Instruction manual
MTL intrinsic safety solutions

September 2016
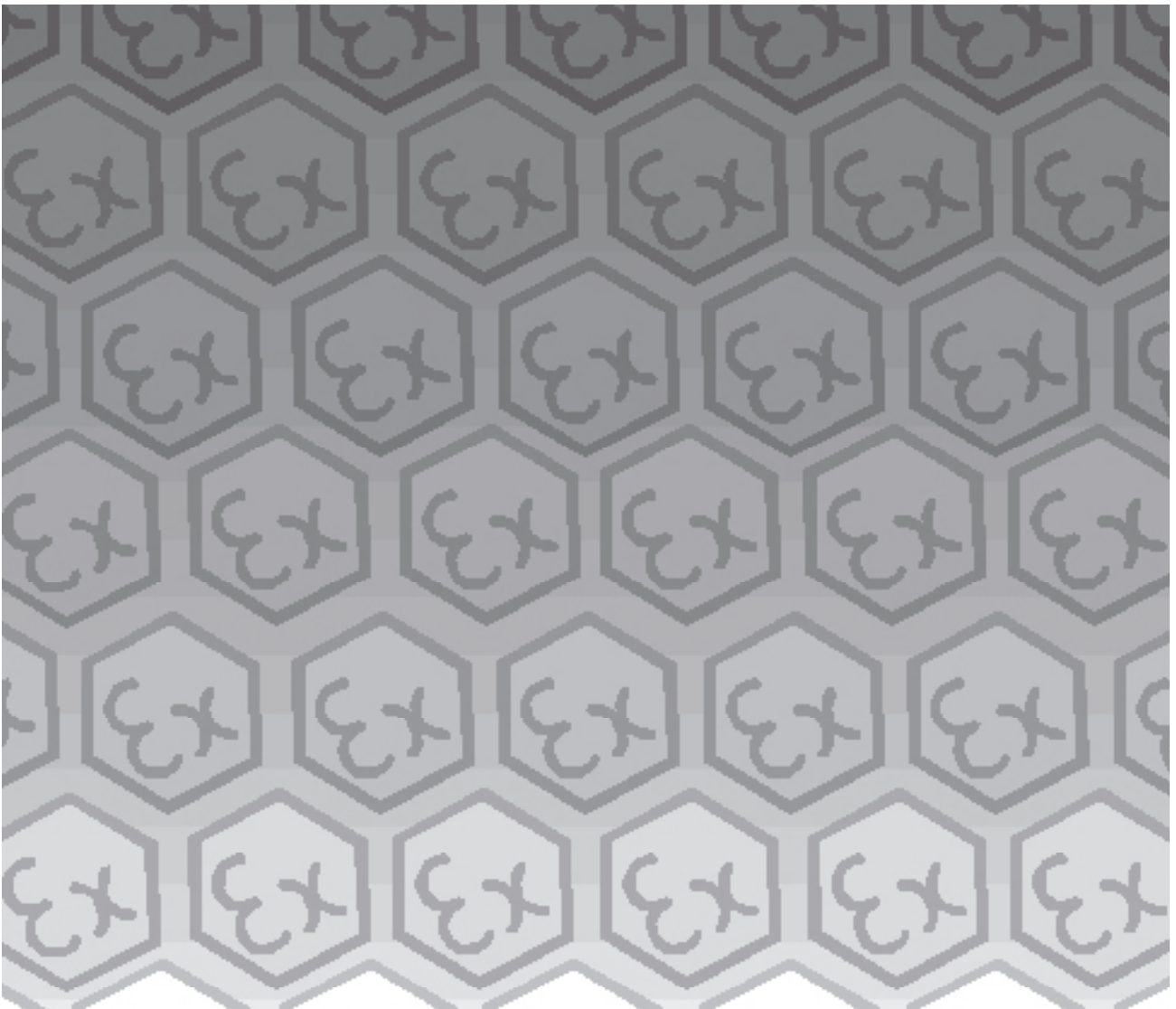INM 9469 rev 4

CROUSE-HINDS
SERIES

MTL9469-ETplus

108Mbps Wireless Bridge/Access Point

F·T·N

Powering Business Worldwide

DECLARATION OF CONFORMITY

A printed version of the Declaration of Conformity has been provided separately within the original shipment of goods. However, you can find a copy of the latest version at http://www.mtl-inst.com/certificates

CONTENTS

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9469-ETplus IS Wireless Access Point/Bridge

1 FEATURES

♦ Intrinsically Safe ATEX / IECEx certified / FM / FMC approved

♦ Ga Ex ia IIC T4 GD (surface), Ma Ex ia I M1 (mining)

♦ Zone 1 / Division 1 mounting in a suitable enclosure

♦ Input voltage: 12V dc (10 – 12.8V)

♦ Input current: 270mA

♦ Extended temperature range (–20°C…+60°C)

♦ PoEx™ - "Power over Ethernet" powered device option - accepts module supply via the Cat5e cable*

♦ 10/100Mb Ethernet twisted pair (Cat5e) RJ45 Connection (100m max)

♦ IEEE 802.11 a/b/g/h & Super AG standards, up to 108 Mbps data rate

♦ Security: WEP, WPA-PSK, WPA2-PSK and IEEE 802.1X (RADIUS)

♦ Access Point, Bridge and Wireless Repeater (WDS) Modes of Operation

♦ Easy web based configuration

♦ Status LED's For:
> 'Power On'
> WLAN ' Activity'
> Status/Mode
> Copper UTP 'Activity'
> Copper UTP '10/100Mb Link'

♦ DIN-rail mounting module

*Note – PoEx is a simple adaptation of the IEEE 802.3af Power over Ethernet (PoE) standard to bring the benefits to the 9400 Range of Hazardous Area devices. This allows two spare pairs in the existing Cat5e cable to distribute the power supply from a 9466 Ethernet Switch (Power Sourcing Equipment – PSE) to each of the devices connected to its five ports (PD – Powered Device). This adaptation is necessary due to restrictions for Hazardous Area use. It is not implied that the device conforms to the 802.3af (PoE) standard.

2   DESCRIPTION

The 9469-ETplus 108Mbps Wireless Bridge / Access Point is a dual functionality module. When used in the Access Point (AP) mode, it allows wireless devices to connect through it onto the wired Ethernet network, either in Ad-hoc or Infrastructure modes. When used as a Bridge, it makes it possible to turn any 10/100 Ethernet device into a wireless device, or to connect two network segments together to make a single network (without the interconnecting wire or fibre optic). Additionally the module may also be used in its Wireless Repeater (WDS) mode to extend the range covered by a wireless network.

The Tri-Band operation offers flexibility in situations where the 2.4GHz band may be overcrowded or where operation in the 5GHz and 5.4GHz bands is desired. The unit supports 802.11d (multi-country roaming) to allow its use globally while complying with regulatory limits.

3   INSTALLATION

WARNING

WARNING: This equipment must be installed, operated and maintained only be trained competent personnel and in accordance with all appropriate international, national and local standard codes of practice and site regulation for intrinsically safe apparatus and in accordance with the instructions contained here. *See also Sections 14, 15 & 16 for approvals and important conditions of safe use.*

3.1   Protection

The module requires mounting within an enclosure providing a degree of protection of at least IP6x, in accordance with EN60529 and in a manner that does not impair the existing creepage and clearance distances. The enclosure must also comply with the requirements of Clauses 7 and 8 of EN 60079-0:2006 and be sealed to prevent the ingress of dust.

3.2   Mechanical mounting

3.2.1   DIN rail mounting
The module will 'snap-fit' onto standard DIN rail (TS35) to EN 50022. Height off rail - including connectors but excluding cables = 119mm.

Tilt the module to engage the top DIN rail clips then rotate down and press to the DIN rail until the lower spring clip is properly engaged.

3.2.2   Flat panel mounting
The module has two fixing holes to enable it to be mounted with two M3.5 screws. Use the template below to establish hole positions. Depth - including connectors but excluding cables = 124mm.
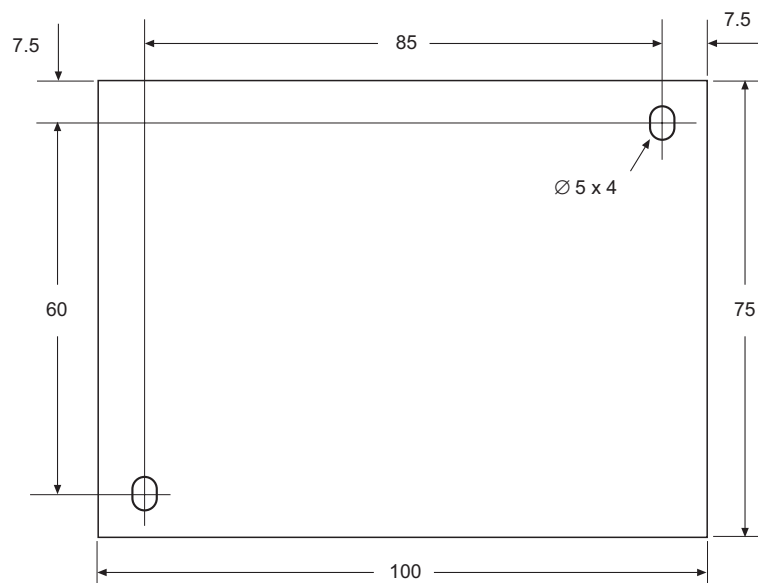
3.3 Electrical connections

DC power can be supplied to the equipment through the front panel screw terminals or alternatively using the Power over Ethernet (PoEx) option where DC power is supplied from a 9466-ET module down the Ethernet Cat5e (or Cat6) cable into the RJ45 connector on the front panel.

WARNING: Whichever wiring method of powering the modules is used, the supply to them must be derived from a suitably certified, intrinsically safe supply.

3.3.1 Front Panel Screw Terminals
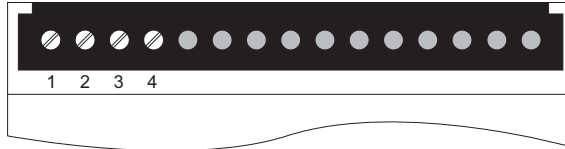
Terminal No.	Function	
1	+12V dc in	When using PoEx – no supply is required on these terminals.
2	+12V dc in	
3	0V	
4	0V	
5–15	No connection	

Note: 1. Terminals 1 & 2 and 3 & 4 are linked internally

3.3.2 Front Panel RJ45 Connectors
10/100 BASE-T Ethernet with TX/RX Crossed MDI-X

Pin No.	Function	
1	RX +	
2	RX –	When using PoEx – no supply is required on screw terminals 1 to 4 - see above.
3	TX +	
4	Supply 12V - PoEx	
5	Supply 12V - PoEx	
6	TX –	
7	Supply 0V - PoEx	
8	Supply 0V - PoEx	

♦ When connecting the Cat5e cable to another device a straight connected RJ45 cable is used, a crossover cable is not required as the RJ45 connector performs the crossover.

♦ It is recommended that Cat5e cables for Hazardous Area Zone 1 use are 'Blue' in colour and are of good quality (see Accessories section), the Safe Area cables being a colour other than blue to aid identification.

3.3.3 WiFi - SMA – Antenna Connections

Main Port   Antenna 1

Aux Port   Antenna 2

Allows the connection of up to two antennae for diversity

The Antenna may be 2.4GHz, 4.9/6GHz or Tri-Band types as required

The antenna should be connected to the SMA socket labelled Main Port. It can be connected directly or through low-loss 50 ohm co-axial cable, which might be required if the module is housed in a metal enclosure, or the position of the antenna needs to be optimised.

The Aux Port may be used for a second antennae if diversity is required.

4   GETTING STARTED

4.1. Select Working mode

The 9469-ETplus creates a link between your Ethernet and a WiFi Network

It can be configured to operate in one of two different modes: Access Point or Bridge, but the default mode is Access Point

4.1.1. Access Point

In Access Point mode, the 9469-ETplus becomes a communications hub to enable various items of WiFi equipment (set in "infrastructure" mode) to connect into a wired Ethernet network.

4.1.2. Bridge

In this mode, the 9469-ETplus gives wired Ethernet output equipment access to a WiFi network. (Use "infrastructure" mode to connect to an existing access point, otherwise use "adhoc" mode.)

4.2. Collect Network Parameters

In order to configure the 9469-ETplus, you will need to have the following pieces of information.

♦ **WiFi Network identifier "SSID"**

The SSID is a character string used to identify your WiFi network. To share the same WiFi network, your device and the other WiFi equipment must use the same SSID. The SSID is up to 32 characters in length. Uppercase and lowercase letters are considered different.

♦ **Radio Channel**

You must choose a radio channel in addition to the SSID to define the transmission frequency the device will use to communicate with other equipment. It is recommended to use less than 3 channels in the same covered area in order to avoid disturbances. It is also recommended to leave at least two unused channels between each radio channel. In Ad-hoc mode, all the equipment must have the same radio channel. Legislation is different in each country; check what channels you can use in the country where the device is installed.

♦ **Device IP Address**

If you don't use DHCP, you must define an IP address for the device. To assign an IP address, contact the network administrator.

♦ **LAN Subnet Mask**

You must configure a subnet mask for the device. Refer to the subnet mast of your local network. Consult the network administrator if in doubt.

♦ **Gateway Address** (if required)

♦ **WEP or WPA Security keys**

5   LOCATING ON THE NETWORK

In order to locate the device on the network, use the *locator* program supplied. This is a simple standalone application that does not require installation, just copy the file to your hard drive

Connect the device to the network and run the *locator.exe* program.

The *locator* program offers the following functions

♦ **Scan**

When you click this button locator looks for the device on the network.

♦ **Configure**

When you click this, you can configure the IP Address or enable DHCP.

♦ **Upgrade**

This button is not implemented within the 9469-ETplus.

♦ **Web**

Clicking this launches the Administrator web page of the device is brought up.

Note. If the device is behind a gateway the locator program will not find it. Use a computer on the same local network as the device for initial setup.

If a firewall is installed on the computer ensure that UDP port 17784 is not blocked

6   WEB CONFIGURATION

To configure the device, run the administration web page. There are two ways to do this

♦   Run your web browser and, if known, enter the IP address in the address field. (Note: the default IP address is 192.168.1.253)

♦   Locate the device using the *locator* program mentioned in Section 5, then click on the Web button.

Once on the Web pages a screen appears as below. Initially there is no password.
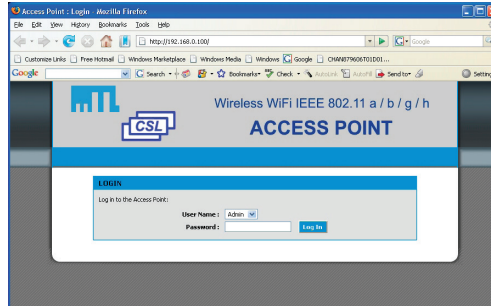
7   SWITCHING BETWEEN ACCESS POINT AND BRIDGE

To change the operating mode, enter the menu BASIC->WIRELESS and choose the firmware you want to use. Then click on Save Settings and Reboot the Device. The device will then restart and use the selected firmware.

8   DEVICE CONFIGURATION

The administration pages consist of the following five categories

♦   **Basic**

Configure IP addresses, 802.11 mode, radio channel, SSID, security.

♦   **Advanced**

Configure MAC address filtering

♦   **Tools**

Set User password, admin password, view firmware version, upgrade firmware

♦   **Status**

Device info, IP addresses, Radio Channel, Connected devices.

♦   **Help**

Comprehensive help on all the parameters

9   UPGRADE

In order to upgrade the device follow the steps below

♦   Open the administration web page

♦   Click on tools -> Firmware

In the firmware upgrade section browse to select the new firmware file

♦   Click on Upload

♦   If the upgrade is successful the device will restart

10   MAINTENANCE & TROUBLESHOOTING

The module is provided with LED indicators to assist in recognising possible fault conditions.

Refer to the following table for assistance in interpreting LED activity.

	OFF	FLASH	ON
PWR (green)	Power fail	N/A	Power OK
WLAN (yellow)	Idle	Wireless LAN data activity	N/A
STAT (red)	AP mode = Normal status	–	Fault
	Bridge mode = connection to AP is established	Bridge mode = attempting to connect to AP	
ACT (yellow)	Ethernet link disconnected	Ethernet link activity	Ethernet link connected
100 (green)	Ethernet link set to 10Mbps	N/A	Ethernet link is 100Mbps

11   ENVIRONMENTAL

Operating Temperature   –20°C…+60°C

Storage Temperature   –20°C…+60°C

Humidity   5…95% RH, non condensing

12   WASTE REMOVAL INFORMATION

The electronic equipment within must not be treated as general waste. By ensuring that this product is disposed of correctly you will be helping to prevent potentially negative consequences for the environment and human health, which could otherwise be caused by incorrect waste handling of this product.

For more detailed information about the take-back and recycling contact Eaton's MTL product line.

13   TECHNICAL

Ethernet LAN
RJ45 10/100 Base TX Interface

WiFi
IEEE 802.11a/b/g/h 2.4 / 5 / 5.4 GHz standards, multi-country Roaming support (IEEE 802.11d). Dynamic Frequency Selection (DFS) support provides flexible selection of best frequency to allow mobility among all existing IEEE 802.11a/b/g/h networks; "ClearVoice" band provides non-overlapping channels for fast-speed data transmission; Transmission Power Control (TPC) offers flexibility to adjust RF output power.

Data Rate
Up to 108Mbps (Super AG mode)

Channels
13 channels (b/g modes), 8 channels (a mode), 11 channels (h mode)

Output Power
Transmitter +20dBm (TPC)

Sensitivity
Receiver –92dBm for IEEE 802.11a/g and –95dBm for IEEE 802.11b

Modulation

OFDM: BPSK, QPSK, 16QAM, 64QAM DSSS: DBPSK, DQPSK, CCK

Security

64/128 bits WEP, WPA-PSK, WPA2-PSK, IEEE 802.11x (RADIUS) authentication, MAC address filtering, SSID broadcast control.

Modes

Access Point (AP) for WiFi Network Infrastructure, Bridge mode to connect any 10/100 wired Ethernet equipment to a wireless network, Repeater (WDS) mode to extend wireless coverage, Infrastructure & AD-HOC modes are supported.

Administration

Built-in Web interface. Setup of the device using a web browser.

14 ACCESSORIES

For interconnecting the 9460-ET range of products, we offer approved RJ45 Cat5e UTP cables in various standard lengths (0.5…100m).

The ANTSMA94 omnidirectional antenna is ideal for use where good general coverage is required.

Ordering details

Copper Twisted Pair UTP Patch Cable (Blue) pre-terminated RJ45-RJ45 connectors
Part No. CSL9405-xx   (-xx is used to signify the length of the cable.)

Part No. ANTSMA94   Omnidirectional antenna

15 APPROVALS

The operating parameters must not exceed those as detailed on the certificate.

- 2014/30/EU   EMC Directive

- 2014/35/EU   Low Voltage Directive

Region	Europe (ATEX)	International IECEx	USA	Canada
Authority	SIRA	SIRA	FM	FMC
Standard	EN 60079-0: 2006, EN 60079-11: 2007, IEC 60079-26: 2006, EN 50303: 2000, IEC 61241-0: 2004, IEC 61241-11: 2005	IEC 60079-0: 2004, IEC 60079-11: 2006, IEC 61241-0: 2004, IEC 61241-1: 2005	3600: 1998 3610: 2007 3810: 2005	C22.2 No. 61010.1: 2004 C22.2 No. 157: 1992 CAN/CSA-E60079-0: 2007 CAN/CSA-E60079-11: 2002
Approved for	Ⓔ I M1 Ⓔ II 1GD Ma Ex ia I Ga Ex ia IIC T4 Ex iaD 20 T135°C (Ta = –40°C to +60°C)*	Ma Ex ia I Ga Ex ia IIC T4 Ex iaD 20 T135°C (Ta = –40°C to +60°C)§	IS/I/1/ABCD/T4 Ta=60°C I/0/AEx ia IIC T4 Ta=60°C	IS/I/1/ABCD/T4 Ta=60°C I/0/Ex ia IIC T4 Ta=60°C
Cert. no.	Sira 07ATEX2064X	IECEx SIR 07.0042X	3034995	3034995C

* (see specification for operating temperature range)

16 FM CERTIFICATION INFORMATION

Special Condition of Use - Factory Mutual (USA & Canada)

♦ The Model 9469-ETplus shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.

♦ The Model 9469-ETplus shall be excluded from use in environments containing chemical vapours of the Ketone or Ester families.

17 ATEX & IECEX CERTIFICATION INFORMATION

The following information is in accordance with the Essential Health and Safety Requirements (Annex II) of the EU Directive 2014/34/EU [the ATEX Directive - safety of apparatus] and is provided for those locations where the ATEX Directive is applicable.

General

a) This equipment must only be installed, operated and maintained by competent personnel. Such personnel shall have undergone training, which included instruction on the various types of protection and installation practices, the relevant rules and regulations, and on the general principles of area classification. Appropriate refresher training shall be given on a regular basis. [See clause 4.2 of EN 60079-17].

b) This equipment has been designed to provide protection against all the relevant additional hazards referred to in Annex II of the directive, such as those in clause 1.2.7.

c) This equipment has been designed to meet the requirements of intrinsically safe electrical apparatus in accordance with EN 60079-0, EN 60079-11 and EN 60079-26.

Installation

a) reference to the IEC code of practice IEC 60079-14. In addition, particular industries or end users may have specific requirements relating to the safety of their installations and these requirements should also be met. For the majority of installations the Directive 1999/92/EC [the ATEX Directive - safety of installations] is also applicable.

b) Unless already protected by design, this equipment must be protected by a suitable enclosure against:
    i) mechanical and thermal stresses in excess of those noted in the certification documentation and the product specification.
    ii) aggressive substances, excessive dust, moisture and other contaminants.

c) This equipment is intrinsically safe electrical apparatus and is normally mounted in a hazardous area. When mounted in a Zone1 location the apparatus must be provided with an enclosure, which offers an additional degree of protection appropriate to the area classification.

Read also the Special Conditions for Safe Use for any additional or more specific information.

Special Conditions for Safe Use

1. When used with Group I gases, the Modules shall each be mounted within an enclosure providing a degree of protection of at least IP54, in accordance with EN 60529, and in a manner that does not impair the existing creepage and clearance distances. The enclosure shall also comply with the requirements of Clauses 7 and 8 of EN 60079-0:2006.

2. The connectors do not meet the ingress protection rating of IP20, therefore, this shall be taken into consideration during the installation of the 9400 Series Ethernet Modules when used with Group II gases, and each module shall be provided with an enclosure that is commensurate with the environment into which it is installed.

3. The supply to the modules must be derived from a suitably certified, intrinsically safe supply.

Inspection and maintenance

a) Inspection and maintenance should be carried out in accordance with European, national and local regulations which may refer to the IEC standard IEC 60079-17. In addition specific industries or end users may have specific requirements which should also be met.

b) Access to the internal circuitry must not be made during operation.

Repair

This product cannot be repaired by the user and must be replaced with an equivalent certified product.

Marking

Each device is marked in accordance with the Directive and CE marked with the Notified Body Identification Number.

This information applies to products manufactured during or after the year 2012.
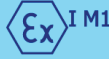
9400 Series Ethernet CSL

9469-ETplus 108Mbps WLAN AP/Bridge

RF Power: 100mW max 2.4/5GHz. Contains FCC ID: TK4-05-WLM54AG

c FM us
APPROVED

Intrinsically Safe CL I, DIV 1, GP A-D; CL I ZN 0
AEx ia IIC (US), Ex ia IIC (Canada);
Install per Control Drawing: 9400 System
Temperature Class T4, -40°C ≤ Ta ≤ +60°C

Sira 07ATEX2064X

IECEx SIR 07.0042X

⟨Ex⟩ II 1 G D   ⟨Ex⟩ I M1

Ma Ex ia I

Serial No. [   ]

Ga Ex ia IIC T4 (Ta=-40ºC to +60ºC)
Ex iaD 20 T135ºC

Made in Derbyshire, England
CONTROLLED SYSTEMS LIMITED
In partnership with MEASUREMENT TECHNOLOGY LTD.
WARNING - Electrostatic precaution - Clean only with a damp cloth.

CE 0518

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the PDF of the Control Drawing

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