



TC S1



## Multi-channel and more

TC S1 and TC M2

The high performance programme controllers TC S1 and TC M2 combine in a unique way complex control features with user friendly operation. The entire controller design - implemented in up to 10 control channels - is fully configurable to allow easy adaption for all applications. The integrated PLC (optional) provides almost unlimited enhancement.

The also configurable sequence of user guidance cuts down the operation only to the steps necessary for your industrial application. The easy operation hides the modern powerful 16-bit processor technology of the TC S1 and TC M2 which provides features which were formerly known only in PC based control systems.

From the technical view as with the TC M2, the compact TC S1 fitted with a 5 line Display (LED) reads all important values continuously and further information page by page. Perfect user guidance on the bright and high contrast 5.5" colour display is provided by the TC M2: It combines highest operation comfort with fast and unique entering of programmes.

**bentrup**

# High performance programme controllers TC S1 and TC M2

The basic configuration of the **TC S1** includes 3 (optional 11) freely configurable analog inputs (for thermocouples, resistance sensors, current / voltage signals), 2 digital inputs, 5 digital outputs (relay or logic output) and 4 analog outputs (optional). By using the bentrup expansion units the TC S1 can be expanded up to almost any number of inputs / outputs (refer to the technical data section).

Up to 99 programmes, up to 99 segments and up to 32 parameters per segment (setpoints, events etc.) cover all applications. The serial communication port (RS485) is included and allows for instance the configuration to be loaded and edited easily using the free bentrup WinConfig (WINDOWS 95 / 98 / NT). Simply download your configuration from the disk to the TC S1 by mouse-click! WinConfig also allows remote maintenance of the TC S1 via the internet.

The **TC M2** includes all the features of the TC S1 but is fitted with a bright and high contrast 5.5" graphic screen. The active matrix technology display (TFT) is especially designed for industrial environments. See at one glance the important values in different colors and easy to understand graphical charts (e.g. temperature charts with real time legend).

## Technical Data TC S1

### General Information

single/multichannel programme controller for panel mounting  
optional with integrated PLC  
displays: 7 segment LED, 6 digit green for programme parameters, 2 digit green for programme no., 3 digit for segment no. resp. value type, 3 lines 6 digits each for process values (shown page by page, total up to 27 values)  
keyboard: easy-to-understand membrane switches (11 keys) with tactile feel, industrial layout  
noise protection (EMC): >IEC801/1 to 4, level IV  
ambient temperature: 0°C to 60°C  
air humidity: 10% to 90%, non condensing  
dimensions, weight: 96 x 96mm front panel, cut-out 92 x 92 mm, depth 220mm, 1.2kg  
power supply: 140V to 264V (alternatively 70V to 140V), 50/60Hz  
electrical contacts type: PHOENIX plug, cable connection by screw terminals, 5.08mm and 3.81mm pattern

### Programmer

programmes: up to 99 (depending on max. no. of segments resp. parameters per segment) Example: max. 99 programmes on a typical 3 zone controller each programme holding up to 15 segments per programme  
programme design: up to 99 segments per programme as heatup, dwell or cooling. Optional programme chaining and cyclic programme repetition (settable number of cycles or infinite).  
parameters per segment: up to 32 (setpoints, events etc.)  
programme selection and control: via keyboard / digital inputs / serial communication / internal weekly clock  
programme course: configurable on definable criteria: time, temperature, digital inputs etc.  
programme memory: 16kB non-volatile memory (EEPROM), data retention >20 years, no battery required  
miscellaneous: real time clock with lithium buffered power off backup

### analog inputs

number, type: 3 (optional 11) totally configurable inputs for all commonly used thermocouples, resistance sensors, current / voltage signals, special application signals (zirconoxyde probe signals, square-root signals etc.)  
processing: Any ranges, units, offsets, scalings and filters can be assigned individually  
accuracy: better than 0.1% full scale, automatic zeropoint, resolution >15bit (45.000 digits)  
CJC reference for thermocouples -20°C to +70°C, selectable internal / external data acquisition rate 2 Hz for main inputs, >0.5Hz for inputs 4 to 11, internal 16 Hz

### digital inputs

number, type: 2 digital inputs 5V to 24V, to dry closing contacts or external logic signals, electrically isolated  
processing: programme selection resp. control, frequency signals, counting, PLC

### analog outputs (option)

number, type: 4 analog outputs to provide selectable signals (process values, control output values, status etc.) configurable voltage / current type, adjustable scaling, electrically isolated  
accuracy: 12 bit, 0.5% non-linearity, 0-5V/0-10V/0-20mA/4-20mA, load >2kOhm (V) resp. <500 Ohm (A).

### digital outputs

number, type: 5 digital outputs as dry contacts (max. 8A / 250V) or electrically isolated logic signal  
processing: PWM output (variable cyclus times, limits etc.), process status, servomotor output (with or w/o feedback), adjustable LIMIT, ALARM etc., 4 Hz update rate

### expanding the inputs / outputs

number, type: by using the bentrup input / output modules the TC S1 can be expanded to up to 48 analog inputs (4 x AI812), 32 digital inputs (4 x DIO808), 16 analog outputs (2 x AO808) and 64 digital outputs (8 x SW808)  
electrical link: the separate SYSBUS communication bus links all modules together via standard SUBD 9 pole cords.

### serial communication

type: RS485 / RS422 serial communication (simple passive signal converter for standard RS232C available), electrically isolated, settable ID data rate: 19200 or 115200 baud  
protocol: bentrup fieldbus protocol, similar to MODBUS, protocol definition is public  
drivers: windows DDE driver for the most easy programming of own applications available, WIZCON 7, other drivers on request  
application programmes: bentrup WinControl 4.0 or higher, see separate product information (process visualization- and recording, filing / editing of programmes, filing / editing of the configuration)

We reserve the right to change any specification without prior notice.

## Technical Data TC M2

single / multichannel programme controller for industrial panel mounting or stand-alone  
display: 5.5" TFT graphic screen, 1/4 VGA (320 x 240 dots), colour, adjustable background light, industrial temperature range, wide viewing angle (90°C horizontal and 60°C vertical !), display of all process parameters as text and graphical chart, visualization of status displays (e.g. servomotor)  
keyboard: easy to understand, large membrane keyboard (32 keys), with tactile feel, industrial layout, additional direct value input via digit keys (0 to 9)  
dimensions, weight: 240 x 200 mm, 120mm depth, mounting frame on request, weight ca. 3.5kg

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INDUSTRIAL CONTROLS

Zum Buchwald 4-6 Phone +49 64 04 91 44-0  
D-35463 Fernwald Fax +49 64 04 91 44-11  
email: info@bentrup.de www.bentrup.com