



MACH-ProWebCom™

Web Enabled Controller

# Web server. Simplified.

Publish your building automation system to the Web quickly and easily with the Reliable Controls® MACH-ProWebCom™. The first 3-in-1 device of its kind, the MACH-ProWebCom™ combines a BTL-listed BACnet Building Controller (B-BC), a BTL-listed BACnet Operator Workstation (B-OWS), and a powerful web server, all in a single package with an installed footprint of a typical building controller.



## TECH SPECS

### Processor

- 147 MHz\*, high-performance, 32-bit embedded microcontroller

### Memory

- 8 MB operating RAM
- 1 MB non-volatile RAM (trends and dynamic values)
- 256 MB\* Flash EEPROM operating system, database, JavaScript, graphics, and controller configuration

### Supply Voltages

- 24 VAC  $\pm 10\%$  20 VA max. 50/60 Hz
- 24 VDC  $\pm 10\%$  4 W max.

### Communications

- IEEE 802.3 Ethernet 10/100 BaseT
- 2 EIA-485 @ 76.8 kbps max.
- 1 EIA-232 115.2 kbps max. PC or modem
- SMART-Net port @ 16 sensors max.

### Browser Support

- IE 8, Firefox 3, Chrome 5, Safari 5, or greater
- JavaScript must be enabled on client
- Flash required for animations and flood fill

### Expansion Modules

- Up to 8 MACH-ProPoint™ expansion modules

### Real-Time Clock

- $\pm 1$  second per day

### Memory/RTC Backup

- 72 hour backup
- 10 years for database

### Wiring Terminals

- 12 to 22AWG (2.5 mm<sup>2</sup> to 0.14 mm<sup>2</sup>)
- Stranded or solid core
- Copper conductors only

### Dimensions

- 15.2 cm L x 13.7 cm W x 3.9 cm H (5 <sup>15</sup>/<sub>16</sub>" L x 5 <sup>3</sup>/<sub>8</sub>" W x 1 <sup>1</sup>/<sub>2</sub>" H)

### Mounting

- #8 clearance holes on 12.7 cm L x 11.0 cm W (5" L x 4 <sup>5</sup>/<sub>16</sub>" W)
- Screw depth 25 mm (1")

### Weight

- 0.25 kg (0.6 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

## FEATURES

### Protocol

- BACnet®
  - B/IP x 2, Ethernet, MS/TP, and PTP
- HTTP/1.1
  - Hyper Text Transfer Protocol
- Reliable Controls Protocol
  - Backward compatibility with previous generation systems
- Modbus
  - Supports both RTU and TCP in master and slave configurations
- SMTP
  - Provides standard email communications for broadcasting email alarms
- SMS
  - GSM/GPRS modem
- SNMP
  - Simple Network Management Protocol

### Inputs and Outputs

- Up to 8 MACH-ProPoint™ expansion modules
- Maximum possible inputs of 128
- Maximum possible outputs of 128

### 256 Variables

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

### 64 PID Loops

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

### 32 Weekly Schedules

- 4 On/Off times for each weekday and 2 override days
- BACnet schedules supported

### 8 Annual Schedules

- Days of the year designated as holidays
- BACnet calendar supported

### 20 Custom Tables

- For creating custom scaling functions

### 64 System Groups

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

### 128 Control-BASIC™ Programs

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

### 96 Trend Logs

- Each Trend Log stores 512 samples and up to 6 points
- Values recorded at user defined intervals
- BACnet Trend Logs supported
- RC-Archive® data visible in browser

### 128 Runtime Logs

- Totals the On time and records the On/Off times of a binary point
- Holds 200 events

### 128 User Passwords

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

### 16 Custom Units

- 8 analog engineering units
- 8 digital engineering units
- 8 multistate units with 8 states, 32 characters each

### Graphic Files

- Supports GIF, TIFF, JPG, PNG, and SWF

### SMART-Net™ Port

- Networks up to 16 SMART-Sensors™

### Real-Time Clock

#### Warranty

- 5 years

#### Certification

- BTL Listed (B-OWS)
- BTL Listed (B-BC)
- UL 916 Listed
- FCC CFR 47 Part 15/B
- CE

## ORDERING

### MPW-C

- MACH-ProWebCom™ controller/Web server

## ACCESSORIES

### MPP-IO

- MACH-ProPoint™ I/O expansion module with 12 universal input and 8 outputs

### MPP-IO-H

- MPP-IO with HOA (Hand/Off/Auto) switches and pot adjust

### MPP-IO-DL

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

### MPP-I

- MPP Input expansion module with 24 universal inputs

### MPP-I-DL

- Door label sheet for MPP-I

### MPP-O

- MACH-ProPoint™ Output expansion module with 16 outputs

### MPP-O-H

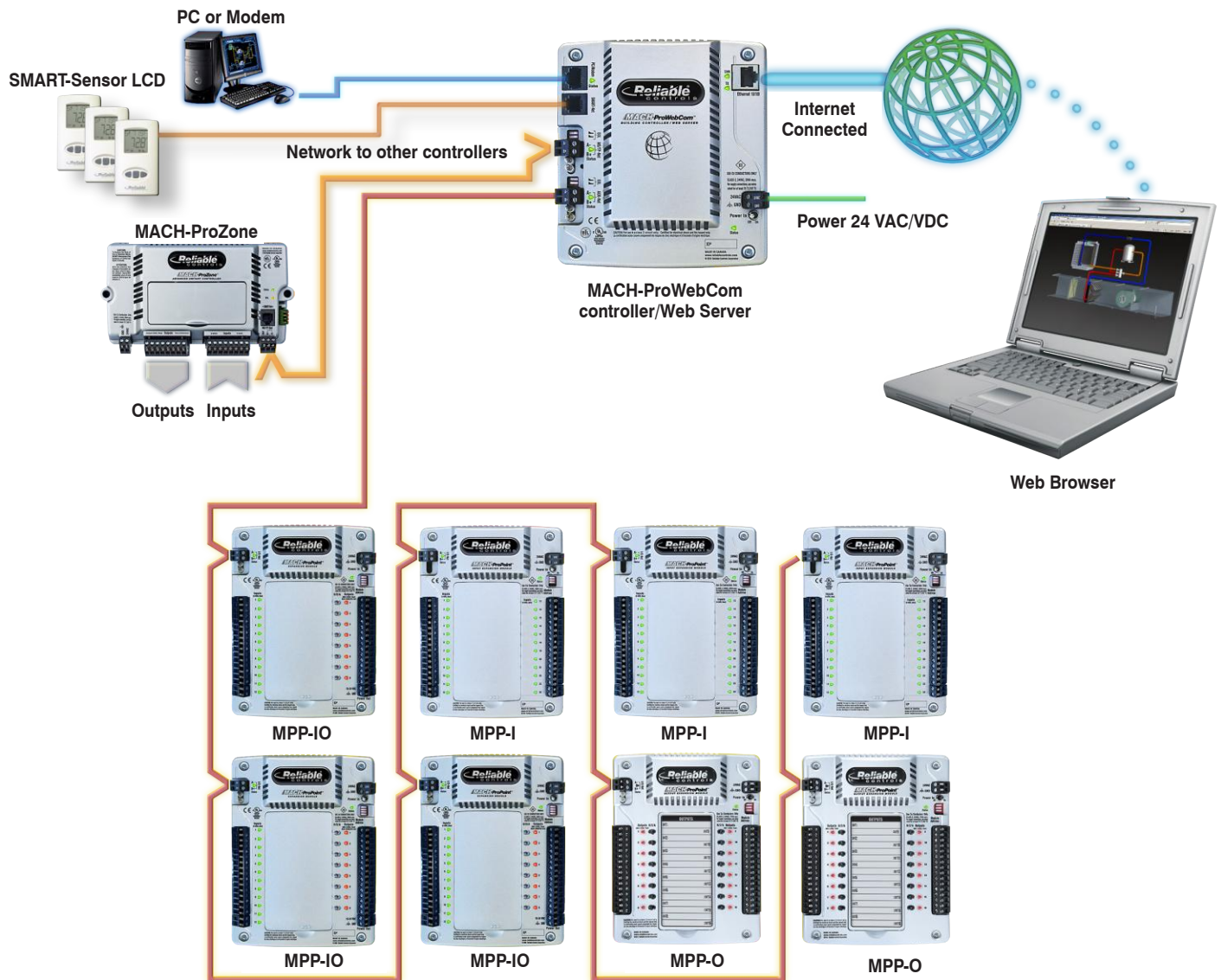
- MPP-O with HOA (Hand/Off/Auto) switches and pot adjust

### MPP-O-DL

- Door label sheet for MPP-O

\* Rev F and greater: previous revisions were 100 MHz and had 128 MB EEPROM

**APPLICATION DIAGRAM**



Connect up to 8 MACH-ProPoint expansion modules (MPP-IO, MPP-O and/or MPP-I) with a maximum input count of 128, and a maximum output count of 128 per controller. Expansion modules are daisy-chained to the I/O-Net port of the controller in any combination while limiting the total inputs, outputs, and modules below maximum.





The Reliable Controls® MACH-ProWeb™ combines the field controller, configurable Web server, and browser driven workstation into a single device which is simple to use, flexible to engineer, and highly economical.

## FIELD CONTROLLER

Program the MACH-ProWeb™ point database, Control-BASIC sequence, and graphics just as you would for any other Reliable Controls® product. The MACH-ProWeb™ is a fully functional BACnet Building Controller (B-BC).

**5000S MACH-ProWeb - Inputs**

Input Name	Value	Auto/Man	Range	Calibration	Average	D	Alarm	Label	Object
1 ACS-SAT	20.8°C	Auto	10K-40 >120	0.1000064					AI1
2 ACS-MAT	22.3°C	Auto	10K-40 >120	0.3000064					AI2
3 ACS-RAT	24.8°C	Auto	10K-40 >120	0.1000064					AI3
4 ACS-SFA	8.8Amps	Auto	0.0 >100	0.0064					AI4
5 ACS-RFA	7.8Amps	Auto	0.0 >100	0.0064					AI5
6 ACS-SPARE	0.0	Auto	Unused	0.0064			Y		AI6
7 ACS-SAT	21.1°C	Auto	10K-40 >120	0.1000064					AI7
8 ACS-MAT	22.7°C	Auto	10K-40 >120	0.3000064					AI8
9 ACS-RAT	24.5°C	Auto	10K-40 >120	0.2000064					AI9
10 ACS-SFA	6.4Amps	Auto	0.0 >100	0.0064					AI10
11 ACS-RFA	4.7Amps	Auto	0.0 >100	0.0064					AI11
12 ACS-SPARE	0.0	Auto	Unused	0.0064			Y		AI12
13	0.0	Auto	Unused	0.0064			Y		AI12

**5000S MACH-ProWeb - Outputs**

Output Name	Value	Auto/Man	Switch	Range	QC	100% Delay	Min. Off	Min. On	S	D	Alarm	Label	Program	In Service	Obj
1 HTG-P2	Start	Auto	Auto	Stop/Start									13	Yes	BO1
2 HTG-P2	Stop	Auto	Auto	Stop/Start									16	Yes	BO2
3 HTG-P3	Start	Auto	Auto	Stop/Start									17	Yes	BO3
4 HTG-P4	Start	Auto	Auto	Stop/Start									18	Yes	BO4
5 HTG-B1-ENA	Enabled	Manual	Auto	Disabled/Enable									System	Yes	BO5
6 HTG-B2-ENA	Enabled	Auto	Auto	Disabled/Enable									15	Yes	BO6
7 HTG-SEC-V	11.1 %	Auto	Auto	0.0 >100%	0.001	10.00							14	Yes	AO7

**5000PRGS MACH-ProWeb - Control-BASIC**

Program Name	Run/ Auto/Man	Timer	Time	Left	Size	Exit	Label
1 FC1-PRG1	Yes Auto	Enabled		2472	No		
2 FC1-PRG	Yes Auto	Enabled		1285	No		
3 CALLS	Yes Auto	Enabled		209	No		

**System Tree**

- MACH-ProSys (2000)
  - MACH-ProWeb (5000)
    - Object List
    - System Groups
    - Inputs
    - Outputs
    - Variables
    - PID-Loops
    - Schedules
    - Calendars
    - Multi-point Trend Logs
    - Single-point Trend Logs
    - Notification Classes
    - Programs
    - RCP Weekly Schedules
    - RCP Trend Logs
    - RCP Runtime Logs
    - Arrays
    - Tables
    - SMART-Sensors
    - MACH-Stat (5001)
    - MACH-Stat (5002)
    - MACH-Stat (5003)
    - MACH-Air (5004)
    - MACH-Air (5006)
    - MACH-Air (5007)
    - MACH-Air (5008)
    - MACH-Air (5009)
    - MACH-Air (5010)
- BACnet

Right-click to access MACH-ProWeb Tools

- ✓ Large Icons
- ✓ Show Icons
- Font Options
- ✓ Allow docking
- Hide
- Refresh System
- Panel File
- Sign-On Log
- Sort
- ReInitialize Device
- Load Descriptors
- Manual Points Report
- Initialize Point Sharing
- MACH-ProWeb Tools
  - Web Users
  - Tree Builder
- BACnet Advanced Properties..

## WEB SERVER

Using the MACH-ProWeb™ Tools in RC-Studio® 2.0, it is extremely simple to select and post resource files to the MACH-ProWeb™ and manage future changes.

**MACH-ProWeb - Tree Builder**

To make a custom tree for the MACH-ProWeb interface, drag and drop any of the following items into Tree Builder: System Groups, Schedules, Trend Logs, Runtime Logs and Alarms. Items within the tree can be renamed to any name and relocated anywhere on the main tree or within custom folders nested two deep. Click the Send button to post your completed tree to the MACH-ProWeb.

- Main
- Rooftop Summary
- SMT-Room
- Security System
- Optimal Start-Stop
- AC Units
- Floors
- VAVs
- Alarms
- Schedules
- Calendars
- Trend Logs
- Runtime Logs

Send Add Folder Close

With the MPW Tree Builder, drag and drop graphics and objects to make your own customized navigation tree.

**MACH-ProWeb - Resource Manager**

Refresh Settings

**Selected Workstation Resources**

- Support Files
- Resource Files
  - 1GRP1 - MAIN-MENU
  - 1GRP2 - MECHANICAL-SUMMARY
  - 1GRP3 - Upper VAV Summary
  - 1GRP4 - AC-1 Upper Interior
  - 1GRP5 - AC-2 Upper Exterior
  - 1GRP6 - AC-3 Production
  - 1GRP7 - AH-1 Lwr Fir OA
  - 1GRP8
  - 1GRP9 - Exhaust Fan Summary
  - 1GRP10
  - 1GRP11 - Production Floorplan

**Resources on MACH-ProWeb**

- Support Files
- Resource Files
  - 1GRP1 - MAIN-MENU
  - 1GRP2 - MECHANICAL-SUMMARY
  - 1GRP3 - Upper VAV Summary

Used Space 15,332,764 bytes 14.62 MB  
Free Space 244,714,077 bytes 233.57 MB  
Total Capacity 260,046,848 bytes 248.24 MB

The operation was canceled.

Drag and drop selected PC workstation resources using the MPW Resource Manager.

MACH-ProWeb Tools

- Resource Manager
- Web Users
- Tree Builder

With the MPW Web Users tool, assign public and private Web users with complete permission control.

**5000MPWPDWS MACH-ProWeb - Web Users**

User Name	Password	Level	Group	Permissions	Enable
1 Public	*****	3	MAIN-MENU	Permissions	<input type="checkbox"/>
2 Bob	*****	3	MAIN-MENU	Permissions	<input type="checkbox"/>
3 Doug	*****	6	MAIN-MENU	Permissions	<input type="checkbox"/>
4 Tom	*****	6	MAIN-MENU	Permissions	<input type="checkbox"/>
5 Roland	*****	7	MAIN-MENU	Permissions	<input type="checkbox"/>
6 Robin	*****	6	MAIN-MENU	Permissions	<input type="checkbox"/>
7 Levi	*****	6	MAIN-MENU	Permissions	<input type="checkbox"/>
8 Kent	*****	1	MAIN-MENU	Permissions	<input type="checkbox"/>
9 Richard	*****	6	MAIN-MENU	Permissions	<input type="checkbox"/>
10 Robert	*****	9	MAIN-MENU	Permissions	<input type="checkbox"/>
11	*****	3	MAIN-MENU	Permissions	<input type="checkbox"/>

Mode Print Abort Close Import

**User Permissions**

<input checked="" type="checkbox"/> Change End-User Values	<input checked="" type="checkbox"/> Change Arrays
<input checked="" type="checkbox"/> Change Operator Values	<input checked="" type="checkbox"/> Change System Date and Time
<input checked="" type="checkbox"/> Change Auto/Manual	<input checked="" type="checkbox"/> Change Advanced BACnet
<input checked="" type="checkbox"/> Change Inputs	<input checked="" type="checkbox"/> Must Enter Change Reason
<input checked="" type="checkbox"/> Change Outputs	<input checked="" type="checkbox"/> Acknowledge Alarms
<input checked="" type="checkbox"/> Change Variables	<input checked="" type="checkbox"/> View Alarms
<input checked="" type="checkbox"/> Change PID Loops	<input checked="" type="checkbox"/> View Audit Trail
<input checked="" type="checkbox"/> Change Weekly Schedules	<input checked="" type="checkbox"/> View Online Help
<input checked="" type="checkbox"/> Change Special Events	<input checked="" type="checkbox"/> Show Tree
<input checked="" type="checkbox"/> Change Calendars	<input checked="" type="checkbox"/> Display Logon for Public user
Auto Log Off 15 min.	

OK Select All Unselect All Cancel

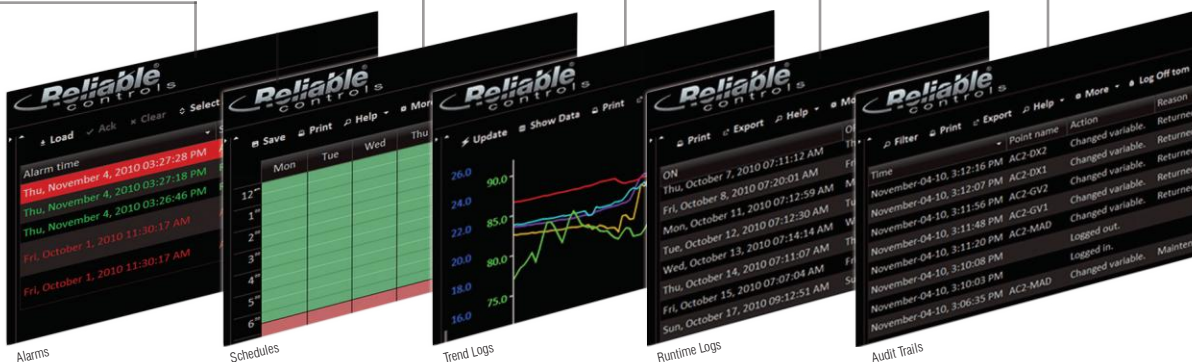
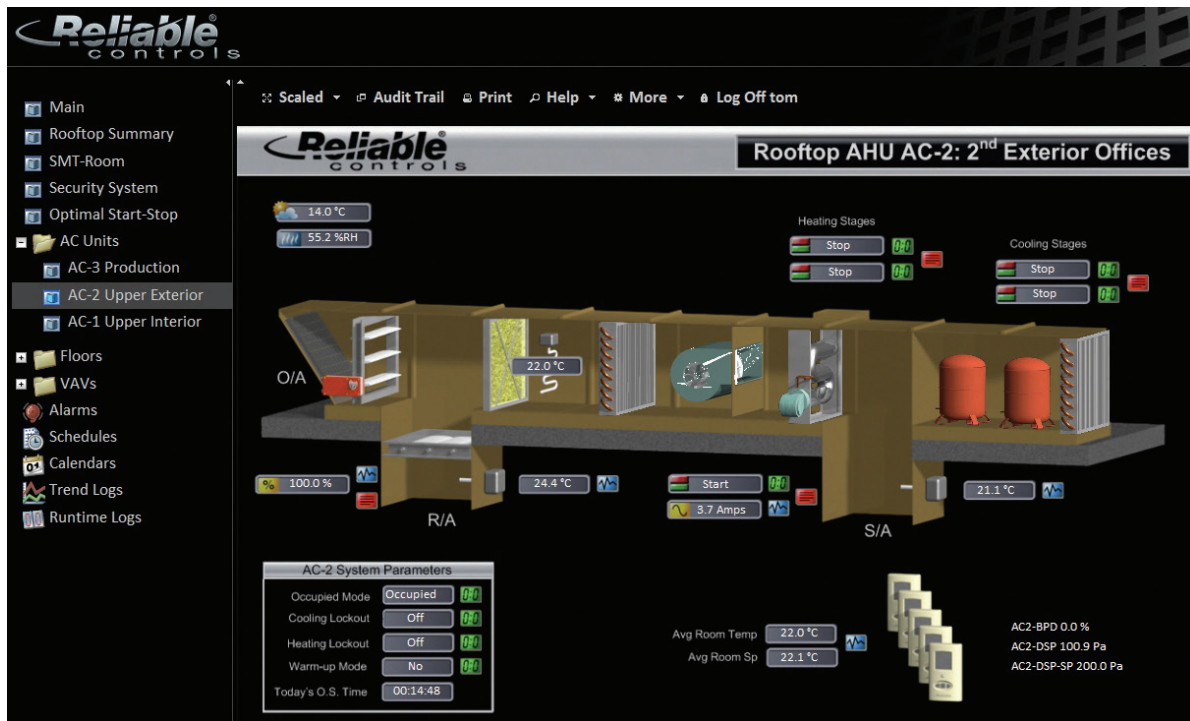
## WORKSTATION

The MPW interface provides total functionality required for day-to-day building operations, and is a BTL-listed BACnet Operator Workstation (B-OWS). Using a standard browser (IE 8, Firefox 3, Chrome 5, Safari 5, or greater) on a PC or Mac, enter the URL of the MACH-ProWeb™ and navigate through the system to access and print point values, alarms, schedules, trend logs, runtime logs, and audit trails.



Public users can access the MACH-ProWeb™ URL and associated system graphics assigned for public views.

Private users log in with credentials.



The MACH-ProWeb™ is the first three-in-one device of its kind, combining B-BC, B-OWS, and Web server capabilities into a single package with an installed footprint of a typical building controller.