



## **EDN/IR** TRANSMITTER & SENSOR

# **INSTRUCTION MANUAL**

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## INTRODUCTION

The EDN/IR series of transmitters use the very reliable NDIR (Non dispersive Infrared) sensor technology to monitor the presence of carbon dioxide, methane or propane (depending on model).

This technique is based upon the fact that gas has a well defined light absorption curve in the infrared spectrum that can be used to identify and detect specific gases.

The Infrared sensor is SIL2 approved and has a wide operating temperature and humidity range.

The EDN/IR is equipped with electronics and firmware that provide linearised and temperature compensated analogue output in the industry standard 4-20mA output format. Additionally voltage free relay contacts are provided for alarm and fault outputs.

### **SPECIFICATION**

#### **APPROVED BY SIL:**

SIL Cert No: C-15-192972-01 (sensor only)

#### **OPERATING TEMPERATURE RANGE:**

-40 to +60°C (Sensor) -0 to +60°C (Transmitter)

#### **OPERATING HUMIDITY RANGE:**

0 - 95% Rh Non-condensing

GAS TYPES: Carbon dioxide, Methane & Propane

EDN/IR 1	Propane:	0-100% LEL
EDN/IR 2	Methane:	0-100% LEL
EDN/IR 3	Carbon dioxide:	0-5000ppm 0-1% Vol 0-2% Vol 0-3% Vol
EDN/IR 4	R134A:	0-2000ppm

#### ACCURACY (AT 25°C):

+/- 1% of FS range for readings below 25% of range

+/- 2% of FS range for readings below 50% of range

+/- 5% of FS range for readings above 50% of range

RESPONSE TIME T90: < 60seconds

#### POWER INPUT VOLTAGE: 15 - 30VDC POWER INPUT CURRENT: 120mA

#### WARM UP TIME (AT 25°C):

60 seconds for full operation > 15 minutes for full specification

#### **RELAY CONTACTS**

Normally energised (fail safe) 30V Max (AC or DC) 1A Max (Non inductive)

#### **CURRENT LOOP OUTPUT**

4 - 20 mA <2.0mA fault 500ohm max load

#### INTERNAL LIGHT INDICATORS



## **INSTALLATION**

The EDN/IR is designed for safe area use only. ATEX certified models are available for Hazardous Area installation. Please contact Electronic Devices for further information tel: (01684) 891500 email: sales@electronic-devices.co.uk

#### CABLE

The core diameter will depend upon the cable length, as an example:

3 core 0.75mm<sup>2</sup> up to 500m. Screened cable should be used for electrically noisy environments.

## SITTING

The gas sensor should be installed close to likely sources of leaks, attention should be given to likely gas flow, temperature of the leaking gas (lighter than air gas may sink before rising). Sensors should be sited below possible leak sources for heavier than air gases and above for lighter than air gases.

Propane Methane Carbon Dioxide heavier than air lighter than air heavier than air

## **CONNECTIONS DIAGRAM**



## **SPECIFICATION**

#### The following information applies to units fitted with the additional motherboard enabling 24VAC input.

INPUT VOLTAGE: 24VAC +/- 25% INPUT CURRENT: 130mA

RELAY 1: Normally energised Alarm 1 & Fault 1A @ 30V Max Non Inductive

RELAY 2:

Normally energised Alarm 2 & Fault 1A @ 30V Max Non Inductive

RELAY 3: Alarm 2 1A @ 30V Max Non Inductive

For full specifications, including calibration proceedure, please see instruction manual.

#### **RELAYS USAGE GUIDE**

Relays 1 & 2 are normally energised. If power is removed from the unit , including possible site power supply issues, an alarm will be activated. Additionally upon powerup (and return of power) the unit will self test for approximately 10-20 seconds which will operate relay 1.

Relay 3 is not normally energised and does not operate during self test. Therfore relay 3 should be considered if the installation suffers from regular power failures where nuisance alarms may occur.



## CALIBRATION

#### TOOLS REQUIRED

- 1. Digital multimeter
- 2. Electronic Devices sensor adapter
- 3. Nitrogen test gas (Purity 99.999%)
- 4. Test gas appropriate to the sensor being tested e.g. 1% CO<sup>2</sup> balance N<sup>2</sup>, 50% LEL Methane balance air.)
- 5. 4mm allen key
- 6. Instrument screw driver
- 7. Valve with 0.3 or 0.5l/m flow rate



#### **INITIAL SETUP PROCEEDURE**

- 1. Ensure sensor is fault free and has been powered on for a minimum of 2 hours.
- 2. Set digital volt meter to mV range, connected between **0V Test Pin** (-ve lead) and **TP1** (+ve lead) see p4. connections diagram for locations
- 3. Using the ED adapter and Nitrogen immerse the sensor and allow 60 seconds to stabilise
- 4. Adjust the zero potentiometer until 0.0mV is <u>JUST</u> reached
- 5. Immerse the sensor in the target gas and allow 60 seconds to stabilise
- 6. Connect the digital volt meter to **TP2** and **0V point** (Shown on diagram)
- 7. Adjust the span potentiometer until the appropriate voltage is reached e.g. TP2 has a range of 0-5VDC (See table below):

If the sensor type is	and the calibration test gas is	then Test point 2 (TP2) should be set to:
EDNIR1	50% LEL Propane	2.5V
EDNIR2	50% LEL Methane	2.5V
EDNIR3 0-5000ppm	5000ppm CO2	5.0V
EDNIR3 1% Vol	1% Vol CO2	5.0V
EDNIR3 2% Vol	2% Vol CO2	5.0V
EDNIR3 3% Vol	3% Vol CO2	5.0V
EDNIR 4	1000ppm R134A	2.5V

#### **ALARM SETTINGS**

The alarm relays are factory set to your requirements, however they can be adjusted. While the display is showing the alarm value required using the appropriate test gas (see procedure above if it is not) adjust the A1 or A2 potentiometer until the relay and lamp operate as required. Do not set set Alarm 1 below 5% of full scale required, doing this will also generate a fault condition when unit alarms.