Series 2600T Pressure Transmitters Connection to PROFIBUS PA / DP

For pressure, differential pressure, level, and pressure/temperature-corrected flow measurement

- **Communication description for PROFIBUS PA / DP**
  - Valid for models 265Dx, 265VS, 265Gx, 265Ax, 267JS, 267Cx, 269JS, 269Cx

ABB

Series 2600T Pressure Transmitters
Connection to PROFIBUS PA / DP

Communication Description

41/15-110-EN_03

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Manufacturer:

1   Note

This communication description is only applicable in conjunction with the operating instructions for the following device types:

- 265Dx, 265VS, 265Gx, 265Ax
- 267JS, 267Cx
- 269JS, 269Cx

The most important enhancements for PROFIBUS PA are described below.

2   Auxiliary power

The transmitter is intended for connection to the DP/PA segment coupler (DP/PA linking device). The permissible terminal voltage ranges from 10.2 ... 32 V DC. The current consumption is 12 mA (mean value for sending).

3   Output signal

The transmitter's output signal is transmitted in digital format in accordance with IEC 1158-2. The transmission protocol conforms to PROFIBUS standard EN 50 170. Pressure transmitter functions are supported in accordance with PROFIBUS PA profile 3.0.

The "OUT" variable is transmitted cyclically. This consists of the output value and one byte of status information. The output value is transmitted with four IEEE 754 floating-point-type bytes.

4   Ambient conditions

Ambient temperature range	-40 ... 85 °C (-40 ... 185 °F)
Storage and transport temperature range	-50 ... 85 °C (-58 ... 185 °F)
Relative humidity	Up to 100 %
Condensation/icing:	Permissible

5   Shielding/Electromagnetic compatibility

A shielded cable is recommended. The inside of the metal cable connection is used for shield contacting purposes.

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Important

The transmitter must be grounded.

6 Setting the address

The slave address may be set by a master (PLC or operating program) using the "SET_SLAVE_ADD" service, or by using the control buttons on an integrated LCD display.

If the address is set by means of the "SET_SLAVE_ADD" service and the "NO_ADD_CHG" flag has the value "true", this is taken into consideration by the 2600T series pressure transmitter. In such cases, it will no longer be possible to change the address using the "SET_SLAVE_ADD" service.

However, if the address is reset to the default value "126", either using "FACTORY_RESET" and the code "2712" or by changing the address with the control buttons on the LCD display, it will once again be possible to set the address using the "SET_SLAVE_ADD" service.

7 Ident Number of 2600T series

The 2600T series pressure transmitter is assigned the Ident Number "04C2" by the manufacturer ("062D" is used for multivariable transmitters). To ensure cyclical operation of the transmitter, it is essential that the Ident Number and GSD file match.

i **Important**

A CD-ROM containing the GSD file for the 2600T series pressure transmitter is supplied with every transmitter.

In the case of controllers/control systems, etc., which do not support replacement of a transmitter (field device) with one that has a new Ident Number during operation, it is possible to change the Ident Number of the 2600T series pressure transmitter using the "Ident Number selector".

The Ident Number is not automatically adjusted at the start of cyclical operation, since the Ident Number - along with the slave address - is used for the purpose of identifying a device.

Ident_number_selector	Ident Number	Note
0	9700	Transmitter with an AI block
1	04C2	2600T (265xx)
1	062D	2600T (267xx / 269xx)
2	9653	AF800
3	9760	Multivariable transmitter
4	Reserved	
...	Reserved	
128	Reserved	
129	9701	Transmitter with two AI blocks (265Dx)
131	009B	600T

8   2600T series modules

Depending on the type, up to five modules can be transmitted in cyclical data traffic. The order of the modules corresponds to their assignment to the individual slots.

The assignment of the individual modules, depending on their type, is indicated in the table below.

PROFIBUS parameters, slots, and blocks

Slot	Block - Offset	Function	265Gx/Ax/Vx	265Dx	267Jx/269Jx	267Cx/269Cx	Hex-Code
1	AIDP – 16 PB - 100	AI differential pressure, pressure, or absolute pressure; physical block	Analog input	Analog input	Analog input	Analog input	94 or 42,84,08,05
2	AIP -16	AI static pressure	-	Analog input	Analog input	Analog input	94 or 42,84,08,05
3	AIT – 16 TTRB - 100	AI temperature; temperature transducer block	-	-	Analog input	Analog input	94 or 42,84,08,05
4	Reserved	Reserved	-	-	-	Empty Module	0
5	MV - 16	Multivariable flow measurement	-	-	-	Input mass flow Input vol flow	42,84,F0,81 or 42,84,F0,82
6	PTRB - 0	Pressure transducer block	X	X	X	X	X

9 Status byte in the 2600T series cyclical output variables

Dec	Hex	Quality		Substatus				Limits		Meaning
		Gr	Gr	QS	QS	QS	QS	Qu	Qu	
		27	26	25	24	23	22	21	20	
0	00	0	0							= bad
64	40	0	1							= uncertain
128	80	1	0							= good (Not Cascade)

9.1 Meaning of "bad"

i **Important**

The output value is not defined.

Dec	Hex	Quality		Substatus				Limits		Meaning
		Gr	Gr	QS	QS	QS	QS	Qu	Qu	
0	00	0	0	0	0	0	0			**= non-specific**
12	0C	0	0	0	0	1	1			**= device failure**
16	10	0	0	0	1	0	0			**= sensor failure**
28	1C	0	0	0	1	1	1			**= out of service**

9.2 Meaning of "uncertain"

i **Important**

The output value is not defined.

Dec	Hex	Quality		Substatus				Limits		Meaning
		Gr	Gr	QS	QS	QS	QS	Qu	Qu	
64	40	0	1	0	0	0	0			= non-specific
68	44	0	1	0	0	0	1			= last usable value
84	54	0	1	0	1	0	1			= engineering unit range violation

9.3 Meaning of "good" (non-cascade)

i **Important**

The output value corresponds to the current process variable within the measuring limits.

Dec	Hex	Quality		Substatus				Limits		Meaning
		Gr	Gr	QS	QS	QS	QS	Qu	Qu	
128	80	1	0	0	0	0	0			= ok
132	84	1	0	0	0	0	1			= Update event
136	88	1	0	0	0	1	0			= active advisory alarm (priority < 8)
140	8C	1	0	0	0	1	1			= active critical alarm (priority < 8)
144	90	1	0	0	1	0	0			= unacknowledged update event
148	94	1	0	0	1	0	1			= unacknowledged advisory alarm
152	98	1	0	0	1	1	0			= unacknowledged critical alarm

9.4 Meaning of the "limits" bits

Dec	Hex	Quality		Substatus				Limits		Meaning
		Gr	Gr	QS	QS	QS	QS	Qu	Qu	
+0	+00							0	0	= ok
+1	+01							0	1	= low limited
+2	+02							1	0	= high limited
+3	+03							1	1	= constant

10 2600T series parameters

A selection of the parameters for the 2600T series is shown below. Parameters that are not supported are indicated by a " - " character in the Access column.

i **Important**

It is only possible to set the 267 / 269 transmitter using the DTM. Changing the parameters using any other means may result in incorrect output values.

Abbreviations in the "Store" columns

D	Dynamic	S	Static
N	Non-volatile	Cst	Constant

10.1 Common parameters for all blocks

Relative index	Parameter name	Object type	Data type	Store	Size	Access	Comments
0	BLOCK OBJECT	Record	DS-32	C	20	r	
1	ST_REV	Simple	Unsigned 16	N	2	r	
2	TAG_DESC	Simple	OctetString *	S	32	r,w	
3	STRATEGY	Simple	Unsigned 16	S	2	r,w	
4	ALERT_KEY	Simple	Unsigned 8	S	1	r,w	
5	TARGET_MODE	Simple	Unsigned 8	S	1	-	
6	MODE_BLK	Record	DS-37	D	3	-	
7	ALARM_SUM	Record	DS-42	D	8	r	(Only supported in AIs)
8	BATCH	Structure	DS-67	S	10	r,w	(AI, PID, and MV only)

10.2 Common parameters for all analog input blocks (AIDP, AIP, AIT)

Relative index	Parameter name	Object type	Data type	Store	Size	Access
10	OUT	Record	DS-33	D	5	r
11	PV_SCALE	Array	Float (*)	S	8	r,w
12	OUT_SCALE	Record	DS-36	S	11	r,w
13	LIN_TYPE	Simple	Unsigned 8	S	1	r,w
14	CHANNEL	Simple	Unsigned 16	S	2	r,w
16	PV_FTIME	Simple	Float	S	4	r,w
17	FSAFE_ TYPE	Simple	Unsigned 8	S	1	-
18	FSAFE_VALUE	Simple	Float	S	4	-
19	ALARM_HYS	Simple	Float	S	4	r,w
21	HI_HI_LIM	Simple	Float	S	4	r,w
23	HI_LIM	Simple	Float	S	4	r,w
25	LO_LIM	Simple	Float	S	4	r,w
27	LO_LO_LIM	Simple	Float	S	4	r,w
30	HI_HI_ALM	Record	DS-39	D	16	r,w
31	HI_ALM	Record	DS-39	D	16	r,w
32	LO_ALM	Record	DS-39	D	16	r,w
33	LO_LO_ALM	Record	DS-39	D	16	r,w
34	SIMULATE	Record	DS-50	S	6	r,w
35	OUT_UNIT_TEXT	Simple	OctetString	S	16	-

10.3 Parameters for pressure transducer block (PTRB)

Relative index	Parameter name	Object type	Data type	Store	Size	Access
8	SENSOR_VALUE	Simple	Float	D	4	r
9	SENSOR_HI_LIM	Simple	Float	N	4	r
10	SENSOR_LO_LIM	Simple	Float	N	4	r
11	CAL_POINT_HI	Simple	Float	S	4	r,w
12	CAL_POINT_LO	Simple	Float	S	4	r,w
13	CAL_MIN_SPAN	Simple	Float	N	4	r
14	SENSOR_UNIT	Simple	Unsigned 16	S	2	r,w
15	TRIMMED_VALUE	Record	DS-33	D	5	r
16	SENSOR_TYPE	Simple	Unsigned 16	N	2	r
17	SENSOR_SERIAL_NUMBER	Simple	Unsigned 32	N	4	r
18	PRIMARY_VALUE	Record	DS-33	D	5	r
19	PRIMARY_VALUE_UNIT	Simple	Unsigned 16	S	2	r,w
20		Simple	Unsigned 16	S	2	r,w
21	SENSOR_DIAPHRAGM_MATERIAL	Simple	Unsigned 16	S	2	r,w
22	SENSOR_FILL_FLUID	Simple	Unsigned 16	S	2	r,w
23	SENSOR_MAX_STATIC_PRESSURE	Simple	Float	N	4	r
24	SENSOR_O_RING_MATERIAL	Simple	Unsigned 16	S	2	r,w
25	PROCESS_CONNECTION_TYPE	Simple	Unsigned 16	S	2	r,w
26	PROCESS_CONNECTION_MATERIAL	Simple	Unsigned 16	S	2	r,w
27	TEMPERATURE	Record	DS-33	D	5	r
28	TEMPERATURE_UNIT	Simple	Unsigned 16	S	2	r,w
29	SECONDARY_VALUE_1	Record	DS-33	D	5	r
30	SECONDARY_VALUE_1_UNIT	Simple	Unsigned 16	N	2	r
31	SECONDARY_VALUE_2	Record	DS-33	D	5	-
32	SECONDARY_VALUE_2_UNIT	Simple	Unsigned 16	S	2	-
33	LIN_TYPE	See General Requirements				
34	SCALE_IN	Array	Float	S	8	r,w
35	SCALE_OUT	Array	Float	S	8	r,w
36	LOW_FLOW_CUT_OFF	Simple	Float	S	4	r,w
37	FLOW_LIN_SQRT_POINT	Simple	Float	S	4	r,w
38	TAB_ACTUAL_NUMBER	See General Requirements				r
39	TAB_ENTRY	See General Requirements				r,w
40	TAB_MAX_NUMBER	See General Requirements				r
41	TAB_MIN_NUMBER	See General Requirements				r
42	TAB_OP_CODE	See General Requirements				r,w
43	TAB_STATUS	See General Requirements				r
44	TAB_X_Y_VALUE	See General Requirements				r,w
45	MAX_SENSOR_VALUE	Simple	Float	N	4	r,w
46	MIN_SENSOR_VALUE	Simple	Float	N	4	r,w
47	MAX_TEMPERATURE	Simple	Float	N	4	r,w
48	MIN_TEMPERATURE	Simple	Float	N	4	r,w

10.4   Parameters for physical block (PB)

Relative index	Parameter name	Object type	Data type	Store	Size	Access
8	SOFTWARE_REVISION	Simple	VisibleString	Cst	16	r
9	HARDWARE_REVISION	Simple	VisibleString	Cst	16	r
10	DEVICE_MAN_ID	Simple	Unsigned 16	Cst	2	r
11	DEVICE_ID	Simple	VisibleString	Cst	16	r
12	DEVICE_SER_Num	Simple	VisibleString	Cst	16	r
13	DIAGNOSIS	Simple	Octetstring	D	4	r
14	DIAGNOSIS_EXTENSION	Simple	Octetstring	D	6	r
17	DEVICE_CERTIFICATION	Simple	VisibleString	Cst	32	r
18	WRITE_LOCKING	Simple	Unsigned 16	N	2	r,w
19	FACTORY_RESET	Simple	Unsigned 16	S	2	r,w
20	DESCRIPTOR	Simple	OctetString	S	32	r,w
21	DEVICE_MESSAGE	Simple	OctetString	S	32	r,w
22	DEVICE_INSTAL_DATE	Simple	OctetString	S	16	r,w
23	LOCAL_OP_ENA	Simple	Unsigned 8	N	1	r,w
24	IDENT_NUMBER_SELECTOR	Simple	Unsigned 8	S	1	r,w
25	HW_WRITE_PROTECTTION	Simple	Unsigned 8	D	1	r

10.5   Parameters for flow block

Relative index	Parameter name	Object type	Data type	Store	Size	Access
10	OUT_VOL_FLOW	Record	DS-33	D	5	r
11	OUT_VOL_FLOW_UNIT	Simple	Unsigned 16	S	2	r, w [1]
12	OUT_MASS_FLOW	Record	DS-33	D	5	r
13	OUT_MASS_FLOW_UNIT	Simple	Unsigned 16	S	2	r, w [1]
14	IN_DP	Record	DS-33	D	5	r
15	IN_P	Record	DS-33	D	5	r
16	IN_T	Record	DS-33	D	5	r

1) Only with DTM for 267/269

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