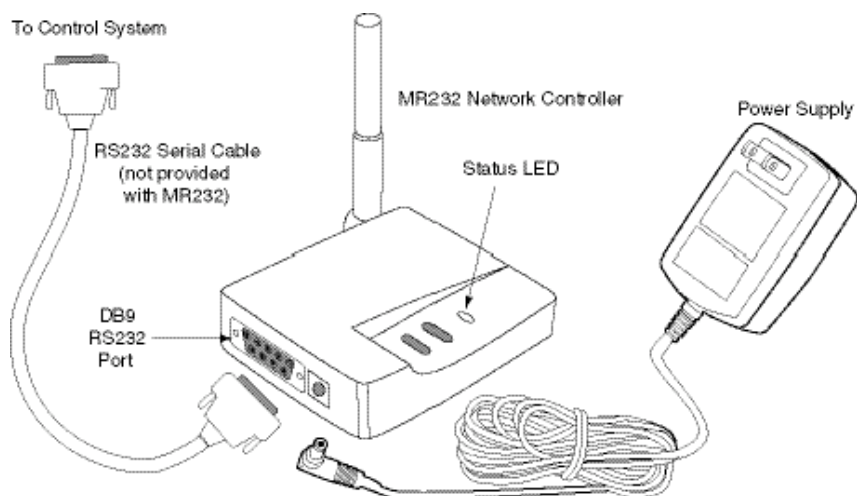




MR232 Network Controller Protocol and Command Guide



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	[MAC] Device MAC address	000000-FFFFFF.....
	[P] Preset Number	house 1-14, room 1-17.....
	[R] Room Number	1-127.....
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		50.....
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1 Description

The MR232 is a Wireless Miro network controller with an RS232 interface. It acts as a command and control station using a simple ASCII communication protocol. With it, both humans and automation systems can control virtually any Wireless Miro access point on the Wireless Miro network. The MR232 provides the ability to offer interconnectivity with automation system and integration providers.

2 Installation

Hardware installation instructions and House ID binding instructions are provided with the MR232. The MR232 connects to an automation system through an industry standard RS232 port.

In a typical installation the MR232 is bound to a specific installation or house. This allows direct access of the house presets as well as the 127 rooms and the 4095 possible groups on the network. To query the Wireless Miro network and log the control points the MR232 is connected to a PC using a generic terminal emulator such as Windows HyperTerminal™ at 38.4Kbd. From this interface, you can build an installation list and create a spreadsheet of all the possible Wireless Miro control points (devices) available on the network. These control points can then be programmed into the automation system to provide a seamless control environment between the two systems.

Limitations

Although the MR232 was not built specifically as an installation tool, there are a number of system setup commands available that allow the device to act as an installation tool in most applications. However, the primary function of the device is to directly control access points already setup and bound through conventional Wireless Miro installation techniques. To effectively setup the system, please refer to the Wireless Miro Installation Guide or the relevant Wireless Miro device installation instructions to create the desired binding relationships.

3 Features

- Direct (non-addressed) recall of 14 house presets
- Direct (non-addressed) access to adjust/store 10 user house presets
- Direct (non-addressed) access to panic mode
- Direct access to recall 17 room presets in 127 rooms
- Direct access to adjust/save 15 user room presets in 127 rooms
- Direct access to control the output level of 4095 groups within the system
- Standard RS232 interface through ASCII protocol for simple setup
- Extract addressing information for the system (House, Room, Group IDs)
- Ability to derive a list of installed devices
- Extract and catalog device MAC addresses
- Query groups for individual device status
- Output group (device) state and commands to RS232 interface

4 Communication Settings

To communicate with the MR232, setup the control system's RS232 port with the following settings.

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

The illustration below shows the pin-outs from the MR232's RS232 DB9 connector.



5 Windows Hyper-Terminal™ Setup

Some type of terminal emulation software is required as a human interface to identify the desired control points in the system. Windows Hyper-Terminal™ is one terminal emulator that may already be on your computer system.

1. Run HYPERTRM.EXE (usually found in Program/Accessories/Communication). Once opened select an appropriate name and Icon as shown in Figure 7.1, then select "OK".
2. The connection you are going to make is a Direct Connect to COM1 or any available COM port (Figure 7.2, next page). Select "OK".
3. Setup the connection as shown in the Port Settings screen (Figure 7.3) and select "OK": 38.4Kbd, 8 bit data, No Parity, 1 Stop Bit, No Flow Control
4. Verify Settings and ASCII Setup as shown on the next page, Figure 7.4.
5. The connection should then be established between the Miro MR232 and the selected PC COM port. When the terminal emulator is later closed, you will be asked whether it is desirable to save the settings. By doing so you will be able re-establish a connection by selecting the ICON created through this process.



Figure 7.1 – New Connection Screen

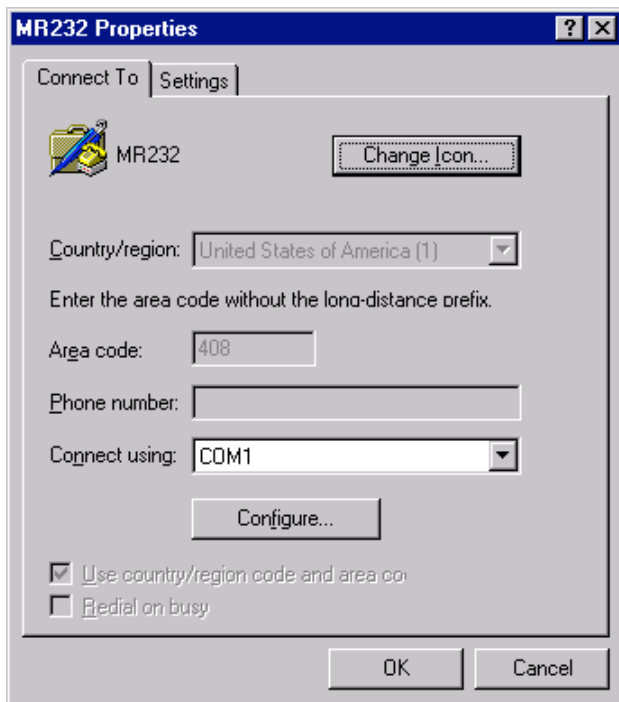


Figure 7.2 – Connect To screen (step 2)

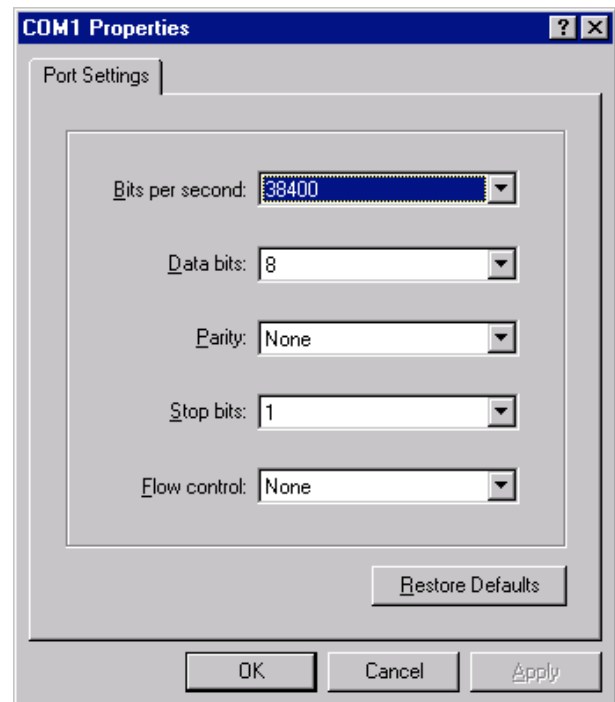


Figure 7.3 – Port settings (step 3)

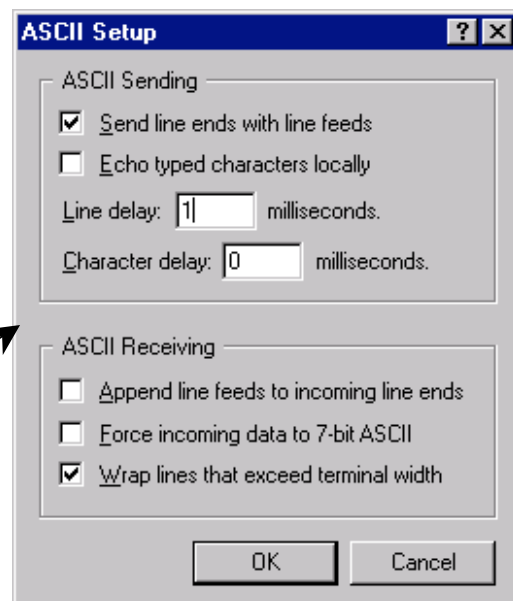
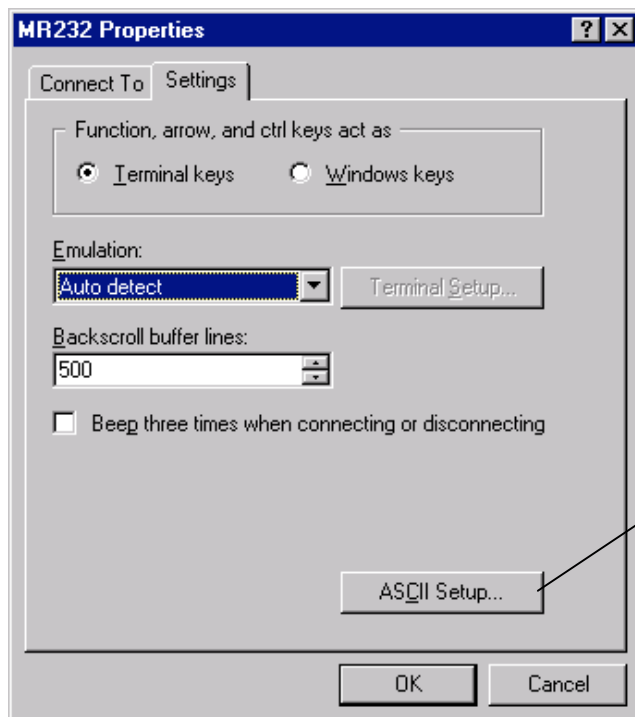


Figure 7.4 – Settings and ASCII Setup (step 4)

6 User Interface

The MR232 has two user interfaces. The first consists of two pushbuttons and a multi-color LED for device status, which are described in this section.

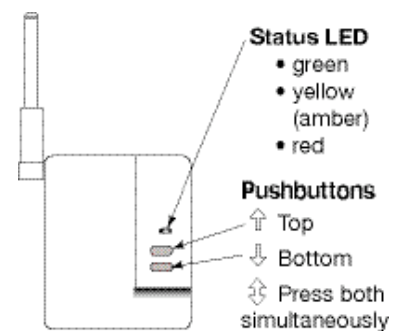
The second interface is through an ASCII terminal connection over the RS232 port. Through this, ASCII commands can be issued to effect controlled responses in the system. The ASCII commands and their operands are listed individually in section 9 ASCII Commands as well as in the command summary in section 11.

Please refer to Windows Hyper-Terminal™ Setup starting on page 10 to connect a PC and setup terminal emulation software to communicate with the MR232.

Pushbuttons

The pushbuttons are the Top button (↑) and the Bottom button (↓).

When operated individually, pressing either pushbutton causes the MR232 to transmit an identification or version message over the RS232 connection and a status message over the Wireless Miro network. This can be used to verify outgoing communications between the serial interface and a terminal emulator.¹ The message includes the device name, firmware version, and configuration setup as shown below. If the MR232 House ID binding has not been completed, the house id is 0000.



Device name	firmware version	building number	house ID	MAC address
>MIRO-MR232	Ver.0x01,	Bld=01,	Hs=0000,	MAC=0xA72D61

The MR232 cannot be the first device in the house to acquire a House ID. The MR232 must get the House ID from a House ID binding initiated from another Wireless Miro device or with the "SETH" command. After the House ID binding is completed, the MR232 sends the following report indicating its new House ID (for this example 0125):

>Updating ID...				
>MIRO-MR232	Ver.0x01,	Bld=01,	Hs=0125,	MAC=0xA72D61

When the buttons are pressed simultaneously (↕) for about 2 seconds and the LED begins to flash yellow (amber, a combination of green and red), the device goes into the LEARN mode. The LEARN mode can be used **after** the MR232 is configured with a House ID, to initiate House Binding for devices being added to the house.

When both pushbuttons are pressed simultaneously (↕) for 10 seconds the LED stops flashing and goes to solid yellow. The device then performs a system reset and clears all memory contents. This resets the MR232 to an unbound, un-configured state with a Building ID of 01 and House ID of 0000.

¹ Alternately, the message can be invoked over the ASCII interface though the command line with the "VER" command.

Status LED Indicator

The MR232 uses color codes similar to all other Wireless Miro devices. 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:

Number of flashes in 5 seconds	Flash Rate
5	1 Hz
10	2Hz
15	3 Hz

The MR232 LED indications are as follows:

Color / Flash Rate	Meaning
 LED OFF	Device is not powered
 Green not flashing	Device is powered, bound and operating normally
 Green flashing 2 Hz	Device has transmitted a message on the Wireless Miro network
NOTE: The yellow (or amber) color is visually a combination of green and red.	
 Yellow not flashing	Device is un-configured (has a House ID of 0000)
 Yellow flashing 2 Hz	Device is part of a binding process. Some other device with a matching House ID started the binding process or the GETID command was used.
 Yellow flashing 3 Hz	Device is the master of a binding process. (The binding was started from this device and must be stopped from this device.)
 Red flashing 2 Hz	Device encountered an error. An invalid command or attempt to TX with an invalid House ID = 0x00. A non-zero House ID is required.

7 System Messages

The MR232 transmits three types of group messages over the RS232 as they occur on the network. If desired, you can suppress these messages with the TSETUP command.

Ramp and Cancel Ramp: When Wireless Miro devices with firmware version 0x0A (hex, version 10 decimal) or higher change their state as a result of a PRRDN, PRRUP, RCHP, RCRP, RORHP, or RORRP command, they send a status message to indicate their new state. These messages are NOT sent from devices with firmware version 0x09 or lower.

Group Status

This periodically transmitted message reports the current device status. The format is:

Group Status	Group ID	Current Level	Last Non-Zero Level	Device Type	Last Error
>GS,	XXXX,	0XXX,	0XXX,	0XXX,	0XXX

Device Types are as follows:

Number	Device Description
0033	Multi-location Controller
0034	Room Preset Controller
0035	House Preset Controller
0036	Room Remote Preset Controller
0037	House Remote Preset Controller
0065	Dimmer or Plug-In Lamp Module
0066	Relay/Switch (Non-Dimming) or Plug-In Appliance Module
0067	Fan Controller

Error codes in a typical application:

Error Codes	[0-255]
No-Load Detected	0134
Overload Detected	0132
Short Circuit Detected	0130

**The LED on the device
generating the error flashes
red until the problem is corrected**

Ramp Group

A group was commanded to ramp to a specific level at a rate defined by the ramp rate. The format is:

Ramp Group	Group ID	Target Level	Ramp Rate
RG,	XXXX,	0XXX,	0XXX

Cancel Ramp

A cancel ramp command stopped the Ramp command. This command typically follows a slowly increasing ramp command and identifies the level at which the group has stopped. The format is:

Cancel Ramp	Group ID	Current Output Level
CR,	XXXX,	0XXX,

8 ASCII Command Operands

Operands are used with commands to define the parameters of the command. Operands are entered at a specific location on the command line, as defined in section 9 ASCII Commands. The following list defines the abbreviations used in the mnemonic tables in the ASCII Commands section. Each mnemonic table in section 9 identifies exactly where each operand entry is used in the command line.

OPERAND	DESCRIPTION	VALID ENTRIES	DEFAULT SETTING
[O/1]	Off/On 0 turns OFF the function described in the command. 1 turns ON the function described in the command.	0 or 1	
[B]	Building ID (Number) One decimal character representing the building ID. The default building ID is 1. It is unlikely that this will need to be changed, except in some commercial applications.	1-7	1
[FT]	Fade Time Optional one to three decimal characters representing the desired fade time in seconds. The fade time is defined as the time interval for the output to change from its present state to the new state. Fade times are typically used in the execution of a preset (RCHP or RP) command. However the fade time is a property of the actual preset and is therefore stored when saving the preset (SHP or RP). When omitted from the command line, the system default fade time of 2 seconds is used. The value of 0 will provide an instantaneous change. A value of 255 will exclude the device from a given preset and thus alter the device preset setup table; therefore the value cannot be used.	0-254	2
[G]	Group ID (Number) One to four decimal characters representing the physical (actual) group number of one or more devices on the Wireless Miro network.	1-4095	
[H]	House ID (Number) One to three decimal characters representing the unique physical (actual) house id of all the devices in the house.	1-255	
[MAC]	Device MAC address A unique 3-byte (24 bit) address of a Wireless Miro device, entered and displayed as 6 hexadecimal values. I.e., 000000 - FFFFFFFF	000000-FFFFFF	
[P]	Preset Number One to two decimal characters representing the physical preset for a house (1-14) or room (1-17). All devices have 17 room presets and 14 house presets. Please refer to the preset tables at the end of this document for more information.	house 1-14, room 1-17	
[R]	Room Number One to three decimal characters representing the physical (actual) room number of one or more devices on the Wireless Miro network.	1-127	

[RR]	Ramp Rate Optional one to three decimal characters representing the desired ramp rate in percent. The ramp rate is defined as a percentage of change per second. Ramp Rate is typically used in a RAMP command. For example, if a unit is off and a ramp command with a target value of XXX is issued along with a RR of 50 (50%), the output ramps to the desired level at 50% per-second. At that rate, the level changes from 0% to 100% in 2 seconds. When omitted from the command line, the system default fade rate of 50 is used. The values 0 and 100 provide an instantaneous change.	0-100	50
[RM]	Rate Multiplier Optional one to three decimal characters representing the Rate Multiplier in a proportional ramp command. The output of an individual device is defined as: <div style="background-color: #f0f0f0; padding: 5px; margin: 10px 0;"> $\text{output_level} = \text{current_level} + \text{rateMultiplier} * \text{preset_level}$ </div> Preset_level is the output level of the preset stored in specified preset. A preset value of zero (0) will select the last preset executed in that room. This allows the user to proportionally ramp only the devices that are currently ON in the event a preset was executed and turn some devices OFF. I.e., if a device was turned off by a preset then the proportional ramp command will not act upon that device because its last preset level value was zero (0). Conversely if a preset of 17 (level fixed at 255-100%) is used, all devices within that room regardless of their current state will start a proportional ramp. When omitted from the command line, the default fade rate multiplier of 30 is used.	1-100	30
[TI]	Time Interval An optional parameter for the Identify (IDR or IDG) commands to allow the user to set the execution time for the identify command. The value can be from 0 to 255 where each increment represents a 4 second interval (Time = X *4sec). With the max value of 255, the time would be; 255 x 4s = 1020 seconds = 18min.	0-255	
[TV]	Target Value Required parameter when commanding a specific action such as a ramp command. When this action is executed with a value other than 0 or 255, the resulting control devices would store this value as their Last Non-Zero value.	0-255	
*[]	Optional command string parameter In some cases, when omitted a default value will be used. Typical optional parameters include Target Value, Preset Number, Ramp Rate, Fade Time, and Rate Multiplier.		
<CR>	Carriage Return		

9 ASCII Commands

A variety of commands are built into the MR232 to perform a wide range of control possibilities. In some cases there may be more than one way to get the same result on the overall system.

Conventions

All commands can be issued in capital or lower case letters with the operand separated by either a space or coma. All of the data is transferred in decimal form with the exception of the device MAC address, which is in hex.

The command prompt ">" displays at the command line. While a command is being executed, there is no command prompt on the screen. The command prompt reappears after the command has been executed and the interface can accept a new command. After a command is issued that requires extensive processing the command prompt may take a long time to reappear (commands such as GETIDL, Get Installation List). Several setup commands like GETID can only be terminated by the user with a subsequent "Enter" to interrupt the command execution.

Commands marked "Device Setup" are typically used to derive system setup information and are not part of a typical home control or automation sequence.

Binding Groups to Rooms with the MR232

Wireless Miro devices in a room that does not have a room controller will not have an associated Room ID. In order to assign a Room ID the end control devices or groups must undergo a Room Binding.

In a room where there is no room controller, the MR232 can be used to create a Room ID. Before doing this, ensure that the Room ID used in the binding process is unique. To do this, refer to the installation or ID list that is created using the GETIDL command.

As an alternative, the IDR or IDG command can be used to query the system and determine if a specific Room ID has been used. In this case, an identify command is first sent to the appropriate room/group device along with a status request. If no device responds (i.e., no device responds with the indicated ID) the following response appears at the terminal "No response to Room ID 0XXX" or "No response to Group ID XXXX".

NOTE regarding the IDR command: No room device responds if the room has been setup (created) by a MRH6 Room Scene Remote (handheld) or a MR232. Devices that are bound to this room respond, but only with their group ID.

House and Room Presets

On the Wireless Miro network, devices treat house and room presets differently. By default, all room presets are included and all house presets are excluded. Generally, in a room it is very likely that the desired effect is to have all groups included in the presets, whereas in a house, it is more likely that the user will want to individually pick the group they wish to respond. The MR232 allows access to 4095 possible groups within a house.

When you perform a single room preset binding, by default all of the remaining room presets are included. E.g., If you perform a room preset binding using a preset of 1, by default this group of devices acts upon all 17 room presets. To exclude one or more room presets from a group, individually remove each preset.

In contrast to this, house presets by default are excluded therefore, if you want one or more groups to act upon a house preset you must include the device in each preset.

It may be desirable to LOCK the system from users to prevent changes to the presets. When locked, devices do not blink their LED during a binding or allow their preset to be changed. Therefore, if there is any question whether the lock function has been used, a global unlock command should be sent to the whole house.

BINDG – BIND Group (Device Setup)

Mnemonic	Operands	Operation
BINDG	[G]	Start a Group Binding

Transmit a “Group Binding” with a specific Group ID. This command is used to create or alter an existing group binding. When creating a unique group ID, the user must ensure the group ID entered is unique and not currently used. Please refer to the GETIDL and IDG commands to ensure the appropriate unique group ID is used.

Example:

```
>BINDG 1000 <CR>      | Start a group binding using the group ID 1000.  
>Executing, Press Enter to Stop...  
>
```

1. Initiate binding using command BINDG 1000.
2. Go to each individual Miro device and make them flash yellow.
3. Go back to emulator and press Enter.

BINDH – BIND House (House Preset-Device Setup)

Mnemonic	Operands	Operation
BINDH	*[P]	Start a House Preset Binding (Def “P” = 1)

Transmit a “House Binding” (same as House Preset Binding) to the whole house. This is used to create or alter a house binding (house preset). In contrast to a room preset binding, by default each house preset is unique and you must add each group to each preset binding. This requires a separate binding for each house preset used.

Example:

```
>BINDH 14 <CR>        | Start a house preset binding of 14 = PANIC  
>Executing, Press Enter to Stop...
```

BINDR – BIND Room (Room Preset-Device Setup)

Mnemonic	Operands	Operation
BINDR	[R] * [P]	Start a Room Preset Binding (Def "P" = 0)

Transmit a "Room Binding" (same as Room Preset Binding) to a specific Room. This is used to create or alter a room preset binding. By default only one room binding is required to have the device act upon all presets with that room. If it is desired to have a device not act upon a specific preset then a room binding must be done with this preset and the devices or group be excluded. When creating a unique physical room, the user must ensure the Room ID entered is unique within the home and not currently used. Please refer to the GETIDL and IDR commands to ensure the appropriate unique Room ID is used.

Example:

```
>BINDR 22 <CR> | Start a room binding using the physical Room ID of 22
>Executing, Press Enter to Stop...
```

1. Initiate binding using command BINDR 22.
2. Go to each individual Miro device and make them flash yellow.
3. Go back to emulator and press Enter.

CPRR – Cancel Proportional Ramp to a Room

Mnemonic	Operands	Operation
CPRR	[R]	Cancel Proportional Ramp command to a specific Room

Transmit a "Cancel Proportional Ramp" to a specific Room. This command is used to stop a slowly increasing or decreasing proportional ramp that is issued to a room. For more information please refer to the proportional ramp room commands PRRUP and PRRDN.

Example:

```
>PRRUP 3 5 | Proportional Ramp Room 3 Up using a known ON preset.
>CPRR 3 <CR> | After a user was comfortable with the new light level, a cancel Proportional
| Ramp would be issued to stop the slowing increasing level change.
```

CRAMP – Cancel Ramp to a Group

Mnemonic	Operands	Operation
CRAMP	[G] *[TV]	Cancel Ramp and Cancel Proportional Ramp command

Transmit a “Cancel Ramp” to a specific Group. This command is typically used to stop a slowly increasing or decreasing ramp command. This command would follow a ramp command (with a TV = 0 or 255) that was issued to a group. If no target value is defined, a cancel proportional ramp is issued to the group.

When a cancel proportional ramp is used, the end devices will not save the new output setting as their LNZ value. I.e., If a control device is being ramped and a cancel ramp is issued without the target value (cancel proportional ramp will be sent to stop the ramp) this new output setting will not be stored as the devices LNZ level. Therefore when the device is turned off and then back on it will return to the LNZ value that was defined before the Ramp/Cancel Proportional Ramp commands were issued.


Example:

```
>CRAMP,43 <CR> | Cancel Ramp Group 43 at the devices' current output level. The optional  
| final output target value is not specified therefore the MR232 will send a  
| cancel proportional ramp command.
```

GETID – Get Device IDs (Device Setup)

Mnemonic	Operands	Operation
GETID	NONE	Enable Network Device Identifier (ID spy)

The GETID command is used to identify the setup of a specific or group of control devices on the network. This will help the integrator to setup the appropriate addresses to control the device.

When invoked, the user would typically go to the desired control point and start then stop a binding process (simultaneously press and hold the  keys on the device for about 2 seconds until the LED flashes). The subsequent transmission by the control device would be captured, decoded and displayed at the terminal. The operator would then return to the terminal and record the ID values so that the point can be controlled by the automation system.

The MR232 exits this mode when the user subsequently accesses the terminal by pressing the Enter key. This allows the user to physically locate and log multiple groups within the home before returning to the terminal. Output Data Includes: Device Sequence No, Device Type, Building ID, House ID, Room ID, Group ID, & MAC address.

Example:

```
>GETID <CR> | Enable Network Spy feature to extract device ID tags.  
>Executing, Press Enter to Stop...  
Please go to the device and start/stop a binding operation...  
  Dev-No  Dev-Tp  Bd-ID  Hs-ID  Rm-ID  Gp-ID  MAC Address  
> 0XXX   00XX   000X   0XXX   0XXX   XXXX   0xFFFFF
```

Typical response by a Plug-In Lamp Module would look something like this...

```
Dev-No,Dev-Tp, Bd-ID, Hs-ID, Rm-ID, Gp-ID, MAC Address  
> 0001, 0065, 0001, 0039, 0107, 1312, 0x98A10D
```

Device Types

Number	Device Description
0033	Multi-Location Controller
0034	Room Preset Controller
0035	House Preset Controller
0065	Dimmer or Plug-In Lamp Module
0066	Relay/Switch (Non-Dimming) or Plug-In Appliance Module
0067	Fan Controller

GETIDL – Get Device ID's List for whole house (Device Setup)

Mnemonic	Operands	Operation
GETIDL		Get Installation List for the whole house

This command builds an installed device list for the whole house. The execution of this command involves multiple message transmissions to each device with the corresponding House ID. The result is a two-step process. Step 1 is to build a table containing each unique MAC address. The second step is to poll each MAC address to get the specific binding information for each device. When installed and configured, the MR232 automatically monitors communications and builds the table outlined in step 1. To build the most complete installation list, wait roughly 30 minutes after the MR232 has been configured before running the GETIDL command.

Output Data Includes: Device No. (Table ID), Device Type, Building ID, House ID, Room ID, Group ID, & MAC address. The maximum number of devices the MR232 can record is 170. Since the Table ID is dynamically built as messages are received over the network, when the device is powered down and back up the device order (Table ID) changes accordingly.

Example:

```
>GETIDL <CR> | Build Installation list for whole house.  
>Executing, Press Enter to Stop...  
Dev-No, Dev-Tp, Bd-ID, Hs-ID, Rm-ID, Gp-ID, MAC Address  
0XXX, 00XX, 000X, 0XXX, 0XXX, XXXX, 0xFFFF
```

Following is an example of an output from three Lamp modules where one of them was previously detected and recorded but has subsequently been powered down or removed.

Dev-No,	Dev-Tp,	Bd-ID,	Hs-ID,	Rm-ID,	Gp-ID,	MAC Address
0001,	0065,	0001,	0039,	0107,	1312,	0x98A10D
0002,	Not Responding...					
0003,	0065,	0001,	0039,	043,	0004,	0x98A7AF

HELP – Interface/Command Help (Device Setup)

Mnemonic	Operands	Operation
HELP	NONE	Provide Command Help

Output help screen or listing for all commands and operands.

Example:

```
>HELP <CR> | Output Command Help.
```

See section 11 for Complete Command Summary.

IDR – Identify Room (Device Setup)

Mnemonic	Operands	Operation
IDR	[R] *[TI]	Identify Room

This is a Setup command that transmits an “Identify Command” to the room. Dimming devices in the room strobe their output once and blink their LED. Non-dimming devices blink their LED. The process is terminated automatically by the end device(s) when the internal timer of the device reaches zero. In addition, a status request is sent to the room so that the operator can quickly query the system and determine if the room already exists. If no device responds with the corresponding ID, the terminal displays the “Not Responding” message. The first device responding to the ID is displayed and all subsequent messages are suppressed.

Output data includes Room ID, Device Type, and Last Error Code. Group devices bound to that room also respond with a status message for their group. If the system messages have been suppressed the groups responding to the status request do not display.

Example:

```
>IDR 43 <CR> | Identify Room 43 for the default time of 4 seconds.
  Rm-ID, Type, Error
>RS, 0043, 0034, 0000 | The room controller for Room 43 responded.
  Gr-ID, C-Lvl, LNZ, Type, Error
>GS, 1120, 0000, 0085, 0065, 0000 | Group 1120, which is bound to room 43 also responded.
>IDR 119 <CR> | Identify Room 119 (where no Room controller exists).
>RS, 0119, Not Responding.... | No Room controller responded.
>GS, 1000, 0000, | Group 1120, which is bound to room 119 responded.
```

IDG – Identify Group

Mnemonic	Operands	Operation
IDG	[G] *[TI]	Identify Group

This is a Setup command that transmits an “Identify Command” to a group. Dimming devices in that group strobe their output and blink their LED. Non-dimming devices blink their LED. The process is terminated automatically by the end device(s) when the internal timer of the group reaches zero. Like the IDR command a status request is sent to the Group. For more information on status messages to a group, please refer to the STSG command. If the TSETUP command has been used to suppress system messages, only a single responding device will be displayed. The default mode is that all group status messages display.

Example:

```
>IDG 1055 75 <CR>           | Identify Group 1055 for 75x4s = 5min
      Gp-ID, C-Lvl, LNZ, Type, Error
>GS, 1055, 0255, 0085, 0065, 0000
>IDG 1055 <CR>               | Terminate identify of Group 1055 in 4 seconds.
>GS, 1055, 0255, 0085, 0065, 0000
>IDG 1001 <CR>               | Where no Group 1001 exists.
>GS, 1001, Not Responding...
```

LNZG – Set Group to Last Non-Zero (Button Pressed)

Mnemonic	Operands	Operation
LNZG	[G]	Simulate Button Pressed UP - Group

Send Button Pressed UP command to the specified group – Depending on the state (output level) of the device, it will act upon the command as follows:

- If the output level is zero (0), it will go to its Last Non-Zero Value, a value from 0-254.
- If the output level is currently non-zero (1-254), the output level will go to its maximum output level of 255.

Following this command, an STSG command is automatically issued after 2 seconds to update the system as to the current state of the group.

Example:

```
>LNZG 4022 <CR>             | Send a button Pressed “UP” command to group 4022.
>GS, 4022, 0255, 0180, 0065, 0000 | From the group status message (GS) we can see that the
                                     | group is currently at 255, its Last Non-Zero value is 180.
```

LNZR – Send Last Non-Zero for an entire room (Button Pressed)

Mnemonic	Operands	Operation
LNZR	[R]	Simulate Button Pressed UP - Room

Send a “Button Pressed-Up” command to the specified room. This command is identical to LNZN except that all groups within a physical room act upon the command.

Caution: When using this command to a room, all devices bound to that room including fan controllers will go to their last commanded ON state.

Following this command, a status request is sent to the room after 2 seconds to update the system as to the current state of the groups within that room.

Example:

>LNZR 66 <CR>	Send a button Pressed “UP” command to room 66, Devices will go to their LNZN value.
>GS, 1001, 0101, 0101, 0065, 0000	Groups within the room respond with their new level.
>LNZR,66 <CR>	Devices will go to the full on State (255).
>GS, 1001, 0255, 0101, 0065, 0000	Groups within the room respond with their new level.

LOCK – LOCK House or Room (Device Setup)

Mnemonic	Operands	Operation
LOCK	[1/0] *[R]	Lock / Unlock whole House or a Room

Lock House/Room – The lock command can be used to lock or unlock both binding and presets of a specific room or the whole house. This would only be done in systems where it was desired to lock everything including the alteration of presets. In this instance if a room or the house were locked, the SAVEHP or SAVERP commands would have no effect on the corresponding devices in the room or house. When the optional room operand is omitted, the lock/unlock command is sent to the whole house.

Example:

>LOCK 1 <CR>	Lock binding and presets for the entire home.
>LOCK 0 <CR>	Unlock (global) Room/House Binding and Presets for the entire home.
>LOCK, 1, 44 <CR>	Lock only Room 44 to all bindings and presets.
>LOCK, 0, 44 <CR>	Unlock only Room 44 to all bindings and presets.

ORHP – Over-Ride House to Preset

Mnemonic	Operands	Operation
ORHP	[P]	Over-ride House to Preset

Over-ride House to Preset - Issue an Over-Ride to preset command to the whole house. All devices bound to the house preset issued will over-ride their present state and go to the designated preset. This command is typically followed by a Revert Over-ride when it is desired to return the house to the previous state. When the command is issued, the target (bound) devices will store their present state in Preset 0 before going to the new preset level. When the RORHP command is issued, the target devices will restore their output value to the value stored in Preset 0.

Example:

```
>ORHP 12 <CR> | Devices within house bound to preset 12 (House ON) would store their  
                | present state go to preset 12.  
  
>RORHP <CR>    | Revert over-ride House, Devices within house would return to their  
                | previous stored state.
```

ORRP – Over-Ride Room to Preset

Mnemonic	Operands	Operation
ORRP	[R] [P]	Over-ride Room to Preset

Over-ride Room to Preset – Issue an Over-Ride to preset command to a given room. Devices within the room bound to the preset issued will then go to the designated preset. This command is typically followed by a Revert Over-Ride Room Preset command to return the room to the previous state. When the command is issued, the target devices will store their present state in Preset 0 before going to the new preset level. When the RORRP command is issued, the target devices will restore their output value to the value stored in Preset 0.

Example:

```
>ORRP 123 17 <CR> | Devices bound to Rm 123 would goto preset 17 (Room-On).  
  
>RORRP 123 <CR>  | Revert over-ride room 123, Devices within Room 123 would return to  
                  | their previous state.
```

PANIC – Control/Toggle PANIC feature (TOGGLE/ON/OFF)

Mnemonic	Operands	Operation
PANIC	[1] / [0]	Force PANIC mode ON/OFF

Force Panic mode ON / OFF. The control parameter 0/1 is required and will explicitly force the feature OFF (0) or ON (1). The “PANIC 1” command is the same as ORHP 14 (Over-Ride House Preset No. 14) while “PANIC 0” is “RORHP 14” (Revert Over-Ride House Preset) issued to the whole house. By default all devices are excluded from the PANIC (house) preset and must go through a manual binding process to be included. For more information about setting up the PANIC feature, please refer to the MRH5 Installation Instructions or the Wireless Miro Installation Guide. The PANIC mode can not be invoked from the RS-232 until the devices are bound to the panic button on the MRH5.

Example:

```
>PANIC 1 <CR> | Force PANIC mode ON, device bound to House Preset 14 will enter
                | PANIC mode.
>PANIC 0 <CR> | Force PANIC mode OFF, device bound to House Preset 14 will exit PANIC mode.
```

PRRDN – Proportional Ramp a Room - Down

Mnemonic	Operands	Operation
PRRDN	[R] [P] *[RM]	Proportional Ramp a room - DOWN

Proportional Ramp Room Down - Transmit a “Proportional Ramp Down Command” to a specific room. Both room number and preset are required. A preset value of 0 will force the devices to use the last preset executed in that room. When the Rate Multiplier is omitted, the default RM (30) is used. Wireless Miro devices with firmware Version 0x0A or higher that change their state with a proportional ramp command (followed by cancel ramp) respond with a status message to indicate their new state. Devices with earlier firmware will not immediately confirm the state change.

Example:

```
> PRRDN 25 17 <CR> | Ramp Room 25 using preset 17 and the default rate multiplier (30).
>CPRR 25           | Stop the light adjustment at the desired level.
```

PRRUP – Proportional Ramp a Room - Up

Mnemonic	Operands	Operation
PRRUP	[R] [P] *[RM]	Proportional Ramp a room - UP

Proportional Ramp Room Up - Transmit a “Proportional Ramp Up Command” to a specific room. Both room number and preset are required. A preset value of 0 will use the last preset executed in that room. When the Rate Multiplier is omitted, the default RM or 12% is used. For Wireless Miro devices with version 0x0A (hex, version 10 decimal) or higher, group devices that change their state with a proportional ramp command (followed by a cancel ramp) will respond with a status message to indicate their new state.

Example:

```
>PRRUP,25,17,20 <CR>      | Ramp Room 25 up using a known preset 17 (255)
                             | with a slower rate multiplier of 20.
>CPRR 25                    | Stop the light adjustment at the desired level.
```

RCHP – Recall House Preset

Mnemonic	Operands	Operation
RCHP	[P]	Recall House Preset XX (1-14)

Recall House Preset - Transmit a Recall House Preset to the whole house. For a list of House Presets, please refer to the House Preset Table at the end of this document. A house preset binding is required to binding the end control devices to the specified house preset. For Wireless Miro devices with version 0x0A (hex, version 10 decimal) or higher, group devices that change their state from a preset command will respond with a status message to indicate their new state.

Example:

```
>RCHP 2 <CR>               | Recall house preset 2.
```

RCRP – Recall Room Preset

Mnemonic	Operands	Operation
RCRP	[R] [P]	Recall Room Preset XX (1-17)

Recall Room Preset # - Transmit to the specified room to recall the desired preset. For a list of Room Presets, please refer to the Room Preset Table at the end of this document. A room preset binding is required to binding the end control devices to the specified house preset. For Wireless Miro devices with version 0x0A (hex, version 10 decimal) or higher, group devices that change their state from a preset command respond with a status message to indicate their new state.

Example:

```
>RCRP 57 5 <CR>           | Recall preset 5 in room 57.
```

RAMPG – Ramp Group; ramp a specific group to a desired output level

Mnemonic	Operands	Operation
RAMPG	[G] [TV] *[RR]	Ramp a specific group to a output level

Ramp Group - Transmit a “Ramp Command” to a specific group with the desired target level. Both group number and target value are required. When the Ramp Rate is omitted, the default ramp rate of 50% is used.

Example:

```
>RAMPG,75,128 <CR>      | Ramp Group 75 to 128 [50% output level] using the default ramp  
                           | rate of 50%.
```

RAMPR – Ramp Room; ramp a specific room to and desired output level

Mnemonic	Operands	Operation
RAMPR	[R] [TV] *[RR]	Ramp a specific room to a specific output level

Ramp Room - Transmit a “Ramp Command” to a specific room with the desired target level. Both room number and desired target value are required. When the Ramp Rate is omitted, the default ramp rate of 50% is used. By sending this command with a target level between 1 to 254 the receiving devices will set the LNz value to that level. In a typical installation the RAMPR command is not the best way to implement a command on the room. For room level commands, presets are more effective and encouraged.

Caution: When issuing this command to a room, all devices bound to that room, including fan controllers, ramp to the target output level.

Example:

```
>RAMPR 16 191 33 <CR>    | Ramp Room 16 to 191 [75% O-L] at a RR of 33% / second.
```

RORHP – Revert Over-Ride House Preset

Mnemonic	Operands	Operation
RORHP	*[P]	Revert Over-Ride House Preset

Revert Over-ride House Preset - Transmit a “Revert Over-ride Command” to the whole house. This command is typically issued following an Over-Ride to House Preset Command when it is desired to return the house to the previous state. When the optional Preset parameter is omitted, the preset used in the last ORHP command is used. For Wireless Miro devices with version 0x0A (hex, version 10 decimal) or higher, group devices that change their state from a preset command will respond with a status message to indicate their new state.

Example:

```
>ORHP 2<CR>              | Over-ride house to house preset. Devices bound to Preset 2 would store their  
                           | current state and go to Preset 2.  
>RORHP <CR>              | Revert Over-ride, devices return to previous state.
```

RORRP – Revert Over-Ride Room Preset

Mnemonic	Operands	Operation
RORRP	[R]*[P]	Revert Over-Ride Room Preset

Revert Over-ride Room Preset - Transmit a “Revert Over-ride Command” to a specific room. This command is typically issued following an Over-Ride to Room Preset Command when it is desired to return the house to the previous state. When the optional Preset parameter is omitted, the preset used in the last ORRP command is used. For Wireless Miro devices with version 0x0A (hex, version 10 decimal) or higher, group devices that change their state with a preset command will respond with a status message to indicate their new state.

Example:

```
>ORRP 23 7<CR>      | Over-ride room 23 to room preset 7. Devices bound to room 23
                       | preset 7 would store their current state and go to Preset 7.
>RORRP 23 7<CR>      | Revert Over-ride, devices return to previous state.
```

SAVERP – Save Room Preset

Mnemonic	Operands	Operation
SAVERP	[R] [P] *[FT]	Save current level to room preset

Save Room Preset – Transmit to the room to save current level as a preset (1-15). When optional fade time parameter is omitted, the default fade time of 2s is used. Devices only act upon and save the room preset if they have been through a binding process and been included in the room preset. Any device excluded from the preset will not record the information. **NOTICE:** Only Room Presets 1-15 can be altered &/or saved. Preset 16 & 17 cannot be changed. The command line help of the MR232 does not reflect this operand restriction. I.e., Help syntax still reflects room presets as 1-17.

Example:

```
>SAVERP,103,12 <CR>  | Save current level in ROOM 103 to Preset 12 with def. fade time.
>SAVERP 43 1 3 <CR>  | Save current level in ROOM 43 to Preset 1 with a fade time of 3s.
```

SAVEHP – Save House Preset

Mnemonic	Operands	Operation
SAVEHP	[P] *[FT]	Save current level to House preset

Save House Preset # – Transmit to the house to save current level as a house preset (1-10). When optional fade time parameter is omitted, the default fade time of 2s is used. Devices only act upon and save the house preset if they have been through a binding process and been included in the house preset. Any device excluded from the specific preset will not record the information. **NOTICE:** Only House Presets 1-10 can be altered &/or saved. Presets 11-14 cannot be changed. The command line help of the MR232 does not reflect this operand restriction. I.e., Help syntax reflects house presets as 1-14.

Example:

```
>SAVEHP 9 5 <CR>      | Save current level to house preset 9 with a fade time of 5s.
```

SETB – Set Building ID (Device Setup)

Mnemonic	Operands	Operation
SETB	[B]	Set Building ID (1-7)

Set Building ID – The default Building ID is 1. It can be changed to use a different Building ID. When the MR232 is un-configured (House ID =0000) it will accept the first Building/House binding that is broadcast as its new default ID.

Example:

```
>SETB 3 <CR>          | Set the Building ID to No. 3.  
>Updating ID...  
>Miro MR232 Ver.0xXX, Bld=03, Hs=0000, MAC=0xFFFFF
```

SETH – Set House ID (Device Setup)

Mnemonic	Operands	Operation
SETH	[H]	Set House ID (0-255)

Set House ID – The default House ID is 0000 and can be changed through the SETH command. As with all Wireless Miro devices, when the House ID is zero and a binding is initiated for another device, the MR232 will automatically accept the House ID and save the value to EEPROM. When the House ID is zero, the MR232 cannot acquire a random unique House ID like a typical Wireless Miro device. It can only acquire an existing House ID from an external binding or be set by the user with this command.

Example:

```
>SETH 97 <CR>          | Set the House ID to No. 97.  
>Updating ID...  
>Miro MR232 Ver.0xXX, Bld=03, Hs=0097, MAC=0xFFFFF
```

STSG – Status Group

Mnemonic	Operands	Operation
STSG	[G]	Get Status of a specific Group

Status Group – Transmit to a specific group to determine the status of the group. Output data includes Group ID, Current Level, Last Non-Zero Level, Device Type, and Last Error. To suppress group status messages, please refer to the TSETUP command.

Example:

```
>STSG 99 <CR>          | Get the status of a group 99. Although the group may have multiple devices,  
                        | the response is terminated once the first device response is acquired.  
                        Gp-ID, C-Lvl, LNZ, Type, Last-Error  
>GS, 0099, 0XXX, 0XXX, 0XXX, 0XXX  
>STSG 4000 <CR>       | Where no Group 4000 exists.  
>GS, 4000, Not Responding...
```

TSETUP – Terminal Setup

Mnemonic	Operands	Operation
TSETUP	[0-1]	Write terminal setup bits

Control terminal setup of the MR232. Currently the only option bit used is to allow the suppression of the system messages. At power-up, default is enabled. When the MR232 is being used as a setup tool, it may be desirable to suppress the status, ramp and cancel ramp messages from being displayed on the terminal.

Bit - 1	System "Status" Messages (Def=1 Enabled)
Bit - 2	Not Currently Used
Bit - 3	Not Currently Used
Bit - 4	Not Currently Used

Example:

```
>TSETUP 0 <CR>      | Suppress System Messages.  
>TSETUP, 1 <CR>      | Re-Enable System Messages.
```

VER – Miro MR232 Status (Device Setup)

Mnemonic	Operands	Operation
VER	NONE	Reset / Identify MR232 Version

Device Reset/Setup Status – This command will force a RESET of the MR232 and clear all volatile RAM. I.e., Internal device installation list will be deleted and will subsequently have to be rebuilt. Non-volatile setup data (Building/House ID) is retained. Upon power-up the Miro MR232 will transmit over RS232 the device setup/status. This includes the product name, firmware version, current configuration, and Device MAC. If the system message had been disabled with the TSETUP command, following the reset of the device, these messages will again be displayed.

Example:

```
>VER <CR>             | Reset Device / Get Version Number.  
>Resetting...  
>Miro MR232 Ver.0xXX, Bld=01, Hs=0XXX, MAC=0xFFFFF
```

10 Recommended Automation Commands

The following commands will have the greatest impact on the system performance while giving the user or system integrator the widest range in flexibility to control the system.

Command	Function
RAMPG	Command a group to go to a any value 0-255
CPRR	Cancel a slow adjusting Proportional Ramp command that was issued to a room
CRAMP	Cancel a slow adjusting Ramp issued to a group
LNZG	Send a Button Pressed command to a Group (0 -> LNZ, LNZ -> 255)
RCHP	Recall House Preset
RCRP	Recall Room Preset
PRRUP	Proportional Ramp Room Up
PRRDN	Proportional Ramp Room Down
ORHP	Over-Ride House Preset
ORRP	Over-Ride Room Preset
RORHP	Revert Over-Ride House Preset
RORRP	Revert Over-Ride Room Preset
SAVEHP	Save House Preset
SAVERP	Save Room Preset
STSG	Status request of a Group

11 Complete Command Summary

Mnemonic	Operands	Operation
**BINDG	[G]	Start a Group Binding
**BINDH	*[P]	Start a House Preset Binding (Default is 1)
**BINDR	[R] [P]	Start a Room Preset Binding
CPRR	[R]	Cancel a Proportional Ramp Command to a Room
CRAMP	[G] *[TV]	Cancel Ramp and Proportional Ramp Command
**GETID	NONE	Enable Network ID spy (used to identify control device)
**GETIDL		Get Installation List whole house
**HELP	NONE	Provide Command Help
**IDG	[G] *[TI]	Identify Group (1-4095)
**IDR	[R] *[TI]	Identify Room (1-127)
LNZG	[G]	Simulate Button Pressed UP - Group
LNZR	[R]	Simulate Button Pressed UP - Room
**LOCK	[0/1] *[R]	LOCK House / Room (No "R" Operand = House)
ORHP	[P]	Over-ride House to Preset
ORRP	[R] [P]	Over-ride Room to Preset
PANIC	[0/1]	Force PANIC mode ON/OFF
PRRDN	[R] [P] *[RM]	Proportional Ramp a Room – DOWN (Followed by a CPRR command)
PRRUP	[R] [P] *[RM]	Proportional Ramp a Room – UP (Followed by a CPRR command)
RCHP	[P]	Recall House Preset XX (1-14)
RCRP	[R] [P]	Recall Room Preset XX (1-17)
RAMPG	[G] [TV] *[RR]	Ramp a specific Group to a output level
RAMP	[R] [TV] *[RR]	Ramp a specific Room to a specific output level
RORHP	*[P]	Revert Over-Ride House Preset (Default "P" = Last ORHP)
RORRP	[R] *[P]	Revert Over-Ride Room Preset (Default "P" = Last ORRP)
SAVERP	[R] [P] *[FT]	Save current level to Room Preset
SAVEHP	[P] *[FT]	Save current level to House Preset
**SETB	[B]	Set Building ID (1-7)
**SETH	[H]	Set House ID (0-255)
STSG	[G]	Get Status of a Specific Group
**TSETUP	[0/1]	Terminal Setup / Disable System Messages
**VER	NONE	Reset / Identify MR232 Version Number

** Intended for system setup only. It is not recommended in a typical automation or control link unless the desired effect is to be able to bind and manipulate system setup and programming.

Operand Summary

Operand	Function (Suitable Values – Range)
[0/1]	1 = ON / 0 = OFF
[B]	Building (1-7)
[H]	House (0-255)
[R]	Room (1-127)
[G]	Group (1-4095)
[P]	Preset (Room = 1-15/17, House = 1-10/14)
[TI]	Time Interval (0-255) (X * 4sec = XXsec) i.e., 255 = 18min
[TV]	Target Value (0-255)
[RM]	Rate Multiplier (1-100), Default Value = 30
[RR]	Ramp Rate (1-100 in Percent), Default Value = 50
[FT]	Fade Time (0-255 in Seconds), Default Value = 2
*	Optional Parameter

Preset Table – Room

Room Preset #	Name	Comments	Dimming devices			Non-Dim (Relay)			Fan controller		
			Level	Fade time	Value	Level	Fade time	Value	Level	Fade time	Value
0	Storage	Storage	100%	2	255,2	ON	2	255,2	100%	2	255,2
1	USER-RP1	Set 1 - RP(A)	100%	2	255,2	ON	2	255,2	100%	Exclude	255,255
2	USER-RP2	Set 1 - RP(B)	75%	2	191,2	ON	2	191,2	75%	Exclude	191,255
3	USER-RP3	Set 1 - RP(C)	50%	2	129,2	ON	2	129,2	50%	Exclude	129,255
4	USER-RP4	Set 1 - RP(D)	25%	2	65,2	ON	2	65,2	25%	Exclude	65,255
5	USER-RP5	Set 1 - RP(E)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
6	USER-RP6	Set 2 - RP(A)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
7	USER-RP7	Set 2 - RP(B)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
8	USER-RP8	Set 2 - RP(C)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
9	USER-RP9	Set 2 - RP(D)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
10	USER-RP10	Set 2 - RP(E)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
11	USER-RP11	Set 3 - RP(A)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
12	USER-RP12	Set 3 - RP(B)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
13	USER-RP13	Set 3 - RP(C)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
14	USER-RP14	Set 3 - RP(D)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
15	USER-RP15	Set 3 - RP(E)	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
16 (*)	ROOM-OFF	Room Button Dn	OFF	2	0,2	OFF	2	0,2	OFF	Exclude	0,255
17 (*)	ROOM-ON	Room button UP	100%	2	255,2	ON	2	255,2	100%	Exclude	255,255

Preset Table – House

House Preset	Name	Comments	Dimming devices			Relay			Fan controller		
			Level	Fade time	Value	Level	Fade time	Value	Level	Fade time	Value
1	USER_HP1	Set 1 - HP(A)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
2	USER_HP2	Set 1 - HP(B)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
3	USER_HP3	Set 1 - HP(C)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
4	USER_HP4	Set 1 - HP(D)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
5	USER_HP5	Set 1 - HP(E)	OFF	2	0,2	OFF	2	0,2	OFF	2	0,2
6	USER_HP6	Set 2 - HP(A)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
7	USER_HP7	Set 2 - HP(B)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
8	USER_HP8	Set 2 - HP(C)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
9	USER_HP9	Set 2 - HP(D)	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255
10	USER_HP10	Set 2 - HP(E)	OFF	2	0,2	OFF	2	0,2	OFF	2	0,2
11 (*)	HOUSE-OFF	House Button Dn	OFF	5	0,5	OFF	5	0,5	OFF	5	0,5
12 (*)	HOUSE-ON	House Button UP	ON	Exclude	255,255	ON	Exclude	255,255	ON	Exclude	255,255
13 (*)	DAYLIGHT	DAYLIGHT	50%	Exclude	129,255	OFF	Exclude	0,255	OFF	Exclude	0,255
14 (*)	PANIC	PANIC	OFF	Exclude	0,255	OFF	Exclude	0,255	OFF	Exclude	0,255

* Factory fixed preset. Cannot be altered by the user.