Details for implementation of PROFIBUS PA interface with

MyPro CPM 431

Scope

This file is effective for the following software versions:

MyPro CPM431   PROFIBUS PA:

                pH :   ab 2.00

This file contains additional information to the operating manuals of MyPro CPM431 with a PROFIBUS PA communication interface.

Cyclic Service of MyPro CPM431

The telegram of the cyclic service of MyPro CPM431 has the following format:

byte	data item	access	data format	unit
0, 1, 2, 3	main measured value	r	32-bit floating point number (IEEE-754)	CPM431 : pH oder mV
4	status of main measured value	r	80h[1] = O.K.	-
5, 6, 7, 8	temperature measured value	r	32-bit floating point number (IEEE-754)	°C
9	status of temperature measured value	r	80h = O.K.	-

The cyclic telegram can be tailored to meet the requirements of a specific process. The above table reflects the maximum contents of a cyclic diagram.

In case not all outputs of MyPro CPM431 are required, any combination of blocks can be eliminated from the cyclic telegram. This can be achieved by a "negative" selection in configuration tool. By eliminating blocks from the telegram, the throughput of a PROFIBUS PA system can be improved.

To achieve the correct assignment of the data items in the cyclic telegram, the PROFIBUS master has to send a FREE_PLACE (0) for the inactive blocks. Example:

byte	data item	status	configuration data[2]
--	main measured value	inactiv	0
0 .. 4	temperature measured value + status	activ	42h, 84h, 08h, 05h

The cyclic telegram of this example contains 5 bytes of device data. The configuration data string (CHK_CFG) is: 0, 42h, 84h, 8h, 5h.

Miscellaneous

- The cyclic telegram of MYCOM 152 is not affected by the configuration of the device.

- The implementation of the physical layer IEC 1158-2 ensures, that a reverse polarity on the signal lines has no effect on the functionality of the device.

- Proper cables for the signal lines are e.g. Belden 3097A or Siemens 6XY 1830-5AH10.

- 32-bit floating point number in IEEE-754 format:

byte n		byte n+1		byte n+2	byte n+3
bit7	bit 6 .... bit 0	bit7	bit 6 .... bit 0	bit 7 .... bit 0	bit 7 .... bit 0
S	2^7 2^6 2^5 2^4 2^3 2^2 2^1	2^0	2^{-1} 2^{-2} 2^{-3} 2^{-4} 2^{-5} 2^{-6} 2^{-7}	2^{-8} 2^{-9} 2^{-10} 2^{-11} 2^{-12} 2^{-13} 2^{-14} 2^{-15}	2^{-16} 2^{-17} 2^{-18} 2^{-19} 2^{-20} 2^{-21} 2^{-22} 2^{-23}
Sign	exponent		mantissa	mantissa	mantissa

Formula: **Value $= (-1)^S * 2^{(exponent - 127)} * (1 + mantissa)$**

Example: 40 F0 00 00 h = 0100 0000 1111 0000 0000 0000 0000 0000 b

$$Value = (-1)^0 * 2^{(129 - 127)} * (1 + 2^{-1} + 2^{-2} + 2^{-3})$$
$$= 1 * 2^2 * (1 + 0,5 + 0,25 + 0,125)$$
$$= 1 * 4 * 1,875$$
$$= 7,5$$

- Coding of status according to „PROFIBUS PA Profile for Process Control Devices - General Requirements" V 2.0:

STATUS-CODE (HEX)	MEANING	DEVICE-CONDITION
0C	device failure	BAD
80	ok	GOOD
44	last usable value	HOLD

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[1] 80h means 80 hex
[2] Depending on the PROFIBUS Master