Supplementary instructions

Sigma X control type with PROFIBUS®

EN

These operating instructions are only valid in combination with the "Operating instructions for diaphragm motor driven dosing pump Sigma X Control type SxCb"!

The operator is liable for any damage caused by installation and operating errors!

Please carefully read these operating instructions before use. · Do not discard.
The operator shall be liable for any damage caused by installation or operating errors.
The latest version of the operating instructions are available on our homepage.

Part no. 982306

BA SI 081 09/18 EN

Table of contents

1 Prerequisites

The pump can be enhanced with the PROFIBUS® functionality by means of a plug-in module. To do this, insert the plug-in module into the front of the pump (similar to a relay module). The operating menu then displays the menu item *'Field bus'* and the status bar shows the PROFIBUS® symbol.

The pump must have the software version V01.01.00.00 or higher in order for the PROFIBUS® module to function. If it is not working, the LED on the PROFIBUS® module slowly flashes red and green.

2 Adjusting the pump

2.1 General

The pump with the plugged-in PROFIBUS® module is adjusted in the same way as the standard pump, with the addition of the bus functionality.

The pump interrupts the set-up process in the event of pauses longer than 60 s.

2.2 Setting the slave address

The address is pre-set to “125”. If a master in the PROFIBUS® segment assigns the slave addresses, manual setting of the slave address is cancelled.

1. Press the *[Menu]* key.
2. Turn the *[Clickwheel]* to *‘Fieldbus’* and press the *[Clickwheel]*.
3. Turn the *[Clickwheel]* to *‘BUS Address’* and press the *[Clickwheel]*.

Always enter the PROFIBUS® address as 3 digits (addresses between “002” and “125”):

1. Set the 1st number using the *[Clickwheel]* and press the *[Priming]* key.

   ⇨ The 2nd number of the address is marked.

2. Set the 2nd number using the *[Clickwheel]* and press the *[Priming]* key.

   ⇨ The 3rd number of the address is marked.

3. Set the 3rd number using the *[Clickwheel]* and press the *[Clickwheel]*.

2.3 Switch PROFIBUS® to active / inactive

In order for the pump to be controlled using the PROFIBUS®, *‘Fieldbus’* must be set to *‘Active’* in the operating menu:

1. Press the *[Menu]* key.
2. Turn the *[Clickwheel]* to *‘BUS active’* and press the *[Clickwheel]*.
3. Turn the *[Clickwheel]* to *‘Active’* or *‘Inactive’* and press the *[Clickwheel]*. You’re done!

All external inputs, such as level monitoring, metering monitor and external control (pause, contact input, analogue input), will continue to function while the PROFIBUS® is *‘active’*. They result in the reactions that would be expected with the pump without the PROFIBUS® module being plugged in - see “Operating instructions for diaphragm motor driven dosing pump Sigma X Control type SxCb”. The pump transmits corresponding information via the PROFIBUS® to the master (PLC Programmable Logic Controller, PC etc.).

If the PROFIBUS® is set to *‘Inactive’*, the settings for the previously selected operating mode are reloaded.

If the pump is switched to another operating mode, it stops and can only be restarted using the *[Stop/Start]* key.

3 Special features in active PROFIBUS® operation

3.1 General

The pump cannot be manually set or programmed in PROFIBUS® operation! To do this, set the PROFIBUS® to 'Inactive'.

- Using the *[Clickwheel]* it is possible to switch between the continuous displays at any time, as in the other operating modes. This does not affect the operation of the pump.
- The settings from other operating modes are carried over when switching over to PROFIBUS® operation. **However, settings made using the PROFIBUS® are not saved!** They only apply as long as the pump is linked to the PROFIBUS®. Only the total number of strokes and the total number of litres continue to be counted and saved.
- If the pump is switched to PROFIBUS® operation, it stops and can only be restarted using the PROFIBUS®.

3.2 Displays

Operating display

There are additional identifiers in the operating display when PROFIBUS® operation is running.

The current identifiers can be found in the "Control elements" chapter in the "Operating instructions for diaphragm motor driven dosing pump Sigma X Control type ...".

Status display

Profi bus Stop PROFIBUS®: The pump has been stopped by the PROFIBUS®. The master has sent the pump a corresponding telegram.

Main display

⇌ Connection error: If the pump loses its connection to the PROFIBUS® (for instance as soon as the PROFIBUS® is stopped), an error message with the ⇌ symbol appears on the main display.

3.3 LEDs on the PROFIBUS® module

LEDs	Cause
Flashing red and green at a slow rhythm	Connection between the PROFIBUS® module and pump has been disrupted; the hardware or software version of the pump may not be suitable for PROFIBUS®
Lit red	No connection to the PROFIBUS®
Lit green	Pump in cyclic operation

3.4 Using the metering monitor

The "Metering monitor" socket must be assigned to use the metering monitor in PROFIBUS® operation. The pump then transmits *'available'* for the "Flow" status bit. The metering monitor can be switched on and off via the PROFIBUS® using the *'Flow control'* parameter - see “Operation” chapter.

4 Installation

Bus installation

All devices that are members of the bus system must be connected in a line. There are up to 32 possible positions (master, slaves, repeaters).

At both the beginning and end of the cable, the bus must be terminated with a terminating resistance.

Plugs and cables

For the PROFIBUS® cable, use a screened, twisted-pair cable in conformity with EN 50170 (cable type A).

Use of shielding which is earthed at one end prevents low-frequency ground loops. Shielding earthed at one end has no effect in combating HF magnetic pick-up. Shielding earthed at both ends as well as twisted conductors work to counter magnetic HF pick-up, but have no effect against electrical HF pick-up.

For PROFIBUS®, it is recommended to establish a bilateral, low-inductance (i.e., large area and low-impedance) connection with the protective earth.

The overall length of the bus cabling without repeaters varies according to the desired data transmission rate:

Tab. 1: Data transmission rate and length of the bus cabling

Data transmission rate	Maximum length of bus cabling
kBit/s	m
1500	200
500	400
187.5	1000
93.75	1200
19.2	1200
9.6	1200

The PROFIBUS® module has a M12 industry socket for connection to the PROFIBUS® cable. The pin configuration complies with the PROFIBUS® standard - see below - which means that commercially available bus plugs may be used. Please note that cable connections made with these plugs generally only meet the requirements for protection against contact and moisture according to IP 20!

Note for achieving IP 65 degree of protection

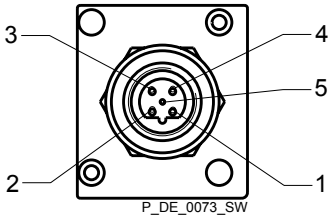
An installation compliant with the protection against contact and moisture according to IP 65 is possible, since the M12 industry socket of the PROFIBUS® module allows this. However, in this case the PROFIBUS® cable must also be fitted with M12 industry plugs in conformity with IP 65.

In order to achieve the IP 65 degree of protection for the PROFIBUS® cable installation, special Y-adapters or terminating adapters must be installed (e.g. - see below).

CAUTION!

- Degree of protection IP 65 applies only to a plug/ socket combination that has been screwed together!
- In ambient conditions requiring protection against contact and moisture according to IP 65, cables with moulded M12 industry plugs must be used (e.g., see below).
- Degree of protection IP 65 applies only to an unwired pump (with PROFIBUS® module) if an IP 65-capable cover is placed over the M12 industry socket! The cover included in the delivery does not guarantee chemical resistance.

Socket on the PROFIBUS® module (M12)

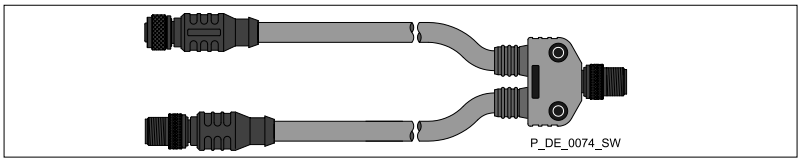


1 5 V
2 A conductor (green)
3 GND
4 B conductor (red)
5 Shielding

.

Y-adapter (order no. 1040956)

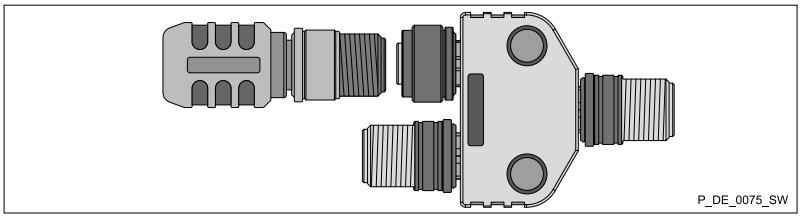
The Y-adapter connects to the pump using a moulded M12 plug. The ends are provided with an M12 plug and an M12 socket. The Y-adapter complies with the requirements for protection against contact and moisture according to IP 65.



.

PROFIBUS® termination, complete (order no. 1040955)

If the pump is the last bus device connected to the PROFIBUS® cable, it must be connected completely as a termination using the PROFIBUS® termination - see EN 50170. The PROFIBUS® termination, complete, complies with the requirements for protection against contact and moisture according to IP 65. (It consists of a Y-plug and terminating resistance.)



5 Operation

5.1 General

The plugged-in PROFIBUS® module make the PROFIBUS® pump a device with slave functionality in conformity with DP-V1. This means that the payload is transmitted both cyclically and acyclically.

5.2 GSD file

The GSD file must be used for configuring the master. It describes all features of the pump in PROFIBUS® operation (keywords, diagnosis, modules, slots). The GSD file can be downloaded from the PROFIBUS® website and from the ProMinent website. The file name is clearly indicated:
`PROM0B02.GSD`

5.3 Description of the data objects

Description of the data objects

The initial parameters must be transmitted from the master so that the pump can participate in cyclic data transmission. Only standard parameterisation is needed for this – there are no application-specific parameters.

Please note: Data is stored according to the "Big-Endian" principle! This means that the byte with the highest-value bits is stored first at the memory location with the lowest storage address. For an example based on “Status” - refer to the section below:

The pump status is stored as UINT32 type at the offset addresses +0 to +3. Bytes are stored in this sequence:

Name	Type	Offset	Byte	Bits
Status	UINT32	+0	0	24 ... 31
		+1	1	16 ... 23
		+2	2	8… 15
		+3	3	0… 7

All the data objects that can be cyclically transmitted are described below.

Tab. 2: All data objects

Name	No.	Type	Description		
Device identifier	0	UINT32	Byte 0+1	= 0x0B02	Identification number
			Byte 2	= 0x50	ProMinent- Identifier for Pumps product group
			Byte 3	= 3	"Sigma b” pump family
Status	1	UINT32	**bit**	**Name**	**Function**

Name	No.	Type	Description			
			0	System	00 – Init	03 –Test
			1		01 – Ready	04 - First run
			2		02 – Diagnosis	05 - Power down
			3	Mode	00 – halt	03 –contact
			4		01 – manual	04 - analogue
			5		02 – batch	
			6	Error	There are errors - see "Errors"	
			7	Warnings	There are warnings - see "Warnings"	
			8	Stop	Pump has stopped	
			9	Priming	Pump is in priming operation (higher-level function)	
			10	Auxiliary	Pump is in auxiliary operation (higher-level function)	
			11	Pause	Pump has been switched to Pause (higher-level function)	
			12	Module	Automatic operation	
			13	Flow	Metering monitor activated	
			14	Batch Mem.	Batch memory is activated	
			15	Calibrated	Pump is calibrated	
			16	Relay 1	Relay 1 is physically present	
			17	Relay 2	Relay 2 is physically present	
			18	AnalogOut	Module is physically present	
			19	Diaphragm rupture	Diaphragm rupture option is installed	
			21	-	-	
			22	-	-	
			24	Overpressure	Drive control signals “back pressure too high”	
			27	-	Always true	
Start-Stop	2	BYTE	Corresponds to Start-Stop switch; if Start-Stop = 0, then the pump is stopped.			
Reset	3	BYTE	If the “Reset” value is switched from 1 to 0, the internal pump memory is deleted (e.g., with batch metering) and - as far as possible - existing errors are deleted.			
Mode	4, 5	BYTE	**Value**	**Name**	**Description**	
			0	Stop	Pump is ready but not metering.	
			1	Manual	Pump is metering continuously at the set frequency.	
			2	Batch	When triggered, the pump meters the number of strokes set in batch preselection.	
			3	Contact	Pump is metering the number of strokes calculated from the product of “Number of triggers * External factor”.	

Name	No.	Type	Description		
			4	Analogue	Pump meters according to the analogue signal and the *'Analogue'* operating mode set on the pump.
Frequency	6, 7	UINT16	Set metering frequency in strokes / hour (0.. "Maximum frequency").		
Actual frequency	8	UINT16	Actual metering frequency in strokes / hour (0.. 'Maximum frequency').		
Maximum frequency	9	UINT16	Maximum metering frequency in strokes / hour (0...12000). The maximum frequency can be significantly lower than in normal mode according to the metering mode set.		
Batch preselection	10, 11	UINT32	Number of strokes in batch operation per trigger. (0…99999).		
Batch start	12	BYTE	If the value changes from 1 to 0, batch metering is activated in batch operation. Batches can also be activated via the contact input.		
Batch memory	13	BYTE	If the batch memory is activated and a new batch is triggered during batch metering already in progress, the remaining strokes are increased by the number of the new batch. If the memory is not activated, the remaining strokes of the batch not yet processed are deleted and the new batch is processed.		
Remaining strokes	14	UINT32	The strokes still to be processed with batch metering		
External factor	15, 16	UINT16	Factor by which the incoming pulses are multiplied. The factor is given as a hundredth. Value range is 1…9999 - the factor is then 0.01…99.99.		
External memory	17	BYTE	Analogue, like batch metering, is also added up here with high factors or the remaining strokes are deleted.		
Stroke length	18	BYTE	Stroke length set on the pump (0...100%)		
Metering monitor	19	BYTE	If a metering monitor is installed, it can be switched on (1). Deactivation is (0).		
Error	21	UINT16	**bit**	**Name**	**Function**
			0	Minimum	Metering liquid level too low
			1	Batch	Too many metering strokes > 100000
			2		Analogue current is less than 4 mA
			3	Analogue > 23mA	Analogue current is greater than 23 mA
			4	Metering monitor	Metering monitor fault
			5	Diaphragm rupture	Faulty diaphragm in the dosing head
			7	Overpressure	Overpressure in the hydraulic system
			8	-	-
			9	-	-
			11	Stroke length changes	The stroke length was changed in locked state.
			13	Bus error	Bus error reported by the module

Name	No.	Type	Description		
			14	System error	System components faulty - see LCD screen
			15	Module error	Fault in module handling
Warnings	22	UINT16	**bit**	**Name**	**Function**
			0	Minimum	Metering liquid level too low
			1	Calibration	Stroke length set outside the calibration tolerance
			2	Metering monitor	Metering monitor fault
			3	Diaphragm rupture	Faulty diaphragm in the dosing head
			4	Airlock	Air in the dosing head
			5	-	-
			6	-	-
			7	Overpressure	Overpressure in the hydraulic system
			8	Low pressure	Pressure too low in the hydraulic system
Stroke counter	23	UINT32	Counts the number of strokes since the last reset		
Delete stroke counter	24	BYTE	If the value changes from 1 to 0, the stroke counter is deleted		
Quantity counter	25	FLOAT	Counts the capacity since the last reset in litres		
Litres per stroke	26	FLOAT	Litres per stroke. Depending on the frequency and stroke length adjustment		
Delete quantity counter	27	BYTE	If the value changes from 1 to 0, the volume counter is deleted		
Identity code	28	STRING	Pump identity code (pump specification)		
Serial number	29	STRING	Pump serial number		
Name	30	STRING	Pump name, freely determinable (max. 32 characters)		
Installation site	31	STRING	Installation site, freely determinable. (max. 32 characters)		

5.4 Cyclic data transmission

DP-V0 describes the cyclic data transmission in the PROFIBUS®.

5.4.1 Overview of the data objects

The data objects are summarised into modules and their configuration identifier – see following table. The configuration identifier allows modules to be excluded from cyclic data transmission during configuration to avoid unnecessarily burdening the cyclic data transmission.

Tab. 3: Modular construction

Module no.	Output	Length	Input	Length	Module name	Configuration identifier (hex)
1	-	-	Status	4 byte	Status	40.83
2	Start-Stop Reset	1 byte 1 byte	-	-	Control	80.81
3	Mode	1 byte	Mode	1 byte	Operating mode	C0,80,80
4	Frequency	2 byte	Frequency Actual frequency	2 byte 2 byte	Frequency	C0,81,83
5	-	-	Maximum frequency	2 byte	Maximum frequency	40.81
6	Batch preselection Batch start Batch memory	4 byte 1 byte 1 byte	Batch preselection	4 byte	Batching	C0,85,83
7	-	-	Remaining strokes	4 byte	Remaining strokes	40.83
8	External factor External memory	2 byte 1 byte	External factor	2 byte	Transmission multiplier	C0,82,81
9	-	-	Stroke length	1 byte	Stroke length	40.80
10	Metering monitor	1 byte	-	-	Flow Control	80.80
12	-	-	Error Warnings	2 byte 2 byte	Error / Warning	40.83
13	Delete stroke counter	1 byte	Stroke counter	4 byte	Stroke number	C0,80,83
14	Delete quantity counter	1 byte	Quantity counter Litres per stroke	4 byte 4 byte	Quantity	C0,80,87

Tab. 4: Pump data (output data)

Offset	Value	Type	Name	Range	Module name	Module no.
+0	-	BYTE	Start-Stop	0.1	Control	2
+1	-	BYTE	Reset	0.1↓	-	
+2	-	BYTE	Mode	see	Operating mode	3
+3 +4	high low	UINT16	Frequency	0..max. Freq.	Frequency	4
+5 +6 +7 +8	high ↓ low	UINT32	Batch preselection	1..99999	Batching	6
+9	-	BYTE	Batch start	0.1↓	-	
+10	-	BYTE	Batch memory	0.1	-	

Offset	Value	Type	Name	Range	Module name	Module no.
+11 +12	high low	UINT16	External factor	0..9999	Transmission multiplier	8
+13	-	BYTE	External memory	0.1	-	
+14	-	BYTE	Metering monitor	0.1	Flow Control	10
+15	-	BYTE	Delete stroke counter	0.1↓	Stroke number	13
+16	-	BYTE	Delete quantity counter	0.1↓	Quantity	14

Tab. 5: Pump data (input data)

Offset	Value	Type	Name	Range	Module name	Module no.
+0 +1 +2 +3	high ↓ low	UINT32	Status	see	Status	1
+4	-	BYTE	Mode	see	Operating mode	3
+5 +6	high low	UINT16	Frequency	0..max. Freq.	Frequency	4
+7 +8	high low	UINT16	Actual frequency	0..max. Freq.		
+9 +10	high low	UINT16	Maximum frequency	0..12000↓	Maximum frequency	5
+11 +12 +13 +14	high ↓ low	UINT32	Batch preselection	1..99999	Batching	6
+15 +16 +17 +18	high ↓ low	UINT32	Remaining strokes	1..99999	Remaining strokes	7
+19 +20	high low	UINT16	External factor	0..99999	Transmission multiplier	8
+21	-	BYTE	Stroke length	0..100↓	Stroke length	9
+26 +27	high low	UINT16	Error	see	Error / Warning	12
+28 +29	high low	UINT16	Warnings	see		
+30 +31 +32 +33	high ↓ low	UINT32	Stroke counter	0..(2^{32})-1	Stroke number	13

Offset	Value	Type	Name	Range	Module name	Module no.
+34 +35 +36 +37	high ↓ low	FLOAT	Quantity counter	... (litre)	Quantity	14
+38 +39 +40 +41	high ↓ low	FLOAT	Litres per stroke	... (litre)		

5.4.2 Configure

It is possible to select on the master which modules are to be involved in cyclic data transmission. Modules and slots always relate to each other. Empty spaces (empty modules) therefore have to be configured for modules to be excluded.

The target configuration is defined in the form of identifiers. The identifier is stated in the last column in for every defined module.

The identifiers of the modules have to be listed successively in ascending order. If the data of a module is not to be involved in cyclic data transmission, then an empty module must be configured at this point.

Example configurations

Tab. 6: Configuration for the transmission of all cyclic modules (42 byte input, 17 byte output)

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7	Module 8
40, 83	80, 81	C0, 80, 80	C0, 81, 83	80, 81	C0, 85, 83	40, 83	C0, 82, 81

Module 9	Module 10	Module 11	Module 12	Module 13	Module 14		
40, 83	80, 80	80, 80	40, 83	C0, 80, 83	C0, 80, 87		

The following table shows an example for a target configuration in which the modules 8, 10, 11 and 14 are excluded from the cyclic data transmission.

INFO

The data objects can still be reached acyclically.

Tab. 7: Target configuration

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7	Module 8
40 83	80 81	C0 80 80	C0 81 83	80 81	C0 85 83	40 83	0

Module 9	Module 10	Module 11	Module 12	Module 13	Module 14		
40 80	0	0	40 83	C0 80 83	0		

The pump checks whether the target configuration corresponds to the actual configuration. If this is not the case, the pump reacts and sends a configuration error in the standard diagnostics.

In order for the target configuration to function, the options for the creation of the identifier formats must be limited and the followings rules must be observed.

- Always use the special identifier format for the coding.
- Always use the byte structure as the format.
- Do not state any manufacturer-specific data (e.g., data types).
- Modules must always be replaced with empty modules to remove them from the cyclic data transmission.

By excluding individual modules from the cyclic data transmission, the offset addresses of the transmitted data objects will shift - see and :

Tab. 8: Pump data (reduced output data)

Offset	Value	Type	Name	Range	Module name	Module no.
+0	-	BYTE	Start-Stop	0.1	Control	2
+1	-	BYTE	Reset	0.1↓		
+2	-	BYTE	Mode	see	Operating mode	3
+3 +4	high low	UINT16	Frequency	0..max. Freq.	Frequency	4
+5 +6 +7 +8	high ↓ low	UINT32	Batch preselection	1..99999	Batching	6
+9	-	BYTE	Batch start	0.1↓		

Offset	Value	Type	Name	Range	Module name	Module no.
+10	-	BYTE	Batch memory	0.1		
+11	-	BYTE	Delete stroke counter	0.1↓	Stroke number	13

Tab. 9: Pump data (reduced input data)

Offset	Value	Type	Name	Range	Module name	Module no.
+0 +1 +2 +3	high ↓ low	UINT32	Status	see	Status	1
+4	-	BYTE	Mode	see	Operating mode	3
+5 +6	high low	UINT16	Frequency	0..max. Freq.	Frequency	4
+7 +8	high low	UINT16	Actual frequency	0..max. Freq.		
+9 +10	high low	UINT16	Maximum frequency	0..12000↓	Maximum frequency	5
+11 +12 +13 +14	high ↓ low	UINT32	Batch preselection	1..99999	Batching	6
+15 +16 +17 +18	high ↓ low	UINT32	Remaining strokes	1..99999	Remaining strokes	7
+19	-	BYTE	Stroke length	0..100↓	Stroke length	9
+20 +21	high low	UINT16	Error	see	Error / Warning	12
+22 +23	high low	UINT16	Warnings	see		
+24 +25 +26 +27	high ↓ low	UINT32	Stroke counter	0..(2^{32})-1	Stroke number	13

5.5 Acyclic data transmission

(from DP-V1)

The acyclically transmitted data are addressed via slot and index. All data summarised under one slot can then be addressed individually via the index and be transmitted acyclically.

Slots are identical to the modules of the cyclical transmission.

Tab. 10: Slots of the acyclic data objects

No.	Slot	Index	Data object	Type	Length	Channel	Channel	Read / write
0	Slot 0	1	Device identifier	UINT32	4 byte	MS1	MS2	read
1	Slot 1	1	Status	UINT32	4 byte	MS1	MS2	read
2	Slot 2	1	Start-Stop	BYTE	1 byte	MS1	MS2	write
3		2	Reset	BYTE	1 byte	MS1	MS2	write
4	Slot 3	1	Mode	BYTE	1 byte	MS1	MS2	write
5		2	Mode	BYTE	1 byte	MS1	MS2	read
6	Slot 4	1	Frequency	UINT16	2 byte	MS1	MS2	write
7		2	Frequency	UINT16	2 byte	MS1	MS2	read
8		3	Actual frequency	UINT16	2 byte	MS1	MS2	read
9	Slot 5	1	Maximum frequency	WORD	2 byte	MS1	MS2	read
10	Slot 6	1	Batch preselection	UINT32	4 byte	MS1	MS2	write
11		2	Batch preselection	UINT32	4 byte	MS1	MS2	read
12		3	Batch start	BYTE	1 byte	MS1	MS2	write
13		4	Batch memory	BYTE	1 byte	MS1	MS2	write
14	Slot 7	1	Remaining strokes	UINT32	4 byte	MS1	MS2	read
15	Slot 8	1	External factor	UINT16	2 byte	MS1	MS2	write
16		2	External factor	UINT16	2 byte	MS1	MS2	read
17		4	External factor	BYTE	1 byte	MS1	MS2	write
18	Slot 9	1	Stroke length	BYTE	1 byte	MS1	MS2	read
19	Slot 10	1	Metering monitor	BYTE	1 byte	MS1	MS2	write
21	Slot 12	1	Error	UINT16	2 byte	MS1	MS2	read
22		2	Warnings	UINT16	2 byte	MS1	MS2	read
23	Slot 13	1	Stroke counter	UINT32	4 byte	MS1	MS2	read
24		3	Delete stroke counter	BYTE	1 byte	MS1	MS2	write
25	Slot 14	1	Quantity counter	FLOAT	4 byte	MS1	MS2	read
26		2	Litres per stroke	FLOAT	4 byte	MS1	MS2	read
27		3	Delete quantity counter	BYTE	1 byte	MS1	MS2	write
28	Slot 15	1	Identity code	STRING	32 byte	MS1	MS2	read
29		2	Serial number	STRING	16 byte	MS1	MS2	read
30		3	Device names	STRING	32 byte	MS1	MS2	Read / write
31		4	Installation place	STRING	16 byte	MS1	MS2	Read / write

5.6 Extended diagnostics

(from the 7th byte)

The pump uses the mechanism of the extended PROFIBUS® diagnostics to report error statuses to the master. The extended diagnostics can be found in the diagnostics telegram. The extended diagnostics include the device-related "Alarm_Type (48)" and the "Diagnostic_User_Data".

Tab. 11: Construction of the extended PROFIBUS® diagnostics telegram

Header_Byte	Alarm_Type	Slot_Number	Alarm_Specifier	Diag-nostic_User_Data
Bit 1-6: Length of the status message, including Header_Byte	48	1	1	see Table ↳ *Tab. 12 'Diag-nostic_User_Data' on page 20*
Bit 7-8: 0				

Diagnostic_User_Data consists of a minimum of one group of 3 bytes with error information. Diagnostic_User_Data consists of a maximum of 19 groups. The error information of a group is coded as follows:

Tab. 12: Diagnostic_User_Data

Service no. (1st byte) (2nd byte)	Error type Type of data access (3rd byte)
No. – see Table ↳ *Chapter 5 'Operation' on page 10*	
0x30	OK
0x31	Date outside of limits
0x32	Date protected
0x34	Option not installed
0x35	Service not defined
0x36	Value cannot be changed
0x37	Update completed
0x55	Communication error
0xD3	Write access
0xE5	Read access

ProMinent GmbH
Im Schuhmachergewann 5-11
69123 Heidelberg
Germany
Telephone: +49 6221 842-0
Fax: +49 6221 842-419
Email: info@prominent.com
Internet: www.prominent.com

982306, 1, en_GB