Details for implementation of PROFIBUS PA interface with Deltapilot S

Scope

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

In case the integration of a device is performed according to the profiles, compatibility and interoperability is achieved through the standardization within the profiles. The device have been tested against the profile specification and support all defined services for a flow devices. In this case please refer to the PROFIBUS PA profile specifications.

Cyclic Service of Deltapilot S PROFIBUS PA

The telegram of the cyclic service of Deltapilot S has the following format:

byte	data item	access	data format	unit
0, 1, 2, 3	Process value	Read	32- floating point number (IEEE-754)	% level
4	Status process value	Read	z.B. 80 (hex) = device OK	---

The status is encoded in accordance with the „PROFIBUS PA Profile for Process Control Devices“, see last page. The status „O.K.“ is encoded as 80h (bit 7 =1; bit 0 .. bit 6 = 0).

Miscellaneous

- 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.
- Suitable cables are e.g. Belden 3097A or Siemens 6XY 1830-5AH10.
- Coding of status according to „PROFIBUS PA Profile for Process Control Devices - General Requirements“ V 2.0:

STATUS-CODE	MEANING	DEVICE-CONDITION
0C	Device failure (means alarm, e.g. E101)	BAD
40	Non-specific (target mode switched to manuell)	UNCERTAIN
80	Gerät OK	GOOD

- 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