Details for implementation of PROFIBUS-PA interface with TMD 834

Scope

This file contains additional information to the operating manual of TMD 834.

In case the integration of a device is performed according to the profiles, compatibility and interoperability is achieved through the standardization within the profiles. In this case please refer to the PROFIBUS-PA profile specifications.

Cyclic Service of TMD 834

The telegram of the cyclic service of TMD 834 has the following format:

byte	data item	access	data format	unit
0, 1, 2, 3	Process value	Read	32-bit floating point number (IEEE-754)	°C, °F
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". 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 (HEX)	MEANING	DEVICE-CONDITION
0C	Device failure (means alarm, e.g. E110)	BAD
40	Non-specific (target mode switched to manual)	UNCERTAIN
80	Device 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** $= (-1)^S * 2^{(\text{exponent} - 127)} * (1 + \text{mantissa})$

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

Value $= (-1)^0 * 2^{(129 - 127)} * (1 + 2^{-1} + 2^{-2} + 2^{-3})$

$= 1 * 2^2 * (1 + 0{,}5 + 0{,}25 + 0{,}125)$

$= 1 * 4 * 1{,}875$

$= 7{,}5$