

# Converter with Bluetooth® Wireless Technology (BTCVT)

## Installation Instructions

MS-BTCVT-0

Part No. 24-10108-2  
Rev. —  
Issued February 1, 2005

### Applications

The Converter with Bluetooth® wireless technology (BTCVT) is a communications converter that provides a temporary connection between AIM software and a field device to commission, synchronize, and balance Metasys® system extended architecture hardware controllers.

The BTCVT provides communication from the Field Controller (FC) bus or the Sensor and Actuator (SA) bus to a Bluetooth wireless technology enabled device, such as a laptop computer. The BTCVT converts Master Slave Token Passing (MSTP) protocol to 2.4 GHz Bluetooth wireless communication and from wireless communication back to MSTP.

A strap, provided with the BTCVT, allows you to hang the BTCVT next to the controller while the wireless connection allows you to be up to 10 m (33 ft) away while you commission the controller with a laptop computer.

The BTCVT is compatible with the following MSTP devices:

- Field Equipment Controller (FEC)
- Variable Air Volume Modular Assembly (VMA)
- Input/Output Module (IOM)
- Network Sensors

The BTCVT uses Bluetooth wireless technology, but is not compatible with other Bluetooth wireless devices. Only use the BTCVT with the wireless card supplied with the BTCVT or a wireless processor.

### Installation

Observe the following guidelines and see the [Mounting](#) section in this document.

- Verify that all parts are shipped with the BTCVT.
- The blue protective boot minimizes shock damage to the BTCVT. If removed from the protective boot, the BTCVT is prone to physical damage.

### Parts Included

- one BTCVT
- one 3Com® Bluetooth PC card and vendor-supplied software
- one 5-ft retractable cable
- one set of Installation Instructions
- one hanging strap with internal magnet

**IMPORTANT:** Magnetic fields can cause damage to magnetic storage media, including cassette tapes, floppy disks, credit cards, and video tapes. Keep all magnets away from all types of magnetic media.

### Special Tools Needed

The BTCVT provides a wireless link to the controller. To access the BTCVT, you need the following:

- laptop Computer running Microsoft® Windows® 2000 Professional operating system or later with the wireless card installed.
- AIM software

## Dimensions

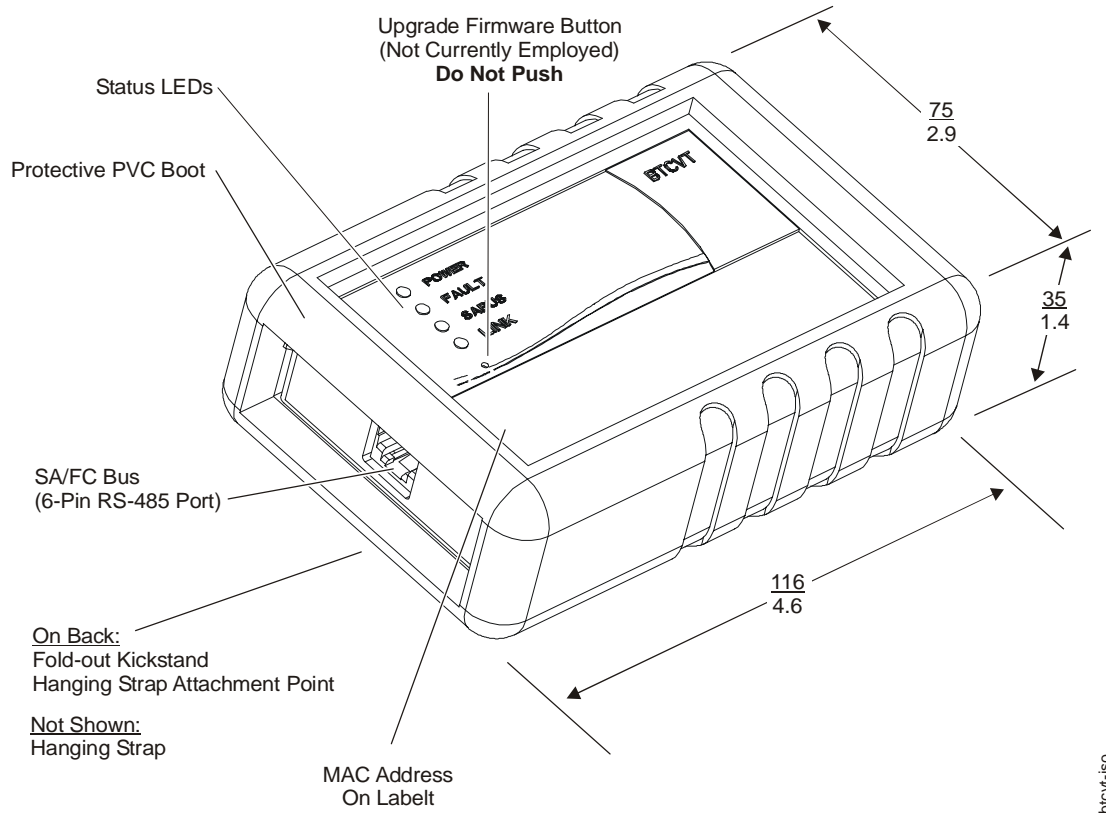


Figure 1: Front of the BTCVT, Dimensions (mm/in.) and Other Physical Features

## Accessories

Table 1: Products and Accessories (Order Separately)

Code Number	Description
MS-BTCVT-0	Converter with Bluetooth Wireless Technology
<??>	Cable replacement set; includes one 5-ft retractable cable

## Mounting

### Mounting Location Considerations

Observe the following guidelines when mounting an BTCVT:

- Always hang the BTCVT using the strap provided.
  - Note:** Use the strap loop to hang the BTCVT or attach the strap magnet to a metal object (such as a metal pipe).
- Mount the Converter in areas free of corrosive vapors and observe the environmental limitations listed in the [Technical Specifications](#) section of this document.

- Objects (including ductwork, cabinets, doors, and glass) can impede the wireless signal. Minimize the amount of objects between the laptop computer and the BTCVT. Use line-of-sight, if possible.

## Wiring

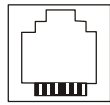
### Wiring Consideration and Guidelines

Observe the following guidelines when wiring the BTCVT:

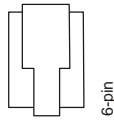
- Do not allow the BTCVT to hang from the cable connection. Always use the strap provided to hang the BTCVT.
- Provide some slack in the cable between the BTCVT and the controller.

### Power Supply, Network, and Communication Connections

See Figure 1 for the location of the communications terminal on the BTCVT.



6 . . . . 1



6-pin

### SA/FC Port

The SA/FC Port on the BTCVT is a 6-pin RS-485 port designed to connect the BTCVT to an accessible SA or FC port on an MSTP device using the cable assembly provided. The SA/FC is a straight through, 1-to-1 connection (not a cross-over). The maximum allowable cable length is 100 ft.

Do not plug the SA/FC Port into a standard phone jack.

**Table 2: SA/FC Port Pin Designations**

Pin Number (Both Ends of Cable)	Signal Name
1	(FC or SA) +
2	(FC or SA) -
3	15 VDC Common
4	15 VDC Hot
5	No Connection
6	No Connection

### Wiring the Converter

Observe the following guidelines and procedures when wiring the BTCVT.

To wire the network communication connections and supply power:

1. After securely hanging the BTCVT, connect one male end of the supplied cable to the BTCVT.
2. Connect the the other end of the cable to the controller.

**Note:** The BTCVT has a dedicated MSTP bus address of 01. Only one BTCVT can be connected to the MSTP bus per physical trunk on the system.

### Setup and Adjustments

The BTCVT device itself requires no commissioning.

### Installing the Bluetooth wireless technology enabled wireless card.

**IMPORTANT:** We recommend that you install the latest version of the wireless card software from the vendor's Website.

To install the wireless card:

1. Use your Web browser, navigate to [http://www.3com.com/products/en\\_US/result.jsp?selected=5&sort=effdt&sku=3CRWB6096B&order=desc](http://www.3com.com/products/en_US/result.jsp?selected=5&sort=effdt&sku=3CRWB6096B&order=desc)

**Note:** Alternatively, search the available downloads for product number 3CRWB6096B for the file called 3crwb6096b1\_2\_10en.exe.

2. Open the file and follow the onscreen instructions to Extract the drivers and software.
3. When Bluetooth product selection dialog box appears, select the PC Card option. The 3Com Wireless Installer dialog box appears.
4. Click on **Install Bluetooth Product**. The Bluetooth Setup dialog box appears and looks for your wireless card.
5. Insert (or reinsert) the wireless card into your computer. The Bluetooth Setup dialog box changes to say Please wait. **Do not click close.**  
The InstallShield Wizard appears.
6. Follow the onscreen instructions until the Bluetooth Connection Manager appears.  
You may now close all open windows.


### Setting Up the BTCVT in the Bluetooth Connection Manager

Once you have installed the Bluetooth wireless card hardware and software, you can set up the BTCVT within the Bluetooth Connection Manager.

This procedure allows the laptop to identify the BTCVT once it is within range and speeds the connection between the BTCVT and AIM software.

**Note:** You only need to set this up once per BTCVT.

To set up the BTCVT in the Bluetooth Connection Manager:

1. Plug the BTCVT into an MSTP device.
2. Double-click the 3Com Bluetooth Connection Manager icon  in the system tray. The Bluetooth Connection Manager appears showing MS-BTCVT in the Friendly Name column.

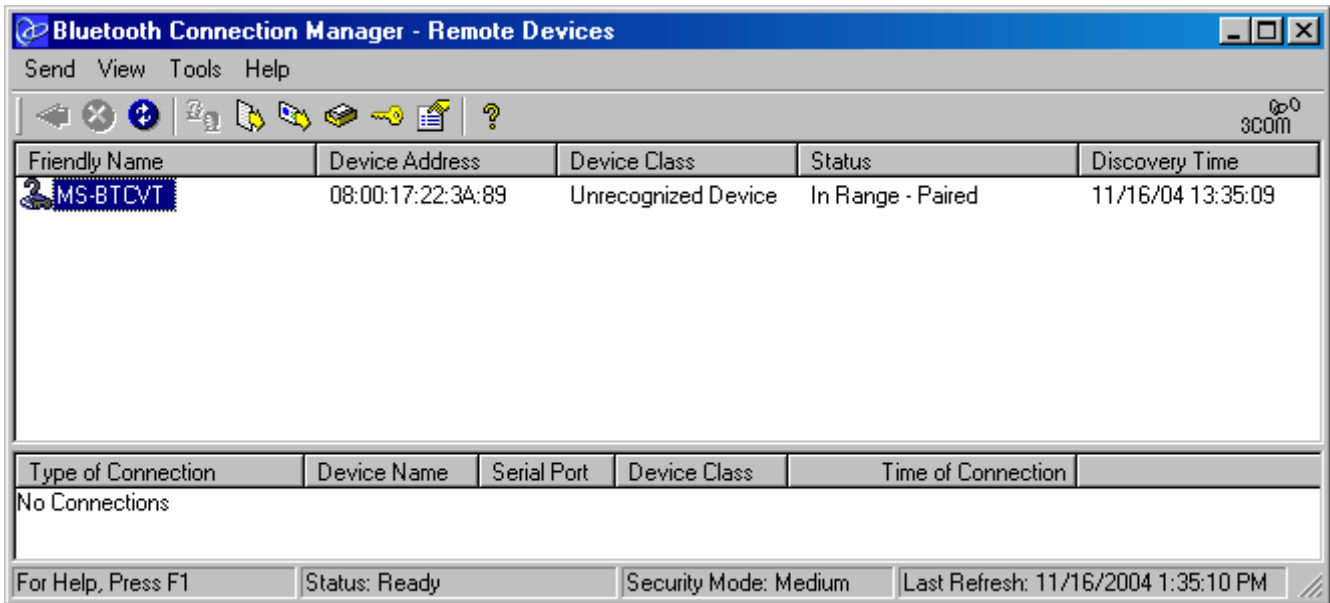



Figure 2: Bluetooth Connection Manager

**Note:** If the icon is red, the wireless card is not installed correctly. Refer to the installation instructions provided with the wireless card.

3. Compare the BTCVT's device address in the Connection Manager to the MAC address printed on the label of the BTCVT. They should match.

**Note:** If multiple devices appear in the window, there are other Bluetooth devices in range. Be sure to set up the device with the device address that matches the BTCVT's printed label.

4. Highlight the BTCVT and select Tools > COM Ports. The Bluetooth COM Ports dialog box appears.
5. Highlight **3Com Bluetooth Serial Client (your COM port number)** and click Edit. The Edit COM Port dialog box appears.

6. Select **Select Now** and click OK.
7. Close the Bluetooth COM Ports dialog box.
8. Double-click MS-BTCVT. The Authentication dialog box appears.
9. Type **BTCVT** and click OK. The Bluetooth Connection Manager - MS-BTCVT dialog box appears with the following fields Serial Port - Emulated serial cable connection.
10. Click the yellow arrow . The Status field reads In Range - Paired (Figure 2).

The Bluetooth wireless card is now ready to communicate to the BTCVT using AIM software.

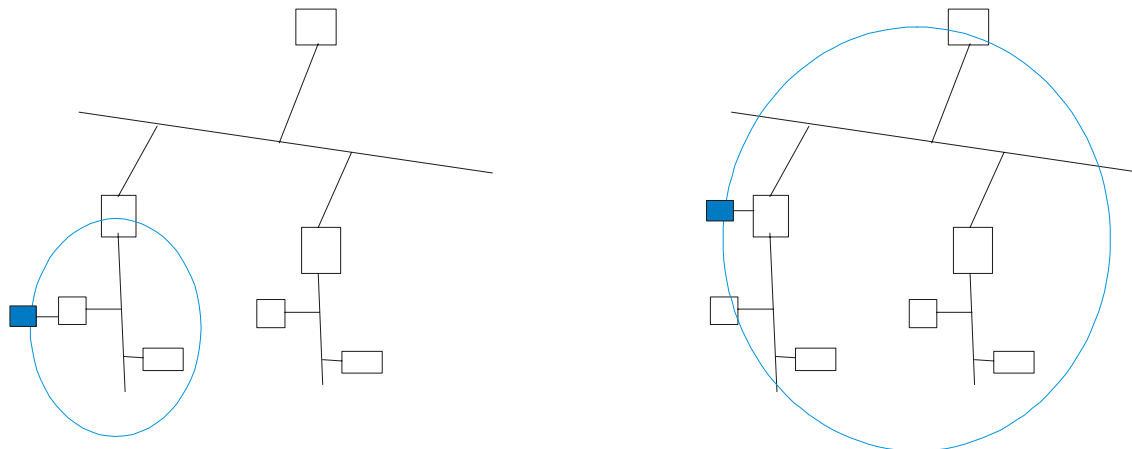
#### Commissioning the Laptop Computer

The HyperTerminal program, provided with the Windows OS, provides a link between the BTCVT and the computer.

## Operation

### Connecting the BTCVT to the System

<where on the system??>



mstp\_topology

Figure 3: Connecting a BTCVT to an MSTP Topology Example

### Establishing a Connection between the BTCVT and AIM Software

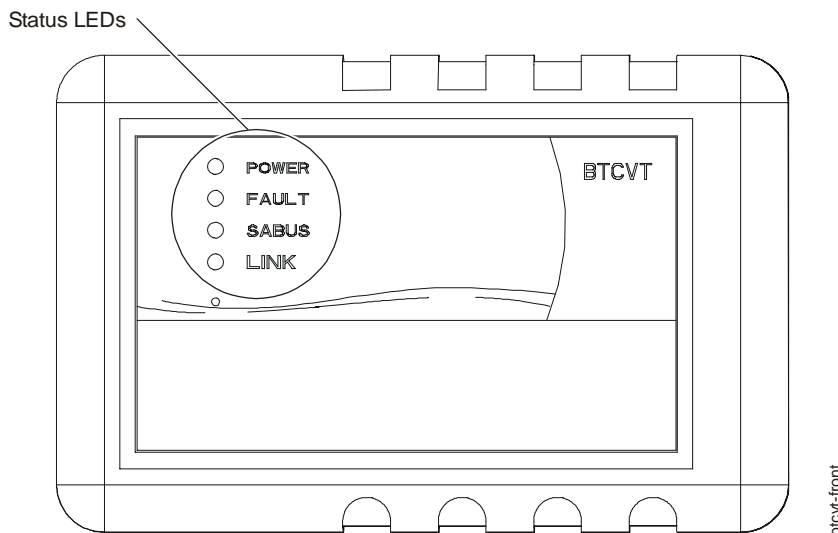
The connection between the BTCVT and AIM software is handled by the AIM software once you have set up the correct COM Port setting in the AIM software. Refer to the AIM Software Help for details.

You can speed up the BTCVT and AIM software connection process by setting up the BTCVT in the Bluetooth Connection Manager. Refer to [Setting Up the BTCVT in the Bluetooth Connection Manager](#).

### Troubleshooting

#### Status Indication LEDs

The Converter has 4 LEDs to indicate power and communication status. Figure 4 shows the LEDs and Table 3 describes their function.



btcvt-front

Figure 4: Front of BTCVT with LED Designations

### **LED Test Sequence at Startup**

During startup, the Converter automatically initiates an LED test to verify the operational status of the LEDs. Immediately after connecting supply power, the following LED lighting sequence occurs:

1. All LEDs light up.

2. The Power LED remains lit while all other LEDs go to Normal operation as indicated in Table 3.

**Table 3: Converter LED Designations and Descriptions**

<b>Color</b>	<b>LED Name</b>	<b>Normal</b>	<b>Descriptions/Other Conditions</b>
<b>Green</b>	<b>Power</b>	On Steady	On Steady = Power is Supplied by Primary Voltage Off = No Power
<b>Red</b>	<b>Fault</b>	Off	Off Steady = No Faults On Steady = Device Fault
<b>Green</b>	<b>SA/FC Bus</b>	Flicker	Flicker = Data Transmission Off Steady = No Data Transmission
<b>Blue</b>	<b>Link</b>	On	On Steady = Bluetooth communication link established Off Steady = Bluetooth communication link not established

### **Testing the Wireless Connection to the BTCVT**

You can test the connection between the laptop and the BTCVT using HyperTerminal software provided with your Microsoft Windows OS software.

To test the wireless connection to the BTCVT:

1. From the Control Panel, navigate to System > Hardware > Device Manager > Ports.
2. Double-click **3Com Bluetooth Serial Client (COM port you are using)**. The Properties dialog box appears.
3. On the Port Settings tab, select 115200 in the Bits per second drop-down list and click OK.
4. On Start menu, select Programs > Accessories > Communications > HyperTerminal. The HyperTerminal program opens.
5. Type a name in the name field and click OK. The Connect To dialog box appears.

6. Select the COM port you are using in the Connect using drop-down list and click OK. The HyperTerminal attempts to connect to the BTCVT.

If the BTCVT's blue Link LED lights, the test was successful.

After approximately four seconds, the BTCVT disconnects from the HyperTerminal program and the LED turns off.

7. Close the HyperTerminal program without saving changes.

### **Repairs and Replacement**

Do not remove the blue protective boot or open the Converter housing. The Converter has no user-serviceable parts inside.

The BTCVT requires no periodic field maintenance.

## Technical Specifications

<b>Product Code</b>	MS-BTCVT-0	Converter with Bluetooth Wireless Technology
<b>Power Requirement</b>	Nominal 15 VDC, provided through the SA/FC Port	
<b>Power Consumption</b>	1.35 Watts maximum	
<b>Ambient Operating Temperature</b>	0° to 50° C (32° to 122° F)	
<b>Ambient Operating Conditions</b>	5 to 95% RH, Noncondensing, 30° C (86° F) Maximum Dewpoint	
<b>Ambient Storage Temperature</b>	-40° to 85° C (-40° to 185° F)	
<b>Ambient Storage Conditions</b>	5 to 95% RH, Noncondensing	
<b>Transmission Power</b>	2.5 mW maximum	
<b>Transmission Speed</b>	<b>Wireless Communication</b> 115.2k bits per second (bps) <b>Serial Communication (SA/FC Bus)</b> 9600, 19.2k, 38.4k, or 76.8k bps	
<b>Transmission Range (Typical)</b>	<b>Wireless Communication</b> 10 m (33 ft) line-of-sight	
<b>Wireless Security</b>	Security Mode 3 - Link Level Enforced Security	
<b>Network and Serial Interfaces</b>	Bluetooth Wireless Technology One RS-485 Bus	
<b>Dimensions</b>	116 x 75 x 35 mm (4.6 x 3.0 x 1.4 in.)	
<b>Housing</b>	Black Plastic Housing Blue Protective Boot	
<b>Weight</b>	0.165 kg (0.365 lb) without hanging components	
<b>Agency Listings</b>	<b>United States</b>	FCC Title 47 - Telecommunications
		Transmitter Complies with FCC part 15.247 Regulations for Low Power Unlicensed Transmitters (Transmitter FCC Identification: <??>)
		Receiver Complies with FCC part 15.109 Regulations for Low Power Unlicensed Receivers (Transmitter FCC Identification: <??>)
	<b>Canada</b>	Industry Canada
		Transmitter RSS-210 Receiver RSS-210
	<b>Europe</b>	European Commission driven by Directives
Transmitter - RTTE Directive 1995/5/EC Test Standard is ETSI EN 300 328 ISM Spread Spectrum 2.4 GHz Transmitter / Receiver - EMC Directive 89/336/EEC Test Standard is ETSI EN 300 328 ISM Spread Spectrum 2.4 GHz		
<b>Japan</b>	Telecommunications Certification	

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

### FCC RADIO FREQUENCY EXPOSURE NOTICE

CAUTION: FCC Radio-Frequency Exposure Notice

This device generates and radiates radio-frequency energy. In order to comply with FCC radio-frequency radiation exposure guidelines for an uncontrolled environment, this equipment has to be installed and operated while maintaining a minimum body to antenna distance of 2.5 cm (1.0 inch). This product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate 3Com's warranty and all applicable regulatory certifications and approvals.



**FCC PART 15 NOTICE (APPLICABLE TO USE WITHIN THE USA)**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**WARNING:** This equipment has been tested and found to comply with the limits for a Class B digital device as applicable, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful: *The Interference Handbook* This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

**WARNING:** Changes or modifications not expressly approved by the party responsible for the compliance could void the user's authority to operate the equipment.

**MANUFACTURER'S DECLARATION OF CONFORMITY**

Johnson Controls, Inc.

Controls Group

507 E. Michigan St.

Milwaukee, WI 53202

Declares that the Product:

Date: **1 February, 2004**

Brand Name: Johnson Controls, Inc.

Model Number: MS-BTCVT-0

Equipment Type: Converter with Bluetooth Wireless Technology

Complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.


**INDUSTRY CANADA NOTICE (APPLICABLE FOR USE WITHIN CANADA)**

IC: xxxxx-yyyyyyyyyy

The term "IC" before the certification/registration number only signifies that the Industry Canada specifications were met.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing. The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

**EUROPEAN COMMUNITY CE NOTICE**

Marking by the symbol  indicates compliance of this equipment to the R&TTE Directive 1999/5/EC. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- ETS 300 328 — Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; data transmission equipment operating in the 2,4GHz ISM band and using spread spectrum modulation techniques
- ETS 301 489-17— Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; specific conditions for Wideband data and High PERFORMANCE Radio Local Area Network (HIPERLAN) equipment
- EN 60950 — Safety of information technology equipment, including electrical business equipment

This device may be used throughout the European Community.



**Controls Group**  
507 E. Michigan Street  
Milwaukee, WI 53202

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