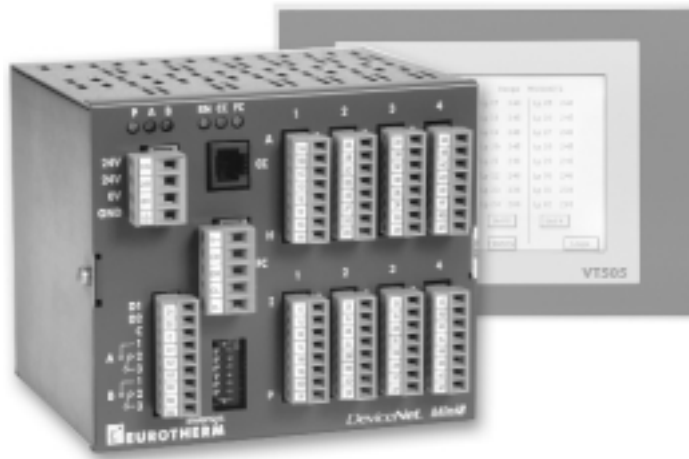


Mini8TM

MODEL

- 8 control loops
- 32 analogue inputs
- Modular & compact
- SP programming
- Maths and logic
- Remote HMI
- Modbus RTU
- DeviceNet

- 5.7" Touchscreen LCD
- 128 User pages
- 34 Variables per page
- 128 recipes
- Modbus RTU master
- Import of Bitmap images



Multi-loop control and Data acquisition Specification Sheet

The **Mini8** offers high performance control usually only found in Eurotherm's panel mount PID controllers. It is also a very competitive and compact data acquisition device. Mini8's modular design enables its I/O and feature set to be selected to cater for a wide range of applications from simple to complex.

Mini8 is an ideal partner to a programmable logic controller. Able to multi-drop on either Modbus RTU or DeviceNet the Mini8 offers a real cost effective alternative to performing analogue measurement or loop control in a PLC. Implementing these functions in the Mini8 reduces the hardware cost of the PLC, relieving it of the burden of performing analogue functions, often allowing a lower specification processor to be used.

The feature set of the Mini8 is comparable with Eurotherm's 3000 series panel controllers including its high performance PID control and SP programming functions together with a range of features such as Maths, Logic and Timing blocks.

When used in a data acquisition installation the Mini8's high density analogue I/O can be combined with Eurotherm's 5000 series data management products to provide unsurpassed local and network access to your process.

VT505 Operator Panel

VT505 provides an ideal operator interface for monitoring and changing process parameters in any slave controller. Compatible with any Modbus RTU product such as the Mini8 it can also be used as a operation window into other communicating devices.

Although compact the VT505 is constructed in a rugged pressed aluminium case with a sealed matrix touch display. Its IP65 panel rating makes it ideal for harsh industrial environments.

Dynamic text, help messages and easy to use function keys provide the operator with rapid access to any data that he wishes to view or adjust. Functions can be programmed via the matrix touch screen for direct access to displays, alarms, recipe download or simply to toggle or alter a variable.

The VT505 can be ordered pre-configured to suit Mini8 applications, enabling plug and play operation, without the need for any user configuration. Alternatively, users can create their own customised view of their process using the VTWIN programming software.

Setpoint Programming

The Mini8 programmer function block enables loop setpoints to follow a pre-determined series of Ramp and Dwell segments. Mini8 can generate one profiled setpoint that can be internally soft wired to any parameter within the device. A maximum of 200 segments can be stored in up to 50 programs. Each program can trigger up to 8 digital event outputs on a per segment basis.

Heater Failure Detection

The Mini8 with a CT3 input card fitted, has the capability of detecting failures in heater loads connected to its time proportioned outputs. By measuring the current flowing through the heaters via 3 current transformer inputs the Mini8 can detect Partial Load failure, Over Current, as well as SSR short or open circuit. Individual load current parameters indicate the measurement for each heater. The current monitor block utilises a cyclic algorithm to measure the current flowing through one heater per measurement interval.

Toolkit Blocks

A range of toolkit functions, including Maths, Logic and Timing blocks can be used to create custom solutions and small machine controllers.

Configuration Tools

Configuration of the Mini8 is achieved by using the iTools Graphical Wiring Editor.



Technical specification

The I/O electrical specifications are quoted as factory calibrated worst-case; for life, over full ambient temperature range and supply voltage. Any "typical" figures quoted are the expected values at 25°C ambient and 24Vdc supply.

The nominal update of all inputs and function blocks is 110ms. However, in complex applications the Mini8 will automatically extend this time in multiples of 110ms.

Environmental Specification

Power Supply Voltage:	17.8Vdc min to 28.8Vdc max.
Supply Ripple:	2Vp-p max.
Power Consumption:	15W max.
Operating Temperature:	0 to 55°C
Storage Temperature:	-10°C to +70°C
Operating Humidity:	5% to 95% RH non-condensing
EMC:	EN61326 for Industrial Environments
Safety:	Meets EN61010, installation category II, pollution degree 2. Max. applied voltage any terminal: 42Vpk.

The Mini8 must be mounted in a protective enclosure. No terminal may be operated in excess of 42V AC/DC

Network Communications Support

Modbus RTU:	RS485, 2 x RJ45, user select switch for 3-wire or 5-wire. Baud rates: 4800, 9600, 19200
DeviceNet:	CAN, 5-pin standard "open connector" with screw terminals. Baud rates: 125k, 250k, 500k

Note: these are mutually exclusive options; refer to the Mini8 order code document.

Configuration Communications Support

Modbus RTU:	3-wire RS232, through RJ11 configuration port. Baud rates: 4800, 9600, 19200
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Note: All versions of Mini8 support one configuration port.

The configuration port can be used simultaneously with the network link.

Fixed I/O Resources

The PSU card supports 2 independent and isolated relay contacts

Relay Output Types:	On/Off (C/O contacts, "On" closing the N/O pair)
Contact Current:	<1A (resistive loads)
Terminal Voltage:	<42V
Contact Material:	Gold
Snubbers:	Snubber networks are NOT fitted.
Contact Isolation:	42Vac/dc max.

The PSU card supports 2 independent and isolated logic inputs

Input Types:	Logic (24Vdc)
Input Logic 0 (off):	< 5Vdc.
Input Logic 1 (on):	> 10.8Vdc.
Input Operating Range:	-30Vdc to +30Vdc.
Input Current:	2.5mA (approx.) at 10.5V; 10mA max @ 30V supply.
Detectable Pulse Width:	110ms min.
Isolation to system:	42Vac/dc max.

TC8 8-Channel TC Input Card

The TC8 supports 8 independently programmable and electrically isolated channels, catering for all standard and custom thermocouple types.

Channel Types:	TC
mV Input Range:	-77mV to +77mV.
Resolution:	20 bit ($\Sigma\Delta$ converter), 1.6 μ V with 1.6s filter time
Temperature Coefficient:	< ± 50 ppm (0.005%) of reading/ $^{\circ}$ C
Cold Junction Range:	-10 $^{\circ}$ C to +70 $^{\circ}$ C
CJ Rejection:	> 30:1
CJ Accuracy:	$\pm 1^{\circ}$ C
Linearisation Types:	C, J, K, L, R, B, N, T, S, LINEAR mV, custom.
Accuracy:	$\pm 1^{\circ}$ C $\pm 0.1\%$ of reading (internal CJC)
Channel PV Filter:	0.0 seconds (off) to 999.9 seconds, 1st order low-pass.
Sensor Break:	AC detector: Off, Low or High resistance trip levels.
Input Resistance :	>100 M Ω
Input Leakage Current:	<100nA (1nA typical).
Common mode rejection:	>120dB, 47 - 63Hz
Series mode rejection:	>60dB, 47 - 63Hz
Isolation channel-channel:	42Vac/dc max
Isolation to system:	42Vac/dc max

DO8 8-Channel Digital Output Card

The DO8 supports 8 independently programmable channels, the output switches requiring external power supply. Each channel is current and temperature protected, holdback limiting occurring at about 100mA. The supply line is protected to limit total card current to 200mA. The 8 channels are isolated from the system (but not from each other). To maintain isolation it is essential to use an independent and isolated PSU.

Channel Types:	On/Off, Time Proportioned
Channel Supply (Vcs):	15Vdc to 30Vdc
Logic 1 Voltage Output:	> (Vcs - 3V) (not in power limiting)
Logic 0 Voltage Output:	< 1.2Vdc no-load, 0.9V typical
Logic 1 Current Output:	100mA max. (not in power limiting)
Min. Pulse Time:	20ms
Channel Power Limiting:	Current limiting capable of driving short-circuit load
Terminal Supply Protection:	Card supply is protected by 200mA self-healing fuse
Isolation (channel-channel):	N/A (Channels share common connections)
Isolation to system:	42Vac/dc max.

CT3 3-Channel Current-Transformer Input Card

The CT3 supports 3 independent channels designed for heater current monitoring. A scan block allows periodic test of nominated outputs to detect load (failure) changes.

Channel Types:	A (current)
Factory set accuracy:	better than $\pm 2\%$ of range
Current Input Range :	0mA to 50mA rms
Transformer Ratio:	10/0.05 to 1000/0.05
Input Load Burden:	1W
Isolation:	None

AO8 8 Channel 4-20mA Output Card

The AO8 supports 8 independently programmable and electrically isolated mA output channels for 4-20mA current-loop applications.

Channel Types:	mA Output
Output Range :	0-20mA, 360 Ω
Setting Accuracy:	$\pm 0.1\%$ of reading
Resolution:	1 part in 10000 (1 μ A typical)
Isolation channel-channel:	42Vac/dc max
Isolation to system:	42Vac/dc max

PID Control Loop Blocks

Number of Loops:	0 or 8 Loops (order options)
Control modes:	On/Off, single PID, Dual channel OP
Control Outputs	Analogue 4-20mA, Time proportioned logic, ON OFF
Cooling algorithms:	Linear, water, fan, or oil
Tuning:	3 sets PID, One-shot auto-tune.
Auto manual control:	Bumpless transfer or forced manual output available
Setpoint rate limit:	Ramp in units per sec, per min or per hour.
Output rate limit:	Ramp in % change per second
Other features:	Feedforward, Input track, Sensor break OP, Loop break alarm, remote SP, 2 internal loop setpoints

Process Alarms

Number of alarms:	32 analogue, 32 digital, 32 Sensor break,
Alarm types:	Absolute high, absolute low, deviation high, deviation low, deviation band, sensor break
Alarm modes:	Latching or non-latching, blocking, time delay.

Setpoint Programmer

The Setpoint Programmer is a software orderable option

Number of programs:	50
Number of segments:	200
Number of event outputs:	8
Digital inputs:	Run, Hold, Reset, Program Advance, Skip Segment, Sync
Power failure action:	Ramp, Reset, Continue
Servo start:	PV, SP

Recipes

Recipes are a software orderable option

Number of recipes:	8
Tags:	24 tags in total

Load Failure Detection

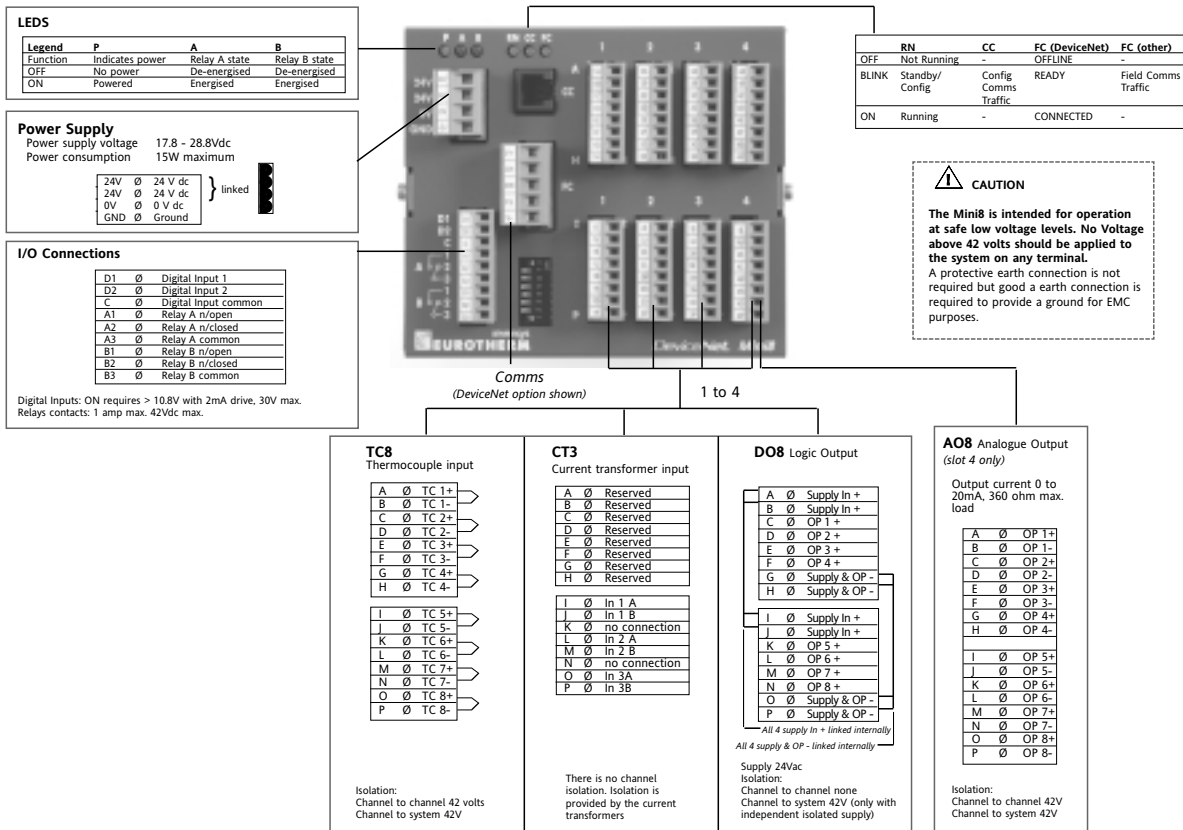
Requires CT3 module

Number of loads:	16 Time Proportioned Outputs Maximum 6 loads per CT input
Alarms:	1 in 8 Partial load failure, Over current, SSR short circuit, SSR open circuit
Commissioning:	Automatic or manual
Interval time:	1 sec - 60 sec

Toolkit Blocks

User Wires	Orderable options of 30, 60 120 or 250
User values:	32 real values
2 Input Maths:	24 blocks Add, subtract, multiply, divide, absolute difference, maximum, minimum, hot swap, sample and hold, power, square root, Log, Ln, exponential, switch
2 Input Logic:	24 blocks AND, OR, XOR, latch, equal, not equal, greater than, less than, greater than or equal to, less than or equal to
8 Input Logic:	2 blocks AND, OR, XOR
8 Input Multiplexor:	4 blocks 8 sets of 8 values selected by input parameter
BCD Input:	2 blocks 2 decades

Input monitor:	2 blocks Max, min, time above threshold
16 Point Linearisation:	2 blocks 16-point linearisation fit
Polynomial Fit:	2 blocks Characterisation by Poly Fit table
Switchover:	1 block Smooth transition between two values
Timer blocks:	4 blocks OnPulse, OnDelay, OneShot, MinOn Time
Counter blocks:	2 blocks Up or down, Directional flag
Totaliser blocks:	2 blocks Alarm at Threshold value
Real time clock:	1 block Day & time, 2 time based alarms
Transducer scaling:	2 blocks Comparison calibration



Mini8 Ordering code

1	2	3	4	5	6	7	8	
Mini8								
9	10	11	12	13	14	15	16	17

1 Model	4 PSU	11 Application	14 Installation Manual
MINI8 Mini8 controller	VL 24Vdc	STD No configuration EC8 ⁽¹⁾ 8 Loop plastics controller *	ENG English GER German FRA French SPA Spanish ITA Italian
2 Control Loops	5 Communications	* Code EC8 requires 250 wires and Slot 1 = TC8, Slot 2 = CT3 or XXX, Slot 3 = DO8, Slot 4 = DO8	15 Configuration Software
ACQ IO Acquisition only 8LP 8 Control loops	MODBUS Modbus RTU ISOLMBUS Isolated Modbus RTU DEVICENET DeviceNet	12 Wires	NONE No CD ITTOOLS ITools CD & Mini8 documentation
3 Programs	6 Temperature Units	30 30 User Wires 60 60 User Wires 120 120 User Wires 250 250 User Wires	16 Warranty
0PRG No programs 1PRG 50 programs	C Centigrade F Fahrenheit	13 Recipes	XXXXX Standard WL005 5 Year
	7 8 9 10 IO Slots 1-4	None No recipes RCP 8 Recipes	17 Calibration Certificates
	XXX No module fitted TC8 8 Channel TC input AO8 ⁽¹⁾ 8 Channel 4-20mA OP DO8 8 Channel logic OP CT3 ⁽²⁾ 3 Channel CT input		XXXXX None CERT1 Certificate of Conformity CERT2 ⁽²⁾ Factory input calibration per input

(1) AO8 in slot 4 only
(2) Only 1 CT3 per Mini8

(1) EC8 is a pre-configured version of Mini8 offering 8 control loops with Heat/Cool logic outputs

(2) CERT2 is 5 point calibration

Accessories

Bulkhead mounting plate 2.49Ω 0.1% Burden Resistor Modbus Load Terminator Network 3.0m RS485 cable Network 0.5m RS485 cable	SubMin8/Mechanics/Mtgplate SubMin8/Shunt/249R.1 SubMin8/Resistor/Mbus/RJ45 SubMin8/Cable/RJ45/3.0 SubMin8/Cable/RJ45/0.5
Mini8 Config tools & Manuals Mini8 Config cable VT505 Config cable VT505 RS232 cable VT505 RS485 cable	SubMin8/CD/std SubMin8/Cable/Config SubVT/Cable/Config SubVT/Cable/232/3.0 SubVT/Cable/485/3.0
Mini8 Installation Booklet Mini8 Engineering manual VT505 Operating booklet	SubMin8/Manual/Inst SubMin8/Manual/Eng SubMin8/Manual/Panel/EC8
1.3A, 30W Power supply 2.5A, 60W Power supply 5A, 120W Power supply 10A, 240W Power supply	2500P/1A3/ENG 2500P/2A5/ENG 2500P/5A0/ENG 1500P/10A/ENG