SIEMENS

SITRANS F

Communication Modules

PROFIBUS PA/DP

Operating Instructions

Edition 09/2014

Answers for industry.

SIEMENS

SITRANS F

Communication Modules PROFIBUS PA/DP

Operating Instructions

Add-on module for use with transmitter types SITRANS F M MAG 6000 and SITRANS F C MASS 6000.

09/2014
A5E00726137-AF

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Division Process Industries and Drives
Postfach 48 48
90026 NÜRNBERG
GERMANY

Order number: A5E00726137
℗ 02/2015 Subject to change

Table of contents

Introduction

1

1.1 Purpose of the Operating Instructions

Purpose

The Operating Instructions provide all information necessary for the installation and use of the PROFIBUS PA and PROFIBUS DP add-on modules (FDK:085U0236 and FDK:085U0237), intended for use with the Siemens Flow Instruments USM-II family of transmitters presently including SITRANS F M MAG 6000 and SITRANS F C MASS 6000.

The Operating Instructions do not explain how to use PROFIBUS with any specific fieldbus host.

Basic knowledge required

The instructions are not intended to be a complete tutorial on the PROFIBUS protocol, and it is assumed the end user already has a general working knowledge of PROFIBUS communication, especially in respect of master station configuration and operation. However an overview is included in the following section to explain some fundamental aspects of the protocol.

See also

For more information about SITRANS F C and SITRANS F M transmitters and sensors, please refer to the appropriate Operating Instructions available on the flowdocumentation homepage (http://www.siemens.com/flowdocumentation) or on the SITRANS F literature CD-ROM.

1.2 PROFIBUS technology

PROFIBUS is a digital, serial, two-way communication system that interconnects field equipment such as sensors, actuators, and controllers. PROFIBUS is designed for instruments used in both process and manufacturing automation with built-in capability to distribute the control application across the network. The fieldbus environment is the base level group of digital networks in the hierarchy of plant networks.

Features

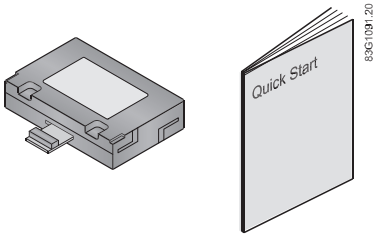
The fieldbus retains the desirable features of the 4–20 mA analog system, including a standardized physical interface to the wire, bus powered devices on a single wire, as well as intrinsic safety options. The fieldbus enables additional capabilities, such as:

- Increased capabilities due to full digital communications
- Reduced wiring and wire terminations due to multiple devices on one set of wires

- Increased selection of suppliers due to interoperability
- Reduced loading on control room equipment with the distribution of some control and input/ output functions to field device

1.3 Items supplied

- PROFIBUS PA / PROFIBUS DP add-on module
- PROFIBUS PA / DP Quick Start



1.4 History

Table 1-1 Firmware revision history

Edition	Changes in manual	FW version	Changes in firmware
12/2005	New	2.00	First edition, profile version 3.00
01/2007	None	2.01	Signalling of update events in status bytes
12/2007	Block tables updated with new parameters • Transmitter diagnosis • Description of I&M indexes • GSD files: – Parameterization – Configuration	2.02	Update to profile version 3.01 • Condensed Status and Diagnostic messages • Identification and Maintenance (I&M) • Access to all transmitter parameters
09/2014	• New configurations described in manual and gsd files. • Behaviour described in section 5.7	2.03	• Added new configurations in cyclic data for batching on relay output in MAG 6000 transmitter. GSD files are compatible from version si03xxxx.gsd and forward. • Update of batch setpoint and compensation in cyclic data no longer interrupts a running batch.

1.5 Further Information

Product information on the Internet

The Operating Instructions are available on the documentation disk shipped with the device, and on the Internet on the Siemens homepage, where further information on the range of SITRANS F flowmeters may also be found:

Product information on the internet (http://www.siemens.com/flow)

Worldwide contact person

If you need more information or have particular problems not covered sufficiently by these Operating Instructions, get in touch with your contact person. You can find contact information for your local contact person on the Internet:

Local contact person (http://www.automation.siemens.com/partner)

Safety notes

2

2.1 General safety instructions

⚠ CAUTION

Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Only qualified personnel should install or operate this instrument.

Note

Alterations to the product, including opening or improper modifications of the product are not permitted.

If this requirement is not observed, the CE mark and the manufacturer's warranty will expire.

2.2 Installation in hazardous area

The PROFIBUS DP module is not allowed for use in hazardous areas.

The PROFIBUS PA module is allowed for use in hazardous areas. In general the PROFIBUS PA output is Non-Ex, except when installed in a Compact SITRANS F C MASS 6000 Ex d or a SITRANS F M MAG 6000 I Ex d.

⚠ WARNING

Before installing in hazardous area, refer to the Operating Instructions of the relevant transmitter.

See also

Intrinsic safety data (Page 67)

Hardware installation

3

This chapter describes the HW installation procedure for the PROFIBUS PA and the PROFIBUS DP add-on modules on Siemens Flow Instruments USM-II transmitters.

The PROFIBUS PA/DP modules can be installed in SITRANS F C MASS 6000 and SITRANS F M MAG 6000 transmitters in all variants except Custody Transfer variants.

Note

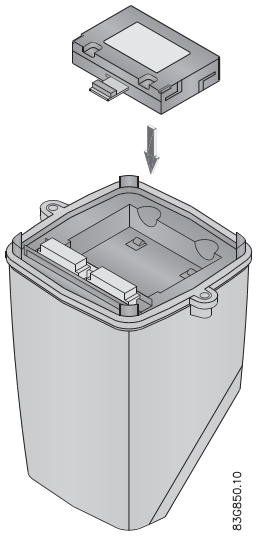
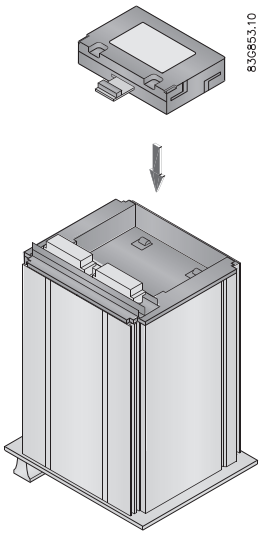
The PROFIBUS PA is allowed for use in hazardous areas. The PROFIBUS PA output is Non-Ex, except when installed in a Compact SITRANS F C MASS 6000 Ex d or a SITRANS F M MAG 6000 I Ex d.

The PROFIBUS DP in not allowed for use in hazardous areas.

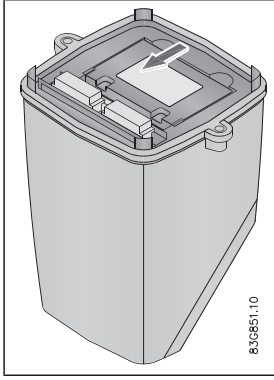
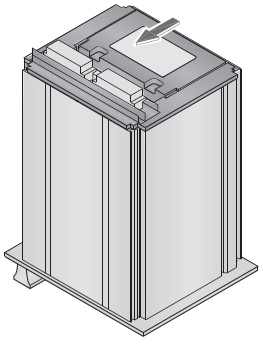
3.1 MAG/MASS 6000 IP67 or 19"

The installation of the add-on module on transmitter types SITRANS F M MAG 6000 IP67, SITRANS F M MAG 6000 19", SITRANS F C MASS 6000 IP67 and SITRANS F C MASS 6000 19" is carried out as follows:

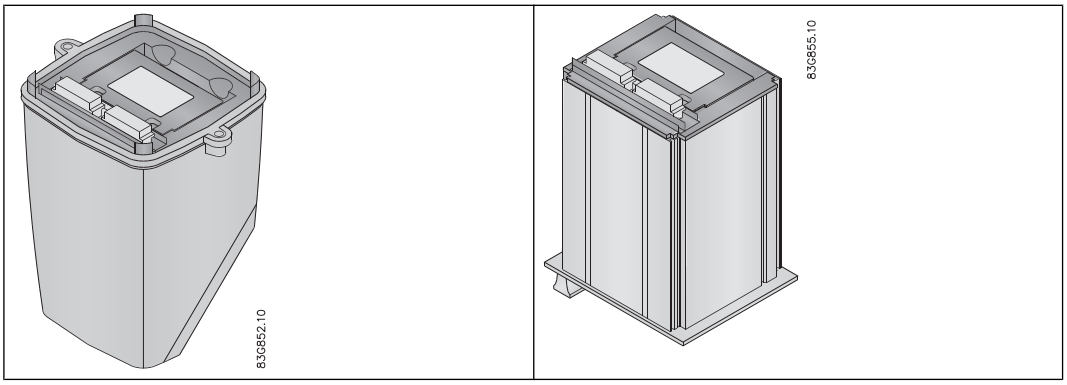
1. Insert the add-on module in the rear end of the transmitter

	
IP 67	19"

2. Press the add-on module in the direction shown until it stops and is firmly seated in position

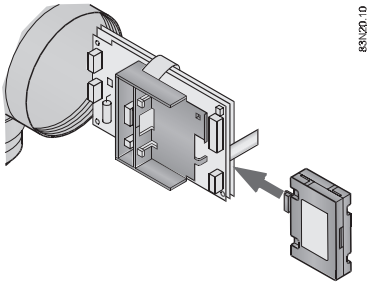
3. The installation is completed


A5E00726137-AF
83G852.10
83G855.10

3.2 MAG 6000 I

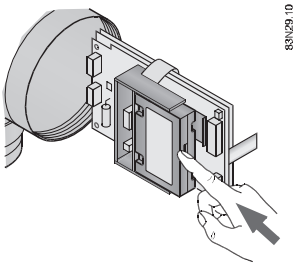
The installation of the add-on module on a SITRANS F M MAG 6000 I is completed as follows:

1. Open the transmitter

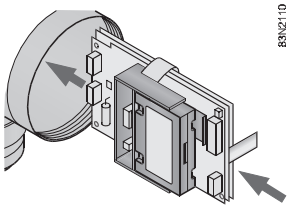


> **⚠ WARNING**
>
> Do not open the transmitter while power on

2. Press the add-on module in the direction shown until it stops and is firmly seated in position



3. Reinsert the complete transmitter module



> **⚠ WARNING**
>
> For installation in hazardous areas, refer to the Ex information in the Operating Instructions of the transmitter.

3.3 MASS 6000 Ex d

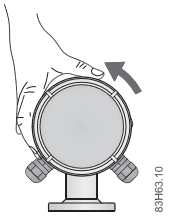
The installation of the add-on module on a SITRANS F C MASS 6000 Ex d is completed as follows:

1. Disconnect the equipment from the supply circuits

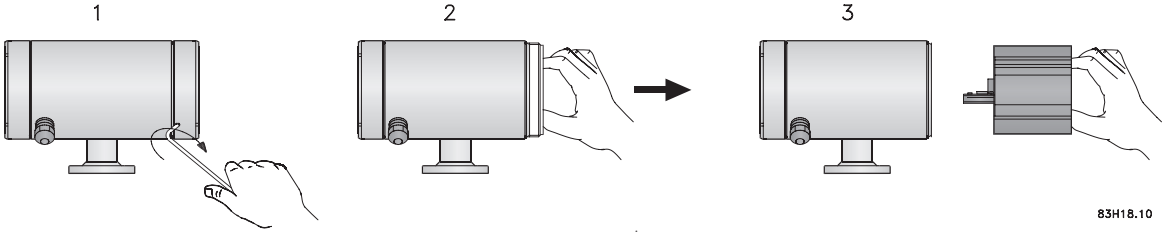
⚠ DANGER

In hazardous locations wait 30 minutes before proceeding further.

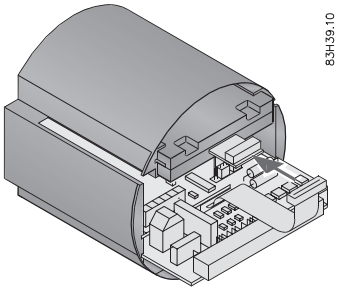
2. Remove the rear cover by loosening the safety tap allen screw and turn the rear cover counter-clockwise



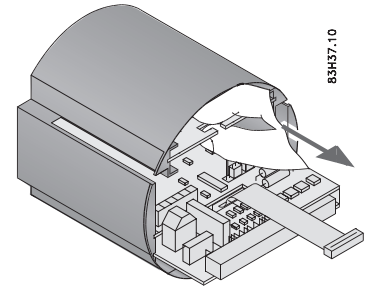
3. Remove the electronics using the holes provided



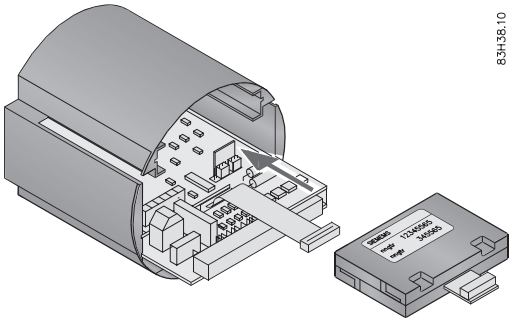
4. Remove the flat cable from the plate



5. Remove the plate from the module bay



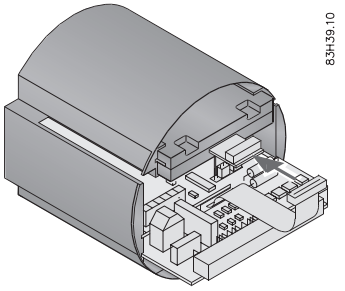
6. Insert the add-on module as shown.



Note

The label on the add-on module must face upwards and the connector outwards

7. Press the add-on module into position and connect the flat cable connector.



Connecting

4

On the electrical termination boards for USM-II transmitters, additional input/output terminals have been reserved for add-on module functions. The numbering range of these terminals is as follows, but how many are actually used depends on the type of add-on module.

Additional terminals reserved for add-on modules:

- MAG 6000: 91 - 97
- MASS 6000: 91 – 100

Note

The standard inputs and outputs continue to function and are not affected by the presence of an add-on module. Any existing transmitter electrical connections remain undisturbed. The MASS 6000 with extra outputs, i.e. 3 current outputs, cannot be extended with an add-on module

⚠ WARNING

Only authorized personnel are allowed to carry to carry out work on electrical connections.

See also

Refer to the relevant product operating instruction for other electrical connection information.

4.1 Wiring PROFIBUS PA

Terminals 95 and 96 are reserved for the PROFIBUS PA connection. The PROFIBUS PA interface is polarity independent, so the wires can be connected arbitrarily.

- 95: PA wire 1. This device is polarity independent
- 96: PA wire 2. This device is polarity independent

To achieve the best EMC performance, the unshielded wires should be as short as possible, 2-3 cm. Shield coverage of 90% is ideal.

⚠ CAUTION

Protection from electromagnetic interference

Use shielded twin core cables for connecting PROFIBUS PA to the SITRANS F transmitter.

Siemens provides a suitable cable for non-hazardous area with order number 6XV1 830-5BH10

Connection topologies

PROFIBUS PA supports LINE, DROP, STAR topology and a combination of the three. The upper half of the figure below shows LINE topology and the lower half shows DROP-LINE topology using a T-connector/Split-connector.

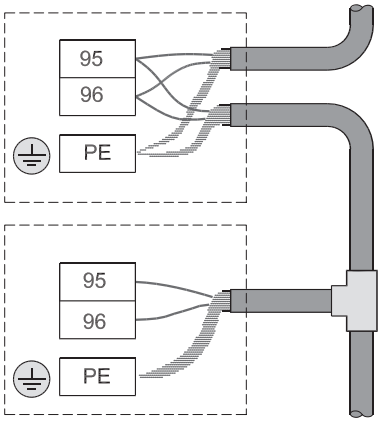


Figure 4-1 PA electrical connection

A maximum of 32 field devices may be connected per fieldbus segment (cf. IEC 61158-2 (MBP)). However, this number may be restricted due to type of ignition protection, bus power option, current consumption of field device etc.

A maximum of four field devices can be connected to a spur.

⚠ CAUTION

Termination

All PA networks must be terminated!

- Install bus terminations at each end of the cable. Terminations are not included in the scope of delivery.
  With various junction boxes (not Ex-rated), the bus termination can be activated via a switch. Otherwise a separate bus terminator must be installed.

  Note

  If the fieldbus is extended with a repeater, the extension must also be terminated at both ends.

  If the bus segment is branched, the device furthest from the segment connector represents the end of the bus.

- Connect shielding with the nearest reference ground.

  ⚠ CAUTION

  Systems without potential equalization

  Only ground cable shielding of fieldbus systems on one side, for example at the fieldbus supply unit or at safety barriers. Otherwise network frequency equalization currents can occur that damage the bus cable or the bus shielding and substantially affect signal transmission.

4.2 Wiring PROFIBUS DP

Terminals 91 to 94 are reserved for the PROFIBUS DP connection.

- 91: Termination terminal
- 92: Dataline B, Pin 3 in DB9 connector, red wire in PROFIBUS cable
- 93: Dataline A, Pin 8 in DB9 connector, green wire in PROFIBUS cable
- 94: Termination terminal

To achieve the best EMC performance, the unshielded wires should be as short as possible, 2-3 cm. Shield coverage of 90% is ideal.

⚠ CAUTION

Protection from electromagnetic interference

It is recommended to use shielded twin core cables for connecting PROFIBUS DP to the SITRANS F transmitter.

Connection topologies

DP supports LINE topology. This means that two cables enter the device. The upper half of the figure below shows one cable entering from the previous device, and one going out to the next device.

The lower half of the figure shows a terminated device. A device must only be terminated if it is the last device on the line, hence only one cable entering the device.

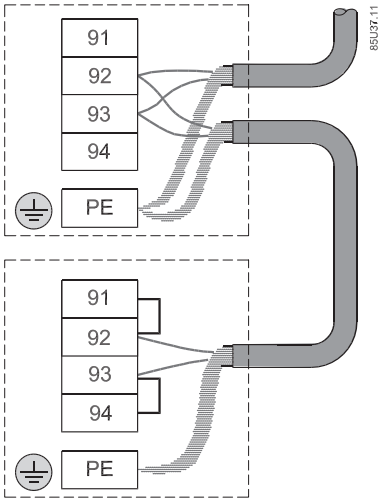


Figure 4-2 DP Electrical connection

Wiring

NOTICE
Termination All DP networks must be terminated! • Use very short wires for the termination

- Install bus terminations at each end of the cable. Terminations are not included in the scope of delivery.
  The device can be terminated by connecting terminals 91 to 92 and 93 to 94.
  With various junction boxes (not Ex-rated), the bus termination can be activated via a switch. Otherwise a separate bus terminator must be installed.

  Note

  If the fieldbus is extended with a repeater, the extension must also be terminated at both ends.

  If the bus segment is branched, the device furthest from the segment connector represents the end of the bus.

- Connect shielding with the nearest reference ground.

⚠ CAUTION
Systems without potential equalization Only ground cable shielding of fieldbus systems on one side, for example at the fieldbus supply unit or at safety barriers. Otherwise network frequency equalization currents can occur that damage the bus cable or the bus shielding and substantially affect signal transmission.

4.3 Installation check

- Make sure that the installation guidelines provided by the "Wiring & Installation Application Guide" on http://www.profibus.com/download/installation-guide/ are followed
- Make sure the wiring requirements for the device are met.
- Make sure that all connectors are properly tightened.

Block overview

5

This PROFIBUS interface complies with the PROFIBUS profile revision 3.01 for Electromagnetic and Coriolis flow transmitters. Presently this includes the MAG 6000 Electromagnetic flow transmitters, and the MASS 6000 Coriolis mass flow transmitters.

During power-up and initialization the module automatically detects the type of transmitter (MAG 6000 or MASS 6000) to which it has been attached, and then communicates the correct slot and index address structure to the bus master.

Much of the device configuration information within the address blocks is standard information and is common to USM-II transmitters (both SITRANS F M and SITRANS F C). The following sections in this document deal with the overall structure and parameters within the slots, blocks, and indexes.

Differences between SITRANS F M and SITRANS F C are explained, and additional comments are given where necessary to clarify the use or understanding of a particular index.

5.1 Cyclic services

The following parameters are accessible using an MS0 relationship from a Class 1 Master.

MS0 specifies cyclic data exchange between a Master and a Slave.

	Parameter	SITRANS F M MAG 6000	SITRANS F C MASS 6000
Input (Master view)	Mass flow		✓
	Volume flow	✓	✓
	Temperature		✓
	Density		✓
	Fraction A[1)]		✓
	Fraction B[1)]		✓
	Pct Fraction A[1)]		✓
	Totalizer 1	✓	✓
	Totalizer 2[2)]	✓	✓
	Batched amount [2)]	✓	✓
	Batch Setpoint	✓	✓
	Batch Compensation	✓	✓
	Batch status (running…)	✓	✓

	Parameter	SITRANS F M MAG 6000	SITRANS F C MASS 6000
Output (Master view)	Set totalizer 1+2	✓	✓
	Set Mode Totalizer 1+2	✓	✓
	Batch Control (start, stop..)	✓	✓
	Batch Setpoint	✓	✓
	Batch Compensation	✓	✓

1) Requires a SENSORPROM containing valid fraction data.

2) Value returned is dependent on the BATCH function.

(When ON, Batch progress is returned, When OFF, TOTALIZER 2 is returned.)

5.2 Acyclic services

The following table lists the additional device specific parameters in SITRANS F M MAG 6000 and SITRANS F C MASS 6000 that are not specified in the PA profile. Parameters can be accessed using a Master Class 1 or Master Class 2.

Table 5-1 Acyclic services

	Parameter	SITRANS F M MAG 6000	SITRANS F C MASS 6000
Process values	Mass flow		✓
	Volume flow	✓	✓
	Temperature		✓
	Density		✓
	Fraction A[1)]		✓
	Fraction B[1)]		✓
	Pct Fraction A[1)]		✓
	Totalizer 1	✓	✓
	Totalizer 2[2)]	✓	✓
	Batched amount	✓	✓
Current output	On/Off	✓	✓
	Selection	✓	✓
	Direction	✓	✓
	Range	✓	✓
	Time constant	✓	✓
	Force mode[1)]	✓	✓
	Force value[1)]	✓	✓

	Parameter	SITRANS F M MAG 6000	SITRANS F C MASS 6000
Digital output	Function	✓	✓
	Frequency selection	✓	✓
	Frequency direction	✓	✓
	Frequency range	✓	✓
	Frequency time constant	✓	✓
	Pulse selection[1)]	✓	✓
	Pulse volume/pulse[1)]	✓	✓
	Pulse volume/pulse min.[1)]	✓	✓
	Pulse volume/pulse max.[1)]	✓	✓
	Pulse volume/pulse unit[1)]	✓	✓
	Pulse mass/pulse[1)]		✓
	Pulse mass/pulse min.[1)]		✓
	Pulse mass/pulse max.[1)]		✓
	Pulse mass/pulse unit[1)]		✓
	Pulse direction[1)]	✓	✓
	Pulse width[1)]	✓	✓
	Pulse polarity[1)]	✓	✓
	Pulse quadrature[1)]		✓
	Pulse time constant[1)]	✓	
	Digital limit selection[1)]	✓	✓
	Digital limit setpoint 1[1)]	✓	✓
	Digital limit setpoint 2[1)]	✓	✓
	Digital limit hysteresis[1)]	✓	✓
	Digital force mode	✓	✓
	Digital force frequency	✓	✓
	Digital force level[1)]	✓	✓
Relay output	Mode[1)]	✓	✓
	Limit selection[1)]	✓	✓
	Limit setpoint 1[1)]	✓	✓
	Limit setpoint 2[1)]	✓	✓
	Limit hysteresis[1)]	✓	✓
	Cleaning cycle[1)]	✓	
	Force mode[1)]	✓	✓
	Force value[1)]	✓	✓
Digital input	Function[1)]	✓	✓
	Totalizer reset mode[1)]	✓	✓
	Force output value[1)]	✓	✓

	Parameter		SITRANS F M MAG 6000	SITRANS F C MASS 6000
Batch Control	On/Off		✓	✓
	Selection		✓	✓
	Setpoint		✓	✓
	Batch compensation		✓	✓
	Cycle counter		✓	✓
	Cycle counter reset		✓	✓
	Mode:	Start	✓	✓
		Pause	✓	✓
		Resume	✓	✓
		Stop	✓	✓
	Counter direction		✓	✓
	Time out		✓	✓
	Time out error		✓	✓
	Overrun		✓	✓
	Overrun error		✓	✓

	Parameter	SITRANS F M MAG 6000	SITRANS F C MASS 6000
General	Sensor type	✓	✓
	Sensor size text	✓	✓
	Sensor temperature coeff. [1)]		✓
	Density parameter A[1)]		✓
	Density parameter B[1)]		✓
	Density temperature coeff. ([1)]		✓
	Density offset[1)]		✓
	Density factor[1)]		✓
	Fraction offset[1)]		✓
	Table slope[1)]		✓
	Driver signal[1)]		✓
	Pickup 1 amplitude[1)]		✓
	Pickup 2 amplitude[1)]		✓
	Zero adjust time		✓
	Zero adjust progress		✓
	Zero Sigma		✓
	Zero Sigma limit		✓
	Zero adjust state		✓
	Mains frequency	✓	
	Correction factor[1)]	✓	✓
	Low flow cut-off percent	✓	✓
	Empty pipe mode	✓	✓
	Empty pipe limit	✓	✓
	Noise filter		✓
	Excitation mode[1)]	✓	
	Exctation frequency	✓	
	Scale upper	✓	✓
	Scale lower	✓	✓
	Q max 2 (night)[1)]	✓	
	Broadcast interval		✓
Error Log/Pending	Error pending/Status log list	✓	✓
	Reset status list	✓	✓
	Suppress error P40	✓	✓
	Error number[1)]	✓	✓
	Error level[1)]	✓	✓

	Parameter	SITRANS F M MAG 6000	SITRANS F C MASS 6000
HMI settings	Line 1 select	✓	✓
	Line 2 select	✓	✓
	Line 3 select	✓	✓
	Units	✓	✓
	Point position	✓	✓
	Language	✓	✓

1) Requires a SENSORPROM containing valid fraction data.

2) Value returned is dependent on the function. (When ON, Batched amount is returned, When OFF, TOTALIZER 2 is returned.)

5.3 Cyclic data exchange

A central controller that cyclically exchanges data with slave devices on a PROFIBUS network is called a Master class 1 device. A GSD file is normally used when setting up the master to exchange data with the slave device. The order of the data in the cyclic message is the same as the order in the GSD file.

Each device supports three different GSD files. The manufacturer specific and the manufacturer independent Profile 3 GSD-files are described in the following.

For a description of Profile 2 GSD-files, please refer to the Profile 2 Operating Manuals, available on the flowdocumentation website (http://www.siemens.com/flow), in the Archive.

Manufacturer specific GSD

This GSD file provides the most comprehensive configuration capabilities.

The following tables list the configuration modules of the GSD file that are possible to configure in respective slots of the class 1 master. Identifier formats for the different configuration modules are found in the Configuration module appendix (Page 133).

Table 5-2 Manufacturer specific GSD, PA Profile 3.00, SITRANS F M MAG 6000

Slot	Parameter name	Configuration modules	Input/output byte sequence	Description
1	Volumeflow	AI (Volumeflow)	Input byte 1 to 5	Volumeflow
2	Totalizer 1	TOTAL	Input byte 1 to 5	Totalizer1
		TOTAL SET_TOT	Input byte 1 to 5 Output byte 1	Totalizer1 Reset Control
		TOTAL SET_TOT MODE_TOT	Input byte 1 to 5 Output byte 1 Output byte 2	Totalizer1 Reset Control Mode control

Slot	Parameter name	Configuration modules	Input/output byte sequence	Description
3	Totalizer 2	TOTAL	Input byte 1 to 5	Totalizer2
		SET_TOT	Output byte 1	Totalizer2
		TOTAL	Input byte 1 to 5	Reset Control
		TOTAL	Input byte 1 to 5	Totalizer2
		SET_TOT	Output byte 1	Reset Control
		MODE_TOT	Output byte 2	Mode control
		BATCH_DO	Input byte 1 to 5	Batch Amount on Digital Output
		B_CTR	Output byte 1	Batch Control
		BATCH_DO	Input byte 1 to 5	Batch Amount on Digital Output
		B_CTR	Output byte 1	Batch Control
		SETP	Output byte 2 to 6	Batch Setpoint
		BATCH_DO	Input byte 1 to 5	Batch Amount on Digital Output
		B_CTR	Output byte 1	Batch Control
		SETP	Output byte 2 to 6	Batch Setpoint
		COMP	Output byte 7 to 11	Batch Compensation
		BATCH_DO	Input byte 1 to 5	Batch Amount on Digital Output
		B_CTR	Output byte 1	Batch Control
		B_STA	Input byte 6	Batch Status
		BATCH_DO	Input byte 1 to 5	Batch Amount on Digital Output
		B_CTR	Output byte 1	Batch Control
		B_STA	Input byte 6	Batch Status
		SETP	Output byte 2 to 6	Batch Setpoint
		BATCH_DO	Input byte 1 to 5	Batch Amount on Digital Output
		B_CTR	Output byte 1	Batch Control
		B_STA	Input byte 6	Batch Status
		SETP	Output byte 2 to 6	Batch Setpoint
		COMP	Output byte 7 to 11	Batch Compensation
		BATCH_RO	Input byte 1 to 5	Batch Amount on Relay Output
		B_CTR	Output byte 1	Batch Control
		BATCH_RO	Input byte 1 to 5	Batch Amount on Relay Output
		B_CTR	Output byte 1	Batch Control
		SETP	Output byte 2 to 6	Batch Setpoint
		BATCH_RO	Input byte 1 to 5	Batch Amount on Relay Output
		B_CTR	Output byte 1	Batch Control
		SETP	Output byte 2 to 6	Batch Setpoint
		COMP	Output byte 7 to 11	Batch Compensation
		BATCH_RO	Input byte 1 to 5	Batch Amount on Relay Output
		B_CTR	Output byte 1	Batch Control
		B_STA	Input byte 6	Batch Status
		BATCH_RO	Input byte 1 to 5	Batch Amount on Relay Output
		B_CTR	Output byte 1	Batch Control
		B_STA	Input byte 6	Batch Status
			Output byte 2 to 6	Batch Setpoint

Slot	Parameter name	Configuration modules	Input/output byte sequence	Description
		SETP		
		BATCH_RO	Input byte 1 to 5	Batch Amount on Relay Output
		B_CTR	Output byte 1	Batch Control
		B_STA	Input byte 6	Batch Status
		SETP	Output byte 2 to 6	Batch Setpoint
		COMP	Output byte 7 to 11	Batch Compensation
Any		EMPTY_MOD-ULE		Inserted in a slot in order to exclude data

Table 5-3 Manufacturer specific GSD, PA Profile 3.00, SITRANS F C MASS 6000

Slot	Parameter name	Configuration modules	Input/output byte sequence	Description
1	Massflow	AI (Massflow)	Input byte 1 to 5	Massflow
2	Density	AI (Density)	Input byte 1 to 5	Density
3	Temperature	AI (Temperature)	Input byte 1 to 5	Temperature
4	Totalizer 1	TOTAL	Input byte 1 to 5	Totalizer1
		TOTAL	Input byte 1 to 5	Totalizer1
		SET_TOT	Output byte 1	Reset Control
		TOTAL	Input byte 1 to 5	Totalizer1
		SET_TOT	Output byte 1	Reset Control
		MODE_TOT	Output byte 2	Mode control

Slot	Parameter name	Configuration modules	Input/output byte sequence	Description
5	Totalizer 2	TOTAL	Input byte 1 to 5	Totalizer2
		TOTAL SET_TOT	Input byte 1 to 5 Output byte 1	Totalizer2 Reset Control
		TOTAL SET_TOT MODE_TOT	Input byte 1 to 5 Output byte 1 Output byte 2	Totalizer2 Reset Control Mode control
		BATCH_DO B_CTR	Input byte 1 to 5 Output byte 1	Batch Amount on Digital Output Batch Control
		BATCH_DO B_CTR SETP COMP	Input byte 1 to 5 Output byte 1 Output byte 2 to 6 Output byte 7 to 11	Batch Amount on Digital Output Batch Control Batch Setpoint Batch Compensation
		BATCH_DO B_CTR B_STA	Input byte 1 to 5 Output byte 1 Input byte 6	Batch Amount on Digital Output Batch Control Batch Status
		BATCH_DO B_CTR B_STA SETP	Input byte 1 to 5 Output byte 1 Input byte 6 Output byte 2 to 6	Batch Amount on Digital Output Batch Control Batch Status Batch Setpoint
		BATCH_DO B_CTR B_STA SETP COMP	Input byte 1 to 5 Output byte 1 Input byte 6 Output byte 2 to 6 Output byte 7 to 11	Batch Amount on Digital Output Batch Control Batch Status Batch Setpoint Batch Compensation
6	Volumeflow	AI (Volumeflow)	Input byte 1 to 5	Volumeflow
7	Fraction A	AI (Fraction A)	Input byte 1 to 5	Fraction A
8	Fraction B	AI (Fraction B)	Input byte 1 to 5	Fraction B
9	PCT Fraction A	AI (PCT Fraction A)	Input byte 1 to 5	PCT Fraction A
Any		EMPTY_MODULE		Inserted in a slot in order to exclude data

Manufacturer independent GSD

This GSD file can be downloaded from www.profibus.com and ensures compatibility with similar devices from other manufactures. It only provides a subset of the manufacturer specific GSD file.

Table 5-4 Manufacturer independent GSD, PA Profile 3.00, SITRANS F M MAG 6000

Slot	Parameter name	Configuration modules	Description
1	AI Flow	AI	Volumeflow
2	Totalizer	TOTAL	Totalizer1
		TOTAL SET_TOT	Totalizer1 Reset Control
		TOTAL SET_TOT MODE_TOT	Totalizer1 Reset Control Mode control
Any		EMPTY_MODULE	Inserted in a slot in order to exclude data

Table 5-5 Manufacturer independent GSD, PA Profile 3.00, SITRANS F C MASS 6000

Slot	Parameter name	Configuration modules	Description
1	AI Flow	AI	Massflow
2	Density	AI	Density
3	Temperature	AI	Temperature
4	Totalizer	TOTAL	Totalizer1
		TOTAL SET_TOT	Totalizer1 Reset Control
		TOTAL SET_TOT MODE_TOT	Totalizer1 Reset Control Mode control
Any		EMPTY_MODULE	Inserted in a slot in order to exclude data

5.4 Cyclic data configuration

AI and TOTAL

Configuration modules of type: AI and TOTAL are all in the format "Data type 101".

Table 5-6 Data type 101 (5 bytes)

VALUE	STATUS
(FLOAT32)	(BYTE)

The first part is the VALUE (4 bytes) in the format FLOAT32 according to IEEE 754. The second part is the STATUS indicating the quality of the VALUE.

Modules: AI and TOTAL are input data to the master. The VALUE has the following default units:

Table 5-7 AI and TOTAL

VALUE	Unit
Volumeflow	m^3/h
Massflow	kg/h
Density	kg/l
Temperature	K
Fraction A+B	kg/s
pct. Fraction A	%

VALUE	MAG6000 Unit	MASS6000 Unit
Totalizer 1	Volumeflow (m^3)	Massflow (kg)
Totalizer 2	Volumeflow (m^3)	Volumeflow (m^3)

The meaning of STATUS is specified in Chapter 7.4.

If any of the modules are not to be used, the "EMPTY_SLOT" can be used instead. This reduces the data load on the bus, and the Master's use of address spacing.

SET_TOT

This control consists of 1 Byte.

Using this parameter the user can reset the related Totalizer to zero.

Table 5-8 SET_TOT

Value	Action
0x00	**RUN** The Totalizer is counting normally
0x01	**RESET** The Totalizer is set to zero.

To ensure 100% detection of the bit combinations, the bit-change must be active for a minimum of 100 mS.

MODE_TOT

This control consists of 1 Byte.

Using this parameter the user can change the count mode of the related Totalizer.

Table 5-9 MODE_TOT

Value	Action
0x00	**BALANCED** Totalizer will increment on positive flow and decrement on negative flow.
0x01	**POS_ONLY** The Totalizer will only count forward on positive flow.
0x02	**NEG_ONLY** The Totalizer will only count backwards on negative flow.
0x03	HOLD The Totalizer will stop counting.

All other values are ignored. The action takes place when the value is changed to a valid selection.

E.g. if MODE_TOT value changes from 0x03 to 0x02, the mode is changed to NEG_ONLY.

Following default values are used:

Table 5-10 MODE_TOT Default values

VALUE MODE	MAG 6000	MASS 6000
Totalizer 1	POS_ONLY Volumeflow (default unit: m^3)	POS_ONLY Massflow (default unit: L)
Totalizer 2	NEG_ONLY Volumeflow (default unit: m^3)	POS_ONLY Volumeflow (default unit: m^3)

To ensure 100% detection of the bit combinations, the bit-change must be active for a minimum of 100 mS.

B_CTR

This control consists of 1 Byte.

Table 5-11 B_CTR

Bit	Function	Description
7		
6	BRES	Resume a paused Batch
5	BPAU	Pause the Batch
4	BOFM	Batch ON/OFF MASK (1 = BOF will be detected ; 0 = BOF will NOT be detected)
3	BOF	Batch ON/OFF (1 = ON ; 0 = OFF)
2	USC	Update Setpoint and Compensation
1	BSTP	Batch Stop
0	BSRT	Batch Start

The actions take place when the bit changes from 0 to 1.

B_STA

This status consists of 1 Byte.

Table 5-12 B_STA

Value	Status
0x00	BATCH_OFF. Batch mode is not enabled.
0x01	BATCH_ON_STOPPED. Batch mode is enabled, but the Batch is stopped.
0x02	BATCH_ON_RUNNING. Batch mode is enabled and the Batch is running.
0x03	BATCH_ON_PAUSED. Batch mode is enabled, but the Batch is paused.

SETP and COMP

Configuration module of type: SETP and COMP are in the format "Data type 101".

Table 5-13 Data type 101 (5 bytes)

VALUE	STATUS
(FLOAT32)	(BYTE)

The first part is the VALUE (4 bytes) in the format FLOAT32 according to IEEE 754. The second part is the STATUS indicating the quality of the VALUE.

SETP and COMP are output data from the master. In this case the user must assign a VALUE and a STATUS.

If the STATUS of either Setpoint or Compensation is bad or uncertain, the corresponding value will not be updated in the flowmeter. This means that the parameters only will be accepted if status equals 0x80 or any other value in the category "Good".

The unit of SETP and COMP follows the related UNIT_TOT.

The default settings are:

Table 5-14 SETP and COMP Default values

VALUE	MAG 6000 unit	MASS 6000 unit
SETP	(l) Volume	(kg) Massflow
COMP	(l) Volume	(kg) Massflow

An update of Batch Setpoint and Compensation through cyclic communication cannot take place during a running batch. If a cyclic command for updating setpoint or compensation is made when a batch is started or paused, then the update is made after the batch is stopped.

EMPTY_MODULE

If any of the modules are not to be used, the "EMPTY_MODULE" can be used instead. This reduces the data load on the bus, and the Masters use of address spacing.

5.5 Acyclic communication

The following information is provided in this chapter:

- Overview of acyclic communication
- Addressing used for acyclic communication
- Example of how to read the low flow cut off using a S7-300/400

Overview

The ability to read and write data acyclicly to a PROFIBUS slave device was added to the PROFIBUS DP specification in order to support PROFIBUS PA. This was version 1 of the standard and is referred to as DPV1. All PROFIBUS PA slave devices support DPV1, and in the last few years many PROFIBUS DP masters have started to support this function as well. You should check with the PLC documentation to verify if the Siemens PLC you have supports DPV1 commands.

There are two types of PROFIBUS DP Masters, a Class 1 master and a Class 2 master. A Class 1 master handles cyclic communications to the slaves and is your traditional PLC or DCS. A Class 2 master is for monitoring and setting up a system and is your traditional engineering work station. SIMATIC S7-300 and S7-400 PLCs are both Class 1 masters. SIMATIC PDM is a class 2 master.

The PROFIBUS specification defines two types of acyclic connections, a so-called MSAC_C1 connection and an MSAC_C2 connection. An MSAC_C1 connection is from a Class 1 master. An MSAC_C2 connection is from a class 2 master.

All PROFIBUS PA slaves support MSAC_C2 connections. The SITRANS F communication modules PROFIBUS PA (FDK:085U0236) and PROFIBUS DP (FDK:085U0237) with PROFIBUS profile 3 support both MSAC__C1 and MSAC_C2.

Acyclic Addressing

Each parameter in a PROFIBUS PA slave are mapped to an address specified by slot and index. The slot number refers to an array of data. The index tells you where in the array, the data you want starts.

In the parameter tables in Appendix A (Page 69) a series of tables give the address of all the parameters for MAG 6000 and MASS 6000. The first diagram shows an overview of the slot indexes for MAG 6000 and MASS 6000. In following tables the different blocks (i.e. transducer block, Analog Input block etc.) are listed with the slot and index information. Then the parameters associated with that block are given in terms of a relative index. This means to get the absolute index, you add the relative index to the index.

Please note that the relative index for a particular parameter will remain the same for the life of the device. However, the index may change over different software revisions. Some software will have you address acyclic communications by using the block and relative index and it calculate the absolute index by looking up the directory. For the S7-300/400, the addressing is done using slot and index, so the user will have to know that this may change in later revisions of the equipment.

Example: Read Low Flow Cut Off in MAG 6000 or MASS 6000

This parameter is located in the Transducer Block (TB1) which is located in slot 1 and the absolute index is 154, the relative index is 9 and the value is a float.

Therefore the address will be:

- Slot: 1
- Absolute index = 154 = x9A

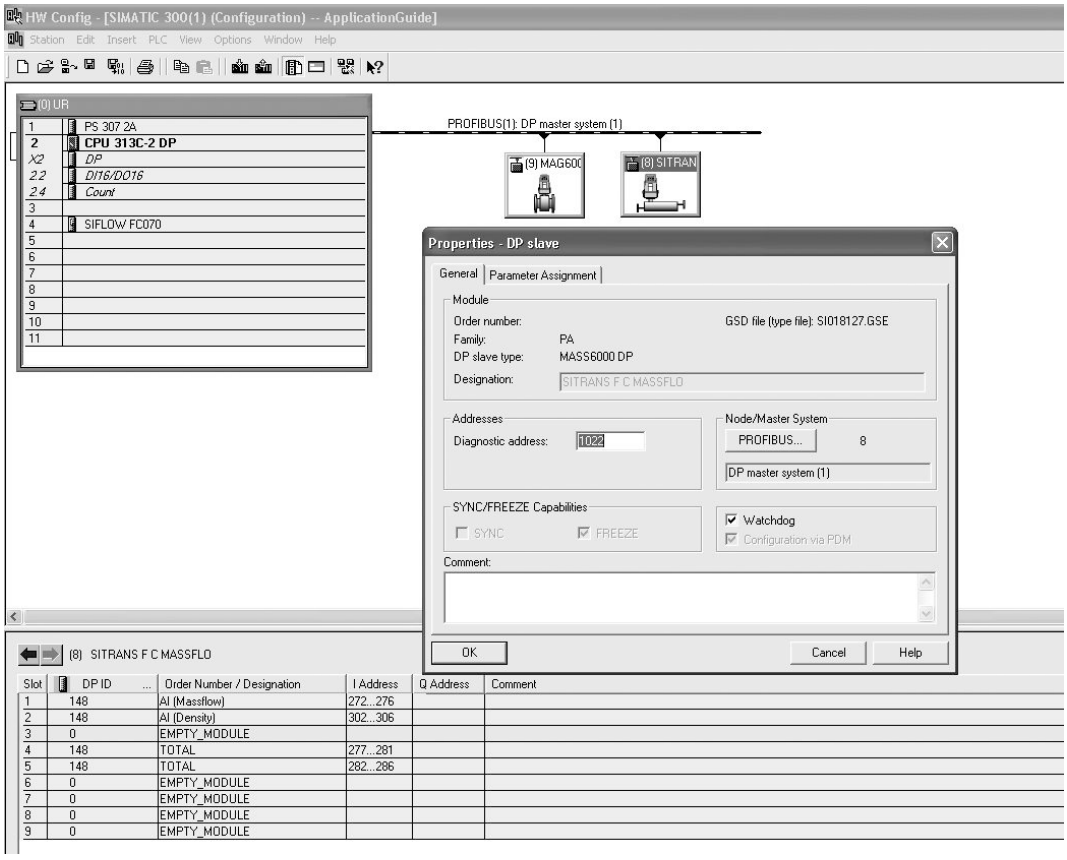
To read this value in a S7-300/400 you need to use SFC59 RD_REC, Read a Data Record (To write data, you would use SFC58 WR_REC). This command has the following inputs:

REQ	Bit input that signals a Read request. This should be a 1
IOID	Word input that is the ID of the address area. For peripheral input (PI), this is a value of x54. For peripheral output (PQ), this is a value of x55
LADDR	Word address of the Logical address of the module. This is where the slot number is referenced. For slot 0, it is the diagnostic address of the device. For slot 1, it is the I/O address of module 1 of the device. For slot 2, it is the I/O address of module 2 and so on.
RECNUM	Byte input. This is the absolute address of the parameter

This command has the following outputs:

RET_VAL	Status word of how the command is going. This cyclic through different values. When is returns either 0 or the number of bytes, then the command has finished.
BUSY	Bit output that indicates if the reading is completed. 1 means that it is not yet completed.
RECORD	The output memory area. The size must be equal to or larger than the size of the parameter requested. This is of data type BYTE.

For our example of a MAG6000 and MASS6000, we had the following HARDWARE CONFIG:



From this, we can see that if we wanted to address slot 0, LADDR would be W#16# 7FE (hex equivalent of 2046). If we wanted to address slot 1, LADDR would be W#16#100 (hex equivalent of 256).

In this case the command will be:

```
CALL SFC 59                          // call sfc59 to read low flow cut off from
                                     MASS6000
REQ:=TRUE
IOID:=B#16#54                        // device is peripheral input
LADDR  :=W#16#10                     // slot 1
RECNUM :=B#16#9A                     // index = 154 = x9A
RET_VAL:=MW10
BUSY:=M20.0
RECORD :=P#M 2.0 Byte 4
```

The electronic temperature will then be placed in MD 2 and is of data type FLOAT.

This command should not be executed on every scan since it will take several scans to execute. The best idea is to use one of the timed OBs in the PLC. For this example, we used OB35 in a S7-300 and set the time interval to 1 second.

System integration

6

This chapter provides information on how to integrate MAG 6000 and MASS 6000 in a PROFIBUS automation and control system.

The chapter shows the necessary steps in order to put the system into operation. After finishing the steps, the system is ready to go into normal operation in the PROFIBUS automation control system.

Note

The device can be used with any host, but the examples in the following chapter describes how to configure the device with SIMATIC S7

Transmitter settings

All PROFIBUS settings of the transmitter are stored in the add-on module in a non-volatile memory. All other transmitter settings are stored in the SENSORPROM® memory unit. The storage location of each parameter is specified in the tables in Parameter tables (Page 69)

Note

If the PROFIBUS module is replaced, all PROFIBUS settings must be downloaded from the master to the device.

Device Tag and address

All devices are shipped with the default note address being 126. Each device in a PROFIBUS network must have a unique node address in order for a master to configure or make requests to the device. The address can be changed via a configuration tool over PROFIBUS or via the PROFIBUS menu in the transmitter display.

The PROFIBUS module also contains TAG Name, TAG Descriptor and TAG Date parameters intended for identification of the flowmeter. These are shown as read-only information in the PROFIBUS menu of the transmitter display and can be changed via a configuration tool over the PFOFIBUS.

Access from Local User Interface

Parameters stored in the SITRANS F transmitter (not in the Fieldbus module) can be accessed through the local display menu. The default password 1000 for accessing the "Setup Menu" in the local display can be changed.

6.1 Function check

Before proceeding further, make sure that installation and connection have been performed successfully.

- See chapter "Hardware installation (Page 13)" for installation verification.
- See chapter "Connecting (Page 19)" for connection verification.

When the function check has been successfully carried out, the device can be switched on.

6.2 Setting PROFIBUS address

Before communicating with the Master, the device address must be selected. This can be done either from the display or from the commissioning software. In the following it is described how to set the address via the local display.

1. Power up the device. If the device has been installed correctly a new menu entry "PROFIBUS PA/DP module" has appeared in the local user interface of the device (between the "Reset mode" and the "Service mode" menu entries.)
   [insert graphic here]
2. Select the address from the keypad:
   - Press for two seconds. The display now says "Basic settings"
   - Press until you reach the " PROFIBUS PA/DP module " menu entry
   - Press
   - Cycle through the PROFIBUS settings by pressing and select "PROFI address".
   - Type in the address using and
   - Lock the selected address with and press for two seconds.

See also

The single menu items of the menu entry "PROFIBUS PA/DP module" are described in detail in chapter: Menu items (Page 141)

For more information about the menu system of the transmitter, refer to the relevant transmitter manual.

6.3 Configuring with SIMATIC S7

The following examples are from a Siemens STEP7 project, and demonstrate how to configure the cyclic DPV0 Dataexchange. In STEP 7 SFC14 should be used for the reading of process values.

6.3.1 Configuring MAG 6000

This example shows the default configuration for SITRANS F M MAG 6000 DP, using the manufacturer specific gsd-file (SIxx8129.gsd). The order of the Slot's is fixed, and can not be changed.

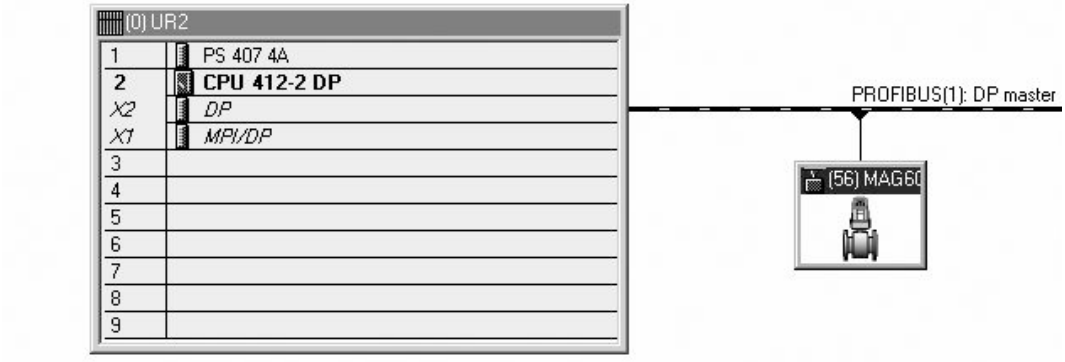
- Slot 1: Volumeflow
- Slot 2: Totalizer 1
- Slot 3: Totalizer 2/Batch

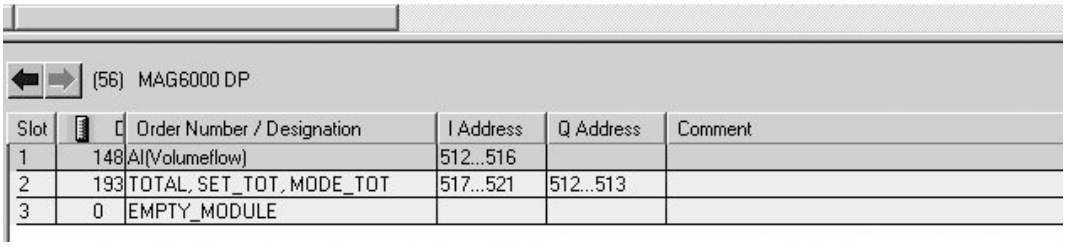
Any values not needed, can be exchanged with an EMPTY_MODULE. This is done by deleting the content of the Slot, and inserting the EMPTY_MODULE.

In this example the flowmeter is configured to send Volumeflow and Totalizer 1 to the master. The master sends the two command bytes, Set Totalizer 1 and Mode Totalizer 1, to the flowmeter.

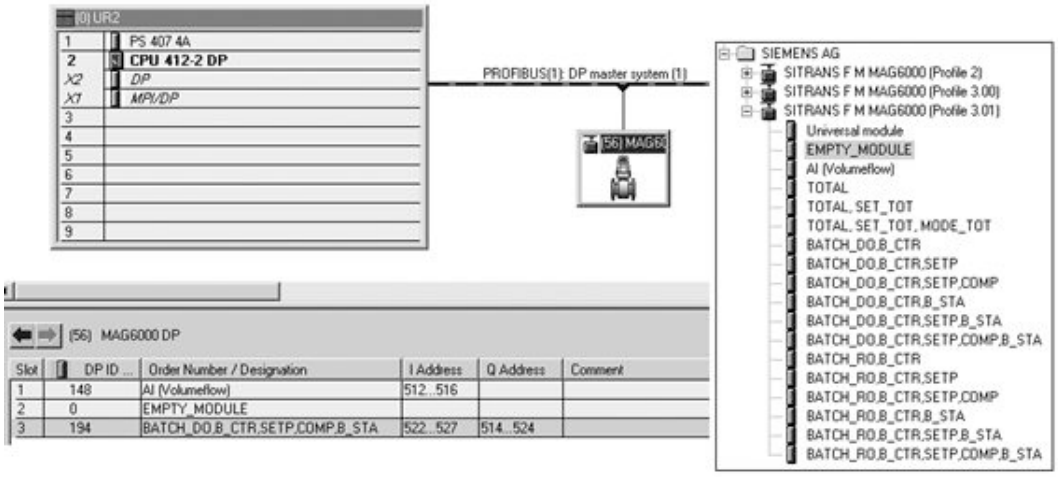
Totalizer 2 is left out by inserting the EMPTY_MODULE.

[Insert graphic / screenshot]





The next example shows Slot 3 being configured for using the Batch functionality on the transmitters digital output. The master sends Batch Control, Batch Setpoint and Batch Compensation to the flowmeter and recieves batch amount and batch status from the flowmeter. In MAG6000 it is possible to assign the batch functionality to the digitial output or to the relay output.



Note

Assigning batch functionality to the relay output is only supported when using:

PROFIBUS module firmware version 2.03 and forward.Gsd files si038129.gsd or si03812a.gsd and forward.

6.3.2 Configuring MASS 6000

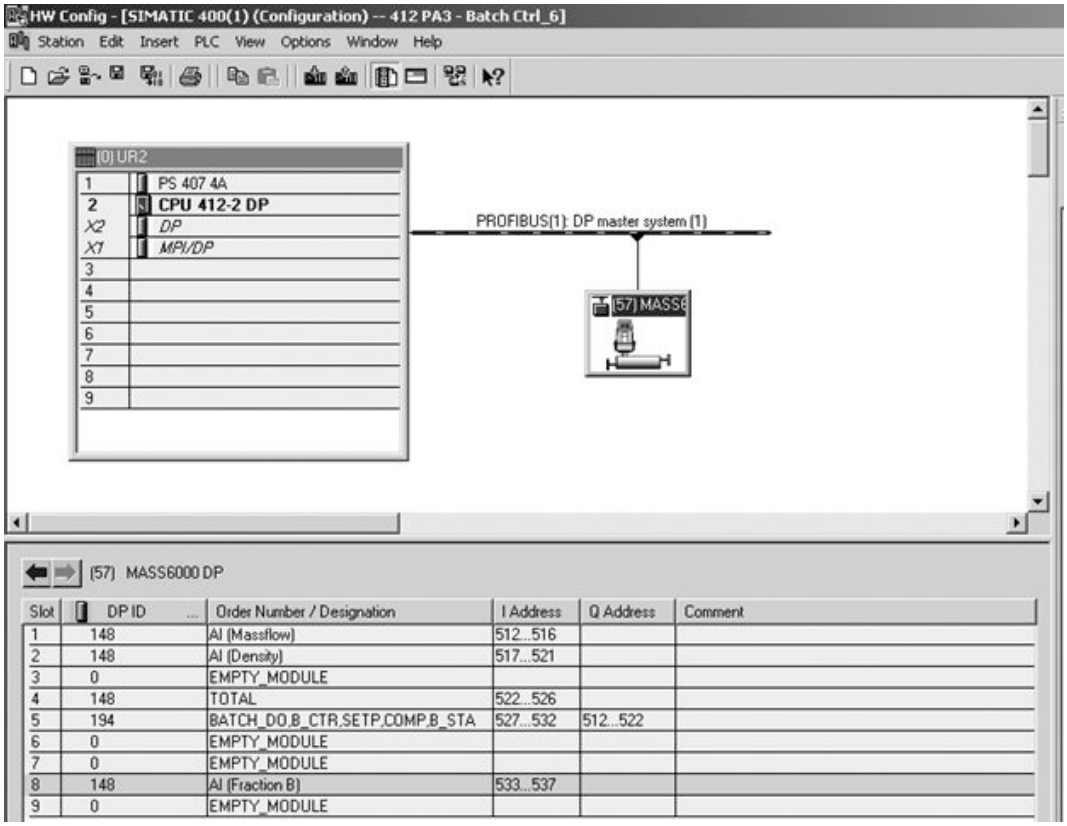
This example shows a configuration for SITRANS F C MASS6000 DP, using the manufacturer specific gsd-file (SIxx8127.gsd). The order of the Slot's is fixed, and can not be changed.

- Slot 1: Massflow
- Slot 2: Density
- Slot 3: Temperature
- Slot 4: Totalizer 1
- Slot 5: Totalizer 2/Batch
- Slot 6: Volumeflow
- Slot 7: Fraction A
- Slot 8: Fraction B
- Slot 9: pct. Fraction A

Any values not needed, can be exchanged with an EMPTY_MODULE. This is done by deleting the content of the Slot, and inserting the EMPTY_MODULE.

In this example the flowmeter is configured to send Massflow, Density, Totalizer1, Batch value, Batch status and Fraction B to the master. The master sends Batch Control, Batch Setpoint and Batch Compensation to the flowmeter. Temperature, Volumeflow, Fraction A and pct. Fraction A are left out by inserting the EMPTY_MODULE.

In MASS6000 the batching functionality can be assigned to the digital output.


HW Config - [SIMATIC 400(1) (Configuration) -- 412 PA3 - Batch Ctrl_6]
Station Edit Insert PLC View Options Window Help
(0) UR2
1 PS 407 4A
2 CPU 412-2 DP
X2 DP
X1 MPI/DP
3
4
5
6
7
8
9
PROFIBUS(1): DP master system (1)
(57) MASS6
(57) MASS6000 DP
Slot | DP ID | Order Number / Designation | I Address | Q Address | Comment
1 | 148 | AI (Massflow) | 512...516 | |
2 | 148 | AI (Density) | 517...521 | |
3 | 0 | EMPTY_MODULE | | |
4 | 148 | TOTAL | 522...526 | |
5 | 194 | BATCH_DO,B_CTR,SETP,COMP,B_STA | 527...532 | 512...522 |
6 | 0 | EMPTY_MODULE | | |
7 | 0 | EMPTY_MODULE | | |
8 | 148 | AI (Fraction B) | 533...537 | |
9 | 0 | EMPTY_MODULE | | |

Alarm, error, and system messages 7

7.1 Introduction

This chapter describes the diagnostic structure of the USMII PROFIBUS module used with Sitrans F C MASS 6000 or Sitrans F M MAG 6000 transmitters.

Diagnostic overview

In DataExchange the PROFIBUS slave has the capability of sending diagnostic data. The diagnostic data is split up into

- Standard diagnosis
  The Standard diagnosis consists off 6 bytes, and is supported by all PROFIBUS devices.
- External diagnosis
  The External diagnosis consists of 8 bytes and is according to the PA Profile 3.00.
- Expanded diagnosis.
  The Extended diagnosis consists of 6 bytes and is device specific.

The diagnostic data consists of 20 bytes in total.

- Diagnostics Event Swtiches:
  The switches configure how Diagnosis and Status bytes are reported when a warning or an error is reported in the transmitter.
- Status bytes:
  Each process value is associated with a status byte which defines the quality of the process value. The status is set in accordance with the active diagnostic data.

7.2 Standard diagnosis

Table 7-1 Standard diagnosis

Byte	Name	Description
1	D1	First Diagnostic byte • Bit 0: Diag.station does not exist (set by Master) • Bit 1: Diag.Station_not _ready. Slave is not ready for data exchange. • Bit 2: Diag.cfg_Fault. Configuration from master is not valid. • Bit 3: Diag.ext_diag. Slave has external diagnostics data. • Bit 4: Diag.not_supported. Slave does not support called function. • Bit 5: Diag.invalid_slave_response. Set by slave to 0. • Bit 6: Diag.prm_fault. Faulty parameterised (Ident number etc.) • Bit 7: Diag.master_lock. Other masters cannot parameterise slave.
2	D2	Second Diagnostic byte • Bit 0: Diag.Prm_req. Slave must be parameterised again • Bit 1: Diag.Stat_diag. Static diagnose (Byte Diag-Bits) • Bit 2: Always 1 • Bit 3: Diag.WD_ON. Watchdog is active • Bit 4: Diag.freeze_mode. Received freeze command • Bit 5: Sync_mode. Received sync command • Bit 6: Reserved • Bit 7: Diag.deactivated. Set by master.
3	D3	Third diagnostic byte. • Bit 0 to 6: Reserved • Bit 7: Diag.ext_overflow
4	DM	Master address after parameterisation(FF means not parameterised)
5	IH	Ident number low byte
6	IL	Ident number high byte

Further information can be found in the PROFIBUS specification.

7.3 External diagnosis

All PROFIBUS PA Profile 3 devices also support External diagnosis that maps the diagnosis of the physical block.

Table 7-2 External diagnosis

Byte	Name	Value	Description
7	Header	14	Block Length
8	Status Type	127	Status
9	Slot Number	0	Slot number of Physical Block 1

Byte	Name	Value	Description
10	Specifier	12	Status appears - Status disappears
11 ... 14	Diagnosis		Profile 3.01 diagnosis. See Expanded and condensed diagnosis (Page 49)

7.3.1 Expanded and condensed diagnosis

The device supports diagnosis according to PA profile 3.00 (Expanded Diagnosis) and from firmware version 2.02 of the PROFIBUS module also according to Amendment 2 to PA profile 3.01 (Condensed Diagnosis). Selecting which type of Diagnosis is used is done with the parameterization telegram in Data Exchange. The parameter COND_STAT_DIAG in Physical block 1 makes it possible to change the diagnosis type when the device is not in Data Exchange.

Table 7-3 Expanded diagnosis

Byte	Bit	Name	Description
0	0		
	1		
	2		
	3		
	4	DIA_MEM_CHKSUM	Set according to the Extended diagnosis table. See Extended diagnosis (Page 51).
	5	DIA_MEASUREMENT	Set according to the Extended diagnosis table. See Extended diagnosis (Page 51).
	6		
	7		
1	0		
	1		
	2	DIA_CONF_INVAL	Set according to the Extended diagnosis table. See Extended diagnosis (Page 51).
	3	DIA_WARMSTART	Set during power-up/initialization to indicate that measurement is invalid.
	4	DIA_COLDSTART	This device cannot differentiate between COLD and WARM restart.
	5	DIA_MAINTENANCE	Set according to the Extended diagnosis table. See Extended diagnosis (Page 51).
	6		
	7	IDENT_NUMBER_VIOLATION	The Ident-number, which is stated in the used GSD file does not correspond to the Ident-number, which is selected by the parameter IDENT_NUMBER_SELECTOR in PB1
2	0 - 7	Reserved	

Byte	Bit	Name	Description
3	0 - 4	Reserved	
	5	PROFILE_SPECIFIC_EXTEN-SION_AVAIL	Fixed to 0
	6	MAN_SPECIFIC_EXTEN-SION_AVAIL	Fixed to 0
	7	EXTENSION_AVAIL	• 0: There is no more information available • 1: More diagnosis info is available in Extended diagnosis

Table 7-4 Condensed diagnosis

Byte	Bit	Name	Description
0	0 - 7		
1	0		
	1		
	2		
	3	DIA_WARMSTART	Set during power-up/initialization to indicate that measurement is invalid.
	4	DIA_COLDSTART	This device cannot differentiate between COLD and WARM re-start.
	5	DIA_MAINTENANCE	Set according to the Extended diagnosis table. See Extended di-agnosis (Page 51).
	6		
	7	IDENT_NUMBER_VIOLA-TION	The Ident-number, which is stated in the used GSD file does not correspond to the Ident-number, which is selected by the param-eter IDENT_NUMBER_SELECTOR in PB1
2	0	DIA_MAINTENANCE_ALARM	Failure of the device or armature
	1	DIA_MAINTENANCE_DE-MANDED	Maintenance demanded
	2	DIA_FUNCTION_CHECK	Device is in function check mode or in simulation or under local control e.g. maintenance
	3	DIA_INV_PRO_COND	The process conditions don’t allow to return valid values. (Set if a value has the quality Uncertain – Process related, no mainte-nance or Bad – Process related, no maintenance)
	4 - 7	Reserved	
3	0 - 4	Reserved	
	5	PROFILE_SPECIFIC_EXTEN-SION_AVAIL	Fixed to 0
	6	MAN_SPECIFIC_EXTEN-SION_AVAIL	Fixed to 0
	7	EXTENSION_AVAIL	• 0: There is no more information available • 1: More diagnosis info is available in Extended diagnosis

7.4 Extended diagnosis

This device provides additional device specific diagnosis. All errors that can be reported via the local keypad display are mapped into this diagnosis.

Table 7-5 Extended diagnosis

Diagnosis extension bit	Error text	Description	Affected status bytes	Status bytes Profile 3.01	External diagnosis Profile 3.01
0	W20 Totalizer 1/ W20 Totalizer 2	During initialization the check of the saved totalizer value has failed. It is not possible to rely on the saved totalizer value any more. The totalizer value must be reset manually in order to rely on future readings	All	Bad, device failure	DIA_MEM_CHKSUM
1	W21 Pulse overflow	Flow is too big compared with Pulsewidth and Amount Per Pulse required	All	Good, Maintenance	DIA_MAINTENANCE
2	W22 Batch timeout	Duration of Batching has exceeded a predefined max. time	All	Uncertain, non specific	
3	W23 Batch overrun	Batch quantity has exceeded a predefined maximum overrun mass or volume	All	Uncertain, non specific	
4	W24 Batch neg. flow	Negative flow direction during batch	All	Uncertain, non specific	
5	W30 Overflow	Flow is above Qmax. settings	All	Uncertain, non specific	
6	W31 Empty pipe	Pipe is empty	All	Uncertain, non specific	
7	W32 Temp. too high	The temperature of the fluid has exceeded the max. temperature rating of the sensor.	All	Uncertain, non specific	
8	W33 Temp. too low	The temperature of the fluid has exceeded the min. temperature rating of the sensor.	All	Uncertain, non specific	
9	W34 Zero adj. Fail	The zero-point adjustment values are outside the limit because there is not zero flow in the sensor. Check zero-flow conditions, valves, pumps etc.	All	Uncertain, non specific	
10	W35 Current out 1	Current output exceeds 120%. Ensure that the sensor is correctly sized and check max. flow setting.	All	Good, Maintenance required	DIA_MAINTENANCE
11	W36 Freq/Pulse Out1	Freq/pulse output exceeds 120%. Ensure that the sensor is correctly sized and check max. Flow setting.	All	Good, Maintenance required	DIA_MAINTENANCE
12	P40 SENSORPROM	SENSORPROM® unit not installed			
13	P41 Parameter range	A parameter is out of range. The parameter could not be replaced by its default value. The error will disappear at the next power-on	All	Uncertain, non specific	DIA_CONF_INVAL

Diagnosis extension bit	Error text	Description	Affected status bytes	Status bytes Profile 3.01	External diagnosis Profile 3.01
14	P42 Current Output	Current loop is disconnected or the loop resistance is too big	All	Good, Maintenance required	DIA_MAINTENANCE
15	P43 Internal error	Too many errors occurred at the same time, some errors are not detected correctly.	All	Uncertain, non specific	DIA_MAINTENANCE
16	P44 CT SENSORPROM	SENSORPROM® unit has been used as CT version	All	Uncertain, non specific	DIA_MAINTENANCE
17	P49 Protect. viol.	Contact Siemens	All	Bad, device failure	DIA_MAINTENANCE
18	P50 Temp. cable	Error in temperature sensor, check cables and connectors	All	Bad, device failure	DIA_MAINTENANCE
19	P51 Pick-up 1/ P52 Pickup 2	Pick-up amplitude too low. Check cables or application for damping (air/ gas in liqid)	All	Bad, device failure	DIA_MAINTENANCE
20	F64 Converprom err	An error in the internal data prom was detected.	All	Bad, non specific	DIA_CONF_INVAL
21	F60 CAN comm. error	CAN bus communication error. An add-on module, the display module or the transmitter is defective	All	Bad, non specific	DIA_MAINTENANCE
22	F61 SENSORPROM err	It is not possible to rely on the data in SENSORPROM® unit anymore	All	Bad, non specific	DIA_MEM_CHKSUM
23	F62 SENSORPROM ID	The SENSORPROM® unit ID does not comply with the product ID. The SENSORPROM® unit is from another type of product SITRANS F C, SITRANS F US etc.	All	Bad, non specific	DIA_CONF_INVAL
24	F63 SENSORPROM	It is not possible to read from the SENSORPROM® unit anymore	All	Bad, non specific	DIA_CONF_INVAL
25	F70 Coil Current	MAG 6000: Coil excitation has failed	All	Bad, Sensor failure	DIA_MEASUREMENT
	F70 Pickup phase	Check cables/polarity	All	Bad, Sensor failure	DIA_MEASUREMENT
26	F71 Internal error	MAG 6000: Internal conversion error in ASIC	All	Bad, Sensor failure	DIA_MEASUREMENT
	F71 Driver phase	Check cables/polarity	All	Bad, Sensor failure	DIA_MEASUREMENT
27	F80 Internal error	Restart or replace	All	Bad, device failure	DIA_MAINTENANCE
28	F81 Internal error	Restart or replace	All	Bad, device failure	DIA_MAINTENANCE
29	F82 Internal error	Restart or replace	All	Bad, device failure	DIA_MAINTENANCE
30	F83 Internal error	Restart or replace	All	Bad, device failure	DIA_MAINTENANCE
31	F84 Sensor level	Pick-up amplitude saturated	All	Bad, device failure	DIA_MAINTENANCE

Diagnosis extension bit	Error text	Description	Affected status bytes	Status bytes Profile 3.01	External diagnosis Profile 3.01
32	W90 Frequency out 2				
33	W91 Pulse2 overflow				
34	W92 Current out 2				
35	W93 Current out 3				
36	P94 Current out 2				
37	P95 Current out 3				
38	F96 Inst. Module	A fatal error from an installed module was detected. Replace	All	Bad, device failure	DIA_MAINTENANCE
39	F97 Add-on module too old	Replace	All	Bad, device failure	DIA_MAINTENANCE
40	Errors not specified	Contact Siemens	All	Bad, device failure	DIA_MAINTENANCE

Note

Some errors no longer mentioned in transmitter manuals are kept in PROFIBUS module and gsd files and manual for backwards compatibility.

7.5 DIAG_EVENT_SWITCH

This parameter consists of an array of switches used for configuring how events in the transmitter affect the DIAGNOSIS parameter and the status bytes. Each switch is related to one event occurring in the transmitter and is defined as described in DIAG_STATUS_LINK (Page 149).

Note

The switch is only active when Condensed Status and Diagnostic messages are enabled from the GSD file.

Table 7-6 DIAG_EVENT_SWITCH

Switch	Event	Default diagnosis setting	Default status setting
1	Warning 20	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
2	Warning 21	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
3	Warning 22	4: DIA_INV_PRO_COND	5: Uncertain–process related, no maintenance
4	Warning 23	4: DIA_INV_PRO_COND	5: Uncertain–process related, no maintenance

Switch	Event	Default diagnosis setting	Default status setting
5	Warning 24	4: DIA_INV_PRO_COND	5: Uncertain–process related, no maintenance
6	Warning 30	4: DIA_INV_PRO_COND	5: Uncertain–process related, no maintenance
7	Warning 31	4: DIA_INV_PRO_COND	5: Uncertain–process related, no maintenance
8	Warning 32	4: DIA_INV_PRO_COND	5: Uncertain–process related, no maintenance
9	Warning 33	4: DIA_INV_PRO_COND	6: Bad – process related, no maintenance
10	Warning 34	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
11	Warning 35	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
12	Warning 36	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
13	Permanent 40	0: No additional bit will be set	0: Good - OK
14	Permanent 41	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
15	Permanent 42	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
16	Permanent 43	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
17	Permanent 44	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
18	Permanent 49	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
19	Permanent 50	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
20	Permanent 51-58	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
21	Fatal 64	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
22	Fatal 60	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
23	Fatal 61	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
24	Fatal 62	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
25	Fatal 63	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
26	Fatal 70	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
27	Fatal 71	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
28	Fatal 80	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
29	Fatal 81	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
30	Fatal 82	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
31	Fatal 83	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
32	Fatal 84	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
33-38	Not used		
39	Fatal 96	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
40	Fatal 97	3: DIA_MAINTENANCE_ALARM	4: Bad – Maintenance alarm
41-48	Not used		

7.6 Status bytes

Status bytes

Table 7-7 Status - meaning of quality

Quality		Quality substatus				Limits		Meaning
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	0	x	x	x	x	x	x	BAD
0	1	x	x	x	x	x	x	UNCERTAIN
1	0	x	x	x	x	x	x	GOOD (Non cascade)
1	1	x	x	x	x	x	x	GOOD (Cascade)

Table 7-8 Status - meaning of limits

Quality		Quality substatus				Limits		Meaning
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
x	x	x	x	x	x	0	0	OK
x	x	x	x	x	x	0	1	Low Limit
x	x	x	x	x	x	1	0	High Limit
x	x	x	x	x	x	1	1	Constant

Table 7-9 Status - meaning of quality substatus

Quality		Quality substatus				Limits		Value	Meaning
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0	0	0	0	0	0	0	0x00	BAD – non specific
0	0	1	0	0	0	1	1	0x23	BAD – passivated
0	0	1	0	0	1	x	x	0x24… 0x27	BAD – maintenance alarm
0	0	1	0	1	0	x	x	0x2B	BAD – process related, no maintenance
0	0	1	1	1	1	1	1	0x3C… 0x3F	BAD – function check / local override
0	1	0	0	1	0	1	1	0x4B	UNCERTAIN – substitute set
0	1	0	0	1	1	1	1	0x4F	UNCERTAIN – initial value
0	1	1	0	1	0	x	x	0x68… 0x6B	UNCERTAIN – maintenance demanded
0	1	1	1	0	0	1	1	0x73	UNCERTAIN – simulated value, start
0	1	1	1	0	1	x	x	0x74… 0x77	UNCERTAIN – simulated value, end

Quality		Quality substatus				Limits		Value	Meaning
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	1	1	1	1	0	x	x	0x78… 0x7B	UNCERTAIN – process value, no maintenance
1	0	0	0	1	0	0	0	0x80	GOOD - Ok
1	0	0	0	0	1	x	x	0x84… 0x87	GOOD – update event
1	0	0	0	1	0	x	x	0x89… 0x8B	GOOD – active advisory alarm
1	0	0	0	1	1	x	x	0x8D… 0x8F	GOOD – active critical alarm
1	0	1	0	0	0	x	x	0xA0… 0xA3	GOOD – initiate fail safe
1	0	1	0	0	1	x	x	0xA4… 0xA7	GOOD – maintenance required
1	0	1	0	1	0	x	x	0xA8… 0xAB	GOOD – maintenance demanded
1	0	1	1	1	0	x	x	0xBC… 0xBF	GOOD – function check

Table 7-10 Status (Extended status) - Meaning of quality substatus

Quality		Quality substatus				Limits		Value	Meaning
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	0	0	0	0	0	0	0	0x00… 0x03	BAD – non specific
0	0	0	0	0	1	x	x	0x04… 0x07	BAD – configuration error
0	0	0	0	1	0	x	x	0x08… 0x0B	BAD – not connected
0	0	0	0	1	1	x	x	0x0C… 0x0F	BAD – device failure
0	0	0	1	0	0	x	x	0x10… 0x13	BAD – sensor failure
0	0	0	1	0	1	x	x	0x14… 0x17	BAD – no communication (last usable value)
0	0	0	1	1	0	x	x	0x18… 0x1B	BAD – no communication (no usable value)
0	0	0	1	1	1	x	x	0x1C… 0x1F	BAD – out of service
0	1	0	0	0	0	x	x	0x40… 0x43	UNCERTAIN – non specific
0	1	0	0	0	1	x	x	0x44… 0x47	UNCERTAIN – last usable value
0	1	0	0	1	0	x	x	0x48… 0x4B	UNCERTAIN – substitute value

Quality		Quality substatus				Limits		Value	Meaning
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
0	1	0	0	1	1	x	x	0x4C… 0x4F	UNCERTAIN – initial value
0	1	0	1	0	0	x	x	0x50… 0x53	UNCERTAIN – sensor conversion not accurate
0	1	0	1	0	1	x	x	0x54… 0x57	UNCERTAIN – engineering unit violation
0	1	0	1	1	0	x	x	0x58… 0x5B	UNCERTAIN – sub normal
0	1	0	1	1	1	x	x	0x5C… 0x5F	UNCERTAIN – configuration error
0	1	1	0	0	0	x	x	0x60… 0x63	UNCERTAIN – simulated value
0	1	1	0	0	1	x	x	0x64… 0x67	UNCERTAIN – sensor calibration
1	0	0	0	1	0	0	0	0x80	GOOD – ok
1	0	0	0	0	1	x	x	0x84… 0x87	GOOD – update event
1	0	0	0	1	0	x	x	0x89… 0x8B	GOOD – active advisory alarm
1	0	0	0	1	1	x	x	0x8D… 0x8F	GOOD – active critical alarm
1	0	0	1	0	0	x	x	0x90… 0x93	GOOD – unacknowledged update event
1	0	0	1	0	1	x	x	0x94… 0x97	GOOD – unacknowledged advisory alarm
1	0	0	1	1	0	x	x	0x98… 0x9B	GOOD – unacknowledged critical alarm
1	0	1	0	0	0	x	x	0xA0… 0xA3	GOOD – initiate fail safe
1	0	1	0	0	1	x	x	0xA4… 0xA7	GOOD – maintenance required

Troubleshooting/FAQs

8

8.1 Device error messages

Table 8-1 Error messages

Error text	Diagnostic Information	Cause/Symptom	Action to take
W21 Pulse overflow	Pulse overflow - adjust Pulse setting.	The pulse settings, pulse width or amount/pulse do not match the actual flow. The pulse duty cycle is higher than 50 % with actual flow.	Reduce either pulse width or amount/pulse, so that the duty cycle does not exceed 50% of Qmax (UpperRange).
W22 Batch timeout	Batching has exceeded a predefined maximum time.	Duration of Batching has exceeded a predefined maximum time.	Check installation and if ok, increase the batch time error setting.
W23 Batch overrun	Batch overrun.	Batch amount is reached, but there is still flow in the pipe.	Check installation and if ok, increase the batch overrun setting.
W24 Batch neg. flow	Batch negative flow .	Flow direction negative during batch.	Check flow direction and flow direction setting.
W30 Flow saturated	Flow is above ScaleUpper.	Flow is above 102.5% of maximum flow (ScaleUpper).	Adjust maximum flow (ScaleUpper) setting.
W31 Empty pipe	Empty pipe.	Pipe has run empty and / or the density is below the set limit for empty pipe detection.	Fill sensor or adjust limit.
W32 Temp. too high	Measured temperature too high.	The measured temperature of the media has exceeded the maximum temperature rating of the sensor.	Adjust the fluid temperature to a value lower than the sensor's maximum limit. Check for disconnections, check Pt1000 temperature sensor, the wiring from sensor to transmitter and the connection board.
W33 Temp. too low	Measured temperature too low.	The measured temperature of the media has exceeded the minimum temperature rating of the sensor.	Adjust the fluid temperature to a value higher than sensor's minimum value. Check for short circuit, check Pt1000 temperature sensor, the wiring from sensor to transmitter and the connection board.
W34 Zero adj. fail	Zero point adjustment failed.	The zero point adjustment offset value is outside the limit of the sensor or the sigma value is above the set limit. Reason: the measured flow is not zero or the flow fluctuates.	Check that the pump is stopped and the valve(s) closed. Check that the fluid is homogenous, air and gas free. Check that the sensor is mounted stress and vibration free.
W35 Current out 1	Current output 1 exceeds 20,5 mA	Check the maximum settings for the assigned process value.	Increase the maximum settings for the assigned process value.
W36 Frequency out 1	Frequency 1 output exceeds 102,5 % of maximum frequency setting.	Check the maximum settings for the assigned process value.	Increase the maximum settings for the assigned process value.

Error text	Diagnostic Information	Cause/Symptom	Action to take
P40 SENSORPROM	No SENSORPROM installed.	No SENSORPROM installed. Reference data in ConverterPROM are used.	Install / exchange SENSORPROM.
P42 Current out 1	Current output, no current in loop.	Current output is set 'ON' and current loop is disconnected or the loop resistance is too big.	If current output is not used, set current output 'OFF'. Else check cables and load to the current output.
P43 Internal error	Too many errors occurred at the same time.	More than 9 errors occurs at the same time.	Check sensor and installation.
P44 CT SENSORPROM	Invalid sensorprom mounted.	CT SENSORPROM mounted in non CT device.	Replace SENSORPROM.
P50 Temp. cable	Error in temperature sensor.	Error in cable or connections from sensor to transmitter .	Measure the resistance to the temperature sensor: • MASS 2100 sensors, PT1000 temperature sensor: Between terminals 3 and 4 the ohmic value has to be app. 1080 ohm at 20°C. • MC2 sensors, PT 100 temperature sensor: Between terminals 93 - 94 and 95 - 96 the ohmic value has to be app. 100 ohm. • MC2 Ex sensors , PT100 temperature sensor Between terminals UT+ and UT- and IT+ and IT-the ohmic value has to be app. 100 ohm.
P51 ASIC overflow	ASIC overflow (Temperature calculation overflow).	The internal calculation of the temperature has an overflow - temperature reading not reliable.	Exchange the transmitter.
P52 ASIC overflow	Overflow in ASIC - In temperature calculation (Temp).	Overflow in ASIC - In temperature calculation (Temp) (Overflow in the secondary temperature calculations).	Exchange the transmitter.
P53 ASIC overflow	ASIC overflow (Massflow calculation overflow).	The massflow calculation has an overflow - massflow reading not reliable.	Exchange transmitter if error persists.
P54 ASIC overflow	ASIC overflow (Density calculation overflow).	The density calculation has an overflow - density reading not reliable.	Check density calibration values.
P55 ASIC overflow	ASIC overflow (Massflow calculation overflow).	The massflow calculation has an overflow - massflow reading not reliable.	Check density calibration values.
P56 ASIC overflow	ASIC overflow (Massflow calculation overflow)..	The massflow calculation has an overflow - massflow reading not reliable.	Check density calibration values.
P57 ASIC overflow	ASIC overflow (Volumeflow calculation overflow)..	The volumeflow calculation has an overflow - volumeflow reading not reliable.	If the density is close to zero the volumeflow value overflows. Set a density offset to adjust the density reading.

Error text	Diagnostic Information	Cause/Symptom	Action to take
P58 ASIC overflow	ASIC overflow (fractionflow calculation overflow).	The fractionflow calculation has an overflow - fractionflow reading not reliable.	The transmitter is faulty - exchange.
F61 SENSORPROM err.	Sensorprom error.	It is not possible to rely on the data in SENSORPROM. ConverterPROM data are used.	Replace Sensorprom.
F62 SENSORPROM ID	Sensorprom error.	The SENSORPROM ID does not comply with the product ID. Error in SENSORPROM data or wrong SENSORPROM installed. ConverterPROM data are used.	Replace Sensorprom.
F63 SENSORPROM	Sensorprom error.	It is not possible to read from or write to the SENSORPROM.	Replace Sensorprom.
F64 Converprom err.	Converter prom error.	It is not possible to rely on the data in the converterprom. Default data are used.	Replace transmitter.
F70 Pickup phase	Pickup phase.	Set if the phase difference between pickup sensors channels 1 and 2 is above limit.	Check wiring from sensor to transmitter.
F84 Sensor level	Sensor jammed.	The input level of the pickups is too high.	Check wiring and sensor.
W90 Frequency out 2	Frequency 2 output exceeds 102,5 % of maximum frequency setting.	Check the maximum settings for the assigned process value.	Increase the maximum settings for the assigned process value.
W91 Pulse2 overflow	Pulse 2 overflow - adjust Pulse setting.	The pulse settings, pulse width or amount/pulse do not match the actual flow. The pulse duty cycle exceeds 50 % of actual flow.	Reduce either pulse width or amount/pulse, so that the duty cycle cannot exceed 50% of Qmax (UpperRange).
W92 Current out 2	Current output 2 exceeds 20,5 mA	Check the maximum settings of the assigned process value.	Increase the maximum settings for the assigned process value.
W93 Current out 3	Current output 3 exceeds 20,5 mA.	Check the maximum settings for the assigned process value.	Increase the maximum settings for the assigned process value.
P94 Current out 2	Current output 2, no current in loop.	Current output 2 is set 'ON ' and current loop is disconnected or the loop resistance is too big.	If current output 2 is not used, set current output 'OFF '. Otherwise check cables and load to the current output 2.
P95 Current out 3	Current output 3, no current in loop.	Current output 3 is set 'ON ' and current loop is disconnected or the loop resistance is too big.	If current output 3 is not used, set current output 'OFF '. Else check cables and load to the current output.

8.2 Basic FAQs

The values on PROFIBUS do not match the values on the local display

You can set the units in the local display and on PROFIBUS independently. Units on PROFIBUS can be changed using a PROFIBUS master with acyclic communication, e.g. SIMATIC PDM. Units in the display can be changed via the local display. As from Profile 3 the units in the local display can also be changed using a PROFIBUS master with acyclic communication, e.g. SIMATIC PDM

Default PROFIBUS units are the following:

Table 8-2 Default PROFIBUS units

Value	Profile 2	Profile 3
Mass flow	kg/s	kg/h
Volume flow	m^3/s	m^3/h
Density	kg/m^3	kg/1
Temperature	°C	K
Fraction	kg/s	kg/h
Totalizer mass	kg	kg
Totalizer volume	m^3	L

I have installed the PROFIBUS module and configured the PLC but I do not read any process value from the device. What should I do?

- Verify that the PROFIBUS menu shown in the display
  If not then make sure that the module is installed correctly.
  As long as the PROFIBUS module is not shown in the display, it will not be possible to connect to the device on PROFIBUS.
- Is the communication status of the device in "DataExchange" mode?
  The communication status can be found in the PROFIBUS menu of the device and can be in following states:
  - Offline PA: The device is not configured by a master.
    Offline DP: The device can't see a master. Either the master is turned off or poor cabling.
  - Online PA: Not supported by PA
    DP: Online A master is detected, but the device is not configured.
  - DataExchange The device is configured and up and running.
  - Timeout The device has been configured, but the watchdog has timed out. Possible error: The master was disconnected.

Can I use PROFIBUS Profile 2 and PROFIBUS Profile 3 device on the same network?

Profile 2 modules and Profile 3 modules can work simultaneously on the same network but please observe that they have different GSD files.

A profile 3 module can also emulate a profile 2 module and hence run on a Profile 2 GSD file.

What is the difference between PROFIBUS DP and PROFIBUS PA?

PROFIBUS DP and PA provide the same access to the data in the device. The difference is the physical layer.

- PROFIBUS DP can be integrated directly into SIMATIC PLC or ET200M, but you always need a coupler or linker for converting the PROFIBUS PA signal to a PROFIBUS DP signal. PROFIBUS DP provides a communication rate up to 12 Mbit/s (MAG 6000 and MASS 6000 only support up to 1.5 Mbit/s), while PROFIBUS PA has a fixed data rate of 31.25 kBit/s.
- PROFIBUS PA is designed for use in hazardous areas (type of protection "intrinsically safe" EEx[i]), and Siemens PROFIBUS PA flowmeters comply with FISCO (Fieldbus Intrinsically Safe Concept).

Is PROFIBUS Profile 3 fully backwards compatible with PROFIBUS Profile 2?

PROFIBUS Profile 3 is not fully backwards compatible with Profile 2.

Profile 3 and Profile 2 use different GSD files (that is you will see different slots, input and output addresses in the HW configuration). If you do not want to make changes in the control system (for example SIMATIC HW configuration) then Profile 3 module can emulate a Profile 2 module and hence run on a Profile 2 GSD file. This feature only supports cyclic data exchange (DPV0), i.e. no acyclic communication (DPV1).

Please do the following for emulating Profile 2 in Profile 3 module:

- To set a Profile 3 module in Profile 2 mode, the Identity number must be changed. This can be done in the local display (in PROFIBUS menu), or through PDM.
- Default unit representation for volume flow, density, and temperature differs for Profile 2 and Profile 3.
  When using a profile 3 module with profile 2 GSD file you need to emulate profile 2 by changing the identity number. In this case you will have Profile 3 default units when emulating Profile 2.
  Default units are following.

Table 8-3 Default PROFIBUS units

Value	Profile 2	Profile 3
Mass flow	kg/s	kg/h
Volume flow	m^3/s	m3/h
Density	kg/m^3	kg/1
Temperature	°C	K/
Fraction	kg/s	kg/h
Totalizer mass	kg	kg
Totalizer volume	m^3	L

These units can be changed through PDM.

- Device specific information in the Status byte has some minor changes. This is only important if used by the PLC application.

Table 8-4 GSD compatibility matrix

FW	Profile	DD (device description)	GSD files	Manuals
V1.00	V 2.00		• DA010648 + SI010648 to SI070648 • DA010649 + SI010649 to SI070649 • DA0105A8 + SI0105A8 to SI0705A8 • DA0105A9 + SI0105A9 to SI0705A9	Profile 2 : Order no. FDK:521H1185 • PROFIBUS DP Profile 2 add-on module for USM II transmitters (http://support.automation.siemens.com/WW/view/en/17593623) Order no. FDK:521H1186 • PROFIBUS PA Profile 2 add-on module for USM II transmitters (http://support.automation.siemens.com/WW/view/en/17604391)
V1.01		V1.01, v1.02 ,v1.04, v1.05		
V1.02		V1.01, v1.02, v1.04, v1.05		
V1.03		V1.01, v1.02, v1.04, v1.05		
V1.04		V1.01, v1.02, v1.04, v1.05		
V1.05		V1.01, v1.02, v1.04, v1.05		
V2.00	V3.00	V02.00.00	• SI018127 + SI0105A8 to SI0705A8 • SI018128 + SI010648 to SI070648 • SI018129 + SI0105A9 to SI0705A9 • SI01812A + SI010649 to SI070649	Profile 3: Order no. A5E00726137 • PROFIBUS PA/DP Profile 3 for transmitter types SITRANS F M MAG 5000/6000 and SITRANS F C MASS 6000 (http://support.automation.siemens.com/WW/view/en/22437482)
V2.01				
V2.03	V3.01	V2.03.01	• SI018127 to SI038127+ SI0105A8 to SI0705A8 • SI018128 to SI038128 + SI010648 to SI070648 • SI018129 to SI038129 + SI0105A9 to SI0705A9 • SI01812A to SI03812A + SI010649 to SI070649	

Technical data

9

9.1 General specifications

Table 9-1 General specifications

Profile Class		
	FW version 2.00 and 2.01	3.00 Class B
	FW version 2.02 and later	3.01 Class B
Connections		
	MS0	1
	MS1	1
	MS2	2
Certification		According to specified profile

9.2 Physical layer specifications

Table 9-2 Physical layer specifications, PROFIBUS PA

Applicable standard	EN 50170
Physical Layer (Transmission technology)	IEC-61158-2
Transmission speed	31,25 Kbits/second
Number of stations	Up to 32 per line segment,(maximum total of 126)
Max. Basic current [IB]	14 mA
Fault current [IFDE]	0 mA
Bus Voltage	9-32 V (Non Ex)

Table 9-3 Physical layer specifications, PROFIBUS DP

Applicable standard	EN 50170 vol.2
Physical Layer (Transmission technology)	RS485
Transmission speed	≤1.5 Mbits/second
Number of stations	Up to 32 per line segment,(maximum total of 126)
Max. Basic current [IB]	14 mA
Fault current [IFDE]	0 mA
Bus Voltage	9-32 V (Non Ex)

9.3 Cable specifications

Recommended cable types

The PROFIBUS standard defines two variations of the bus cable: Cable type A and cable type B. It is recommended to use cable Type A in all new installations.

Both types have cable shielding that guarantees adequate protection from electromagnetic interference and thus the most reliable data transfer.

Table 9-4 Cable type A specifications

	Type A
Cable structure	twisted pair, individual shield
Wire size	0.8 mm^2 (AWG 18)
Loop resistance (DC)	44 Ω/km
Impedance at 31.25 kHz	100 Ω ± 20%
Attenuation at 39 kHz	3 dB/km
Capacitive asymmetry	2 nF/km
Envelope delay distortion (7.9 to 39 kHz)	1.7 µs/km
Shield coverage	90%
Max. cable length (inc. spurs >1 m)	1900 m (6233 ft)

Siemens provides a suitable cable for non-hazardous area with following order number - 6XV1 830-5BH10

Overall cable length

The overall cable length is made up of the length of the main cable and the length of all spurs (>1 m/3.28 ft).

The maximum network expansion depends on the type of ignition protection and the cable specifications.

Note

If repeaters are used the maximum allowed cable length is doubled. Max. three repeaters are permitted between user and master.

Spurs

The line between distribution box and field unit is described as a spur. By non Ex applications the max. length of a spur depends on the number of spurs (>1 m/3.28 ft):

Number of spurs	1 to 12	13 to 14	15 to 18	19 to 24	25 to 32
Max. length per spur	120 m (393 ft)	90 m (295 ft)	60 m (196 ft)	30 m (98 ft)	-

9.4 Intrinsic safety data

Table 9-5 IS (Intrinsic Safety) data

Electronic safety specification (FISCO)	MASS 6000 Ex d (Compact mounted)	MAG 6000 I Ex d (Compact or remote mounted)
Max. U_i	17,5 V	17,5 V
Max. I_i	380 mA	380 mA
Max. P_i	5.32 W	5.32 W
Max. L_i	10 µH	0 µH
Max. C_i	5 nF	0 nF
Max. U_o	1.3 V	-
Max. I_o	50 µA	-

Table 9-6 FISCO cable requirements

Loop resistance	Rc	15 ... 150 Ω/km
Loop inductance	Lc	0.4 ... 1 mH/km
Capacitance	Cc	80 ... 200 nF/km
Max spur length	IIC and IIB	30 m
Max. trunk length	IIC	1 km
	IIB	5 km

Parameter tables

A

The following tables describe the details of all the parameters available. The tables are needed when programming a Class 1 Master (supporting DPV1) to access parameters in the profile.

Abs. Index	Absolute Index within the SLOT
Rel. Index	Relative Index within the Block
Parameter	Name of the parameter within the profile
Data type [size]	Specifying the data type and size of the parameter.
Parameter type	• C = Constant: parameter value cannot be changed • S = Static: parameter value is retained through power-off/on cycle. Change of parameter is indicated in block's static revision counter (ST_REV) • N = Non static: parameter value is retained through power-off/on cycle • D = Dynamic: parameter value is NOT retained through power-off/on cycle
Storage location	• T = stored in the transmitters SensorProm • L = stored locally in the PROFIBUS Add-On module
FW version	Specifies the first PROFIBUS module firmware revision, which supports the parameter.
Access	R = only readable W = only writeable R/W = read and write
Default value	A new device contains default values. Default values can also be obtained by using the "Set To Default" command
Description	Short description of the parameter.

A.1 Slot/Index

SITRANS F M Slot / Index overview

Table A-1 Acyclic data, Master Class 1 & 2

Slot	Block	Absolute index
0	PB1	0 - 74
	TB	75 - 254
1	DM	0 - 15
	Analog Input FB	16 - 74
	PB2	75 - 144
	TB	145 - 254
2	Totalizer 1 FB	16 - 74
	PB3	75 - 144
3	Totalizer 2 / Batch FB	16 - 74

Table A-2 Cyclic data, Master Class 1

Slot	Outputs	Inputs
1		Volume Flow
2	SET_TOT MODE_TOT	Totalizer 1
3	SET_TOT MODE_TOT BTCH_CTRL Setpoint Compensation	Totalizer 2/batched amount Batch_status Batched amount added

SITRANS F C Slot / Index overview

Table A-3 Acyclic data, Master Class 1 & 2

Slot	Block	Absolute index
0	PB1	0 - 74
	TB	75 - 254
1	DM	0 - 15
	Analog Input FB (Mass Flow)	16 - 74
	PB2	75 - 144
	TB	145 - 254
2	Analog Input FB (Density)	16 - 74
	PB3	75 - 144
3	Analog Input FB (Temperature)	16 - 74

Slot	Block	Absolute index
4	Totalizer 1 FB	16 - 74
5	Totalizer 2 / Batch FB	16 - 74
6	Analog Input FB (Volume Flow)	16 - 74
7	Analog Input FB (Fraction A)	16 - 74
8	Analog Input FB (Fraction B)	16 - 74
9	Analog Input FB (Fraction A%)	16 - 74

Table A-4 Cyclic data, Master Class 1

Slot	Outputs	Inputs
1		Mass Flow
2		Density
3		Temperature
4	SET_TOT MODE_TOT	Totalizer 1
5	SET_TOT MODE_TOT BTCH_CTRL Setpoint Compensation Batched amount added	Totalizer 2/batched amount Batch_status
6		Volumeflow
7		Fraction A
8		Fraction B
9		Fraction A%

A.2 Physical Block parameters (PB1)

Table A-5 Physical Block (PB1), SLOT 0

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
0 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
1 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
2 [2]	TAG_DESC	VisSt (32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW
3 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to groupBlocks. FW version: 2.00 Default value: 0 Access: RW
4 [4]	ALERT_KEY	Uns8	S [L]	This parameter contains the identification number of the plant unit. It helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW
5 [5]	TARGET_MODE	Uns8	S [L]	The target mode attribute indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 8 Access: RW
6 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,8,8 Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
7 [7]	ALARM_SUM	DS-42	D [L]	This parameter contains the current states of the block alarms. FW version: 2.00 Default value: 0,0,0,0 Access: R
8 [8]	SOFTWARE_ REVISION	VisStr (16)	C [L]	Firmware version of the PROFIBUS module. FW version: 2.00 Default value: "x.xx" Access: R
9 [9]	HARD-WARE_REVI-SION	VisStr (16)	C [L]	Hardware version of the PROFIBUS module. FW version: 2.00 Default value: x.xx Access: R
10 [10]	DEVICE_MAN_ID	Uns16	C [L]	Identification code of the manufacturer of the field device. FW version: 2.00 Default value: 42 Access: R
11 [11]	DEVICE_ID	VisStr (16)	C [L]	Manufacturer specific identification of the device. FW version: 2.00 Default values: • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" Access: R
12 [12]	DE-VICE_SER_NUM	VisStr (16)	C [L]	Serial number of the PROFIBUS module. Only visible on the module FW version: 2.00 Default value: See label Access: R
13 [13]	DIAGNOSIS	OctStr (4)	D [L]	Detailed information of the device, bitwise coded. More than one message possible at the same time. If MSB of byte 4 is set to 1 more diagnose information is available in the DIAGNOSIS_EXTENSION parameter. The device supports two types of diagnosis: • Expanded Diagnosis is supported from firmware version 2.00. • Condensed Diagnosis is supported from PROFIBUS module firmware version 2.02. FW version: 2.00 Default value: - Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
14 [14]	DIAGNOSIS_ EXTENSION	OctStr (6)	D [L]	Additional manufacturer-specific information of the device, bitwise coded. More than one message possible at the same time. FW version: 2.00 Default value: - Access: R
15 [15]	DIAGNOSIS_MASK	OctStr (4)	C [L]	Definition of supported DIAGNOSIS information-bits. FW version: 2.00 Default value: 80,0f,b8,00 Access: R
16 [16]	DIAGNOSIS_MASK_ EXTENSION	OctStr (6)	C [L]	Definition of supported DIAGNOSIS_EXTENSION information-bits. FW version: 2.00 Default value: ff,ff,ff,ff,ff,03 Access: R
17 [17]	DEVICE_ CERTIFICATION	VisStr (32)	C [L]	Certifications of the field device. FW version: 2.00 Default value: See nameplate Access: R
18 [18]	WRITE_LOCKING	Uns16	N [L]	Software write protection. 0 – acyclic write service of all parameters, except this WRITE_LOCKING. 2457 is the default value and means all writeable parameters of a device are writeable. FW version: 2.00 Default value: 2457 Access: RW
19	FATORY_RESET	Uns16	S [T,L]	Value range and description, see Table A-6 FACTORY_RESET (Page 78) FW version: 2.00 Default value: 0 Access: RW
20 [20]	DESCRIPTOR	VisStr (32)	S [L]	User-definable text to describe the device within the application FW version: 2.00 Default value: Flow Transmitter Access: RW
21 [21]	DEVICE_MESSAGE	VisStr (32)	S [L]	User-definable message to describe the device within the application within the application or in the plant. FW version: 2.00 Default value: All blanks (0x20 hex) Access: RW
22 [22]	DEVICE_INSTAL_DATE	VisStr (16)	S [L]	Date of installation of the device. FW version: 2.00 Default setting: All blanks (0x20 hex) Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
23 [23]	Reserved			
24 [24]	IDENT_NUMBER_SELECTOR	Uns8	S [L]	Each PROFIBUS device has an ident_number provided by the PNO. Value range and description, see Table A-7 IDENT_NUMBER_SELECTOR (Page 78) FW version: 2.00 Default setting: 1 Access: RW (Cannot be written when the device is in DataExchange).
25 [25]	Reserved			
26 [26]	FEATURE	DS-68	N [L]	This parameter specifies which features are supported in the device and which of the supported features are enabled. The supported features can be enabled from the parameterization telegram for Data Exchange. Supported features, see Table A-8 FEATURE (Page 79) FW revision: 2.02 Default setting: 0B,00,00,00, 09,00,00,00 Access: R
27 [27]	COND_STATUS_ DIAG	Uns8	S [L]	Used for enabling and disabling Condensed Status and Diagnostic messages when the device is not in Data Exchange. When the device is parameterized for DataExchange this parameter is updated according to the setting for "Condensed Status and Diagnostic Messages" in the GSD file. Values: • 0: Condensed Status and Diagnostics is enabled. • 1: Condensed Status and Diagnostics is disabled. Expanded Diagnosis and status as defined in PA profile 3.00 is used. FW revision: 2.02 Default setting: 1 Access: RW
28 [28]	DIAG_EVENT_SWITCH	Diag_Event_Switch	S [L]	Indicates and controls the reaction of the device on device specific diagnostic events if "Condensed Status and Diagnostic messages" is enabled. For further information, see: DIAG_EVENT_SWITCH (Page 53) FW revision: 2.02 Default setting: - Access: RW
30 ... 41 [30 ... 41]	Reserved			

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
42 [4]	PRODUCT_CODE	VisStr (48)	C [L]	Ordering number of the PROFIBUS module: • PROFIBUS PA module: "FDK:085U0236" • PROFIBUS DP module: "FDK:085U0237" FW version: 2.00 Default setting: - Access: R
43 ... 44 [43 ... 44]	Reserved			
45 [45]	ERRORPENDING_LIST	OctStr (60)	D [T]	Detailed transmitter error information. For device driver use only. FW version: 2.00 Default setting: - Access: R
46 [46]	SYSTEM_ERROR_STATE	Uns8	D [T]	Detailed transmitter error information. For device driver use only. FW version: 2.00 Default setting: - Access: R
47 [47]	ERRORPENDING_ACCEPTION_LEVEL	Uns8	S [T]	Detailed transmitter error information. Configures the lowest level of error types (Warning/Permanent/Fatal) to be reported on the PROFIBUS interface. The parameter can be used for suppressing warnings or for suppressing both warnings and permanent errors.The error levels for current, digital and relay outputs and status log are not affected. FW version: 2.00 Default value: • 1: Warning Parameter values: • 0: Information • 1: Warning • 2: Permanent • 3: Fatal Access: RW
48 [48]	STATUSLOG_LIST	OctStr (60)	D [T]	Detailed transmitter error information. For device driver use only. FW version: 2.00 Default setting: - Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
49 [49]	STATUS-LOG_ACCEPT-ION_LEVEL	Uns8	S [T]	Detailed transmitter error information. Configures the lowest level of error types (Warning/Permanent/Fatal) to be reported in the Status Log List. The error levels for current, digital and relay outputs and Error Pending List are not affected. FW version: 2.00 Default value: • 0 Information Parameter values: • 0 Information • 1 Warning • 2 Permanent • 3 Fatal Access: RW
50 [50]	STATUS-LOG_RESET	Uns8	N [T]	Detailed transmitter error information. Resets contents of the Status Log List FW version: 2.00 Default setting: - Parameter values: • 0 No action • 1 Reset Access: RW
51 [51]	SUP-PRESS_P40_SE NSORPROM	Uns8	N [T]	Can be used for suppressing Permanent error P40, which is being reported from the transmitter when no SensorProm is Installed. The setting is reset to value 0 when the transmitter is re-started. Values: • 0: Do not suppress permanent error P40 • 1: Suppress Permanent error P40 FW revision: 2.02 Access: RW
51 ... 73 [51 ... 73]	Reserved			
74 [74]	VIEW_1	View Object	C [L]	Collection of parameters. The relative Index's listed in "Default value" are returned. FW version: 2.00 Default setting: 01,06,07,13 Access: R

Table A-6 FACTORY_RESET

Value	Action
0	No action
1	Cold Start-up – Command for resetting the PA slave for default values. The slave node address, update rate and the IDENT_NUMBER_SELECTOR remain the same
2506	Warm Start-up – Command for warm start-up of the device. All parameters remain unchanged
2712	Resets the node address only (default value 126)
Other between 0 and 32767	Reserved
32768-33000	Device Specific (Not used)
33001	Update Rates for cyclic data – Set 1 (Only SITRANS F C MASS6000) – Factory setting
33002	Update rates for cyclic data – Set 2 (Only SITRANS F C MASS 6000)
33003	Update rates for cyclic data – Set 3 (Only SITRANS F C MASS 6000)
33004-65535	Device Specific (Not used)

These manufacturer specific options set the update rates for cyclic data. Using these options will result in the flowmeter restarting with the new update Rates. The following sets can be specified:

Value	Setting
33001	**2 Hz**: Mass flow, Density, Temperature, Volume flow, Fraction A, Fraction B, Fraction A%, Totalizer 1, Totalizer 2
33002	**10 Hz:** Mass flow **2 Hz**: Density, Temperature, Volume flow, Fraction A, Fraction B, Fraction A%, Totalizer 1, Totalizer 2
33003	**10 Hz**: Mass flow **5 Hz**Totalizer 1, Totalizer 2 **2 Hz**: Density, Temperature, Volume flow, Fraction A, Fraction B, Fraction A%

This parameter cannot be written when the device is in DataExchange mode.

Table A-7 IDENT_NUMBER_SELECTOR

Value	Action
0	Manufacturer spec. ID PA-profile v3
1	Manufacturer spec. ID PA-profile v2, DPVO only - for backward compatibility
2	Manufacturer independent ID according to the PROFIBUS profile for Process Control Devices, Version 3.0

Table A-8 FEATURE

FW version	Supported features
2.00	• Expanded Status/Diagnosis
2.01	• Expanded Status/Diagnosis • MS1 Application relationship
2.02 and later	• Expanded Status/Diagnosis • Condensed Status and Diagnostic message (Profile 3 ID numbers only) • MS1 Application relationship

A.3 Physical Block parameters (PB2)

Table A-9 Physical Block (PB2), SLOT 1

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
75 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
76 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
77 [2]	TAG_DESC	VisStr(32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW
78 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to group Blocks. FW version: 2.00 Default value: 0 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
79 [4]	ALERT_KEY	Uns8	S [L]	This parameter contains the identification number of the plant unit. It helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW
80 [5]	TARGET_MODE	Uns8	S [L]	The target mode attribute indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 0 Access: RW
81 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,8,8 Access: R
82 [7]	ALARM_SUM	DS-42	D [L]	This parameter contains the current states of the block alarms. FW version: 2.00 Default value: 0,0,0,0 Access: R
83 [8]	SOFTWARE_ REVISION	VisStr(16)	C [T]	Firmware version of the Transmitter. FW version: 2.00 Default value: "x.xx" Access: R
84 [9]	HARDWARE_REVISION	VisStr(16)	C [T]	Hardware version of the Transmitter. FW version: 2.00 Default value: "x.xx" Access: R
85 [10]	DEVICE_MAN_ID	Uns16	C [L]	Identification code of the manufacturer of the field device. FW version: 2.00 Default value: 42 Access: R
86 [11]	DEVICE_ID	VisStr(16)	C [L]	Manufacturer specific identification of the device. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
87 [12]	DEVICE_SER_NUM	VisStr(16)	C [T]	Serial number of the transmitter FW version: 2.00 Default value: "xxxxxxNxxx" Access: R
88 [13]	DIAGNOSIS	OctStr(4)	D [L]	Detailed information of the device, bitwise coded. More than one message possible at the same time. If MSB of byte 4 is set to 1 more diagnose information is available in the DIAGNOSIS_EXTENSION parameter. FW version: 2.00 Default value: - Access: R
89 [14]	DIAGNOSIS_ EXTENSION	OctStr(6)	D [L]	Additional manufacturer-specific information of the device, bitwise coded. More than one message possible at the same time. FW version: 2.00 Default value: - Access: R
90 [15]	DIAGNOSIS_MASK	OctStr(4)	C [L]	Definition of supported DIAGNOSIS information-bits. FW version: 2.00 Default value: 80,0f,b8,00 Access: R
91 [16]	DIAGNOSIS_MASK_ EXTENSION	OctStr(6)	C [L]	Definition of supported DIAGNOSIS_EXTENSION information-bits. FW version: 2.00 Default value: ff,ff,ff,ff,ff,03 Access: R
92 [17]	DEVICE_ CERTIFICATION	VisStr(32)	C [L]	Certifications of the field device. FW version: 2.00 Default value: See nameplate Access: R
93 [18]	Reserved			
94 [19]	Reserved			
95 [20]	DESCRIPTOR	VisStr(32)	S [L]	User-definable text to describe the device within the application FW version: 2.00 Default setting: "Flow Transmitter" Access: RW
96 [21]	DEVICE_MESSAGE	VisStr(32)	S [L]	User-definable message to describe the device within the application within the application or in the plant. FW version: 2.00 Default setting: All blanks (0x20 hex) Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
97 [22]	DEVICE_INSTAL_DATE	VisStr(16)	S [L]	Date of installation of the device. FW version: 2.00 Default setting: All blanks (0x20 hex) Access: RW
98 [23]	Reserved			
99 [24]	IDENT_NUMBER_SELECTOR	Uns8	S [L]	Each PROFIBUS device has an ident_number provided by the PNO. Value range and description, see Table A-7 IDENT_NUMBER_SELECTOR (Page 78) FW version: 2.00 Default setting: 1 Access: RW (Cannot be written when the device is in Data-Exchange).
100 ... 116 [25 ... 41]	Reserved			
117 [42]	PRODUCT_CODE	VisStr(48)	C [T]	Ordering number of the Transmitter. FW version: 2.00 Default setting: Transmitter specific Access: R
118 [43]	OPERATING_HOURS	Uns32	N [T]	Time since device power up in seconds. FW version: 2.02 Default setting: Transmitter specific Access: R
119 [44]	DISPLAY_LANGUAGE	Uns8	S [T]	Sets the language on local keypad display. Values outside the allowed intervals will NOT return an error. The resulting language from writing a non specified value is not specified. Value range and description, see Table A-10 DISPLAY_LANGUAGE (Page 84) FW version: 2.00 Default setting: Transmitter specific Access: RW
120 [45]	LOCAL_PASSWORD	Uns16	S [T]	Sets the local keypad display password. Passwords from 1000-9999 are possible. FW version: 2.00 Default setting: 1000 Access: RW
121 [46]	DISPLAY_UNIT_MASSFLOW	Uns8	S [T]	Sets the unit of the value in the local keypad display.* Default setting: Transmitter specific FW version: 2.00 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
122 [47]	DISPLAY_POINT_MASSFLOW	Uns8	S [T]	This parameter sets the decimal point in the local. keypad display. Values outside the allowed interval 0…7 will return an error. FW version: 2.00 Default setting: Transmitter specific Access: RW
123 [48]	DISPLAY _UNIT_VOLUMEFLOW	Uns8	S [T]	Sets the unit of the value in the local keypad display.* FW version: 2.00 Default setting: Transmitter specific Access: RW
124 [49]	DISPLAY_POINT_VOLUMEFLOW	Uns8	S [T]	This parameter sets the decimal point in the local keypad display. Values outside the allowed interval 0…7 will return an error. FW version: 2.00 Default setting: Transmitter specific Access: RW
125 [50]	DISPLAY _UNIT_FRAC_AB	Uns8	S [T]	Sets the unit of the value in the local keypad display.* FW version: 2.00 Default setting: Transmitter specific Access: RW
126 [51]	DISPLAY_POINT_FRAC_A	Uns8	S [T]	Sets the decimal point in the local keypad display. Values outside the allowed interval 0…7 will return an error. See details below. FW version: 2.00 Default setting: Transmitter specific Access: RW
127 [52]	DISPLAY_POINT_FRAC_B	Uns8	S [T]	Sets the decimal point in the local keypad display. Values outside the allowed interval 0…7 will return an error. See details below. FW version: 2.00 Default setting: Transmitter specific Access: RW
128 [53]	DISPLAY_UNIT_TOTALIZER_1	Uns8	S [T]	Sets the unit of the value in the local keypad display.* FW version: 2.00 Default setting: Transmitter specific Access: RW
129 [54]	DISPLAY_POINT__TOTALIZER_1	Uns8	S [T]	Sets the decimal point in the local keypad display. Values outside the allowed interval 0…7 will return an error. See details below. FW version: 2.00 Default setting: Transmitter specific Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
130 [55]	DISPLAY_UNIT__TOTALIZER_2	Uns8	S [T]	Sets the unit of the value in the local keypad display.* FW version: 2.00 Default setting: Transmitter specific Access: RW
131 [56]	DISPLAY_POINT__TOTALIZER_2	Uns8	S [T]	Sets the decimal point in the local keypad display. Values outside the allowed interval 0…7 will return an error. See details below. FW version: 2.00 Default setting: Transmitter specific Access: RW
132 [57]	DISPLAY_UNIT__DENSITY	Uns8	S [T]	Sets the unit of the value in the local keypad display.* FW version: 2.00 Default setting: Transmitter specific Access: RW
133 [58]	DISPLAY_POINT__DENSITY	Uns8	S [T]	Sets the decimal point in the local keypad display. Values outside the allowed interval 0…7 will return an error. See details below. FW version: 2.00 Default setting: Transmitter specific Access: RW
134 [59]	DISPLAY_LINE_1	Uns8	S [T]	Sets the value to be shown in line 1 of the keypad display. FW version: 2.00 Default setting: 0 Access: RW
135 [60]	DISPLAY_LINE_2_AND_3	Uns8(2)	S [T]	Sets the values to be shown in line 2+3 of the keypad FW version: 2.00 Default setting: 0,1 Access: RW
136 ... 143 [61 ... 68]	Reserved			
144 [69]	VIEW_1	View Object	C [L]	Collection of parameters. The relative Index's listed in "Default value" are returned. FW version: 2.00 Default setting: 01,06,07,13 Access: R

* All display unit settings can be found in Local display units (Page 143)

Table A-10 DISPLAY_LANGUAGE

Value	Action	MASS 6000	MAG 6000
0	English	✓	✓
1	German	✓	✓

Value	Action	MASS 6000	MAG 6000
2	French	✓	✓
3	Danish	✓	✓
4	Swedish	✓	✓
5	Finnish	✓	✓
6	Russian	✓	✓
7	Spanish	✓	✓
8	Italian	✓	✓
9	Portuguese	✓	✓
10	Polish (MAG 6000 only)		✓

A.4 Physical Block parameters (PB3)

Table A-11 Physical Block (PB3), SLOT 2

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
75 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
76 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
77 [2]	TAG_DESC	VisStr(32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW
78 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to group Blocks. FW version: 2.00 Default value: 0 Access: RW
79 [4]	ALERT_KEY	Uns8	S [L]	Contains the identification number of the plant unit. It helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
80 [5]	TARGET_MODE	Uns8	S [L]	The target mode attribute indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 8 Access: RW
81 [6]	MODE_BLK	DS-37	D [L]	Contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,8,8 Access: R
82 [7]	ALARM_SUM	DS-42	D [L]	Contains the current states of the block alarms. FW version: 2.00 Default value: 0,0,0,0 Access: R
83 [8]	SOFTWARE_ REVISION	VisStr(16)	C [T]	There is no Firmware version of the sensor. FW version: 2.00 Default value: "Not available" Access: R
84 [9]	HARDWARE_REVISION	VisStr(16)	C [T]	There is no hardware version of the sensor. FW version: 2.00 Default value: "Not available" Access: R
85 [10]	DEVICE_MAN_ID	Uns16	C [L]	Identification code of the manufacturer of the field device. FW version: 2.00 Default value: 42 Access: R
86 [11]	DEVICE_ID	VisStr(16)	C [L]	Manufacturer specific identification of the device. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: R
87 [12]	DEVICE_SER_NUM	VisStr(16)	C [T]	Serial number of the transmitter FW version: 2.00 Default value: "xxxxxxNxxx" Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
88 [13]	DIAGNOSIS	OctStr(4)	D [L]	Detailed information of the device, bitwise coded. More than one message possible at the same time. If MSB of byte 4 is set to 1 more diagnose information is available in the DIAGNOSIS_EXTENSION parameter. FW version: 2.00 Default value: - Access: R
89 [14]	DIAGNOSIS_ EXTENSION	OctStr(6)	D [L]	Additional manufacturer-specific information of the device, bitwise coded. More than one message possible at the same time. FW version: 2.00 Default value: - Access: R
90 [15]	DIAGNOSIS_MASK	OctStr(4)	C [L]	Definition of supported DIAGNOSIS information-bits. FW version: 2.00 Default value: 80,0f,b8,00 Access: R
91 [16]	DIAGNOSIS_MASK_ EXTENSION	OctStr(6)	C [L]	Definition of supported DIAGNOSIS_EXTENSION information-bits. FW version: 2.00 Default value: ff,ff,ff,ff,ff,03 Access: R
92 [17]	DEVICE_ CERTIFICATION	VisStr(32)	C [L]	Certifications of the field device. FW version: 2.00 Default value: See nameplate Access: R
93 [18]	Reserved			
94 [19]	Reserved			
95 [20]	DESCRIPTOR	VisStr(32)	S [L]	User-definable text to describe the device within the application FW version: 2.00 Default setting: "Flow Transmitter" Access: RW
96 [21]	DEVICE_MESSAGE	VisStr(32)	S [L]	User-definable message to describe the device within the application within the application or in the plant. FW version: 2.00 Default setting: All blanks (0x20 hex) Access: RW
97 [22]	DEVICE_INSTAL_DATE	VisStr(16)	S [L]	Date of installation of the device. FW version: 2.00 Default setting: All blanks (0x20 hex) Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
98 [23]	Reserved			
99 [24]	IDENT_NUMBER_SELECTOR	Uns8	S [L]	Each PROFIBUS device has an ident_number provided by the PNO. • 0: Manufacturer spec. ID PA-profile v3.00 • 1: Manufacturer spec. ID PA-profile v.2.0 Only DPV0. For backward compatibility. • 2: Manufacturer independent ID according to the PROFIBUS Profile for Process Control Devices, Version 3.0 FW version: 2.00 Default setting: 1 Access: RW (Cannot be written when the device is in Data-Exchange).
100 ... 116 [25 ... 41]	Reserved			
117 [42]	PRODUCT_CODE	VisStr(48)	C [T]	Ordering number of the Sensor. FW version: 2.00 Default setting: Sensor specific Access: R
118 [43]	Reserved			
119 [44]	SENSORPROM_INSTALLED	Uns8	C [T]	• 0 = SensorProm NOT installed • 1 = SensorProm installed FW version: 2.00 Default setting: - Access: R
120 [45]	Reserved			
121 [46]	SENSOR_TYPE	VisStr(16)	C [T]	Information about sensor type, e.g SITRANS F M MAG 5100 W. FW version: 2.00 Default setting: Sensor specific Access: R
122 [47]	SENSOR_SIZE_TEXT	VisStr(16)	C [T]	Information about sensor size, e.g .DN50 FW version: 2.00 Default setting: Sensor specific Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
123 ... 143 [48 ... 68]	Reserved			
144 [69]	VIEW_1	View Object	C [L]	Collection of parameters. The relative Index's listed in "Default value" are returned. FW version: 2.00 Default setting: 01,06,07,13 Access: R

A.5 Transducer Block parameters (TB2)

Table A-12 Transducer Block (TB2), SLOT 0

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
75 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
76 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
77 [2]	TAG_DESC	VisStr (32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW
78 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to group Blocks. FW version: 2.00 Default value: 0 Access: RW
79 [4]	ALERT_KEY	Uns8	S [L]	Identification number of the plant unit. Helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
80 [5]	TARGET_MODE	Uns8	S [L]	Indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 8 Access: RW
81 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,8,8 Access: R
82 [7]	ALARM_SUM	DS-42	D [L]	The current states of the block alarms. FW version: 2.00 Default value: 0,0,0,0 Access: R
83 ... 90 [8 ... 15]	Reserved			
91 [16]	CURRENT_OUT_ACTIVE	Uns8	S [T]	Enable or disable the current output. FW version: 2.00 Value range: • 0: Off • 1: On Default value: 0 Access: RW
92 [17]	CURRENT_OUT_SELECTION	Uns8	S [T]	Specify the process value that controls the Current Output. FW version: 2.00 Value range, see Table A-14 DIGITAL_OUT_FUNCTION (Page 99) Default value: 0xFF Access: RW
93 [18]	CURRENT_OUT_DIRECTION	Uns8	S [T]	Current output mode. FW version: 2.00 Value range: • 1: Unidirectional • 2: Bidirectional Default value: 1 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
94 [19]	CURRENT_OUT_RANGE	Uns8	S [T]	Define the range of the current output FW version: 2.00 Value range: • 0: 0-20 mA • 1: 4-20 mA • 2: 4-20 mA and Alarm Default value: 1 Access: RW
95 [20]	CURRENT_OUT_TIMECONST	Float	S [T]	Filter the output. Influences the values on the display and on MAG 6000 it also influences the cyclic volumeflow. FW version: 2.00 Value range: 0.1 ... 30 seconds Default value: 5.0 Access: RW
96 [21]	Reserved			
97 [22]	DIGITAL_OUT_FUNCTION	Uns8	S [T]	Assign the functionality of the digital output. FW version: 2.00 Value range, see Table A-13 Common table for selection parameters CURRENT_OUT, DIGITAL_LIMIT, FREQ_OUT and RELAY_LIMIT (Page 98) Default setting: 0 Access: RW
98 [23]	DIGITAL_LIMIT_SELECTION	Uns8	S [T]	Specify the process value that controls the Digital Output when the functionality "Direction Limit" is selected. FW version: 2.02 Value range, see Table A-13 Common table for selection parameters CURRENT_OUT, DIGITAL_LIMIT, FREQ_OUT and RELAY_LIMIT (Page 98) Default setting: 0xFF Access: RW
99 [24]	DIGITAL_LIMIT_MODE	Uns8	S [T]	Select the usage of one or two setpoints when functionality "Direction Limit" is enabled. FW version: 2.02 Value range: • 1: 1 setpoint • 2: 2 setpoints Default setting: 0 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
100 [25]	DIGITAL_LIMIT_SETPOINT1	Float	S [T]	Specify the lower limit in percentage of upper value above which the output shall be active. FW version: 2.02 Default setting: 0.0 Access: RW
101 [26]	DIGITAL_LIMIT_SETPOINT2	Float	S [T]	Specify the upper limit in percentage of upper value below which the output shall be active. Only used when the Digital Limit Mode specifies the usage of two setpoints. FW version: 2.02 Default setting: 0.0 Access: RW
102 [27]	DIGITAL_LIMIT_HYSTERESIS	Float	S [T]	Specify a hysteresis for digital limit setpoint 1 and setpoint 2. FW revision: 2.02 Default setting: 0.05 Access: RW
103 ... 105 [28 ... 30]	Reserved			
106 [31]	FREQ_OUT_SELECTION	Uns8	S [T]	Specify the process value that controls the Digital Output when functionality "Frequency" is selected. FW version: 2.00 Value range, see Table A-13 Common table for selection parameters CURRENT_OUT, DIGITAL_LIMIT, FREQ_OUT and RELAY_LIMIT (Page 98) Default setting: 0xFF Access: RW
107 [32]	FREQ_OUT_DIRECTION	Uns8	S [T]	Digital output mode. FW version: 2.00 Value range: • 1: Unidirectional • 2: Bidirectional Default setting: 1 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
108 [33]	FREQ_OUT_RANGE	Uns8	S [T]	Specify max frequency. FW version: 2.00 Value range • 0: 10 KHz • 1: 5 KHz • 2: 1 KHz • 3: 500 Hz Default setting: 0 Access: RW
109 [34]	FREQ_OUT_TIMECONSTANT	Float	S [T]	Filter the output. FW version: 2.00 Value range: 0.1 ... 30 seconds. Default setting: • MAG 6000: 5.0 • MASS 6000: 5.0 Access: RW
110 [35]	PULSE_OUT_SELECTION	Uns8	S [T]	Specify the process value that controls the Digital Output when functionality "Pulse" is selected. FW version: 2.02 Value range, see Table A-15 PULSE_OUT_SELECTION (Page 99): • 1: Mass flow (MASS 6000 only) • 2: Volume flow • 5: Fraction A (MASS 6000 only) • 6: Fraction B (MASS 6000 only) • 0xFF: No selection Default setting: • MAG 6000: 2 • MASS 6000: 1 Access: RW
111 [36]	PULSE_OUT_VOLUME_PER_PULSE_UNIT	Uns16	S [L]	Selects the unit of volume/pulse in the PROFIBUS module FW version: 2.02 Default setting: 1034 Access: RW
112 [37]	PULSE_OUT_VOLUME_PER_PULSE	Float	S [T]	Specifies the volume amount for each pulse FW version: 2.02 Default setting: • MAG 6000: 0.001963495 • MASS 6000: 0.006 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
113 [38]	PULSE_OUT_VOLUME_PER_PULSE_MIN	Float	S [T]	The minimum volume amount per pulse FW version: 2.02 Default setting: Sensor specific Access: R
114 [39]	PULSE_OUT_VOLUME_PER_PULSE_MAX	Float	S [T]	The maximum volume amount per pulse FW version: 2.02 Default setting: Sensor specific Access: R
115 [40]	PULSE_OUT_MASS_PER_PULSE_UNIT	Uns16	S [L]	Selects the unit of mass/pulse in the PROFIBUS module Only valid for MASS 6000 transmitters. FW version: 2.02 Default setting: 1088 Access: RW
116 [41]	PULSE_OUT_MASS_PER_PULSE	Float	S [T]	Specifies the mass amount for each pulse Only valid for MASS 6000 transmitters. FW version: 2.02 Default setting: 6.0 (MASS 6000 only) Access: RW
117 [42]	PULSE_OUT_MASS_PER_PULSE_MIN	Float	S [T]	The minimum mass amount per pulse Only valid for MASS 6000 transmitters. FW version: 2.02 Default setting: Sensor specific (MASS 6000 only) Access: R
118 [43]	PULSE_OUT_MASS_PER_PULSE_MAX	Float	S [T]	The maximum mass amount per pulse Only valid for MASS 6000 transmitters. FW version: 2.02 Default setting: Sensor specific (MASS 6000 only) Access: R
119 [44]	PULSE_OUT_DIRECTION	Uns8	S [T]	Specifies the direction of the pulse output. FW version: 2.02 Value range: • 1: Unidirectional (the output only gives of pulses is the measured value is positive) • 2: Bidirectional (the output gives of pulses by positive and negative values) Default setting: 1 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
120 [45]	PULSE_OUT_WIDTH	Uns8	S [T]	Pulse width of the Digital Output. FW version: 2.02 Value range, see Table A-16 PULSE_OUT_WIDTH (Page 99) Default setting: 10 Access: RW
121 [46]	PULSE_OUT_POLARITY	Uns8	S [T]	Digital output pulse polarity. FW version: 2.02 Value range: • 0: Negative • 1: Positive Default setting: 1 Access: RW
122 [47]	PULSE_OUT_QUADRATURE	Uns8	S [T]	Filter the output in case of process noise (only very noisy environment). Only valid for MASS 6000 transmitters. FW version: 2.02 Value range: • 0: Off • 1: On Default setting: 0 (MASS 6000 only) Access: RW
123 [48]	PULSE_OUT_TIMECONST	Float	S [T]	Time constant for the pulse output. Only valid for MAG 6000 transmitters. FW version: 2.02 Value range: 0.1 ... 30.0 seconds Default setting: 0.1 (MAG 6000 only) Access: RW
124 ... 126 [49 ... 51]	Reserved			
127 [52]	RELAY_OUT_MODE	Uns8	S [T]	Specify the mode of the Relay Output. FW version: 2.02 Value range, see Table A-17 RELAY_OUT_MODE (Page 100) Default setting: Error Level Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
128 [53]	RELAY_LIMIT_SELECTION	Uns8	S [T]	Specify the process value that controls the Relay Output. FW version: 2.02 Value range, see Table A-13 Common table for selection parameters CURRENT_OUT, DIGITAL_LIMIT, FREQ_OUT and RELAY_LIMIT (Page 98) Default setting: 0xFF Access: RW
129 [54]	RELAY_LIMIT_MODE	Uns8	S [T]	Select the usage of one or two setpoints when functionality "Direction Limit" is selected for the Relay Output FW version: 2.02 Value range; • 0: 1 setpoint • 1: 2 setpoints Default setting: 0 Access: RW
130 [55]	RELAY_LIMIT_SETPOINT1	Float	S [T]	This parameter specifies the lower limit in percentage of upper value, above which the output shall be active. FW version: 2.02 Default setting: • MAG 6000: 0.0 • MASS 6000: 0.1 Access: RW
131 [56]	RELAY_LIMIT_SETPOINT2	Float	S [T]	This parameter specifies the upper limit in percentage of upper value, below which the output shall be active. Setpoint2 is used only when the relay limit mode specifies the usage of two set-points FW version: 2.02 Default setting: • MAG 6000: 1.0 • MASS 6000: 0.5 Access: RW
132 [57]	RELAY_LIMIT_HYSTERESIS	Float	S [T]	This parameter specifies a hysteresis for relay limit setpoint1 and setpoint2 FW version: 2.02 Default setting: 0.05 Access: RW
133 [58]	RELAY_CLEANING_CYCLE_TIME	Uns32	S [T]	Selects the periodic interval between cleaning the elctrodes of the sensor. Value is in the time unit seconds and in the rante 1-240 hours Only valid for MAG 6000 FW version: 2.02 Default setting: 86400 (MAG 6000 only) Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
134 ... 135 [59 ... 60]	Reserved			
136 [61]	ERROR_NUMBER	Uns8	S [T]	This parameter is for selecting an error number which will casue the relay output or digital output to be active "ON" FW version: 2.02 Default setting: 0 Access: RW
137 [62]	ERROR_LEVEL	Uns8	S [T]	This parameter is for selecting an error level which, when reached, will casue the relay output or digital output to be active "ON" FW version: 2.02 Default setting: 1 Access: RW
138 ... 143 [63 ... 68]	Reserved			
144 [69]	DIGITAL_OUT_FORCE_MODE	Uns8	S [T]	Used to activate simulation on the digital output • 0: Low • 1: Simulate active FW version: 2.00 Default setting: 0 Access: RW
145 [70]	DIGITAL_OUT_FORCE_LEVEL	Uns8	S [T]	Simulation frequency level • 0: Low • 1: High FW version: 2.02 Default setting: 1 Access: RW
146 [71]	DIGITAL_OUT_FORCE_FREQ	Float	S [T]	Simulation frequency Range: 1-12000 Hz FW version: 2.00 Default setting: 1 Hz Access: RW
147 [72]	RELAY_OUT_FORCE_MODE	Uns8	S [T]	For forcing the relay output on or off • 0: Normal • 1: Forced FW version: 2.02 Default setting: 0 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
148 [73]	RELAY_OUT_FORCE_VALUE	Uns8	S [T]	Setting to force the relay output into: • 0: Forced to On • 1: Forced to Off FW version: 2.02 Default setting: 0 Access: RW
149 [74]	CURRENT_OUT_FORCE_MODE	Uns8	S [T]	Used to activate simulation on the current output • 0: Normal • 1: Simulate active FW version: 2.02 Default setting: 0 Access: RW
150 [75]	CURRENT_OUT_FORCE_VALUE	Float	S [T]	Simulation value in unit Ampere Range: 0.0-0.024 FW version: 2.02 Default setting: 0.02 Access: RW
151 ... 253 [76 ... 178]	Reserved			
254 [179]	VIEW_1		C [L]	Collection of parameters. The relative Indices listed in "Default value" are returned. FW version: 2.02 Default setting: 01,06,07 Access: R

Common selection parameters

The values and actions in this table cover the following parameters

- CURRENT_OUT_SELECTION
- DIGITAL_LIMIT_SELECTION
- FREQ_OUT_SELECTION
- RELEAY_LIMIT_SELECTION

Table A-13 Common table for selection parameters CURRENT_OUT, DIGITAL_LIMIT, FREQ_OUT and RELAY_LIMIT

Value	Action	MASS 6000	MAG 6000
1	Mass flow	✓	
2	Volume flow	✓	✓

Value	Action	MASS 6000	MAG 6000
3	Density	✓	
4	Temperature	✓	
5	Fraction A	✓	
6	Fraction B	✓	
7	Fraction A%	✓	
0xFF	No selection		

DIGITAL_OUT_FUNCTION

Table A-14 DIGITAL_OUT_FUNCTION

Value	Action
0	Disconnected
1	Frequency
2	Pulse
3	Error level
4	Error number
5	Direction limit
6	Batch

PULSE_OUT_SELECTION

Table A-15 PULSE_OUT_SELECTION

Value	Action	MASS 6000	MAG 6000
1	Mass flow	✓	
2	Volume flow	✓	✓
5	Fraction A	✓	
6	Fraction B	✓	
0xFF	No selection		

PULSE_OUT_WIDTH

Table A-16 PULSE_OUT_WIDTH

Value	Action
0	64 µs
1	130 µs
2	260 µs
3	510 µs
4	1.0 ms
5	2.0 ms
6	4.1 ms

Value	Action
7	8.2 ms
8	16 ms
9	33 ms
10	66 ms
11	130 ms
12	260 ms
13	520 ms
14	1.0 s
15	2.1 s
16	4.2 s

RELAY_OUT_MODE

This parameter cannot be written when the device is in DataExchange mode.

Table A-17 RELAY_OUT_MODE

Value	Action	MASS 6000	MAG 6000
3	Error Level	✓	✓
4	Error Number	✓	✓
5	Direction Limit	✓	✓
6	Batch		✓
7	Cleaning		✓
0	Off	✓	✓

A.6 Transducer Block parameters (TB1)

Table A-18 Transducer Block (TB1), SLOT 1

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
145 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default settings: According to profile Access: R
146 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default settings: 0 Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
147 [2]	TAG_DESC	VisStr (32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default settings: - Access: RW
148 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to group Blocks. FW version: 2.00 Default settings: 0 Access: RW
149 [4]	ALERT_KEY	Uns8	S [L]	This parameter contains the identification number of the plant unit. It helps to identify the location (plant unit) of an event. FW version: 2.00 Default settings: 0 Access: RW
150 [5]	TARGET_MODE	Uns8	S [L]	The target mode attribute indicates what mode of operation is desired for the block. FW version: 2.00 Default settings: 8 Access: RW
151 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default settings: 8,8,8 Access: R
152 [7]	ALARM_SUM	DS-42	D [L]	This parameter contains the current states of the block alarms. FW version: 2.00 Default settings: 0,0,0,0 Access: R
153 [8]	CALIBR_FACTOR	Float	S [T]	Calibration factor of the Sensor. Only Writeable without a SENSOR-PROM. FW version: 2.00 Default settings: Sensor specific Access: RW
154 [9]	LOW_FLOW_CUTOFF	Float	S [T]	Setting of a percentage of selected Qmax. This filters noise in installation reducing fluctuations in display and all outputs. FW version: 2.00 Default settings: 1.5% of max. of scaling Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
155 [10]	MEASUREMENT_ MODE	Uns8	S [T]	Mode of flow measurement. This device only supports Bidirectional. FW version: 2.00 Default value: 1 Access: RW
156 [11]	FLOW_DIRECTION	Uns8	S [T]	Assigns an arbitrary positive or negative sign to the measured PV value. FW version: 2.00 Default settings: 0 Access: RW
157 [12]	ZERO_POINT	Float	S [T]	Offset compensation value for specific specific the flow sensor, so that true zero flow value can be indicated during no flow condition. For MAG6000 it is only possible in SV version. FW version: 2.00 Default settings: Sensor specific Access: RW
158 [13]	ZERO_POINT_ADJUST	Uns8	N [T]	Initiates a device specific adjustment cycle that determines the true ZERO_POINT value during no-flow process conditions. The result is placed in ZERO_POINT. For MAG6000 it is only possible in SV version. 0=Cancel, 1=Execute FW version: 2.00 Default settings: 0 Access: RW
159 [14]	ZERO_POINT_UNIT	Uns6	S [L]	Selected unit code for ZERO_POINT parameter.FW version: 2.00 Default settings: • MAG 6000: 1349 [m^3/h] • MASS 6000: 1322 [kg/s] Access: RW
160 [15]	NOMINAL_SIZE	Float	S [T]	Ideal size of the measuring pipe, or process pipe size for insertion type flow transmitter. Only Writeable without a SENSORPROM. FW version: 2.00 Default settings: Sensor specific Access: RW
161 [16]	NOMINAL_SIZE_UNITS	Uns16	S [L]	Selects the unit for nominal size parameter. FW version: 2.00 Default settings: 1013 [mm] Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
162 [17]	VOLUME_FLOW	101	D [T]	Measuring value, measured volume flow. This is the PV for MAG 6000 FW version: 2.00 Default settings: - Access: R
163 [18]	VOLUME_FLOW_UNITS	Uns16	S [L]	Selects the unit for volume flow. FW version: 2.00 Default settings: 1349 [mm] Access: RW
164 [19]	VOLUME_FLOW_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (volume flow) ofthe sensor. Always zero. FW version: 2.00 Default settings: 0 Access: RW
165 [20]	VOLUME_FLOW_HI_LIMIT	Float	S [T]	Absolute value of the upper range value (volume flow) of the sensor. MAG6000=Qmax MASS6000=Volume flow max. FW version: 2.00 Default settings: Sensor specific Access: RW
166 [21]	MASS_FLOW	101	D [T]	Measuring value, measured mass flow. This is the PV for MASS 6000. FW version: 2.00 Default settings: - (MASS 6000 only) Access: R
167 [22]	MASS_FLOW_UNITS	Uns16	S [L]	Selects the unit for mass flow. FW version: 2.00 Default settings: 1322 [kg/s] (MASS 6000 only) Access: RW
168 [23]	MASS_FLOW_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (mass flow) of the sensor. Always zero. FW version: 2.00 Default settings: 0 (MASS 6000 only) Access: RW
169 [24]	MASS_FLOW_HI_LIMIT	Float	S [T]	Absolute value of the upper range value (mass flow) of the sensor. MASS 6000 = Massflow max. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: RW
170 [25]	DENSITY	101	D [T]	Measuring value, measured density. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
171 [26]	DENSITY_UNITS	Uns16	S [L]	Selects the unit for density. FW version: 2.00 Default settings: 1103 [kg/l] (MASS 6000 only) Access: RW
172 [27]	DENSITY_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (density) of the sensor. MASS 6000 = Density min. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: RW
173 [28]	DENSITY_HI_LIMIT	Float	S [T]	Absolute value of the upper range value (density) of the sensor. MASS 6000 = Density max. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: RW
174 [29]	TEMPERATURE	101	D [T]	Measuring value, measured temperature. FW version: 2.00 Default settings: - (MASS 6000 only) Access: R
175 [30]	TEMPERATURE_UNITS	UNS16	S [L]	Selects the unit for temperature. FW version: 2.00 Default settings: 1000 [K] (MASS 6000 only) Access: RW
176 [31]	TEMPERATURE_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (temperature) of the sensor. MASS 6000=Temperature min. FW version: 2.00 Default settings: Sensor specific Access: RW
177 [32]	TEMPERATURE_HI_LIMIT	Float	S [T]	Absolute value of the upper range value (temperature) of the sensor. MASS 6000=Temperature max. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: RW
178 ... 185 [33 ... 40]	Reserved			
186 [41]	SAMPLING_FREQ	101	D [T	Indicates the field frequency of the sensor. FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
187 [42]	SAMPLING_FREQ_UNITS	Uns16	S [L]	Indicates the field frequency of the sensor. FW version: 2.00 Default settings: 1077 [Hz] (MAG 6000 only) Access: R, W
188 ... 197 [43-52]	Reserved			
198 [53]	FRACTION_A	101	D [T]	Indicates the field frequency of the sensor. FW version: 2.00 Default settings: - (MAG 6000 only) Access: R
199 [54]	FRACTION_A_UNITS	Uns16	S [L]	Indicates the field frequency of the sensor. FW version: 2.00 Default settings: 1322 [kg/s] (MAG 6000 only) Access: R, W
200 [55]	FRACTION_A_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (fraction A) of the sensor. Always zero. FW version: 2.00 Default settings: 0 (only valid value) (MAG 6000 only) Access: R
201 [56]	FRACTION_A_HI_LIMIT	Float	S [T]	Indicates the field frequency of the sensor. FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: R, W
202 [57]	FRACTION_B	101	D [T]	Measuring value, measured fraction B. FW version: 2.00 Default settings: - (MAG 6000 only) Access: R
203 [58]	FRACTION_B_UNITS	Uns 16	S [L]	Selects the unit for fraction B. FW version: 2.00 Default settings:1322 [kg/s] (MAG 6000 only) Access: R, W
204 [59]	FRACTION_B_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (fraction B) of the sensor. Always zero. FW version: 2.00 Default settings: 0 (only valid value) (MAG 6000 only) Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
205 [60]	FRACTION_B_HI_LIMIT	Float	S [T]	Absolute value of the upper range value(fraction B) of the sensor. MASS 6000 = Fraction B max. FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: R, W
206 [61]	FRACTION_A_PCT	101	D [T]	Measuring value, measured PCT fraction A. FW version: 2.00 Default settings: - Access: R
207 [62]	FRACTION_A_PCT_UNITS	Uns16	S [L]	Selects the unit for PCT fraction A. FW version: 2.00 Default settings: 1342 [%] (MAG 6000 only) Access: R, W
208 [63]	FRACTION_A_PCT_LO_LIMIT	Float	S [T]	Absolute value of the lower range value (PCT fraction A) of the sensor. MASS 6000 = Pct. Fraction A min. FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: R, W
209 [64]	FRACTION_A_PCT_HI_LIMIT	Float	S [T]	Absolute value of the upper range value (PCT fraction A) of the sensor. MASS 6000 = Pct. Fraction A max. FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: R, W
210 [65]	ZERO_ADJUST_TIME	Uns16	S [T]	Decides how long time the zero-adjust shall run. 1-999 seconds FW version: 2.00 Default settings: 30 (MAG 6000 only) Access: R, W
211 [66]	ZERO_ADJUST_PROGRESS		S [T]	Displays the progress of the zero-adjust. 0-100%. FW version: 2.00 Default settings: 0 (MAG 6000 only) Access: R
212 [67]	ZERO_SIGMA	Float	S [T]	Zero Sigma is the standard deviation of the zero-adjust. The sigma value is a measure for the flow stability during the zero adjustment. FW version: 2.00 Default settings: 0 (MAG 6000 only) Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
213 [68]	ZERO_SIGMA_LIMIT	Float	S [T]	A limit to which the zero-adjust is accepted. FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: RW
214 [69]	ZERO_ADJUST_ERROR_STATE	Uns8	S [T]	Indicates if any errors have occurred during the zero-adjust. See (Page 100) FW version: 2.00 Default settings: 0 (MAG 6000 only) Access: R
215 [70]	MAINS_FREQ	Uns8	S [T]	Selects the mains power supply frequency corresponding to the country where the flowmeter is installed(US = 60 Hz). Influences the EXITATION_FREQ. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: RW
216 [71]	QMAX_2	Float	S [T]	Sets the upper limit of the measurement range, the Current output and the Frequency output. It is only active when QMAX_2 has been chosen via the external input. FW version: 2.00 Default settings: Sensor specific (MASS 6000 only) Access: R, W
217 [72]	LOW_FLOW_CUTOFF_PERCENT	Float	S [T]	When the actual flow is below this limit, the flow forced to zero. 0-9.9% of: MAG 6000 = WOLUME_FLOW_HI_LIMIT, MASS6000 =MASS_FLOW_HI_LIMIT. Unit is percentage. FW version: 2.00 Default settings: 1.5% of output scaling Access: R, W
218 [73]	EMPTY_PIPE_MODE	Uns8	S [T]	Enables/disables the Empty pipe detection. 0=Off, 1=OnRW FW version: 2.00 Default settings: • MAG 6000: 0 • MASS 6000: 1 Access: R, W
219 [74]	EMPTY_PIPE_LIMIT	Float	S [T]	When the density is below this limit, and EMPTY_PIPE_MODE is ON, Empty pipe is reported in diagnostics. Unit is percentage. FW version: 2.00 Default settings: 500 kg/m^3 (MASS 6000 only) Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
220 [75]	NOISE_FILTER_FLOW	Uns8	S [T]	Noise filter sets from 1-5 is FLOW possible. 1=minimum filtering, 5=maximum filtering. FW version: 2.00 Default settings: 4 (MASS 6000 only) Access: R, W
221 [76]	CORRECTION_FACTOR	Float	S [T]	With this parameter it is FACTOR possible to make a correction to the measured flow. FW version: 2.02 Default settings: 1.0 Access: R, W
222 [77]	EXCITATION_MODE	Uns8	S [T]	This parameter specifies ifexcitation is On/Off. 1 = ON or 0 = OFF Excitation mode is from PROFIBUS only writeable from MAG 6000 transmitter firmware version 3.04. FW version: 2.02 Default settings: 1 (MAG 6000 only) Access: R, W
223 [78]	EXCITATION_FREQ	Uns8	S [T]	The Excitation frequency is sensor dependent and MAINS_FREQUENCY dependent. See FW version: 2.00 Default settings: Sensor specific (MAG 6000 only) Access: R, W
224 [79]	SENSOR_TC	Float	S [T]	Sensor Temperature coefficient (%/deg C). FW version: 2.02 Default settings: -0.0005 (MASS 60000 only) Access: R
225 [80]	DENSITY_PARM_A	Float	S [T]	Density parameter A FW version: 2.02 Default settings: -1000.0 (MASS 60000 only) Access: R
226 [81]	DENSITY_PARM_B	Float	S [T]	Density parameter B FW version: 2.02 Default settings: 1.0E+8 (MASS 60000 only) Access: R
227 [82]	DENSITY_TC	Float	S [T]	Density Temperature coefficient (%/deg C) FW version: 2.02 Default settings: -0.0005 (MASS 60000 only) Access:

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
228 [83]	DENSITY_OFFSET	Float	S [T]	With this parameter it is possible to make an offset on the measured density. FW version: 2.02 Default settings: 0.0 (MASS 60000 only) Access: R
229 [84]	DENSITY_FACTOR	Float	S [T]	With this factor it is possible to make a correction to the density. FW version: 2.02 Default settings: 1.0 (MASS 60000 only) Access: R, W
230 [85]	FRACTION_OFFSET	Float	S [T]	If the flowmeter is ordered with fraction. With this parameter it is possible to make an offset on the measured fraction. FW version: 2.02 Default settings: 0.0 (MASS 60000 only) Access: R, W
231 [86]	TABLE_SLOPE	Float	S [T]	If the flowmeter is ordered with fraction. Table slope of measured fraction. FW version: 2.02 Default settings: 1.0 (MASS 60000 only) Access: R, W
233 [87]	UPDATE_RATE_MASS_FLOW	Uns16	S [T]	Displays the update rate for the process value. See Table A-6 FACTORY_RESET (Page 78). The value is not influenced by SET_TO_DEFAULT. FW version: 2.00 Default settings: 2 Hz (MASS 60000 only) Access: R
234 [88]	UPDATE_RATE_VOLUME_FLOW	Uns16	S [T]	Displays the update rate for the process value. See Table A-6 FACTORY_RESET (Page 78) The value is not influenced by SET_TO_DEFAULT. FW version: 2.00 Default settings: 2 Hz (MASS 60000 only) Access: R
235 [89]	UPDATE_RATE_DENSITY	Uns16	S [T]	Displays the update rate for the process value. See Table A-6 FACTORY_RESET (Page 78). The value is not influenced by SET_TO_DEFAULT. FW version: 2.00 Default settings: 2 Hz (MASS 60000 only) Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
236 [90]	UP-DATE_RATE_TEMPERATURE	Uns16	S [T]	Displays the update rate for the process value. Table A-6 FACTORY_RESET (Page 78). The value is not influenced bySET_TO_DEFAULT. FW version: 2.00 Default settings: 2 Hz (MASS 60000 only) Access: R
237 [91]	UPDATE_RATE-FRACTION_AB	Uns16	S [T]	Displays the update rate for the process value. See Table A-6 FACTORY_RESET (Page 78). The value is not influenced bySET_TO_DEFAULT. FW version: 2.00 Default settings: 2 Hz (MASS 60000 only) Access: R
238 [92]	UPDATE_RATE-FRACTION_A%	Uns16	S [T]	Displays the update rate for the process value. See Table A-6 FACTORY_RESET (Page 78). The value is not influenced bySET_TO_DEFAULT. FW version: 2.00 Default settings: 2 Hz (MASS 60000 only) Access: R
[93-94]	Reserved			
240 [95]	DRIVER_SIGNAL	Float	D [T]	Driver signal FW version: 2.02 Default settings: - [A] (MASS 60000 only) Access: R
241 [96]	PICKUP1_AM-PLITUDE	Float	D [T]	Sensor A amplitude FW version: 2.02 Default settings: - [V] (MASS 60000 only) Access: R
242 [97]	PICKUP2_ AMPLITUDE	Float	D [T]	Sensor B amplitude FW version: 2.00 Default settings: - [V] (MASS 60000 only) Access: R
243 [98]	SENSOR_FREQ	Float	D [T]	Frequency of the measuring tube. FW version: 2.00 Default settings: - [Hz] (MASS 60000 only) Access: R
244 [99]	DIGI-TAL_IN_FUNC-TION	Uns8	S [T]	Selects the setting of the digital input. See (Page 100) FW version: 2.02 Default settings: 0 Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
245 [100]	DIGITAL_IN_TOT_RESET_MODE	Uns8	S [T]	FW version: 2.02 Default settings: 4 Access: R, W
246 [101]	DIGITAL_IN_FORCE_OUT_VALUE	Float	S [T]	FW version: 2.02 Default settings: 0.0 Access: R, W
147 ... 253 [102 ... 108]	Reserved			
254 [109]	VIEW_1	Float	C [L]	FW version: 2.00 Default settings: • MAG 6000: 01,06,07,13, 21,25,29 • MASS 6000: 01,06,07,13,17,41 Access: R

ZERO_ADJUST_ERROR_STATE

If the value differs from "0", a new zero adjust, under better conditions, must be performed.

Table A-19 ZERO_ADJUST_ERROR_STATE

Value	Setting
0	OK
1	Offset exceeds limit in ASIC
2	Offset exceeds limit in the converted value
3	Sigma exceeds limit

EXCITATION_FREQUENCY

This index sets the excitation frequency in MAG 6000. Changing this paramter also sets the sampling frequency to the same value as the EXCITATION_FREQUENCY. Two sets exist, one for Mains frequency 50 Hz and one for Mains frequency 60 Hz.

Table A-20 EXCITATION_FREQUENCY

Value	Excitation frequency (Mains frequency)
0	3.125 Hz (50 Hz)
1	6.25 Hz (50 Hz)
2	12.5 Hz (50 Hz)
3	25 Hz (50 Hz)

Value	Excitation frequency (Mains frequency)
4	1.5625 Hz (50 Hz)
5	44 Hz
6	2.0833 Hz
7	1.875 Hz (60 Hz)
8	3.75 Hz (60 Hz)
9	7.5 Hz (60 Hz)
10	15 Hz (60 Hz)
11	30 Hz (60 Hz)

DIGITAL_IN_FUNCTION

Table A-21 DIGITAL_IN_FUNCTION

Value	Setting	MASS 6000	MAG 6000
0	Off	✓	✓
1	Start Batch	✓	✓
2	Hold/Continue	✓	✓
3	Stop Batch	✓	✓
4	Zero Adjust	✓	✓
5	Totalizer reset	✓	✓
6	Force output	✓	✓
7	Freeze output	✓	✓
8	Qmax 2 (night)[1)]		✓
9	Manual cleaning[1)]		✓

A.7 Analog Input Block parameters

Table A-22 Totalizer 1 Function Block, SLOT 2 (MAG 6000) or SLOT 4 (MASS 6000)

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
16 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
17 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
18 [2]	TAG_DESC	VisStr(32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW
19 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to groupBlocks. FW version: 2.00 Default value: 0 Access: RW
20 [4]	ALERT_KEY	Uns8	S [L]	Identification number of the plant unit. Helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW
21 [5]	TARGET_MODE	Uns8	S [L]	Indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 8 Access: RW
22 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,0x98,8 Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
23 [7]	ALARM_SUM	DS-42	D [L]	This parameter contains the current states of the block alarms. FW version: 2.00 Default value: 0,0,0,0 Access: R
24 [8]	BATCH	DS-67	S [L]	This parameter is intended to be used in Batch applications in line with IEC 61512 Part1. FW version: 2.00 Default value: 0,0,0,0 Access: R, W
25 [10]	OUT	101	D [L]	The Function Block parameter OUT contains the current measurement value in a vendor specific or configuration adjusted engineering unit and the belonging state in AUTO MODE. The Function Block parameter OUT contains the value and status set by an operatorin MAN MODE. FW version: 2.00 Default value: - Access: R
26 [11]	PV_SCALE	Array Float (2)	S [L]	Conversion of the Process Variable into percent using the high and low scale values. The engineering unit of PV_SCALE high and low scale values are directly related to the PV_UNIT of the configured Transducer Block (configured via Channel parameter). The PV_SCALE high and low scale values follow the changes of the PV_UNIT of the related TransducerBlock automatically, i.e. a change of the Transducer Block PV_Unit causes no bump at OUT from AI. There are exceptions possible where the bump is required such as cleaning of analyzers. FW version: 2.00 Default value: 100,0 Access: R, W
27 [12]	OUT_SCALE	DS-36	S [L]	The Function Block parameter contains the values of the lower limit and upper limit effective range, the code number of the engineering unit of Process Variable and the number of digits on the right hand side of the decimal point. FW version: 2.00 Default value: See (Page 113) Access: R, W
28 [13]	LIN_TYPE	Uns8	S [L]	Type of linearization. FW version: 2.00 Default value: 0 Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
29 [14]	CHANNEL	Float	S [L]	A fixed reference to the active Transducer Block which provides the measurement value to the Function Block. The channel cannot be changed. FW version: 2.00 Default value: Block specific Access: R, W
30 [16]	PV_FTIME	Float	S [L]	Filter time of the Process Variable. The Function Block parameter contains the time constant for the rise time of the FB output up t a value of 63,21 % resulted from a jump on the input (PT1 filter). The engineering unit of the parameter is second. FW version: 2.00 Default value: 0 Access: R, W
31 [17]	FSAFE_TYPE	Uns8	S [L]	Defines the reaction of device if a fault is detected. The calculated ACTUAL MODE remains in AUTO. 0: value FSAFE_VALUE is used as OUT Status - UNCERTAIN_Substitute Value,1: use last stored valid OUT value Status - UNCERTAIN_LastUsableValue if there is no valid value available, then UNCERTAINInital_Value, OUT value is = Initial value 2: OUT has the wrong calculated value and status Status - BAD_* (* as calculated) FW version: 2.00 Default value: 1 Access: R, W
32 [18]	FSAFE_VALUE	Float	S [L]	Default value for the OUT parameter, if a sensor or sensor electronic fault is detected. The unit of this parameter is the same like the OUT one. FW version: 2.00 Default value: 0 Access: R, W
33 [19]	ALARM_HYS	Float	S [L]	Hysteresis. FW version: 2.00 Default value: 0 Access: R, W
34 [21]	HI_HI_LIM	Float	S [L]	Value for upper limit of alarms. Unit is the same as OUT. FW version: 2.00 Default value: See (Page 117) Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
35 [23]	HI_LIM	Float	S [L]	Value for upper limit of warnings. Unit is the same as OUT. FW version: 2.00 Default value: See (Page 117) Access: R, W
36 [25]	LO_LIM	Float	S [L]	Value for lower limit of warnings. Unit is the same as OUT. FW version: 2.00 Default value: See (Page 117) Access: R, W
37 [27]	LO_LO_LIM	Float	S [L]	Value for lower limit of alarms. Unit is the same as OUT. FW version: 2.00 Default value: See (Page 117) Access: R, W
38 [30]	HI_HI_ALM	DS-39	D [L]	State of the upper limit of alarms. FW version: 2.00 Default value: 0 Access: R
39 [31]	HI_ALM	DS-39	D [L]	State of the upper limit of warmings. FW version: 2.00 Default value: 0 Access: R
40 [32]	LO_ALM	DS-39	D [L]	State of the lower limit of warnings. FW version: 2.00 Default value: 0 Access: R
41 [33]	LO_LO_ALM	DS-39	D [L]	State of the lower limit of alarms. FW version: 2.00 Default value: 0 Access: R
42 [34]	SIMULATE	DS-50	S [L]	For commissioning and test purposes the input value from the Transducer Block in the Analog Input Function Block AI-FB can be modified. That means that the Transducer and AI-FB will be disconnected. FW version: 2.00 Default value: Disabled Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parame-ter type [loca-tion]	Description FW version Default value MAG/MASS Access
43 [35]	OUT_UNIT_TEXT	VisStr(16)	S [L]	For FW version: 2.00 Default value: - Access: R, W
44 ... 73 [36 ... 57]	Reserved			
74 [58]	VIEW_1		C [L]	Collection of parameters. The relative Index's listed in "De-fault value" are returned. FW version: 2.00 Default value: Access: R

OUT_SCALE

Table A-23 OUT_SCALE

AI-BLOCK	Default values			
	Upper_Scale	Lower_Scale	Unit_Code	Decimal point
Mass Flow	100	0	1322 (kg/s)	2
Volume Flow	100	0	1349 (m^3/h)	2
Density	100	0	1103 (kg/l)	2
Temperature	100	0	1000 (K)	2
Fraction A+B	100	0	1322 (kg/s)	2
Fraction A%	100	0	1342 (%)	2

A.7.1 HI_LIM and HI_HI_LIM

HI_LIM and HI_HI_LIM

This table lists the default vaues of the HI_LIM and HI_HI_LIM parameters.

Table A-24 HI_LIM and HI_HI_LIM

AI-BLOCK	Default values
Mass Flow	367 kg/s
Volume Flow	100 000.0 m^3/h
Density	2.0 kg/l
Temperature	523.15 k

AI-BLOCK	Default values
Fraction A+B	367.0 kg/s
Fraction A%	100 %

LO_LIM and LO_LO_LIM

This table lists the default vaues of the LO_LIM and LO_LO_LIM parameters.

Table A-25 LO_LIM and LO_LO_LIM

AI-BLOCK	Default values
Mass Flow	-367 kg/s
Volume Flow	-100 000.0 m^3/h
Density	0.1 kg/l
Temperature	223.15 k
Fraction A+B	-367.0 kg/s
Fraction A%	0.0 %

A.8 Totalizer 1 Function Block parameters

Table A-26 Totalizer 1 Function Block, SLOT 2 (MAG 6000) or SLOT 4 (MASS 6000)

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
16 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
17 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
18 [2]	TAG_DESC	VisStr(32)	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
19 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to groupBlocks. FW version: 2.00 Default value: 0 Access: RW
20 [4]	ALERT_KEY	Uns8	S [L]	Identification number of the plant unit. Helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW
21 [5]	TARGET_MODE	Uns8	S [L]	Indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 8 Access: RW
22 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,0x98,8 Access: R
23 [7]	ALARM_SUM	DS-42	D [L]	This parameter contains the current states of the block alarms. FW version: 2.00 Default value: 0 Access: R
24 [8]	BATCH	DS-67	S [L]	This parameter is intended to be used in Batch applications in line with IEC 61512 Part1. FW version: 2.00 Default value: 0,0,0,0 Access: R, W
25 [10]	TOTAL	101	N [L]	The Function Block parameter TOTAL contains the integrated quantity of the rate parameter provided by CHANNEL and the associated status. FW version: 2.00 Default value: 0 Access: R
26 [11]	UNIT_TOT	Uns16	S [L]	Unit of the totalized quantity. FW version: 2.00 Default value: • MAG6000: 1038 (l) • MASS6000:1088 (kg) Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
27 [12]	CHANNEL	Uns16	S [L]	Reference to the active Transducer Block which provides the measurement value to the Function Block. FW version: 2.00 Default value: • MAG 6000: 0x0111 • MASS 6000: 0x0115 Access: RW
28 [13]	SET_TOT	Uns8	N	Used to reset/preset the value of the Totalizer. 0=Totalize/run, 1=Reset to zero, 2=Preset to PRESET_TOT value. As long as the Reset/Preset is active, the MODE_TOT is set to HOLD. Note it is not possible to preset to adifferent value but zero. FW version: 2.00 Default value: 0 Access: R, W
29 [14]	MODE_TOT	Uns8	N [T]	This Function Block parameter governs the behavior of the totalization.The following selections are possible: 0: BALANCED; true arithmetic integrationof the incoming rate values. 1: POS_ONLY; totalization of positiveincoming rate values only. 2: NEG_ONLY; totalization of negativeincoming rate values only. 3: HOLD; totalization stopped. FW version: 2.00 Default value: 1 Access: R, W
30 [15]	FAIL_TOT	Uns8	S [L]	Fail-safe mode of the Totalizer FunctionBlock. This parameter governs thebehaviour of the Function Block during the occurrence of input values with BAD status. The following selectionsare possible: 0: RUN ; totalisation is continued using the input values despite the BAD status.The status is ignored. Note it is not possible to use other settings. FW version: 2.00 Default value: 0 Access: R, W
31 [16]	PRESET_TOT	Uns8	S [L]	It is only possible to preset the Totalizer to zero. FW version: 2.00 Default value: 0.0 Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
32 [17]	ALARM_HYS	Float	S [L]	Hysteresis. FW version: 2.00 Default value: 0 Access: R, W
33 [18]	HI_HI_LIM	Float	S [L]	Value for upper limit of alarms. Unit is the same as OUT. FW version: 2.00 Default value: 1e30 Access: R, W
34 [19]	HI_LIM	Float	S [L]	Value for upper limit of warnings. Unit is the same as OUT. Unit is the same as OUT. FW version: 2.00 Default value: 1e30 Access: R, W
35 [20]	LO_LIM	Float	S [L]	Value for upper limit of warnings. Unit is the same as OUT. FW version: 2.00 Default value: -1e30 Access: R, W
36 [21]	LO_LO_LIM	Float	S [L]	Value for lower limit of alarms. Unit is the same as OUT. FW version: 2.00 Default value: -1e30 Access: R, W
37 [22]	HI_HI_ALM	DS-39	D [L]	State of the upper limit of alarms. FW version: 2.00 Default value: 0 Access: R
38 [23]	HI_ALM	DS-39	D [L]	State of the upper limit of warnings. FW version: 2.00 Default value: 0 Access: R
39 [24]	LO_ALM	DS-39	D [L]	State of the lower limit of warnings. FW version: 2.00 Default value: 0 Access: R
40 [25]	LO_LO_ALM	DS-39	D [L]	State of the lower limit of alarms. FW version: 2.00 Default value: 0 Access: R
41 ... 51 [26 ... 35]	Reserved			

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
52 [36]	UPDATE_RATE_TOT	Uns16	S [T]	Update rate of Totalizer values via Profibus. It can be changed using the parameter FACTORY_RESET in the Physical block. FW version: 2.00 Default value: 2[Hz] Access: R
53 ... 73 [37 ... 57]	Reserved			
74 [58]	VIEW_1		C [L]	Collection of parameters. The relative Index's listed in "Default value" are returned. FW version: 2.00 Default value: Access: R

A.9 Totalizer 2/Batch Function Block parameters

Table A-27 Totalizer 2 / Batch Function Block, SLOT 3 (MAG 6000) or SLOT 5 (MASS 6000)

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
16 [0]	BLOCK_OBJECT	DS-32	C [L]	Characteristics of this particular block FW version: 2.00 Default value: According to profile Access: R
17 [1]	ST_REV	Uns16	N [L]	Increments when a Parameter of type "S" is changed FW version: 2.00 Default value: 0 Access: R
18 [2]	TAG_DESC	VisStr [32]	S [L]	Description of the block. • MAG 6000: "SITRANS F M MAGFLO" • MASS 6000: "SITRANS F C MASSFLO" FW version: 2.00 Default value: - Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
19 [3]	STRATEGY	Uns16	S [L]	Grouping of Function Block. The STRATEGY field can be used to groupBlocks. FW version: 2.00 Default value: 0 Access: RW
20 [4]	ALERT_KEY	Uns8	S [L]	Identification number of the plant unit. Helps to identify the location (plant unit) of an event. FW version: 2.00 Default value: 0 Access: RW
21 [5]	TARGET_MODE	Uns8	S [L]	Indicates what mode of operation is desired for the block. FW version: 2.00 Default value: 0 Access: RW
22 [6]	MODE_BLK	DS-37	D [L]	This parameter contains the current mode, the permitted and normal mode of the block. FW version: 2.00 Default value: 8,8,8 Access: R
23 [7]	ALARM_SUM	DS-42	D [L]	This parameter contains the current states of the block alarms. FW version: 2.00 Default value: 0 Access: R
24 [8]	BATCH	DS-67	S [L]	This parameter is intended to be used in Batch applications in line with IEC 61512 Part1. FW version: 2.00 Default value: 0,0,0,0 Access: R, W
25 [10]	TOTAL	101	N [L]	The Function Block parameter TOTAL contains the integrated quantity of the rate parameter provided by CHANNEL and the associated status. FW version: 2.00 Default value: 0 Access: R
26 [11]	UNIT_TOT	Uns16	S [L]	Unit of the totalized quantity. FW version: 2.00 Default value: 1038 (l) Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
27 [12]	CHANNEL	Uns16	S [L]	Reference to the active Transducer Block, which provides the measurement value to the Function Block. FW version: 2.00 Default value: 0 Access: R, W
28 [13]	SET_TOT	Uns8	N	Used to reset/preset the value of the Totalizer. 0=Totalize/run, 1=Reset to zero, 2=Preset to PRESET_TOT value. As long as the Reset/Preset is active,the MODE_TOT is set to HOLD. Note it is not possible to preset to a different value but zero. FW version: 2.00 Default value: 0x0111 Access: R, W
29 [14]	MODE_TOT	Uns8	N [T]	This Function Block parameter governs the behavior of the totalization. The following selections are possible: 0: BALANCED; true arithmetic integration of the incoming rate values. 1: POS_ONLY; totalization of positive incoming rate values only. 2: NEG_ONLY; totalization of negative incoming rate values only. 3: HOLD; totalization stopped. If BATCH_ON_OFF=1, MODE_TOT will return a “Temporal Invalid” error to the master, when a write is made to MODE_TOT. FW version: 2.00 Default value: MAG 6000 = 2, MASS 6000 = 1 Access: R, W
30 [15]	FAIL_TOT	Uns8	S [L]	Fail-safe mode of the Totalizer Function Block. This parameter governs the behavior of the Function Block during the occurrence of input values with BAD status. The following selections are possible: 0: RUN ; totalization is continued using the input values despite the BAD status. The status is ignored. Note is not possible to use other settings. FW version: 2.00 Default value: 0 Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parame-ter type [loca-tion]	Description FW version Default value MAG/MASS Access
31 [16]	PRESET_TOT	Float	S [L]	It is only possible to preset the Totalizer to zero. FW version: 2.00 Default value: 0,0 Access: R, W
32 [17]	ALARM_HYS	Float	S [L]	It is only possible to preset the Totalizer to zero. FW version: 2.00 Default value: 0,0 Access: R, W
33 [18]	HI_HI_LIM	Float	S [L]	Value for upper limit of alarms. Unit is the same as OUT. FW version: 2.00 Default value: 1e30 Access: R, W
34 [19]	HI_LIM	Float	S [L]	Value for upper limit of warnings. Unit is the same as OUT. FW version: 2.00 Default value: 1e30 Access: R, W
35 [20]	LO_LIM	Float	S [L]	Value for lower limit of warnings. Unit is the same as OUT. FW version: 2.00 Default value: 1e30 Access: R, W
36 [21]	LO_LO_LIM	Float	S [L]	Value for lower limit of alarms. Unit is the same as OUT. FW version: 2.00 Default value: 1e30 Access: R, W
37 [22]	HI_HI_ALM	DS-39	D [L]	State of the upper limit of alarms. FW version: 2.00 Default value: 0 Access: R
38 [23]	HI_ALM	DS-39	D [L]	State of the upper limit of warnings. FW version: 2.00 Default value: 0 Access: R
39 [24]	LO_ALM	DS-39	D [L]	State of the lower limit of warnings. FW version: 2.00 Default value: 0 Access: R

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
40 [25]	LO_LO_ALM	DS-39	D [L]	State of the lower limit of alarms. FW version: 2.00 Default value: 0 Access: R
41 ... 51 [26 ...35]	Reserved			
52 [36]	UPDATE_RATE_TOT	UNS16	S [T]	Update rate of Totalizer values via PROFIBUS. It can be changed using the parameter FACTORY_RESET in the Physical block, see Table A-6 FACTORY_RESET (Page 78). FW version: 2.00 Default value: 2 [Hz] Access: R
53 ... 58 [37 ... 42]	Reserved			
59 [43]	BATCH_ON_OFF	Uns8	S [T]	Parameter to change Totalizer 2 to Batch mode. 0= Batch OFF 1= Batch ON FW version: 2.00 Default value: 0 Access: RW
60 [44]	BATCH_SELECTION	Uns8	S [T]	Selects which process value to batch. See (Page 122) FW version: 2.00 Default value: 0 • MAG: Absolute volume flow value • MASS: Absolute mass flow value Access: RW
61 [45]	BATCH_CY-CLE_COUNTER	Uns32	D [T]	Counter that increments every time a batch is started FW version: 2.00 Default value: 0 Access: R
62 [46]	BATCH_CY-CLE_CNT_RESET	Uns8	N [T]	Writing “1” to this parameter will reset CNT_RESET the BATCH_CYCLE_COUNTER. FW version: 2.00 Default value: 0 Access: RW

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
63 [47]	BATCH_COUNT_DIR	Uns8	S [T]	Specifies if the totalized value for the DIR batch is counted up or down. 0= DOWN: Batched value is counted down until it reaches BATCH_SETPOINT 1= UP: Batched value is counted up until it reaches BATCH_SETPOINT. FW version: 2.00 Default value: 0 Access: R, W
64 [48]	BATCH_TIMEOUT	Uns8	S [T]	Enables/disables BATCH_TIME_ERROR 0=OFF, 1=ON FW version: 2.00 Default value: 0 Access: R, W
65 [49]	BATCH_TIME_ERROR	Uns32	S [T]	If active, an error will be reported if ERROR batch is not finished within this time. Range: 1-360000 seconds FW version: 2.00 Default value: 3600 s Access: R, W
66 [50]	BATCH_OVERRUN	Uns8	S [T]	Enables/disables BATCH_OVERRUN_ERROR 0=OFF, 1=ON FW version: 2.00 Default value: 0 Access: R, W
67 [51]	BATCH_OVER-RUN_ERROR	Float	S [T]	If an actual batch has an overrun exceeding this value, an error will be reported. Range: 0-100m^3 or 0-100000 kg (MASS6000 only) FW version: 2.00 Default value: 0 Access: R, W
68 [52]	BATCH_SETPOINT	101	S [T]	Batch Setpoint. This parameter sets the desired quantity to be batched. Can also be set via SETP in cyclic communication. Range: 0-999999 m^3 or 0-999999 kg (MASS 6000 only) FW version: 2.00 Default values: • MAG: 0.01 m3 • MASS: 0.005 kg Access: R, W

Abs. index [rel. index]	Parameter name	Data type [size]	Parameter type [location]	Description FW version Default value MAG/MASS Access
69 [53]	BATCH_COMPENSATION	101	S [T]	Batch Compensation. This parameter is used to compensate for delays etc. in the application. Can also be set via register COMP in cyclic communication. Range: 0-100 m^3 or 0-100000 kg (MASS 6000 only) FW version: 2.00 Default value: - Access: R, W
70 [54]	BATCH_CONTROL	Uns8	N [T]	Batch Control. Used to control the batch. See (Page 122). Can also be set via register B_CTRL in cyclic communication. FW version: 2.00 Default value: 0 Access: R, W
71 [55]	BATCH_STATUS	Uns8	D [T]	Batch Status. Shows the status of the batch. See (Page 122) FW version: 2.00 Default values: 0 Access: R
72 [56]	BATCH_TIME_CONST	Float	S [T]	Not to be used. FW version: 2.00 Default values: • MAG 6000: 0.1 s • MASS 6000: 0 s Access: R, W
74 [57]	BATCH_LEAD_CONST	Float	S [T]	Adaptive batch constant. Range: 0-16.77 FW version: 2.00 Default value: 0 Access: R, W
74 [58]	VIEW_1		C [L]	Collection of parameters. The relative Index's listed in "Default value" are returned. FW version: 2.00 Default value: - Access: R

BATCH_SELECTION

Table A-28 BATCH_SELECTION

Value	Action	MASS 6000	MAG 6000
0X0111	Mass	✓	
0X0115	Volume	✓	✓

Value	Action	MASS 6000	MAG 6000
0X0135	Fraction A	✓	
0X0139	Fraction B	✓	

BATCH_SELECTION

Table A-29 BATCH_SELECTION

Bit	Value	Action
0	0X01	BATCH START
1	0X02	BATCH STOP
2	0X04	UPDATE SETPOINT AND COMPENSATION (only cyclic control)
3	0X08	BATCH ON/OFF (only cyclic control)
4	0X10	BATCH MASK BIT (only cyclic control)
5	0X20	BATCH PAUSE
6	0X40	BATCH RESUME
7	0X80	Not used

If other values than 0x01, 0x02, 0x20 or 0x40 are set for this varable in acyclic communication, error response "Invalid range" will be returned to the master. In cyclic communication bit 7 is ignored. Return vaue when read is always 0.

BATCH_STATUS

Table A-30 BATCH_STATUS

Value	Action	Description
0X01	BATCH_OFF	Batch mode is not enabled.
0X02	BATCH_ON_STOPPED	Batch mode is enabled, but the Batch is stopped.
0X04	BATCH_ON_RUNNING	Batch mode is enabled and the Batch is running.
0X08	BATCH_ON_PAUSED	Batch mode is enabled, but the Batch is paused.

A.10 Identification and maintenance indices (I&M)

I&M index is short for Identification and Maintenance index. The transmitter has three I&M indices, which can be used in order to get quick identification and maintenance information about the device. The I&M indices are located in slots 1, 2 and 3 at absolute index 255. Each I&M index is divided into subindices. The subindices are accessed one at a time by using the call service defined in /IEC 61158/.

Note

I&M indexes are supported from PROFIBUS module FW version 2.02.

Table A-31 Parameter: IM_INDEX

FI_Index	Element	Parameter name	Data type (size)	Mapped Parameter in PROFIBUS-PA profile
65000	0	Header (reserved)	Visible-String(10)	-
	1	MANUFACTURER_ID	Unsigned16	PB.DEVICE_MAN_ID
	2	ORDER_ID	Visible-String(20)	PB.DEVICE_ID
	3	SERIAL_NUMBER	Visible-String(16)	PB.DEVICE_SER_NUM
	4	HARDWARE_REVISION	Unsigned(16)	Fixed to 0xFFFF
	5	SOFTWARE_REVISION	Record	Fixed to V,0xFF,0xFF,0xFF
	6	REV_COUNTER	Unsigned16	• In slot 0: Sum of ST_REV in device • In slot 1 & 2: Sum of ST_REV in slot
	7	PROFILE_ID	Unsigned16	Fixed to 0x9700 for all PA slaves
	8	PROFILE_SPECIF-IC_TYPE	OctetString(2)	BLOCK_OBJECT info*
	9	IM_VERSION	Unsigned8(2)	Fixed to 1, 1 (version 1.1)
	10	IM_SUPPORTED	OctetString(2)	Fixed to 0x000F
65001	0	Header (reserved)	Visible-String(10)	-
	1	TAG_FUNCTION	Visible-String(32)	PB.TAG_DESC*
	2	TAG_LOCATION	Visible-String(22)	-
65002	0	Header (reserved)	Visible-String(10)	-
	1	INSTALLATION_DATE	Visible-String(16)	PB.DEVICE_INSTALL_DATE*
	2	Reserved	Octet-String(38)	-
65003	0	Header (reserved)	Visible-String(10)	-
	1	DESCRIPTOR	Visible-String(54)	PB.DESCRIPTOR*
65016	0	Header (Reserved)	Visible-String(10)	-
	1	PA_IM_VERSION	Unsigned8(2)	Fixed to 1, 0 (version 1.0)
	2	HARDWARE_REVISION	Visible-String(16)	PB.HARDWARE_REVISION*
	3	SOFTWARE_REVISION	Visible-String(16)	PB.SOFTWARE_REVISION*
	4	Reserved	Octet-String(18)	Fixed to 0x0000
	5	PA_IM_SUPPORTED	OctetString(2)	Fixed to 0, 0

* Related physical block located in the same slot as the I&M index.

- Unused – Visible strings are filled with 0x20 (spaces). Octet strings are filled with 0x00 (zeroes)

Configuration module

B

B.1 Configuration module

Table B-1 Configuration module

Configuration module	Identifier byte	Identifier format	Extended Identifier format
AI	0x94	0x42, 0x84, 0x81, 0x81	0x42, 0x84, 0x08, 0x05
TOTAL	0x94	0x42, 0x84, 0x85, 0x81	0x41, 0x84, 0x85
TOTAL, SET_TOT		0xC2, 0x80, 0x84, 0x85, 0x83	0xC1, 0x80, 0x84, 0x85
TOTAL, SET_TOT, MODE_TOT		0xC2, 0x81, 0x84, 0x85, 0x87	0xC1, 0x81, 0x84, 0x85
BATCH_DO, B_CTR			0xC2, 0x80, 0x84, 0xF1, 0x01
BATCH_DO, B_CTR, SETP			0xC2, 0x85, 0x84, 0xF1, 0x02
BATCH_DO, B_CTR, SETP, COMP			0xC2, 0x8A, 0x84, 0xF1, 0x03
BATCH_DO, B_CTR, B_STA			0xC2, 0x80, 0x85, 0xF1, 0x04
BATCH_DO, B_CTR, B_STA, SETP			0xC2, 0x85, 0x85, 0xF1, 0x05
BATCH_DO, B_CTR, B_STA, SETP, COMP			0xC2, 0x8A, 0x85, 0xF1, 0x06
BATCH_RO, B_CTR			0xC2, 0x80, 0x84, 0xF2, 0x01
BATCH_RO, B_CTR, SETP			0xC2, 0x80, 0x84, 0xF2, 0x02
BATCH_RO, B_CTR, SETP, COMP			0xC2, 0x80, 0x84, 0xF2, 0x03
BATCH_RO, B_CTR, B_STA			0xC2, 0x80, 0x84, 0xF2, 0x04
BATCH_RO, B_CTR, B_STA, SETP			0xC2, 0x80, 0x84, 0xF2, 0x05
BATCH_RO, B_CTR, B_STA, SETP, COMP			0xC2, 0x80, 0x84, 0xF2, 0x06
EMPTY_SLOT	0x00		

GSD files

C

All PROFIBUS devices have a unique ID number which is used to identify the device. This PROFIBUS interface supports 3 different ID numbers for each technology. The ID number is also used as part of the GSD filename.

A GSD-file is needed to be able to configure the master. The GSD-file describes what a device can do and what it supports. Some software tools support integration of an individual image of the device. Such image has DIB-format and the extension .DIB.

The ID number selected in the device and the GSD-file must match in order to enter Dataexchange. The ID number can be changed or verified via the local keypad display or by the use of a Class2 master like PDM.

The ID number cannot be changed when the device is in DataExchange. The default ID numbers are marked with bold in the tables below.

Following GSD and DIB-files can be used:

Table C-1 PROFIBUS PA GSD/DIB files

Flowmeter	ID Number	GSD-file	DIB-file	Description
SITRANS F M MAG 6000	**0x812A (Default)**	**SI0181A.gsd** **SI0281A.gsd**	**SI812An.dib**	**Manufacturer spec. ID** **PA-profile v3.00** **Recommended to use "SI0281A.gsd"**
	0x812A	SI03812A.gsd	S812An.dib	Manufacturer spec. ID PA-profile v3.01
	0x0649	SIxx0649.gsd	SI0649n.dib	Manufacturer spec. ID PA-profile v.2.0 Only DPV0. For backward compatibility of old GSD files.
	0x9740	PA139740.gsd	PA_9740n.dib	Manufacturer independent GSD file according to the PROFIBUS Profile for Process Control Devices, Version 3.0

Flowmeter	ID Number	GSD-file	DIB-file	Description
SITRANS F C MASS 6000	**0x8128 (default)**	**SI018128.gsd** **SI028128.gsd**	**SI8128n.dib**	**Manufacturer spec. ID** **PA-profile v3.00** **Recommended to use "SI028128.gsd"**
	0x8128	SI038128.gsd	S8128n.dib	Manufacturer spec. ID PA-profile v3.01
	0x0648	Sixx0648.gsd	SI0648n.dib	Manufacturer spec. ID PA-profile v.2.0 Only DPV0. For backward compatibility of old GSD files.
	0x9742	PA139742.gsd	PA_9742n.dib	Manufacturer independent GSD file according to the PROFIBUS Profile for Process Control Devices, Version 3.0

Note: xx is the revision of the GSD-file.

Table C-2 PROFIBUS DP GSD/DIB files

Flowmeter	ID Number	GSD-file	DIB-file	Description
SITRANS F M MAG 6000	**0x8129 (Default)**	**SI018129.gsd** **SI028129.gsd**	**SI8129n.dib**	**Manufacturer spec. ID** **PA-profile v3.00** **Recommended to use "SI028129.gsd"**
	0x8129	SI038129.gsd	S8129n.dib	Manufacturer spec. ID PA-profile v3.01
	0x05A9	SIxx05A9.gsd	SI05A9n.dib	Manufacturer spec. ID PA-profile v.2.0 Only DPV0. For backward compatibility of old GSD files.
	0x9740	PA039740.gsd	PA_9740n.dib	Manufacturer independent GSD file according to the PROFIBUS Profile for Process Control Devices, Version 3.0

Flowmeter	ID Number	GSD-file	DIB-file	Description
SITRANS F C MASS 6000	**0x8127 (default)**	**SI018127.gsd** **SI028127.gsd**	**SI8127n.dib**	**Manufacturer spec. ID** **PA-profile v3.00** **Recommended to use "SI028127.gsd"**
	0x8127	SI038127.gsd	S8127n.dib	Manufacturer spec. ID PA-profile v3.01
	0x05A8	Sixx05A8.gsd	SI05A8n.dib	Manufacturer spec. ID PA-profile v.2.0 Only DPV0. For backward compatibility of old GSD files.
	0x9742	PA039742.gsd	PA_9742n.dib	Manufacturer independent GSD file according to the PROFIBUS Profile for Process Control Devices, Version 3.0

Note: xx is the revision of the GSD-file.

See also

GSD-files and DIB-files can be downloaded from the Siemens homepage:

http://support.automation.siemens.com/WW/view/en/17327023

C.1 GSD file compatibility

The PROFIBUS module provides backwards compatibility to earlier GSD files. This makes it possible to replace a module containing an earlier firmware version with a module containing the most recent firmware and still maintain compatibility to an already existing configuration through GSD files of a class 1 master.

Features supported by GSD files

The following table shows the features, which are supported, when combining compatible GSD files and Firmware versions of the PROFIBUS module.

Table C-3 GSD file compatibility

GSD file	Compatible FW versions	Supported features
sixx05A8.gsd sixx05A9.gsd sixx0648.gsd sixx0649.gsd	1.05 2.00 2.01 2.02 …	DPV0
si018127.gsd si018128.gsd si018129.gsd si01812A.gsd	2.00 2.01 2.02 …	DPV0 Acyclic communication with Class 1 master Control of bit 3 (Diag.Ext_Diag) in standard Diagnosis
si028127.gsd si028128.gsd si028129.gsd si02812A.gsd	2.02 …	DPV0 Acyclic communication with Class 1 master Condensed Status and Diagnostic messages Control of bit 3 (Diag.Ext_Diag) in standard Diagnosis
si038127.gsd si038128.gsd si038129.gsd si03812A.gsd	2.03	DPV0 Acyclic communication with Class 1 master Condensed Status and Diagnostic messages Control of bit 3 (Diag.Ext_Diag) in standard Diagnosis Batch functionality on Relay Output

Replacing old PROFIBUS module Firmware versions with version 2.03

The following table describes actions which are required when replacing an older FW version with FW version 2.03.

Table C-4 Replacing old FW versions

Old FW version	GSD files in new setup	Action
1.00-1.05	sixx05A8.gsd sixx05A9.gsd sixx0648.gsd sixx0649.gsd	Using existing PLC configurations with old GSD files*) 1. Install PDM device driver version 02.02.00 Transmitter parameters can be uploaded from device to new DD. Function block parameters must be transferred from old DD 2. Change Identity number either from the local display or from PDM device driver
	si028127.gsd si028128.gsd si028129.gsd si02812A.gsd	Updating PLC with new GSD files 1. Install PDM device driver version 02.02.00 Transmitter parameters can be uploaded from device to new DD. Function block parameters must be transferred from old DD 2. Install new GSD files. Be aware: In new GSD Condensed Status and Diagnostics are enabled per default New PA Profile 3 Totalizer controls in cyclic 2.02 data from FW version 2.00

Old FW version	GSD files in new setup	Action
2.00-2.01	si018127.gsd si018128.gsd si018129.gsd si01812A.gsd	Using existing PLC configurations with old GSD files Install PDM device driver version 02.02.00 Transmitter parameters can be uploaded from device to new DD. Function block parameters must be transferred from old DD
	si028127.gsd si028128.gsd si028129.gsd si02812A.gsd	Updating PLC with new GSD files 1. Install PDM device driver version 02.02.00 Transmitter parameters can be uploaded from device to new DD. Function block parameters must be transferred from old DD 2. Install new GSD files. Be aware: In new GSD Condensed Status and Diagnostics are enabled per default
2.02	si038127.gsd si038128.gsd si038129.gsd si03812A.gsd	Updating PLC with new GSD files 1. Install PDM device driver version 02.02.00 or newer Transmitter parameters can be uploaded from device to new DD. Function block parameters must be transferred from old DD 2. Install new GSD files. Be aware: In new GSD Condensed Status and Diagnostics are enabled per default

* This configuration is only supported for backwards compatibility to existing PLC configurations using the old FW versions 1.00 to 1.05.

Menu items

D

Below the submenus under the main menu "PROFIBUS PA/DP module" is described:

Table D-1 Menu items

Item	Value	Description
PROFI address	0-126	Device address [Factory setting: 126] Address number 126 cannot be selected. This address means new device and is programmed from factory. The address can be changed when the device is Online or Offline.
TAG name	String 0-32 bytes	Can be used to TAG the device. Master class 2 is needed to change the TAG name.
TAG descriptor	String 0-32 bytes	Can be used to describe the TAG. Master class 2 is needed to change the TAG descriptor. [Default: "Flowmeter"]
TAG date	8 bytes	Can be used to date the installation. Master class 2 is needed to change the TAG descriptor. [Default: "None"]
PROFI SW version	x.xx	Firmware version of the PROFIBUS module.
Detected Baud rate	xxxxx	• PROFIBUS PA: Only 31,25kbit/s is possible • PROFIBUS DP: The detected Baud rate of the DP network is shown.
ID Number		Shows the actual ID number. The ID number can be changed when the device is Online or Offline. See GSD files (Page 135) for further information.
Comm status		This menu can be used in service cases. It displays the state of the device. Following modes are possible: • Offline: – PA: The device is not configured by a master. – DP: The device can't see a master. Either the master is turned off or poor cabling. • Online: – PA: Not supported by PA – DP: A master is detected, but the device is not configured. • DataExchange: The device is configured and up and running. • Timeout: The device has been configured, but the watchdog has timed out. Possible error: The master was disconnected.

Local display

E

E.1 Local display units

These parameters set the units of the local keypad display. The unit codes are device specific and not according to PROFIBUS profile 3.

Note

Changing the units does not influence the units on the PROFIBUS interface. Setting a value different from the specified will return an error.

Table E-1 Mass units

Value	Unit
0x00	kg
0x01	ton
0x02	lb
0x03	mg
0x04	g

Table E-2 Massflow units

Value	Unit
0x00	kg/s
0x10	kg/m
0x20	kg/h
0x30	kg/d
0x01	ton/s
0x11	ton/m
0x21	ton/h
0x31	ton/d
0x02	lb/s
0x12	lb/m
0x22	lb/h
0x32	lb/d
0x03	mg/s
0x13	mg/m
0x23	mg/h
0x33	mg/d
0x04	g/s

Value	Unit
0x14	g/m
0x24	g/h
0x34	g/d

Table E-3 Volume units

Value	Unit
0x00	Cum
0x01	ml
0x02	l
0x03	hl
0x04	MAG: 0x04 = BBL42 MASS: 0x04 = Nm^3
0x05	Ml
0x06	MAG 6000: 0x06 = BBL32 MASS 60000: 0x06 = US BBL
0x08	Cuft
0x09	Cuin
0x0A	US G
0x0E	US kG
0x0B	US MG
0x0C	UK G
0x0F	UK kG
0x0D	MAG 6000: 0x0D = UK MG MASS 6000: 0x0D = US OBL

Table E-4 Volumeflow units

Value	Unit
0x00	Cum/s
0x10	Cum/m
0x20	Cum/h
0x30	Cum/d
0x01	ml/s
0x11	ml/m
0x21	ml/h
0x31	ml/d
0x02	l/s
0x12	l/m
0x22	l/h
0x32	l/d
0x03	hl/s

Value	Unit
0x13	hl/m
0x23	hl/h
0x33	hl/d
0x04	MAG 6000: BBL42/s MASS 6000: Nm^3/s
0x14	MAG 6000: BBL42/m MASS 6000: Nm^3/m
0x24	MAG 6000: BBL42/h MASS 6000: Nm^3/h
0x34	MAG 6000: BBL42/d MASS 6000: Nm^3/d
0x05	Ml/s
0x15	Ml/m
0x25	Ml/h
0x35	Ml/d
0x06	MAG 6000: BBL32 P S MASS 6000: US BBL P S
0x16	MAG 6000: BBL32 P M MASS 6000: US BBL P M
0x26	MAG 6000: BBL32 P H MASS 6000: US BBL P H
0x36	MAG 6000: BBL32 P D MASS 6000: US BBL P D
0x08	Cuft/s
0x18	Cuft/m
0x28	Cuft/h
0x38	Cuft/d
0x09	Cuin/s
0x19	Cuin/m
0x29	Cuin/h
0x39	Cuin/d
0x0A	US G P S
0x1A	US G P M
0x2A	US G P H
0x3A	US G P D
0x0B	US MG P S
0x1B	US MG P M
0x2B	US MG P H
0x3B	US MG P D
0x0C	UK G P S
0x1C	UK G P M
0x2C	UK G P H
0x3C	UK G P D

Value	Unit
0x0D	MAG 6000: UK MG P S MASS 6000: US OBL P S
0x1D	MAG 6000: UK MG P M MASS 6000: US OBL P M
0x2D	MAG 6000: UK MG P H MASS 6000: US OBL P H
0x3D	MAG 6000: UK MG P D MASS 6000: US OBL P D
0x0E	US kG P S
0x1E	US kG P M
0x2E	US kG P H
0x3E	US kG P D
0x0F	UK kG P S
0x1F	UK kG P M
0x2F	UK kG P H
0x3F	UK kG P D

Table E-5 Density units

Value	Unit
0x00	kg/cum
0x10	kg/cuft
0x20	kg/in
0x30	kg/cucm
0x01	ton/cum
0x11	ton/cuft
0x21	ton/cuin
0x31	ton/cucm
0x02	lb/cum
0x12	lb/cuft
0x22	lb/in
0x32	lb/cucm
0x03	mg/cum
0x13	mg/cuft
0x23	mg/cuin
0x33	mg/cucm
0x04	g/cum
0x14	g/cuft
0x24	g/cuin
0x34	g/cucm

E.2 Local display lines

These parameters set the information to be visualised in display lines 1-3 in the local keypad display. Values outside the allowed interval return an error.

Note

Changing display lines on local display

When using the PROFIBUS to change the display lines in a menu currently being displayed, it may be necessary to re-enter the menu to display it correctly.

DISPLAY_LINE_1

Table E-6 DISPLAY_LINE_1 values

Value	MASS 6000 settings	MAG 6000 settings
0	Massflow	Volumeflow
1	Volumeflow	Totaliser 1
2	Fraction A	Totaliser 2
3	Fraction B	
4	Fraction A%	
5	Totaliser 1	
6	Totaliser 2	
7	Temperature	
8	Density	

DISPLAY_LINE_2 (Bit 4-7)

Table E-7 DISPLAY_LINE_2 values

Value	MASS 6000 settings	MAG 6000 settings
0x0_	Text for line 3 (Fixed text corresponding to the value in line 3), Default	Text for line 3 (Fixed text corresponding to the value in line 3), Default
0x1_	Totalizer 2	Volumeflow
0x2_	Massflow	Volumeflow percent
0x3_	Massflow percent	Qmax
0x4_	Volumeflow	Totalizer 1
0x5_	Volumeflow percent	Totalizer 2
0x6_	Fraction A text	Batch cycle counter
0x7_	Fraction A	Sensor size
0x8_	Fraction A [percent]	Sensor type
0x9_	Fraction B text	Tag descriptor (stored in MAG 6000)
0xa_	Fraction B	Operating time

Value	MASS 6000 settings	MAG 6000 settings
0xb_	Fraction B [percent]	Qmax text
0xc_	Fraction A percent	
0xd_	Density	
0xe_	Temperature	
0xf_	Totalizer 1	

DISPLAY_LINE_3 (Bit 0-3)

Table E-8 DISPLAY_LINE_3 values

Value	MASS 6000 settings	MAG 6000 settings
0x_0	Volumeflow	
0x_1	Massflow, Default	Volumeflow percent
0x_2	Massflow percent	Qmax
0x_3	Volumeflow	Totalizer 1, Default
0x_4	Volumeflow percent	Totalizer 2
0x_5	Fraction A text	Batch cycle counter
0x_6	Fraction A	Sensor size
0x_7	Fraction A [percent]	Sensor type
0x_8	Fraction B text	Tag descriptor (stored in MAG 6000)
0x_9	Fraction B	Operating time
0x_a	Fraction B [percent]	Qmax text
0x_b	Fraction A percent	
0x_c	Density	
0x_d	Temperature	
0x_e	Totalizer 1	
0x_f	Totalizer 2	

Data sets

F

F.1 Data sets

Table F-1 DS 32: Block Structure

Element	Element name	Data type	Size
1	Reserved	Unsigned8	1
2	Block Object	Unsigned8	1
3	Parent Class	Unsigned8	1
4	Class	Unsigned8	1
5	DD Reference	Unsigned32	4
6	DD Revision	Unsigned16	2
7	Profile	Octet String	2
8	Profile Revision	Unsigned16	2
9	Execution Time	Unsigned8	1
10	Number of Parameters	Unsigned16	2
11	Address of Views	Unsigned16	2
12	Number of View	Unsigned8	1

Table F-2 Data type 101: Value & Status

Element	Element name	Data type	Size
1	Value	Float	4
2	Status	Unsigned8	1

Table F-3 DS 36: Scaling Structure

Element	Element name	Data type	Size
1	EU at 100%	Float	4
2	EU at 0%	Float	4
3	Units Index	Unsigned16	2
4	Decimal Point	Unsigned8	1

Table F-4 DS 37: Mode Structure

Element	Element name	Data type	Size
1	Actual	Unsigned8	1
2	Permitted	Unsigned8	1
3	Normal	Unsigned8	1

Table F-5 DS 39: Alarm Float Structure

Element	Element name	Data type	Size	Description
1	Unacknowledged	Unsigned8	1	
2	Alarm State	Unsigned8	1	• 0 = no alarm • > 0 = alarm
3	Time Stamp	Time Value	8	This device does not provide a realtime clock, and therefore always returns "1st of January 1984".
4	Subcode	Unsigned16	2	Always 0
5	Value	Float	4	OUT value

Table F-6 DS 42: Alarm Summary Structure

Element	Element name	Data type	Size	Description
1	Current	Octet String	2	Limit alarm bits will be set to 1 or 0 if the alarm reason occurs (1) or is gone(0). The update event bit will be set to 1 after ST_REV increment or other problems (see block specification) and will be set to 0 after 10 s. Note: Some alarm reasons are mapped to the cyclic status reporting.
2	Unacknowledged	Octet String	2	Reserved
3	Unreported	Octet String	2	Reserved
4	Disabled	Octet String	2	Reserved

Table F-7 Octet string definition

Octet	Bit	Element	Description
0	0	Discrete Alarm	Only Function Blocks with discrete limit parameters
0	1	HI_HI_ALARM	Only Function Blocks with analog limit parameters
0	2	HI_ALARM	Only Function Blocks with analog limit parameters
0	3	LO_LO_ALARM	Only Function Blocks with analog limit parameters
0	4	LO_ALARM	Only Function Blocks with analog limit parameters
0	5-6	Reserved	
0	7	Update event	E.g. increment of ST_REV
1	0-7	Reserved	

Table F-8 Octet string coding

Octet 0								Octet 1							
Bit 7							Bit 0	Bit 7							Bit 0

Table F-9 DS 50: Simulate – Floating Point Structure

Element	Element name	Data type	Size	Description
1	Simulate Status	Unsigned8	1	Status written by an operator to simulate the Transducer Block value status.
2	Simulate Value	Float	4	Value written by an operator to simulate the Transducer Block value.
3	Simulate Enabled	Unsigned8	1	Switch to enable or disable simulation: • 0 = Disabled • >0 = Enabled

Table F-10 DS 67: Batch Structure

Element	Element name	Data type	Size	Description
1	Batch ID	Unsigned32	4	Identifies a certain batch to allow assignment of equipment-related information (e.g. faults, alarms ...) to the batch.
2	Rup	Unsigned16	2	No. of Recipe Unit Procedure or of Unit: Identifies the active Control Recipe Unit Procedure or the related Unit (e.g. reactor, centrifuge, drier). (Unit is defined in IEC61512 Part1 / ISA S88, but in a different meaning as parameter UNIT i.e. Engineering Unit)
3	Operation	Unsigned16	2	No. of Recipe Operation: Identifies the active Control Recipe Operation.
4	Phase	Unsigned16	2	No. of Recipe Phase: Identifies the active Control Recipe Phase.

Table F-11 DS 68: Feature Structure

Element	Element name	Data type	Size
1	Supported	Octet String	4
2	Enabled	Octet String	4

Table F-12 Octet string definition of Supported

Octet	Bit	Element	Description
1	0	Condensed_status	Defines the general method how the whole device handles status and diagnostics: • 0: Condensed status and diagnosis is not supported. • 1: Condensed status and diagnosis information according to the Amendment 2 to PROFIBUS profile for process control devices V3.01.
1	1	Expanded Status/Diagnosis	Defines the general method how the whole device handles status and diagnostics • 0: Expanded status/diagnosis as defined in this General Requirement part of the profile for process control devices V3.00 is not supported. • 1: As defined in the General Requirement part of the profile for process control devices V3.00.
1	2	DxB	• 0: no support of data exchange broadcast • 1: data exchange broadcast supported
1	3	MS1_AR	• 0: no support of MS1 application relationship • 1: MS1 application relationship supported
1	4	ProfiSafe	• 0: no support of PROFIsafe communication • 1: PROFIsafe communication supported
1	5	Reserved	
1	6	Reserved	
1	7	Reserved	
2-4		Reserved	

Table F-13 Octet string definition of Enabled

Octet	Bit	Element	Description
1	0	Condensed_status	Defines the general method how the whole device handles status and diagnostics: • 0: disabled (As defined in this General Requirement part of the profile for process control devices V3.0) • 1: enabled (Condensed status and diagnosis information according to Amendment 2 to PROFIBUS profile for process control devices V3.00)
1	1	Expanded Status/Diagnosis	Defines the general method how the whole device handles status and diagnostics • 0: disabled • 1: enabled (As defined in this General Requirement part of the profile for process control devices V3.00)
1	2	DxB	• 0: disabled (no support of data exchange broadcast) • 1: enabled (data exchange broadcast enabled)

Octet	Bit	Element	Description
1	3	MS1_AR	• 0: disabled (no support of MS1 application relationship) • 1: enabled (MS1 application relationship enabled)
1	4	ProfiSafe	• 0: disabled (no support of PROFIsafe communication) • 1: enabled (PROFIsafe communication enabled)
1	5	Reserved	
1	6	Reserved	
1	7	Reserved	
2-4		Reserved	

Table F-14 DIAG_EVENT_SWITCH Structure

Element	Element name	Data type	Size
1	Diag Status Link	Array of unsigned	48
2	Slot	Unsigned8	1
3	Index (absolute)	Unsigned8	1

The DIAG_STATUS_LINK element is an array of switches. Each switch element of the Diag_Status_Link consists of one byte. The byte value of the lower nibble specifies the status code setting and the byte value of the upper nibble specifies the Diagnosis setting.

Table F-15 DIAG_STATUS_LINK

	Description
Status code (low nibble)	• 0: Diagnostic event has no affect on the status. Status will be GOOD – ok • 1: Diagnostic event is treated as maintenance request. Status will be GOOD – maintenance required. • 2: Diagnostic event is treated as immediate maintenance request. Status will be GOOD – maintenance demanded • 3: Diagnostic event is treated as immediate maintenance request. Status will be UNCERTAIN – maintenance demanded • 4: Diagnostic event is treated as failure. Status will be BAD – maintenance alarm • 5: Diagnostic event is treated as invalid process condition. Value is conditionally usable. Status will be UNCERTAIN – process related, no maintenance • 6: Diagnostic event is treated as invalid process condition. Value is not usable. Status will be BAD – process related, no maintenance • 7: Diagnostic event is treated as function check without usable value. Status will be BAD – function check / local override • 8: Diagnostic event is treated as function check with usable value. Status will be GOOD – function check.
Diagnosis (high nibble)	• 0: Diagnostic event has no affect on the diagnosis. DIAGNOSIS: No additional bit will be set. • 1: Diagnostic event is treated as maintenance request. DIAGNOSIS: DIA_MAINTENANCE will be set. • 2: Diagnostic event is treated as immediate maintenance request. DIAGNOSIS: DIA_MAINTENANCE_DEMAND will be set. • 3: Diagnostic event is treated as failure. DIAGNOSIS: DIA_MAINTENANCE_ALARM will be set. • 4: Diagnostic event is treated as invalid process condition. DIAGNOSIS: DIA_INV_PRO_COND will be set. • 5: Diagnostic event is treated as function check or simulation. DIAGNOSIS: DIA_FUNCTION_CHECK will be set.

Switch settings for an event number ‘n’:

Status code setting = Diag_Status_Link[n] & 0x0F

Diagnosis setting = Diag_Status_Link[n] & 0xF0

The Diag_Status_Link element is an array of switches. Each switch element of the Diag_Status_Link consists of one byte. The byte value of the lower nibble specifies the status code setting and the byte value of the upper nibble specifies the Diagnosis setting.

Table F-16 Diag_Status_Link

	Description
Status code (low nibble)	• 0: Diagnostic event has no affect on the status. Status will be GOOD – ok • 1: Diagnostic event is treated as maintenance request. Status will be GOOD – maintenance required. • 2: Diagnostic event is treated as immediate maintenance request. Status will be GOOD – maintenance demanded • 3: Diagnostic event is treated as immediate maintenance request. Status will be UNCERTAIN – maintenance demanded • 4: Diagnostic event is treated as failure. Status will be BAD – maintenance alarm • 5: Diagnostic event is treated as invalid process condition. Value is conditionally usable. Status will be UNCERTAIN – process related, no maintenance • 6: Diagnostic event is treated as invalid process condition. Value is not usable. Status will be BAD – process related, no maintenance • 7: Diagnostic event is treated as function check without usable value. Status will be BAD – function check / local override • 8: Diagnostic event is treated as function check with usable value. Status will be GOOD – function check.
Diagnosis (high nibble)	• 0: Diagnostic event has no affect on the diagnosis. DIAGNOSIS: No additional bit will be set. • 1: Diagnostic event is treated as maintenance request. DIAGNOSIS: DIA_MAINTENANCE will be set. • 2: Diagnostic event is treated as immediate maintenance request. DIAGNOSIS: DIA_MAINTENANCE_DEMAND will be set. • 3: Diagnostic event is treated as failure. DIAGNOSIS: DIA_MAINTENANCE_ALARM will be set. • 4: Diagnostic event is treated as invalid process condition. DIAGNOSIS: DIA_INV_PRO_COND will be set. • 5: Diagnostic event is treated as function check or simulation. DIAGNOSIS: DIA_FUNCTION_CHECK will be set.

Switch settings for an event number ‘n’:

Status code setting = Diag_Status_Link[n] & 0x0F

Diagnosis setting = Diag_Status_Link[n] & 0xF0

Parameterization

G

G.1 Parameterization

Different behaviors of the slave can be selected in the SET_PRM telegram. This behavior is set before the slave enters DataExchange.

The following table shows the structure of the parameterization for use with the PA profile 3 ID numbers.

Table G-1 Parameterization structure

User_Prm_Data [x]	Description	Default value	Features
0	DPV1_status_0	0x80	• 0x00: MSAC_C1 Disables • 0x80: MSAC_C1 Enabled
1	DPV1_status_1	0x00	
2	DPV1_status_2	0x00	
Structure for Condensed Status and Diagnostic messages*)			
3	Structure_Length	0x05	Length of the following bytes including this byte.
4	Structure_Type	0x20	Manufacturer specific
5	Slot_Number	0x00	
6	Reserved	0x00	
7	Prm_Cond	0x01	Condensed Status and Diagnostic messages • 0x00 Expanded Diagnosis enabled • 0x01 Condensed Status and Diagnostic messages enabled
Structure for control of bit 3 (Diag.Ext_Diag) in Standard Diagnosis			
8	Structure_Length	0x05	Length of the following bytes including this byte.
9	Structure_Type	0x20	Manufacturer specific
10	Slot_Number	0x00	

User_Prm_Data [x]	Description	Default value	Features
11	Reserved	0x00	
12	Ext_Diag_Bit	0x01	Control of bit 3 (Diag.Ext_Diag) in standard Diagnosis • 0x00: If extended diagnosis is available the diagnosis flag is set. Device specific diagnosis is ALWAYS transferred with diagnosis data. But Bit 3 (Diag.Ext_Diag) in Standard Diagnosis is NEVER set. • 0x01: Diag flag behaves according to PROFIBUS specifications. If extended diagnosis is available the device specific diagnosis are transferred with diagnostic data and bit 3 Diag.Ext_Diag) in Standard • Diagnosis is set. (Default in GSD files) • 0x02: Extended diagnosis does not cause the Diag flag to be set in DataExchange.

*) Supported from PROFIBUS module firmware version 2.02

If the structure for Condensed Status and Diagnostic messages is omitted in the GSD file, the Condensed Status and Diagnosis will be disabled.

If the structure for control of bit 3 (Diag.Ext_Diag) in Standard Diagnosis is omitted, the Ext_Diag_Bit will be 0x01 and the Diag.Ext_Diag flag behaves according to the PA profile.

If User_Prm_Data 0-12 are omitted then DPV1_status_0 will be 0x00.

See also

The compatibility between different versions of GSD files and Firmware versions is described in Appendix C (Page 135). The appendix also specifies the features, which are supported by the different GSD files.

Glossary

Acyclic data

Data read over the acyclic communication channel, and this data could take several bus scans to read. The total amount of time that this process takes is random and therefore acyclic.

Baud rate

The speed of the network in bits per second.

Class 1 Master

A type of device on a PROFIBUS network and the traditional master in process control systems. Refers to a Distributed Control System (DCS) or Programmable Logic Controller (PLC).

Class 2 Master

A type of device on a PROFIBUS network and the traditional engineering work station. An example of a class 2 master is SIMATIC PDM.

Cyclic data

Data that is read in every bus scan. It's the input and output data used for control and is time sensitive.

EMC Performance

Electromagnetic Compatibility Performance.

The capability of equipment or systems to be used in their intended environment within designed efficiency levels without causing or receiving degradation due to unintentional EMI. EMC generally encompasses all of the electromagnetic disciplines.

FB

→ *Function Block*

FISCO

Fieldbus Intrinsic Safe Concept. A standard that makes it easy to place FISCO approved instruments into zone 0 and above environments.

Fraction

Fraction is defined as a part of a mixture.

Mixtures consist of two components (A+B), which can be measured separately. If the flowmeter is ordered with fraction, e.g. °BRIX, the flowmeter is able to calculate the % concentration of sugar in a water (B) + sugar (A) mixture.

Function Block

The Function Blocks specify the automation functions of the device and compose parameters and algorithms that control the functionality of the application system. Function Blocks are used as building blocks in defining the monitoring and control application.

GSD

General System Data (or Generic Slave Description) is a text file defining all the protocol information and cyclic data of a field device. It is used by the network configuration software to identify the slave and to set up the data exchange between the master and the slave during cyclic data exchange.

IEC

International Electrical Congress is an international standards organization committed to creating and maintaining international and open standards for use in the electrical industries.

Interoperability

The ability to connect different devices to different manufacturers on the same network and have them work correctly. This is a core strength of PROFIBUS.

Intrinsically safe

An intrinsically safe device keeps the voltage and current low enough so that it cannot generate a spark of sufficient energy to ignite the gas/particles in the atmosphere making it safe for use.

ISA

Instrumentation, Systems and Automation Society is a worldwide organization that develops standards, certifies industry professionals, provides education and training, publishes books and technical articles, and hosts conferences and exhibitions.

Master

A type of device on PROFIBUS that controls communication to slave devices. One PROFIBUS network can have several Masters on it, and they share communications by using a token ring protocol.

MBP

Manchester encoded Bus Powered. This is the physical layer defined in IEC-61158-2 that is used for PROFIBUS PA.

Physical block

The physical block encompasses all parameters and functions required to identify the hardware and software (revision numbers, limit values, etc.)

Physical Layer

Refers to medium used to get the ones and zeros from point A to point B. This layer of the protocol is all about wires and voltage and current levels.

PROFIBUS

PROFIBUS is a digital, serial, two-way communication system that interconnects field equipment such as sensors, actuators, and controllers. PROFIBUS is designed for instruments used in both process and manufacturing automation with built-in capability to distribute the control application across the network. The fieldbus environment is the base level group of digital networks in the hierarchy of plant networks.

PROFIBUS DP

DP stands for Decentralized Peripheral and was designed for remote input output devices. This forms the core protocol of PROFIBUS. If PROFIBUS were a book, it would be called PROFIBUS DP.

PROFIBUS PA

A chapter in the PROFIBUS book that adds functions to the core protocol for process control applications. PA refers to Process Automation.

PROFIdrive

A chapter in the PROFIBUS book that adds functions to the core protocol for high speed drive applications.

Profile

A profile is a standardization of a field device from the bus point of view. It defines the output and the core device parameters.

PROFISafe

A chapter in the PROFIBUS book that adds functions to the core protocol for safety applications.

Protocol

Protocol refers to a set of rules. In industrial communications, it simply refers to a set of rules defining how something is done. For example, how to get information from point A to point B. Since one set of rules can be made up of many different sets of rules, one protocol can be made up of different sub-protocols.

Slave

A type of device on PROFIBUS that will only talk on the network after a Master device has requested information.

TB

→ *Transducer Block*

Transducer Block

The Transducer Block contains the measuring technology and device-specific data of the device. The Transducer Block data are independent of the automation application.

USMII

Transmitter platform including SITRANS F M MAG 6000 and SITRANS F C MASS 6000 transmitters.

Index

M

P

S

T

U

V

W

For more information

www.siemens.com/flow

Siemens A/S
Flow Instruments
Nordborgvej 81
DK-6430 Nordborg

Subject to change without prior notice
Order No.: A5E00726137
Lit. No.: A5E00726137-AF

A5E00726137

www.siemens.com/processautomation