REV	DESCRIPTION	INT:	REV. DATE	APPROVED
1	ECO# C01301	MJS	3/21/05	CG
2	ECO# C01394	MJS	6/10/05	CG
3	ECO# C02412	DR	10/3/07	CG
4	ECO# C02476	MJS		

TITLE BOX PAGE ONLY.
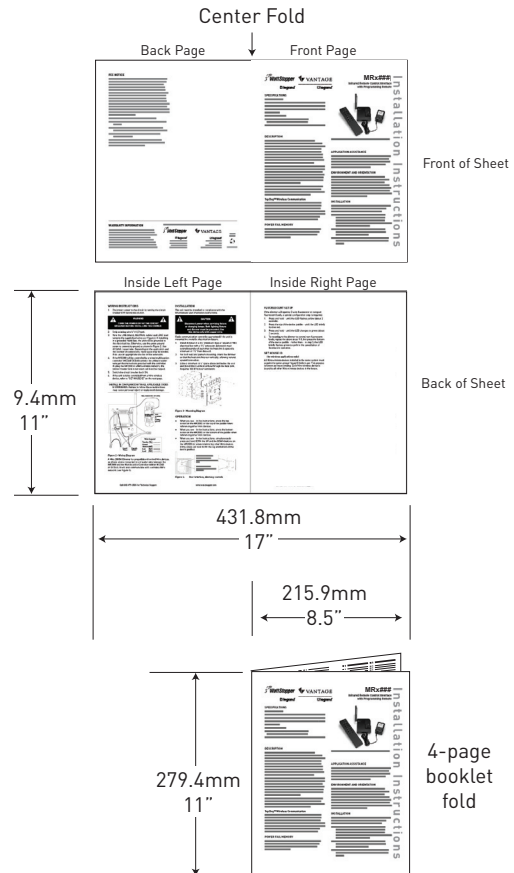**DO <u>NOT</u> MAKE FILM • DO <u>NOT</u> PRINT**

MATERIAL: White 16lb (60g/m sq), uncoated, prefer recycled stock

Ink: Black

Print Two Sides, 2 sheets 8.5" (Wide) x 11"
(High), stapled upper left corner

OR

Print Two Sides, 1 sheet 11" x 17"
folded to 8.5" x 11"

Center Fold

Back Page   Front Page

Front of Sheet

Inside Left Page   Inside Right Page

9.4mm
11"

Back of Sheet

431.8mm
17"

215.9mm
8.5"

279.4mm
11"

4-page
booklet
fold

IF YOU HAVE ANY QUESTIONS REGARDING SPECIFICATIONS OR REQUIRE
ADDITIONAL FILE FORMATTING, PLEASE CONTACT Mary Jo Sowinski.

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DRAWN BY	SOWINSKI	**WattStopper** **legrand®**
PLM		SANTA CLARA, CALIFORNIA
MARCOM		
ENGINEERING		Title:
QA		MR232 Installation Instructions
TITLE BOX PG	SCALE 1:1	Drawing #: 05135 / Orig. Drawing Date: 17 MAR 05 / Revision Date: 19 NOV 07 / REV. #: 4

To Control System

MR232 Network Controller

Power Supply

RS232 Serial Cable

Status LED

DB9 RS232 Port

MR232
Network Controller

SPECIFICATIONS

UL and cUL Listed

MR232 Input Voltage.....................9-12VDC, 50mA minimum

AC-DC adaptor (provided)

   Input..120VAC, 60Hz

   Output 9VDC, 50mA

DESCRIPTION

The MR232 Network Controller provides the communication interface between a Miro wireless lighting control system and other RS232 compatible building controls. It acts as a command and control station using an ASCII communication protocol. With it, both humans and automation systems can control virtually any Miro device on the wireless network.

The MR232 provides the ability to offer interconnectivity with automation system and building control integration providers.

Top Dog™ Wireless Communication

Miro wireless devices use radio signals to communicate with each other to control lighting and other types of electric loads in selected areas. These wireless devices use the 900MHz band for high-speed control communication. Using the "frequency-agile" Top Dog™ technology, these wireless devices avoid interference with other 900MHz devices, such as cordless phones and baby monitors.

OPERATION

The MR232 interfaces to an automation system through an industry standard RS232 port.

In a typical installation the interface is bound to a specific installation or house. This binding provides direct access of the house presets as well as the 127 rooms and the 4095 possible groups on the network.

To query the wireless system and log the control points (devices), connect the MR232 to a PC running a generic terminal emulator such as Windows Hyper-TerminalTM at 38.4Kbd. From this interface, the user can build an installation list and use it to create a spreadsheet of all the possible control points (devices) available on the network. These control points can then be programmed into the automation systems and provide a seamless control environment between the two systems.

Power Fail Memory

After a power failure, all wireless devices automatically return to the state that they were in immediately prior to loss of power. All configuration and scene control information is preserved.

Application Assistance
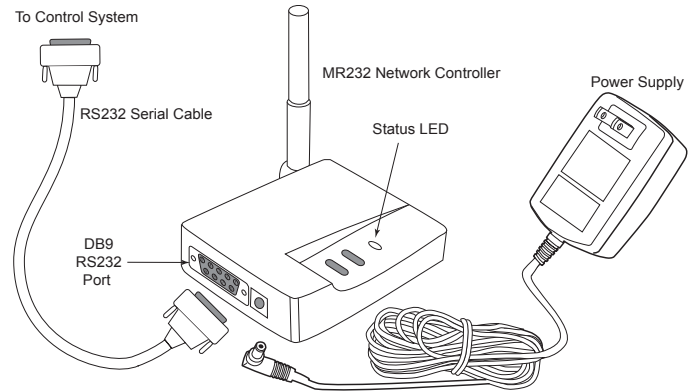
The MR232 Protocol Guide provides more information about how to configure command sequences to pass from a building automation control system through the MR232 Network Controller and on to the Miro wireless system. Instructions for installation, binding operations, and use are included with the relevant wireless devices. Application support information and installation guides are available online.

> Do not locate the MR232 close to any device that may cause interference or behind large metal objects that can block radio reception. Avoid fluorescent light fixtures, TV sets, computers, refrigerators, microwave ovens, range hoods, safes, etc.

INSTALLATION

1. Use an RS232 serial cable of the appropriate length. If the one supplied is not appropriate, see CONNECTIVITY for DB9 serial cable information.

2. Locate the MR232 within reach of the serial cable connecting it to the building automation system (max. 50 feet, unless an RS232 extension device is used). Ideally, the MR232 should be in a central location, taking into consideration both the horizontal and vertical space in the building. In a 2-story plus basement structure, a good position may be on the first floor atop a cabinet.

3. Connect the DB9 serial cable to the MR232 and control terminal.

4. Plug the external power supply into a convenient 120 volt outlet, and connect the power cord to the MR232's power socket.

5. The status LED will light yellow, indicating that the unit is ready for configuration.

Set House ID

All Miro wireless devices installed in the same system must acquire the same unique House ID before use. This process is known as house binding. Each wireless device is bound to all other wireless devices in the house. If you are not familiar with the binding processes for the wireless devices in your installation, please review the Installation Guide, or individual installation instructions provided with the devices.

IMPORTANT: The MR232 can not be used to initiate a house binding until it has acquired a house ID through a binding initiated from another Miro wireless device in the system.

1. With all devices installed and energized, make sure that every wireless device LED is yellow (amber). If any LED is off, be sure the circuit breaker is on and the device is correctly installed.

2. Go to any wireless device EXCEPT the MR232. Press and hold the Up and the Down buttons simultaneously until its LED flashes yellow (about 2 seconds). This indicates that it has acquired a unique House ID.

3. Make sure that all other wireless device LEDs are flashing green and the MR232 is flashing yellow, indicating that they have all acquired the same House ID.

4. Return to the device used in step 2, which is still flashing yellow. Press and hold the Up and the Down buttons simultaneously until the LED changes to solid green (about 2 seconds).

5. All device LEDs in the House change to solid green, indicating house binding is complete.

Other Bindings

The MR232 is a whole house device that is not bound to any group or room. Other wireless devices in the system should be bound to appropriate groups and rooms before you attempt to control them from the Network Interface.

CONNECTIVITY

The illustration below shows the pin-outs from the Miro Network Controller's RS232 DB9 connector.
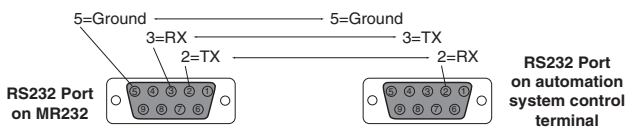

To communicate with the MR232 from the control system, setup the terminal's RS232 COM port as follows:

    Baud Rate 38.4Kbd
    Data Bits 8
    Parity.. None
    Stop Bits 1
    Flow Control .... None

USER INTERFACE

The MR232 has two user interfaces. The first consists of two pushbuttons and a multi-color LED for device status.

The second interface is through an ASCII terminal connection over the RS232 port. Through this, ASCII commands can be issued and cause controlled responses on the system. The "HELP" command lists the system commands. The commands and operands are described in the MR232 Protocol Guide, available online.

Status LED
Green
Yellow (amber)
Red

Pushbuttons
⇧ Top
⇩ Bottom
⇕ Press both simultaneously
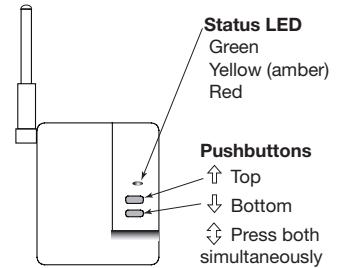
Pushbuttons

The pushbuttons are the Top button (⇧) and the Bottom button (⇩).

Initiate Version and Status Messages

Press either pushbutton to transmit an identification or version message over the RS232 connection as well as a status message over the wireless network. This can be used to verify outgoing communications between the serial interface and a terminal emulator. The message includes the product name, part number, firmware version, and current configuration. Regardless of the configuration, it will also transmit a status message on the wireless network with its MAC address so that it can be identified like any other wireless network device. (This message can be invoked over the ASCII interface though the command line with the "VER" command.)

Learn Function and Binding Operations

Press both buttons simultaneously for about 2 seconds to invoke the LEARN function. When un-configured the MR232 cannot be the first device to initiate a house binding (its LED flashes red). However, after a house ID is assigned to the MR232 - either by a house ID binding initiated from another wireless device or with the "SETH" command - the MR232 can be used to initiate future binding processes.

Reset to Factory Default/unconfigure

When both the buttons are simultaneously pressed for a period of 10 seconds, the device will perform a system reset and clear all memory contents. This resets the device to an unbound, unconfigured state with a House ID of zero (0) and Building ID of one (1).

Status LED Indicator

The MR232 uses color codes similar to all other MIRO products. The LED can display one of three colors: green, yellow (amber), or red. The color can be constant, or can flash at one of three rates to further distinguish reported conditions.

Once per second .... 1 Hz

Twice per second .... 2 Hz

Three times per second .... 3 Hz

To determine the flash rate, count the number of flashes in 5 seconds:

5 flashes .... 1 Hz

10 flashes .... 2 Hz

15 flashes .... 3 Hz

The MR232 LED indications are as follows:

Color	Behavior	Meaning
None	Off	Device is not powered.
Green	On, not flashing	Device is powered, has a house ID, operating normally.
Green	Flashing @ 2 Hz	Device transmitted a message on the wireless network.
Yellow	On, not flashing	Device does not have a house ID.
Yellow	Flashing @ 2 Hz	Device is part of a binding process. Binding was started by some other device with a matching house ID or through GETID command.
Yellow	Flashing @ 3 Hz	Device is the master of a binding process. Binding was started on this device and must be stopped on this device.
Red	Flashing @ 2 Hz	Device has encountered an error. An invalid command or attempting to transmit with an invalid house ID (0x00). A non-zero house ID is required.

TROUBLESHOOTING

During Set House ID, the LED is not flashing on some Wireless Miro devices.

- **If LED is solid green before initiating house ID binding:**

  The device already has another house ID. Reset it to the factory default so that it can be bound to the desired house ID. Resetting to factory defaults is described in the "I need to start over" issue.

- **If LED is solid yellow after initiating house ID binding:**

  The device may be out of range of the initiating device. It may be necessary to add a MRR2 Repeater if reception to a particular area of the house is blocked.

I need to start over.

You can reset any wireless device to factory default settings by pressing and holding ⇕ until the LED changes to solid yellow (approximately 10 seconds). During the process, the LED flashes yellow and when complete, it changes to solid yellow. The device can then be reconfigured, exactly like any new device.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, 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.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

WARRANTY INFORMATION

Manufacturer warranties its products to be free of defects in materials and workmanship for a period of five (5) years. There are no obligations or liabilities on the part of manufacturer for consequential damages arising out of, or in connection with, the use or performance of this product or other indirect damages with respect to loss of property, revenue or profit, or cost of removal, installation or reinstallation.

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