MFC 300 **Supplementary instructions**

Signal converter for mass flowmeters

Description of PROFIBUS interface

PROFIBUS PA:
PROFIBUS device with MBP Physical Interface and PA Profile 3.0 (V3.0.3 / 100811)
PROFIBUS DP:
PROFIBUS device with RS485 Physical Interface and PA Profile 3.0 (V3.0.3 / 100811)

KROHNE

1.1 Scope of the document

These instructions are supplementary to the signal converter Handbook. For all other data, use the relevant chapters of the Handbook. If you do not have this document, please contact the nearest office or download them from the manufacturer's internet site.

> *INFORMATION!*
> *The information in this chapter only contains the data applicable to PROFIBUS communication. The technical data in the Handbook shall be valid in its current version, provided that it is not rendered invalid or replaced by this supplement.*

1.2 Scope of delivery

The information in this chapter only contains the data applicable to PROFIBUS communication. The technical data in the Handbook shall be valid in its current version, provided that it is not rendered invalid or replaced by this supplement.

A device for PROFIBUS communication is supplied with:

- Supplementary instructions for PROFIBUS communication
- PROFIBUS device data files (GSD) which can be also downloaded from the manufacturer's internet site

1.3 Special notes

Don't switch off (power off) the signal converter immediately after manual change of parameter values:

- Please wait approx. 10 seconds before you switch off the signal converter after you have done both a parameter download via PROFIBUS or a manual change of a parameter value via the local display.

> *CAUTION!*
> *Please wait approx. 15 seconds before you switch off the signal converter after you have carried out a "Factory Reset" (PROFIBUS "Coldstart") via PROFIBUS or local display.*

"Deactivation of the Service Parameter Lock" of the signal converter via PROFIBUS:

- After writing down the service password (via PROFIBUS) the "Deactivation of the Service Parameter Lock" will last at least 20 minutes if the internal password timer of the signal converter won't be retriggered by writing this password again. The "Deactivation of the Service Parameter Lock" will be terminated at once by a PROFIBUS Coldstart / Warmstart or if the internal password timer of the signal converter elapsed.

2.1 Software history

Issued	Signal converter		Application program		System integration		
Mth./ year	Hardware	Firmware	Hardware	Software	Driver	Version	Model name
11/06	Signal converter with RS485 interface + PA Profile 3.0	V2.2.1 / 061117	Simatic PCS7 other SPS of other manufact.	HW Config other Software of other SPS manufact.	GSD manuf. specific	KR014510.GSD	MFC300 (RS485) Rev.1
					GSD profile specific	PA039742.GSD	Flow, dens, temp with 3AI, 1TOT (PhyL 0)
			Laptop / PC	PDM (≥ 6.0 SP3)	DD (Ident.-No.)	M3P*DD0300.03**	-
				Pactware	DTM ≥	GFP*DTM1.3.1 FDT1.2	-
01/11	Signal converter with RS485 interface + PA Profile 3.0	V3.0.3 / 100811	Simatic PCS7 other SPS of other manufact.	HW Config other Software of other SPS manufact.	GSD manuf. specific	KR014510.GSD	MFC300 (RS485) Rev.1
					GSD profile specific	PA039742.GSD	Flow, dens, temp with 3AI, 1TOT (PhyL 0)
			Laptop / PC	PDM (≥ 6.0 SP3)	DD (Ident.-No.)	M3P*DD0300.03**	-
				Pactware	DTM ≥	GFP*DTM1.3.1 FDT1.2	-

GFP*: Generic Flow PROFIBUS
M3P*: MFC300 PROFIBUS
**: PDM 6.0

2.2 System configuration of PROFIBUS DP network

The following diagram shows a typical network configuration with PROFIBUS devices with RS485 interface in a non-hazardous environment. The PROFIBUS devices with RS485 interface do not need any segment coupler. They are connected directly to the PROFIBUS DP network.
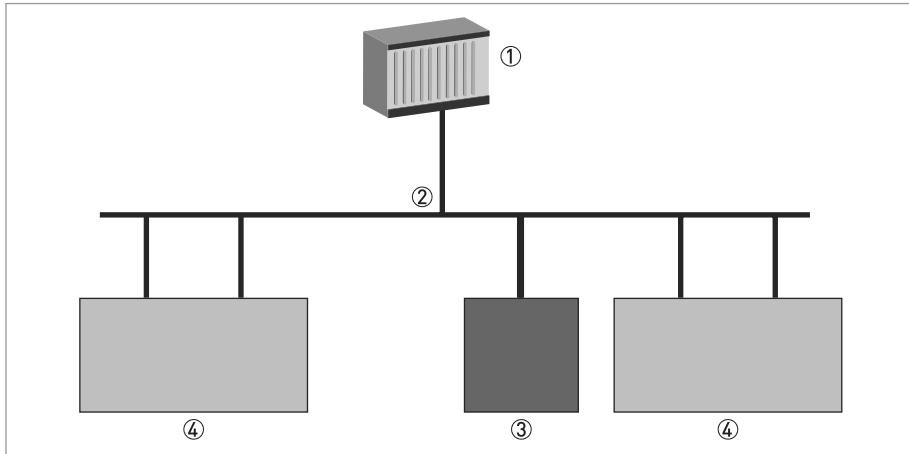
Figure 2-1: PROFIBUS DP network

① SPS
② PROFIBUS DP network with max. 12 Mbit/s
③ Signal converter
④ Other devices with PROFIBUS RS485 interface

2.3 Electrical connection for DP signal converter

INFORMATION!
For a detailed description of the electrical connections please refer to the standard signal converter handbook.

Signal converter terminals	B	B-	C	C-	D	D-
PROFIBUS designation	T	+B	-A	-T	+B	-A
	①	②	③	④	⑤	⑥

①   Termination positive

②   TxD+/RxD+ second connection

③   TxD-/RxD- second connection

④   Termination negative

⑤   TxD+/RxD+ first connection

⑥   TxD-/RxD- first connection

External connection with spur
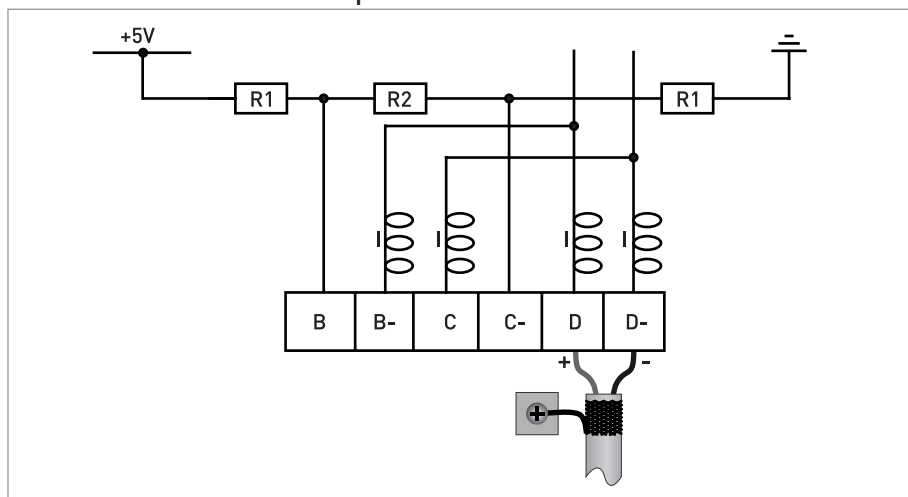
CAUTION!
Spurs are not allowed at high data rates!

I = 110 nH
R1 = 390 Ω
R2 = 220 Ω

External connection at last device with active internal bus termination
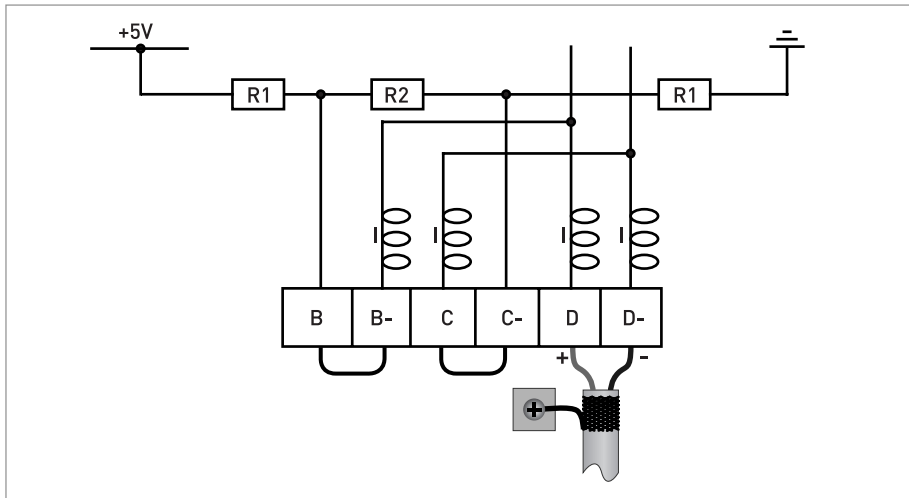
I = 110 nH
R1 = 390 Ω
R2 = 220 Ω

External connection to a trunk
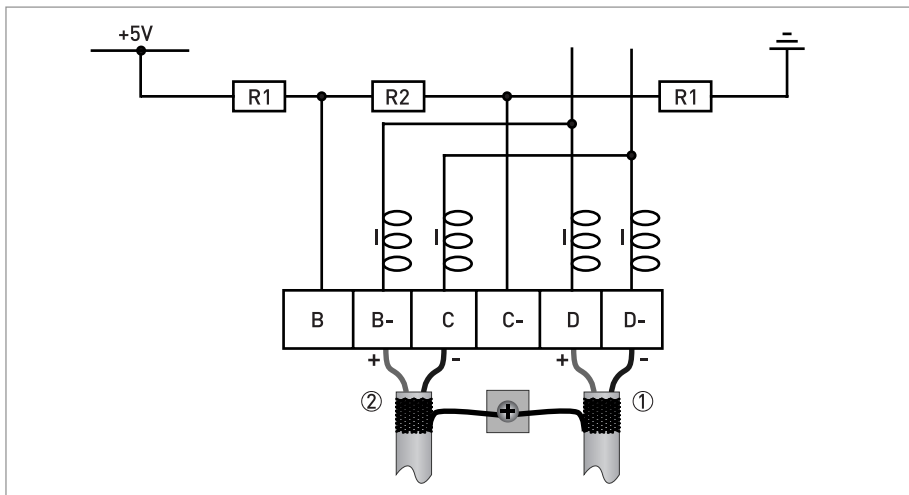
① e.g. incoming data lines
② e.g. outgoing data lines

I = 110 nH
R1 = 390 Ω
R2 = 220 Ω

2.4 Technical data

Hardware

Type	PROFIBUS RS485 interface according to IEC 61158-2
Connection	Dependent of polarity; please note at electrical connection!

Software

GSD	GSD file on CD-ROM or from internet site
Device profile	PA Profile compact class B, V 3.0
Address range	0…126 (default 126)
	0…125 via PROFIBUS service set_slave_add
	0…126 via local display
	126 via factory_reset = 2712
Local control	Local display and operator interface at device
SAPs	2 x MS1 SAPs — acyclic interface to PLC
	3 x MS2 SAPs — the number of MS2 Service Access Points is typically equal to the maximum number of master class 2 tools
Function blocks	1 x TB = Transducer Block: contains the parameters and functions defined in PA Profile 3.0
	1 x PB = Physical Block: contains the parameters defined in PA Profile 3.0
	8 x AI = Analog Input Blocks: contains the parameters defined in PA Profile 3.0
	3 x TOT = Totalizer Function Blocks: contains the parameters defined in PA Profile 3.0

2.5 GSD files for the data transfer

A PROFIBUS GSD ZIP file (e.g. GSD-31777815.zip; including both all GSD files and additional data files) you can get on a CD ROM or can be downloaded from the internet. The GSD file contains information that will be needed for project planning of the PROFIBUS communication network.

The relevant data files (e.g. _ _ _ _ .bmp / _ _ _ _ .dib) must be loaded into the bus configuration system/master system before start-up of the bus system.

2.5.1 Cyclic data exchange

During network configuration the user has to define which function block outputs of the signal converter should be transferred cyclically to the master. Network configuration will be done using one of the GSD files described before. The order of transmission of a function block always remains the same even if a function block is defined as an "Empty" block **(if so, no function block output data will be sent to the master and all function block outputs following the empty block will move up one position)**.

2.5.2 Baud rate

Supported baud rates are listed in the GSD file. After power-on or PROFIBUS timeout a baud rate search is active to detect the current transfer speed on the bus. It is not necessary to set the baud rate manually.

If the data transmission rate is changed during operation the baud rate search will not be started by the device. A new power-up or a manual interruption of the PROFIBUS communication is required to activate the baud rate search in this case.

2.5.3 Ident.-No. supported

The signal converter with PROFIBUS RS485 interface is based on PROFIBUS PA Profile V 3.0. The device supports two Ident-No.:

- Ident-No. "4510hex" belongs to the GSD file KR014510.GSD and includes the complete functionality of the Coriolis mass flowmeter.
- The application of the manufacturer independent Ident-No. "9742hex" (GSD file "PA039742.GSD") provides interchangeability of devices, i.e. an exchange of Coriolis mass flowmeters of different vendors.

Please follow the instructions in the manual of the host supplier when installing the GSD File you need and the additional files (_ _ _ _ .bmp and _ _ _ _ .dib) into the PLC.

INFORMATION!
If separated by the bus configuration system the device entry of the PROFIBUS RS485 interface with PA Profile 3.0 will be located within the slave family PROFIBUS PA.

2.5.4 Manufacturer specific GSD files: KR014510.GSD

The manufacturer delivers the GSD files with the entire device functionality, which is listed as follows:

Block number	Default configuration Function block output: value and status	KR014510.GSD Ident-No. 4510	Default unit
1	Mass Flow	AI-FB	kg/s
2	Density	AI-FB	kg/m^3
3	Medium Temperature	AI-FB	K
4	Mass Totaliser	Totaliser-FB	kg
5	Volume Totaliser	Totaliser-FB	m^3
6	Mass Totaliser	Totaliser-FB	kg
7	Volume Flow	AI-FB	m^3/h
8	Concentration 1	AI-FB	%
9	Concentration 2	AI-FB	%
10	Concentration Mass Flow 1	AI-FB	kg/s
11	Concentration Mass Flow 2	AI-FB	kg/s

- AI: Analog Input Function Block
- FB: Function Block

There are separate settings to select the units for local display and PROFIBUS. Modifications of the units of the display will have no effect on the data transferred via PROFIBUS.
A master class 2 tool is required to modify the units for PROFIBUS transfer.

INFORMATION!
During network configuration the user has to define which function block outputs of the signal converter should be transferred cyclically to the master. This is performed by a bus configuration tool (e.g. "HW- Config" for PC-S7 from Siemens). This tool offers specific functions as follows:
1. It is possible to configure an "Empty" block (the code of an "Empty" block is defined as 0x00) on each block number. This implies: no data are transmitted in the cyclic data telegram for this block.
2. There is NO "Totaliser (TOT)" function block allowed on block position 1, 2, 3, 7, 8, 9, 10 and 11! On these positions, only an "Analog Input (AI)" function block or an "Empty" block is allowed! (Note: All codes supported by "Analog Input (AI)" - and "Totaliser (TOT)" – function blocks will be found in the corresponding GSD files.)
3. There is NO "Analog Input (AI)" function block allowed on block position 4, 5 and 6! On these positions, only a "Totaliser (TOT)" function block or an "Empty" block is allowed!
4. There is a choice of 7 different totaliser functions, which can be allocated to the blocks 4, 5 and/or 6.

Definition of totaliser functions

Total	cyclic transfer of the totaliser value with status to the master
SetTot + Total	cyclic transfer of the totaliser value with status to the master + cyclic control data from master to the device via the parameter SetTot
ModeTot + Total	cyclic transfer of the totaliser value with status to the master + cyclic control data from master to the device via the parameter ModeTot
SetTot + ModeTot + Total	cyclic transfer of the totaliser value with status to the master + cyclic control data from master to the device via the parameters SetTot and ModeTot (in the given order)
SetTot	cyclic control data from master to the device via the parameter SetTot
ModeTot	cyclic control data from master to the device via the parameter ModeTot
SetTot + ModeTot	cyclic control data from master to the device via the parameters SetTot and ModeTot (in the given order)

Both, the Byte SetTot and ModeTot are cyclically sent from the master to the device if these bytes are inserted as output data via the PLC configurator. The meaning of these control bytes are as follows:

Function of control bytes

SetTot	
SetTot = 0	Totaliser is totalising.
SetTot = 1	Totaliser will be reset to 0 and stays at 0 until SetTot is switched back again to 0. If the value of SetTot changes from "1" to "0" the totaliser starts counting from 0.
SetTot = 2	Totaliser is set to the value defined by PresetTot. PresetTot can be written via an acyclic master (totaliser in block 4 = Slot 4 Index 32; totaliser in block 5 = Slot 5 Index 32; totaliser in block 6 = Slot 6 Index 32). If the value of SetTot changes from "2" to "0" the totaliser starts counting from the current value defined by PresetTot.
SetTot > 2	Not allowed. Value is ignored; totaliser remains in its last valid setting.
ModeTot	
ModeTot = 0	Totaliser totalises positive and negative values.
ModeTot = 1	Totalises only positive values.
ModeTot = 2	Totalises only negative values.
ModeTot = 3	Totaliser is stopped, no totalisation will be done.
ModeTot = 248	Totalises all values as positive, negative values will be multiplied with -1.0.
ModeTot = 249	Totalises all values as negative, positive values will be multiplied with -1.0.

All other values of ModeTot not allowed. Value is ignored; totaliser remains in its last valid setting.

The standard block configuration may be changed by the customer but using the default settings is highly recommended. If the standard block configuration should be changed by the customer an acyclic master tool or the device display menu must be used to change the "channel parameter" value of the block which should be connected to another transducer output value.

2.5.5 Profile specific GSD file: PA039742.GSD

The functionality of the profile specific GSD file is limited. This GSD file includes only four blocks:

Block number	Standard configuration Function block output value	PA039742.GSD Ident-No. 9742	Default unit
1	Mass Flow	AI-FB	kg/s
2	Density	AI-FB	kg/m^3
3	Medium Temperature	AI-FB	K
4	Mass Totaliser	Totaliser-FB	kg

The device has to be switched from full functionality (manufacturer specific) to interchangeable basic configuration (profile specific) by using both a master class 2 tool or the device display menu (IDENT_NUMBER_SELECTOR: Slot 0, Index 40; change byte value to 0). In the next step, the device has to be configured using the PA039742.GSD file.

3.1 Software history

Issued	Signal converter		Application program		System integration		
Mth./ year	Hardware	Firmware	Hardware	Software	Driver	Version	Model name
11/06	Signal converter with MBP interface + PA Profile 3.0	V2.2.1 / 061117	Simatic PCS7 other SPS of other manufact.	HW Config other Software of other SPS manufact.	GSD manuf. specific for stand. DP/PA segment coupler	KR014511.GSD	MFC300 (MBP) Rev.1
					GSD manuf. specific for SK2/SK3 segment coupler of P&F	YP14511.GSD	YP0 MFC300 (MBP) Rev.1
					GSD profile specific	PA139742.GSD	Flow, dens, temp with 3AI, 1TOT (PhyL 1)
			Laptop / PC	PDM (≥ 6.0 SP3)	DD (Ident.-No.)	M3P*DD0300.03**	-
				Pactware	DTM ≥	GFP*DTM1.3.1 FDT1.2	-
01/11	Signal converter with MBP interface + PA Profile 3.0	V3.0.3 / 100811	Simatic PCS7 other SPS of other manufact.	HW Config other Software of other SPS manufact.	GSD manuf. specific for stand. DP/PA segment coupler	KR014511.GSD	MFC300 (MBP) Rev.1
					GSD manuf. specific for SK2/SK3 segment coupler of P&F	YP14511.GSD	YP0 MFC300 (MBP) Rev.1
					GSD profile specific	PA139742.GSD	Flow, dens, temp with 3AI, 1TOT (PhyL 1)
			Laptop / PC	PDM (≥ 6.0 SP3)	DD (Ident.-No.)	M3P*DD0300.03**	-
				Pactware	DTM ≥	GFP*DTM1.3.1 FDT1.2	-

GFP*: Generic Flow PROFIBUS
M3P*: MFC300 PROFIBUS
**: PDM 6.0

3.2 System configuration of PROFIBUS PA network

The following diagram shows a typical instrumentation with PROFIBUS PA devices with MBP interface in hazardous and non-hazardous locations, including connections of conventional devices (e.g. with 4...20 mA signals) in a PROFIBUS network.

As a rule, the PROFIBUS PA segment is connected to a segment coupler which, among other things, carries out the conversion to the PROFIBUS DP bus line. It should be mentioned that the segment coupler is normally set to a fixed baud rate on the DP side.
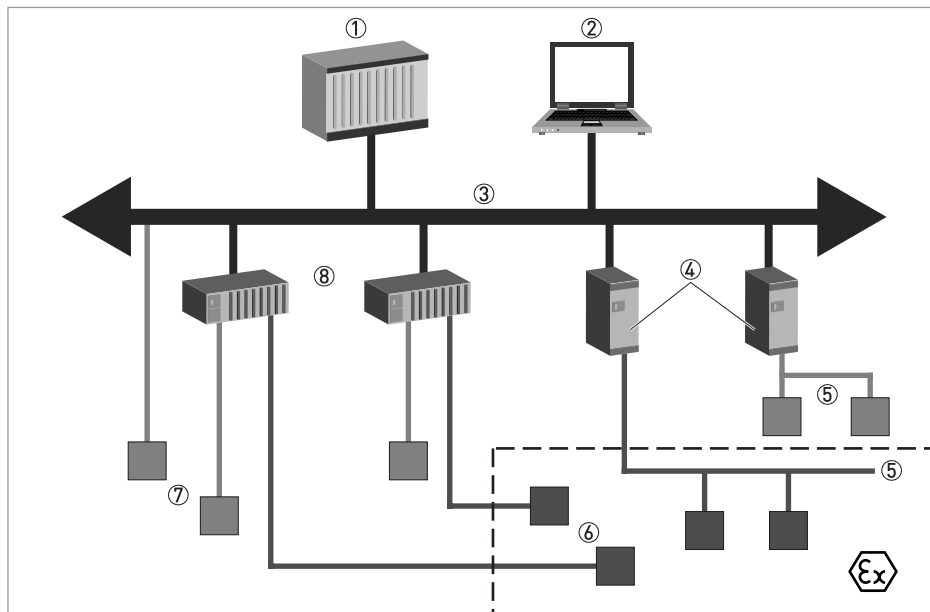
Figure 3-1: PROFIBUS PA network

① Control system (PLC); class 1 master
② Engineering or operation control tool; class 2 master
③ PROFIBUS DP network with max. 12 Mbit/s
④ PROFIBUS PA segment coupler DP / PA
⑤ PROFIBUS PA network with 31.25 kbit/s

⑥ HART® device
⑦ More devices with 4...20 mA
⑧ Analogue I/O module

3.3 Electrical connection for PA signal converter

INFORMATION!
The wiring between the device and the PROFIBUS PA bus is independant of polarity.
The signal converter PROFIBUS PA interface will operate only if the additional power supply for the device is connected/available.
For a detailed description of the electrical connections please refer to the standard signal converter handbook. Refer also to the PROFIBUS PA user and installation guideline (Version 2.2, February 2003 PNO order no. 2.092).

Connection to a spur
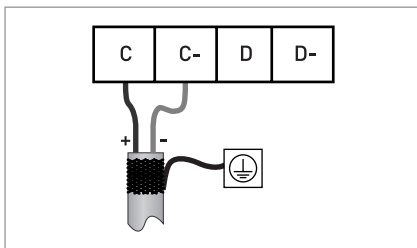
or
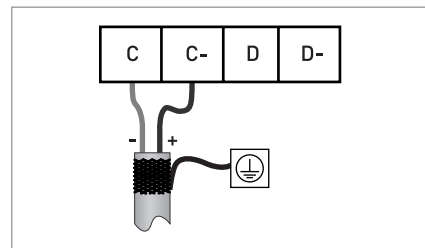
Connection to a trunk
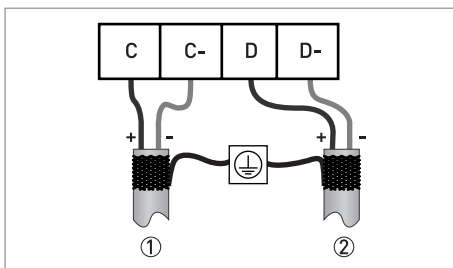
or
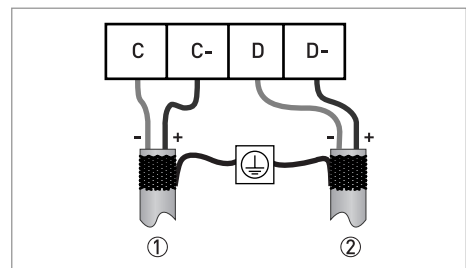
① e.g. incoming data lines
② e.g. outgoing data lines

3.4 Technical data

Hardware

Type	PROFIBUS RS485 interface according to IEC 61158-2 with 31.25 kbits/s; voltage mode
Connection	Independent of polarity at electrical connection
Base current	10.5 mA
FDE	Yes, separate fault disconnection electronics provided (FDE = Fault Disconnection Electronics)
Fault current	6 mA (fault current = max. continuous current − base current)
Starting current	<12 mA
Ex approval	Ex ia IIC or Ex ib IIC/IIB, FISCO Device
	For detailed information refer to standard product documentation.

Software

GSD	GSD file on CD-ROM or from internet site
Device profile	PA Profile compact class B, V 3.0
Address range	0…126 (default 126)
	0…125 via PROFIBUS service set_slave_add
	0…126 via local display
	126 via factory_reset = 2712
Local control	Local display and operator interface at device
SAPs	2 x MS1 SAPs — acyclic interface to PLC
	3 x MS2 SAPs — the number of MS2 Service Access Points is typically equal to the maximum number of master class 2 tools
Function blocks	1 x TB = Transducer Block: contains the parameters and functions defined in PA Profile 3.0
	1 x PB = Physical Block: contains the parameters defined in PA Profile 3.0
	8 x AI = Analog Input Blocks: contains the parameters defined in PA Profile 3.0
	3 x TOT = Totalizer Function Blocks: contains the parameters defined in PA Profile 3.0

3.5 GSD files for the data transfer

A PROFIBUS GSD ZIP file (e.g. GSD-31777815.zip; including both all GSD files and additional data files) you can get on a CD ROM or can be downloaded from the internet. The GSD file contains information that will be needed for project planning of the PROFIBUS communication network.

The relevant data files (e.g. _ _ _ _ .bmp / _ _ _ _ .dib) must be loaded into the bus configuration system/master system before start-up of the bus system.

3.5.1 Cyclic data exchange

During network configuration the user has to define which function block outputs of the signal converter should be transferred cyclically to the master. Network configuration will be done using one of the GSD files described before. The order of transmission of a function block always remains the same even if a function block is defined as an "Empty" block **(if so, no function block output data will be sent to the master and all function block outputs following the empty block will move up one position)**.

3.5.2 Ident.-No. supported

The signal converter with PROFIBUS MBP interface is based on PROFIBUS PA Profile V 3.0. The device supports three Ident-No.:

- Ident-No. "4511hex" belongs to the GSD file KR014511.GSD and YP014511.GSD and includes the complete functionality of the Coriolis mass flowmeter.
- The application of the manufacturer independent Ident-No. "9742hex" (GSD file "PA139742.GSD") provides interchangeability of devices, i.e. an exchange of Coriolis mass flowmeters of different vendors.
- Ident-No. "E801hex"
  For detailed information refer to *Signal converter MFC 300 PROFIBUS PA with MBP interface as replacement for older signal converter MFC 050/051 PA* on page 22.

Please follow the instructions in the manual of the host supplier when installing the GSD File you need and the additional files (_ _ _ _ .bmp and _ _ _ _ .dib) into the PLC.

INFORMATION!
If separated by the bus configuration system the device entry of the PROFIBUS MBP interface with PA Profile 3.0 will be located within the slave family PROFIBUS PA.

3.5.3 Manufacturer specific GSD files: KR014511.GSD and YP014511.GSD

The KR014511.GSD file is for use with the standard DP/PA coupler and the YP014511.GSD file is for use with the transparent DP/PA coupler SK2/SK3 of Pepperl & Fuchs (up to 12 MBaud on the DP segment).

INFORMATION!
For devices with MBP interface there are always two types of GSD files in our GSD compilation:
- *One standard GSD file for a standard DP/PA segment coupler with file name: "KR0....GSD"*
- *One special GSD file specific for the segment coupler SK2/SK3 of Pepperl & Fuchs with file name: "YP0....GSD"*

It should be noted that both GSD files support device functionality as described below:

Block number	Default configuration Function block output: value and status	KR014511.GSD YP014511.GSD Ident-No. 4511	Default unit
1	Mass Flow	AI-FB	kg/s
2	Density	AI-FB	kg/m^3
3	Medium Temperature	AI-FB	K
4	Mass Totaliser	Totaliser-FB	kg
5	Volume Totaliser	Totaliser-FB	m^3
6	Mass Totaliser	Totaliser-FB	kg
7	Volume Flow	AI-FB	m^3/h
8	Concentration 1	AI-FB	%
9	Concentration 2	AI-FB	%
10	Concentration Mass Flow 1	AI-FB	kg/s
11	Concentration Mass Flow 2	AI-FB	kg/s

- AI: Analog Input Function Block
- FB: Function Block

There are separate settings to select the units for local display and PROFIBUS. Modifications of the units of the display will have no effect on the data transferred via PROFIBUS.
A master class 2 tool is required to modify the units for PROFIBUS transfer.

INFORMATION!

During network configuration the user has to define which function block outputs of the signal converter should be transferred cyclically to the master. This is performed by a bus configuration tool (e.g. "HW- Config" for PC-S7 from Siemens). This tool offers specific functions as follows:

1. It is possible to configure an "Empty" block (the code of an "Empty" block is defined as 0x00) on each block number. This implies: no data are transmitted in the cyclic data telegram for this block.

2. There is NO "Totaliser (TOT)" function block allowed on block position 1, 2, 3, 7, 8, 9, 10 and 11! On these positions, only an "Analog Input (AI)" function block or an "Empty" block is allowed! (Note: All codes supported by "Analog Input (AI)" - and "Totaliser (TOT)" – function blocks will be found in the corresponding GSD files.)

3. There is NO "Analog Input (AI)" function block allowed on block position 4, 5 and 6! On these positions, only a "Totaliser (TOT)" function block or an "Empty" block is allowed!

4. There is a choice of 7 different totaliser functions, which can be allocated to the blocks 4, 5 and/or 6.

Definition of totalizer functions

Total	cyclic transfer of the totalizer value with status to the master
SetTot + Total	cyclic transfer of the totalizer value with status to the master + cyclic control data from master to the device via the parameter SetTot
ModeTot + Total	cyclic transfer of the totalizer value with status to the master + cyclic control data from master to the device via the parameter ModeTot
SetTot + ModeTot + Total	cyclic transfer of the totalizer value with status to the master + cyclic control data from master to the device via the parameters SetTot and ModeTot (in the given order)
SetTot	cyclic control data from master to the device via the parameter SetTot
ModeTot	cyclic control data from master to the device via the parameter ModeTot
SetTot + ModeTot	cyclic control data from master to the device via the parameters SetTot and ModeTot (in the given order)

Both, the Byte SetTot and ModeTot are cyclically sent from the Master to the device if these bytes are inserted as output data via the PLC configurator. The meaning of these control bytes are as follows:

Function of control bytes

SetTot	
SetTot = 0	Totaliser is totalising.
SetTot = 1	Totaliser will be reset to 0 and stays at 0 until SetTot is switched back again to 0. If the value of SetTot changes from "1" to "0" the totaliser starts counting from 0.
SetTot = 2	Totaliser is set to the value defined by PresetTot. PresetTot can be written via an acyclic master (totaliser in block 4 = Slot 4 Index 32; totaliser in block 5 = Slot 5 Index 32; totaliser in block 6 = Slot 6 Index 32). If the value of SetTot changes from "2" to "0" the totaliser starts counting from the current value defined by PresetTot.
SetTot > 2	Not allowed. Value is ignored; totaliser remains in its last valid setting.
ModeTot	
ModeTot = 0	Totaliser totalises positive and negative values.
ModeTot = 1	Totalises only positive values.
ModeTot = 2	Totalises only negative values.
ModeTot = 3	Totaliser is stopped, no totalisation will be done.
ModeTot = 248	Totalises all values as positive, negative values will be multiplied with -1.0.
ModeTot = 249	Totalises all values as negative, positive values will be multiplied with -1.0.

All other values of ModeTot not allowed. Value is ignored; totaliser remains in its last valid setting.

The standard block configuration may be changed by the customer but using the default settings is highly recommended. If the standard block configuration should be changed by the customer an acyclic master tool or the device display menu must be used to change the "channel parameter" value of the block which should be connected to another transducer output value.

3.5.4 Profile specific GSD file: PA139742.GSD

The functionality of the profile specific GSD file is limited. This GSD file includes only four blocks:

Block number	Standard configuration Function block output value	PA139742.GSD Ident–No. 9742	Default unit
1	Mass Flow	AI-FB	kg/s
2	Density	AI-FB	kg/m^3
3	Medium Temperature	AI-FB	K
4	Mass Totaliser	Totaliser-FB	kg

The device has to be switched from full functionality to interchangeable basic configuration by using one of both a master class 2 tool (IDENT_NUMBER_SELECTOR: Slot 0, Index 40; change byte value to 0) or the device display menu. In the next step, the device has to be configured using the PA139742.GSD file.

3.5.5 Using the display menu to distinguish the current revision of the device (PA)

Use the display to open the Fct. B3.5 or C6.8.2 of the signal converter. You will get the following information:

- KROHNE Ident.-No. (of the assembled PROFIBUS PCB)
- Software revision (of the PROFIBUS software)
- Date of production (of the PROFIBUS device)

3.6 Signal converter MFC 300 PROFIBUS PA with MBP interface as replacement for older signal converter MFC 050/051 PA

3.6.1 Ident.-No. supported

Ident.-No. "E801hex": This Ident.-No. belongs to KROHE801.GSD / YP01E801.GSD and supports a compatibility mode concerning the cyclic data transfer (cyclic measurement values and diagnosis) if the MFC300 with PROFIBUS MBP interface will be used for replacement of an "MFC050/051PA". It is **not** necessary to adapt the PLC configuration. Communication functions are restricted to those functions supported by MFC050/051 converters. Take care to set the "MFC300 PROFIBUS MBP interface" parameters in a way to get the same behaviour as of "MFC050/051PA" concerning calculation of measuring values and totalizers (this has to be done manually).

⚠️ *CAUTION!*
This Ident.-No. will be available only if a PROFIBUS PA software version ≥3.0.0 is used.

3.6.2 Manufacturer specific GSD files (PA): KROHE801.GSD and YP01E801.GSD for the older signal converter MFC050/051 with PROFIBUS MBP interface

The PROFIBUS signal converter with MBP Interface operating in the MFC050/051 compatibility mode ensures operation with a PLC system with software parameters based on the MFC050/051PA. This option is important for those customers who do not want to change the parameters in the PLC software after having replaced the MFC050/051PA by an MFC300 with PROFIBUS MBP interface. The existing GSD files of the MFC050/051PA ("KROHE801.GSD" or "YP01E801.GSD") can still be used.

In this application, the compatibility mode of the MFC300 with PROFIBUS MBP interface has to be selected (display menu D2.2.4 - Identification No. -> choose MFC050/051); some other entries have to be performed in a next step.

In order to provide communication between "MFC300 with PROFIBUS MBP interface" and the PLC, you may - in principle — use the GSD of the "MFC050/051PA" ("KROHE801.GSD" or "YP01E801.GSD") and —alternatively - the GSD of the "MFC300 with PROFIBUS MBP interface" ("KR014511.GSD" or "YP014511.GSD") which performs full functionality of the "MFC300 with PROFIBUS MBP interface".

> **INFORMATION!**
> *The "MFC050/051 compatibility mode" is not recommended for MFC300 PROFIBUS module with RS485 interface. The GSD file has to be exchanged because of its different timings and supported baud rates. Nevertheless the feature is not blocked in this case because RS485 interface will operate under the MFC050/051 conditions, too. The user has to take care about the different bus connections.*

If the GSDs of the "MFC050/051PA" ("KROHE801.GSD" or "YP01E801.GSD") are used…

- The MFC050/051PA parameter set for the PLC control software will be maintained, i.e. there is no adaptation needed with reference to the replaced interface of the MFC300 with PROFIBUS MBP interface.

- In this usage of the GSD the **PA Profile 3.0** functionality is provided in the PLC for both replacements.

- Compatibility is restricted to the PROFIBUS MS0 services. In addition the "MFC050/051 status" is provided for AI Block and Totalizer outputs if the related parameters are accessed via acyclic MS2 services and "MFC050/051 compatibility mode" is enabled. This is to get a unique value independent from the access mechanism.

- There is no further compatibility mode regarding the acyclic parameter access, i.e. MFC300 Device Description or DTM has to be used even if "MFC050/051 compatibility mode" is enabled. This mode does not provide mechanical or electrical compatibility (i.e. housing size and connector positions, measuring sensor, power consumption, etc.).

- If an MFC300 signal converter is operating in "MFC050/051 compatibility mode" its functionality is restricted to the MFC050/051 features, e.g. there will be no possibility to transfer more than two Totalizer Function Block outputs. MS1 services, i.e. acyclic parameter accesses by a master class 1, are not supported in "MFC050/051 compatibility mode".

If the GSD of "MFC300 with PROFIBUS MBP interface" (KR014511.GSD or YP014511.GSD) is used…

- The MFC050/051PA parameter set for the PLC control software has to be adapted with reference to the MFC300 PROFIBUS MPB interface.

- In this usage of the GSD the **PA Profile 3.0** functionality is provided and all diagnostic features of the "MFC300 with PROFIBUS MBP interface" are being made available.

> **INFORMATION!**
> *Even if the PROFIBUS module is operating in "MFC050/051 compatibility mode" the behaviour might be different from MFC050/051 devices. Because of additional self-tests warnings or failure messages may occur under conditions when MFC050/051 will not report any problem. Unexpected status messages may occur.*
> *There is no warranty that MFC300 PROFIBUS PA devices can replace the MFC050/051 PA device in any case without modifications of the PLC/PCS software.*

3.6.3 Manufacturer specific GSD file: KROHE801.GSD

This GSD file is for use with standard DP/PA segment coupler if the "MFC050/051 compatibility mode" is selected of the MFC300 PROFIBUS PA device with MBP interface.

3.6.4 Manufacturer specific GSD file: YP01E801.GSD

This GSD file is for use with the transparent DP/PA segment coupler SK2/SK3 of Pepperl&Fuchs (up to 12 MBaud on the DP segment) and supports the same device functionality as listed before (Manufacturer specific GSD file: KROHE801.GSD).

> **INFORMATION!**
> *However, both sets of GSDs, when applied, **do not** provide the same level of functionality in the PLC.*

4.1 Function blocks

The PROFIBUS MBP interface is based on the PROFIBUS PA Profile Version 3.0 and supports the following blocks:

- 1 physical block.
  This block contains the parameters defined in PA Profile 3.0.
- 1 transducer block for Coriolis mass flow devices.
  This block provides the parameters and functions defined in PA Profile 3.0.
- 8 Analog Input (AI) function blocks.
  As default: Mass Flow / Density / Medium Temperature / Volume Flow / Concentration 1 / Concentration 2 / Concentration Mass Flow 1 / Concentration Mass Flow 2 /.
- 3 totalizer (TOT) function blocks.
  As default the first and the third totalizers will totalize "Mass" and the second one will totalize "Volume".

4.2 Data structure of function block output values

The data structure of function block outputs consists of 5 bytes: a 4 byte float value (Float Format according IEEE Standard 754 Short Real Number) followed by a 1 byte status value. If all 11 function block outputs have been configured (see above), 55 bytes will be transmitted.

4.2.1 Float value

Example of float format

Byte n								Byte n+1							
Bit7	Bit6							Bit7	Bit6						
VZ	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}	2^{-7}
	Exponent								Mantissa						

Byte n+2								Byte n+3							
Bit7								Bit7							
2^{-8}	2^{-9}	2^{-10}	2^{-11}	2^{-12}	2^{-13}	2^{-14}	2^{-15}	2^{-16}	2^{-17}	2^{-18}	2^{-19}	2^{-20}	2^{-21}	2^{-22}	2^{-23}
Mantissa								Mantissa							

Example (binary): 40 F0 00 00 (hex) = 0100 0000 1111 0000 0000 0000 0000 0000

Formula:

$\text{value} = (-1)^{VZ} * 2^{(\text{Exponent} - 127)} * (1 + \text{Mantissa})$

$\text{value} = (-1)^0 * 2^{(129 - 127)} * (1 + 2^{-1} + 2^{-2} + 2^{-3})$

$\text{value} = 1 * 4 * (1 + 0.5 + 0.25 + 0.125)$

$\text{value} = 7.5$

4.2.2 Status value

The meanings of the status byte (unsigned integer) are described in the following tables.

Quality		Quality substatus				Limits		
Gr	Gr	QS	QS	QS	QS	Qu	Qu	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	0							= bad
0	1							= uncertain
1	0							= good (Non Cascade)
1	1							= good (Cascade) - not supported

Status = bad

Quality		Quality substatus				Limits		
Gr	Gr	QS	QS	QS	QS	Qu	Qu	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	0	0	0	0	0			= non-specific
0	0	0	0	0	1			= configuration error
0	0	0	0	1	0			= not connected
0	0	0	0	1	1			= device failure
0	0	0	1	0	0			= sensor failure
0	0	0	1	0	1			= no communication (last usable value)
0	0	0	1	1	0			= no communication (no usable value)
0	0	0	1	1	1			= out of service

Status = uncertain

Quality		Quality substatus				Limits		
Gr	Gr	QS	QS	QS	QS	Qu	Qu	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	1	0	0	0	0			= non-specific
0	1	0	0	0	1			= last usable value
0	1	0	0	1	0			= substitute-set
0	1	0	0	1	1			= initial value
0	1	0	1	0	0			= sensor conversion not accurate
0	1	0	1	0	1			= engineering unit violation (unit not in the valid set)
0	1	0	1	1	0			= sub-normal
0	1	0	1	1	1			= configuration error
0	1	1	0	0	0			= simulated value

Status = good (Non Cascade)

Quality		Quality substatus				Limits		
Gr	Gr	QS	QS	QS	QS	Qu	Qu	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
1	0	0	0	0	0			= ok
1	0	0	0	0	1			= update event
1	0	0	0	1	0			= active advisory alarm (priority < 8)
1	0	0	0	1	1			= active advisory alarm (priority > 8)
1	0	0	1	0	0			= unacknowledged update event
1	0	0	1	0	1			= unacknowledged advisory alarm
1	0	0	1	1	0			= unacknowledged critical alarm
1	0	1	0	0	0			= initiate fail safe
1	0	1	0	0	1			= maintenance required

Status = Limits

Quality		Quality substatus				Limits		
Gr	Gr	QS	QS	QS	QS	Qu	Qu	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
						0	0	= ok
						0	1	= low limited
						1	0	= high limited
						1	1	= constant

Check the first two quality bits in order to get the quality information of the measurement value:

- **Good (Non Cascade):** function block output value is ok and can be used without restrictions
- **Good (Cascade):** will not be supported, because it is not applicable for the device
- **Uncertain:** function block output value can be used but the accuracy can not be guaranteed (e.g. function block outputs value has been frozen or A/D converter is saturated or out of range)
- **Bad:** function block output value is bad - don't use it for process control!

The "Quality-Substatus" and "Limit" bits will be used for further diagnostics or limit checking.

INFORMATION!
The status should be monitored because a number will be transmitted even if the status of the measurement value is bad or uncertain. This is the only way to check the quality of the transmitted measurement values.

4.3 Diagnosis parameter

4.3.1 Diagnosis

Parameter DIAGNOSIS will contain detailed information of the device, bitwise coded. More than one message possible at once (as below-mentioned). If MSB of byte 4 is set to 1 than more diagnose information is available in the DIAGNOSIS_EXTENSION parameter.

The manufacturer specific parameter "DIAGNOSIS_EXTENSION" will contain bitwise coded more detailed information of the internal status conditions and error conditions of the PROFIBUS device.

The corresponding GSD file will contain all messages supported by this device - have a look at the UNIT_DIAG_BIT(i) definitions.

4.3.2 DIAGNOSIS

Octet number	Bit number	Subparameter	Indication type	Default value	Description
1	0	DIA_HW_ELECTR	R	0	Hardware failure electronics
	1	DIA_HW_MECH	R	0	Hardware failure mechanics
	2	DIA_TEMP_MOTOR	R	0	Motor temperature too high
	3	DIA_TEMP_ELECTR	R	0	Electronic temperature too high
	4	DIA_MEM_CHKSUM	R	0	Memory error
	5	DIA_MEASUREMENT	R	0	Failure in Measurement / Sensor
	6	DIA_NOT_INIT	R	0	Device not initialized (no selfcalibration)
	7	DIA_INIT_ERR	R	0	Selfcalibration failed
2	0	DIA_ZERO_ERR	R	0	Zero point error (limit position)
	1	DIA_SUPPLY	R	0	Power supply failed (electrical, pneumatic)
	2	DIA_CONF_INVAL	R	0	Configuration not valid
	3	DIA_WARMSTART	A	0	Restart (warmstart)
	4	DIA_COLDSTART	A	0	Coldstart (with default data)
	5	DIA_MAINTENANCE	R	0	Maintenance required
	6	DIA_CHARACT	R	0	Characteristics invalid
	7	IDENT_NUMBER_VIOLATION	R	0	Ident. No. violation: Set to 1 if the Ident_Number of the running cyclic data transfer and the value of physical block IDENT_NUMBER_SELECTOR parameter are different

Octet number	Bit number	Subparameter	Indication type	Default value	Description
3	0	Reserved		0	Reserved for use by PNO
	1	Reserved		0	Reserved for use by PNO
	2	Reserved		0	Reserved for use by PNO
	3	Reserved		0	Reserved for use by PNO
	4	Reserved		0	Reserved for use by PNO
	5	Reserved		0	Reserved for use by PNO
	6	Reserved		0	Reserved for use by PNO
	7	Reserved		0	Reserved for use by PNO
4	0	Reserved		0	Reserved for use by PNO
	1	Reserved		0	Reserved for use by PNO
	2	Reserved		0	Reserved for use by PNO
	3	Reserved		0	Reserved for use by PNO
	4	Reserved		0	Reserved for use by PNO
	5	Reserved		0	Reserved for use by PNO
	6	Reserved		0	Reserved for use by PNO
	7	EXTENSION_AVAILABLE		0	Extension available: More diagnose information available in the Diagnosis_Extension parameter (if available)

4.3.3 DIAGNOSIS_EXTENSION

Octet number	Bit number	Subparameter	Comment*
1	0	**F - Device Error**	Fatal device error - general info
	1	F - Application Error	Fatal application error - general info
	2	S - Out Of Specification	Uncertain Measurement - general info
	3	C - Checks In Progress	Test function activated - general info
	4	Parameter (DM)	Parameter error - general info
	5	Display	Display error - general info
	6	Sensor Electronic (ADC)	Sensor error - general info
	7	IO 1	IO1 error - general info
2	0	IO 2	IO2 error - general info
	1	Output A	Output A (Puls / Current) error - general info
	2	Output B	Output B (Puls / Current) error - general info
	3	Fieldbus	Fieldbus module error - general info
	4	F - No Device Communication	Internal Communication failure
	5	**F - Parameter Update Error**	Parameter requested not available
	6	I - Power Fail	Device has been powered up
	7	I - Write Cycles Overflow	Too much write cycles occured
3	0	Reserved	
	1	F - Sensor Exceeding Limit	Mass flow is greater than max. flowrate
	2	F - Tube Not Oscillating	Measurement tube is not oscillating
	3	F - System Control	System control generated an application error
	4	F - Stop Mode	Sensor is switched off
	5	F - SE System Error	Sensor error
	6	F - SE Comms. Failure	Communication error with sensor electronics
	7	Reserved	
4	0	S - Sensor Signal Error	Drive signal is switched off due to sensor signals
	1	S - Excessive Noise	(for future use only)
	2	S - External Vibration	(for future use only)
	3	S - Sensor Levels	Oscillation amplitude of sensor A or sensor B to low
	4	S - Temperature Drift	(for future use only)
	5	S - Tube Asymmetry	(for future use only)
	6	S - System control	System control caused "out of spec" flag
	7	S - SE PCB Temperature	Temperature on SE PCB is exceeding maximum limit

Octet number	Bit number	Subparameter	Comment*
5	0	S - Tube Temperature	Temperature is exceeding limits
	1	S - Density	Process density is over range
	2	S - Startup	The device is in startup mode
	3	S - Power Fail	Device has been powered up
	4	S - Resistor Circuit Defective	Temperature and strain measurement defective
	5	S - SE Defective	"Operational fault in sensor electronics"
	6	S - 2 Phase Flow	2 phase signal is above the programmed threshold
	7	S - Density Calib. Failed	Density calibration failed
6	0	S - BE PCB Temperature	Temperature on BE PCB is exceeding maximum limit
	1	S - Interface PCB Fault	Error detected during self-monitoring of interface card
	2	Reserved	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	C - Zero Calibration	Zero calibration performed
	7	C - Standby Mode	Device is in standby mode

*: for a more detailed description of the above-mentioned subparameters please check the signal converter handbook (section: Status messages and diagnostic information)

(F): Device Error
(F): Application Error
(S): Uncertain measurement / measurement out of specification
(C): Simulation of the measured value
(I): Information

4.3.4 Mapping of DIAGNOSIS_EXTENSION bits into DIAGNOSIS bits

How to read this table:

If e.g. an S - Temperature Drift error has been detected the below-mentioned DIAGNOSIS_EXTENSION bits will be set:

* DIAGNOSIS_EXTENSION (Octet 1 / Bit 2): S - Out Of Specification
* DIAGNOSIS_EXTENSION (Octet 4 / Bit 4): S - Temperature Drift

These bits will be mapped to the below-mentioned DIAGNOSIS bits (which will be set additionally):

* DIAGNOSIS (Octet 2 / Bit 5): DIA_MAINTENANCE
* DIAGNOSIS (Octet 4 / Bit 7): EXTENSION_AVAILABLE

Octet number	Bit number	Subparameter	DIA_HW_ELECTR	DIA_HW_MECH	DIA_TEMP_MOTOR	DIA_TEMP_ELECTR	DIA_MEM_CHKSUM	DIA_MEASUREMENT	DIA_NOT_INIT	DIA_INIT_ERR	DIA_ZERO_ERR	DIA_SUPPLY	DIA_CONF_INVAL	DIA_WARMSTART	DIA_COLDSTART	DIA_MAINTENANCE	DIA_CHARACT	IDENT_NUMBER_Violation	Reserved	Reserved	EXTENSION_AVAILABLE
1	0	**F** - Device Error	X																		X
	1	F - Application Error						X													X
	2	S - Out Of Specification														X					X
	3	C - Checks In Progress																			X
	4	Parameter (DM)																			X
	5	Display																			X
	6	Sensor Electronic (ADC)																			X
	7	IO 1																			X
2	0	IO 2																			X
	1	Output A																			X
	2	Output B																			X
	3	Fieldbus																			X
	4	F - No Device Communication						X													X
	5	**F** - Parameter Update Error						X													X
	6	I - Power Fail																			X
	7	I - Write Cycles Overflow														X					X
3	0	Reserved																			
	1	F - Sensor Exceeding Limit						X													X
	2	F - Tube Not Oscillating						X													X
	3	F - System Control						X													X
	4	F - Stop Mode						X													X
	5	F - SE System Error						X													X
	6	F - SE Comms. Failure						X													X
	7	Reserved																			

Octet number	Bit number	Subparameter	DIA_HW_ELECTR	DIA_HW_MECH	DIA_TEMP_MOTOR	DIA_TEMP_ELECTR	DIA_MEM_CHKSUM	DIA_MEASUREMENT	DIA_NOT_INIT	DIA_INIT_ERR	DIA_ZERO_ERR	DIA_SUPPLY	DIA_CONF_INVAL	DIA_WARMSTART	DIA_COLDSTART	DIA_MAINTENANCE	DIA_CHARACT	IDENT_NUMBER_Violation	Reserved	...	Reserved	EXTENSION_AVAILABLE
4	0	S - Sensor Signal Error														X						X
	1	S - Excessive Noise														X						X
	2	S - External Vibration														X						X
	3	S - Sensor Levels														X						X
	4	S - Temperature Drift														X						X
	5	S - Tube Asymmetry														X						X
	6	S - System control														X						X
	7	S - SE PCB Temperature														X						X
5	0	S - Tube Temperature														X						X
	1	S - Density														X						X
	2	S - Startup														X						X
	3	S - Power Fail														X						X
	4	S - Resistor Circuit Defective														X						X
	5	S - SE Defective														X						X
	6	S - 2 Phase Flow														X						X
	7	S - Density Calib. Failed														X						X
6	0	S - BE PCB Temperature														X						X
	1	S - Interface PCB Fault														X						X
	2	Reserved																				
	3	Reserved																				
	4	Reserved																				
	5	Reserved																				
	6	C - Zero Calibration																				X
	7	C - Standby Mode																				X

X :Ext_Diag (Bit 3 of Station_Status_1) will be set too!

X :Corresponding DIAGNOSIS bits is set to 1 if status occured

Detailed description of special settings concerning the PROFIBUS features easily operated via the local display menu of the signal converter (refer to the following sections). For a detailed description of the menus and functions in general please refer to the standard product documentation of the signal converter.

5.1 Menu A, Quick Setup

No.	Function	Settings / descriptions

A2 Tag

No.	Function	Settings / descriptions
A2	Tag	Tag descriptor of the physical block of the PROFIBUS module will be displayed. The Tag descriptor provides an application specific reference to the blocks. It will be assigned by the user of the device. The Tag descriptor is an octet string (a visible string will be preferred) consisting of 32 byte. The first 21 characters will be displayed only!

A3 Reset

No.	Function	Settings / descriptions
A3	Reset	-
A3.1	Reset Errors	This menu function can be used to reset all errors that are not removed automatically (power fail, totaliser overflow)
		Reset? Select: no / yes
		No: Exit the function. Yes: Resets the errors and exits the function.
The following reset menus for the totaliser are only available, if the quick access has been activated in the menu "Setup > Device > Quick Setup". Each totaliser can be activated for quick access independently.		
A3.2	FB4 totaliser 1	For PROFIBUS devices: The totaliser can be reset to zero in this menu.
A3.3	FB5 totaliser 2	
A3.4	FB6 totaliser 3	

A4 Station Address

No.	Function	Settings / descriptions
A4	Station Address	Selects the address of the device at the PROFIBUS interface.
		The PROFIBUS address can also be changed using the PROFIBUS service "set_slave_add". The input range is 0...125 according to the PROFIBUS specification. Address 126 is the default address and cannot be set via the PROFIBUS service "set_slave_add" - use menu instead to reset to default address.

5.2 Menu B, Test

No.	Function	Settings / descriptions

B3 Information

No.	Function	Settings / descriptions
B3.5	PROFIBUS	Available if there is a PROFIBUS interface in existence; displays the following mentioned information about the PROFIBUS interface: Ident No. / software revision no. of the PROFIBUS software / production date

5.3 Menu C, Setup

No.	Function	Settings / descriptions

C4 I/O Totaliser

No.	Function	Settings / descriptions
C4.1	FB4 Totaliser 1	Set function of Totaliser _
C4.2	FB5 Totaliser 2	_ stands for 1, 2, 3 (= Totaliser 1, 2, 3)
C4.3	FB6 Totaliser 3	
C4._.1	Totaliser Function	Select: Absolute Total (counts positive and negative values) / Incremental Total (counts only the positive values) / Decremental Total (counts only the negative values) / Stop Totaliser (totaliser is stopped, no counting) / All As Positive (neg. input will be multiplied with -1.0) / All As Negative (pos. values will be multiplied with 1.0)
C4._.2	Measurement	Select: Volume Flow / Mass Flow / Contentration Total 1 / Contentration Total 2 / Conc. volume flow 1 / Conc. volume flow 2
C4._.3	Preset Value	Predefines a threshold (using high low limit value of the totaliser affected; the THRESHOLD bit will be set in the long status information bytes of the interface if the actual value of the totaliser is outside these limits. This can be also used for a status output.
C4._.4	Reset Totaliser	The current value of the totaliser can be set to zero.
		Select: No / Yes (reset totaliser 1…3)
C4._.5	Error Behaviour	Defines the behaviour of this function block in case of errors.
		Select: hold meas. value / ignore error / stop totaliser
		hold meas. value: Totalization is continued based on the last incoming value with good status before the first occurrence of bad status. **ignore error:** Totalization is continued using the input values despite the bad status. The status is ignored. **stop totaliser:** Totalization is stopped during occurrence of bad status of incoming values.
C4._.6	Information	Serial no. of the I/O board, software version no. and production date of the circuit board will be displayed

C5 I/O PROFIBUS

No.	Function	Settings / descriptions
C5	I/O PROFIBUS	Using the menu functions mentioned below you will be able to control basically the five analog input blocks of this PROFIBUS device. These eights menus are identical so they are grouped together and their functions are described in one go.
C5.1	FB1 Analog Inp.	There are 8 analog input blocks. _ stands for the 8 analog input blocks: FB1 (_ = 1), FB2 (_ = 2), FB3 (_ = 3), FB7 (_ = 4), FB8 (_ = 5), FB9 (_ = 6), FB10 (_ = 7), FB11 (_ = 8),
C5.2	FB2 Analog Inp.	
C5.3	FB3 Analog Inp.	
C5.4	FB7 Analog Inp.	
C5.5	FB8 Analog Inp.	
C5.6	FB9 Analog Inp.	
C5.7	FB10 Analog Inp.	
C5.8	FB11 Analog Inp.	
C5._.1	Measurement	Select measurement for the analog input blocks: Mass Flow / Density / Temperature / Concentration 1 / Concentration 2 / Conc. mass flow 1 / Conc. mass flow 2 / Conc. volume flow 1 / Conc. volume flow 2 / Sensor Deviation / Sensor Average / Drive Energy / Tube Frequency / Tube Strain / Inner Cylinder Strain / Flow Velocity / Volume Flow / Electronics Temperature / Supply

| No.	Function	Settings / descriptions
C5._.2	Time Constant	Set time constant for this function block (_).
C5._.3	Error Behaviour	Defines the behaviour of this function block in case of errors.
		Select: hold value / ignore error / replace value
		hold value: Last valid OUT value stored will be used as OUT value. **ignore error:** OUT has the wrong calculated value and status "Bad" as calculated. **replace value:** The "replacement value" will be used as OUT value.
C5._.4	replacement value	Available, if the error behaviour "replace value" is selected. Defines the value that replaces the measured value at this function block in case of an error.

C6 Device

In this menu all functions are grouped that have no effect on the measurement or any output directly.		
C6.1.1	Tag	Tag descriptor of the physical block of the PROFIBUS module will be displayed. The Tag descriptor provides an application specific reference to the blocks. It will be assigned by the user of the device. The Tag descriptor is an octet string (a visible string will be preferred) consisting of 32 byte. The first 21 characters will be displayed only!
C6.3.1	Function	Specify number of measured value lines (font size)
		Select: one line / two lines / three lines
C6.3.2	Measurement 1.line	Select the measurement of the 1st line:
		Select: Volume Flow / Mass Flow / Temperature / Density / Flow Velocity / Diagnosis 1 / Diagnosis 2 / Diagnosis 3 / Concentration 1 / Concentration Flow 1
C6.3.8	Measurement 2.line	Specify measurement of 2nd line (only available if this 2.line is activated)
		Select: Volume Flow / Mass Flow / Temperature / Density / Flow Velocity / Bargraph / FB4 Totaliser 1 / FB5 Totaliser 2 / FB6 Totaliser 3 / Operating Hours / Diagnosis 1 / Diagnosis 2 / Diagnosis 3 / Concentration 1 / Concentration Flow 1
C6.3.10	Measurement 3.line	Specify measurement of 3rd line (only available if this 3.line is activated)
		Select: Volume Flow / Mass Flow / Temperature / Density / Flow Velocity / FB4 Totaliser 1 / FB5 Totaliser 2 / FB6 Totaliser 3 / Operating Hours / Diagnosis 1 / Diagnosis 2 / Diagnosis 3 / Concentration 1 / Concentration Flow 1
C6.4	2. Meas. page	Setting of the measurement for the second measuring page.
		For PROFIBUS devices this page shows only the PROFIBUS values FB1…FB8.
C6.4.1 C6.4.3 C6.4.5	Measurement 1.line Measurement 2.line Measurement 3.line	Select the measurement of the 1st, 2nd and 3rd line: FB1 Analog inp. 1 / FB2 Analog inp. 2 / FB3 Analog inp. 3 / FB4 Totaliser 1 / FB5 Totaliser 2 / FB6 Totaliser 3 / FB7 Analog inp. 4 / FB8 Analog inp. 5 / FB9 Analog inp. 6 / FB10 Analog inp. 7 / FB11 Analog inp. 8
C6.4.2 C6.4.4 C6.4.6	Format 1.line Format 2.line Format 3.line	Fixed number of digits after the decimal point or automatic, where the number of digits is automatically adjusted to the available space.
C6.6	Special Functions	-
C6.6.1	Reset Errors	This menu function can be used to reset all errors that are not removed automatically (power fail, totalizer overflow)
		reset? Select: no / yes
C6.6.2	Save Settings	Save current settings. Select: break (exit function without saving) / backup 1 (save in storage location 1) / backup 2 (save in storage location 2)
		Query: continue copy? (cannot be undone) Select: no (exit function without saving) / yes (copy current settings to storage backup 1 or backup 2)

No.	Function	Settings / descriptions
C6.6.3	Load Settings	Load saved settings. Select: break (exit function without loading) / factory settings (load in state as delivered) / backup 1 (load data from storage location 1) / backup 2 (load data from storage location 2) / load sensor data (factory settings of calibration data)
		Query: continue copy? (cannot be undone) Select: no (exit the function without saving) / yes (load data from the selected storage location)
C6.8	Physical Block	This menu is only available, if a PROFIBUS interface is present.
C6.8.1	Station Address	Selects the PROFIBUS station address of the device.
		The PROFIBUS address can also be changed using the PROFIBUS service "set_slave_add". The input range is 0...125 according to the PROFIBUS specification. Address 126 is the default address and cannot be set via the PROFIBUS service "set_slave_add" - use menu instead to reset to default address.
C6.8.2	Information	Available if there is a PROFIBUS interface in existence; displays the following mentioned information about the PROFIBUS interface: Ident No. / software revision no. of the PROFIBUS software / production date
C6.8.3	Diag. extension	Content of the PROFIBUS diagnosis extension is displayed.
C6.8.4	Diag. extension 2	Content of the additional diagnosis stored is displayed.
C6.8.5	Diag. extension i	Content of the internal diagnosis stored is displayed.
C6.8.6	Diag. extension h	h = history
		Content of the PROFIBUS diagnosis extension is displayed. Shows diagnosis information of all diagnosis bits, which are set again since the last delete.
C6.9	Quick Setup	Activate quick access in quick setup menu; default setting: quick setup is active (yes)
		Select: yes (switched on) / no (switched off)
C6.9.1	Reset Totaliser 1	The reset can be activated in the "Quick Setup" to get a quick access of the function. Select: yes (activated) / no (switched off)
C6.9.2	Reset Totaliser 2	
C6.9.3	Reset Totaliser 3	

5.4 Menu D, Service

This menu is protected. You will need to use the service password to gain access.

No.	Function	Settings / descriptions
D2		In this menu all functions related to different data sets can be found.
D2.2	Service Parameters	
D2.2.1	Cold Start	Resetting of the signal converter can be done here but all changes up to this point are automatically stored and cannot be discarded.
		Select: no (terminates the function) / yes (performs the reset and leaves the setting mode)
D2.2.2	Save Factory Data	Copies the actual data into the factory setting; this overwrites the factory settings done during calibration!
		Query: save settings? (cannot be undone) Select: break (exit function without saving) / factory settings (saves the settings as factory settings)
		Query: continue copy? (cannot be undone) Select: no (exit function without saving) / yes (copy current settings to the selected storage location)
D2.2.4	Identification No.	Sets different device modes for the cyclic communication of the PROFIBUS interface.
		Select: signal converter (the normal settings incl. all manufacturer specific parameters are supported) / profile (uses only the profile defined functions, no extras, only profile specific parameters are supported) / MFC050/051 (compatibility mode)
D2.2.5	PB Cold Start	Initiates a PROFIBUS cold start.
		During a PROFIBUS cold start nearly all parameter values of the whole device will be set to their default values (Exceptions are the PROFIBUS address and the identification No.). The cold start will be carried out without disconnecting an already established connection to a PROFIBUS master system.
		Query: reset? (to default values) = cold start begins Select: no (terminates the function) / yes (PROFIBUS cold start will be carried out at once; the setting mode is terminated)
D2.2.7	Diag. extension h	h = history
		Delete the stored history.
		Query: reset? = reset history to 0) Select: no (no change) / yes (all saved data are deleted)

KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature assemblies
- Pressure transmitters
- Analysis products
- Products and systems for the oil & gas industry
- Measuring systems for the marine industry

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