

**Critical Environment Technologies  
Canada Inc.**

[www.critical-environment.com](http://www.critical-environment.com)

**Installation Manual for  
AST-IS18-M**

**Infrared CO<sub>2</sub> Modbus Transmitter  
(0 - 4% volume range) with Temperature sensor,  
IP65 Rated Industrial Enclosure, LCD Display & Relay**



**MANUAL REVISION-B, May 2018**

**#145, 7391 VANTAGE WAY  
DELTA, BC CANADA V4G 1M3  
PH: 604-940-8741 TOLL FREE: 877-940-8741**

This product is in accordance with EMC 2004/108/EC, RoHS 2011/65/EU, 92/31/EEG including amendments by the CE-marking Directive 93/68/EEC.

This product fulfills the following demands:  
EN 61000-4-2 Level 2, EN 61000-4-3 Level 2, EN 61000-4-4 Level 4, EN 61000-4-6,  
EN 61000-4-8 Level 4, EN 55022 Class B



**IMPORTANT NOTE**

Read and understand this manual prior to using this instrument. Carefully read the warranty policy, service policy, notices, disclaimers and revisions on the following pages.

This product must be installed by a qualified electrician or factory trained technician and according to instructions indicated in this manual. This instrument should be inspected and calibrated regularly by a qualified and trained technician.

This instrument has not been designed to be intrinsically safe. For your safety, **do not** use it in classified hazardous areas (explosion-rated environments).

INSTRUMENT SERIAL NUMBER:

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PURCHASE DATE:

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PURCHASED FROM:

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**WARRANTY POLICY**

Critical Environment Technologies Canada Inc. (CETCI), also referred to as the manufacturer, warrants this instrument, (excluding sensors, battery packs, batteries, pumps and filters) to be free from defects in materials and workmanship for a period of **two years from the date of purchase from our facility**. The sensors have a warranty period of **one year on a pro-rated basis from the date of purchase from our facility**. If the product should become defective within this warranty period, we will repair or replace it at our discretion.

The warranty status may be affected if the instrument has not been used and maintained as per the instructions in this manual or has been abused, damaged, or modified in any way. This instrument is only to be used for purposes stated herein. The manufacturer is not liable for auxiliary interfaced equipment or consequential damage.

Due to ongoing research, development, and product testing, the manufacturer reserves the right to change specifications without notice. The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data.

All goods must be shipped to the manufacturer by prepaid freight. All returned goods must be pre-authorized by obtaining a Returned Merchandise Authorization (RMA) number. Contact the manufacturer for a number and procedures required for product transport.

## **SERVICE POLICY**

CETCI maintains an instrument service facility at the factory. Some CETCI distributors / agents may also have repair facilities; however, CETCI assumes no liability for service performed by anyone other than CETCI personnel.

Repairs are warranted for 90 days after date of shipment (sensors have individual warranties).

Should your instrument require non-warranty repair, you may contact the distributor from whom it was purchased or you may contact CETCI directly.

Prior to shipping equipment to CETCI, contact our office for an Returned Merchandise Authorization (RMA) number. All returned goods must be accompanied with an RMA number.

If CETCI is to do the repair work, you may send the instrument, prepaid, to:

**Attention: Service Department**  
**Critical Environment Technologies Canada Inc.**  
**Unit 145, 7391 Vantage Way**  
**Delta, BC, V4G 1M3**

Always include your RMA number, address, telephone number, contact name, shipping / billing information, and a description of the defect as you perceive it. You will be contacted with a cost estimate for expected repairs, prior to the performance of any service work.

For liability reasons, CETCI has a policy of performing all needed repairs to restore the instrument to full operating condition.

Pack the equipment well (in its original packing if possible), as we cannot be held responsible for any damage incurred during shipping to our facility.

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## **DISCLAIMER**

Under no circumstances will CETCI be liable for any claims, losses or damages resulting from or arising out of the repair or modification of this equipment by a party other

than CETCI service technicians, or by operation or use of the equipment other than in accordance with the printed instructions contained within this manual or if the equipment has been improperly maintained or subjected to neglect or accident. Any of the foregoing will void the warranty.

Under most local electrical codes, low voltage wires cannot be run within the same conduit as line voltage wires. It is CETCI policy that all wiring of our products meet this requirement.

It is CETCI policy that all wiring be within properly grounded (earth or safety) conduit.

**REVISIONS**

This manual was written and published by CETCI. The manufacturer makes no warranty or representation, expressed or implied including any warranty of merchantability or fitness for purpose, with respect to this manual.

All information contained in this manual is believed to be true and accurate at the time of printing. However, as part of its continuing efforts to improve its products and their documentation, the manufacturer reserves the right to make changes at any time without notice. Revised copies of this manual can be obtained by contacting CETCI or visiting [www.critical-environment.com](http://www.critical-environment.com)

Should you detect any error or omission in this manual, please contact CETCI at the following address:

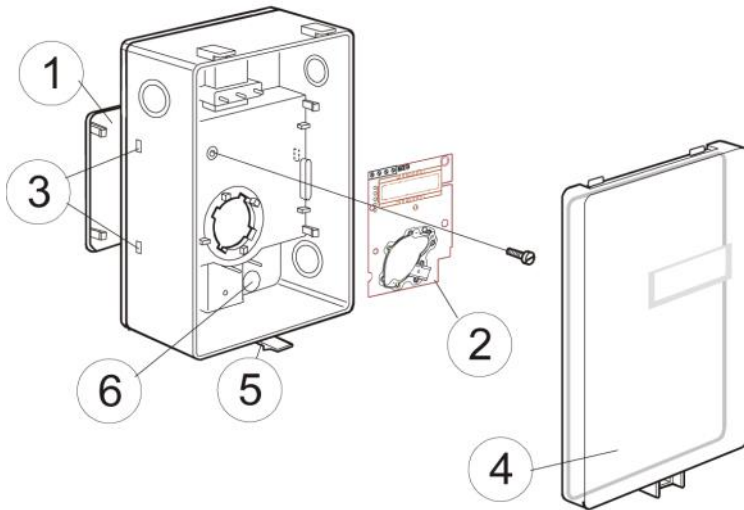
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In no event will CETCI, its officers or employees be liable for any direct, special, incidental or consequential damages resulting from any defect in any manual, even if advised of the possibility of such damages.

# AST-IS18-M

The AST-IS18-M infrared Carbon Dioxide (CO<sub>2</sub>) sensor / transmitter measures the temperature of the environment and the concentration of carbon dioxide indoors in 0-4% volume. Ideal for applications such as inside greenhouses. It offers Modbus® RS-485 output. 1 relay and an LCD display all housed in an industrial, IP65 rated, water tight, wall mount enclosure. The enclosure cover has a built-in rubber gasket and all other connections must be tight and sealed to prevent water intrusion. It is designed for connecting to Direct Digital Control (DDC).

## ITEM LOCATORS



- 1 Wall plate
- 2 PCB (Factory supplied mounted in box)
- 3 Hole for wall plate hooks
- 4 Snap-in lid
- 5 Locking screw of the lid (not shown)
- 6 Air holes

**KEY FEATURES:**

- State of the art non-dispersive infrared (NDIR) technology to measure carbon dioxide gas
- Reliable and accurate built-in NTC thermistor for measuring temperature
- Modbus® RS-485 output
- One contact free relay (min load: 1mA/5V; rated load: 0.5A/125VAC, 1A/24VDC)
- Membrane covered sample chamber for a stable, reliable and highly accurate carbon dioxide sensor
- Fully coated PCB together with a special filter equipped housing for resistance towards dust and humidity
- Maintenance free in normal applications
- IP65 rated

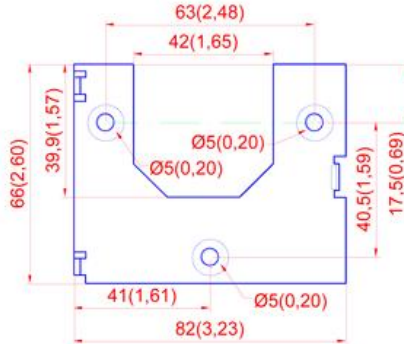
**SPECIFICATIONS:****AST-IS18-M**

Measurement Range	0 - 4% CO <sub>2</sub>
Power Supply	24 VDC or VAC, 50/60 Hz (half-wave rectifier input)
Power Consumption	<3 W average
Linear Output	na
Temperature Sensor Range	0oC to 50oC (32oF to 122oF)
Accuracy	na
Operating Temperature	0oC to 50oC (32oF to 122oF)
Operating Humidity	0-95% RH non-condensing
Display	Yes
Enlosure Ratings	IP65 rated
Dimensions	177 x 85 x 38 mm 7 x 3.35 x 1.5 inches
Alarm	No
Mute button	No
Relay Output	Min load: 1 mA / 5V Rated load: 0.5 A / 125 VAC, 1 A / 24 VDC
Mounting Type	Wall mount
Probe length	na
Communication	Modbus RS-485
Certifications	CE and EMC

## WALL MOUNTING INSTRUCTIONS

The enclosure is delivered with the wall plate attached. The wall plate has to be removed before the sensor is mounted onto the wall. Unscrew the screw on the side of the box.

There are several mounting holes available to ensure a secure mounting location.



If cover must be removed for any reason, loosen single securing screw on bottom of enclosure, press tab to release cover and hinge upward to remove.

Normally the PCB should not be removed from the housing. If for some reason the PCB must be removed it must be handled carefully and protected from electrostatic discharge.

- 1) Electrical cable entry:** The box has a factory mounted cable entry bushing in dimension PG7, item-3 in drawing on previous page. Never feed more than one cable through each cable entry bushing, or else gas might leak through!
- 2) Screw the wall plate onto the wall:** The wall plate has several holes from which to choose the best location to secure the transmitter with screws. Drill holes for 3,5mm screws and put dowel into them. Dowels and screws 3,5 x 25mm are included in a plastic bag
- 3) The lid can be locked** with the screw at the bottom of the sensor box, item-5 on drawing on previous page.

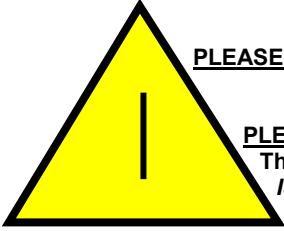


If for some reason the PCB must be removed it must be handled carefully and protected from electrostatic discharge! Normally, removing the PCB is not required.



## ELECTRICAL CONNECTIONS

The power supply has to be connected to  $\sim$  and  $\text{—} \text{+}$ .  $\text{—} \text{+}$  is considered as system ground. The AST-IS18-M must have the same ground reference as the controller. Unless different transformers are used, special precautions need to be taken.



**PLEASE NOTE!** The *AST-IS18-M* RS485 GND *is not* galvanically separated from the *AST-IS18-M* power supply!

**PLEASE NOTE!**

The same ground reference has to be used for the *AST-IS18-M* unit and for the control system!

If possible, keep the sensor powered up after mounting.

Connection Terminal	Function	Electrical Data	Remarks
$\sim$ $\text{+}$	Power (+)	24VAC/DC+ (+20%), 1W	See Note 1
$\text{—} \text{+}$	Power ground (-)	24VAC/DC -	
RS-485 Adapter			
A	Data line	Connects to next A data line in network	Do not reverse polarity (do not connect A to B)
B	Data line	Connects to next B data line in network	
5	Normally Closed Relay	Contact free relay, minimum load: 1mA/5V rated load: 0.5A/125VAC 1A/24VDC	Standard Relay Open <1.4% CO2 Closed <1.5% CO2 The relay output is potential free
6	Relay COM		
7	Normally Open Relay		
8	Not used		

**NOTE 1:** The ground terminal is used as negative power supply DC input or AC phase ground  $\text{—} \text{+}$  (half wave rectifier). The RS485GND, protected by a PTC resistor, is the same as power ground G0 (permitting a "3-wire" configuration). A single transformer may be used for the entire system.

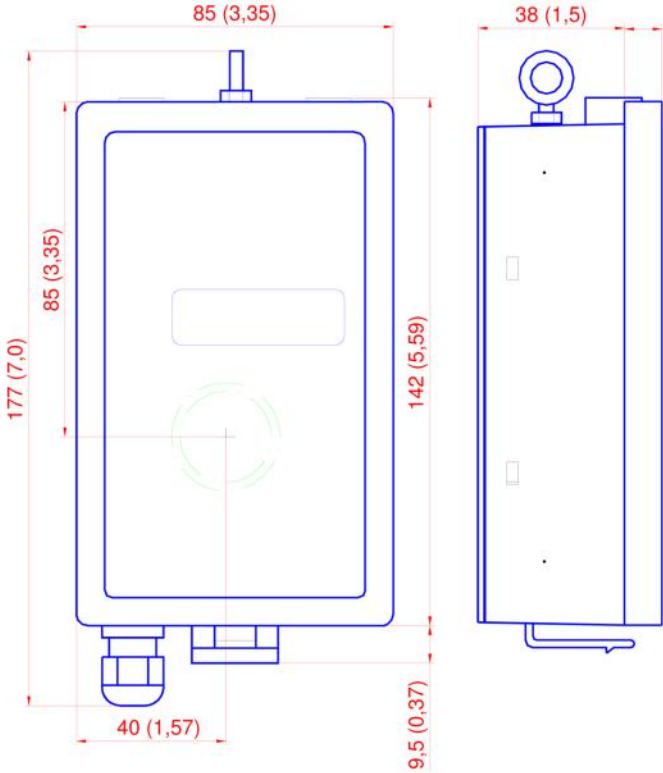
# DIMENSIONS

## Shown in mm (and inches)

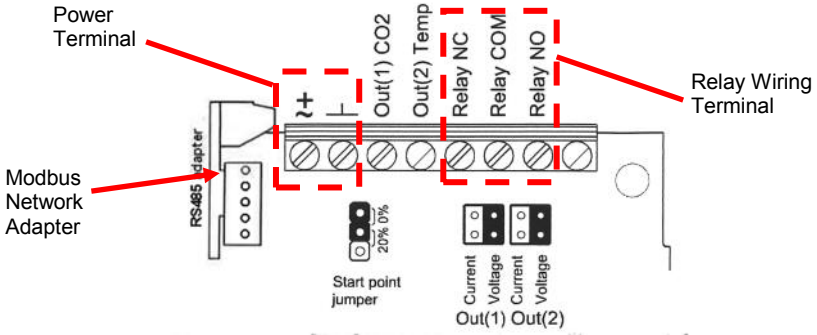
Note: Enclosure is shown without wall plate brackets.

Never feed more than one cable through each cable entry bushing.

The lid can be locked with the screw at the bottom of the sensor box.

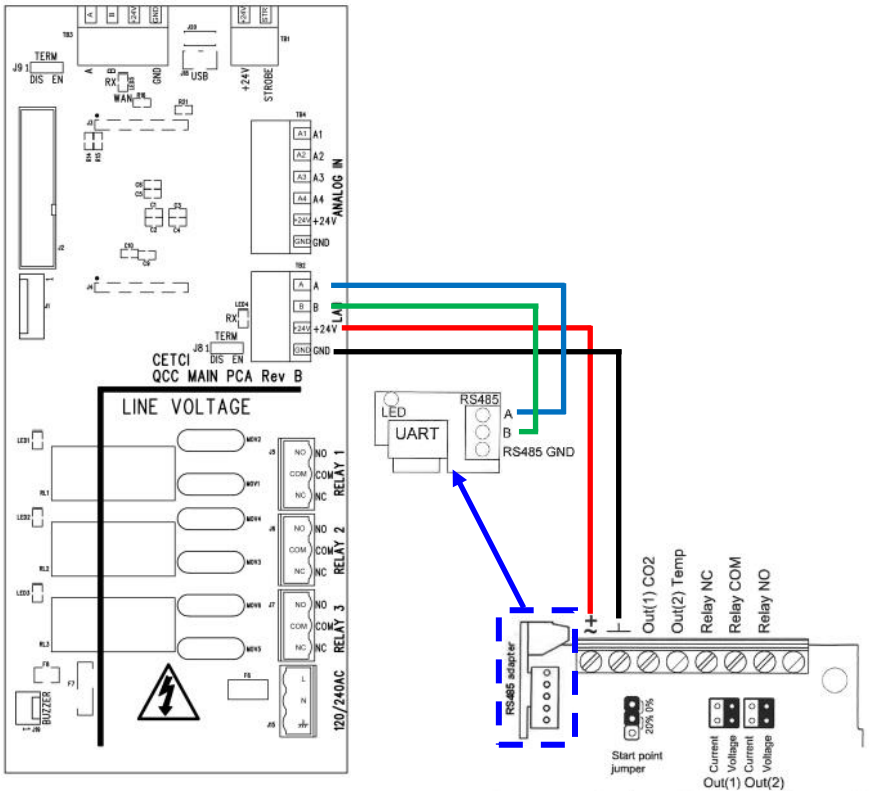


# WIRING TERMINALS



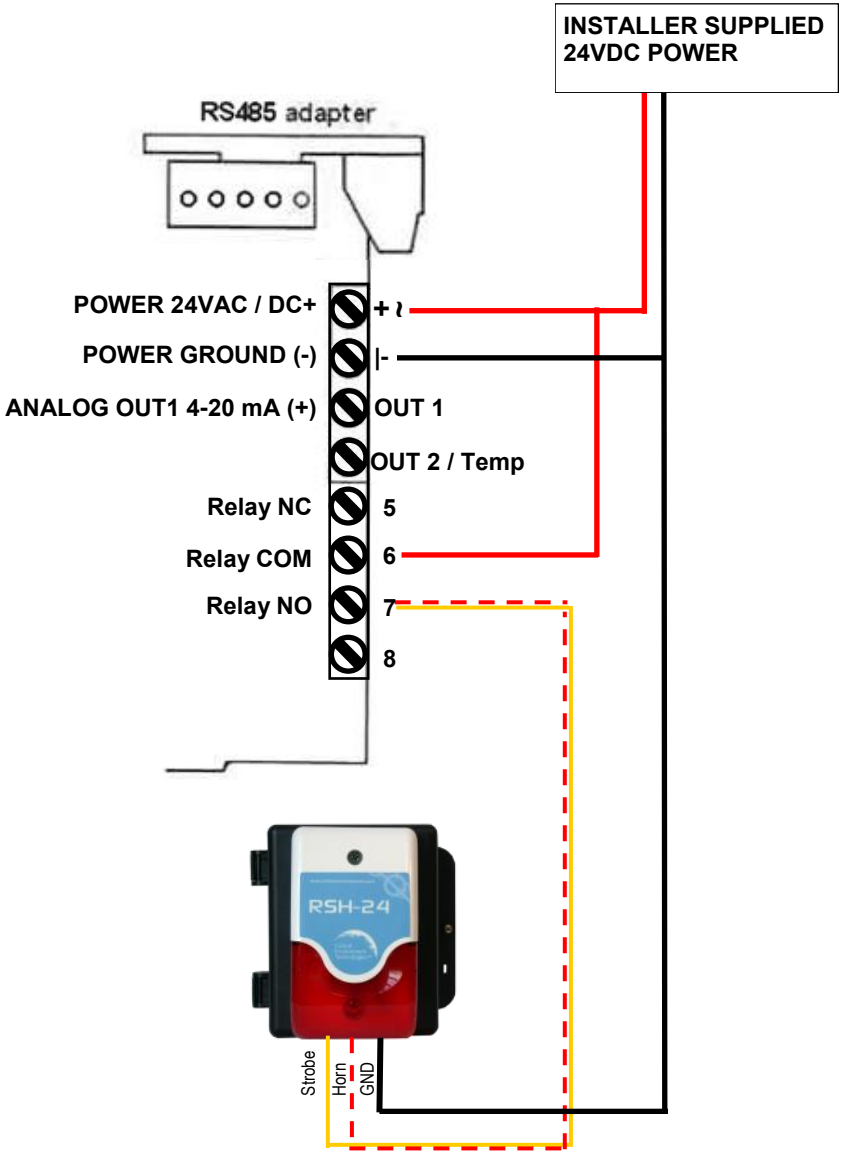
## 4-BUS NETWORK WIRING TO QCC QUAD CHANNEL CONTROLLER (OR OTHER MODBUS DEVICE)

The network adapter (indicated by the broken blue line) is used to connect the AST-IS18-M to an Modbus RS-485 network. The green LED flashes every time the adapter answers calls from the network master. The adapter is placed on the UART connector with all five pins connected.



# 24VDC POWER WIRING TO REMOTE STROBE / HORN COMBO (RSH-24VDC)

**NOTE:** THE RELAY ON THE AST-IS18 DO NOT OPERATE IN A FAILSAFE MODE



Strobe & Horn operate together

To enable Strobe only, connect the yellow wire and the black wire. To enable Horn only, connect the red wire and the black wire.







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