User Manual

ModuMesh

Model: MOD

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Notices and Warnings

Notices

Please **read all of this manual** before you install, operate or maintain this product. Pay attention to notes, warnings and instructions. The manufacturer cannot be held liable for any damage which occurs as a result of noncompliance with this manual.

Do not tamper with device. Should the device be tampered with in any manner other than a procedure which is described and specified in this manual, the warranty is cancelled and the manufacturer is exempt from liability.

The product is designed exclusively for the described application. Use of this product in conditions not specified in this manual or, contrary to the instructions provided by the manufacturer, is considered improper handling / use of the product and will void your warranty. The manufacturer will not be held liable for any damages resulting from improper use of the product.

This manual should be read carefully by relevant personnel and the end user**.** This manual should be kept with the product and be made available as needed. **Once you install or use the product, you accept that you have read, understood and complied with this manual**.

CAA Sensors endeavours to make the content of this manual correct but is not responsible for omissions or errors and the consequences caused. In case of any doubts or questions regarding this manual or the product, please contact CAA Sensors.

Warnings

Ignoring the warnings can lead to serious injury and/or cause damage!

When handling, operating or carrying out maintenance on this product, personnel must employ safe working practices and observe all local health & safety requirements and regulations.

Improper operation or maintenance of this product could be dangerous and result in an accident causing damage to machinery or injury or death.

The manufacturer cannot anticipate every possible circumstance which may represent a potential hazard. The warnings in this manual cover the most common potential hazards and are therefore not all-inclusive. If the user employs an operating procedure, an item of equipment or a method of working which is not specifically recommended by the manufacturer they must ensure that the product will not be damaged or made unsafe and that there is no risk to persons or property.

NEVER CHANGE ORIGINAL COMPONENTS WITH ALTERNATIVES.

Electrical Safety

Any contact with energised parts of the product, may lead to an electrical shock which can lead to serious injuries or even death. The user shall take all measures necessary to protect against electrical shock.

Consider all regulations for electrical installations.

The system must be disconnected from any power supply during maintenance work.

Any electrical work on the system is only allowed by authorised qualified personnel.

Storage and transportation

Please make sure that the storage and transportation temperature of the sensor is between -40°C to +70°C (-40°F to 158°F) and the humidity is <90%, no condensation. Avoid direct UV and solar radiation during storage.

Cleaning

If you need to clean the sensor it is recommended to use a clean, dry cloth. For stubborn marks, use distilled water or isopropyl alcohol only.

Please note: contamination on the sensor tip will affect calibration and accuracy of the sensor. Removal of the contamination may not fix the issue.

Disposal

Electronic devices are recyclable material and do not belong in the household waste. The product, accessories and its packing material must be disposed according to local statutory requirements.

Introduction

About the ModuMesh

Intended use

CAA Sensors ModuMesh is suitable for use in manufacturing, industrial and commercial building environments providing the specifications are met. This includes:

- Sensor is used indoors
- The correct frequency band is used for your region:
  - 868MHz (EU),
  - 902-928MHz (Americas and Australia)
- Working temperature is between: -25°C to +70°C (-13°F to +158°F)
- Power supply is between: 9 to 30 vDC
- The device is **not** used in explosive areas.

Refer to the *Specifications* section for full requirements.

About the ModuMesh

ModuMesh is wireless Modbus RS485 mesh device. It allows you to wirelessly transmit data from sensors to a display or data acquisition module, thus removing the need for long runs of cable.

How many ModuMesh devices do I need?

At a minimum, you need two (2) ModuMesh devices – one Primary Controller and one Node.

- The **Primary Controller** is always connected to the Modus Master (eg a display or data acquisition module). The Primary Controller translates all Modbus frames from the Modbus Master to the ModuMesh Nodes.
- ModuMesh **Nodes** are connected to sensors (see picture on next page).
  - If the sensors are located close together, you can daisy chain them to a single Node.

The network follows a star topology, with all wireless communications converging at the Primary Controller.

How many Modbus registers can a ModuMesh handle?

The Primary Controller can handle up to 64 Modbus registers. The total number

of registers from all Nodes must be less than 64 Registers.

Note: the more registers you have the slower the speed of data transmission.

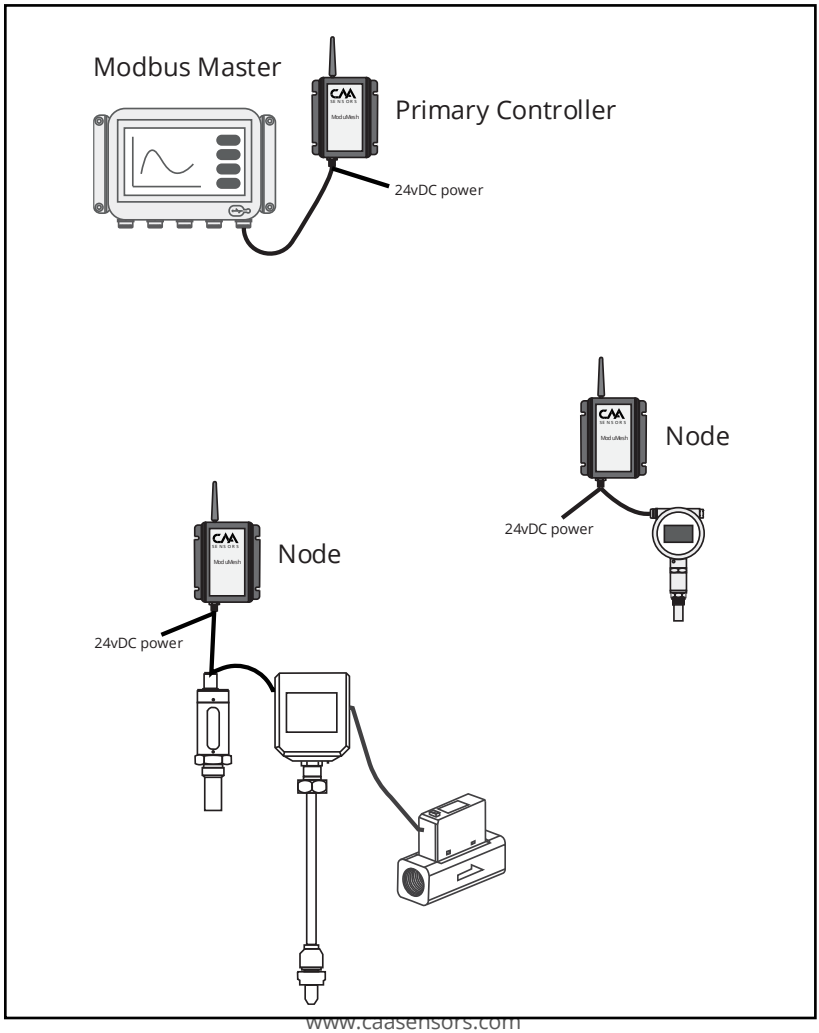
How far apart can ModuMesh devices be?

ModuMesh devices have a maximum range of 1km (line of sight). However, practical application will be less and will depend on the number and type of obstacles (eg concrete walls).

Being a mesh network, additional ModuMesh Nodes can be installed at mid points in the network for extended network coverage.

Is data encrypted?

Data has AES 128-bit Encryption.



Specifications

Radio Frequency	EU 868MHz
	Australia, Asia and Americas 902-928MHz
Sensitivity	-104dBm typ
RF Power	Up to +26 dBm
Range	Up to 1km (line of sight)
Antenna	SMA Female connector with a 3m cable
	Inputs / Outputs
Input	M12, 5 pin male connector
Modbus Protocol	Modbus RTU (RS485)
Wireless	Wireless AES128 Encrypted Mesh
	Power
Power Supply	9 to 30 vDC 9vDC @ 80mA 30vDC @ 24mA
Consumption	Idle 170 mW
	Transmitting Peaks up of 700 mW
Electrical Connection	M12, 5 pin male connector
	Other Information
Ambient Temperature	-25°C to +70°C -13°F to +158°F
Relative Humidity	5 to 95% RH without condensation
Mounting	Wall Mount
Casing	Powder-coated Aluminium
Dimensions	120 x 98 x 27 mm 4.7” x 3.85” x 1.1
IP Rating	IP54
Warranty	12 months

CE	UNE-EN 60950-1:2007 +Corr:2007+A11:2009+A1:2011 +A12:2011/AC2012 (Partial) UNE-EN 61000-6-1:2007 UNE-EN 61000-6-3:2007 UNE-EN 55 022:2011 + Err (UNE-EN55022:2011/AC) UNE-EN 55 024:2011 EN 301489-1 v1.8.1 (2008-02) (Partial) (1 – 6 GHz Band)

ModuMesh Pack

Each ModuMesh pack comes with:

- ✓ ModuMesh Device
- ✓ Antenna with 3 meter cable

Antenna

ModuMesh device

Installation

Installation Overview

Installation

Step 1 – Attach ModuMesh to wall and connect Antenna

- The device must be installed on a solid, vertical surface (eg a wall or post), near a power supply.

Step 2 – Connect power (9-30vDC) and sensor(s)

- Multiple sensors can be connected (via daisy chain) to the ModuMesh device.

Tools and Equipment needed for installation

(not included with Dew Point Sensor Pack)

Drill

Screws

Screw Driver

M12 cable

M12 Connectors

Sensors

Installation

WARNING! Incorrect installation or wiring can damage the device and any sensor(s) connected to it. Incorrect installation or wiring can also cause the device and sensor(s) to work incorrectly.

Notes

- **Before installing the device, make sure it is rated for your system** (refer to the “Specifications” section).
  - Use of the product outside specified ranges or operating parameters can lead to malfunctions and may damage the product or system.
- Do not use this product in explosive environments.
- Always use the correct tools to install the product.
- Do not disassemble the product.
- Follow all local and national safety requirements and regulations for electrical installations.
- **The system must be disconnected from any power supply during installation and maintenance work.**
- Any electrical work on the system is only allowed by authorised and qualified personnel.
- The product must be installed properly, otherwise it may lead to inaccurate data.

Step 1 – Attach ModuMesh to wall and connect Antenna

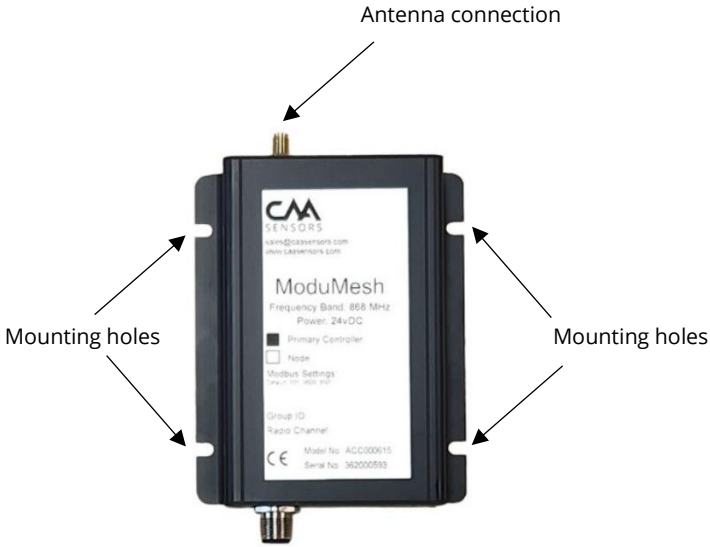
There are 4 mounting holes on the side of the device.

The device must be installed on a solid, vertical surface (eg a wall or post).

- Fix firmly to prevent loosening or shaking

Make sure the device is installed near a power point.

Attach antenna to device



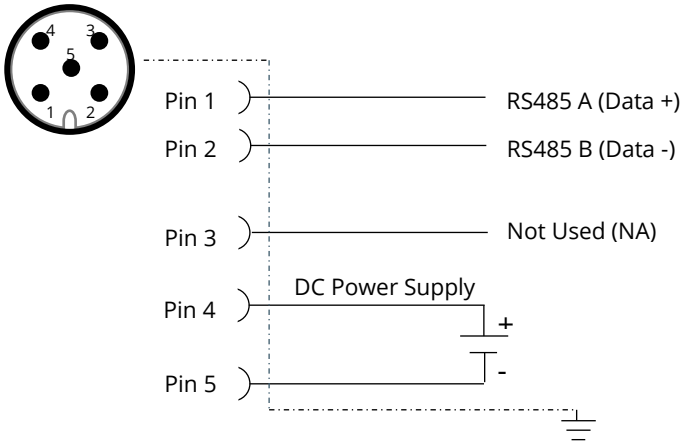
Step 2 – Connect Power and Sensor(s)

Connect Power and sensor(s) to the device via the M12 connector.

Multiple sensors can be connected to the ModuMesh device via daisy chain.

The ModuMesh has one 5 pin, M12 connector on the bottom of the device.

Connector	
Pin 1	RS845, Data + (A)
Pin 2	RS845, Data - (B)
Pin 3	Not used
Pin 4	+9 to 30 vDC
Pin 5	0 vDC (Ground for Modbus)



Warranty

CAA Sensors provides a 12-month warranty for all devices. The warranty covers materials and workmanship under the stated operating conditions from the date of delivery. Please report any findings immediately and within the warranty time.

If faults occur during the warranty period CAA Sensors will repair or replace the defective unit, without charge for repair labour and material costs but there is a charge for other services such as labour to remove or reinstall the instrument, transport and packing. Warranty repairs do not extend the period of warranty.

The following damage is excluded from this warranty:

- Improper use and non-adherence to the user manual.
- Use of unsuitable accessories.
- External influences (e.g. damage caused by vibration, damage during transportation, excess heat or moisture).

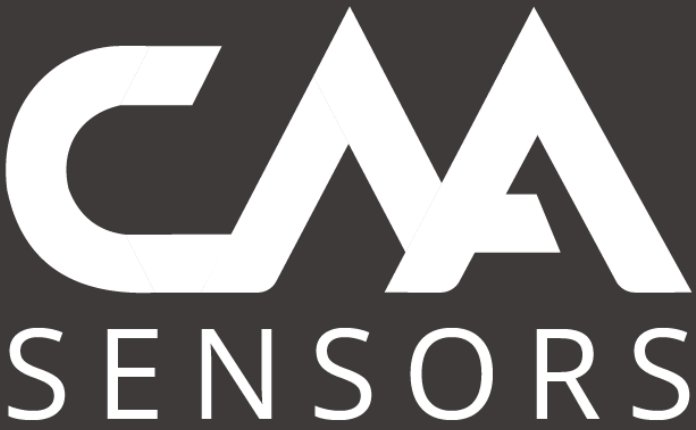
The warranty is cancelled when one of the following situations occurs:

- The user opens the measurement instrument without a direct request written in this manual.
- Repairs or modifications are undertaken by third parties or unauthorised persons.
- The serial number has been changed, damaged or removed.

Other claims, especially damage occurring on the outside of the instrument (e.g. dents, marks), are not included unless responsibility is legally binding.

For more information, contact CAA Sensors:

- Phone: +61 494095632
- WhatsApp: +61 494095632
- E-mail: sales@caasensors.com



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