

Reliable Controls MACH-System

# Reliable controls

...people and technology you can rely on™

BACNET® LISTED DEVICE

MOUNTS DIRECTLY TO EQUIPMENT OR IN ENCLOSURE

FULLY PROGRAMMABLE, AND NETWORKABLE LARGE SYSTEM CONTROLLER

EXPANDABLE TO 32 INPUTS AND 32 UNIVERSAL OUTPUTS CONFIGURED BY USER

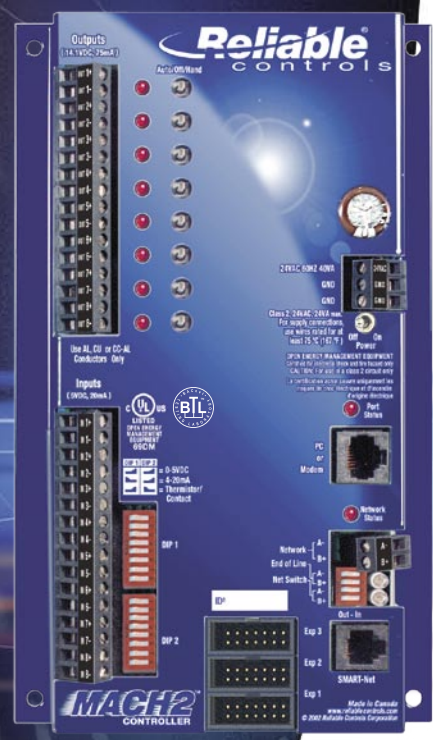
EASY TO WIRE 45 DEGREE REMOVABLE CONNECTORS

HAND/OFF/AUTO SWITCHES WITH FEEDBACK

ROBUST POWDER-COATED STEEL PACKAGE

5 YEAR WARRANTY

## MACH2™ SYSTEM CONTROLLER



The Reliable Controls® MACH2™ controller is an excellent solution for large rooftop and mid-sized mechanical room applications, and ships with the Reliable Controls® **industry best** 5 year warranty.



The Reliable Controls® MACH2™ is a high-performance, fully programmable and expandable BACnet® listed controller. The MACH2™ controller features 8 universal inputs and 8 universal outputs, and can be expanded into a 32-in/32-out controller. The controller is ideal for large rooftop or mid-sized mechanical room applications. The MACH2™ ships standard with removable connectors, proportional output status LEDs, and support for 16 SMART-Sensor™ LCDs.

### TECHNICAL SPECIFICATION

#### Processor

- 40 MHz, high-performance
- 16-bit embedded microcontroller

#### Memory

- 512k NV RAM user database
- 128k Flash EEPROM operating system firmware and controller configurations

#### Supply Voltages

- 24 VAC/VDC, 24 VA max.

#### Communications

- EIA-485 @ 76.8 kbps max.
- EIA-232 PC or Modem
- SMART-Net™ (16 SMART-Sensors™ max.)

#### Universal Inputs

- 8 universal inputs
- 10 bit A/D converter
- Analog: 0-5 VDC, 4-20 mA, thermistor
- Digital: dry contact
- Impedance: 15k Ω on 0-5 VDC range 250 Ω on 4-20 mA range 10k Ω on thermistor range
- 40 Hz pulse counting (supports flow meters)
- 24 VAC over voltage protection

#### Universal Outputs

- 8 universal outputs
- 8 bit D/A converter

- Analog: 0-12 VDC
- Digital: 0-12 VDC
- Manual ON provides 14.1 VDC
- LED indicator (glows proportionally)
- Output power: 75 mA @ 12 VDC
- 24 VAC over voltage and short protection

#### Real-Time Clock

- ±1 second per day

#### Memory/RTC Backup

- 72 hour capacitor backup
- Optional battery backup for 1 year lithium (offline)

#### Dimensions

- 21.5 cm L x 14 cm W x 3.81 cm H (8.5" L x 5.5" W x 1.5" H)

#### Mounting

- #6 clearance holes on 20.3 cm L x 12.3 cm W (8" L x 4.8" W)

#### Weight

- 0.4 kg (1.0 lb.)

#### Ambient Limits

- Operating: 0 °C to 40 °C (32 °F to 104 °F)
- Shipping: -20 °C to 60 °C (-40 °F to 140 °F)
- Humidity: 10% to 90% RH non-condensing

### FEATURES

#### Protocol

- BACnet®
  - MS/TP (EIA-485)
  - PTP (EIA-232)
- Reliable Controls®
  - Network (EIA-485/Token Bus)
  - PC & Modem (EIA-232)

#### 8 Control-BASIC™ Programs

- User programmable control strategy in a readable, BASIC-like language
- 2500 bytes per program

#### 8 Inputs

- Universal ranges
- DIP switch selectable 0-5 VDC, 4-20 mA, thermistor/dry contact

#### 8 Outputs

- Universal ranges
- Expandable to 32 outputs using MACH2™ expansion cards
- Optional switch control (Hand/Off/Auto)
- HOA position feedback to RC-Studio®

#### 128 Variables

- Selectable standard and custom ranges, as well as fixed or program-driven values

#### 32 PID Controllers

- Standard P, PI, or PID controllers for closed loop control

#### 32 Trend Logs

- Each trend log stores 255 samples of 6 points at programmable time intervals

#### 64 Runtime Logs

- Totals the on time and records the on/off times of a digital point
- Holds 200 samples

#### 32 System Groups

- Allows related points to be grouped on to one display
- 160 points/group

#### 16 Weekly Schedules

- 4 on/off times for each weekday and 2 override days

#### 8 Annual Schedules

- Days of the year designated as holidays

#### 16 Variable Arrays

- Up to 128 elements in a one-dimensional array

#### 128 User Passwords

- Protects access to system
- Each user is assigned a user name and an access level

#### 5 Custom Tables

- For creating custom input ranges

#### 16 Custom Units

- 8 analog engineering units
- 8 digital engineering units

#### SMART-Net™ Port

- Networks up to 16 SMART-Sensors™

#### 127 Network In Points

#### 127 Network Out Points

#### Real-Time Clock

#### Warranty

- 5 years

#### Certification

- BTL listed to ASHRAE Standard 135
- ISO 16484-5
- UL listed 916
- UUKL Pending

### ORDERING

#### M2 (base model)

- MACH2™ with 8 Universal Inputs and 8 Universal Outputs

#### M2-HC

- Base model with HOA switches

#### M2-B

- Base model with battery

#### M2-HC-B

- Base model with HOA switches and battery

### APPLICATION DIAGRAM

