

**LEDS**

Legend	P	A	B
Function	Indicates power	Relay A state	Relay B state
OFF	No power	De-energised	De-energised
ON	Powered	Energised	Energised

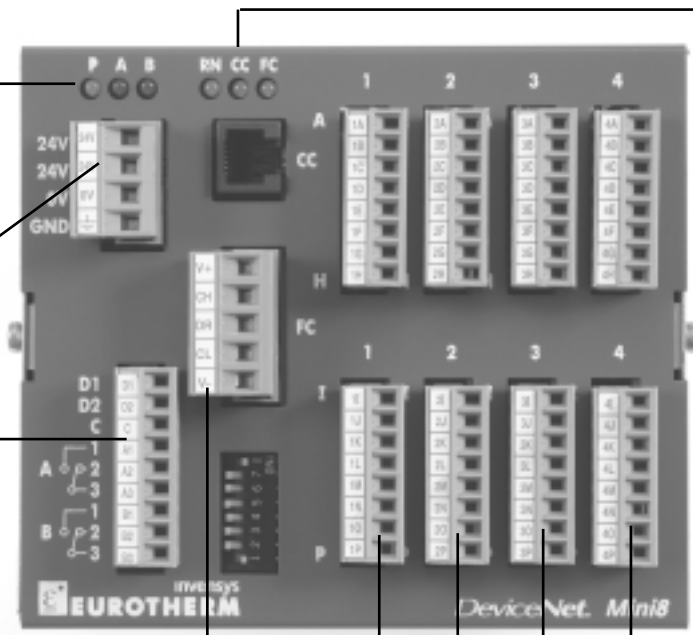
**Power Supply**  
Power supply voltage 17.8 - 28.8Vdc  
Power consumption 15W maximum

24V	Ø	24 V dc	} linked	Screw terminals can accept wire sizes 0.2-2.5mm (24-12awg)
24V	Ø	24 V dc		
0V	Ø	0 V dc		
GND	Ø	Ground		

**I/O Connections**

D1	Ø	Digital Input 1
D2	Ø	Digital Input 2
C	Ø	Digital Input common
A1	Ø	Relay A n/open
A2	Ø	Relay A n/closed
A3	Ø	Relay A common
B1	Ø	Relay B n/open
B2	Ø	Relay B n/closed
B3	Ø	Relay B common

Digital Inputs: ON requires > 10.8V with 2mA drive, 30V max.  
Relays contacts: 1 amp max. 42Vdc max.



	RN	CC	FC (DeviceNet)	FC (other)
OFF	Not Running	-	OFFLINE	-
BLINK	Standby/Config	Config Comms Traffic	READY	Field Comms Traffic
ON	Running	-	CONNECTED	-



**CAUTION**

The Mini8 is intended for operation at safe low voltage levels. No Voltage above 42 volts should be applied to the system on any terminal.

A protective earth connection is not required but good earth connection is required to provide a ground for EMC purposes.

Do not replace the battery. Return to factory if replacement battery is required.

Comms - see over (DeviceNet option shown) 1 to 4

TC8	CT3	DO8
Thermocouple input	Current transformer input	Logic Output
A Ø TC 1+	A Ø Reserved	A Ø Supply In +
B Ø TC 1-	B Ø Reserved	B Ø Supply In +
C Ø TC 2+	C Ø Reserved	C Ø OP 1 +
D Ø TC 2-	D Ø Reserved	D Ø OP 2 +
E Ø TC 3+	E Ø Reserved	E Ø OP 3 +
F Ø TC 3-	F Ø Reserved	F Ø OP 4 +
G Ø TC 4+	G Ø Reserved	G Ø Supply & OP -
H Ø TC 4-	H Ø Reserved	H Ø Supply & OP -
I Ø TC 5+	I Ø In 1 A	I Ø Supply In +
J Ø TC 5-	J Ø In 1 B	J Ø Supply In +
K Ø TC 6+	K Ø no connection	K Ø OP 5 +
L Ø TC 6-	L Ø In 2 A	L Ø OP 6 +
M Ø TC 7+	M Ø In 2 B	M Ø OP 7 +
N Ø TC 7-	N Ø no connection	N Ø OP 8 +
O Ø TC 8+	O Ø In 3A	O Ø Supply & OP -
P Ø TC 8-	P Ø In 3B	P Ø Supply & OP -

Isolation:  
Channel to channel 42 volts  
Channel to system 42V

There is no channel isolation. Isolation is provided by the current transformers

Supply 24Vdc  
Isolation:  
Channel to channel none  
Channel to system 42V (only with independent isolated supply)

All 4 supply In + linked internally  
All 4 supply & OP - linked internally

This controller is intended for industrial temperature and process control applications when it will meet the requirements of the European Directives on Safety and EMC. Use in other applications, or failure to observe the installation instructions of this handbook may impair safety or EMC. The installer must ensure the safety and EMC of any particular installation.

**Safety**  
This controller complies with the European Low Voltage Directive 73/23/EEC, by the application of the safety standard EN 61010.

**Electromagnetic compatibility**  
This controller conforms with the essential protection requirements of the EMC Directive 89/336/EEC, by the application of EMC standard EN61326. This instrument satisfies the general requirements of the industrial environment defined in EN 61326.

**GENERAL**  
The information contained in this manual is subject to change without notice. While every effort has been made to ensure the accuracy of the information, your supplier shall not be held liable for errors contained herein.

**Unpacking and storage**  
The packaging should contain an instrument Installation guide and may contain a CD.  
If on receipt, the packaging or the instrument are damaged, do not install the product but contact your supplier. If the instrument is to be stored before use, protect from humidity and dust in an ambient temperature range of -30°C to +75°C.

**Service and repair**  
This controller has no user serviceable parts. Contact your supplier for repair.

**Electrostatic discharge precautions**  
When the controller is removed from its packaging, some of the electronic components are vulnerable to damage by electrostatic discharge through the connectors from someone handling the controller. To avoid this, before handling the controller discharge yourself to ground.

**Cleaning**  
Do not use water or water based products to clean labels or they will become illegible. Isopropyl alcohol may be used to clean labels. A mild soap solution may be used to clean other exterior surfaces of the product.

**INSTALLATION SAFETY REQUIREMENTS**  
**Safety Symbols**  
Various symbols are used on the instrument, they have the following meaning:

**Personnel**  
Installation must only be carried out by suitably qualified personnel.

**Enclosure of live parts**  
To prevent hands or metal tools touching parts that may be electrically live, the controller must be installed in an enclosure.

**Wiring**  
It is important to connect the controller in accordance with the wiring data given in this guide. Take particular care not to connect AC supplies to the low voltage sensor input or other low level inputs and outputs. Only use copper conductors for connections (except thermocouple inputs) and ensure that the wiring of installations comply with all local wiring regulations. For example in the UK use the latest version of the IEE wiring regulations, (BS7671). In the USA use NEC Class 1 wiring methods.

**Power Isolation**  
The installation must include a power isolating switch or circuit breaker. The device should be mounted in close proximity to the controller, within easy reach of the operator and marked as the disconnecting device for the instrument.

**Overcurrent protection**  
The power supply to the system should be fused appropriately to protect the cabling to the units.

**Conductive pollution**  
Electrically conductive pollution must be excluded from the cabinet in

which the controller is mounted. For example, carbon dust is a form of electrically conductive pollution. To secure a suitable atmosphere, install an air filter to the air intake of the cabinet. Where condensation is likely, for example at low temperatures, include a thermostatically controlled heater in the cabinet.

This product has been designed to conform to BSEN61010 installation category II, pollution degree 2. These are defined as follows:-  
**Installation Category II**  
The rated impulse voltage for equipment on nominal 230V supply is 2500V.

**Pollution Degree 2**  
Normally only non conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected.

**Over-Temperature Protection**  
When designing any control system it is essential to consider what will happen if any part of the system should fail. In temperature control applications the primary danger is that the heating will remain constantly on. Apart from spoiling the product, this could damage any process machinery being controlled, or even cause a fire.

Reasons why the heating might remain constantly on include:

- the temperature sensor becoming detached from the process
- thermocouple wiring becoming short circuit;
- the controller failing with its heating output constantly on
- an external valve or contactor sticking in the heating condition
- the controller setpoint set too high.

Where damage or injury is possible, we recommend fitting a separate over-temperature protection unit, with an independent temperature sensor, which will isolate the heating circuit.  
Please note that the alarm relays within the controller will not give protection under all failure conditions.

**INSTALLATION REQUIREMENTS FOR EMC**  
To ensure compliance with the European EMC directive certain installation precautions are necessary as follows:

- For general guidance refer to EMC Installation Guide, HA025464.
- When using relay outputs it may be necessary to fit a filter suitable for suppressing the conducted emissions. The filter requirements will depend on the type of load. For typical applications we recommend Schaffner FN321 or FN612.
- If the unit is used in table top equipment which is plugged into a standard power socket, then it is likely that compliance to the commercial and light industrial emissions standard is required. In this case to meet the conducted emissions requirement, a suitable mains filter should be installed. We recommend Schaffner types FN321 and FN612.

**Routing of wires**  
To minimise the pick-up of electrical noise, the low voltage DC connections and the sensor input wiring should be routed away from high-current power cables. Where it is impractical to do this, use shielded cables with the shield grounded at both ends. In general keep cable lengths to a minimum.

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## Mini8 CONTROLLER

### INSTALLATION AND WIRING INSTRUCTIONS

#### WHAT IS THE Mini8?

The Mini8 is a compact DIN rail mounting 8 loop PID controller and data acquisition unit. It offers a choice of I/O and a choice of field communications.

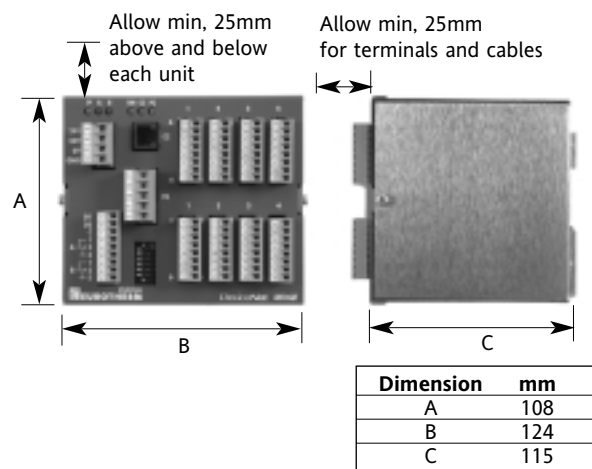


The Mini8 mounts on 35mm Top Hat DIN Rail.

The Mini8 is pre-assembled in the factory to give the I/O required for the application as specified in the order code. With standard applications the Mini8 is also supplied configured. Alternatively the Mini8 may be configured using Eurotherm's iTools configuration suite running on a personal computer.

### Mounting information

The Mini8 is intended to be mounted on symmetrical DIN rail to EN50022-35 x 7.5 or 35 x 15, mounted horizontally.



Mounting:  
The Mini8 is intended for mounting within a cabinet and for indoor use only.

1. Mount the DIN rail horizontally, using suitable fastenings. The unit is NOT designed to be mounted in other orientations.
2. Hook the upper edge of the DIN rail clip on the instrument on the top of the DIN rail and push.

To remove use a screwdriver to lever down the lower DIN rail clip and lift forward when the clip has released.

Environmental Requirements	Minimum	Maximum
Temperature	0°C	55°C
Humidity (non condensing)	5% RH	95% Rh
Altitude		2000m

### Communications

All Mini8 controllers have a configuration port a field communication port on the communications module in slot 2.

#### LEDS

Legend	RN	CC	FC
LED	Green	Green	Green
Function	Indicates run mode	Indicates config activity	Indicates Field comms activity
OFF	Not running	--	Offline
Blinking	Standby	Config traffic	Ready
ON	Running	--	Running

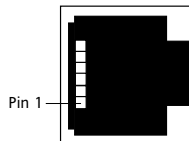
The Mini8 is controlling normally ONLY if the RN LED is permanently ON.

### The Configuration Port

An RS232 configuration port is just under the LEDs on an RJ11 socket. The Mini8 is configured from a PC using Eurotherm's iTools Configuration Tools running on a personal computer.

Note: The Mini8 is not controlling whilst it is being configured.

9 pin DF to PC COM port	RJ11 Pin	Function
-	6	(N/C)
3 (TX)	5	RX
2 (RX)	4	TX
5 (0V)	3	0V (GND)
	2	(N/C)
	1	Reserved



The cable is available from Eurotherm Part Code: SubMini8/cable/config

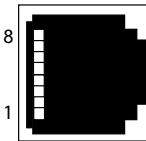
Note: The Mini8 can also be configured over the Modbus network, if that is the field communications fitted.

### MODBUS

Protocol is Modbus RTU, RS422, RS485 3 wire or 5 wire. The Modbus network connection is two RJ45 sockets connected in parallel. This allows Cat 5 patch cables to be used, the first socket into the device and the second one to daisy chain on to the next slave, or for a line terminator.

#### Modbus RJ45 connections

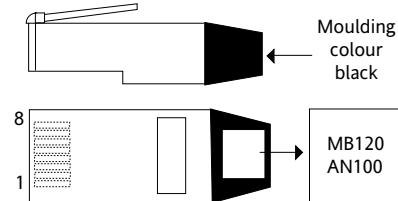
RJ 45 Pin	3 wire	5 wire
8		RXA
7		RXB
6		GND
5		
4		
3	GND	GND
2	D-	TXA
1	D+	TXB



#### Modbus - RJ45 Communications line terminator

The communication line must daisy chain from device to device and be correctly terminated at the end of the line. A Modbus terminator containing the correct termination resistors is available from Eurotherm, order code SubMini8/TERM/MODBUS/RJ45. The Modbus terminator is BLACK.

Baud rate: The Baud rate is set in configuration, via iTools.

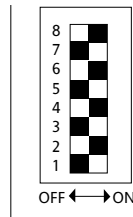


The default is 19200.

#### Modbus Address Switch

This switch is situated at the bottom of the Comms module. Each Mini8 must have a unique address on the Modbus network. The switch gives addresses from 1 to 31. If Address 0 is set the Mini8 will then take the address and parity settings entered in the configuration of the instrument. This allows for addresses above 31.

Sw	OFF	ON
8	3 wire	5 wire
7	No Parity	Parity
6	Even	Odd
5	-	Address 16
4	-	Address 8
3	-	Address 4
2	-	Address 2
1	-	Address 1



### DeviceNet

Protocol is DeviceNet CAN interface.

CAN uses the CAN open connector screw terminal, 5 way with 5.08mm pitch. The mating DeviceNet connector (female Open Connector) is supplied to facilitate screw-in user wiring.

Legend	Function
V+	V+
CH	CAN HIGH
DR	DRAIN
CL	CAN LOW
V-	V-



#### DeviceNet Terminators

The DeviceNet specification states that the bus terminators (121 ohm) should not be included as any part of a master or slave. They are not supplied but should be included in the cabling where required.

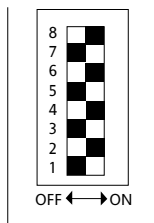
#### Power

The DeviceNet bus is powered from the the system. The Mini8 load is approximately 100mA.

#### The DeviceNet Address Switch

This switch is situated at the bottom of the Comms Slot. Each Mini8 must have a unique address on the DeviceNet network and all units must be set to the same Baud rate. The switch gives addresses from 0 to 63.

Sw	OFF	ON
8	Baud rate	Baud rate
7	Baud rate	Baud rate
6	-	Address 32
5	-	Address 16
4	-	Address 8
3	-	Address 4
2	-	Address 2
1	-	Address 1



#### Baud rate

Switch	125k	250k	500k
8	Off	Off	On
7	Off	On	Off

If address 0 is set the Mini8 will take the address and Baud rate entered in the Configuration of the instrument.