checked for a maximum value. However, this monitoring function used to be activated only after a ramp function had been completed. While the ramp function was being executed at the beginning of the calibration process, the pressure could exceed the maximum pressure.

Bug fixing: Monitoring is now also active during the ramp function at the beginning of the calibration function.

16.2.5 430_Axis_control

The I-term of the pressure controller got stuck in the switching mode "minimum value with active integrator"

CQ-ID: Defdb00206531

Description: When mode "minimum value with active integrator" (→ P-0-2850, Bit 0 – 2 = 0x4) was set in the changeover logic Q → p (flow to pressure), the I-term of the pressure controller got stuck, if a P-gain (→ P-0-2804) of 0 was set. As a result, the pressure controller could no longer be switched on.

Bug fixing: When mode "minimum value with active integrator" is set in the changeover logic Q → p (flow to pressure), the I-term of the pressure controller continues to work properly, if a P-gain of 0 is set.

The I-term is limited so that with inactive pressure controller the pressure controller output signal is somewhat greater than the valve or flow command value.

The integrator of the pressure controller can stop in the case of a negative pressure control deviation

CQ-ID: Defdb00208519

Description: In the operating mode "closed-loop pressure control / direct valve control" or "closed-loop pressure control / (open-/closed-loop) flow control" it could happen that with a negative pressure control deviation (→ S-0-0827) the integrator of the pressure controller came to a stop, if "minimum value with active integrator" (→ P-0-2850, bit 0 – 2 = 0x4) was selected for Q → p in the changeover logic.

This was, however, only the case when the following two conditions were met:

1. The pressure command value was > actual pressure value and the integrator was limited by the valve command value or the flow command value.
2. When the actual pressure value slowly increased and became higher than the pressure command value, the integrator of the pressure controller came to a stop. The error did not occur if the pressure increased sufficiently fast.

Alternating control: I-term of the force controller is calculated, although the force controller has not been activated

CQ-ID: Defdb00208171

Description: If the operating mode of torque/force control was switched to a position control mode (e.g. drive-controlled positioning) when alternating control was configured, the I-term of the force controller was calculated although force control had not been active. This could cause consequential errors in alternating control.

16.2.6 590_Analog_inputs_and_outputs

Error F2270 or warning E2270 is automatically generated once during run-up

CQ-ID: Defdb00208328

Description: In the case of valves on the basis of IFB hardware (P-0-1520 = "IFB...") and in the case of SY(H)DFEF systems, error F2270 (analog input, wire break) or warning E2270 was generated during booting of the firmware, if the following conditions were met:

1. A pressure cell was connected to connector X2N, and cable break monitoring had been activated for this pressure cell in the assignments for the analog inputs.
2. By setting bit 0 of parameter P-0-4088 (Master communication: Drive configuration) an automatic run-up to OM was to be executed.

Bug fixing: Error F2270 (analog input, wire break) or warning E2270 (analog input, wire break) is no longer generated.

Workaround: Error F2270 has to be cleared once via command S-0-0099 (C0500 Reset class 1 diagnostics).

16.2.7 630_Firmware_handling

The access to IAC-2x valves is sporadically no longer possible, if the power supply fails while firmware is being downloaded

CQ-ID: Defdb00206498

Description: In the case of valves based on IAC 2X hardware (P-0-1520 = "IAC...") the following could happen during a firmware download.

- Via IndraWorks a new firmware version is loaded to the valve.
- Once the firmware version has been completely downloaded to the valve, the downloaded firmware is stored in the internal flash.
- If the power supply to the valve was switched off while storing to the internal flash was taking place, it was possible that some sectors of the internal flash got corrupted and could not be accessed.
- This resulted in the fact that during the next run-up of the valve (→ application of the supply voltage) an exception was triggered.
- In this situation the MS LED (MS = module status) was then solid red.
- The valve was therefore defective and had to be sent in for repair.

Bug fixing: With the new version of the boot kernel 01V10 (P-0-2999.0.128 = FWL-IAC_B*-01V10-NN-NNNN) for valves on IAC-2x hardware basis this can no longer happen, because with this version of the boot kernel it can be recognized that individual sectors of the internal flash cannot be accessed. The internal flash is then cleared completely and thus access allowed again to all sectors of the internal flash. Thus, a failed firmware download can be repeated by the user.

16.2.8 690_Offline_and_simulation

Offline server: Functional packages in S-0-0030 for synchronization axis not correct

CQ-ID: Defdb00205668

Description: In the case of the offline server for the synchronization axis (= axis 3) the active functional packages were not correctly displayed in parameter S-0-0030 (firmware version). Instead, letter 'N' was shown for all functional packages.

→ S-0-0030 = FWA-HYDRV*-HDM-20S18-D5-N-NNN-NN

Due to this error, some dialogs for the synchronization axis were not correctly displayed in S-0-0030 in IndraWorks.

Bug fixing: In the case of the offline server for the synchronization axis the active functional packages are now correctly displayed in parameter S-0-0030.

→ S-0-0030 = FWA-HYDRV*-HDM-20S18.10-D5-1-SYN-ML

16.2.9 750_EtherCAT

SoE: The last command value in the cyclic data is not accepted

CQ-ID: Defdb00206519

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") in conjunction with bus system EtherCAT the last command value bytes from the master were not accepted in the HydraulicDrive in the case of certain cyclic configurations (length of data was a multiple of 4 bytes).

Workaround: Parameter S-0-0000 is to be configured as dummy parameter at the last position of the command values.

With a certain configuration, command or actual values are not copied

CQ-ID: Defdb00206521

Description: If, while bus system EtherCAT was active, the command or actual configuration was transmitted with an empty parameter S-0-0024 or parameter S-0-0016, the configuration was not correctly adopted in the device. In this case, the configuration transmitted last remained active.

Workaround: At least one command or actual value has to be configured in parameter S-0-0024 or S-0-0016, respectively; alternatively, dummy parameter S-0-0000 has to be used.

17 HDx20V20

17.1 Functional enhancements

17.1.1 315_Identification

Alias parameter for S-0-1300.0.11 (ordering code) is missing

- CQ-ID:** Defdb00208228
- Description:** For parameter S-0-1300.0.11 (ordering code) no alias parameter had been defined. Thus, it was impossible to transmit this parameter with 16-bit bus systems (e.g. VARAN).
- Extension:** For parameter S-0-1300.0.11 (ordering code) alias parameter S-0-3508 had been defined.

17.1.2 426_Valve_control

Range selection for main stage offset compensation

- CQ-ID:** Defdb00211268
- Description:** In the past the control deviation used to be integrated independently of the stroke range (that is $\pm 100\%$), when main stage offset compensation was activated, which is in fact suitable for most 4/3 directional valves.
- However, for 4/2 or special 4/3 directional valves the integration may only be carried out in certain ranges. Outside these ranges the current offset compensation value has to be maintained. This is to prevent valves which feature a permanent control deviation from continuing to integrate and therefore reaching the compensation limits.
- Now, a specific range can be defined during the production of the valve.

17.1.3 430_Axis_control

Characteristic curve correction in flow control

- CQ-ID:** Defdb00211266
- Description:** For p/Q valves an appropriate p/Q characteristic curve is determined and stored in the valve in the production process. To allow customers to actually make a correction of this p/Q characteristic curve (e.g. within the small signal range) the valve characteristic curve can now also be activated in the "p/Q" mode.
- The characteristic curve can be activated via parameter P-0-2873.0.8 (characteristic curve type).
 - The actual correction characteristic curve is set via parameters P-0-2873.0.9 (flow characteristic curve) and P-0-2873.0.10 (controller output characteristic curve).

See also application manual RE 30338-FK/02.2020, chapter 7.2.2 Flow controller.

Control bit of flow controller - different calculation of delta-p per quadrant

- CQ-ID:** Defdb00211267
- Description:** Bit 3 of parameter P-0-2800 (p/Q controller control word) is used for activating the new functionality. If this bit is set in conjunction with functional package "p/Q" the Delta-p for the flow controller is calculated from system pressure - chamber pressure (A or B) irrespective of whether the pressure controller is active.

See also application manual RE 30338-FK/02.2020, chapter 7.2.2 Flow controller.

17.1.4 510_Operation_modes

Acceptance of valve command values without latency

CQ-ID: Defdb00211265

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") with active functional package "IFB", the valve command values can be adopted in the valve control without latency in the "direct valve control" mode, if parameter P-0-0556 (axis controller configuration) is set as follows:

- Bit 15 is set for 1:1 timing.
- Bit 11 is set for the acceptance without latency.

17.1.5 515_Single_axis_operation_modes

Alias for P-0-2928.0.1 (valve command value control word) is missing

CQ-ID: Defdb00208252

Description: For parameter P-0-2928.0.1 (valve command value control word) no alias parameter had been defined. Thus, it was impossible to transmit this parameter with 16-bit bus systems (e.g. VARAN).

Extension: For parameter P-0-2928.0.1 (valve command value control word) alias parameter P-0-3866 was created.

17.2 Fixed bugs

17.2.1 426_Valve_control

Valves on IFB hardware basis: Main stage offset compensation does not work

CQ-ID: Defdb00206860

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") the main stage offset compensation did not work.

17.2.2 430_Axis_control

The I-term of the pressure controller got stuck in the switching mode "minimum value with active integrator"

CQ-ID: Defdb00206861

Description: When mode "minimum value with active integrator" ($\rightarrow$ P-0-2850, Bit 0 – 2 = 0x4) was set in the changeover logic $Q \rightarrow p$ (flow to pressure), the I-term of the pressure controller got stuck, if a P-gain ($\rightarrow$ P-0-2804) of 0 was set. As a result, the pressure controller could no longer be switched on.

Bug fixing: When mode "minimum value with active integrator" is set in the changeover logic $Q \rightarrow p$ (flow to pressure), the I-term of the pressure controller continues to work properly, if a P-gain of 0 is set.

The I-term is limited so that with inactive pressure controller the pressure controller output signal is somewhat greater than the valve or flow command value.

Actual pressure value filter is not set

CQ-ID: Defdb00206532

- Description:** When changing over to an operation mode with pressure control (e.g. pressure control/(open/closed-loop) flow control) takes place, the pressure controller is initialized. In this context, the filter for the actual pressure value was not correctly set so that a jump occurred in the filtered actual value (→ P-0-2806.0.24). As a further consequence, a jump occurred at the output of the pressure controller when the DT1-term of the pressure controller was active.
- Bug fixing:** The filter for the actual pressure value is now set to the current actual pressure value when an operation mode with pressure control is activated.

17.2.3 590_Analog_inputs_and_outputs

Error F2270 or warning E2270 is automatically generated once during run-up

- CQ-ID:** Defdb00206768
- Description:** In the case of valves on the basis of IFB hardware (P-0-1520 = "IFB...") and in the case of SY(H)DFEF systems, error F2270 (analog input, wire break) or warning E2270 was generated during booting of the firmware, if the following conditions were met:
1. A pressure cell was connected to connector X2N, and cable break monitoring had been activated for this pressure cell in the assignments for the analog inputs.
 2. By setting bit 0 of parameter P-0-4088 (Master communication: Drive configuration) an automatic run-up to OM was to be executed.
- Bug fixing:** Now, error F2270 (analog input, wire break) or warning E2270 (analog input, wire break) is no longer generated.
- Workaround:** Error F2270 has to be cleared once via command S-0-0099 (C0500 Reset class 1 diagnostics).

18 HDx20V20.10

18.1 Functional enhancements

18.1.1 302_Control_sections

Boot kernel 01V06 - internal memory utilized completely

CQ-ID: Defdb00208010

Description: In the case of valves based on IAC hardware for variable-speed pump controls (P-0-1520 = "IACP3...") in conjunction with the current boot kernel 01V04 the internal memory (→ SRAM) of 80 kbytes made available by the valve electronics was not initialized or used. Only 64 kbytes of the internal memory were used.

Notice:

The variable-speed pump control is used with pressure and flow control systems of types SY(H)DFEn and A4V..HS5En.

Extension: With the new boot kernel 01V06, the available internal memory of 80 kbytes is now completely utilized.

The firmware derivative HDP - internal memory is utilized completely

CQ-ID: Defdb00208498

Description: In the case of firmware derivative HDP, the internal memory (→ SRAM) of 80 kbytes made available by the valve electronics was not utilized. Only 64 kbytes of the internal memory used to be addressed.

Notice:

The firmware derivative HDP is the firmware, which is used for pressure and flow control systems of types SY(H)DFEn and A4V..HS5En.

Extension: Now, the complete available internal memory of 80 kbytes is utilized in firmware derivative HDP.

18.1.2 316_Condition_monitoring

Condition monitoring for pump control

CQ-ID: Defdb00212223

Description: For the pump control, condition monitoring functions were implemented to provide information on the condition of the pump system. Over the time in operation, wear and tear or aging of the system may occur in dependence on various boundary conditions. The condition monitoring functions are designed to detect this process of aging or wear.

18.1.3 428_Pump_control

Speed adaptation characteristic curve for pressure control

CQ-ID: Defdb00212226

Description: For pump control, the parallel structure was extended by an adaptation characteristic curve for the speed-related adaptation of the pressure controller.

18.1.4 430_Axis_control

Alias for P-0-2937.0.3 (input of force feedback value) is missing

CQ-ID: Defdb00208067

Description: For parameter P-0-2937.0.3 (input of force feedback value) no alias parameter had been defined. Thus, it was impossible to transmit this parameter cyclically over 16-bit bus systems (e.g. EtherCAT).

Extension: For parameter P-0-2937.0.3 (input of force feedback value) alias parameter P-0-3866 was created.

Alias parameters for P-0-2873.0.24 and P-0-2873.0.25 (limitation of valve control variable) are missing

CQ-ID: Defdb00210413

Description: For the parameters P-0-2873.0.24 (limitation of valve control variable, A-side) and P-0-2873.0.25 (limitation of valve control variable, B-side). Thus, it was impossible to transmit this parameter over 16-bit bus systems (e.g. VARAN).

Extension: For parameter P-0-2873.0.24 (limitation of valve control variable, A-side) alias parameter P-0-3892 was created.

For parameter P-0-2873.0.25 (limitation of valve control variable, B-side) alias parameter P-0-3893 was created.

Parameter set switching for valve characteristic curve

CQ-ID: Defdb00212227

Description: The valve characteristic curve (→ P-0-2873.0.9 and P-0-2873.0.10) was extended so that parameter sets can be switched for it.

18.1.5 560_Probe_function

Probe functionality

CQ-ID: Defdb00212222

Description: The probe functionality was implemented in analogy to the functionality of electric drives.

A probe is a contact element that, when activated, triggers a pulse which starts a measuring process. Probes are mostly activated by axis motion over a machine part (cam etc.) at the mechanical axis system. Measured values are position feedback values, points in time and time intervals.

18.1.6 640_Diagnostic_system

Triggering for local multi-axis measurement

CQ-ID: Defdb00212224

Description: For the VT-HMC with 2 axes the oscilloscope function was extended for multi-axis measurements so that one of the local axes can be defined as trigger axis.

18.1.7 688_Service_functions

Backup/restore for VT-HMC with synchronization

CQ-ID: Defdb00212225

Description: For the VT-HMC with active synchronization axis the backup/restore functionality was extended so that when a backup is created the data of all axes (→ 2 axes + synchronization axis) are stored completely on the SD card. When the restore function is executed, the data of all axes are restored and the synchronization axis is activated.

Backup/restore with retain data

CQ-ID: Defdb00212228

Description: The backup/restore functionality was extended in order that retain data are stored on the SD card and restored with the restore function.

18.1.8 735_EtherNet/IP

Certification for EtherNet/IP

CQ-ID: Defdb00212229

Description: The bus system EtherNet/IP was certified for all HydraulicDrive products.

18.2 Fixed bugs

18.2.1 200_PLC_basic_system

VT-HMC with 2 axes: F6010 is triggered on axis 1 only

CQ-ID: Defdb00205985

Description: If a PLC error occurred on the VT-HMC with 2 axes (e.g. division by zero) the resulting runtime error F6010 was triggered only on axis 1, but not on all axes of the VT-HMC.

Bug fixing: If an error occurs on the PLC, error F6010 is now triggered on all axes.

18.2.2 280_Libraries, function blocks

GAT compact – mode for relative positioning does not work properly

CQ-ID: Defdb00206396

Description: With GAT compact the mode for relative positioning did not work properly. When this mode is activated the axis should utilize the current actual position value as reference for the relative movement.

However, the axis received the following value as new target position: Current target position + relative command value.

This corresponds, however, to the mode “additive positioning”.

18.2.3 302_Control_sections

The boot kernel can no longer be loaded

CQ-ID: Defdb00207105

Description: In the case of valves based on IAC-2x hardware (P-0-1520 = "IAC...") as well as of control cabinet electronics VT-HMC and VT-HPC, from firmware release HDx20V08 up to and including firmware release HDx20V18 it was no longer possible to load the boot kernel correctly into the device, since the checksum of the boot kernel had not been saved. This caused an exception during next booting (→ MS-LED was solid red) and it was no longer possible to access the device.

In some situations, analog inputs could not be acquired any longer

CQ-ID: Defdb00207771

Description: In conjunction with the firmware derivative HDP the acquisition of the analog inputs could get impeded in certain situations and thus no longer worked properly.

Notice:

The firmware derivative HDP is the firmware, which is used for the pressure and flow control systems of types SY(H)DFEn and A4V..HS5En.

18.2.4 310_Functional_package_and_hardware_enabling

VT-HMC with 2 axes: Functional packages can only be set, if all axes are in PM

CQ-ID: Defdb00206680

Description: In the case of a VT-HMC with 2 axes it was only possible to set the functional packages for an axis in parameter P-0-2003 (selection of functional packages) when all axes were in the PM mode.

Bug fixing: It is now possible to set the functional packages for an axis in parameter P-0-2003 irrespective of the state of the other axes.

18.2.5 415_Measuring_systems

"C02XX Error when reading encoder data => encoder X" when Sercos encoders are used

CQ-ID: Defdb00206096

Description: A prerequisite for the use of a Sercos encoder (P-0-0077 = 20(FKM) / 21(CCD)) is decoupled operation (see S-0-0425, Sub-device state machine control word). By decoupled operation of the subdevice state machine it is to be ensured that firstly, master communication is switched to operational (P4) and then the subdevice state machine is switched to OM. While switching to OM takes place the encoder evaluation is initialized. If, at the time of initializing the encoder evaluation, the connection to the Sercos encoder had not yet been established, the encoder evaluation immediately generated a switching command error "C02XX Error while reading encoder data => encoder X".

Bug fixing: If the cyclic connection to the Sercos encoder has not yet been established at the time when the encoder is initialized, the encoder evaluation waits for approx. 30 s to check whether the cyclic connection can be established to the Sercos encoder and whether the encoder signals "ready for operation". If the connection has still not been established after these approx. 30 s or the Sercos encoder does not signal "ready for operation", the encoder initialization generates a switching command error "C02XX Error while reading encoder data => encoder X".

With an analog position encoder (4 - 20 mA) reference is lost after a reboot

CQ-ID: Defdb00208753

Description: If an analog position encoder (4 - 20 mA) was used, error F2174 (loss of reference) always occurred after a reboot, if a filter time (→ P-0-2910.0.6) was set for the analog encoder and encoder monitoring (→ P-0-2910.0.1, bit 5) was active.

The error was caused by the fact that a value of 0 mA instead of the currently present current was applied to the filter of the analog input, to which the position encoder was connected. Therefore, a signal value outside the valid range was determined for the analog current input (4 - 20 mA) during the first sampling cycles. Consequently, an supposed encoder error was detected which led to loss of reference.

18.2.6 420_Drive_control

Alternating control - switching back to position control incorrect

CQ-ID: Defdb00205642

Description: Under alternating control switching back to position control did not work properly if the switching ramp (→ P-0-2856.0.5) was equal to 0.

18.2.7 428_Pump_control

Invalid parameter P-0-2981 when calibrating the valve offset

- CQ-ID:** Defdb00195671
- Description:** For calibrating the valve offset value in pump control it used to be possible to define 8 pressure ratings for the calibration by means of parameter P-0-2981 (valve correction pressure rating). The last pressure rating was, however, not stored correctly so that after a reboot the characteristic curve for the offset value (→ P-0-2981) became invalid.
- Bug fixing:** Parameter P-0-2981 (valve correction pressure rating) was correct so that only 7 valid pressure ratings can be entered.
- Workaround:** Only a maximum of 7 pressure ratings may be entered in parameter P-0-2981 (valve correction pressure rating).

No valid assignment for actual pressure value 2 - upon the second activation of pressure transducer 2 no error is generated

- CQ-ID:** Defdb00196086
- Description:** Pressure transducer 2 (→ P-0-2950, bit 8) could only be activated when no valid assignment of an analog input to the actual pressure value 2 (P-0-2941) was present. Upon the first attempt to activate it, the activation was prevented and a correct error returned. However, upon the second activation attempt, no error was signaled.
- Bug fixing:** The activation of pressure transducer 2 is now always prevented if no valid assignment is present, and a corresponding error is returned.

Writing the pump controller control word via the signal control word does not work

- CQ-ID:** Defdb00205013
- Description:** If bit 8 of parameter P-0-2950 was mapped to the signal control word for switching the pressure transducer, a change was not accepted for this bit, i.e. switching of the pressure transducers was not carried out.
- Bug fixing:** The change is now accepted, if P-0-2950 is written via the signal control word.

Calibration of swivel angle factor is aborted too late in the case of excessively high pressure

- CQ-ID:** Defdb00205732
- Description:** When the swivel angle factor is calibrated, the actual pressure value is checked for a maximum value. However, this monitoring function used to be activated only after a ramp function had been completed. While the ramp function was being executed at the beginning of the calibration process, the pressure could exceed the maximum pressure.
- Bug fixing:** Monitoring is now also active during the ramp function at the beginning of the calibration function.

Integrator is not initialized correctly when switching from parallel structure to cascade structure

- CQ-ID:** Defdb00205743
- Description:** The pump control offers the option of always calculating the integrator for the pressure controller (also in swivel angle control). With this selection the integrator only has to be initialized when switching from parallel structure to cascade structure. In this case the integrator was initialized with the internal flow command value by mistake.

Bug fixing: The integrator is now initialized with the current actual flow value. It is therefore possible to switch between parallel structure and cascade structure without any jumps.

Correct default value for P-0-2943 is not loaded for SY(H)DFEF

CQ-ID: Defdb00206785

Description: In the case of SY(H)DFEF systems, the command "Load basic parameters" always loaded the default value 100 cm³ as displacement for P-0-2943 (pump displacement).

Bug fixing: Now, the correct displacement is loaded for the SY(H)DFEF system delivered.

Deactivation of internal torque limitation with P-0-2950 bit 1

CQ-ID: Defdb00208985

Description: If bit 1 was set to 0 in the pump controller control word P-0-2950, P-0-2952 deactivated not only the torque limitation, but also the internal torque limitation for field weakening operation.

Bug fixing: Bit 1 in the pump controller control word P-0-2950 can now only be used for activating or deactivating the torque limitation defined in P-0-2952.

18.2.8 430_Axis_control

The integrator of the pressure controller can stop in the case of a negative pressure control deviation

CQ-ID: Defdb00208629

Description: In the operation modes "Closed-loop pressure control/direct valve control" or "Closed-loop pressure control/(open/closed-loop) flow control" it could happen that in the case of a negative pressure control deviation (→ S-0-0827), the integrator of the pressure controller came to a stop, if "minimum value with active integrator" (→ P-0-2850, bit 0 – 2 = 0x4) was selected in the changeover logic for Q → p.

This was, however, only the case, if the following two conditions were met:

1. The pressure command value was > actual pressure value and the integrator was limited by the valve command value or the flow command value.
2. When the actual pressure value slowly increased and became higher than the pressure command value, the integrator of the pressure controller came to a stop. The error did not occur if the pressure increased sufficiently fast.

Bug fixing: For the pressure controller parameter P-0-2806.0.24 (Pressure feedback value, filtered) alias parameter P-0-3859 was created.

18.2.9 435_Axis_control

Alternating control - switching back to position control incorrect

CQ-ID: Defdb00205642

Description: Under alternating control switching back to position control did not work properly if the switching ramp (→ P-0-2856.0.5) was equal to 0.

Alternating control - incorrect switching back from closed-loop force control

CQ-ID: Defdb00206072

Description: In certain situations it could happen that in alternating control switching from active force control to position control took place although the currently set position command value should not cause this changeover.

Alternating control is not correctly deactivated

CQ-ID: Defdb00206412

Description: In certain cases it could happen that alternating control has not properly switched from force control to position control.

Bug fixing: For alternating control the procedure for switching from force to position control was internally adapted so that it now works in all scenarios known.

Alternating control is not exited when positive stop drive procedure and change back lock are active simultaneously

CQ-ID: Defdb00206438

Description: If the axis was commanded by an external control it could happen that the axis could no longer exit force control when the command "positive stop drive procedure" was to be completed while the change back lock was activated at the same time.

Bug fixing: When the command "positive stop drive procedure" is completed, the setting of the change back lock is ignored so that the axis can exit force control.

Alternating control: The I-term of the force controller is calculated, although the force controller has not been activated

CQ-ID: Defdb00208172

Description: If the operating mode of torque/force control was switched to a position control mode (e.g. drive-controlled positioning) when alternating control was configured, the I-term of the force controller was calculated although force control had not yet been active. This could cause consequential errors in alternating control.

F2028 can be triggered after deactivation of alternating control

CQ-ID: Defdb00208806

Description: When alternating control was deactivated (→ P-0-2853, bit 0 = 0) error F2028 (excessive control deviation) could occur. This happened in particular, if in bit 8 of P-0-0556 restarting on the basis of command values had been selected. However, if actual values had been selected as starting values the error did not occur.

Bug fixing: When alternating control is now deactivated, the starting value is always the actual position value and error F2028 is therefore prevented.

18.2.10 437_Synchronization_control

Switching the synchronization axis to OM is not possible, if axes are not homed

CQ-ID: Defdb00206891

Description: It was impossible to switch the synchronization axis to OM if not all other axes had been homed.

Bug fixing: The synchronization axis can now be switched to OM independently of the reference of the other axes. The other axes are now not checked for homing before the synchronization axis is enabled.

Actual values as starting values incorrect

CQ-ID: Defdb00207158

Description: When synchronization was switched on, the starting values were actual values, but not command values.

Bug fixing: When synchronization is now switched on, the starting values are command values.

In the case of an error of a slave axis, not all axes are stopped

CQ-ID: Defdb00207159

Description: In the event of an error on a slave axis, all axes (including the synchronization axis) have to be stopped. The error response was, however, executed only for the axis on which the error occurred. The other axes remained in closed-loop control.

Bug fixing: An error on one slave axis now results in the fact that the configured error response is carried out for all axes.

Axis number incorrect

CQ-ID: Defdb00207160

Description: The limits for the travel range of the synchronization axis could not be set independently of the slave axes.

Bug fixing: The slave axes now have no influence on the travel range limits for the synchronization axis.

Travel range limits are overwritten

CQ-ID: Defdb00207161

Description: The slave axes are incorrectly numbered.

Bug fixing: The slave axes are now numbered in ascending order starting with axis 1.

Scaling for P-0-2862.x.3 incorrect

CQ-ID: Defdb00207162

Description: The parameters P-0-2862.x.3 were not displayed with the correct scaling.

Bug fixing: The parameters are now displayed with the correct scaling.

Travel range of synchronization axis cannot be freely changed

CQ-ID: Defdb00207163

Description: The maximum travel range of the synchronization axis was automatically pre-assigned.

Bug fixing: The maximum travel range of the synchronization axis can now be freely selected.

Travel range of synchronization axis cannot be freely changed

CQ-ID: Defdb00207163

Description: The maximum travel range of the synchronization axis was automatically pre-assigned.

Bug fixing: The maximum travel range of the synchronization axis can now be freely selected.

The break distance is not always calculated

CQ-ID: Defdb00207164

Description: To be able to calculate the current model error that is formed for the break mechanism, a model calculation is carried out. This calculation could not be deactivated.

Bug fixing: By entering 0.0 for P-0-2860.0.14 (model loop gain) the model calculation can now be deactivated.

While synchronization is active the master axis cannot be switched over

CQ-ID: Defdb00207197

Description: While synchronization was active it was impossible to change the master axis.

Bug fixing: It is now possible to change the active master axis while synchronization is active, if the following two conditions are met:

1. I-terms of the synchronization position controller (P-0-2862.x.11) are unequal to zero
2. I-terms of the synchronization velocity controller (P-0-2864.x.11) are equal to zero

Force command value P69 on axis 1 is cleared when a movement has been triggered on the synchronization axis

CQ-ID: Defdb00207781

Description: As soon as a movement had been triggered in synchronization, the active torque/force command value controller of the slave axis was incorrectly written.

Bug fixing: In the case of movements in synchronization the active torque/force command value corresponds to the correct command value from S-0-0550 or S-0-0551, respectively, depending on the direction of movement.

For the synchronization axis an incorrect actual position value is displayed, if the reference of the master axis is changed

CQ-ID: Defdb00210698

Description: If the reference of the master axis was set within the maximum travel range with a large actual position value, it was possible that an incorrect actual position value was displayed for the synchronization axis.

Bug fixing: It is now possible to set the reference of the master axis within the maximum travel range without an incorrect actual position value being displayed for the synchronization axis.

18.2.11 530_Error_reactions

"Decelerated" is detected via "in position" (S-0-0336, bit 0), which can cause problems.

CQ-ID: Defdb00209031

Description: Parameter S-0-0273 is used to parameterize the time within which the drive is to be decelerated. "Decelerated" means that the velocity of the drive is smaller than the standstill window (S-0-0124). At present, "decelerated" is recognized via "in position" S-0-0336, bit 0. This often led to problems, because in certain situations the position could no longer be reached, which could lead to error F2028, for example.

The problem occurred with the setting "Best possible deceleration" F2/F4 error "quick stop" P-0-0119 = 2.

Bug fixing: The quick stop is now no longer checked for "in position". The system only checks for standstill and then outputs the valve standstill value.

18.2.12 585_Digital_inputs_outputs

VT-HMC with 2 axes: Digital outputs cannot be utilized as sensor supply

CQ-ID: Defdb00207718

Description: In conjunction with the VT-HMC with 2 axes the digital outputs could not be utilized as sensor supply, because the parameter P-0-2918.0.3 (sensor supply via digital outputs) was not available.

Bug fixing: Parameter P-0-2918.0.3 (sensor supply via digital outputs) is now also available for the VT-HMC with 2 axes.

For more information, see also functional description in chapter "Utilization of the digital outputs of the HPC and HMC for sensor supply"

18.2.13 620_Parameters

2WRCE with F1 interface: Actual value output to connector XH1 is no longer correct after loading of basic parameters

CQ-ID: Defdb00208168

Description: When basic parameters were loaded for 2WRCE valves with F1 interface (→ command value 4 - 20 mA and actual valve value 4 - 20 mA) the parameterization of the actual valve value output was changed so that the actual valve value was not correctly output as corresponding current signal on connector XH1, pin F.

Workaround: Correction of the parameterization of the actual valve value output via IndraWorks after basic parameters were loaded.

18.2.14 622_Scaling

Conversion error in the case of large flow values

CQ-ID: Defdb00208513

Description: In the case of valves with large maximum flows (→ greater than 16000 l/min) a limit value error could occur when switching to OM was carried out.

18.2.15 625_Optional_memory_card

The technology function is not reloaded automatically when the SD card is inserted again

CQ-ID: Defdb00205015

Description: If the SD card with a technology function (e.g. HS55(n)) was removed from the VT-HPC after initial loading, the functionality was not reloaded automatically when the SD card was inserted again.

Bug fixing: The technology function is now always loaded from the SD card.

Workaround: To trigger reloading, all list entries of the P-0-0669.0.1 have to be or set to zero.

Backup/restore does not work with HDM20V18

CQ-ID: Defdb00207064

Description: With firmware version HDM20V18 the backup/restore functionality did not work.

Backup/restore does not work for the synchronization axis

CQ-ID: Defdb00208842

Description: The backup/restore functionality did not work for the synchronization axis in conjunction with the VT-HMC with 2 axes.

Backup command - PLC parameters P-0-1349.x.y are not stored in the par file for the boot project

CQ-ID: Defdb00209092

Description: When the machine archive was created, parameters P-0-1349.x.y, which contain the PLC program, were not stored in the parameter file for the PLC boot project (→ MLD_Boot01.par), but the PLC program was stored in the individual parameter files together with the user data of the individual axes (→ Axis01.par, Axis02.par). This resulted in errors upon the restore command.

18.2.16 690_Offline_and_simulation

Offline parameterization cannot be started for SY(H)DFEn

CQ-ID: Defdb00206809

Description: In IndraWorks 14VRS the offline parameterization could not be started for the pressure and flow control system of type SY(H)DFEn. When the offline parameterization was started, an exception occurred which caused it to crash.

Bug fixing: With IndraWorks 15V06 patch 2 or higher the offline parameterization works correctly for SY(H)DFEn.

Offline server: Functional packages in S-0-0030 for synchronization axis not correct

CQ-ID: Defdb00206865

Description: In the case of the offline server for the synchronization axis (= axis 3) the active functional packages were not correctly displayed in parameter S-0-0030 (firmware version). Instead, letter 'N' was shown for all functional packages.
→ S-0-0030 = FWA-HYDRV*-HDM-20S18-D5-N-NNN-NN
Due to this error, some dialogs for the synchronization axis were not correctly displayed in S-0-0030 in IndraWorks.

Bug fixing: In the case of the offline server for the synchronization axis the active functional packages are now correctly displayed in parameter S-0-0030.
→ S-0-0030 = FWA-HYDRV*-HDM-20S20-D5-1-SYN-ML

Offline parameterization is not supported for SY(H)DFEn

CQ-ID: Defdb00207943

Description: In IndraWorks 14VRS the offline parameterization could not be started for the pressure and flow control system of type SY(H)DFEn. An error message was displayed stating that the device type is not supported.

Bug fixing: With IndraWorks 15V06 patch 2 or higher the offline parameterization is supported for SY(H)DFEn.

18.2.17 710_Master_communication_basic_functions

WRCE valves - incorrect content of parameter P-0-4089.0.17

CQ-ID: Defdb00204536

Description: For WRCE valves the content of parameter P-0-4089.0.17 (Master communication: List of available protocols) was not correct. The parameter contained too many protocols that cannot be set at all for the WRCE valve.

18.2.18 715_General_communication_services

Incomplete firmware version during UDP browsing

CQ-ID: Defdb00208154

Description: During UDP browsing the firmware version was displayed incompletely. In the case of a patch version (→ HDB-20V16.30) the information about the patch version was not displayed (→ HDB-20V16).

18.2.19 725_Profibus

Incorrect content of P-0-4089.0.17 for VT-HMC or VT-HPC with Profibus

- CQ-ID:** Defdb00208577
- Description:** The list of available master communications was not generated correctly for VT-HMC and VT-HPC with PROFIBUS. Any existing PROFIBUS option was not recognized.
- Bug fixing:** The PROFIBUS option recognition was corrected.
- Workaround:** Enter PROFIBUS (= 16) manually in P-0-4089.0.1.

18.2.20 730_PROFINET

Parameter P-0-4089.0.13 invalid when loading default values

- CQ-ID:** Defdb00209158
- Description:** If PROFINET was set as bus system and for a VT-HMC with 2 axes plus synchronization axis default values are loaded on the first axis, loading of the default values was aborted with error C0751, incorrect parameter default value, and parameter P-0-4089.0.13 was displayed as invalid parameter.

18.2.21 750_EtherCAT

SoE: The last command value in the cyclic data is not accepted

- CQ-ID:** Defdb00207128
- Description:** For valves based on IFB hardware (P-0-1520 = "IFB...") in conjunction with bus system EtherCAT the last command value bytes from the master were not accepted in the HydraulicDrive in the case of certain cyclic configurations (length of data was a multiple of 4 bytes).
- Workaround:** Configure parameter S-0-0000 as dummy parameter at the last position of the command values.

18.2.22 780_Analog_interface

Automatic acknowledgement of error F2270 also when SY(H)DFEF system is active

- CQ-ID:** Defdb00206769
- Description:** With firmware release Hdx20V16 or higher, in the case of WRCE valves, for which exclusively analog command values can be provided, error F2270 (analog input, wire break) is automatically acknowledged as soon as the cause of error is no longer present.
- This automatic error acknowledgement was also active for SY(H)DFEF systems when the master communication has been deactivated via parameter P-0-4089.0.1.
- Bug fixing:** This automatic acknowledgement of error F2270 is now only active for WRCE valves.

19 HDx20V20.20

19.1 Fixed bugs

19.1.1 437_Synchronization_control

Wrong actual position value of synchronization axis

CQ-ID: Defdb00209677

Description: The actual position value of the synchronization axis was displayed incorrectly under certain circumstances, if the actual axes had exceeded certain axes.

Bug fixing: The actual value of the synchronization axis is now also displayed in the case of high real actual values.

20 HDx20V20.30

20.1 Fixed bugs

20.1.1 801_Power_supply_general

Output stage error F8285 is not triggered in the case of a short-circuit

CQ-ID: Defdb00210368

Description: Since firmware release HDx20V16 error F8285 (output stage error) had no longer been generated, if an error was present at the output stage of the VT-HPC (e.g., short-circuit of pins a1 and a2 at connector XG21, to which the valve is connected). The enable for the output stage was reset internally in the firmware, but the error F8285 was not triggered.

21 HDx20V20.40

21.1 Functional enhancements

21.1.1 302_Control_sections

VT-HMC - making overload error configurable as warning

CQ-ID: Defdb00211673

Description: **Reconfiguring F8283 to E8283**

Error F8283 (→ overload) can be redefined by means of the new bit 7 of parameter P-0-2819 to generate a warning (→ E8283).

Status parameter for overload P-0-2885.0.13

The new parameter P-0-2885.0.13 indicates whether the digital outputs of the base card or the extension card are overloaded.

Bit 0 = overload of the digital outputs of the base card

Bit 1 = overload of the digital outputs of the extension card

Bit 2 = overload of the voltage supply for the swivel angle sensor

22 HDx20V22

22.1 Notes on the firmware update to HDx20V22

22.1.1 VT-HMC with 2 axes - correction of PROFINET configuration required in the master

Description Within the framework of release HDx20V22 the PROFINET interface of the HydraulicDrive devices was extended. Therefore, the PROFINET interface of the VT-HMC with 2 axes (R901441904, VT-HMC-2-1X/M-0-00/00) had to be adapted. So far, the input and output data were defined for each axis of the VT-HMC in separate modules. **As of release HDM20V22 the input and output data have to be defined for all axes together in one module.**

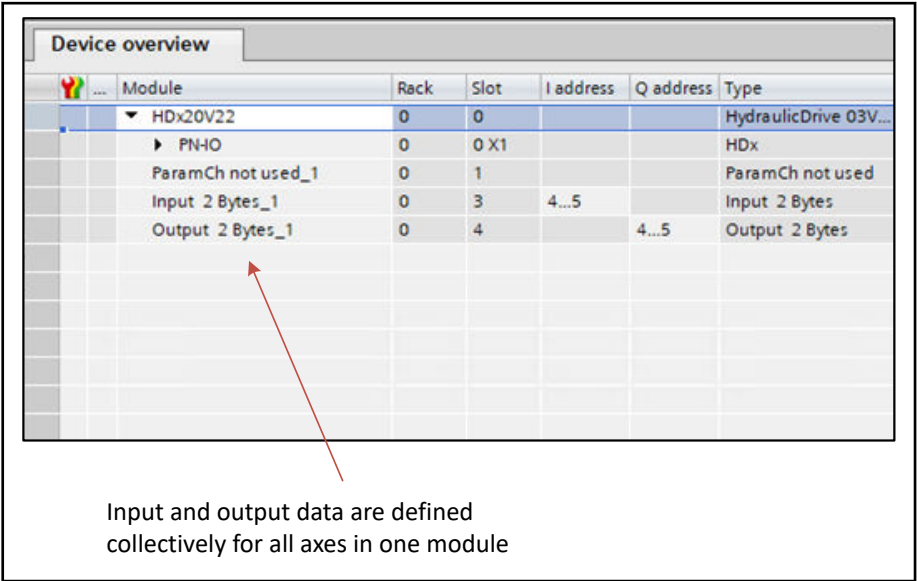


Fig. 22-1: Definition of input and output data in one module

For the configuration of the VT-HMC with 2 axes the current description file **GSDML-V2.4-Bosch_Rexroth_AG-011F-Hydraulic-Drive_03V00-20210608.xml** has to be used.

If the firmware of the VT-HMC with 2 axes is to be updated from release versions HDM20V12 up to and including HDM20V20 to release HDM20V22 or higher, the following steps have to be performed:

1. Download the firmware HDM20V22 to the VT-HMC
2. Upload the current description file GSDML-V2.4-Bosch_Rexroth_AG-011F-HydraulicDrive_03V00-20210608.xml
3. Correct the input and output data

If the steps listed above are not followed, the VT-HMC signals an error **F4012** (incorrect I/O length) after the firmware update.

22.2 Functional enhancements

22.2.1 280_Libraries, function_blocks

Updating the direct variables for firmware HDx20V22

CQ-ID: Defdb00209258
Description: The direct variables were updated for firmware release HDx20V22.

22.2.2 302_Control_sections

VT-HMC - making overload error configurable as warning

CQ-ID: Defdb00212232

Description: **Reconfiguring F8283 to E8283**

For the VT-HMC the error F8283 (→ overload) can be redefined by means of the new bit 7 of parameter P-0-2819 to generate a warning (→ E8283).

Status parameter for overload P-0-2885.0.13

The new parameter P-0-2885.0.13 indicates whether the digital outputs of the base card or the extension card are overloaded.

Bit 0 = overload of the digital outputs of the base card

Bit 1 = overload of the digital outputs of the extension card

Bit 2 = overload of the voltage supply for the swivel angle sensor

22.2.3 428_Pump_control

Alias parameters missing for pump control parameters

CQ-ID: Defdb00208900

Description: For the following parameters for setting the pump control no alias parameters were defined. Thus, it was impossible to transmit this parameter cyclically over 16-bit bus systems (e.g. EtherCAT).

- P-0-2958.0.3 (Correction value: torque limitation)
- P-0-2958.0.7 (Output of swivel angle command value processing)
- P-0-2947.0.16 (Reference pressure for pump controller calibration)
- P-0-2806.0.12 (Output pump pressure controller I-part)

The following parameters have now been assigned to these parameters:

- P-0-2958.0.3 → P-0-3886
- P-0-2958.0.7 → P-0-3887
- P-0-2947.0.16 → P-0-3888
- P-0-2806.0.12 → P-0-3889

Sytronix: Missing direct variables P-0-2957.0.1

CQ-ID: Defdb00208950

Description: Parameter P-0-2957.0.1 (Pressure normalization) is now available as direct variable.

Extension of pump control for A2 pumps

CQ-ID: Defdb00212235

Description: The pump control was extended so that a VT-HPC can now be used to control an A2 pump.

Notice:

For utilizing this functionality the SD-card VT-SD-HPC-EO5-000-001-000-000 (R901545529) has to be inserted in the VT-HPC.

22.2.4 620_Parameters

Pressure parameter S-0-0813 not available in average value filter

CQ-ID: Defdb00210414

Description: S-0-0813 (System pressure) is available as parameter in the average value filter.

22.2.5 730_PROFINET

Certification for PROFINET

CQ-ID: Defdb00212233

Description: The bus system PROFINET was certified for all HydraulicDrive products.

Ring structure supported

CQ-ID: Defdb00212234

Description: In the past HydraulicDrive devices supported only the star and line structure topologies for PROFINET. Now, the ring structure topology (→ MRP) is also possible.

Ring structures are used for increasing the availability of a PROFINET network.

22.3 Fixed bugs

22.3.1 310_Functional_package_and_hardware_enabling

The functional package “technology function” (TF) is not activated when basic parameters are loaded while the SD card is plugged

CQ-ID: Defdb00209210

Description: If the command “Load basic parameters” was started while the additional function for variable-speed operation of the VT-HPC(n) was activated, the additional function for variable-speed operation was deactivated again when the VT-HPC was restarted the next time, even if the SD card continued to remain inserted.

Bug fixing: When the command “Load basic parameters” is called, the additional function for variable-speed operation remains active.

Workaround: In an error state the value of list parameter P-0-0669.0.1 has to be set to zero in the parameter editor. This results in the reactivation of the additional function when the next restart is carried out.

22.3.2 302_Control_sections

Overloading of the current inputs on connector XH2 or XH4 is not displayed

CQ-ID: Defdb00208871

Description: So far, no error message was output in the case of overloading of the analog input on connector XH2 or XH4. When the input is overloaded, a safety circuit is active which prevents the input from being destroyed. However, in this state no valid value is read in for the analog input.

Bug fixing: Now the error message “F2291 - Overload of analog inputs, safety circuit active” is output.

22.3.3 415_Measuring_systems

Master communication encoder – command for switching from PM to OM gets stuck

CQ-ID: Defdb00211242

Description: When the master communication encoder (P-0-0077 = 20) was selected for position acquisition, the switching command from PM to OM got stuck in an endless loop and it was impossible to cancel the command.

22.3.4 420_Drive_control

Sporadically no loading of the position controller I-term when alternating control was switched off

CQ-ID: Defdb00206674

Description: The position controller is configured as PI-controller. The force controller is active (P-0-2855, bit 0). The position interpolator has been stopped and is set to the target value (→ "Continue" behavior). If alternating control is now switched off (P-0-2853, bit 0), the active force controller output is to be copied to the I-term of the position controller and the position command value is to be set to the actual position value.

The force controller output was, however, sporadically not copied to the I-term, but the position command value was set to the actual position value plus the controller output. This behavior was, however, only correct, if the I-term was not activated for the position controller.

Bug fixing: The I-term is now correctly loaded.

Force controller integrator force change window (P-0-2845.0.4) - conversion of decimal places not correct

CQ-ID: Defdb00209466

Description: Force weighting was set to the unit kN with 2 decimal places. If a force change window (P-0-2845.0.4) of 0.50 kN was set for the integrator of the force controller, the integrator started to work as early as at 500 kN, that is, at a value greater by a factor of 1000.

Bug fixing: The internally calculated force change window for the force controller is now calculated correctly.

Travel motion when setting the enable

CQ-ID: Defdb00210907

Description: When positioning with active alternating control was stopped by withdrawing the enable and, at the same time, alternating control was deactivated, it could happen that when the enable was set again the last travel motion was automatically continued.

22.3.5 428_Pump_control

Error when switching to 2nd pressure transducer in pump control

CQ-ID: Defdb00208875

Description: During switching to the 2nd pressure transducer a check is run to see whether a valid assignment is available for P-0-2941: "Pressure feedback value 2". In the past, this check used to verify whether P-0-2941 is entered in an assignment. It was, however, not checked whether the assignment is valid or active.

Bug fixing: This check now verifies whether P-0-2941 is entered in an assignment and whether this assignment is valid and/or active.

Error when transmitting P-0-2941, Pressure feedback value 2, via master communication

CQ-ID: Defdb00208882

Description: Before switching over to pressure feedback value 2, a check is run to verify whether a cyclic assignment is available for the parameter. If no assignment is available, i.e. the value is not written, switching is prevented. In the past it was only checked whether an assignment to an analog input is available. A

transmission of pressure feedback value 2 via MDT data of master communication was not checked. Thus, it was impossible to transmit pressure feedback value 2 via master communication.

Bug fixing: Apart from the analog assignments, MDT data of master communication are checked. This check is, however, only possible with the bus systems EtherNet/IP, PROFINET, PROFIBUS and POWERLINK. With other bus systems, if pressure feedback value 2 is activated, no check is run to verify whether a valid assignment is available.

Adjustment of default value for P-0-2947.0.5

CQ-ID: Defdb00208920

Description: During swivel angle calibration the pressure control error is monitored. If a given pressure control error (P-0-2947.0.5) is exceeded, calibrating is stopped. The default value for this monitoring function used to be set to 8 bar. In some systems, pressure pulsation can exceed this limit value, which causes the calibration to stop.

Bug fixing: The default value for the threshold value was increased to 12 bar.

Workaround: The threshold value has to be adapted manually via parameter P-0-2947.0.5.

22.3.6 430_Axis_control

Output of integrator is frozen when switching back to closed-loop flow control (min value principle)

CQ-ID: Defdb00211095

Description: While switching back to closed-loop flow control took place using the min value principle, it could happen that the output of the integrator (P-0-2806.0.9) got frozen. Thus, the criterion "with active integrator" was no longer fulfilled for "Min value principle with active integrator" (P-0-2850 bit 0-2 = 0x4). As a consequence, it was possible that switching back to closed-loop pressure control did not take place, because the output of the pressure controller had not become smaller than the output of the flow controller in due time.

22.3.7 435_Axis_control

Command value step change when switching from Ab -> AF, if the force controller had been active before

CQ-ID: Defdb00209462

Description: Initially, the torque/force control mode was active. Then, switching to Ab was carried out and the active valve controller output P-0-2914 = 0% was set. The input of output adjustment P-2873.0.12 was, however, not cleared immediately, but ramped to 0. This behavior is not correct, unless a ramp was set for best possible deceleration.

If, in this state, the mode of operation was changed to drive-controlled positioning and switching to AF was carried out, a jump occurred in the position command value, because the residual amount of P-2873.0.12 was added to the position command value. This was not correct. The position command value has always to start from the actual position value, unless a standstill value was defined.

22.3.8 437_Synchronization_control

Controller deviation not correct for synchronization axis

CQ-ID: Defdb00211061

Description: The model error was not formed correctly for the synchronization axis.

Synchronization axis cannot be commanded via P-0-4077

CQ-ID: Defdb00211063

Description: Under certain circumstances it was not possible to switch the synchronization axis from PM to OM via P-0-4077. The switching command was stopped with a wrong command error.

22.3.9 510_Operation_modes

Switching to the direct valve control mode - valve ramp time not correct

CQ-ID: Defdb00210103

Description: The operation mode was switched from “drive-controlled positioning” to “direct valve control”. In the “direct valve control” mode, the current controller output P-0-2914 was to be ramped to 0 % via a ramp in S-0-0869. When the operation mode was changed, the starting value was the current controller output, but the ramp time in S-0-0869 did not refer to a controller output of 100 % as documented for the S-0-0869, but to the current value in P-0-2873.0.12 (Input of controller output adjustment).

22.3.10 755_VARAN

With a cycle time of 500 µs no oscilloscope measurements possible

CQ-ID: Defdb00209538

Description: When several Ethernet telegrams greater than 1500 bytes are sent within a short time with an Arburg VARAN control, individual telegrams are sporadically lost. This occurs in particular, if several telegrams are sent by the VARAN master within a short time from the drive without acknowledgement (e.g., when reading oscilloscope measurements).

Bug fixing: For sending Ethernet telegrams over VARAN, a minimum span of 2 ms is adhered to between the individual Ethernet telegrams. This behavior can be configured. For this purpose, bit 10 can be activated for VARAN in parameter P-0-4089.0.5 (alternatively, P-0-2318).

22.3.11 801_Power_supply

No enable acknowledgement signals

CQ-ID: Defdb00210214

Description: The enable acknowledgement signals indicate on the valve connector that the output stage A or B was disabled and the valve position is within a safe range.

Since firmware release Hdx20V16 these enable acknowledgement signals were no longer formed correctly.

23 HDx20V24

23.1 Functional enhancements

23.1.1 302_Control_sections

Hysteresis for monitoring for undervoltage

CQ-ID: Defdb00212313

Description: In the past only a fixed threshold value could be defined for monitoring the supply voltage for undervoltage. As of firmware release HDx20V24 it is possible to determine also a corresponding hysteresis.

Note:

The threshold value and the hysteresis value for undervoltage can be taken from the relevant valve data sheet.

Improvement of short-circuit monitoring of the 13.5 V sensor supply

CQ-ID: Defdb00212321

Description: For valves based on IFB hardware (P-0-1520 = "IFB...") monitoring of the 13.5 V sensor supply was improved (→ main stage sensor or swivel angle sensor for pump control). If the sensor voltage is now short-circuited, only error F8069 is generated together with corresponding detailed diagnostics, but no further subsequent errors.

23.1.2 426_Valve_control

Change of pilot for WRC-4x valves

CQ-ID: Defdb00212314

Description: The firmware was extended so that the pilot valve of WRC-4x valves can now be changed.

Note:

As of IndraWorks version 15V20 the appropriate wizard was implemented for this purpose.

Pilot pressure-related control for WRC-4x valves

CQ-ID: Defdb00212318

Description: As of firmware version HDE20V24 it is possible to activate a pilot pressure-related control for WRC-4x valves.

Note:

As of IndraWorks version 15V18 the appropriate dialog is implemented for this purpose.

23.1.3 437_Synchronization_control

Synchronization control (force/alternating control) for VT-HMC with 2 axes

CQ-ID: Defdb00212317

Description: For the VT-HMC with 2 axes, firmware HDM20V24 features synchronization control for force/alternating control.

Note:

Synchronization can only be activated, if SD card VT-SD-HMC-SYNC-000-001-000-000 (R901512467) is inserted in the VT-HMC with 2 axes.

23.1.4 590_Analog_inputs_and_outputs

Change of pressure sensor sandwich plate now possible

CQ-ID: Defdb00212320

Description: As of firmware release HDE20V24 it is possible to replace the pressure sensor sandwich plate without any difficulties.

Note:

As of IndraWorks version 15V22 the dialog required for this was implemented.

23.2 Fixed bugs

23.2.1 435_Axis_control

Force controller control word cannot be activated via signal control word or digital inputs

CQ-ID: Defdb00204328

Description: Activating the individual bits of the force controller control word (→ P-0-2840) via the signal control word (→ S-0-0145) or via the digital inputs did not work.

23.2.2 510_Operation_modes

When the operation mode is changed the I-term of the pressure controller is not activated correctly

CQ-ID: Defdb00207237

Description: If the mode "Minimum value with active integrator" (P-0-2850, bit 0-2 = 4) was selected in the changeover logic Q→p, the I-term of the pressure controller was not correctly started but always cleared when an operation mode with pressure control (e.g. closed-loop pressure control/direct valve control) was activated.

Bug fixing: If the mode "Minimum value with active integrator" is now selected in the changeover logic Q→p, the I-term of the pressure controller is now started according to the current flow or valve command value when the operation mode is changed to a mode with pressure control.

23.2.3 640_Diagnostic_system

No status message "Torque/force command value reached" with inverted force scaling

CQ-ID: Defdb00209225

Description: The message "Torque/force command value reached" (S-0-0824, bit 0) was not generated, if force scaling had been negated.

Bug fixing: The message "Torque/force command value reached" (S-0-0824, Bit 0) is now generated with both positive and negative force scaling as soon as the actual force value is within the target window.

After a change of the operation mode the diagnostic message number of the operation mode is not correct in S-0-0390

CQ-ID: Defdb00210646

Description: When switching from the primary operation mode to a secondary operation mode, parameter S-0-0390 did not display the correct diagnostic number of the operation mode now active.

23.2.4 735_EtherNet_IP

Behavior as “non-DLR Device” is not supported

- CQ-ID:** Defdb00211412
- Description:** In conjunction with EtherNet/IP DLR, HydraulicDrive devices used to behave like “non-compliant devices” so that their use was not permitted in a DLR ring.
- Note:**
Non-compliant devices can have unforeseeable and adverse effects on the fault recognition and restoration of the ring.
- Bug fixing:** HydraulicDrive devices now send all telegrams to both Ethernet ports and thus meet the requirements for “Non-DLR Devices”.
- Note:**
A Non-DLR device is a device that does not support the DLR protocol but complies with all relevant directives. The use of these devices is not recommended, because they render the localization of ring errors more difficult.

23.2.5 750_EtherCAT

Control parameter changes are not accepted

- CQ-ID:** Defdb00211604
- Description:** In the bus state “Operational”, write accesses to parameters that can only be edited at the parameterization level will result in internal switching back to the parameterization level. This resulted in the fact that write functions of the parameters are no longer called and thus changes to the control parameters are not accepted directly.
- Workaround:** In IndraWorks you have to switch manually to the parameterization level and back to the operating mode or, alternatively, let the bus run up.

23.2.6 755_VARAN

Control parameter changes are not accepted

- CQ-ID:** Defdb00211604
- Description:** In the bus state “Operational”, write accesses to parameters that can only be edited at the parameterization level will result in internal switching back to the parameterization level. This resulted in the fact that write functions of the parameters are no longer called and thus changes to the control parameters are not accepted directly.
- Workaround:** In IndraWorks you have to switch manually to the parameterization level and back to the operating mode or, alternatively, let the bus run up.

23.2.7 760_Powerlink

Object 1030 subindex 9 has the wrong default value

- CQ-ID:** Defdb00210696
- Description:** In the Device Description File of Ethernet POWERLINK a default value was defined for object 0x1030, subindex 9. This default value is, however, not uniform for all HDx firmware derivatives, which causes problems in the certification.
- Bug fixing:** Since the default value is not required in the Device Description File, it was removed to allow the openConformance certification test to be carried out successfully without having to change the old products, which are already certified, in an incompatible manner.

Bus cycle time and MTU variable are not adopted

CQ-ID: Defdb00211653

Description: The Ethernet POWERLINK object bus cycle time 0x1006 (Cycle time) and MTU variable 0x1F98/8 (Async MTU) were not correctly adopted.

24 HDx20V24.10

24.1 Functional enhancements

24.1.1 430_Axis_control

Valve stroke greater than 100 % can be set

CQ-ID: Defdb00212319

Description: As of firmware release HDE20V24.10 it is possible to set a valve stroke greater than 100 % in the factory (e.g. valve 5WRPF10F1B70L-3X/M00/24VD10).

24.2 Fixed bugs

24.2.1 415_Measuring_systems

Master communication encoder – command for switching from PM to OM gets stuck

CQ-ID: Defdb00212322

Description: When the master communication encoder (P-0-0077 = 20) was selected for position acquisition, the switching command from PM to OM got stuck in an endless loop and it was impossible to cancel the command.

25 HDx20V24.20

25.1 Functional enhancements

25.1.1 426_Valve_control

Command C9400 for approaching the valve end positions extended

CQ-ID: Defdb00212431

Description: Command C9400 (open-loop controlled valve operation), which is used for determining the valve end positions of WRC-4x valves, has been extended so that the end positions are now approached in closed-loop control.

25.1.2 620_Parameters

Additional parameters for pressure controllers and force controllers are MDT-capable

CQ-ID: Defdb00212549

Description: The following parameters for setting the pressure controller or the force controller are now MDT-capable and can thus be cyclically configured in the drive telegram.

- P-0-2806.0.4 (Pressure controller integration time constant)
- P-0-2816 (Pressure controller positive factor for D-component, cascade)
- P-0-2817 (Pressure controller negative factor for D-component, cascade)
- P-0-2845.01 (Force controller P-gain)
- P-0-2845.0.3 (Force controller integration time)

25.2 Fixed bugs

25.2.1 437_Synchronization_control

Command value correction does not work

CQ-ID: Defdb00211631

Description: Command value correction could not be used for the synchronization axis.

Bug fixing: Command value correction has been activated for the operation modes "drive-internal interpolation" and "drive-controlled positioning".

25.2.2 590_Analog_inputs_and_outputs

Filter for the assignment of analog inputs was not correctly initialized

CQ-ID: Defdb00212451

Description: The filter for the assignment of analog inputs was not correctly initialized so that when switching to OM, error F2270 (Analog input, wire break) could be triggered by mistake.

This could happen, if, for example, an analog input was parameterized as current input (→ 4 - 20 mA), cable break monitoring was activated and a filter time greater than or equal to 5 ms was set.

25.2.3 620_Parameters

Parameter set switching did not work in conjunction with ramp times for pressure and flow command value

CQ-ID: Defdb00212449

Description: In the case of the following parameters, which are used to define the ramp times for the pressure and flow command value, parameter set switching did not work:

- S-0-0810 (Pressure ramp time)
- S-0-0811 (Pressure ramp reference)
- S-0-0855 (Flow ramp reference)
- S-0-0856 (Flow ramp time)

25.2.4 720_Profile_adaptation

FluidPower profile did not work with IFB valves

CQ-ID: Defdb00212507

Description: In the case of IFB valves (→ firmware derivative HDE) the FluidPower profile did not work.

With the other firmware derivatives HDB, HDC, HDM and HDP, switching back to the primary operation mode via bit "Activate pressure controller" was not possible.

26 HDx20V24.30

26.1 Fixed bugs

26.1.1 780_Analog_interface

Axis switches automatically from AF to Ab after 2 seconds

CQ-ID: Defdb00212458

Description: After the enable of the axis was set, the axis switched automatically from AF to Ab, if the following conditions were met:

- No master communication active (P-0-4089.0.1 = 2)
- Analog profile set (P-0-4084 = 0xFF00)
- Enable provided via P-0-4028 and setting of enable via a digital input (→ P-0-0300) or via the signal control word (→ S-0-0145)

27 HDx20V26

27.1 Functional extensions

27.1.1 302_Control_sections

Analog p/Q valves based on IFB hardware

CQ-ID: Defdb00212780

Description: As of firmware version HDE20V26 analog p/Q valves on IFB hardware basis (P-0-1520 = "IFB...") are supported.

For these p/Q valves both, the flow command value and the pressure command value are provided via an analog input.

Examples of such valves are:

- 4WRPQ6Q5-32S-3X/MGF/24BD60 (R901581335)
- 4WRPQ10Q5-80S-3X/MGF/24BD60 (R901591406)

27.1.2 420_Drive_control

Base clock cycle time of 250 µs for bus valves

CQ-ID: Defdb00212842

Description: As of firmware release HDE20V26 it is possible to set a base clock cycle time of 250 µs for bus valves on IFB hardware basis (P-0-1520 = "IFB..."), if EtherCAT or VARAN has been selected as master communication.

See also application manual RE 30338-FK/07.2024, chapter 7.1.3 Features of the control loops.

27.1.3 428_Pump_control

Pump control - adaption characteristic curve for non-linear dependence on speed

CQ-ID: Defdb00212844

Description: As of firmware release HDx20V26 it is possible to configure the P-term and the D-term for a non-linear dependence on speed. By means of the three list parameters P-0-2907 (→ speed), P-0-2908 (→ P-factor) and P-0-2909 (→ D-factor) one characteristic curve each can be defined for the P-term and the D-term. Up to 8 freely selectable support points may be assigned.

See also application manual RE 30338-FK/07.2024, chapter 7.4.5 - Functions of the parallel structure

27.1.4 430_Axis_control

Pressure controller with direction-dependent D-term

CQ-ID: Defdb00212840

Description: The pressure controller has been extended by a direction-dependent D-term.

See also application manual RE 30338-FK/07.2024, chapter 7.2.3 Pressure controller.

27.1.5 620_Parameters

Extension by 3rd average value filter for display

CQ-ID: Defdb00212841

Description: As of firmware release HDx20V26 up to 3 average value filters for display can be parameterized. In the past, a maximum of 2 average value filter for display were available.

See also application manual RE 30338-FK/07.2024, chapter 9.6 Average value filter.

27.1.6 620_Parameters

Additional parameters for closed-loop control (pressure, position, force, synchronization) are MDT-capable

CQ-ID: Defdb00212843

Description: The following parameters for controller settings (pressure, position, force, synchronization) are now MDT-capable and can thus be cyclically configured in the drive telegram.

Pressure controller (parallel and cascade structure)

- P-0-2965 (Pressure controller P-gain 2 positive)
- P-0-2966 (Pressure controller P-gain 2 negative)
- P-0-2967 (Pressure controller control deviation threshold positive)
- P-0-2968 (Pressure controller control deviation threshold negative)
- P-0-2806.0.6 (Pressure controller accuracy window integrator)
- P-0-2806.0.15 (Pressure controller initialization integrator, threshold 1)
- P-0-2806.0.16 (Pressure controller initialization integrator, threshold 2)
- P-0-2806.0.17 (Pressure controller preload, pressure change filter time)
- P-0-2812 (Feedback of actual pressure value derivative to integrator)
- P-0-2815 (Pressure controller output signal, negative limit, cascade)
- P-0-2818 (Pressure controller upper integrator limit, cascade)
- P-0-2838 (Pressure controller lower integrator limit, cascade)

Position controller

- P-0-2830.0.4 (Position controller integration time constant)
- P-0-2830.0.6 (Position controller integrator position window)

Force controller

- P-0-2845.0.5 (Force controller integrator force window)

Synchronization controller

- P-0-2862.0.2 (Synchronization position integral time)
- P-0-2862.0.3 (Synchronization position limitation integrator)
- P-0-2860.0.5 (Synchronization integrator accuracy window)

Pressure command value generator

- S-0-0810 (Pressure ramp time)

27.1.7 755_Varán

DHCP functionality for VARAN

CQ-ID: Defdb00212781

Description: The DHCP functionality was implemented for the VARAN bus system.

The automatic address assignment via DHCP can be activated via bit 3 in parameter P-0-1535 (→ Settings IP communication).

See also application manual RE 30338-FK/07.2024, chapter 4.10.3 Ethernet over VARAN.

27.2 Fixed bugs

27.2.1 415_Measuring_systems

Monitoring of the inrush current for the 5 V encoder set too sensitive

CQ-ID: Defdb00212778
Description: Monitoring of the inrush current for the 5 V encoder supply of the VT-HMC was set too sensitive so that certain TLL and EnDat encoders could not be used.

27.2.2 428_Pump_control

Max value for P-0-2988 too small

CQ-ID: Defdb00211124
Description: The max value for P-0-2988 (→ Controller output adjustment, swivel angle minimum value) used to be 0 %. For some pump systems it is, however, necessary to enter a positive value here. For this reason, the max value was increased to 20 % in order that the minimum swivel angle limitation can now be adjusted between -100 % and +20 %.
Workaround: With manual configuration of the swivel angle sensor it was possible to correctly parameterize the signal range.

Signal range for swivel angle sensor SWS not correct

CQ-ID: Defdb00212776
Description: If type SWS was selected as swivel angle sensor via parameter P-0-2948, the signal range was not correctly set. The signal range was parameterized automatically as follows:

- Lower limit: 0.5 V (= -100 %)
- Upper limit: 4.5 V (= 100 %)

Bug fixing: The signal range is now correctly parameterized:

- Lower limit: 4.5 V (= -100 %)
- Upper limit: 0.5 V (= 100 %)

Workaround: With manual configuration of the swivel angle sensor it was possible to correctly parameterize the signal range.

It is possible to write negative speeds to P-0-2993

CQ-ID: Defdb00212594
Description: It was possible to write negative speeds to parameter P-0-2993 (→ current drive speed), which resulted in high speeds in the firmware.
Bug fixing: Now, only positive speeds can be written to parameter P-0-2993.

27.2.3 430_Axis_control

Switching mode Q → p: Excessive charging of the I-term of the pressure controller while D-term is active

CQ-ID: Defdb00212151
Description: In switching mode Q → p with switch-on threshold a very strong change in pressure at the time of changeover (i.e. when the switching threshold is

reached) and with an active D-term (→ P-0-2806.0.22) resulted in the fact that the I-term of the pressure controller was excessively charged. This could lead to strong overshoots.

VT-HMC with 2 axes: Setting the I-term of the pressure controller of the 2nd axis does not work properly

CQ-ID: Defdb00212618

Description: When switching from Q (open-loop) to closed-loop pressure control, setting of the I-term of the pressure controller for the 2nd axis did not work properly, because the values of the two parameters P-0-2806.0.15 (→ Pressure controller initialization integrator, threshold 1) and P-0-2806.0.16 (→ Pressure controller initialization integrator, threshold 2) were not correctly accepted.

27.2.4 435_Axis_control

Alternating control: Position interpolator gets stuck in the rapid/creep speed positioning profile

CQ-ID: Defdb00212552

Description: With a rapid/creep speed positioning profile, alternating control became active while the profile was being followed. For alternating control, "Break" was set as behavior for the position interpolator. During changing over to alternating control the position interpolator was stopped according to its setting. If the pressure then fell or the pressure command value increased, the position controller was reactivated. However, the position interpolator was not restarted, but got stuck.

27.2.5 445_Limitations

Travel range monitoring does no longer work after homing

CQ-ID: Defdb00210865

Description: Travel range monitoring does no longer work with an incremental encoder after the following sequence:

1. The encoder was not referenced.
2. The homing procedure was selected without enable (→ S-0-0147 = 0b0110.0100).
3. The axis was not in control. The homing procedure was initiated via command S-0-0148.
4. The axis then was homed, but the travel range limits were no longer effective.

Bug fixing: Travel range monitoring now also works after homing without enable.

27.2.6 510_Operation_modes

Switching from direct valve control to drive-controlled positioning - setpoint position incorrectly calculated

CQ-ID: Defdb00212167

Description: When switching the operation mode from direct valve control to drive-controlled positioning, the setpoint position is calculated in a way to avoid controller output jumps. However, if the controller output was inverted (→ P-0-2873.0.3) the setpoint position was calculated in the wrong direction. If, for example, the operation mode was changed over while a cylinder was extending, the cylinder retracted again a little bit.

27.2.7 640_Diagnostic_system

Recording of P-0-4028 does not work

CQ-ID: Defdb00210834

Description: The value of parameter P-0-4028 (→ device control word) was not correctly recorded.

27.2.8 715_General_communication_services

The switching frame can cause unwanted machine movements

CQ-ID: Defdb00206242

Description: The utilization of the switching frame for switching to standard Ethernet in conjunction with the bus systems EtherCAT and VARAN, the profile "Analog" (→ P-0-4084 = 0xFF00) was activated, which, depending on wiring, could cause the HydraulicDrive to switch to closed-loop control and thus cause a machine movement.

Bug fixing: Now, when switching to standard Ethernet by means of the switching frame, no profile is activated anymore (→ P-0-4084 = 0x0000).

27.2.9 750_EtherCAT

Incorrect fluid power state, if errors are present during starting

CQ-ID: Defdb00212709

Description: The following error was present in the Fluid Power profile: If, when the HydraulicDrive was started, an error of category F2, F3, F4 or F6 was present, the firmware switched to an incorrect fluid power state. After the first activation of the fluid power state machine the HydraulicDrive was not switched to closed-loop control, although this was signaled by the Fluid Power status word.

28 HDx20V26.10

28.1 Functional enhancements

28.1.1 302_Control_sections

Sporadic error F2100 / fault-tolerant storing of retain data in the EEPROM

CQ-ID: Defdb00213164

Description: Within the framework of the routine analysis of repair statistics, an unusually large number of errors was observed on valve types **4WRPDH**, **4WRLD**, **VT-DFPD** and **SYDFED**: Error message **F2100** occurs sporadically after the warranty period expired. In particular, firmware versions **HDB18V08** to **HDB20V18** are affected by this.

Cause:

Cyclic writing of retain data to the EEPROM can - in particular at higher ambient temperatures - result in sporadic error messages of type **F2100**.

Solution:

This problem was solved with firmware patch version **HDB20V26.10**. Moreover, a more fault-tolerant process was implemented for storing the retain data in the EEPROM.

Valves, on which error F2100 already occurred can be repaired by updating the firmware to **HDB20V26.10**.

How to proceed for updating the firmware to HDB20V26.10:

Please follow the steps below in the given order:

1. **Upload firmware:**
Upload firmware HDB20V26.10 to the valve using IndraWorks
2. **Switch to OM:**
After having uploaded the firmware via IndraWorks, switch to OM mode.
3. **Position data reference in the case of 4WRPDH and 4WRLD:**
Error F2174 (loss of reference, encoder 1) might occur, since the position data reference has not been saved correctly in the retain data. → Set the position data reference for encoders using IndraWorks.
4. **Calibration in the case of VT-DFPD and SYDFED:**
The pump might be incorrectly calibrated. → Recalibrate via IndraWorks.
5. **Rebooting:**
Following the adjustments reboot the valve via IndraWorks.
6. **Check the diagnostic memory:**
After rebooting check the diagnostic memory for the presence of warnings with regard to invalid parameters.

28.1.2 688_Service_functions

Telnet deactivated by default

CQ-ID: Defdb00212913

Description: For security reasons, the Telnet service is deactivated by default. If required, the service can be re-activated via parameter P-0-1535.

28.2 Fixed bugs

28.2.1 428_Pump_control

Swivel angle offset calibration impossible

CQ-ID: Defdb00212931

Description: With the following system configuration it was impossible to carry out a swivel angle offset calibration:

- **Direction of rotation:** Counter-clockwise rotating pump
- **Pump systems** HS5, HS5K, HS5P, HS5KP, HS5M, HS5E

After the calibration was started the actual value of the swivel angle rose immediately to high positive or negative values. As a consequence, either an error message was generated or the user aborted the calibration process manually.

Calibrating the system successfully was not possible under these conditions.

Default values missing for speed adaption

CQ-ID: Defdb00213012

Description: As of firmware release HDx20V26 it is possible to configure the P-term and the D-term of the pressure controller in dependence on the non-linear speed.

This is possible by means of the three list parameters:

- P-0-2907 (speed)
- P-0-2908 (P-factor)
- P-0-2909 (D-factor)

However, for these parameters no default value was stored in the firmware.

Bug fixing: The following default values are now assigned to these parameters:

Element	P-0-2907	P-0-2908	P-0-2909
0	250.00	1.5	3.20
1	500.00	1.25	2.20
2	1000.00	1.15	1.35
3	1500.00	1.00	1.00
4	2000.00	0.90	0.80
5	3000.00	0.70	0.58
6	4000.00	0.52	0.42

28.2.2 660_Ethernet_engineering

No connection via Ethernet after input of reserved IP address

CQ-ID: Defdb00213018

Description: The IP address range from 240.x.x.x to 255.x.x.x is reserved and must not be used.

However, no related check had been implemented in the firmware so that it was possible to enter an IP address from this range. After such an IP address was entered it was no longer possible to access the device via Ethernet.

28.2.3 755_VARAN

With a bus cycle time of 250 μ s the message counter is only refreshed every second cycle

CQ-ID: Defdb00212806

Description: If a bus cycle time of 250 μ s was used over VARAN the message counter was output in the refreshed state in the cyclic actual value in only every second cycle.

Consequently, the message counter remained constant for two clock cycles and then jumped by two counts to the current value.

29 Firmware replacement

29.1 Brief description

29.1.1 Basic principles

Explanation of terms	The following cases are distinguished for firmware replacement: • Release update An old firmware release (e.g. HDB-17V12) contained in the device is replaced by a new firmware release (e.g. HDB-17V14). • Version upgrade The older firmware version contained in the device is replaced by a new firmware version (example: HDB-17V14 is replaced by HDB-18V10).
Replacement	Firmware can be replaced using the following hardware and software: • Computer with software "IndraWorks" or • Computer with TFTP client  The "IndraWorks" commissioning software can be ordered from Rexroth. The scope of supply of "IndraWorks" contains documentation which describes the operation of the program.
To be noticed	After every firmware replacement (release update and version upgrade), check the following parameters for validity: • P-0-2003, Selection of functional packages • P-0-4089.0.1, Master communication: Protocol It might be necessary that you set them valid manually during the first run-up after the firmware replacement.

29.1.2 Preparations and boundary conditions for firmware replacement

Preparations for replacing firmware	You have to make the following preparations for firmware replacement: 1. Drive controller must be on (24 V supply). 2. The drive controller must not be in operating mode (communication phase 4) (cf. P-0-0115). 3. It is recommended that you save the required parameters before replacing the firmware.
General notes on how to carry out firmware replacement	You have to observe the following points when carrying out the firmware replacement: • For the firmware replacement via IndraWorks, Ethernet communication to the drive has to be possible. • Do not switch off the 24 V control voltage while replacing the firmware. • The firmware has always to be replaced completely.
Communication types	The engineering communication works in different ways, depending on the activated bus system (cf. P-0-4089.0.1). Make the settings and comply with the requirements in accordance with the bus system used. For further information, see chapter "TCP/IP communication".



After you have changed the IP settings, the device has to be re-started for activating the settings. If several devices have been connected via the master communication bus, you have to make sure that an unequivocal IP address is assigned to each node.

IP settings on the computer See Microsoft help, keyword "LAN connection"

29.2 Firmware release update

29.2.1 General information

Before you update the firmware release, it is recommended that you save the backup parameters of the drive!

29.2.2 Firmware release update with computer

1. Connect the drive to the computer (recommended: Cat5e Ethernet cable)
2. Load firmware

There are two possibilities of performing a firmware release update using a computer:

- By means of IndraWorks or
- with a TFTP client

1. *Firmware release update with IndraWorks*

- 1.1 Open "IndraWorks Suite or IndraWorks Ds".
- 1.2 IndraWorks Suite: Load project for relevant axis or create new project; to do this, address axis over Ethernet.
- 1.3 IndraWorks Suite: Switch project "online".
IndraWorks Ds: Establish connection with the controller via the dialog "Connection Selection".
- 1.4 IndraWorks Suite: Select/highlight controller and call "Firmware Management" in context menu.
IndraWorks Ds: Call menu item **Diagnosis/Service ► Firmware Management...**
A new window opens and drive firmware currently available in the drive is displayed.
- 1.5 Highlight new firmware (*.ibf file) in upper part of dialog and start firmware download by clicking "Download" button.
The firmware download runs automatically and all required firmware components are loaded to the drive.
- 1.6 After the firmware download has been completed, close the "Firmware Management" window.

2. *Firmware release update using a TFTP client*

- 2.1 Firmware update service is made available via a TFTP server. Command for sending the firmware is "put" command.



It is possible with any TFTP client supporting this command (e.g. Windows command line program "tftp.exe") to carry out a firmware release update **without IndraWorks**.

Example (with "Microsoft Windows consoles TFTP client"):

To carry out a firmware release update, only a "put" request is transmitted. Do not use an optional alternative name for the file on the target system. For the host, the IP address of the device is to be specified (standard is 192.168.0.1):

```
tftp -i 192.168.0.1 put FWA-HYDRV_-HDB-18V10-D5.ibf
```

See also functional description: "Firmware download via TFTP server"

3. Restart drive
4. Put machine into ready-for-operation status again according to the machine manufacturer's instructions.
5. Check functions of drive.

29.3 Firmware version upgrade

29.3.1 General information

When firmware in a drive controller is replaced by firmware of a **more recent version**, this is called firmware version upgrade (e.g., FWA-HYDRV*-HDB-17V12-D5 replaced by FWA-HYDRV*-HDB-18V10-D5).



Before carrying out the firmware version upgrade, you have to save all parameters (e.g., with "IndraWorks"). **After** firmware replacement, the parameters need to be restored, because the command "C07_1 Load defaults procedure command (factory settings)" is carried out automatically. After the desired parameter file was loaded, the drive controller is ready for operation again.

29.3.2 Saving parameter values

Before the firmware upgrade, all application-specific parameter values have to be saved on a data carrier. The parameter backup can be carried out by means of:

- **"IndraWorks" commissioning software**
→ Saving parameter values to external data carrier
- or -
- **Control master**
→ Saving parameter values on master-side data carrier

29.3.3 Version upgrade with "IndraWorks"

Requirements The following requirements should have been met in order that a firmware version upgrade with "IndraWorks" makes sense:

- Existing Ethernet connection between PC and drive controller
- Current parameter setting of axis was saved.



When upgrading from HDB-17VRS to HDB-18VRS, the error F8100 is sometimes generated during the drive controller's initial start-up. This error can be cleared via the display and will not occur again during the next booting process.

Firmware upgrade with "IndraWorks"

Carrying out the firmware version upgrade with "IndraWorks" requires the following steps:

1. Load firmware

- 1.1 Open "IndraWorks Suite or IndraWorks Ds".
- 1.2 IndraWorks Suite: Load project for relevant axis or create new project; to do this, address axis over Ethernet.
- 1.3 IndraWorks Suite: Switch project "online".
IndraWorks Ds: Establish connection with the controller via the dialog "Connection Selection".
- 1.4 IndraWorks Suite: Select/highlight controller and call "Firmware Management" in context menu.
IndraWorks Ds: Call menu item **Diagnosis/Service ► Firmware Management....**
A new window opens and drive firmware currently available in the drive is displayed.
- 1.5 Highlight new firmware (*.ibf file) in upper part of dialog and start firmware download by clicking "Download" button.
The firmware download runs automatically and all required firmware components are loaded to the drive.
- 1.6 After the firmware download has been completed, close the "Firmware Management" window.
- 1.7 Reboot drive controller

2. Put drive into ready-for-operation state

⇒ Switch project "online"!

After project has been switched "online", a message sometimes signals that "IndraWorks" could not establish communication to drive via Ethernet interface, as drive-internal settings for Ethernet communication were reset.

⇒ In this case, reconfigure communication via button "Search for devices"!

⇒ As the firmware in the drive no longer complies with the version stored in the project, a corresponding message is displayed. Select desired option in the dialog to make the drive available in the project again and allow reestablishing communication with the device.

⇒ Set functional package and master communication protocol manually via corresponding parameters.

⇒ Activate command "C07_1 Load defaults procedure command (factory settings)". All buffered parameters are thereby set to their default values.

3. Load parameter values

⇒ Load saved parameter file!

⇒ Switch off drive and re-start so that the parameterization becomes active.

4. Put machine into ready-for-operation state

- ⇒ Put machine into ready-for-operation status again according to the machine manufacturer's instructions.
- ⇒ Check functions of drive.

29.4 Upgrade to HDB-18V08

As of version HDB-18V08, the firmware download is carried out exclusively via the TFTP protocol. With the predecessor versions HDB18V06 and HDB17V16 the SIS protocol is active.

For the upgrade, an intermediate step is necessary, i.e. the FWA file (version HDB18V08) is loaded twice. In a first step, the TFTP loader is activated. In a second step, the respective, complete FWA version is loaded via the activated loader.

The description refers to the IndraWorks Ds 13V10 operator interface used.

29.5 Upgrade From HDB-17/18 (SSI) to 18V08 (TFTP)

Upgrading must be carried out in the following sequence:

1. Call →Service→Firmware administration in IndraWorks
2. Select file name **FWA-HDB-18V08.ibf**
3. Start download

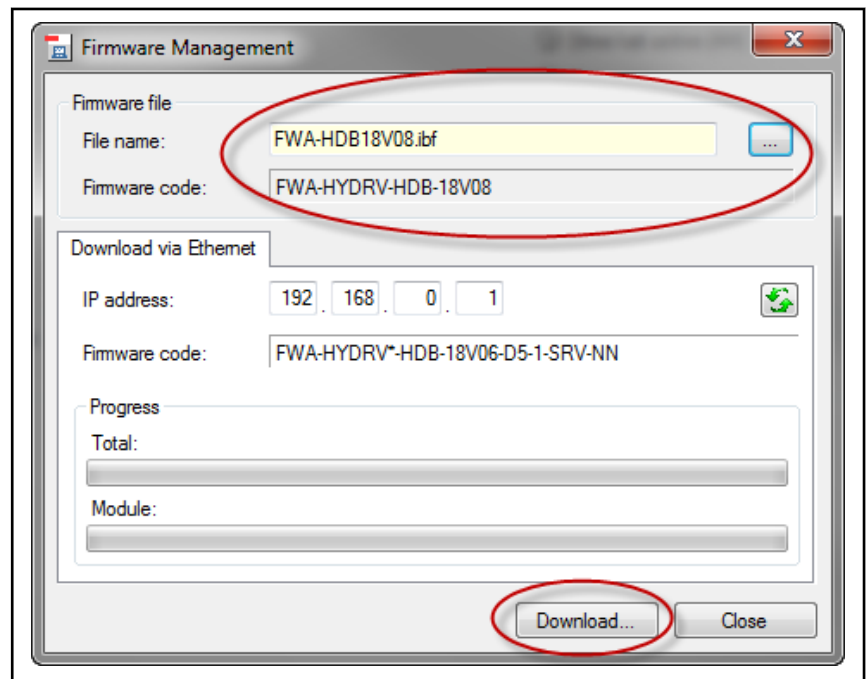


Fig. 29-1: Upgrade to HDB-18V08

4. The following safety warning must be observed and, if necessary, confirmed by clicking **Yes**.

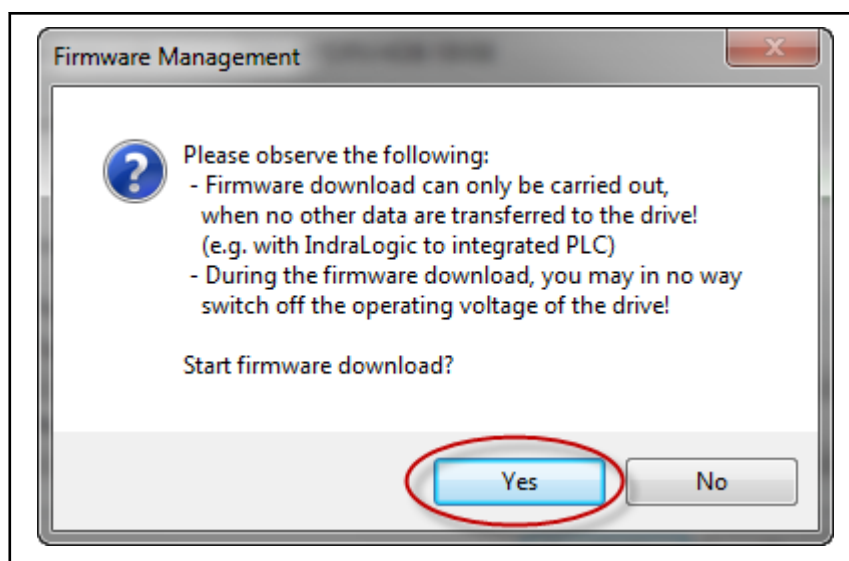


Fig. 29-2: Upgrade to HDB-18V08



The download is started now.

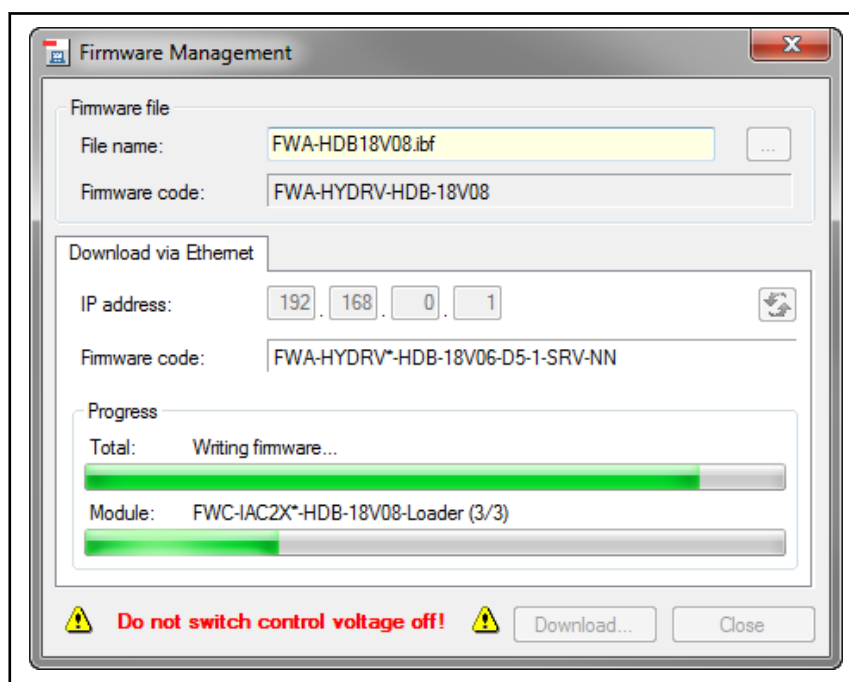


Fig. 29-3: Upgrade to HDB-18V08



A successful download is confirmed by the subsequent information window.

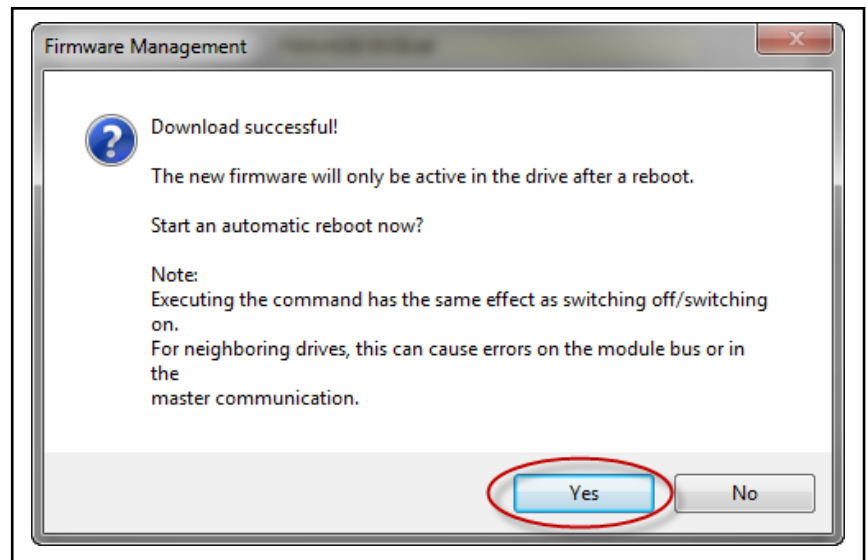


Fig. 29-4: Upgrade to HDB-18V08

5. A restart is required. It is executed after clicking **YES**. The device can also be booted manually.



Following the restart, the TFTP loader is now active.

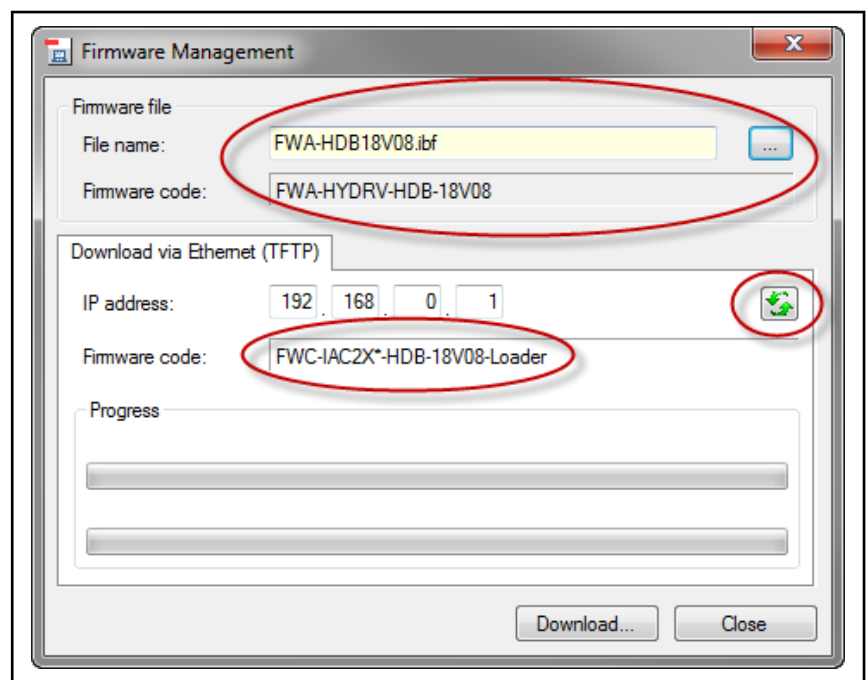


Fig. 29-5: Upgrade to HDB-18V08

6. The download must be started again.



The IP address was reset to 192.168.0.1. Otherwise, the address has to be entered later.

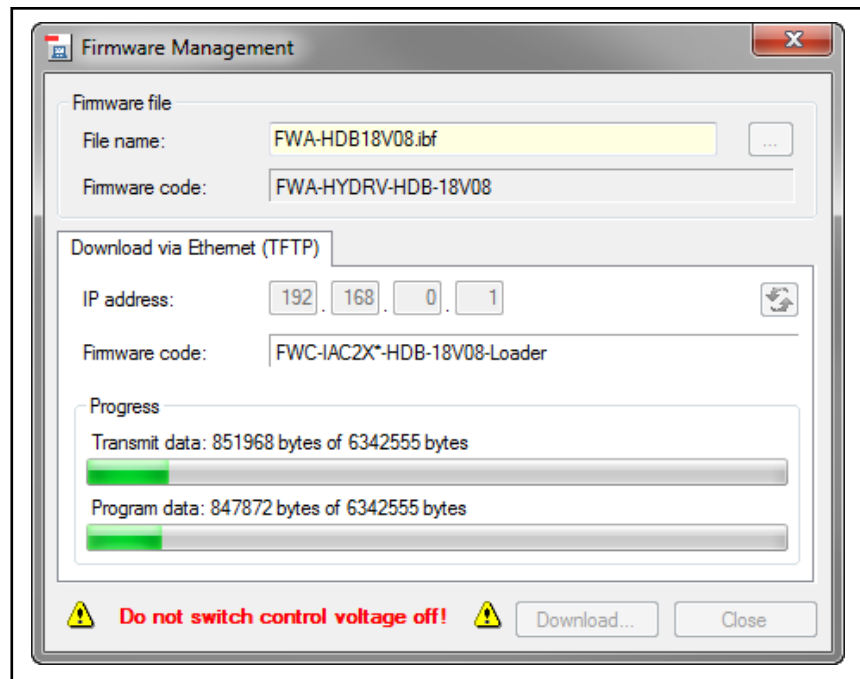


Fig. 29-6: Upgrade to HDB-18V08



A successful download is confirmed by an information window.

7. A restart is required. It is executed after clicking **YES**. The device can also be booted manually.

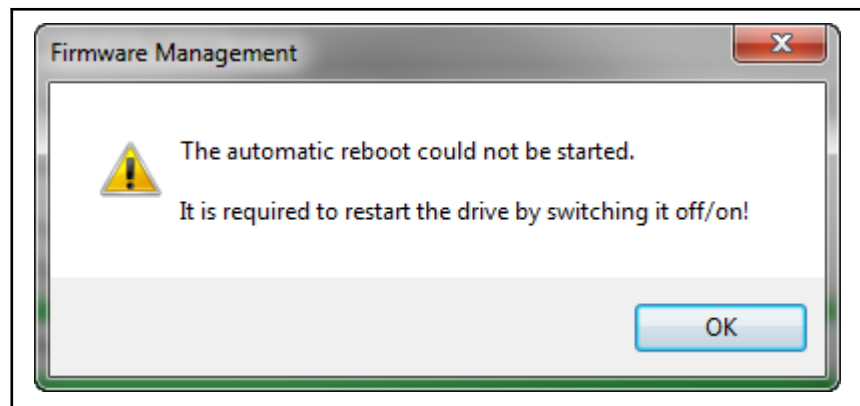


Fig. 29-7: Upgrade to HDB-18V08



After a restart was carried out, re-copying processes take place, which are signaled by red/green flashing of the ModulStateLED. Then, the new version (HDB-18V08) is active.

29.6 Possible problems arising during firmware replacement

General information After an incomplete firmware update, the drive controller might no longer be operable.

Firmware replacement is carried out incompletely, if one of the following situations occurs during the sequence of firmware replacement:

- 24 V supply of control section is switched off
- Connection to drive is interrupted (e.g. defective interface cable)
- Crash of update software / of computer

If there is no valid firmware available in the control section, the loader is started. With the loader, it is possible to replace the firmware of the control section.



Upon successful firmware replacement in the control section, a restart has to be carried out.

Firmware replacement in the control section in the event of an error

The following steps are required for loading the firmware to the control section in the case of error:

1. Open "IndraWorks Suite or IndraWorks Ds".
2. IndraWorks Suite: In the menu, call firmware management under **Tools ▶ Drive ▶ Firmware Management**.
IndraWorks Ds: In the menu, call firmware management under **Diagnosis/Service ▶ Firmware Management**.
A new window opens in which the firmware file last used is displayed on the PC.
3. Select "Download via Ethernet" tab.
4. Set IP address "192.168.0.1".
5. Highlight desired firmware (*.ibf file) and start firmware download via **Download** button.
6. The firmware download runs automatically and all required firmware components are loaded to the drive.
7. After the firmware download has been completed, close the "Firmware Management" window.
8. Restart drive.

29.7 Reboot command

Functional description

Various, fundamental changes in the configuration of the drive will not become effective before the system is rebooted such as

- Loading of new firmware to firmware
- Changeover of functional package
- Changeover of Multi-Ethernet protocol

To avoid that the control voltage of the device concerned and possibly other devices that may be supplied with the same control voltage need to be switched off and on completely, the "S-0-1350, C6400 reboot command" is implemented.

Sequence of the reboot command

Upon the start of the command, retain data are saved. Then, a fixed delay time of 2 sec has to elapse before the reboot process is initiated. The delay time allows starting of the command at several drives of a system in parallel without resulting in a breakdown of the Sercos communication immediately after the start of the command due to the drive boot process. During the delay time, the command signals "in process".

For safety reasons, the command can only be started in the parameter mode (PM).

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Notes

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