Application Note AN1102
PROFIBUS interface on TC-S1 / TC-M2

1.) General Informations

PROFIBUS became a worldwide communication standard for industrial automation. In 2002 bentrup joined the community by making PROFIBUS available to the state-of-the-art programme controllers TC S1 and TC M2. For details about PROFIBUS check on www.profibus.com.

The bentrup TC-S1 resp. TC-M2 acts as a Profibus-DP-Slave.

2.) Physical Layer (PHY)

The physical layer is designed as EIA-RS-485. The electrical connection is made by a standard SUB-D9 pole connector (female on controller's side). The pin assignment complies to the standard layout:

Pin#	Description
6	VP
3	RxD/TxD-P
8	RxD/TxD-N
5	DGND

Use proper cabling especially on high data rates. Make sure that cables are properly terminated 390R/150R/390R.

3.) Data rates

The bentrup PROFIBUS supports all speeds defined by EN50170 up to 12 MB.

4.) GSD File

Refer to the BENTS1M2.GSD file for all further details of the available communication settings and options. Current release 1.0 supports only a subset of all controller tags, but they include all commonly required data (actual temperatures, setpoints, control outputs etc.). The selection of the data for cyclic readout is done by the PROFIBUS setup software (e.g. Siemens NCM). The bentrup GSD file supports the configuration services.

5.) Value Syntax

Commonly the values are represented as signed 16-bit binary number. On some value types (like temperature values) the decimal point can be shifted to obtain a fixed point value (set tag “SP-DEC” resp. “IN-DEC”).

Channel output values (%) are always transferred as 1/100 (e.g. 42.78% is transferred as 4278).

The following values represent special error conditions:

Value	stands for
32767	over
-32768	underrun
-32767	invalid

6.) Demand Data

The bentrup TC-S1 / M2 PROFIBUS interface supports the industrial standard “Demand Data” feature. Contact bentrup for a current list of controller Tags.

7.) Indicator Panel

The 3 indicators on the panel at the back side of the controller show the current initialization status of the PROFIBUS interface:

RED BAUD_SEARCH state
PROFIBUS interface has been recognized successfully by the TC-S1/M2 and is now waiting for a telegram resp. valid baud rate. Indicator goes off after valid signal detected. Check cabling, polarization and contacts if the indicator stays on.

YELLOW WAIT_CFG state
Controller has received a valid parameter telegram and is now waiting for a configuration telegram. Check DP-Master programming if the indicator stays on after system start.

GREEN Data Exchange Mode
Controller has successfully received parameter and configuration telegram and there fore entered Data Exchange Mode. Controller is ready for Data Exchange.

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