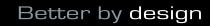# Reliable controls ®

Perennial performance

Destined to be a workhorse of the industry, the Reliable Controls® MACH-Pro1 is a rugged, flexible and fully programmable BACnet Building Controller (B-BC) ideal for mid-sized rooftop equipment or small mechanical room applications.

Better by design

TECH SPECS

Processor
- 100 MHz, high-performance, 32-bit embedded microcontroller

Memory
- 8 MB operating RAM
- 1 MB non-volatile RAM (trends and dynamic values)
- 4 MB Flash EEPROM operating system, database, and controller configuration

Supply Voltages
- 24 VAC ±10%, 75 VA max. 50/60 Hz
- 24 VDC ±10% 26 W max.

Communications
- 1 EIA-485 @ 76.8 kbps max. Auto-baud detection
- 1 EIA-232 @ 115.2 kbps max. PC or modem
- SMART-Net port @ 8 sensors max.

Universal Inputs
- 12 universal inputs
- 12-bit A/D converter
- Analog: 0–10 VDC, 4–20 mA, thermistor
- Binary: dry contact
- Impedance:
  1M Ω for 0–10 VDC range
  250 Ω for 4–20 mA range
  20k Ω pull-up for thermistor/dry contact range
- Pulse counting up to 150 Hz (supports flow meters)
- 24 VAC over-voltage protection

8 Outputs
- 12-bit D/A converter
- Analog: 0–12 VDC
- Binary: 0/12 VDC
- Manual ON provides adjustable 0–12 VDC (HOA model only)
- LED indicator (glows proportionally)
- Output power: 75 mA @ 12 VDC
- 24 VAC over-voltage and short protection

Peripheral Power
- Onboard variable 15–24 VDC power supply providing up to 200 mA of DC power to peripheral devices
  (if powered by 24 VDC, the maximum voltage output is 22 VDC)

Real-Time Clock
- ±1 second per day

Memory/RTC Backup
- 72 hour backup
- 10 years for database

SETUP-Tool™
- SETUP-Tool optional for configuration

Dimensions
- 25.4 cm L x 13.7 cm W x 3.9 cm H (10" L x 5 3/8" W x 1 1/2" H)

FEATURES

Protocol
- BACnet®
  - MS/TP and PTP

12 Inputs
- Universal ranges
- Jumper selectable 0–10 VDC, 4–20 mA, thermistor/dry contact

8 Outputs
- Universal ranges
- Optional HOA (Hand/Off/Auto) switches
- HOA position feedback to RC-Studio®

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

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

8 Schedules
- 14 On/Off times for each weekday or exception

4 Calendars
- Days of the year designated as holidays

10 Custom Tables
- For creating custom scaling functions

16 System Groups
- Allows related points to be grouped on to one display
- 80 points/group

16 Control-BASIC™ Programs
- User programmable control strategy in a readable, BASIC-like language
- 3200 bytes per program

Trend Logs
- Each Trend Log stores up to 8 points
- Values recorded at user-defined intervals
- Dynamically assigned

Runtime Logs
- Totals the On time and records the On/Off times of every binary point
- Holds 200 events
- Dynamically assigned

128 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

24 Custom Units
- 8 analog engineering units
- 8 binary engineering units
- 8 multistate units

SMART-Net™ Port
- Networks up to 8 SMART-Sensors

Real-Time Clock

Warranty
- 5 years

Certification
- BTL Listed (B-BC)
- UL916 Listed
- FCC CFR 47 Part15/B
- CE

Mounting
- #8 clearance holes on 23.0 cm L x 11.0 cm W (9 1/16" L x 4 5/16" W)
- Screw depth 25 mm (1")

Weight
- 0.6 kg (1.3 lb)

Ambient Limits
- Operating: -20 °C to 55 °C (-4 °F to 131 °F)
- Shipping: -40 °C to 60 °C (-40 °F to 140 °F)
- Humidity: 10% to 90% RH non-condensing

ORDERING

MP1
- MACH-Pro1 controller

MP1-H
- MACH-Pro1 controller with HOA (Hand/Off/Auto) switches and potentiometer overrides for each output

ACCESSORIES

MPP-IO-DL
- Door label sheet for MP-S, MP-S-H, MPW-S, MPW-S-H, MPP-IO, MPP-IO-H, MP1, MP1-H, MP2, and MP2-H

Designed and Manufactured in Canada

PC or Modem

SMART-Sensor LCD

Network to other controllers

MACH-ProZone™

Power 24 VAC/VDC

12 - Inputs

8 - Outputs

MACH-Pro1 controller