

Application Note AN1002

Input / Output Options on TC500 Series Controllers

1.) Control Outputs

The bentrup TC500 series controllers provide various different control output options.

- switching control outputs (as 220V output, dry open contacts or logic output)
- steady control outputs (0-20mA or 4-20mA)

1.1.) Switching Control Outputs

These kinds of outputs are used to drive contactors, flaps, servo motors, i.e. whenever an ON/OFF only signal is required. The TC500 series controllers can be fitted with up to 4 outputs. They come as

- 220V (resp. mains supply) control output (max total load 0.5A)
- dry open contacts, ie. common of all 4 outputs is lead to the plug (max load 2A each)
- logic outputs (up to 3), 0/5V DC output for driving solid state relays (SSR). The signal is electrically isolated and has a short circuit protection/current limit of 50mA each. Check out our Application Note AN0302 for further advises about using SSR's

1.2.) Steady Control Outputs

These kinds of outputs are used to drive steady controllable devices like thyristors, position controllable motors/valves, data loggers. The TC500 series controllers provide up to 2 steady (analog) outputs 0-20mA or 4-20mA (set by user configuration).

2.) Ordering Codes

The number and kind of output signal is factory preset and can not be changed easily. Therefore please specify the required output signal types as described below.

The 2nd digit of the number following the thermocouple code determines the number of *switching control outputs*. All TC500 controllers come with 2 *switching control outputs* by default. If not specified different they come as 220V control outputs. Otherwise use "**DOC**" for dry open contacts and "**SSR**" for solid state output. Add "**2ANA**" to specify the 2 steady control outputs option.

Examples:

TC507 for S thermocouple, 1 zone, 4 control outputs: TC507-S-14- . .

TC507 for S thermocouple, 1 zone, 2 control outputs: TC507-S-12- . .

TC505 for K thermocouple, 2 zones, 4 control outputs dry open contacts: TC507-S-24 **DOC**- . .

TC505 for K thermocouple, 2 zones, 2 control outputs, 2 steady outputs : TC507-S-12-**2ANA**. .

See appendix for HAN15X pin assignment and explanation.

3.) Operating Mode of a Control Outputs

Note that the actual operation mode of an output (ie. whether it works as an ALARM, an EVENT, a motorized valve etc.) is user configurable by the configuration and therefore can be adjusted at anytime. To access all options please ask for the TC500 technical manual which describes the large configuration mode of the TC500 controllers (about 2000 parameters, we recommend to use the free PC configuration software bentrup WinConfig to setup).

4.) Signal Inputs of bentrup TC500 controllers

Most commonly thermocouples are used to acquire the temperature on TC500 series controllers. Since they comply to fixed signal standards only the type of thermocouple needs to be selected and no further settings are required. However, TC500 series controller can be configured to accept almost any kind of signal (voltage, current, resistance). Signal conversion into any kind of linear, logarithmic or trigonometric value is available as well. Check the TC500 technical manual for details if you intend to use one of these options.

5.) Serial Input/Output Options on TC500 controllers

As a state-of-the-art instrument an optional serial communication interface is available on TC500 controller series. Physically as EIA-RS-232 or EIA-RS-485 the protocol options are bentrup fieldbus (see Application Note AN0902 for details) or PROFIBUS (check out www.profibus.com for details). Remote operation via the www over TCP/IP are simple to setup.

For TC500 series controller the free of charge software bentrup WinControl Light can be used for at-site data recording and process visualization. To use this feature make sure that you order the TC500 series controller with the "bentrup RS232 interface" (+ €115). This option can be added at anytime.

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