**Mx-MTB**

**HVAC CONTROL BOARD**

**DESCRIPTION**

The Magnum HVAC Control Board (Mx-MTB) has the ability to control fan coil units, PTAC units, heat pumps, up to two cool and three heat. The Mx-MTB uses wireless communication to provide quick and easy implementation of the energy-saving HVAC controls. When the Mx-MTB receives an “occupied” signal from any of Magnum's wireless sensors (including Mx-RPW), the user immediately gains full control of the HVAC settings. When the Mx-MTB receives an “unoccupied” signal, it sets the room back to the preset unoccupied temperature. When used with Magnum's Gateway, the thermostat can also be connected to BACNet HVAC control systems.

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Part Numbers (Frequency Dependent)</th>
<th>M9-MTB (902 MHz - North America)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M8-MTB (868 MHz - Europe and China)</td>
</tr>
<tr>
<td></td>
<td>MJ-MTB (928 MHz - Japan)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>50 ft-150 ft typical</td>
</tr>
<tr>
<td><strong>Input Voltage</strong></td>
<td>24 VAC</td>
</tr>
<tr>
<td><strong>Max Loads</strong></td>
<td>24V (1.5 amp/circuit)</td>
</tr>
<tr>
<td><strong>Temperature Monitor Range</strong></td>
<td>32°F to 99.9°F (0°C to 37.7°C)</td>
</tr>
<tr>
<td><strong>Temperature Set Point Range</strong></td>
<td>60°F to 85°F(15.5°C to 29.5°C)</td>
</tr>
<tr>
<td><strong>Operating Environment</strong></td>
<td>14°F to 131°F (-10°C to 55°C) Non Condensing Humidity</td>
</tr>
<tr>
<td><strong>Storage Environment</strong></td>
<td>-4°F to 131°F (-20°C to 55°C) Non Condensing Humidity</td>
</tr>
<tr>
<td><strong>Fan Control</strong></td>
<td>Selectable: Auto Cycle, Low, Medium, High, Economy, Off</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>Stores up to 30 Device IDs</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>+/- 1°F (0.5°C)</td>
</tr>
<tr>
<td><strong>Heat / Cool Control</strong></td>
<td>• Compressor  • Auxiliary Heat</td>
</tr>
<tr>
<td></td>
<td>• Reversing Valve  • Low Fan</td>
</tr>
<tr>
<td></td>
<td>• Medium Fan      • High Fan Relays</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>3” W x 4.25” L x 0.875” H (76.2 mm W x 107.95 mm L x 22.225 mm H)</td>
</tr>
<tr>
<td><strong>Radio Certifications</strong></td>
<td>TCM300U  FCC (SZV-STM300U); IC (Canada 5713A-STM300U)</td>
</tr>
</tbody>
</table>

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Mx-MTB
HVAC CONTROL BOARD

CONNECTION OVERVIEW

COMPATIBLE DEVICES
- Mx-RPW (Room Control Panel / Occupancy Sensor)
- Mx-MRC1 (Window / Door Sensor)
- Mx-EDWS (Window / Door Sensor)
- Mx-EKCS (Key Card Reader)
- Mx-KC1 (Key Card Reader)
- Mx-ML2 (Motion / Lux Sensor)
- Mx-EOSC (Motion / Lux Sensor)
- Mx-EOSW (Motion / Lux Sensor)
- Mx-RTS1 (Single Channel Remote Temp Sensor)
- Mx-RTHS1 (1 Channel Remote Temp / rH Sensor)
- Mx-RTS3 (Three Channel Remote Temp Sensor)
- Mx-RTS1-SP (Single Channel Remote Temp Sensor with Set Point Dial)
- Mx-RTHS1 (1 Channel Remote Temp / rH Sensor with Set Point Dial)

APPLICATIONS
- Hotels & Resorts
- Colleges & Universities
- New Construction
- Executive Offices
- Perimeter Zones
- Daylight Harvesting
- Restrooms
- Private Offices
- Retrofits
- Conference Rooms
- Lighted Hallways
- Cruise Ships
- Classrooms
- Daycare Facilities

Thermistor: To be placed in return air stream
**Mx-MTB**  
**HVAC CONTROL BOARD**

**ADDITIONAL AVAILABLE MTB1 WIRED CONNECTIONS**

<table>
<thead>
<tr>
<th>Name</th>
<th>Signal</th>
<th>Type</th>
<th>Connections</th>
<th>Allowable Usage (Must be so configured)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB</td>
<td>NO, NC Dry Contact</td>
<td>SB - COM</td>
<td></td>
<td>Wired Entry Door Switch, Wired Motion Sensor</td>
</tr>
<tr>
<td>SD</td>
<td>NO, NC Dry Contact</td>
<td>SD - COM</td>
<td></td>
<td>Wired Balcony Door, Wired Window Sensor</td>
</tr>
<tr>
<td>RMT1</td>
<td>10K Thermistor, Type 2</td>
<td>RMT1 - COM</td>
<td></td>
<td>Pipe Temperature Sensor (Aquastat), Return Air Temperature Sensor, Supply Air Temperature Sensor, Outdoor Temperature Sensor</td>
</tr>
<tr>
<td>RMT2</td>
<td>10K Thermistor, Type 2</td>
<td>RMT2 - COM</td>
<td></td>
<td>Pipe Temperature Sensor (Aquastat), Return Air Temperature Sensor, Supply Air Temperature Sensor, Outdoor Temperature Sensor</td>
</tr>
<tr>
<td>RTN AIR</td>
<td>10K Thermistor, Type 2 (Provided)</td>
<td>Required</td>
<td>RTN AIR - COM</td>
<td>Required Return Air Temperature Sensor, Required for Any and All Configurations, Not Configurable</td>
</tr>
<tr>
<td>CH1</td>
<td>0-10V Assignable Output</td>
<td>Analog</td>
<td>CH1 - COM</td>
<td>Function and Polarity are Assignable Using AirConfig</td>
</tr>
<tr>
<td>CH2</td>
<td>0-10V Assignable Output</td>
<td>Analog</td>
<td>CH2 - COM</td>
<td>Function and Polarity are Assignable Using AirConfig</td>
</tr>
<tr>
<td>CH3</td>
<td>0-10V Assignable Output</td>
<td>Analog</td>
<td>CH3 - COM</td>
<td>Function and Polarity are Assignable Using AirConfig</td>
</tr>
</tbody>
</table>

*Notes: All “COM” terminals are electrically connected to the “C” power connection.*

**NOTE:** The MTB requires the return air sensor (included) to be connected for ALL configurations. It is NOT optional. The MTB will not operate without it being connected and it should be located in a return air stream.
Mx-MTB
HVAC CONTROL BOARD
24 VAC CONNECTIONS FOR MX-MTB1 CONTROLLER

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
FAN COIL, 4 PIPE
LOW SPEED FAN
MEDIUM SPEED FAN
HIGH SPEED FAN
COLD WATER VALVE
24 VAC HOT
24 VAC COMMON
HOT WATER VALVE

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
FAN COIL, 2 PIPE
LOW SPEED FAN
MEDIUM SPEED FAN
HIGH SPEED FAN
WATER VALVE
24 VAC HOT
24 VAC COMMON
UNUSED

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
FC, 2 PIPE, AUX HEAT
LOW SPEED FAN
MEDIUM SPEED FAN
HIGH SPEED FAN
WATER VALVE
24 VAC HOT
24 VAC COMMON
AUX HEAT

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
FC, 2 PIPE, VALVELESS
LOW SPEED FAN
MEDIUM SPEED FAN
HIGH SPEED FAN
UNUSED
24 VAC HOT
24 VAC COMMON
UNUSED

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
HP11, 1H, 1C
LOW SPEED FAN
REVERSING VALVE
COMPRESSOR
24 VAC HOT
24 VAC COMMON
UNUSED

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
HP12: 1C, 2H
LOW SPEED FAN
REVERSING VALVE
COMPRESSOR
24 VAC HOT
24 VAC COMMON
SECOND STAGE HEAT

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
HP22: 2C, 2H
FAN
STAGE 2 CP
REVERSING VALVE
STAGE 1 CP
24 VAC HOT
24 VAC COMMON
UNUSED

MTB1 PCB
FAN1
FAN2
FAN3/RV
RC
C
W1
RH
HP23: 2C, 3H
FAN
STAGE 2 CP
REVERSING VALVE
STAGE 1 CP
24 VAC HOT
24 VAC COMMON
AUX HEAT

AH11, 1H, 1C
LOW SPEED FAN
MEDIUM SPEED FAN
HIGH SPEED FAN
REVERSING VALVE
COMPRESSOR
24 VAC HOT
24 VAC COMMON
HEAT

AH11, 1H, 1C, 2 XFMR
LOW SPEED FAN
MEDIUM SPEED FAN
HIGH SPEED FAN
REVERSING VALVE
COMPRESSOR
24 VAC #1 HOT
24 VAC COMMON
HEAT

AH21: 2C, 1H (RV)
FAN
STAGE 2 CP
UNUSED OR RV
STAGE 1 CP
24 VAC HOT
24 VAC COMMON
HEAT

AH22: 2C, 2H
FAN
STAGE 2 CP
STAGE 2 HEAT
STAGE 1 CP
24 VAC HOT
24 VAC COMMON
STAGE 1 HEAT

ALL 2-PIPE FAN COILS REQUIRE A PIPE TEMPERATURE SENSOR. SOME AC UNIT CONTROLLERS REQUIRE A REVERSING VALVE INPUT.
FC = FAN COIL, HP = HEAT PUMP, AC = COMPRESSOR BASED COOLING, AUX HEAT = ELECTRIC STRIP OR FOSSIL FUEL
UNUSED CONNECTIONS ARE TO REMAIN UNCONNECTED.
NOTE: THE RC-RH JUMPER IS ON THE MTB PC BOARD ITSELF AND IS NORMALY POPULATED. TO ACCESS AND
CUT THAT JUMPER, THE BOARD MUST BE REMOVED FROM THE CASE. USE FLUSH CUTTING PLIERS.

Magnum Innovations
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