Models:
MM01: MiniMAX Controller, Primary Network
MM02: MiniMAX Controller, Sub System Network

Type: MiniMAX Controller

Overview

The Innotech MiniMAX Controller is a state of the art digital processing system that has the capability of controlling various types of industrial and commercial systems. The MiniMAX can operate as a standalone device, using its own universal I/O and TRIAC Outputs to receive information and control external equipment, or as part of a network of Innotech devices, where MM01 interfaces with the Primary Network, and MM02 interfaces with the Sub System Network.

The MiniMAX Controller features Universal I/O channels (UIO) which combine the functions of Universal Input and Analog Output channels into a single software programmable channel. Each UIO can be independently set via software to have input or output functionality. With this structure, you are free to assign functions as required, instead of choosing a fixed controller to fit the job.

The MiniMAX configuration program is created on a computer using a Windows® based design program. This allows the user to configure the internal processes of the MiniMAX by using a graphical programming tool. The user places various process blocks and interconnecting lines to design the required control algorithm for the system.

A connector on the bottom right side of the case provides an RS485 communication interface for communicating with other networked devices.

Features

- 100 millisecond cycle/scan time
- 7 x independent configurable Universal Inputs/Outputs
- 4 x 24VAC TRIAC Outputs
- 1 x RS485 Serial Communications Port (MM02)
- 2 x RS485 Serial Communications Ports (MM01)
- User selectable Baud Rate
- All wire connections by pluggable screw terminals
- Program resides in non-volatile flash RAM

Applications

The Innotech MiniMAX Controller is designed for mounting inside a control cubicle and offers programmable channels, enabling it to monitor and control all types of external plant and equipment. Although the MiniMAX is flexible, it is primarily designed for the air conditioning and building automation industry.

The small size of the MiniMAX also gives it the advantage of being installed in small places without taking up valuable switchboard real-estate.

The MiniMAX is similiar in operation to the MAXIM I or MAXIM II Digital Controllers, but provides Universal Input/Output points that are user configurable and completely independent.

The creation of control strategies is made simple by the use of the Innotech MAXCon utility. MAXCon, with its powerful Graphical User Interface, allows the user to create an entire control strategy in block-diagram form.

Typical applications include:

- Air conditioning and heating systems
- Lighting control
- Monitoring device
- Distributed I/O points controller
- Cold/Freezer Rooms

The MM02 has communication termination requirements. Refer to the Innotech Network Cabling Manual DS 99.04 for using End of Line jumpers (EOL) when connecting to a network. Incorrect use of End of Line Jumpers can cause unreliable communication or total network failure.

The MiniMAX should be installed in an environment that does not exceed the maximum operating parameters of the device. It should be mounted in a clean and dry environment.

Specifications

POWER SUPPLY REQUIREMENTS	
Power input	24VAC ±10% @ 50/60Hz
Transformer nominal rating Maximum TRIAC Load	35VA
Transformer nominal rating No TRIAC Load	10VA
The operating voltage must meet the requirements of Safety Extra Low Voltage (SELV) to EN60730. The transformer used must be a Class 2 safety transformer in compliance with EN60742 and be designed for 100% duty. It must also be sized and fused in compliance with local safety regulations.	

ENVIRONMENTAL	
Operating Temperature	0 to 40°C non-condensing
Storage Temperature	0 to 50°C non-condensing

ENCLOSURE	
Housed in a rectangular case suitable for DIN Rail mounting. Housing molded from flame retardant plastics recognized by UL as UL94-V0.	
Colour	Grey
Dimensions (Maximum)	(W)71mm x (H)115mm x (D)67mm

APPROVALS
EN61326:2013 for CE Marking and RCM Labelling
Title 47 CFR, Part 15 Class A for FCC Marking
UL listed to UL916, File Number E242628

ANALOGUE MODE	
Input accuracy	±0.1 V
Input impedance	~75 kΩ
Input resolution	~10 mV
Output accuracy	±0.1 V (RLoad > 2 kΩ)
Output resolution	~40 mV

DIGITAL MODE	
Output current (Max)	10mA
Output voltage swing	0.3V – 9.5V @ 10mA
Input voltage range	0V – 10V
Input impedance (Dry)	~8.8KΩ
Switching threshold (Dry)	4.5V
Input impedance	~75KΩ
Switching threshold	5V
PWM duty cycle accuracy	±5 %

TEMPERATURE MODE (With Innotech SEN Series Detectors)	
Nominal sensing range	-5°C to 60 °C
Accuracy	±3.5%FS (R25 °C = 10 kΩ)

TRIAC OUTPUTS	
4 TRIAC outputs switch 24VAC Power Supply through to the outputs	
Current rating	Min: 20mA / Max: 250mA
Modes	Modulated PWM or Digital ON/OFF
Pilot relays recommended when switching high voltage/inductive loads	
Modulation On-Delay staggered between channels	

UNIVERSAL INPUTS / OUTPUTS

Total of 7 UIOs available, which can be configured with software as shown below:

UIO Type		Input Range	Output Range
Analogue Input		0 – 10 V DC	0 – 10 V DC
Dry Digital Input		Open or Closed	OFF or ON
Voltage Digital Input		0 – 10 V DC	OFF or ON
Thermistor Input		96 kΩ – 677 Ω	-50 °C to 100 °C
LUX Sensor Input	Nominal	20 kΩ – 400 Ω	3 to 1000 LUX
	Full Range	1MΩ – 0Ω	0 to 2500 LUX
Dry Pulse Counter Input		Open or Closed 20ms Min. ON Time 20ms Min. OFF Time	0 to 25 pulses per second ±1 pulse accuracy
Voltage Pulse Counter Input		0 – 10V Square Wave 20ms Min. ON Time 20ms Min. OFF Time	0 to 25 pulses per second ±1 pulse accuracy
Analogue Output		0 to 100%	0 – 10 V DC
Digital Output		OFF or ON	0 or 10 V DC
PWM		0 to 100%	0 to 100% Duty Cycle @ 13Hz

COMMUNICATIONS
1 RS485 serial communication channel

- Optimized for fast data transmission with IG01 Sub System Gateway
- Provides Net comms only if used without IG01
- Communication to handheld Commissioning Tool (CT01)
- 5 way pluggable screw terminal connector for MM01
- 4 way pluggable screw terminal connector for MM02

Status LEDs

MM01

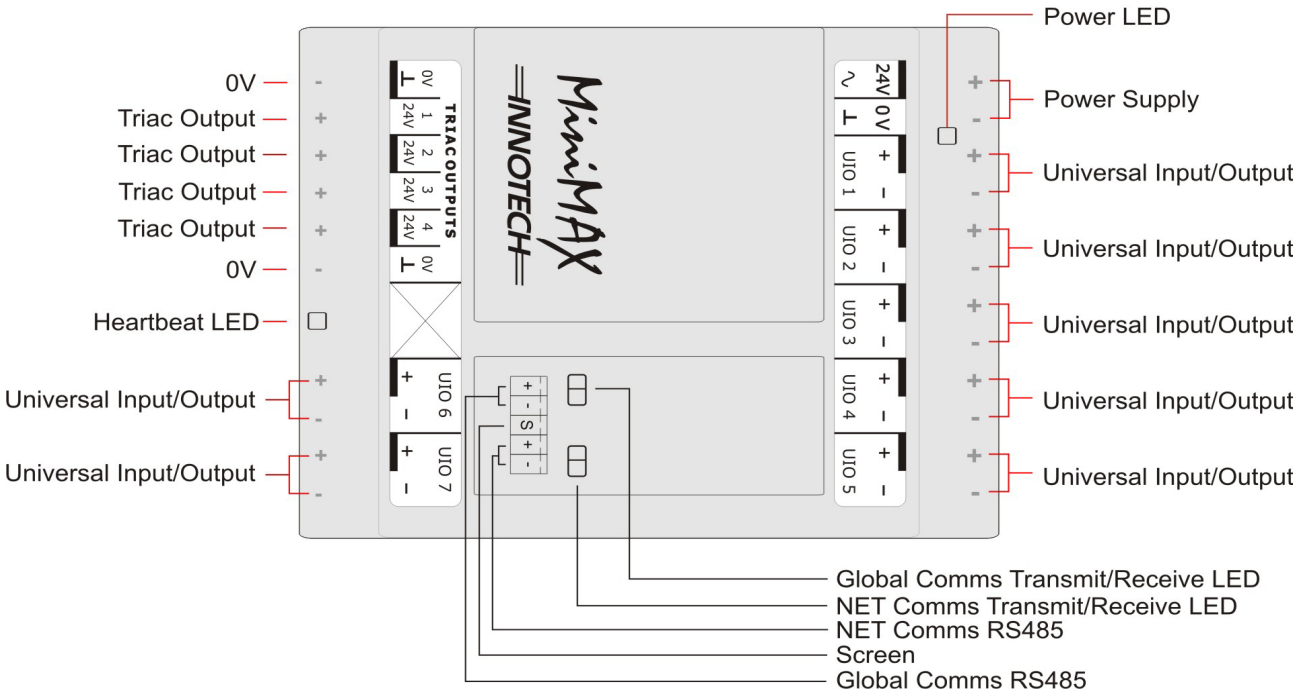
LED Indicator		LED Colour	Description
Power		Red	Power is ON
Heartbeat		Flashing Red	Device status OK
Communication	Net	Red	Data transmit
		Green	Data receive
	Global	Red	Data transmit
		Green	Data receive

MM02

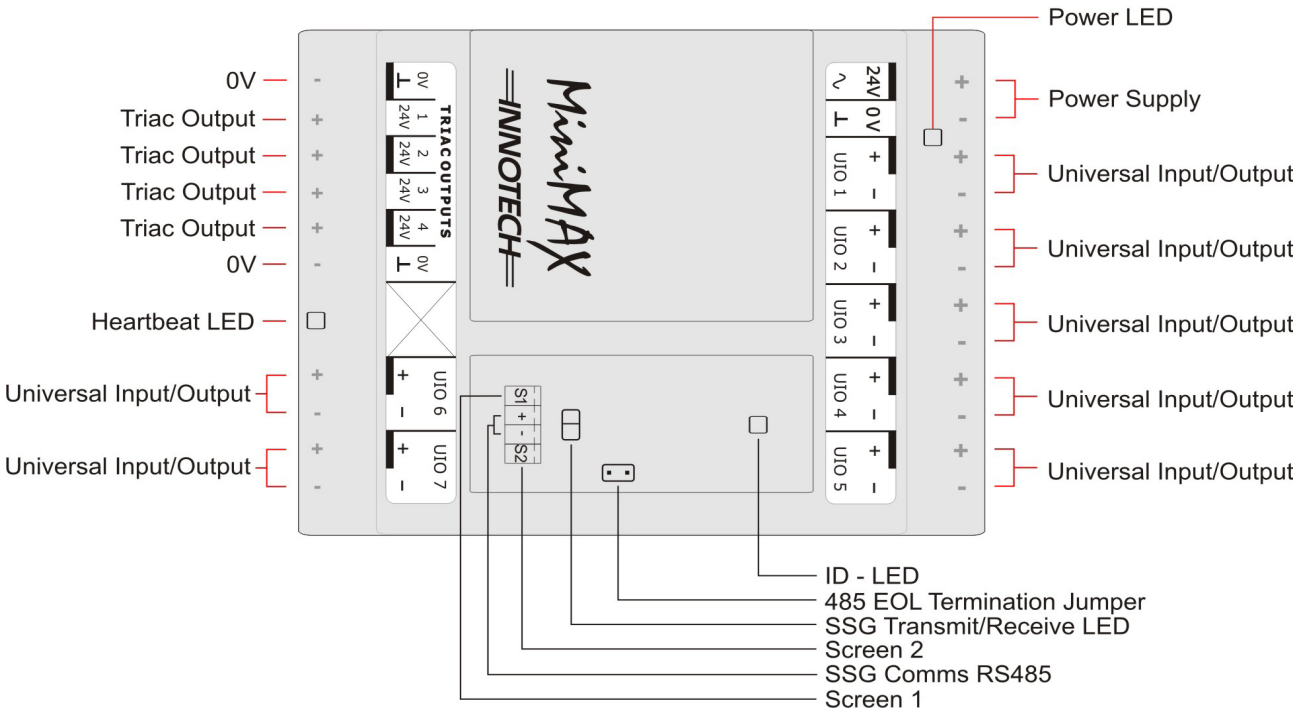
LED Indicator		LED Colour	Description
Power		Red	Power is ON
Heartbeat		Flashing Red	Device status OK
Identification		Flashing Red	Helps locate a MM02 with a specific device address during commissioning using the Ping command in iComm, or another HMI tool. Can also be used to aid in assigning a specific device address to a particular MM02.
Communication	Sub System Network	Red	Data transmit
		Green	Data receive

MiniMAX Connection Diagram

MM01



MM02



FCC Class A Notice

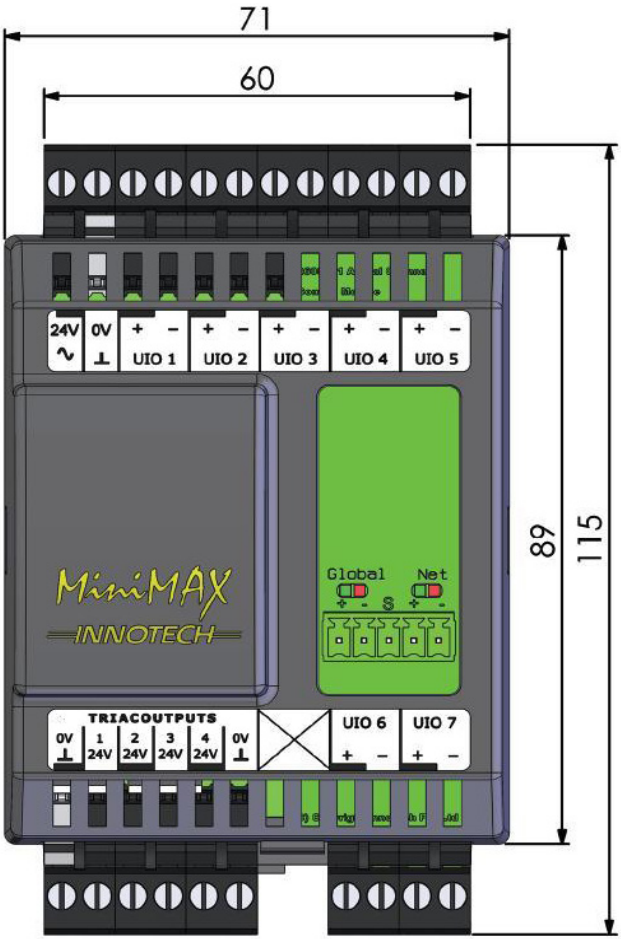
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation

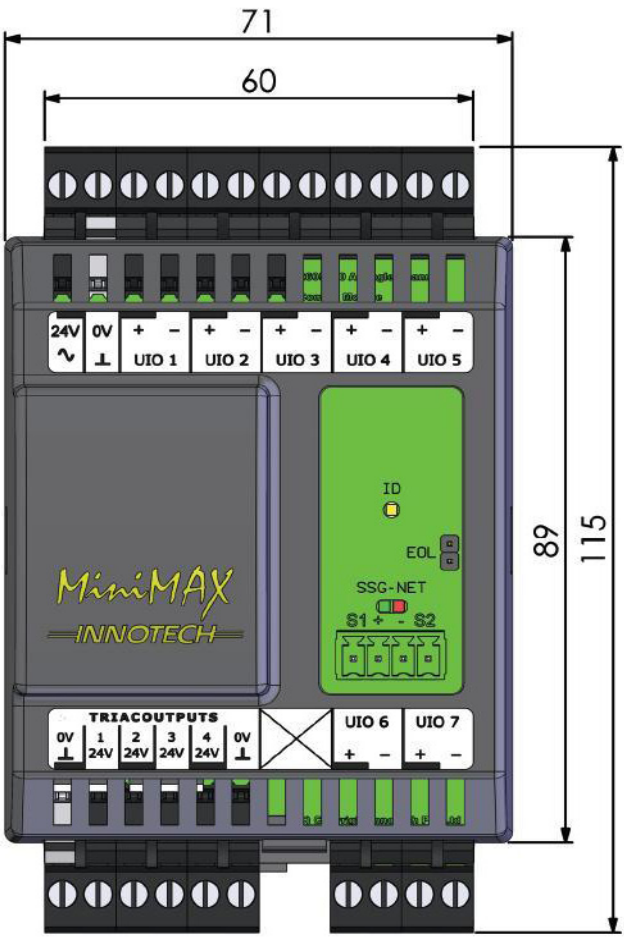
Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Modifications to this device, may void the authority granted to the user by the FCC to operate this equipment.

MiniMAX Dimensional Diagram

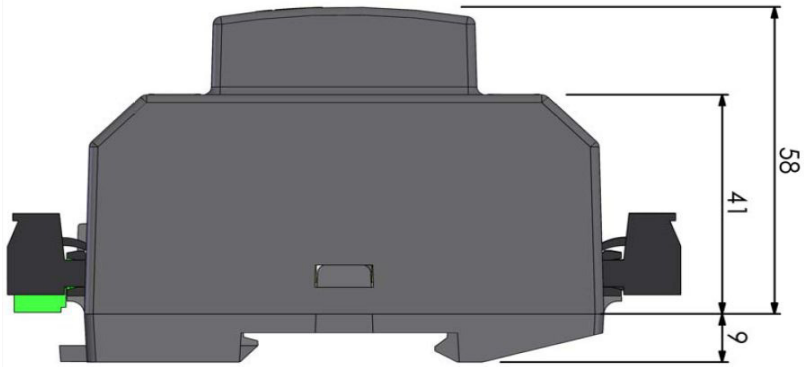
MM01



MM02



MM01 and MM02



INNOTECH®

Australian Owned, Designed & Manufactured
by Mass Electronics Brisbane

Phone: +61 7 3421 9100 **Fax:** +61 7 3421 9101
Email: sales@innotech.com.au www.innotech.com.au

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