

Communications Interface Leds

Do NOT replace the battery. Return the unit to the factory if replacement is required. stective Earth connection is required. ALWAYS ensure that the protective Earth is fit-

The Mini8 Controller is intended for operation at sate low voltage levels, except the Rela





INSTALLATION SAFETY REQUIREMENTS

Various symbols used on the instrument are described below:

Caution (refer to the accompanying documents) Caution (refer to the



Installation Category And Pollution Degree

This unit has been designed to conform to BS EN61010 installation category II

- and pollution degree 2. These are defined as follows:

 Installation category II. The rated impulse voltage for equipment on nominal 230V ac mains is 2500V.
- Pollution degree 2. Normally, only non-conductive pollution occurs However, occasionally a temporary conductivity caused by condensation shall be expected.

Personnel

Installation MUST be carried out only by qualified personnel

Enclosure Of Live Parts

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

It is important to connect the unit in accordance with the data on this sheet, ensuring the protective Earth connection is ALWAYS fitted first and disconnected last. Wiring MUST comply with local wiring regulations, e.g. in the UK, the latest IEE wiring regulations (BS7671), or for the USA, NEC Class 1 wiring methods. Use only copper conductors for connections. Terminal tightening torque 0.4Nm max.

Caution

Do not connect AC supply to low voltage sensor input or low level inputs and outputs

Power Isolation

The installation must include a power isolating switch or circuit breaker. This should be in close proximity to the unit (< 1 metre), in easy reach of the operator and marked as the disconnecting device for the unit.

Overcurrent Protection

It is recommended that the power supply to the system be fused appropriately to protect the cabling to the unit. **Conductive Pollution**

Electrically conductive pollution, e.g. carbon dust, MUST be excluded from the enclosure in which the unit is installed. To secure a suitable atmosphere in

conditions of conductive pollution, an air filter should be fitted to the air intake of the enclosure. Where condensation is likely, a thermostatically controlled heater should be included in the enclosure. Over-temperature Protection

When designing a control system it is essential to consider the consequences should any part of the system fail. In temperature control applications the primary danger is the heating will remain constantly on. This could spoil the product, but more seriously, it might damage the process machinery being controlled, or even cause a fire.

Reasons for the heating remaining on continuously include:

- The temperature sensor is detached from the process
- The thermocouple wiring has short circuited
 The unit has failed with the heating output constantly on
- The external valve or contactor is sticking in the heating condition
- Unit setpoint is set too high

Where damage or injury can occur, it is recommended that a separate over-temperature protection unit, and an independent temperature sensor, to isolate the heating circuit, be fitted.

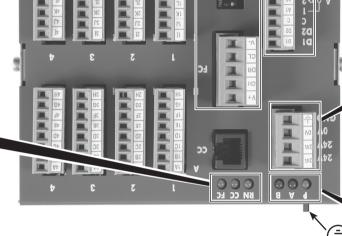
Note Alarm relays within the unit do not indicate all failure conditions.

Installation Requirements For EMC

To comply with European EMC directive certain installation precautions are

For general guidance, refer to EMC Installation Guide, part no. HA025464. With relay outputs, it may be necessary to fit suitable filters to suppress conducted emissions. Filter requirements depend on the type of load. Typical applications may use Schaffner FN321 or FN612.

For table-top installation, if a standard power socket is to be used, compliance with commercial and light industrial emissions standard is usually required. To comply with conducted emissions standard, a suitable mains filter must be installed, such as Schaffner FN321 or FN612.



COMMUNICATIONS

Relay Contacts: Relay A Common ٤А V8.01@ Relay A n/closed SARelay A n/open Amč.S : Sarve current: 2.5mA aniiabnu = V8.01 + ot V2 +nO = V8.82 + ot V8.01 +Digital Input Common Studal latigid DS Digital Input 1 Id $\mathbb{HO} = VZ + OIV8.8S$ Note: Digital Inputs: puəбə

Standard I/O Connections

Power comsumption: 15W max ower supply voitage: 17.8Vdc min to 28.8Vdc max POWER SUPPLY SPECIFICATION Ground Λ0 24V dc 747 Linked Alddno puəbəŋ

This terminal can accept wire sizes 0.2 - 2.5mm (24 - 12 awg).

Power Supply Off - De-Energised On - Energised Indicates Relay B state Red В Off - De-Energised On - Energised adicates Relay A state Кед On - Power On Off - Power Off Indicates Power status Green noitsA Function Colour puə6ə-

FED²

Eurotherm

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Routing Of Wires

To minimise interference from electrical noise, low voltage DC connections and sensor input wiring must be routed away from high-current power cables. If this is not practical, use shielded cables, shield grounded at both ends, and keep cable lengths to a minimum.

GENERAL

This unit is intended for Industrial Temperature and Process Control applications, within the requirements of the European Directives on Safety and EMC

Warning The Safety and EMC protection provided can be seriously impaired, if the instru ment is not used in the manner specified. The installer MUST ensure the Safety and

Unpacking And Storage

The packaging contains the unit, this sheet, and a CD. If on receipt, the packaging or unit are damaged, do NOT install, but contact the supplier. If being stored pefore use, protect from humidity and dust in an ambient temperature range of

Caution: Electrostatic discharge

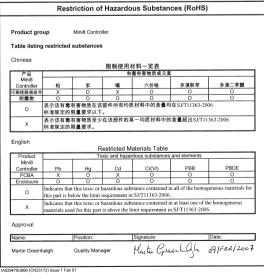
Always observe all electrostatic precautions, before handling the unit.

Service And Repair

The unit has no servicable parts. Contact the supplier for repair.

Isopropyl Alcohol may be used to clean the labels. (Labels will become illegible if water or water based products are used.) A mild soap solution can be used to clean other exterior surfaces.

RoHS statement



MANUFACTURING ADDRESS

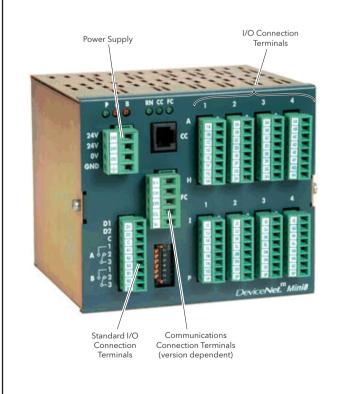
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What is the Mini8 Controller?

The Mini8 Controller is a compact multi-loop PID controller and data acquisition unit, offering a choice of I/O and field communications and designed for mounting on a 35mm 'Top Hat' DIN Rail.

Pre-assembled in the factory, the controller is fitted with all the I/O required for the application, as specified at time of order. With standard applications the Mini8 Controller can be supplied as a configured instrument or it can be configured using iTools configuration software running on a personal computer.

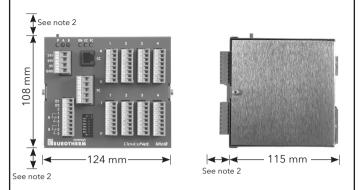
HA028497/6 (CN26281)

INSTALLING THE MINI8 CONTROLLER

MOUNTING THE UNIT

This unit is intended to be mounted horizontally on a symmetrical DIN rail, 35 x 7.5 or 35 x 15, to the requirements of EN50022.

- 1. The controller is for interior use only, and must be mounted in a suitable enclosure.
- 2. A gap of at least 25mm should be left above and below the unit, for ventilation, and in front of it, for cable clearance.



DIN RAIL MOUNTING

1. Mount the DIN rail horizontally, using suitable bolts.

Note The unit is NOT designed to be mounted in any other orientation.

- 2. Ensure that the DIN rail makes good electrical contact with the metal base of the panel.
- Guide the unit to the DIN rail, allowing the upper teeth of the DIN rail Mounting Bracket to rest behind the DIN rail itself.
- 4. Slowly and firmly, push the top of the unit back until the DIN rail Locking Mechanism springs back into place. This is confirmed by an audible 'Click'.

The unit is now mounted to the DIN rail.

Note To remove the unit, a screwdriver should be used carefully to lever down the DIN rail locking mechanism and the unit lifted forward when released from the DIN rail.

Environmental Requirements	Minimum	Maximum
Temperature	0°C	55°C
Humidity (Relative - RH)	5% RH	95% RH
Altitude		2000m

COMMUNICATIONS INTERFACE

Various operational functions are indicated through the LED's across the top of the unit.

All controllers have a configuration port and a field communication port on the communications module.

Note If the Run mode (RN) red LED is permanently ON, the unit is operating

CONFIGURATION PORT

The EIA232 configuration port (RJ-11 socket) is located to the right of the Power connector. The Mini8 Controller is configured using iTools configuration software running on a PC.

Note The unit will NOT control during configuration.

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

Appropriate cable is available from the supplier, order code SubMin8/ cable/config.

The unit can also be configured to communicate via Modbus™ and Modbus/TCP using the field network, dependent on the hardware fitted

Intentionally left blank

COMMUNICATIONS - MODBUS

Protocol is Modbus RTU, EIA422, EIA485 3-wire or 5-wire.

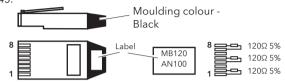
The Modbus network connection is two RJ45 sockets connected in parallel. This allows category 5 patch cables to be used, the first socket into the unit and the second one out to daisy-chain on to the next slave, or for a line terminator.

The connectors includes 2 LEDs, a Yellow LED showing communication activity and a Green LED showing transmitted data.

RJ45 Pin	Colour	3-wire	5-wire	
3 7 5 5 1 1 3	Brown Brown/White Green Blue/White Blue Green/White Orange/White	N/A N/A N/A N/A N/A Gnd A	RXA RXB Gnd N/A N/A Gnd TXA TXB	Pin 8 → Pin 1 →
ŀ	Plug shroud to Ca	ible scree	n	

RJ45 COMMUNICATION TERMINATORS

The communication line must daisy-chained from unit to unit with the unit at each end of the chain correctly terminated. A black Modbus terminator containing the correct termination resistors is available from the supplier, order code SubMin8/TERM/MODBUS/ RJ45

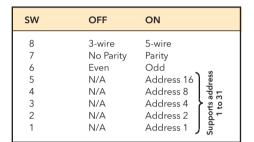


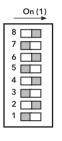
The Baud rate is default to 19200, but can be set during configuration using the iTools configuration software.

THE ADDRESS SWITCH

This switch is situated below the the Comms connector. Each unit must have a unique address on the Modbus network.

Note If address 0 is set the unit will take the address and Parity settings from the configuration of the instrument.





COMMUNICATIONS - DEVICENET®/CANOPEN

This instrument supports DeviceNet CAN interface, CANopen V4.02 CANopen interface and Enhanced DeviceNet Protocol

CANopen and DeviceNet use a 5-way screw terminal connector with 5.08mm pitch. The mating connector is supplied to aid user

Enhanced DeviceNet uses an M12, five-pin 'Micro-Connect' connector.

Screened DeviceNet used for field wiring.

specified cable should be

TERMINATORS

DeviceNet®/Enhanced DeviceNet®

The DeviceNet® specification states that the bus terminators (121 Ω) must not be included as any part of a master or slave.

The CANopen Cabling and Connector Pin Assignment specification shows the minimum

termination resistance is 118Ω with these auidelines

Bus Length (m) Termination Resistance (Ω) 0 to 40 40 to 100 150 to 300

Pin Legend Function

CAN HIGH

CAN LOW

Function

CAN LOW

CAN HIGH

V+

DRAIN

DRAIN

V+

CH

DR

CL

CAN_L

CAN_H

V-

V+

DR

Pin Legend

Note Terminators are not supplied, but must be used where required.

POWER

The CAN bus is powered by the network at approximately 100mA.

ADDRESS CONFIGURATION

Each unit must have a unique network address, configured as shown below. The comms. module automatically restarts after the address

Note iTools can be used to configure the address when the switches are set to

	OII.			
SW	OFF	DeviceNet®	CANopen	On (1)
8	Baud rate	Baud rate	Baud rate	8
7	Baud rate	Baud rate	Baud rate	7 🔲
6	-	Address 32) 🚜	Reserved	6 🗔
5	-	Address 8	Address 16	5
4	-	Address 8	Address 8	
3	-	Address 4	Address 4 👌 ধ 🗜	
2	-	Address 4 Address 2 Address 2	Address 1	
1	-	Address 1	Address 1) 3	

The Enhanced DeviceNet® version uses 2 BCD rotary switches.

SW		Enhanced DeviceNet®				
0 to 9	MSD	First digit of address	l			
0 to 9	LSD	Second digit of address	ı			
For example, an address of 13 would be configured by						
setting	setting the MSD to 1 and LSD to 3.					



Note Any address between 64 and 99 is ignored. The address must be

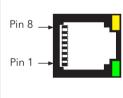
configured using iTools.

COMMUNICATIONS - MODBUS/TCP

Protocol is Modbus/TCP, 10 Base T on an Ethernet network.

The connector includes 2 LEDs, a Yellow LED showing communication activity and a Green LED showing transmitted data.

RJ45 Pin	Colour	Signal			
8	Brown	N/A			
7	Brown/White	N/A			
6	Green	Rx-			
5	Blue/White	N/A			
4	Blue	N/A			
3	Green/White	Rx+			
2	Orange	Tx-			
1	Orange/White	Tx+			
Plug shroud to Cable screen					



On (1)

7

6

5

4

3 2

1

ATA

THE ADDRESS SWITCH

This switch is situated at the bottom of the Comms slot. Switches 1 to 7 are used to configure the instrument unit ident parameter. Switch 8 is used for DHCP (Dynamic Address) enabling.

SW	OFF	ON
8	DHCP disabled	DHCP enabled
7	N/A	Address 64
6	N/A	Address 32
5	N/A	Address 16
4	N/A	Address 8
3	N/A	Address 4
2	N/A	Address 2
1	N/A	Address 1

Note Use iTools to configure the address when the switches are set 0 and the unit identifier parameter is set to 'Instr'.

ALLOCATION OF IP ADDRESS

<u>DHCP</u> is where the instrument (IP host) will ask a DHCP server to provide it with an IP Address. Typically this happens at start-up, but can be repeated during operation. DHCP includes the concept of assigned values that will 'expire'.

A DHCP server is required that can respond to the request. The DHCP server will need to be configured to correctly respond to the request. This configuration depends on the local company network policy.

BAUD RATE

Swit

All units must be set to the same Baud rate and must be restarted after the Baud rate is edited. This is configured using the DIP switch (as left) on the DeviceNet® and CANopen versions.

For the Enhanced DeviceNet version a BCD rotary switch is used, as below. Only the indicated positions should be used.

Note The Baud rate can be configured using iTools when in the O/R position.

500 Pro	1M (CANopen)	500k	250k	125k	witch
250 — 🧲	On	On	Off	Off	8
125 O/R	On	Off	On	Off	7

Note The Prog position must be selected when the instrument is started to enable firmware upgrades.

COMMUNICATIONS - PROFIBUS™

Protocol is Profibus DP. There are two Profibus communications board options are available.

3-wire RS485 connection via a 9 Pin D-type connector. Intended for installations using standard Profibus cables.

Note Profibus cabling must make provision for line terminators.

■ 3-wire RS485 connection via 2 RJ45 sockets.

RJ45 Pin	9 PIN D-Type	Signal	Function
-	1	Shield	Shield (Gnd)
-	2	N/A	N/A
1	3	RxD/TxD-P	Receive/Transmit Data 'P'
-	4	N/A	N/A
3	5	DGnd	Data Ground
6	6	VP	Voltage Plus
7	7	N/A	N/A
2	8	RxD/TxD-P	Receive/Transmit Data 'N'
8	9	N/A	N/A

RJ45 COMMUNICATION TERMINATORS

The communication line must daisy-chained from unit to unit with the device at each end of the chain correctly terminated. For RJ45 units a (grey) Profibus terminator containing the correct termination resistors is available from the supplier, order code SubMin8/TERM/ PROFIBUS/RJ45.



For D-type termination, 390 Ohm resistors should be wired across pins 3 and 6 and pins 4 and 8 and a 220 Ohm resistor between pins 5 and 8.

BAUD RATE

Note The Baud rate is set by the Profibus master via the network.

Set at a switch located below the Comms connector. Each unit must have a unique address on the Profibus network.

Switch 8 is not used, and Address 0 is invalid. If all switch elements are set 'Off', the Profibus address will be as set in

iTools. Otherwise, the address set at the switch overrides any address set in iTools

sw	OFF	ON	
8	N/A	N/A	
7	N/A	Address 64 .	
6	N/A	Address 32	ess
5	N/A	Address 16	
4	N/A	Address 8	s add
3	N/A	Address 4	Supports 1 to
2	N/A	Address 2	dd
1	N/A	Address 1	ی ر

