



Actuator controls

AUMATIC AC 01.2/ACExC 01.2

Profibus DP-V1

DTM (Device Type Manager)

for FDT (Field Device Tool)



Purpose of the document:

The present document describes the handling of AC2DTM for actuator controls AUMATIC AC 01.2/ACExC 01.2 on the basis of the PACTware FDT frame application; the instructions apply accordingly for other FDT applications.

Reference documents:

- Operation instructions (Assembly, operation, commissioning) for actuator
- Manual (Operation and setting) AUMATIC AC 01.2 Profibus DP
- Manual (Device integration Fieldbus) AUMATIC AC 01.2 Profibus DP

Reference documents can be downloaded from the Internet (www.auma.com) or ordered directly from AUMA (refer to <Addresses>).

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1. Introduction

Process data DP-V0 Extended functions DP-V1	<p>The field devices used in the industrial process automation today have, aside from the compulsory main functions, a variety of more detailed application functions to adapt their performance optimally to the process requirements. In addition to this, most field devices have even more functions and methods to diagnose their own field device status. When using open, internationally standardised fieldbus systems such as Profibus DP-V1, access to these device-specific application and diagnostic functions is made through the same fieldbus cables also used for process data exchange between field device and control system. Beside cyclic process data exchange via Profibus DP-V0, an additional acyclic communication via Profibus DP-V1 can hereby be established, without additional wiring. It serves for adapting parameters of application functions or reading status and diagnostic data during operation.</p> <p>By means of the optional acyclic Profibus DP-V1 services, AUMA field devices offer access to</p> <ul style="list-style-type: none">• Status and diagnostic data in compliance with NAMUR NE 107• Parameters of application functions to adapt to process requirements• Data within the electronic device ID for detailed device identification• Operational data for preventive maintenance <p>Furthermore, detailed device status information can be transferred for diagnostics.</p>
Access via FDT interface	<p>Device access to all connected field devices is thereby made via a central operation and monitoring software, located e.g. in the control room. A standardised software interface enables uniform integration of various field devices into the operation and monitoring software. Details of this software interface were laid down and published in the FDT interface specification (FDT = Field Device Tool, refer to www.profibus.com or www.fdt-group.org).</p>
FDT frame application	<p>A typical operation and monitoring software with FDT interface is e.g. PACTware (www.pactware.com). These tools are also called FDT frame applications, as they contain the various DTMs for all field devices within a plant.</p>
Device integration via DTM	<p>A DTM (Device Type Manager) is an device-specific software component required to integrate a field device of a certain manufacturer into the operation and monitoring software (FDT frame application) or into a DCS with FDT interface.</p> <p>DTM as free download for actuator controls AUMATIC AC 01.2/ACExC 01.2 is available on our website: www.auma.com. With DTM, the user does no longer have to worry about details regarding Profibus DP-V1 communication, but can use device-specific application and diagnostic functions immediately after installation and assignment of the device address.</p>

2. Installation

2.1 AUMA scope of delivery

	Installation package Device Type Manager (DTM) for AUMATIC AC 01.2 /ACExC 01.2 , for free download from our website www.auma.com , with the following content:
Setup.exe	Installation file for Device Type Manager AC2DTM.
Documentation	hb_ac2_profibus_v1_dtm_geraeteintegration_de.pdf Manual AUMATIC device integration with DTM in German. hb_ac2_profibus_v1_dtm_geraeteintegration_en.pdf Manual AUMATIC device integration with DTM in English.

2.2 Summary of the AUMATIC AC2DTM functions

AUMATIC AC2DTM provides the following functions:

- Reading and writing AUMATIC parameters.
- Reading and writing the electronic device ID for detailed identification of the AUMATIC.
- Reading and clearing the operating data for diagnosis and preventive maintenance.
- Online diagnostics regarding current actuator and controls status.
- Tool tips with short description for each parameter.
- Comprises Manual (operation and setting) AUMATIC AC 01.2/ACExC 01.2 Profibus DP and Manual (fieldbus device integration) AUMATIC AC 01.2/ACExC 01.2 Profibus DP
- Offline and online operation mode
- Cyclic Profibus DP-V0 communication channels.
(e.g. for integration into ABB systems).
- AC2DTM conforms to FDT specification 1.2 including addendum.

2.3 Prerequisites for device integration with AC2DTM

The following programs/hardware must be available on PC/laptop:

- FDT frame application (operation and monitoring software), with FDT specification 1.2
e.g. PACTware (www.pactware.com).
- CommDTM (communication DTM) for Profibus DP-V1 interface, e.g. Profi USB interface with PROFIdtm by Softing AG (www.softing.com).

2.4 Software AC2DTM installation

1. Exit all programs.
2. Start AC2DTM installer_1.0.2.xxx.
3. Follow the instructions of the setup program.

3. Projecting (add AUMATIC into FDT)

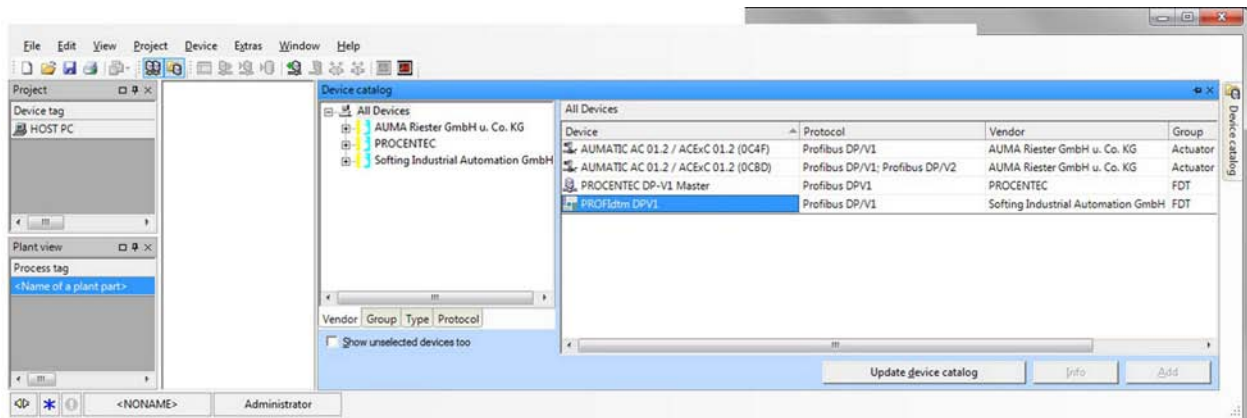
This chapter describes the projecting with the example of the FDT frame application PACTware. Please refer to the PACTware Online help for a complete program description.

When using a different FDT frame application, the procedure to be followed is described basically in the same way.

3.1 FDT frame application: start

1. Start PACTware
2. Display device catalog using **View > Device catalog** menu. The device catalog shows all DTMs installed on the computer, sorted by manufacturer.

Figure 1: View device catalog



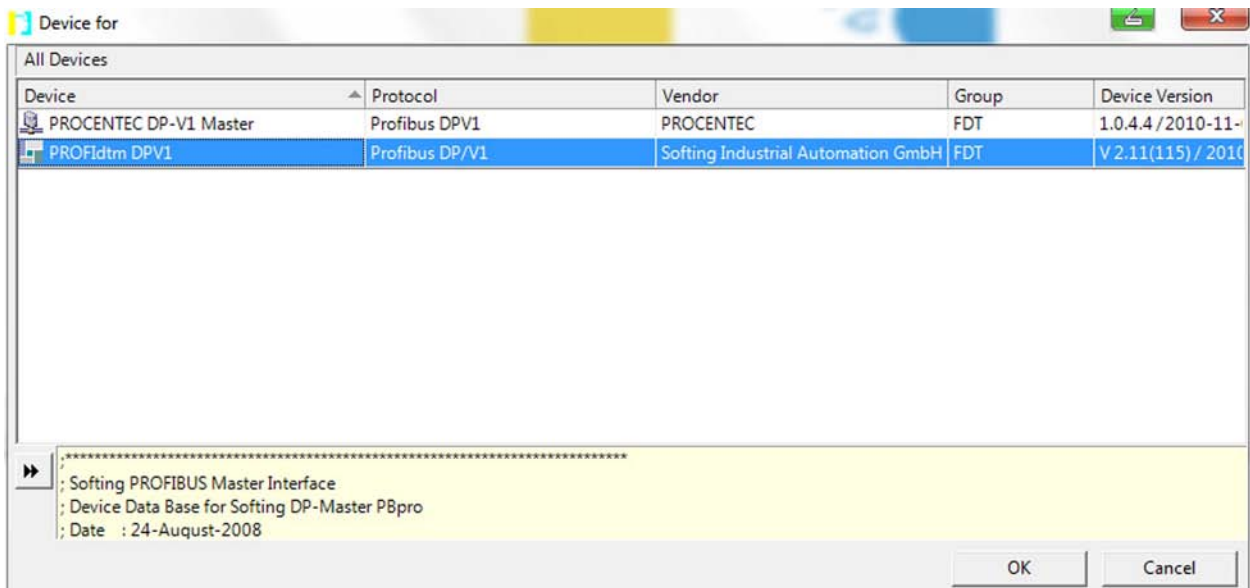
3. Click **Update device catalog** to display all available DTMs within the system.

3.2 CommDTM: add

A CommDTM (communication DTM) is a software component which must be available for a project. The AC2DTM and all further DTMs for other field devices are then assigned to the CommDTM.

1. Click **HOST PC** using right mouse button and select **Add device. Device for** window displays available CommDTMs.

Figure 2: Display available COMM DTMs

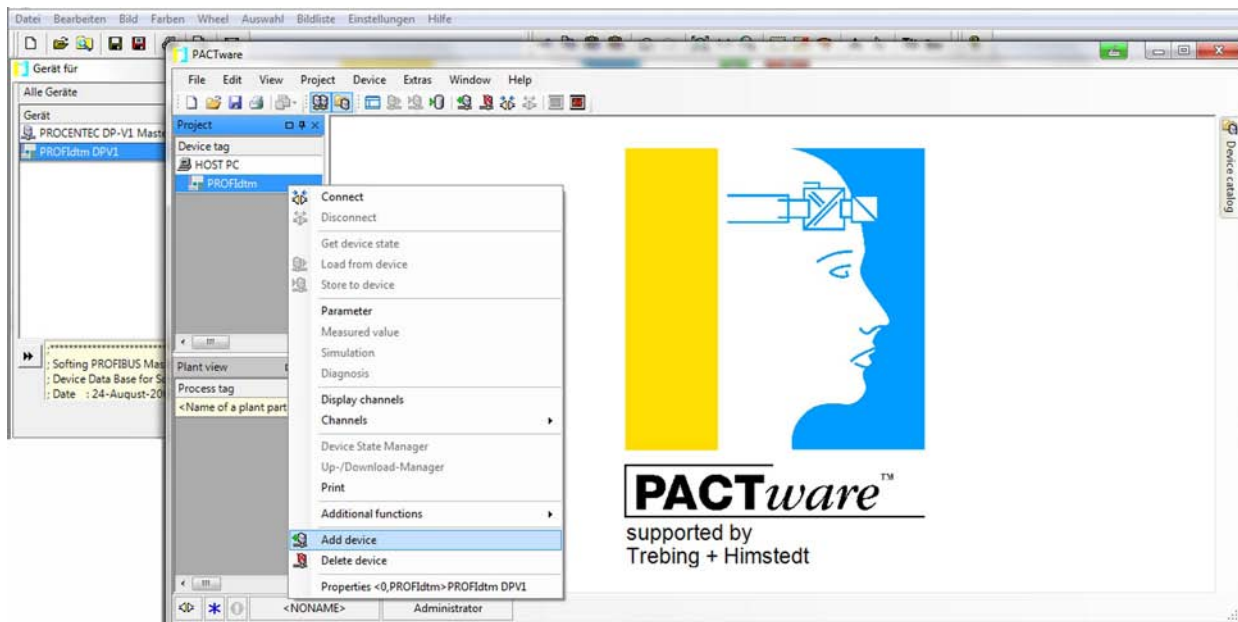


2. Click **CommDTM** and confirm with **OK**.

3.3 Add AUMATIC

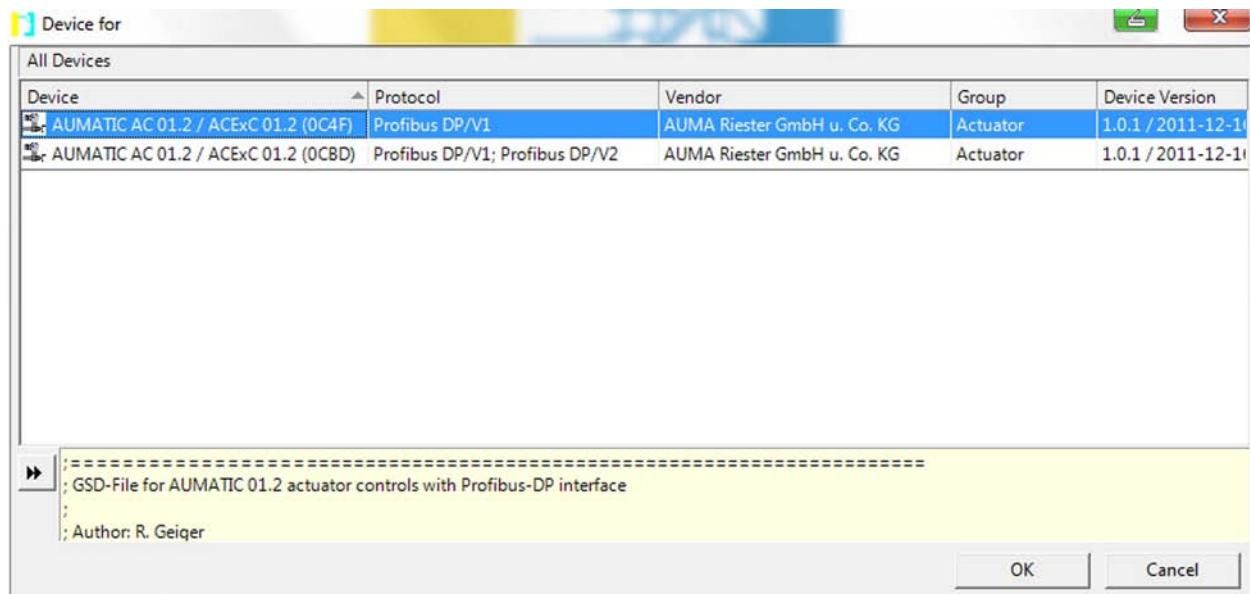
1. Click CommDTM (here: <0.PROFIdtm>PROFIDTM V1>) using right mouse button.

Figure 3: Add AUMATIC



2. Click **Add device** command.
➔ **Device for PROFIdtm DPV1** window shows all available devices:

Figure 4: Available devices



Information: AUMA actuators with actuator controls AC 01.2 are logged in the PNO with the following identification numbers:

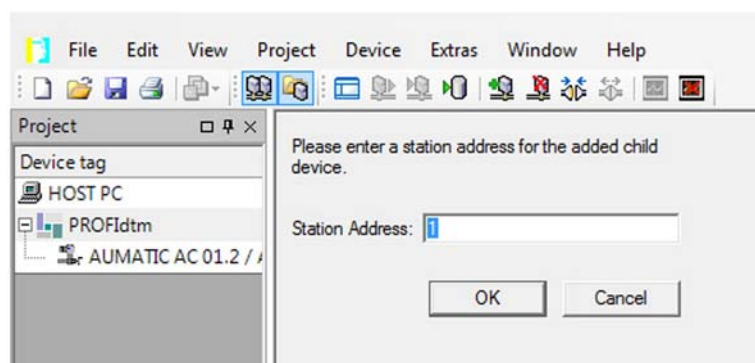
- Ident number of the standard version: **0x0C4F** with functions for:
 - Single channel Profibus DP interface (not redundant)
 - Redundant Profibus DP interface according to AUMA redundancy
- Ident number of the extended version: **0x0CBD** with functions for:
 - Redundant Profibus DP interface according to Profibus DP-V2 redundancy
 - Time stamp and alarms according to Profibus DP-V2

Therefore, make sure to use the suitable AC2DTM version. The current identification number can be displayed via the following menu: **Diagnostic > Profibus details > Profibus ID no.**

3. Select **Device** (AUMATIC actuator) and confirm with **OK**.

➡ The dialog window for entering the station address opens:

Figure 5: Enter station address



4. Enter **Station Address** (Profibus DP device address of AUMATIC) and confirm with **OK**.

Information The station address entered must be identical with the device address of the AUMATIC connected!

You may request the device address at the AUMATIC local controls display as follows:

Customer settings M0041

Profibus DP M0016

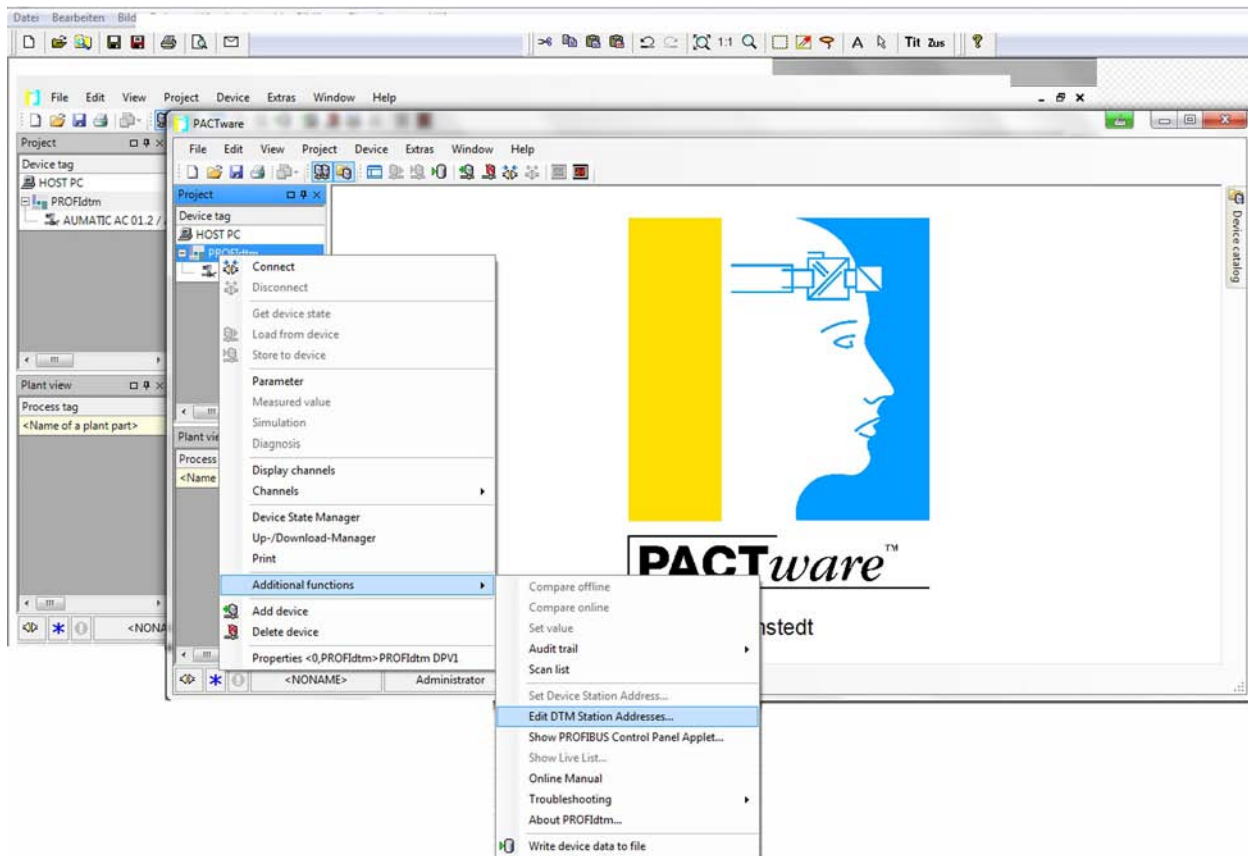
DP1 slave address M0098

DP2 slave address M0295

3.4 Device address: adapt subsequently

1. Click CommDTM (here: **<0.PROFIdtm>PROFIDTM V1**) using right mouse button and select **Additional functions**.
➡ The dialog window indicates:

Figure 6: Available devices



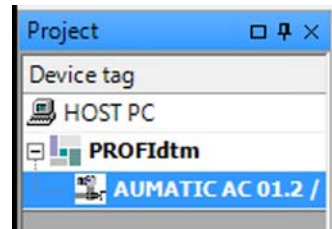
2. Click **Edit DTM Station Addresses...**
➡ The device address may be modified within the dialog opening now.

4. Working with AUMATIC DTM

4.1 AUMATIC DTM: start

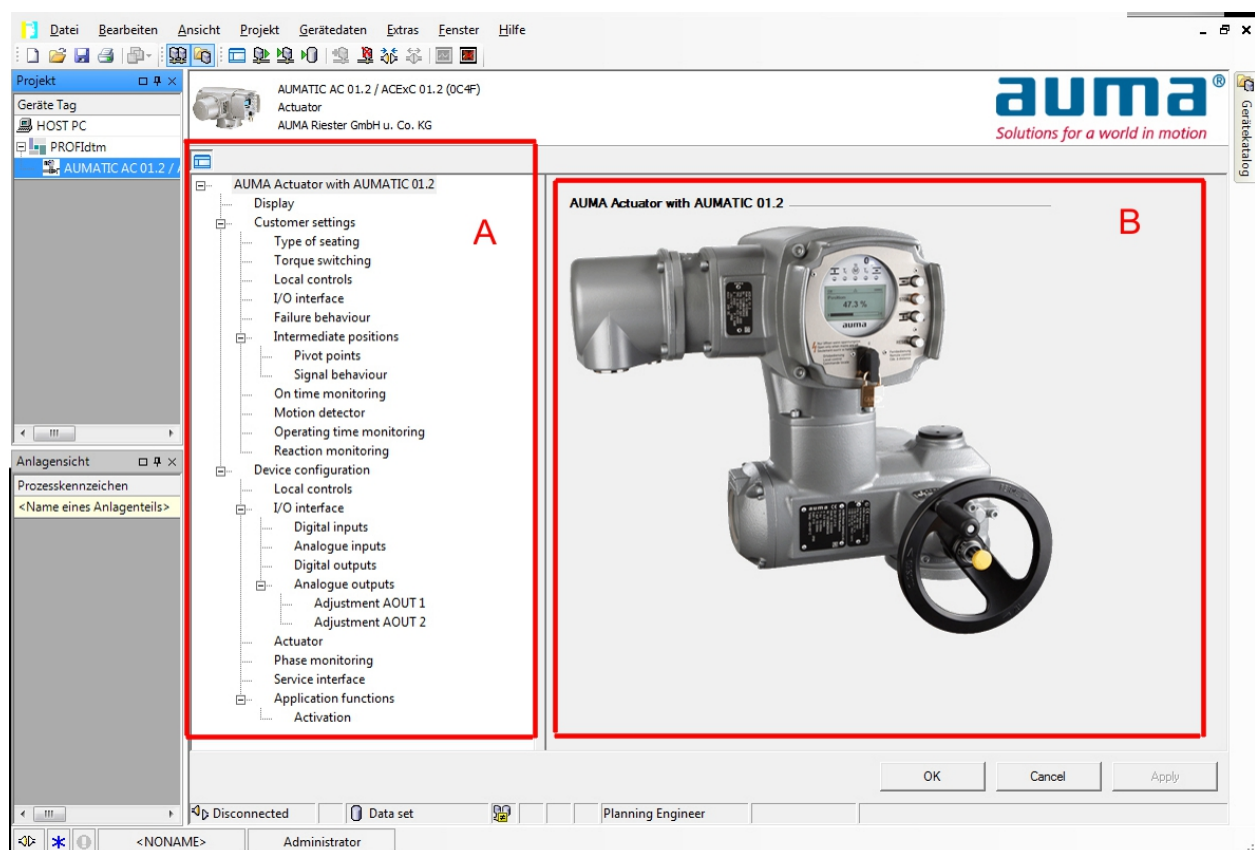
When using PACTware, double click the AUMATIC projected within the project tree to start the AUMATIC DTM.

Figure 7: Default setting



4.2 Main window

Figure 8: Main window



Area A Area A marks the tree view on AC2DTM. The tree structure is used to quickly switch between the various parameters.

Area B Area B marks the main view of parameters. Parameter values of parameters selected in area B are shown here.

4.3 Language of AUMATIC DTM: select

The AUMATIC DTM supports many languages, and can be selected independently of the FDT frame application language setting:

1. Select AC2DTM.
2. Click using right mouse button and select **Additional functions**.
3. Continue with: **Global settings > Language**.

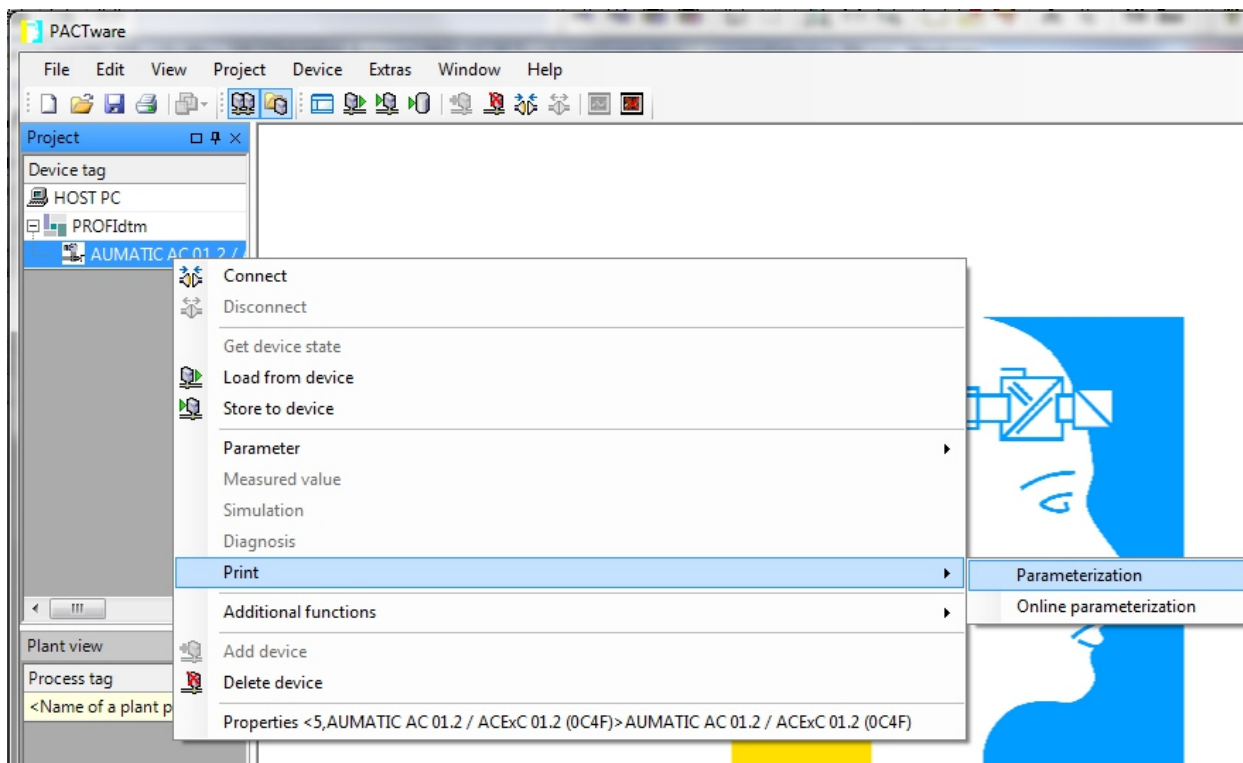
4.4 Device data: print

Parameter data of AC2DTM can be printed. The parameters from the data base or online parameterization can be selected for printing.

For example, data saved in the device memory may be printed to dispose of all parameter conditions in the event of failure for any subsequent troubleshooting required. The selection criteria can be:

1. Select AC2DTM.
2. Click using right mouse button and select **Print**.
 - Parameterization: Printing the saved offline parameters
 - Online parameterization: Printing the online parameters

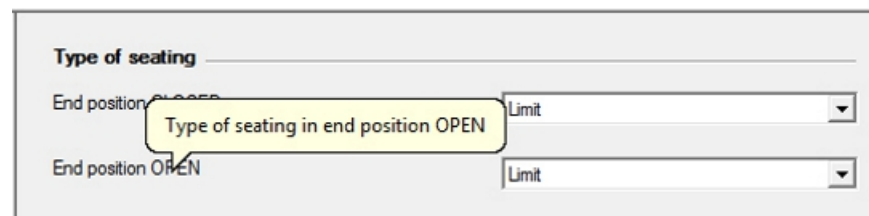
Figure 9: Print device data



When clicking the selection, a preview window opens containing further buttons for adapting the print layout.

4.5 Help for AUMATIC DTM

If the mouse points to a parameter, the pertaining tool tip is displayed for more detailed explanation.



Furthermore, the manuals available for the controls can be selected and displayed:

1. Select AC2DTM.
2. Click using right mouse button and select **Additional functions**.
3. Select Manual Device integration or Device manual.

5. Functions for data communication with AC2DTM

5.1 Communication to AUMATIC: connect/disconnect

Before loading data from or storing data to the AUMATIC, you have to establish a connection to the device.

→ Click the AUMATIC icon with the right mouse button and select **Connect** or **Disconnect**.

5.2 AUMATIC data: load from device/store to device

This function allows reading/writing of AUMATIC parameters into the AUMATIC DTM. It is possible to display and/or set parameters in the offline parameter display. They are stored in the frame application database.

→ Click the AUMATIC icon with the right mouse button and select **Load from device** or **Store to device**.

Information These functions are only available if the connection to the device is active.

Parameter values must be within the admissible minimum and maximum limits. A red exclamation mark appears when entering invalid values:

Figure 11: Example: invalid value



Delay time	00:03,0	s
Failure position	111	%

FDT user levels FDT frame applications distinguish amongst five different user levels to which different user rights can be assigned.

An **Observer** of AC2DTM can only read the information supplied by AUMATIC actuator controls.

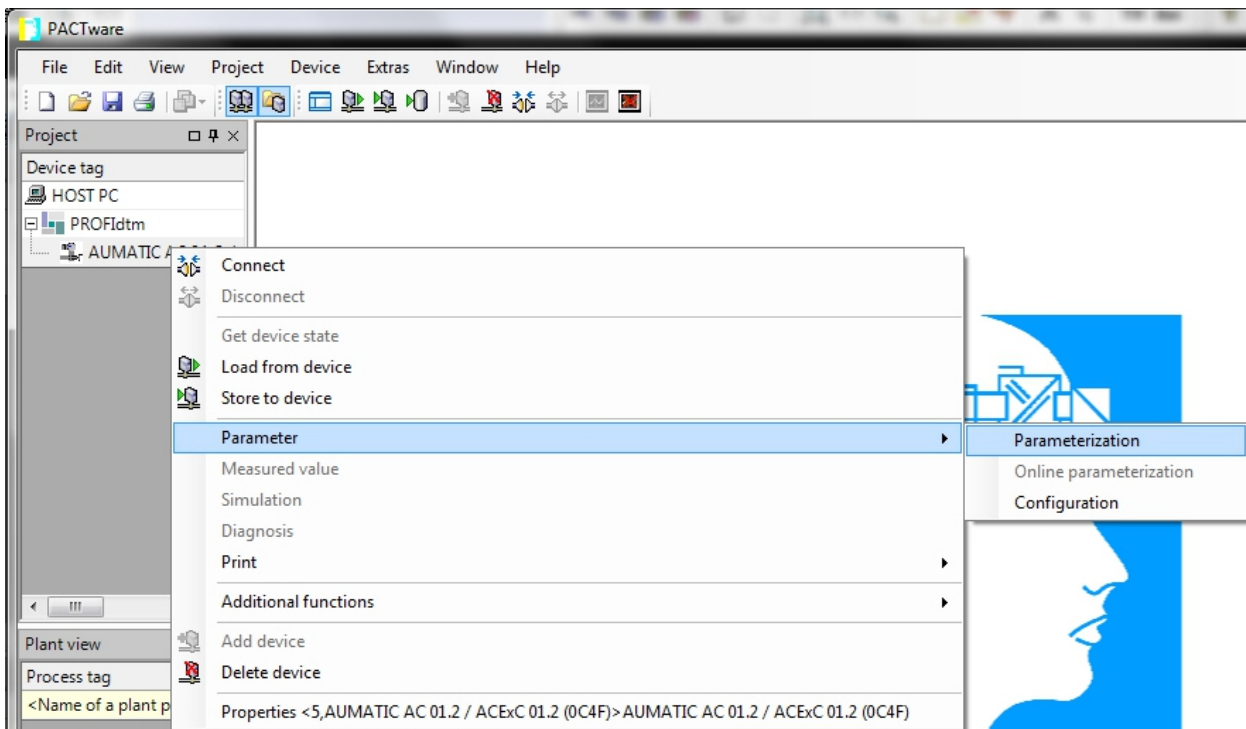
All other user levels can read and mostly write the information stored within the AUMATIC in compliance with the rights of the **Observer**.

5.3 Offline parameterization

In offline mode, parameter values can be modified without connection to the AUMATIC. Settings can be saved in the database of FDT frame application and transmitted to the AUMATIC in the event of active connection.

→ Click AUMATIC icon with right mouse key and select **Parameter > Parameterization**.

Figure 12: Offline parameterization



- Information**
- If no communication is available, the DTM can only be started in offline mode.
 - In offline parameterization, the parameters displayed in the DTM are not synchronised with those modified simultaneously online within the AUMATIC (e.g. via the display).

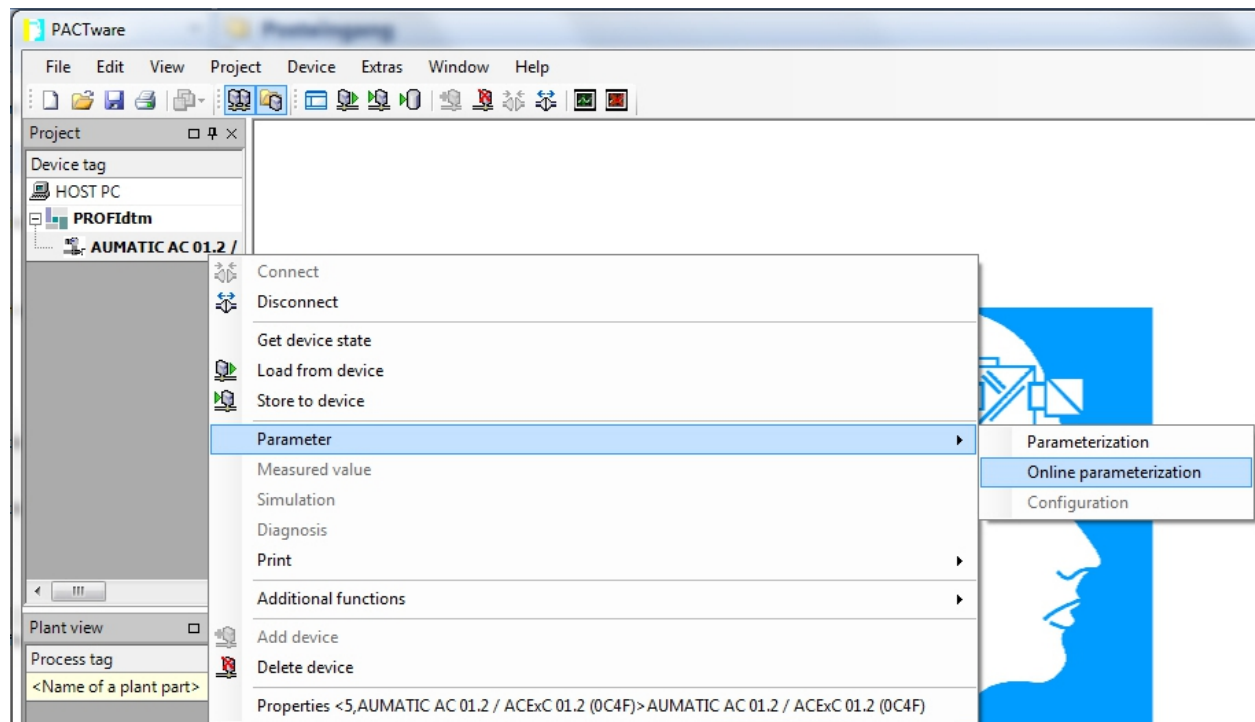
NOTICE**Parameter data record in the AUMATIC is overwritten!**

- First load data from the AUMATIC to then specifically modify individual parameters in AC2DTM. The complete parameter record should only be retransmitted to the AUMATIC after this procedure. This is the only way to ensure that the AC2DTM values match the values currently available in the AUMATIC.
- During storing of offline parameters, all parameters are transmitted to the AUMATIC. In case only individual AUMATIC parameters are to be modified, use online parameterization.

5.4 Online parameterization

- Information** This function is only available if connection to the device is active.

Figure 13: Online parameterization



Like for the offline parameterization, parameters can be written or modified. The difference is that the modified value is stored to the device immediately after entry confirmation. Thus, the displayed values correspond to the device values.

Static parameters are always read by the AUMATIC, at first start of online parameterization and whenever a screen window is opened (e.g. diagnostic windows).

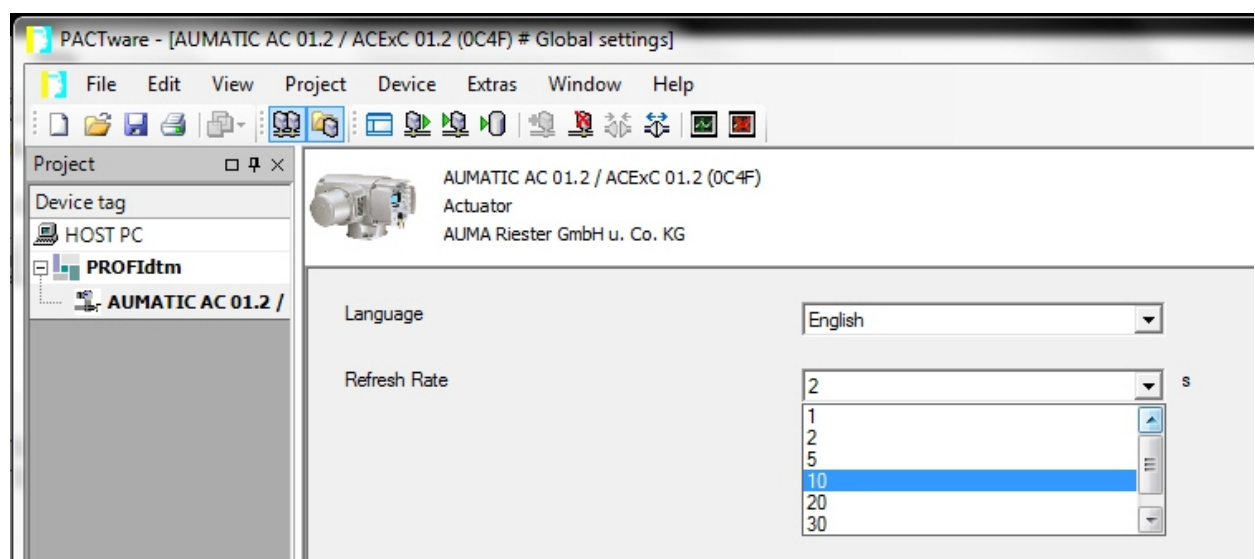
Dynamic data is additionally read at periodic intervals at an adjustable cycle time by the AUMATIC.

Dynamic data is marked with two green arrow icons.

The parameter refresh rate can be adjusted as desired:

1. Select AC2DTM.
2. Click the AUMATIC icon with the right mouse button and select **Additional functions > Global settings > Refresh Rate**.

Figure 14: Set refresh rate of dynamic parameters.

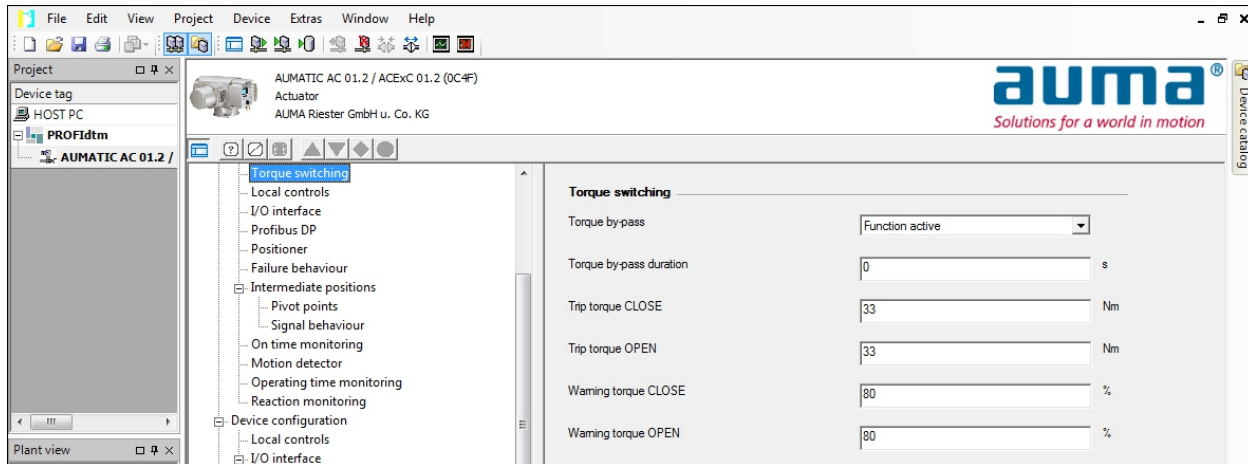


5.5 Special features of the programming

Parameters for setting intermediate positions

Setting of tripping torques in direction OPEN or direction CLOSE is only available in combination with Non-intrusive actuators (parameters Tripping torque OPEN or Tripping torque CLOSE).

Figure 15: Set tripping torques



6. Profibus DP-V0 communication channel

AC2DTM supports various configurations for cyclic data exchange via Profibus DP (e.g. in combination with ABB control systems). Depending on the configuration selected, the number of communication channels varies. You may select the following options:

input	Output	Consistent
4 Bytes	4 Bytes	consistent
8 Bytes	4 Bytes	consistent
12 Bytes	4 Bytes	consistent
16 Bytes	8 Bytes	consistent
20 Bytes	8 Bytes	consistent
6 Bytes	2 Bytes	consistent
32 Bytes	12 Bytes	consistent

Profibus DP-V0 communication channel can be set as follows:

1. Select AC2DTM.
 2. Click using right mouse button and select **Parameter** > **Configuration**.
- All configurations refer to process representation input default arrangement 1.

Figure 16: Configuration of Profibus DP-V0 communication channel

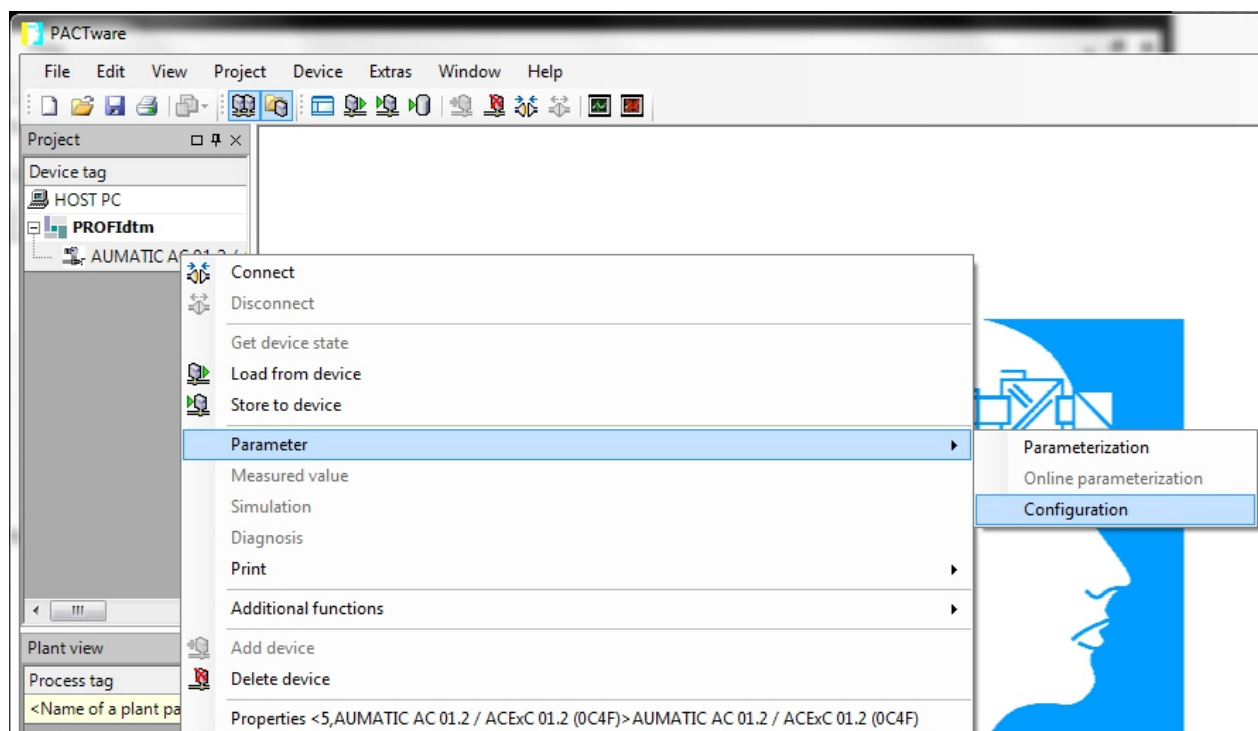
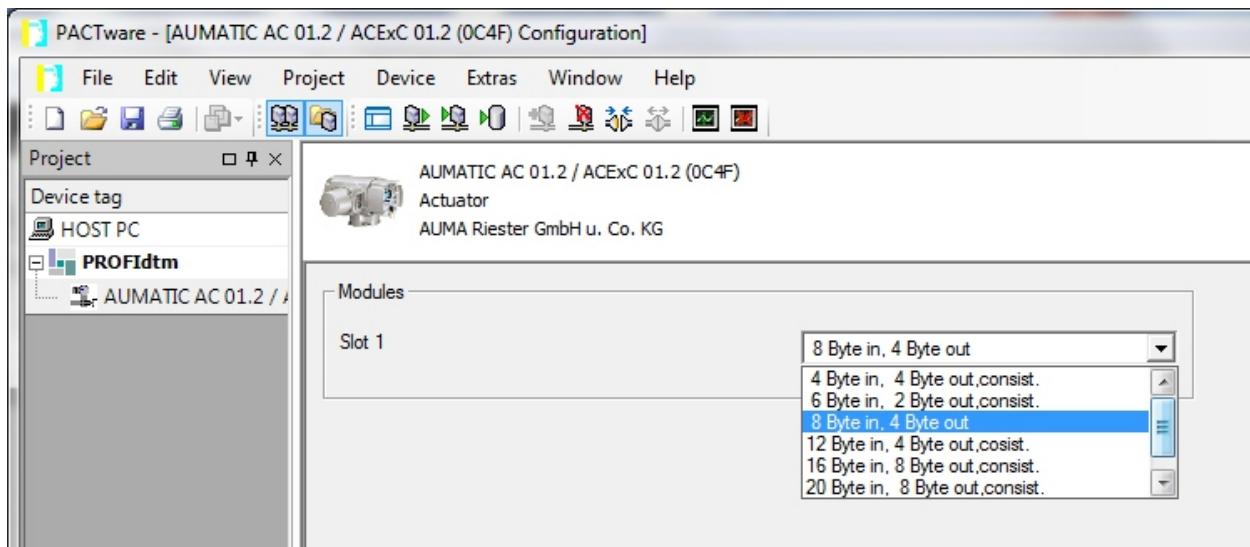


Figure 17: Communication channel



Process representation input (default process representation)

Grey bits are collective signals. They contain the results of a disjunction (OR operation) of other information.

Byte1: Logical signals

Fault	Warnings	Running CLOSE	Running OPEN	Not ready REMOTE	Setpoint reached	End p. CLOSED	End p. OPEN
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 2: Actuator signals

Torque sw. CLOSED	Torque sw. OPEN	Limit sw. CLOSED	Limit sw. OPEN	Selector sw. LOCAL	Sel. sw. REMOTE	Phase fault	Thermal fault
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 3: Actual position value (H)Byte 4: Actual position value (L)

Actual position High byte (positioner)

Actual position Low byte (positioner)
--

Byte 5: Device status

Device ok	Failure	Function check	Out of spec.	Maintenance requ.	Fault	Warnings	Not ready REMOTE
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 6: Operation status

Running LOCAL	Running REMOTE	Handwheel oper.	Actuator running	-	Start step mode	In intermed. position	Op. pause active
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 7: Intermediate positions

Interm. pos. 8	Interm. pos. 7	Interm. pos. 6	Interm. pos. 5	Interm. pos. 4	Interm. pos. 3	Interm. pos. 2	Interm. pos. 1
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 8: Discrete inputs

-	-	Input DIN 6	Input DIN 5	Input DIN 4	Input DIN 3	Input DIN 2	Input DIN 1
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 9: Input AIN 1 (H)

Input AIN 1

Byte 10: Input AIN 1 (L)

Input AIN 1

Byte 11: Torque (H)

Torque High byte

Byte 12: Torque (L)

Torque Low byte

Byte13: Not ready REMOTE 1

I/O interface	FailState fieldbus	EMCY behav. active	EMCY stop active	Local STOP	Interlock aktive	Sel. sw. not REMOTE	Wrong oper. cmd
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 14: Not ready REMOTE 2

Handwheel active	Service active	PVST active	Interlock by-pass	Disabled	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 15: Fault 1

No reaction	Internal fault	Torque fault CLOSE	Torque fault OPEN	Phase fault	Thermal fault	Mains quality	Configuration error
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 16: Fault 2

Incorrect phase seq	Config. error REMOTE	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 17: Warning 1

Wrn no reaction	--	Torque wrn OPEN	Torque wrn CLOSE	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 18: Warning 2

Config. warning	RTC not set	RTC button cell	--	24 V DC, external	Wrn motor temp.	Wrn gearbox temp.	Wrn controls temp.
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 19: Warning 3

Op. time warning	WrnOnTiRunning	WrnOnTiStarts	Internal warning	Wrn input AIN 1	Wrn input AIN 2	Wrn FOC	Wrn FO cable budget
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 20: Warning 4

PVST fault	PVST abort	Failure behav. active	Wrn FOC connection	--	WrnSetpointPos	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 21: Input AIN 2 (H)

Input AIN 2

Byte 22: Input AIN 2 (L)

Input AIN 2

Byte 23: Failure

Fault	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 24: Maintenance required

--	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 25: Out of specification 1

Warnings	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 26: Out of specification 2

--	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 27: Out of specification 3

--	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 28: Out of specification 4

--	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 29: Function check 1

--	--	PVST active	EMCY stop active	Handwheel active	Service active	Sel. sw. not REMOTE	Local STOP
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 30: Function check 2

--	--	--	--	--	--	--	--
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 31: Status fieldbus

Channel 2 activity	Channel 1 activity	Ch.2 FailState Fieldb.	Ch.1 FailState Fieldb.	Channel 2 DataEx	Channel 1 DataEx	Channel 2 active	Channel 1 active
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 32: Reserved 2

--	--	--	--	--	--	--	--
----	----	----	----	----	----	----	----

Byte 33: Reserve <div></div>	Byte 34: Reserve <div></div>	Byte 35: Reserve <div></div>	Byte 36: Reserve <div></div>
Byte 37: Reserve <div></div>	Byte 38: Reserve <div></div>	Byte 39: Reserve <div></div>	Byte 40: Reserve <div></div>

7. Appendix: Literature

- FDT Interface Specification; Specification for Profibus Device Description and Device Integration, Release 5/2001, Version: 1.2 Order No.2.162, www.profibus.com
- Field Device Tool FDT; Die universelle Feldgeräteintegration [the universal field device integration], Oldenbourg Verlag [publisher] ISBN 3-486-27044-3
- FDT Joint Interest Group www.fdt-group.org
- AUMA reference documents

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