Your Global Automation Partner



excom[®] I/O System Integration in Honeywell Experion via PROFIBUS-DP

Integration Manual



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Transferring HART[®] variables to the control system (HART[®] over PROFIBUS)

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1 About This Manual

These instructions describe the integration of the excom[®] system in the Honeywell Experion R500.1 control system via PROFIBUS-DP.

Read these instructions carefully before using the product. This will prevent the risk of personal injury and damage to property or equipment.

The possibilities are shown for the GSD-based integration, from the installation of the GSD right through to the handling of the I/O data and the associated diagnostics.

Other applications of the excom[®] system are described in addition to the general integration: Setting up redundancy

Changing parameters during operation

Changing configurations during operation

Keep these instructions safe during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

This manual is written for specially trained personnel, and must be read carefully by anyone who is charged with the commissioning, operation or maintenance of the device.

1.2 Explanation of symbols

The following symbols are used in these instructions:



DANGER

DANGER indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a possible hazardous situation with the risk of death or serious injury if it is not prevented.

NOTICE

NOTICE indicates a situation that may cause possible damage to property if it is not prevented.

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NOTE

NOTE indicates tips, recommendations and important information. The notes contain information, particular operating steps that facilitate work and possibly help to avoid additional work resulting from incorrect procedures.

MANDATORY ACTION

This symbol denotes actions that the user must carry out.

RESULT OF ACTION

This symbol denotes the relevant results of actions and procedures.

1.3 Other documents

Besides this document the following material can be found on the Internet at www.turck.com: Data sheets

Quick start guides

- excom[®] manuals
- Approvals

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to **techdoc@turck.com**.

- 2 Notes on the System
- 2.1 System identification

This manual applies to the Turck excom[®] system.

2.2 Manufacturer and service

Turck supports you in your projects – from the initial analysis right through to the commissioning of your application. The Turck product database offers you several software tools for programming, configuring or commissioning, as well as data sheets and CAD files in many export formats. You can access the Product Database directly via the following address: www.turck.de/products For further inquiries in Germany contact the Sales and Service Team on: Sales: +49 208 4952-380 Technical: +49 208 4952-390

For overseas inquiries contact your national Turck representative.

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3 For Your Safety

The product is designed according to state of the art technology. Residual hazards, however, still exist. Observe the following safety instructions and warnings in order to prevent danger to persons and property. Turck accepts no liability for damage caused by failure to observe these safety instructions.

3.1 Intended use

The excom[®] system is integrated in the Honeywell Experion R500.1 control system using GSD files.

These devices are designed solely for use in industrial areas.

The devices must only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Notes on Ex Protection

- The system must only be fitted, installed, operated and maintained by trained and qualified personnel. When using devices in Ex circuits, the user must also have additional knowledge of explosion protection (EN 60079-14 etc.).
- Only use devices in Ex areas when installed in the appropriate protective enclosure.
- Only use the system in compliance with the applicable national and international regulations, standards and laws.
- Observe national and international regulations for explosion protection.
- Only use the device within the permissible operating and ambient conditions (see technical data and Ex approval specifications).
- Observe the operating instructions of the installed equipment.
- Cables and terminals with intrinsically safe circuits must be indicated use light blue for color-coding. Separate cables and terminals from non-intrinsically safe circuits or isolate accordingly (EN 60079-14).
- Carry out a "Verification of intrinsic safety".
- Never connect equipment to intrinsically safe circuits if this equipment was previously used once in non-intrinsically safe circuits.

4 Integrating the excom[®] System in Honeywell Experion

The excom[®] system is integrated in the Honeywell Experion R500.1 control system using GSD files. The following describes all the steps required from the installation of the GSD files right through to the handling of I/O data and diagnostics.

- 4.1 Requirements
- 4.1.1 Requirements Software

This example uses the following software:

- Honeywell Experion R500.1
- Gateway 2.3.1.0 firmware file
- GSD file V1.6.4
- 4.1.2 Requirements Hardware

This example uses the following hardware:

Honeywell hardware

- CC-PCF901 control firewall
- CC-PCNT01 (C300) controller
- DP-2 CC-IP0101 PROFIBUS gateway

Turck hardware

- MT16-2G module rack
- PSD24Ex power supply unit (2 ×)
- GDP-IS gateway
- DI40Ex digital input module
- DO40Ex digital output module
- DM80Ex digital input/output module
- AIH40Ex analog input module
- AOH40Ex analog output module
- DO401Ex digital output module
- SC12Ex segment coupler (RS485-IS)

The excom[®] station in the following example has the following setup:



Fig. 1: excom[®] station (example)



4.2 Installing GSD files

The GSD file for excom[®] is available at www.turck.com.

➤ Download the GSD file from www.turck.com.

➤ Unpack the zip file.

The zip file required for the gateway firmware is shown in the document "GSD Version History – excom[®].pdf" from the zip archive. Newer firmware versions of the gateways are compatible with configurations that are based on older GSD files. The folders of the individual GSD files contain image files to graphically illustrate the excom[®] station in the configuration.

Save GSD file at C:\ProgramData\SYCONnet\PROFIBUS\GSD.



In some operating systems, the GSD folder is not automatically displayed. > Activate hidden elements.

➤ If a graphical display of the excom[®] station is required, also save the image files contained in the zip archive in the GSD folder.

Integrating a GSD file in Honeywell Experion

- ► Launch the Experion Configuration Studio.
- ➤ Open the PROFIBUS gateway module (PGM) via the "+" sign (here: PGM2_252).
- Double-click the required PB-Link (here: PBLINK_254) to open the configuration user interface.
- Select the PROFIBUS link (PBLINK) on which the excom[®] station is to be configured. The selection of the Profibus link depends on the ports of the PGM on which the PROFIBUS network is to be created. Each PGM is provided with 2 ports.
- Double-click to open the PROFIBUS link.
- > Open the Field Network Configuration tab.

📲 Control Builder - Project - Assignment		- 0 >	×
File Edit View Tools Chart Templates	; Field Devices Controller Add-Ins Window Help		
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Project - Assignment 🚺 🚺	SYSTEM:PBLINK Block, PBLINK_254 - Parameters [Project] ? X	Project - Containment	×
Enter Name to Search 🗸 🍑 🏢 🗙	Server Displays Control Confirmation Identification	Enter Name to Search 🗸 🚽 🎹	X
Boot	Main Field Network Configuration Field Network Status Slave Status DPV1 Statistics Server History	Rent Rent	
G300 261		3⊂ CM 211	
□			
PRLINK 253	▲ PROFIBUS DPV 0		
PBLINK_254	⊕- PROFIBUS DPV 1		
		🔁 CM_273	
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B DATASET	Show Parameter Names OK Cancel Help		
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Library		I I I I I I I I I I I I I I I I I I I	
For Help, press F1		PRIMARY C5-8-0-NRSERVER M	/INGR
Construction (19) (Construction)			

Fig. 2: Installing GSD – Selecting a PROFIBUS link

- ► Refresh the device catalog via the Reload Catalog button.
- The program searches the folder C:\ProgramData\SYCONnet\PROFIBUS\GSD and loads all GSD files present there into the device catalog.
- After the device catalog is refreshed, all available GSD files are shown in Experion in the following folder: Profibus DPV 0/1 → Master/Slave

	Server Displays	Control Confirm	ation	Identifi	cation		
Main	Field Network Configuration	Field Network Status	Slave Status	DPV1 Statistics	Server History		
i 🕞 🖬							
			^				
	netDevice						
	Cables						
	GSDDTM	I.DTMDev. 1					
	100 % c	omplete (DTM 2 of 2)					
	6 📃						
		Cancel					
		SYST	EM:PBLINK Block, Pl	BLINK 254 - Parameter	[Proiect]		?
				-			
			Server D Main Field	isplays Network Configuration	Field Network State	Confirmation	n Identification
			Main		TIER NELWORK SLEL	us	Slave Status DI VI Statistics Server Histo
			📽 🔚 📿 😭 🗉	Ŭ			
						^	
							E PROFIBUS DPV 1
			l —				Master
			Drofiburg C	atoway Droffburg Cato	umul (1) (#1)		CIF104P-DPS
			Prolibus G	ateway[Pronbus Gate	way]<1>(#1)		
			T				CIF80-DPS
							COM-C-DPS
							EC1-DEB-DPS
ow Param	neter Names						excom (1.6.4)
							PMC-DPS
						t	Fieldbus / Vendor \ DTM Class /
						Γ	DTM: GSD Slave
							Vendor: Hilscher GmbH
							Version: 2.0200.4.510 Date: 2012-11-27
							Device: excom (1.6.4)
						~	Info: [T164FF9F.GSD]

Fig. 3: Installing GSD – Selecting excom®



NOTE

An update of the GSD file for an existing slave is not possible in Experion and Sycon. net. If a different GSD file is required, the slave must be fully reconfigured.



Creating a PROFIBUS slave 4.3

- ➤ Open the PGM (see chapter 4.2).
- ➤ Double-click the PBLINK to open it.
- ► In the Field Network Configuration tab open the PROFIBUS DPV 0 or PROFIBUS DPV 1 → Slave folder.

Selecting the PROFIBUS versions (DPV 0 or DPV 1) has the following effects on the data exchange:

PROFIBUS DPV 0	PROFIBUS DPV 1
 Cyclic data exchange between master and slave Transfer of process values incl. HART variables Fast data exchange 	 All functions of PROFIBUS DPV 0 Acyclic data exchange (parameterization of field devices, reading of additional status messages of field devices etc.) possible Acyclic data exchange always after exchange of the cyclic data

> Drag the GSD file onto the graphically displayed PROFIBUS line.



Creating a PROFIBUS slave (example: PROFIBUS DPV 1) Fig. 4:

4.4 Configuring a slave

- > Start the configuration by double-clicking the excom[®] station shown in the graphic.
- Available and already configured excom[®] modules, as well as the required quantities of data are displayed in the configuration window.

No module has yet been configured in the example project. The Configured Modules area is empty.

Vendor: Hans 1	urck GmbH & Co. KG			De ^r Ver	vice ID: ndor ID:	0xFF -	9F		
Navigation Area 📃			м	odules					
Configuration	Available Modules:								
General	Module		Outputs	In/Out	1	Identifier		Slot Restri	ctions
ight Modules	Empty slot	0	0	0	0x00				
Signal Configuration	E GDP	0	0	0	0x01.0x02				
Parameters	GDP C	2	2	0	0xC1,0x40,	0x40,0x2D			
Groups	GDP YO	1	1	0	0xC1,0x00,	0x00,0x31			
Extensions	DM80	1	1	0	0xC1,0x00,	0x00,0x04			
DPV1	DM80 S	2	1	0	0xC1,0x00,	0x01,0x05			
DPV2	🗍 🔅 DM80 8I	1	0	0	0x41,0x00,	0x06			
Redundancy	DM80 S 8I	2	0	0	0x41,0x01,	0x07			
Paules Description						2		_	
Device Description	Configured Modules:						Insert	A	ppen
Device	Slot	Module	Innuts 10	Dutouts	In/Out	Iden	tifier	Slot Re	stricti
				4					
	Length of input/output data	a: 0 bytes (max	. 488 byte	s)				R	emov
	Length of input/output data Length of input data:	a: 0 bytes (max 0 bytes (max	. 488 byte . 244 byte	s) s)				R	emov
	Length of input/output data Length of input data: Length of output data:	a: 0 bytes (max 0 bytes (max 0 bytes (max 0 (max, 25)	. 488 byte . 244 byte . 244 byte	s) s) s)				R	emov
	Length of input/output data Length of input data: Length of output data: Number of modules:	a: 0 bytes (max 0 bytes (max 0 bytes (max 0 (max. 25)	. 488 byte . 244 byte . 244 byte	s) s) s)				R	emov

Fig. 5: Slave Configuration window



Adding excom® modules

- > Add excom[®] modules according to the arrangement of the module rack:
- > Select the excom[®] module in the Available Modules area.
- ► Click the Append button.
- > Select and add other excom[®] modules via Append and Insert as required.
- > When all used excom[®] modules are listed in the Configured Modules area click Apply.



NOTE

All unused slots must be configured with blank modules (empty slots). This does not apply to all slots after the last I/O module and redundant gateways that are not present.



Fig. 6: Configuring an excom[®] station as a slave

4.5 Configuring a network

Settings must be carried out on the PROFIBUS gateway module (PGM) in order to ensure trouble-free communication between the excom[®] system and the Honeywell control system.



A warning symbol indicates values that jeopardize stable bus communication.

- ► Open the PBLINK.
- ➤ Open the Field Network Configuration tab.
- ➤ Open the PGM shown in the graphic.

IO Device: Profibus	Gateway ell				Device ID: Vendor ID:	0x 	:0004			X
Navigation Area 📃				Bus Parameters	;					
Settings	Profile:	PROFIBUS D	p v							
netX Driver	Bus Parameters	s								
Device Assignment	Baud Rate:	1500 ~	kBit/s	Station Address:	1	-				
Configuration Bus Parameters	Slot Time:	300	tBit	Target Rotation Time:		20000	tBit			
Address Management	Min. Station Delay Time:	11	tBit		=	13.3333	ms			
Station Table Master Settings	Max. Station Delay Time:	150	tBit	GAP Actualization Factor	:	10				
Time Sync	Quiet Time:	0	tBit	Max. Retry Limit:		1				
	Setup Time:	1	tBit	Highest Station Address	(HSA):	126				
	Bus Monitoring									
	Data Control Time:	120	ms 🗌	Override slave specific Wa	atchdog Con	trol Time				
	Min. Slave Interval:	2000	μs	Watchdog Control Time:		20	ms			
	Calculated Timing									
	Tid1:	37	tBit							
	Tid2:	150	tBit							
	Expected min. bus cycle time:	1437	μs							
		4	۷۵ ac	alues marked with this symb djusted to changes in the to	ool should be opology.	Adju	ist			
					OK	Cancel		Apply	н	elp

Fig. 7: Configuring a network

- → Click Configuration → Bus Parameters.
- > Change the parameters manually or automatically via the Adjust button.
- → The software automatically sets the values required for the actual bus configuration.



Setting the bus cycle time

•		
Ш	J	

NOTE

If the bus cycle time is changed, it is not possible to carry out a hot configuration in run (HCIR), because it is a significant intervention in the communication between the master and slave.

Managing I/O signals via the Address Management

The Address Management manages all input and output signals from the slave to the PGM. The view enables you to switch between input signals and output signals.

The Address Management also displays the descriptions and data types of the modules used.

 Example (see figure below): Adjust the tags for subsequent processing according to the application.

avigation Area 📃			Address	s Manageme	nt		
Settings					Display Medeu		
🔄 Driver	Inputs	 Defragment 			Display Houe.	Decimal ~	CSV Expo
netX Driver	П	Station	Device/Module	Type	Tag	Leng	h Ad
Device Assignment	Dirig Lock	2 excom	1.6.4]	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	excom (1.6.4)	12	0
Configuration	8-1	GDP C <	Slot 1>		GDP C	2	0
Bus Parameters		(16 Bit) u	nsigned input	unsigned	Input_1	2	0
Address Management	. e	DI40. <s< td=""><td>ot 2></td><td></td><td>DI40.</td><td>1</td><td>2</td></s<>	ot 2>		DI40.	1	2
Station Table		(8 Bit) by	e input	byte	Input_2	1	2
Master Settings	_ ⊜,	DM80 8I	<slot 4=""></slot>		DM80 8I	1	3
Time Sync		(8 Bit) by	e input	byte	Input_3	1	3
	<u> </u>	AIH40 <	ilot 5>		AIH40	8	4
	-	(16 Bit) u	nsigned input	unsigned	Input_4	2	4
	-	(16 Bit) u	nsigned input	unsigned	Input_5	2	6
		(16 Bit) u	nsigned input	unsigned	Input_6	2	8
		(16 Bit) u	nsigned input	unsigned	Input_7	2	10
	< Group selected more	dules Ungroup	Add reserved area	a Lock	all slaves Unlo	ck all slaves	

Fig. 8: Configuration – Address Management window

NOTE

The Add reserved area button (see above) enables the memory to be reserved for later use in cyclic data traffic. Other modules can be added if required at the reserved locations. If HCIR is used, the modules can also be added without interruption during operation.

Managing slave addresses via the Station Table

The Station Table enables the addresses of all configured slaves of the PROFIBUS network to be displayed and changed.

> Enter the address in the Station column (example: 2).

IO Device: Profibus G Vendor: Honeywel	Sateway I			Device ID: Vendor ID:	0x0004 		>
Navigation Area 📃			Station Table				
 Settings Torver netX Driver Configuration Bus Parameters Address Management Station Table Master Settings Time Sync 	Activate Station	Zexcom (1.6.4)	excom (1.6.4)	Name	Hens Turck Gmb	Vendor H & Co., KG	
				ОК	Cancel App	oly H	Help

Fig. 9: Entering the slave address (example: 2)

Master settings – Setting the watchdog

The watchdog depends on the speed of the master. It is recommended that the watchdog is set at 1.5 MB to 1 s for internal redundancy switching.



4.6 Setting slave parameters

The slave parameterization makes it possible to set the gateway and the I/O modules according to the application. The used modules can be selected in the software via the Modules drop-down menu.

4.6.1 Setting slave-specific parameters

- ► Select the module.
- ➤ Adjust the parameters according to the application. The following table shows one example of a parameterization step:

Parameter	Selection	Meaning
Grid frequency	50 or 60 Hz	Activates a filter, that filters out transmissions of the grid frequency to the analog inputs The filter eliminates 50 Hz or 60 Hz overlays that are caused on the analog inputs by the grid frequency used.
Analog data format	LSB, MSB or no status	Specifies the location at which the status bit is mapped
Backplane	Type of module rack	Selection of the type of module rack (not absolutely necessary)
HCIR	Various parameters	Enables a configuration during operation (hot configuration in run), see chap- ter 4.10 and 4.11

IO Device: ex Vendor: Ha	com Ins Turck GmbH & Co. KG	Device ID: Vendor ID:	0xFF9F -							
Navigation Area 📃		Parameters								
Configuration	Module: <slot 1=""> GDP C</slot>	~	Display mode:	Hexadecimal						
General		1958) 1979								
Modules Signal Configuration	Parameters:									
Parameters	Name	Value								
Groups	arid frequency	50Hz								
Extensions	analog data format	status MSB	status MSB MT 18 (16 I/O modules)							
DPV1	backplane	MT 18 (16 I/O								
DPV2	redundancy mode	off	off							
Redundancy	power supply	single	single select 0							
Device Description	cyclic data	select 0								
Device	HCIR active	off								
GSD	HCIR WCBC factor	base x 1								
	HCIR WCBC base (x 100ms)	0x05	0x05							
	address offset	disable	disable							
	address offset value	0x00								
	CAN redundancy	on								
	SF2	select 0								
	SF3	select 0								
	-									
	- An									
		OK	Concol	Apply	Hole					

Fig. 10: Slave-specific parameters

4.6.2 Setting module-specific parameters

Module-specific parameter setting enables the settings of the I/O modules to be adjusted. The settable parameters of the I/O modules are described in the excom[®] manual.

Example: Setting the AIH40Ex analog input module

- ► Select Field Network Configuration.
- ► Open the menu of the excom[®] station.
- > In the Configuration window select the Parameters menu item.
- ➤ Select the AIH40Ex I/O module from the drop-down menu.
- Adjust the parameters for each channel according to the application. The following table shows one example of a parameterization step:

Parameter	Selection	Description
Short circuit detection	on off	– Short circuit monitoring
Open line detection	on off	– Wire-break monitoring
Failsafe mode	minimum, maximum or last valid value	 State in which the inputs or outputs are kept in the event of serious commu- nication faults (example: last valid process value)
HART status/range	off/020 mA off/420 mA on/420 mA	 Selection of the measuring range for analog modules Activate or deactivate HART[®] communication Select 420 mA as the measuring range to activate HART[®] communication.
Filter	off 0.1 s 2.6 s 29.2 s	– Example: 0.1 s



Vendor: H	ans Turck GmbH & Co. KG	Device ID: 0xFF9F Vendor ID: -				
Navigation Area		Parameters				
Configuration General Modules Signal Configuration	Module: <pre><slot 5=""> AIH40 1H</slot></pre> Parameters:	✓ Display mode:	Hexadecimal			
Parameters Groups Extensions	Name ch. 1: short circuit detection	Value on				
DPV1 DPV2 Redundancy	ch. 1: failsafe mode ch. 1: HART status / range ch. 1: filter (PT1)	last valid value off / 420mA 0.1s				
Device Description Device GSD	ch. 2: short circuit detection ch. 2: open line detection ch. 2: failsafe mode	off off min value				
ch. 2: HART status / range ch. 2: HART status / range ch. 2: filter (PT1) ch. 3: short circuit detection		off / 020mA 0.1s				
	ch. 3: open line detection ch. 3: failsafe mode ch. 3: HAPT status (rance	off min value off / 020mA				
	ch. 3: filter (PT1) ch. 4: short circuit detection	0. is off				
	ch. 4: open line detection ch. 4: failsafe mode ch. 4: HART status / range	off min value off / 020mA				
	ch. 4: filter (PT1)	0.1s	>			

Fig. 11: Setting module-specific parameters

- Activate the status bit in the configuration of the gateway in order to transfer the status messages of the I/O modules to the controller level.
- > Define the mapping of the status bit (SB) in the configuration of the gateway (MSB or LSB).

	Input word bit position (channel 14)															
Parameter	15	5 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0									0					
Status MSB	SB Bit position of the measured value (021000 corresponds to 021 mA)															
Status LSB	Status Bit position of the measured value (021000 corresponds to 021 mA) SB								SB							
Without status	-	Bit po	sition o	f the m	easurec	l value ((0210	00 corr	espond	ls to 0	.21 mA)				

- → The changes are indicated in Honeywell Experion with a yellow triangle next to the PBLINK.
- Transfer data to the controller: Right-click the PBLINK, select Load from the context menu and confirm.



Fig. 12: Transferring parameters to the controller



4.7 Configuring I/O data

- > Open the excom[®] station in the Field Network Configuration window.
- ► Open Signal Configuration.
- The names and data types of the excom[®] modules used can be set in the Signal Configuration menu. The entered name corresponds to the name of the PROFIBUS module in the Honeywell station.

Vendor: Ha	com Ins Turck GmbH	& Co. KG			Vendor ID:	UXFF9F	
Vavigation Area				Signal Co	nfiguration		
Configuration							
General		Slot	Туре	Name	Data Type	IO Type	Module Identifier
Modules	<u></u>	1	GDP C	GDP C			0xC1,0x40,0x40,
Signal Configuration	- <u>-</u>	2	DI40.	DI40.			0x41,0x00
Parameters				Input_2	Boolean 🔽	input	
Groups		3	DO40.	DO40.	Boolean		0x81,0x00
Extensions		4	DM80 8I	DM80 8I	Unsigned 16		0x41,0x00
DBV1	- 12	5	AIH40 1H	AIH40 1H	Unsigned32		Ux41,Ux45
DEVI	- <u></u>	6	AOH40	AOH40	Unsigned64		0x81,0x43
DPV2	- <u></u>	/	DO40.	DO40.	Integer8		0x81,0x00
Device GSD	4				Roat Float Float64 TimeOfDay (with I Date TimeOfDay (witho Time Difference (Time Difference (Network Time Network Time Diff	Date indication) out Date indication) with Date indication) without Date indication ference)
	Add Signal	Remove]	r	OK	Cascal	Default

Fig. 13: Configuring I/O data – Changing the name and data type of a module

A device support block (DSB) has to be created in order to use the process values in the control system. The DSB represents the excom[®] station in the Experion environment.



Only one DSB can be created for each excom[®] station.

Creating a DSB

- ► Choose File \rightarrow New \rightarrow Device \rightarrow DSB \rightarrow TURCK EXCOM.
- ➤ If required, enter the device name and PROFIBUS address of the excom[®] station.
- > Assign a DSB: Drag a DSB from Unassigned and drop it on the required PBLINK.



Fig. 14: Configuring I/O data – Creating a DSB



Linking data with Honeywell Experion – Creating a PDC

- ► Open IOM Configuration.
- > Open the PDC (process data collection) of the I/O module to be set.

The tags from the Address Management of the PGM must be identical to the settings from the Signal Configuration window of the excom[®] station. Turck recommends also keeping the Names identical to avoid address conflicts.

Either inputs or outputs can be read for each PDC. In the example project, two PDCs must be created for each of the following devices:

- Inputs and outputs are parameterized for one device (e.g. DM80...).
- The gateway is configured as a GDP-C gateway and has two input bytes for status messages and 2 output bytes for controlling the redundancy behavior.

The number of inputs and outputs must often be corrected if HART[®] modules were configured. Configuration Studio here selects the maximum number of channels automatically. > Set the number of channels in the Number of channels area.



Fig. 15: Configuring I/O data – Creating a PDC

Linking data with Honeywell Experion – Creating a PIOMB function block

A PROFIBUS I/O module block (PIOMB) is used as the interface between the individual PDCs and the controller.

- > Select PIOMB via the library and append on the controller by drag and drop.
- ► Add by confirming with Finish.
- If necessary change the name of the PIOMB: Click the appropriate line and assign the new name.

Project - Assignment					Project - Containme		
Enter Name to Search 🛛 🗸 🎫 🔰	×				Enter Name to Searc		
E- St Root					E Root		
G300_261					💿 🔁 exampl		
€ CEEC300_264					B exampl		
	Name New Function Block(s)			20 20			
	Tag) Names	Item Name	Item Names			
🗈 🗲 Unassign <mark>e</mark> d	Source	Destination PIOMP 211	Source	Destination	1		
		PIOMB_311		59			
발 Project 超 Monitoring							
Library - Containment							
	Change the name in the destination column to	o the new					
PD03IP	desired name or accept the default.			Hind/Replace			
📮 🧧 PGM_IF							
···· 🍁 PBAIC HANNEL					-		
			< Back Finish	Cancel Help			
					T ¹		
🐵 🍵 РВНІС МВ							
PIOMB							
	~						
fiff Library					∃∃ Proiect 1 1 1		
F' 1C Condition		1					

Fig. 16: Creating the PIOMB function block



- ➤ Open the PIOMB.
- > Open the PDC Name Reference menu item.
- ► Select the required PDC.
- > PDC number and description depend on the values entered in the IOM Configuration.

ΝΟΤΕ

In larger networks, Turck recommends assigning unique names for the PIOMBs in the Tag Name menu item.



Fig. 17: Editing PIOMBs

Linking data with Honeywell Experion – Adding a PROFIBUS channel

A PROFIBUS channel block must be created in order to process a signal.

- ► Create a control module via File \rightarrow New \rightarrow Control Module.
- ➤ Drag the control module from Unassigned to the required controller (example: CEEC300_264).
- > Select the required channel from the library.
- > Drag the channel onto the control module.



Fig. 18: Creating a PROFIBUS channel block (example: PBAICHANNEL – PROFIBUS analog input channel)



Linking data with Honeywell Experion – Configuring a PROFIBUS channel

To complete the configuration of a PROFIBUS channel, the channel must be assigned to a PIOMB.

- ➤ Double-click the required I/O module to select it (here: PIOMB_5_AI41).
- > The program automatically shows the appropriate PIOMBs for the selected module.
- ► Select the channel and the POIMB via Assign Channel Block.

Main Identification Dependencies Block Pins Channel Block Configuration	Configuration Parameters
Channel Block Configuration Channel Name PBAICHANNELA Execution Order in CM 10	
Channel Name PBAICHANNELA Execution Order in CM 10	
Channel Block to IO Module Assignment	
Module Name PIOMB_5_AI41 V Module Type Profibus I/O Module Block	~
Channel Number Channel	Name
	٨
Assisted to Madda DIOMD 5 AM1	A
Assign Channel Block	
Select an empty channel in the list box at right and press the "Assign Channel Block" button above.	
Unassign Channel Block	

Fig. 19: Assigning a PROFIBUS channel

Linking data with Honeywell Experion – Loading settings in the project

Modules with settings that have to be loaded in the project are indicated in the project tree. These are marked with two arrows or a yellow triangle.

➤ Right-click the marked components.

➤ Select the Load option from the context menu.

➤ Repeat these steps until there are no more marked components present in the project tree. or

➤ Select all marked components and load them at the same time.

Project - Assignment 💽 🗵
Enter Name to Search 🧹
■ Root ■ C300_261 ■ CEEC300_264 ■ I/O ■ I/O ■ PIOMB_311 IOLINK_262 IOLINK_263 ■ PGM2_252 ■ PBLINK_253 ■ PBLINK_254 ■ TURCK_EXCOM_295 ■ Z
_ ± Project ↓ ■ Monitoring

Fig. 20: Marked components in the project tree



Observing online data in the Monitoring view

The actual process data is displayed in the Monitoring view.

- ➤ Open the PIOMB in the Monitoring view.
- ➤ The actual process data of the selected PIOMB is displayed in the Runtime Data tab (example: Analog Channel Data).



Fig. 21: Example: Process data for AIH40, 1st channel actively supplied

Monitoring online data via the DSB

The actual process of a DSB is displayed in the Monitoring view.

- ► Call the IOM Configuration of the DSB in Monitoring mode.
- ➤ Select the PDC.
- → The process data is displayed in the lower area of the window (example: Floating point value).

Main Slave Status IOM Configuration Gateway Redundancy Device Alams Config Device Alams Status Number of Configurable PDC's 34 O 9 PDC Type PDC Description Net Tag Name Number of Channels Hold on failure 0 Gateway Status GW Status Input_1 1	s DPV1
Number of Configurable PDC's 34 O	
PDC Type PDC Description Net Tag Name Number of Channels Hold on failure 0 Gateway Status GW Status Input_1 1	
0 Gateway Satus (W) Status (put_1 1 1 Gateway Command Output_1 1 □ 2 Digtal put-0140Ex D140 input_2 4 □ 3 Digtal Output-0040Ex D040 Output_2 4 □ □ 4 Digtal put-0140Ex D040 Output_2 4 □ □ 5 Analoginut-0140Ex AIH40 input_3 8 □ □ 6 Analoginut-0140Ex AIH40 input_3 4 □ □ 7 Digtal jung-AiH40Ex AIH40 Input_3 4 □ □ 8 Analoginut-AiH40Ex AIH41 input_10 5 □ 3 9 NotConfigured 1 □ □ □ □ □	
1 Gateway Command OW Command Output_1 1 2 Digstandu-NdBE DH0 Hput_2 4 3 Digstandu-NdBE DH0 Output_2 4 4 Digstandu-NdBE DM80 Hput_3 8 5 Attagging	
2 Digital/out-D4045x D140 hput_2 4 3 Digital/out-D4045x D040 Output_2 4 4 Digital/output-D0405x D040 Output_2 4 5 Analogingut-AllH405x AllH40 hput_4 5 6 Analogingut-AllH405x AllH40 hput_4 5 7 Digital/output-A0H405x ADH40 Output_7 4 8 Analogingut-AllH415x AllH41 Input_4 5 9 NatOgingut-AllH415x AllH41 Input_10 5 9 NatOgingut-AllH415x AllH41 Input_10 5 10 NatOgingut-AllH415x Input_10 5 □	
3 DigitalCuput-0040Er D040 Output_2 4 □ 4 Digital_hout-0M80Er D040 Input_3 8 □ 5 AnsiogNuput-ANH40Er A0H40 Output_3 4 □ 6 AnalogNuput-ANH40Er A0H40 Output_3 4 □ 7 DigitalOutput-OH40Er A0H41 Input_10 5 □ 9 NetConfigured 1 □ 1 NetConfigured 1 □	
4 Dgtal_hput_0M80Ex DM80 hput_3 8 5 Analoghuput_AHH40ix IAH40 Iput_4 5 6 Analoghuput_AHH40ix IAH40 Iput_4 5 7 DigtalOutput_AHH40ix Output_3 4	
5 Aratophopx-AltH40 kpct_4 5 6 Aratophopx-AltH40k AOH40 Output_3 4 7 Digta0ctput-AOH40Ex AOH40 Output_7 4 8 Aratophput-AltH41Ex AltH41 kpct_10 5 9 NetConfigured 1 10 NetConfigured 1 1	
6 AnalogOutput-AOH40Ex AOH40 Output_3 4 7 DiptelOutput-O40Ex DO40 Output_7 4 8 AnalogPut-AHH41Ex AHH41 Input_10 5 9 NetConfigured 1 10 NetConfigured 1 > >	
7 DipaliOutput-004DEx DO40 Output_7 4 □ 8 Analoginput-AiH41Ex AiH41 Input_10 5 □ 9 9 NatConfigured 1 □ 1 □ 1 □ 10 NatConfigured 1 □ □ ↓ ↓ ↓ ↓	
8 Analoginput-AlH41Ex AlH41 input_10 5 □ □ 10 Input_00 5 □ 10 NetConfigured 1 □ □ 10 NetConfigured 1 □ □ 1 □ 10 NetCo	
9 NotConfigured 1 1	
10 NotConfigured	
	>
Channel Description Status Ch data boolean Numeric raw data Floating point value	alue
0 Channel 0 Good_NonCascade 13350 58.4375	
1 Channel 1 Good_NonCascade 0 -25	
2 Channel 2 Good_NonCascade 0 -25	
3 Channel 3 Good_NonCascade 0 -25	
4 HART Data - SV1 Good_NonCascade 2141192192 NaN	
4 HART Data - SV1 Good_NonCascade 2141192192 NaN	

Fig. 22: Example: Process data of a DSB



4.8 Showing and using PROFIBUS diagnostics

In order to use the PROFIBUS diagnostics, a connection must be established between the host PC and the excom[®] station.

- ➤ Open Field Network Configuration.
- ► Right-click the excom[®] station.
- ➤ Select the Connect option in the context menu.
- ► Open the excom[®] station.
- ► Click Diagnosis.

Example: The red dot in front of Extended diagnosis indicates that extended diagnostics are present (e.g. channel fault).



Fig. 23: Standard PROFIBUS diagnostics (listed according to significance)

Example: Using extended diagnostics

The extended diagnostics provides detailed information on the status of the excom[®] system. The diagnostic message transmitted from the excom[®] module is shown in the top line in hexadecimal format. The diagnostics are shown in the other lines broken down in channel-specific faults.

The following example shows the display of the extended diagnostics:

Diagnostic - excom (1.6.4)[exco	m (1.6.4)]<3>							
IO Device: excon Vendor: Hans	n Turck GmbH & Co. KG			Device ID: Vendor ID:	0xFF9F -			Fi
Navigation Area			Extended Diag	nosis				
🔄 Diagnosis		1950 80 500						
Diagnosis	Number	Diagnostics Message						
🚔 Extended Diagnosis	RAW	0x09, 0x82, 0x00, 0x0	0, 0x00, 0x00, 0x00, 0x00, 0x00,	, 0x44, 0x10, 0x00, 0x	00, 0x84, 0xC1	0x26, 0x	84, 0xC2	, 0x2
Process Image Monitor	1	Device related: excom	status diagnosis.					
	2	Device related: module	/ status.					
	3	Device related: .						
	4	Device related: Red. G	DP valid / na					
	5	Device related: valid	slot 1.					
	6	Device related: valid	slot 2.					
	7	Device related: valid	slot 3.					
	8	Device related: valid	slot 4.					
	9	Device related: valid	slot 5.					
	10	Device related: valid	slot 6.					
	11	Device related: valid	slot 7.					
	12	Device related: valid	slot 8.					
	13	Device related: valid	slot 9.					
	14	Device related: valid	slot 10.					
	15	Device related: valid	slot 11.					
	16	Device related: valid	slot 12.					
	17	Device related: valid	slot 13.					
	18	Device related: valid	slot 14.					
	19	Device related: valid	slot 15.					
	20	Device related: valid	slot 16					
	21	Device related: valid	slot 17					
	22	Device related: valid	slot 18					
	22	Device related: valid	dot 19					
	24	Identifier related: Bute	Position 4 (Module DMR0)					
	25	Channel related, Dyte	Position 4 line break (Channel 1 1	Disastian innut/output	Tune hit)			
	25	Channel related: Byte I	Position 4 line break (Channel 1, I	Direction input/output,	Type bit).			
	20	Channel related: byte	osiuuri 4 iirie break (Charinei 2, i	Direction input/output,	Type bity.			
	<							
				Update Cy	slic	~	St	ор
								-
				OK (Cancel	Apply	He	elp

Fig. 24: Extended diagnostics



Using PROFIBUS diagnostics

The diagnostics functions of the PROFIBUS gateway module are provided for a general Profibus diagnostics.

- ➤ Open Field Network Configuration.
- ➤ Right-click the PROFIBUS gateway module.
- ➤ Select the Connect option in the context menu.
- ➤ Open the PROFIBUS gateway module.
- → The following diagnostics can be called:
 - General Diagnosis: General overview via the PROFIBUS network
 - Master Diagnosis: Overview over all slaves (number of the configured and active slaves, number of the slaves with diagnostics)
 - Bus Diagnosis: Overview of the communication via PROFIBUS
 - Station Diagnosis: Overview of all PROFIBUS stations (not configured, error-free, with diagnostics, not found, with errors)
 - Firmware Diagnosis: Honeywell-internal diagnostic display



Fig. 25: PROFIBUS diagnostics

4.9 Setting redundancy

The Honeywell Experion control system supports line redundancy. This line redundancy can be implemented with one or two masters (e.g. for hot standby).

The GDP-... gateway provides in the GDP-C configuration one input word and output word each, by which status messages can be transmitted. The status messages can be used for example to switch to the second gateway if redundancy is active.

Only one gateway is always active in redundant operation. The redundant gateway is in standby mode. The redundant gateway sends status messages on request by the master. If both gateways are restarted (e.g. after a power failure), the gateway located on the left on the module rack always starts up first.

Line redundancy can be implemented with one or two segment couplers (e.g. SC12Ex). When only one segment coupler is deployed, the entire communication is aborted if the segment coupler fails.

4.9.1 Redundancy with one master – Creating a topology

When redundancy is implemented with one master (PGM), the bus line is split shortly after the master and connected to the one or two segment couplers. The bus lines are fed from the segment coupler to the gateway terminals on the module racks.



Fig. 26: Redundant setup with one master and one segment coupler (example)





Fig. 27: Redundant setup with one master and 2 segment couplers (example)

4.9.2 Redundancy with two masters – Creating a topology

With redundancy featuring 2 masters (PGM), the active master communicates with the excom[®] station. The second master and the redundant gateway of the excom[®] station is in standby mode. The redundant line takes over the communication as soon as there is a fault in the data exchange between master 1 and gateway 1. For this a redundancy link module (RLM) must be switched after the two masters. This controls the data traffic inside the network.



Fig. 28: Redundant setup with 2 masters and 2 segment couplers (example)



4.9.3 Configuring and parameterizing redundancy

The gateway parameter setting enables the redundancy to be activated and configured independently of the topologies illustrated in Ch. 4.9.1 and Ch. 4.9.2.

- ► Open the excom[®] station.
- > Select in the Parameters window the gateway from the drop-down list.
- > Set the "redundancy mode" parameter to "line redundancy".
- > Set the "address offset" parameter to "enable".
- > Set the "address offset value" to a value $\neq 0$.

A virtual PROFIBUS address must be set for the redundant gateway. The virtual PROFIBUS address consists of the PROFIBUS DP address of the excom[®] station set on the module rack + the set "address offset" value.

- > Activate virtual addressing via the "address offset" gateway parameter.
- Set via the "address offset value" parameter the value that is added to the set hardware address.



Each virtual PROFIBUS address and each real PROFIBUS address must only occur once in a network.

The PROFIBUS master sends regular polling messages via the FDL telegram. The passive gateway responds to the FDL telegram and sends a receipt confirmation to the master. By receiving the FDL telegram, the gateway cyclically checks the communication readiness of the master.



NOTE

NOTE

If the excom[®] system is set up in a topology for line redundancy and the "redundancy mode" parameter is deactivated, the excom[®] system operates despite this via the line redundancy. However, the communication between master and passive gateway is not checked. If the redundant gateway or the network connection is faulty, no diagnosis is supplied to the master.

11 C					
E Control Builder - Project - Assignment					- 4 ~
File Edit View Tools Chart Templates	🕨 脖 Configuration - excom (1.6.4)[excom (1.6.4)]<2>		– 🗆 🗙	
▕▆₽₽₽ ↔ ₽ x ₽œ ₽					
Project - Assignment	IO Device: ex	com na Turck Cable & Ca. KC	Device ID: 0xFF9F		Assignment 🔷 🗵
Entry Mana to Carach	Vendor. na	ins function a co. Ko	Vendor 1D.	FUI	
Enter Name to Search					ame to Search V
	Navigation Area		Parameters		, Root
💮 🕊 C300_261	Configuration	Module: <slot 1=""> CDP C</slot>	Display mode:	Hevaderimal	C300_261
□ PGM2_252	General	Calot 12 GDP C	 Display mode. 	Hexadecinai *	- PGM2_252
PBLINK_253	Modules	Deservations			🗲 Unassigned
PBLINK_254	Signal Configuration	Parameters:	Locas		
	Parameters	Name	Value		
🐨 🛫 Unassigned	Groups	grid frequency	50Hz		
	Extensions	analog data format	status MSB		
	DPV2	badiplane	MT18 (16 I/O modules)		
	Redundancy	redundancy mode	line redundancy		
	Device Description	cyclic data	select 0		
	Device	HCIR active	on		
	GSD	HCIR WCBC factor	base x 16		
		HCIR WCBC base (x 100ms)	0x05		
		address offset	enable		
		address offset value	0x01		
_≝ Project 1 1 Monitoring		CAN redundancy	on		
		SF2	select 0		
Library - Containment		55	select 0		
ONEWIRELESS					
🐵 🚽 PBUSIF					
E PCDI					
PGM_IF					
Description PBAICHANNEL					
PBAOCHANNEL					
	1				
PBDOCHANNEL			OK Cancel	Apply Help	
	-		Calicer	, when	
	Disconnected 🚺 Data Set	1			-
	2				
11 Library				33	Project 🛛 🗯 Monitoring

Fig. 29: Configuring and parameterizing redundancy



NOTE

To distinguish between the virtual and physical PROFIBUS addresses, Turck recommends providing all active stations with odd addresses and setting an "address offset" of 1. This represents physical PROFIBUS addresses with odd numbers and virtual PRO-FIBUS addresses with even numbers.



4.9.4 Redundancy handling

Calculating the virtual PROFIBUS address of the excom® station (example)

- A virtual PROFIBUS address is required for operation with line redundancy.
- The excom station has PROFIBUS address 3. 0x01 was selected as "address offset" (=1_{dec}). The virtual PROFIBUS address is 4 (3+1). Virtual address 4 must not be used by any other device in the same network.

Graphically displaying the PROFIBUS address

The PROFIBUS address can be graphically displayed via the diagnostics functions.

- Establish a connection between PROFIBUS master and excom[®] station via the Field Network Configuration.
- ► Right-click the PROFIBUS master.
- ▶ Select Additional Functions \rightarrow LifeList in the context menu.
- → All visible stations of the PROFIBUS network are displayed in the following window.



Fig. 30: Overview of the PROFIBUS stations in the LifeList

Setting the Highest Station Address

The Highest Station Address (HSA) defines the highest possible address of the station (e.g. an excom[®] station) that can be polled by the master. The highest possible address is by default 126.

If the virtual address of the excom[®] station is higher than the HSA, no FDL communication to the master can be established and no virtual address can be accessed. The excom[®] Profibus diagnostics show "Red. GDP no DP comm".

- ➤ Open the configuration of the PROFIBUS master.
- ► Select Bus Parameters.
- Select an HSA so that no slave has a higher address than the HSA.

avigation Area 📃				Bus Paramete	rs			
Settings 🔄 Driver	Profile:	PROFIBUS D	p v	Í.				
netX Driver	Bus Parameters							
Device Assignment	Baud Rate:	1500 ~	kBit/s	Station Address:	1			
Configuration	Slot Time:	300	tBit	Target Rotation Time:	15582	Bit		
Address Management	Min. Station Delay Time:	11	tBit		= 10.3880	ns		
Station Table Master Settings	Max. Station Delay Time:	150	tBit	GAP Actualization Factor:	10			
Time Sync	Quiet Time:	0	tBit	Max. Retry Limit:	1			
0.000749900 - 0.004	Setup Time:	1	tBit	Highest Station Address (HSA)	: 126			
	Bus Monitoring							
	Data Control Time:	120	ms 🔽	Override slave specific Watchd	og Control Time			
	Min. Slave Interval:	2000	μs	Watchdog Control Time:	20	ns		
	Calculated Timing							
	Tid1:	37 1	Bit					
	Tid2:	150	Bit					
	Expected min. bus cycle tim	e: 2484	μs					
			A v:	alues marked with this symbol sho	uld be			
				djusted to changes in the topolog	iy. Adju	t		

Fig. 31: Highest station address (example)



Replacing a gateway



NOTE

In order to replace the gateway in redundancy operation, the firmware version and hardware version of both gateways must be identical.

If the active gateway has to be replaced, it is possible to switch to the redundant gateway via the controller.

- ► Call DSB in Monitoring mode.
- ► Choose the Gateway Redundancy tab.
- ► Click the Switch over Gateway button.
- When the indication of the PRIO LED switches to the redundant gateway, the required gateway can be replaced.



Fig. 32: Switch over Gateway button



Fig. 33: LED behavior of the gateway before switchover (left) and after switchover (right)

4.10 Changing the configuration and/or parameters during operation (HCIR)

Hot configuration in run (HCIR) enables parameters and configurations to be changed during operation without having to interrupt the ongoing application. HCIR makes it possible to change wire break or failsafe strategies during operation and add new modules.

Setting HCIR

- ► Open the excom[®] module.
- > Set the "HCIR active" parameter to "on".
- ➤ Set the "HCIR WCBC base" and "HCIR WCBC factor" parameters as follows in order to obtain an HCIR timer of 1 s:

Parameters	Setting
HCIR WCBC base (× 100 ms)	0x0A (10 _{dec})
HCIR WCBC factor	base × 1

IO Device: e: Vendor: H	xcom ans Turck GmbH & Co. KG	Device ID: Vendor ID:	0xFF9F -		
Navigation Area 🔲		Parameters			
Configuration General	Module: <slot 1=""> GDP C</slot>	~	Display mode:	Hexadecimal	
Modules Signal Configuration	Parameters:				
Parameters Groups	Name grid frequency	Value 50Hz			
DPV1	analog data format backplane	status MSB MT 18 (16 I/O m	nodules)		
Redundancy	redundancy mode power supply	line redundancy redundant	1		
Device Description	cyclic data HCIR active	select 0 off			
GSD	HCIR WCBC factor HCIR WCBC base (x 100ms)	base x 1 0x05			
	address offset value	enable 0x01			
	SF2	select 0			
	553	select 0			
		OK	Cancel	Apply	Heln

Fig. 34: Setting HCIR



Setting the PROFIBUS master – Watchdog setting

The watchdog time defines the time in which the slave expects to be polled again by the master. If the polling signal does not reach the excom[®] station, the excom[®] modules switch to the defined failsafe mode.

- ➤ Open the configuration of the PROFIBUS master.
- ► Open Master Settings.
- ► Enter the Watchdog time.



Fig. 35: Setting the watchdog



Turck recommends setting the HCiR timer to 500 ms and the factor to basex16. The Watchdog time depends on the speed of the master. A Watchdog time of 1 s for 1.5 MB is recommended for internal redundancy switching.

Expanding memory for excom® modules

The memory can be expanded for the modules to be added in order to change the configuration of the excom[®] stations or add additional modules. 128 bytes are reserved by default.

- ➤ Open the Address Management of the PROFIBUS master.
- ► Click the Add reserved area button.
- ► Click the Lock button.
- → The reserve memory for other excom[®] modules is created.
- ➤ Repeat the procedure for all inputs and outputs required.

IO Device: Profibus Vendor: Honeyw	Gateway ell				Device ID: 0x0004 Vendor ID:)
Vavigation Area 📃			Addre	ss Manage	ment		
Settings	Inputs	∨ Defi	fragment		Display Mode: Decimal	~	CSV Expor
netX Driver	ПП	Station	. Device/Module	Type	Tag	Length	Addres
Device Assignment	E Lock	2	excom (1.6.4)		excom (1.6.4)	28	0
Configuration	. ÷		GDP C <slot 1=""></slot>		Slot1	2	0
Bus Parameters	L E		DI40. <slot 2=""></slot>		Slot2	1	2
Address Management	E E		DM80 8I <slot 4=""></slot>		Slot4	1	3
Station Table			AIH40 1H <slot 5=""></slot>		Slot5	12	4
Master Settings	L ±		AIH41 IH <slot 8=""></slot>		Slot8	12	16
Time Sync							
Time Sync	< Group selected mo	odules	Ungroup Add reserved a	rea	ock all slaves Unlock all slaves		

Fig. 36: Expanding the memory for excom[®] modules



Adjusting the bus cycle time

- ➤ Open the configuration of the PROFIBUS master (PGM).
- ► Adjust the bus cycle time.
- ➤ Click the Adjust button to accept the bus cycle time calculated by the system.
- ➤ Optional: Double the bus cycle time to calculate the buffer time for the safe completion of the HCIR.

IO Device: Profibus Vendor: Honeyw	Gateway ell				Device ID: Vendor ID:	0x0004 			>
Navigation Area 📃				Bus Parameters					
Settings 🔄 Driver	Profile:	PROFIBUS D	• v						
netX Driver	Bus Parameters								
Device Assignment	Baud Rate:	1500 ~	kBit/s	Station Address:	1	_			
Configuration Bus Parameters	Slot Time:	300	tBit	Target Rotation Time:	15582 tBit				
Address Management	Min. Station Delay Time:	11	tBit	-	10.3880 ms				
Station Table Master Settings	Max. Station Delay Time:	150	tBit	GAP Actualization Factor:	10				
Time Sync	Quiet Time:	0	tBit	Max. Retry Limit:	1				
	Setup Time:	1	tBit	Highest Station Address (HSA):	126				
	Bus Monitoring								
	Data Control Time:	120	ms 🗌	Override slave specific Watchdog C	ontrol Time				
	Min. Slave Interval:	2000	μs	Watchdog Control Time:	20 ms				
	Calculated Timing								
	Tid1:	37 1	Bit						
	Tid2:	150 1	Bit						
	Expected min. bus cycle time	: 2484	JS			_			
		4	۷۵ ac	alues marked with this symbol should djusted to changes in the topology.	be Adjust				
					ОК	Cancel	Apply	н	elp

Fig. 37: Adjusting the bus cycle time

4.11 Transferring HART[®] variables to the control system (HART[®] over PROFIBUS)

HART[®] variables can also be used to read process data from HART[®]-capable field devices. PROFIBUS makes it possible to transfer the following HART[®] secondary variables to the control system:

- Measured values (digitized)
- Device temperature
- Percentage value
- Contamination of the sensor
- etc.

The HART® secondary variables are mapped cyclically to PROFIBUS as floating-point values.

HART[®]-capable I/O modules (e.g. AIH40...) and HART[®]-capable field devices enable a maximum of 8 HART[®] variables per module to be transferred to the control system (max. 4 per channel). The data is exchanged with the cyclic process data.

Adding HART® variables

- > Open the excom[®] station in the Field Network Configuration.
- ► Click Modules.
- > Select and add the required input module (e.g. AIH40-4H).

-	N
ш,	l Tł

OTE ne AIH40 input module can be selected with 1, 4 or 8 HART[®] secondary variables. The

HART[®] variables can be divided up in the parameter setting between the individual channels.

The HART[®] secondary values are supplied to the control system as floating point values. A 2 word memory is required for each variable.

The 4H configuration in the AIH40 input module has the following data volume:

- Analog data: 4 × 1 word = 4 words
- HART[®] variables: 4 × 2 words = 8 words
- Total data volume: 12 words

IO Device: ex Vendor: Ha	com Ins Turck	GmbH & Co. KG				De	evice ID endor ID	:):	0xFF9i -	F		Fi
Navigation Area 📃					м	odule	s					
Configuration	Availal	ble Modules:										
General		l N	Iodula	Innute	Outroute	l h/0	• 1	k	lantifiar		Slot Restrict	ionel
i Modules	-	A141	loquie	o	Outputs	0	0.41	0.42.0.2			SIDE RESUICE	UTIS
Signal Configuration	-17	A141 A143		0	0	0	0x41	0x43,0x2	7			
Parameters	- 12	A040		0	8	0	0x81	0x43.0x2	7			
Groups	N D	AIH40		8	0	0	0x41	0x43.0x0	B			
Extensions	10	AIH40 1H		12	0	0	0x41	0x45.0x0	С			
DPV1				6 Word			0x41	0x45,0x0	С			
DPV2] ¢	AIH40 4H		24	0	0	0x41	0x4B.0x0	D			
Redundancy				12 Word	ł.		0x41	.0x4B.0x0	D			
Device Description	_ P	AIH40 8H		40	0	0	0x41	,0x53,0x0	E			
Device	一里	AIH41		8	0	0	0x41	,0x43,0x1	3			
GSD	_ P	AIH41 1H		12	0	0	0x41	.0x45.0x1	4			
050	- 분	AIH41 4H		24	0	0	0x41	.0x4B.0x1	5			
	10	AIH418H		40	0	0	UX41	UX53,UX I	ь _			
	Confic	ured Modules:							L	Insert	App	end
		Slot	Module	1	nputs C	Outputs	In/Out		Identif	ier	Slot Rest	riction
	▶ 🖻 🕴	1 AIH40 8H		40	0		0	0x41.0	<53,0x0E			
	÷.	2 GDP C		2	2		0	0xC1,0	x40,0x40,	0x2D		
	- E	3 DM80		1	1		0	0xC1,0	x00,0x00,	0x04		
	- E	4 DO40.		0	1		0	0x81,0	<00,0x08			
	_ ±	5 DM80		1	1		0	0xC1,0	x00,0x00,	0x04		

Fig. 38: Adding HART® variables





All HART[®] secondary variables activated in the parameter setting take up one space in the mapped input data, even if no HART[®]-capable device is connected at the corresponding channel.

Example: An AIH40 analog input module has the configuration 4H. If all HART[®] variables are set at the channels 1 and 2, only the first four HART[®] variables from channel 1 are nevertheless mapped.

Setting I/O modules for HART® variables

- ► Open the excom[®] station.
- ➤ Select the required module (e.g. AIH40 4H).
- ➤ Select channels for HART[®] communication via the parameters SV1 to SV4 for each channel.
- ➡ Example (see below): 4 HART[®] secondary variables from channel 4 are polled cyclically and then mapped to the cyclic data exchange.

IO Device: ex Vendor: Ha	com ans Turck GmbH & Co. KG	Device ID: Vendor ID:	0xFF9F -		R
Navigation Area 📃		Parameters			
Configuration General Modules	Module: <slot 3=""> AIH40 4H</slot>	~	Display mode:	Hexadecimal	~
 ⇒ Parameters Groups Extensions DPV1 DPV2 Redundancy Solvice Description Device GSD 	Name ch. 2: SV1 ch. 2: SV2 ch. 2: SV3 ch. 2: SV4 ch. 3: short drouid detection ch. 3: singt detection ch. 3: singt ender ch. 3: SV1 ch. 3: SV2 ch. 3: SV3 ch. 3: SV3 ch. 4: short drouid detection ch. 4: short drouid detection ch. 4: syst ch. 4: filter (PT1) ch. 4: sV1 ch. 4: sV2 ch. 4: sV2 ch. 4: SV3 ch. 4: SV3 ch. 4: SV4	Value off off off off off min value 0.1s off off off off off off off on on on min value 0.1s off off on on on on on on on on			^

Fig. 39: Setting HART[®] communication for AIH40-4H with level sensor on channel 4

Example: Observing HART® communication

The values transferred via the HART[®] communication can be viewed in Monitoring mode.

The following figure shows the measured values for a sensor that is connected to channel 3 of an AIH40Ex analog input module.

Channel description	Meaning
HART data – CH3 SV1	Digitized measured value (%)
HART data – CH3 SV2	Internal temperature of field device (°C)
HART data – CH3 SV3	Measuring accuracy
HART data – CH3 SV4	Measured value (m)

Slave Status I of Configurable PDC's PDC Type	OM Configuration (Gateway Redundancy	Device Alarms Config	Device Alarms Status	DPV1
of Configurable PDC's	34				
PDC Type					
	PDC Description	Net Tag Name	Number of Channels	Hold on failure	
lotConfigured			1		
ateway Command	GW Command	Output 10	1		-
Digital Output-DM80Fx	DM80 Out 1	Output 20	8		-
nalogInput-AIH40Ex	AIH40	Input 30	8		
)igitalOutput-DO40Ex	DO40	Output 30	4		
Digital Output-DM80Ex	DM80 2	Output 40	8		
lotConfigured			1		
lotConfigured			1	Γ	
lotConfigured			1		
lotConfigured			1		
lotConfigured			1		
				3	>
Channel Description	Status	Ch data boolean	Numeric raw data	Floating point valu	ie
Channel 1	Good_NonCascade		0	-25	
Channel D	Good NonCasanda		0		
Jnannel Z	GUUU_INUTICascaue		U	-25	
Channel 3	Good_NonCascade		0	-25	_
Channel 3 Channel 4	Good_NonCascade Good_NonCascade Good_NonCascade		0 17947	-25 -25 87.16875	
Channel 2 Channel 3 Channel 4 HART Data - CH3 SV1	Good_NonCascade Good_NonCascade Good_NonCascade Good_NonCascade		0 17947 1118716035	-25 -25 87.16875 87.126	
Channel 2 Channel 3 Channel 4 HART Data - CH3 SV1 HART Data - CH3 SV2	Good_NonCascade Good_NonCascade Good_NonCascade Good_NonCascade Good_NonCascade		0 17947 1118716035 1104133182	-25 -25 87.16875 87.126 25.96692	
Channel 2 Channel 3 Channel 4 HART Data - CH3 SV1 HART Data - CH3 SV2 HART Data - CH3 SV3	Good_NonCascade Good_NonCascade Good_NonCascade Good_NonCascade Good_NonCascade Good_NonCascade		0 17947 1118716035 1104133182 1097859072	-25 -25 87.16875 87.126 25.96692 15	
	ateway Command igital_Output-DM80Ex nalogInput-AIH40Ex igitalOutput-D040Ex igital_Output-DM80Ex lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured lotConfigured	ateway Command GW Command igital_Output-DM80Ex DM80 Out1 nalogInput-AIH40Ex AIH40 igital_Output-DO40Ex DO40 igital_Output-DM80Ex DM80 2 lotConfigured	ideway Command GW Command Output_10 igital_Output-DM80Ex DM80 Out1 Output_20 nalogInput-AIH40Ex AIH40 Input_30 igital_Output-DO40Ex DO40 Output_30 igital_Output-DM80Ex DM80 2 Output_40 lotConfigured Input_40 lotConfigured Input_40	igital_Output-DM80Ex DM80 Out 1 Output_20 8 nalogInput-AIH40Ex AIH40 Input_30 8 igital_Output-DM80Ex DO40 Output_30 4 igital_Output-DM80Ex DM80 2 Output_30 4 igital_Output-DM80Ex DM80 2 Output_30 4 igital_Output-DM80Ex DM80 2 Output_40 8 lotConfigured 1 1 1 lotConfigured 1 1 1 lotConfigured 1 1 1 channel Description Status Ch data boolean Numeric raw data Channel 1 Good_NonCascade 0 0 0	Jateway Command GW Command Output_10 1 I igital_Output-DM80Ex DM80 Out 1 Output_20 8 Image: Second Se

Fig. 40: Observing HART® communication





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