



Operation/Reference Guide

# Mio R-2

## Remote Control Device



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# Overview

## The Mio R-2

The Mio R-2 remote provides custom control features, contained in an elegant handheld rechargeable device. The Mio R-2 controls 6 different device modes, supports 3 macro functions and is capable of executing 219 functions. The Mio R-2 can transmit in 38 KHz IR, 455 KHz IR, 418 RF (1-way) (**FG147-418**), 433 RF (1-way) (**FG147-433**), or 38 KHz and one of the RF frequencies.

Selecting a source device sends a command to the master and runs predetermined events associated with that source. Selecting a macro will run predefined events, which might not be associated with sources listed, then return the device to its previous mode.

You need KeypadBuilder to properly program this device. The application and documentation are available from [www.amx.com](http://www.amx.com).

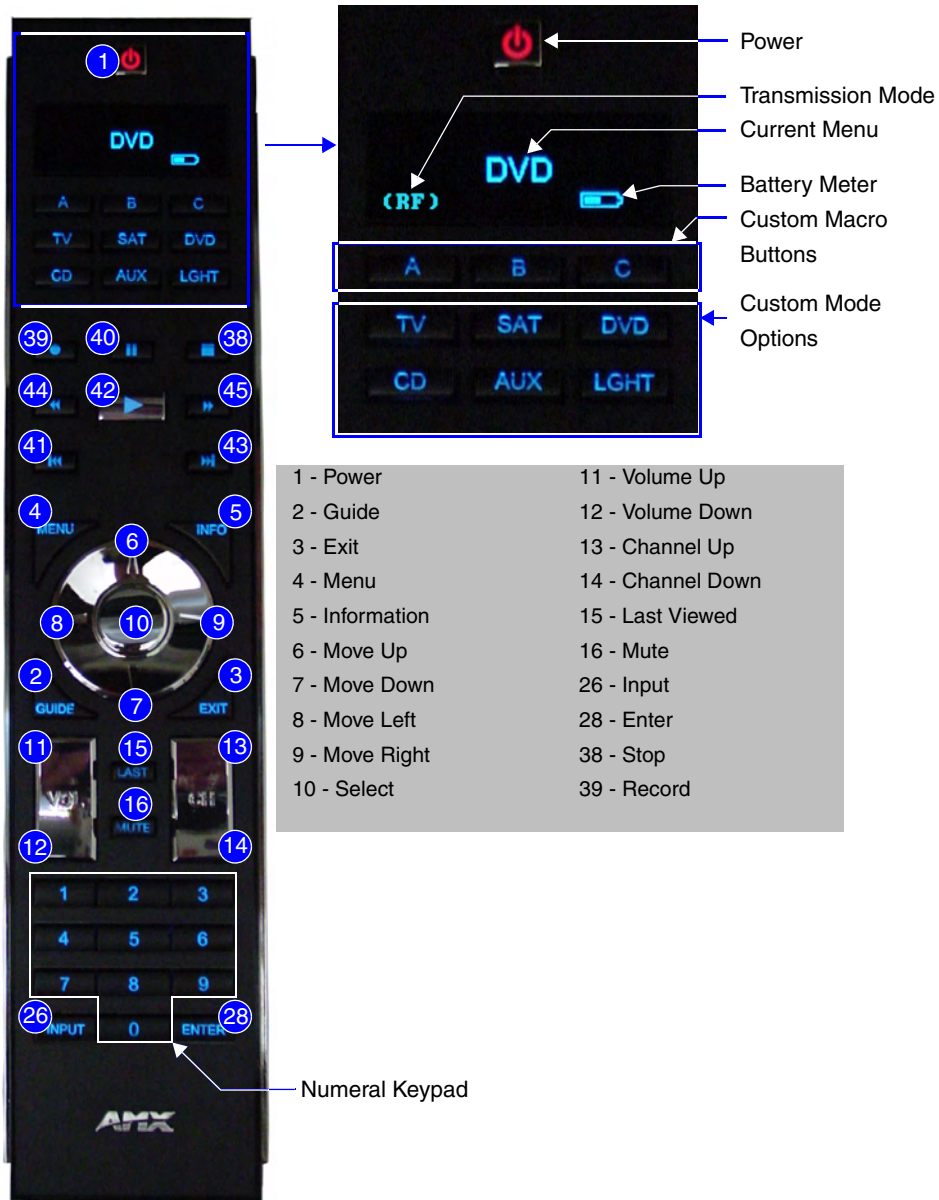


FIG. 1 The Mio R-2 Device

**Touch And Tilt Sensor**

The Mio R-2 wakes up upon touching either the chrome side rails or pressing a button. When holding the remote and it times out, you can reawaken the device by tilting it. Errant jostling such as a bumped table will not wake the device unless you are holding it.



## Specifications

The Mio R-2 device specifications are as follows:

| <b>Mio R-2 (FG147-418/433) Specifications</b>      |   |
|--|---|
| Battery  | 4 AAA Alkaline Batteries (5 hours battery life)   |
| Transmission Frequencies                           | <ul style="list-style-type: none"> <li>• AMX 38 KHz/455 KHz IR</li> <li>• 418 RF (1-way) (<b>FG147-418</b>)</li> <li>• 433 RF (1-way) (<b>FG147-433</b>)</li> </ul>   |
| Transmission Range (distance) with Mio IR Receiver | <ul style="list-style-type: none"> <li>• 100 feet at 38KHz (IR)</li> <li>• 50 feet at 455KHz (IR)</li> <li>• 300 feet at 418 (RF)</li> <li>• 200 feet at 433 (RF)</li> </ul>  |
| Transmission Range (angle)                         | <ul style="list-style-type: none"> <li>• 140 degrees (+/-70° from perpendicular) horizontally from an axis extending from the end of the remote. (IR)</li> <li>• 40 degrees (+/-20° from perpendicular) vertically from an axis extending from the end of the remote. (IR)</li> </ul>   |
| Top Components                                     | <ul style="list-style-type: none"> <li>• LED - blue backlit buttons indicate device is awake</li> <li>• Display (OLED) - 128 x 32 pixels, active area is 29.42mm x 7.98mm</li> <li>• Pushbuttons - the power button is red backlit; the rest are blue backlit buttons. 45 buttons; 9 custom buttons (3 macro and 6 device).</li> </ul>  |
| Rear Component                                     | <ul style="list-style-type: none"> <li>• Programming Port - 2.5 mm stereo female conductor jack</li> <li>• Battery Door</li> <li>• Rechargeable Battery Connection</li> </ul>   |
| Dimensions (HWD)                                   | 9.50 x 2.00 x .74 (241.3 mm x 50.8 mm x 18.80 mm)   |
| Supported Languages:                               | <ul style="list-style-type: none"> <li>• Arabic</li> <li>• English</li> <li>• French</li> <li>• German</li> <li>• Greek</li> <li>• Hebrew</li> <li>• Hindi</li> <li>• Italian</li> <li>• Japanese</li> <li>• Korean</li> <li>• Mandarin Chinese</li> <li>• Portuguese</li> <li>• Russian</li> <li>• Spanish</li> <li>• Thai</li> </ul>  |
| Weight   | <ul style="list-style-type: none"> <li>• .45 lbs (20 g) without batteries</li> <li>• .55 lbs (25 g) with batteries</li> </ul>   |
| Operating Environment:                             | <ul style="list-style-type: none"> <li>• Operating Temperature: 0° to 50° C (32° to 122° F)</li> <li>• Storage Temperature: -10° to 70° C (14° to 158° F)</li> </ul>  |
| Other AMX Equipment                                | <ul style="list-style-type: none"> <li>• DB-9 extension cable (<b>FG10-727</b>)</li> <li>• Programming Cable - a 3 wire, 2.5 mm stereo jack (<b>FG10-817</b>)</li> <li>• Custom engraving (<b>FG147-01</b>)</li> <li>• Mio-RCC Kit (<b>FG147-03K</b>)</li> <li>• Mio-RCC Charging Base (<b>FG147-02</b>)</li> <li>• Mio-RBP Rechargeable Lithium Ion Battery (<b>FG147-10</b>)</li> <li>• AXR-RF 418 MHZ RF Receiver (<b>FG782-418</b>)</li> <li>• AXR-RF 433 MHZ RF Receiver (<b>FG782-433</b>)</li> </ul> |

## **FCC compliance**

This device complies with Part 15 of the FCC rules. Subject to the following two conditions:

1. This device must not cause harmful interference and
2. This device must accept all interference, including interference that interferes with the operation of this device.

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

# Mio R-2 Setup

## Installing Your Custom Buttons

3. Flip and turn the Mio R-2 device so that the buttons are facing away from you and the device is upside down.
4. Holding the device in both hands, place your thumbs on the battery door and push up to slide the battery door free.
5. Unscrew the 6 screw points indicated in FIG. 2.

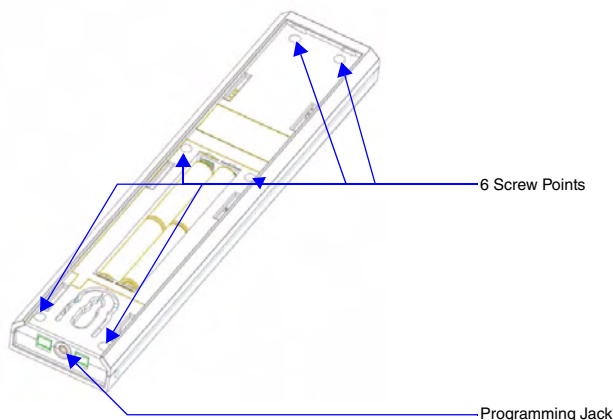


FIG. 2 Internal Mio R-2 Components

6. Turn the unit over so the buttons are facing you.
7. Lift the top assembly away from the PCB.
8. If necessary, push out the standard buttons from the front of the top assembly.
9. Drop on your custom button pad and verify the alignment with the guide posts on the PCB.
10. Place the top assembly back down on the PCB and return the unit over, exposing the 6 screw points.
11. Tighten the 6 screw points.
12. Place the battery door back on the device, slide to lock it in place.

## Inserting Batteries into The Mio R-2

To install your 4 AAA batteries into the Mio R-2 device:

1. Flip and turn the Mio R-2 device so that the buttons are facing away from you and the device is upside down.
2. Holding the device in both hands, place your thumbs on the battery door and slide the battery door free.
3. Insert the batteries as indicated inside the battery compartment.
4. Place the battery door back on the device, slide to lock it in place.

## Battery Low Indicator

When the battery charge level is too low to sustain continuous operation, the LCD flashes, "Battery Low" and the device shuts down.

# Programming The Mio R-2

Most functionality of the Mio R-2 is handled using the application, *KeypadBuilder*. Go to [www.amx.com](http://www.amx.com) for the *KeypadBuilder Instruction Manual*.

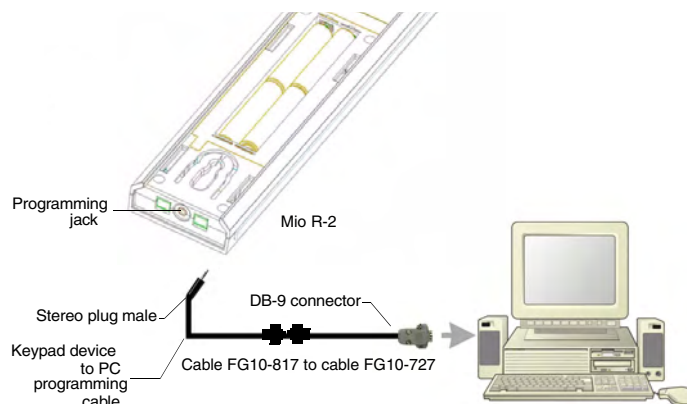
There are a select number of Serial Commands the Mio R-2 recognizes. For a full list and descriptions, consult the *Persistent Serial Commands* section on page 11.

## Using Connector Ports on The Mio R-2

The programming jack is used for communication between the device and KeypadBuilder. The programming jack uses a three-wire, 2.5 mm stereo jack, you can order the programming cable (**FG10-817**) from AMX if you do not currently possess one. While loading your configuration file make sure the device is situated as such that the batteries will not fall out. The load will fail if your batteries fall out during the process.

To download KeypadBuilder Configuration Files:

1. Set the Mio R-2 Download mode to ON. See the Configuration Mode section for details.
2. Flip and turn the Mio R-2 device so that the buttons are facing away from you and the device is upside down.
3. Holding the device in both hands, place your thumbs on the battery door and slide the battery door free.
4. Connect the 2.5 mm stereo plug (male) end of the programming cable (**FG10-817**) into the programming jack on the bottom side of the remote device.
5. If necessary, connect the DB-9 end of the programming cable to the female DB-9 connector on the DB-9 extension cable (**FG10-727**).
6. Connect the female DB-9 terminal end of the extension cable to the port on the back of your computer.
7. Configure the communication parameters in KeypadBuilder.



**FIG. 3** Connecting The Keypad Device to Your PC

## IR Code Matrix

The IR Code emitted depends upon which of the 6 configurable modes is selected. Below is the list of codes for each button within each mode.

| IR Code Matrix |               |        |        |        |        |        |        |
|----------------|---------------|--------|--------|--------|--------|--------|--------|
| Button         | Label         | Mode 1 | Mode 2 | Mode 3 | Mode 4 | Mode 5 | Mode 6 |
| 1              | Power Symbol  | 9      | 49     | 89     | 129    | 169    | 209    |
| 2              | GUIDE         | 38     | 78     | 118    | 158    | 198    | 238    |
| 3              | EXIT          | 37     | 77     | 117    | 157    | 197    | 237    |
| 4              | MENU          | 31     | 71     | 111    | 151    | 191    | 231    |
| 5              | INFO          | 39     | 79     | 119    | 159    | 199    | 239    |
| 6              | L             | 32     | 72     | 112    | 152    | 192    | 232    |
| 7              | M             | 33     | 73     | 113    | 153    | 193    | 233    |
| 8              | K             | 34     | 74     | 114    | 154    | 194    | 234    |
| 9              | A             | 35     | 75     | 115    | 155    | 195    | 235    |
| 10             | SELECT        | 36     | 76     | 116    | 156    | 196    | 236    |
| 11             | VOL +         | 24     | 64     | 104    | 144    | 184    | 224    |
| 12             | VOL -         | 25     | 65     | 105    | 145    | 185    | 225    |
| 13             | CH +          | 22     | 62     | 102    | 142    | 182    | 222    |
| 14             | CH -          | 23     | 63     | 103    | 143    | 183    | 223    |
| 15             | LAST          | 40     | 80     | 120    | 160    | 200    | 240    |
| 16             | MUTE          | 26     | 66     | 106    | 146    | 186    | 226    |
| 17             | 1             | 11     | 51     | 91     | 131    | 171    | 211    |
| 18             | 2             | 12     | 52     | 92     | 132    | 172    | 212    |
| 19             | 3             | 13     | 53     | 93     | 133    | 173    | 213    |
| 20             | 4             | 14     | 54     | 94     | 134    | 174    | 214    |
| 21             | 5             | 15     | 55     | 95     | 135    | 175    | 215    |
| 22             | 6             | 16     | 56     | 96     | 136    | 176    | 216    |
| 23             | 7             | 17     | 57     | 97     | 137    | 177    | 217    |
| 24             | 8             | 18     | 58     | 98     | 138    | 178    | 218    |
| 25             | 9             | 19     | 59     | 99     | 139    | 179    | 219    |
| 26             | INPUT         | 29     | 69     | 109    | 149    | 189    | 229    |
| 27             | 0             | 10     | 50     | 90     | 130    | 170    | 210    |
| 28             | ENTER         | 21     | 61     | 101    | 141    | 181    | 221    |
| 29             | A (Macro 1)   | 250    | 250    | 250    | 250    | 250    | 250    |
| 30             | B (Macro 2)   | 251    | 251    | 251    | 251    | 251    | 251    |
| 31             | C (Macro 3)   | 252    | 252    | 252    | 252    | 252    | 252    |
| 32             | TV (Mode 1)   | 241    | 241    | 241    | 241    | 241    | 241    |
| 33             | SAT (Mode 2)  | 242    | 242    | 242    | 242    | 242    | 242    |
| 34             | DVD (Mode 3)  | 243    | 243    | 243    | 243    | 243    | 243    |
| 35             | CD (Mode 4)   | 244    | 244    | 244    | 244    | 244    | 244    |
| 36             | AUX (Mode 5)  | 245    | 245    | 245    | 245    | 245    | 245    |
| 37             | LGHT (Mode 6) | 246    | 246    | 246    | 246    | 246    | 246    |
| 38             | STOP ■        | 2      | 42     | 82     | 122    | 162    | 202    |
| 39             | REC ●         | 8      | 48     | 88     | 128    | 168    | 208    |
| 40             | PAUSE         | 3      | 43     | 83     | 123    | 163    | 203    |

| IR Code Matrix (Cont.) |           |        |        |        |        |        |        |
|------------------------|-----------|--------|--------|--------|--------|--------|--------|
| Button                 | Label     | Mode 1 | Mode 2 | Mode 3 | Mode 4 | Mode 5 | Mode 6 |
| 41                     | S. REV ◀◀ | 7      | 47     | 87     | 127    | 167    | 207    |
| 42                     | PLAY ▶    | 1      | 41     | 81     | 121    | 161    | 201    |
| 43                     | S. FWD ▶▶ | 6      | 46     | 86     | 126    | 166    | 206    |
| 44                     | REW ◀◀    | 5      | 45     | 85     | 125    | 165    | 205    |
| 45                     | FWD ▶▶    | 4      | 44     | 84     | 124    | 164    | 204    |

## Configuration Mode

The configuration mode allows you to set the following device features:

- IR Transmit Mode (38 KHz, 455 KHz or both 38 KHz IR and RF)
- Timeout Adjustment
- Download Mode
- Debug Mode
- Battery Type
- LED Awake Brightness
- LED Sleep Brightness

To enter configuration Mode:

1. Press and hold the **STOP** button and the **INPUT** button. The two buttons must be pressed within 0.1 seconds of each other and held down for 2 seconds. The device indicates you are now in configuration mode. See below for available modes.
2. Press the **EXIT** key when you are finished.



NOTE

*Your settings will not be lost in the event your batteries die or are removed.*

## IR Transmit Mode

Pressing button "1" on the remote toggles the IR transmission mode between 38KHz, 455KHz, RF, and both 38KHz IR and RF. The display indicates the current mode.

## Timeout Adjustment

Press button "2" on the remote to change the sleep timeout from the default. Each time "2" is pressed, the sleep timeout raises incrementally. The pre-determined sleep timeouts are:

- 3 seconds
- 6 seconds
- 9 seconds
- 12 seconds

The display indicates the selected sleep timeout.

## Download Mode

Pressing "3" on the remote toggles the Download mode OFF and ON. The Download mode must be ON before you can download a file to the Mio R-2 device. While the Download mode is ON the device will not go to sleep. A power cycle will return the device to Download OFF.

## Debug Mode

Pressing button "4" on the remote toggles development mode between ON and OFF. The display indicates the selected mode. In development mode, the display shows the IR code assigned to buttons when pressed.

This mode is useful to the programmer when determining what IR codes are associated to each mode.

## Battery Type

Pressing button "6" on the remote toggles the battery type between Normal and Recharge. The display indicates the selected type. The type of battery in the Mio R-2 dictates the battery type you need to set.

## LED Awake Brightness

Pressing button "7" on the remote toggles the Power LED brightness mode from LOW to MED and then HIGH. The display indicates the selected mode.

## LED Sleep Mode Brightness

Pressing button "8" on the remote toggles the Sleep brightness mode from OFF to LOW and then MED. The Sleep brightness is the state the Mio R-2 assumes while in the charging cradle.



## Persistent Serial Commands

There are a select number of persistent commands the Mio R-2 recognizes. Establish a HyperTerminal session with your device to use the following commands:

| Serial Commands |   |
|-----------------|---|
| @BRT            | <p>Set Brightness level</p> <p><b>Syntax:</b></p> <pre>"'BRIT-&lt;awake brightness level&gt;,&lt;sleep brightness level&gt;' "</pre> <p><b>Variables:</b></p> <p>brightness level # = a value from 0 - 32.</p> <p>""@BRT-#" (Set LED Awake brightness level)</p> <p>""@BRT-#,#" (Set LED Awake brightness level, sleep brightness level)</p> <p><b>Example:</b></p> <p>(1) "'@BRT-16' "</p> <p>Sets the awake brightness level to 50%.</p> <p>(2) "'@BRT-32,5' "</p> <p>Sets the awake brightness level to 100% and sleep brightness level to approximately 15%</p> |
| IRMODE #        | <p>Sets the IR transmission frequency to either 455KHz or 38KHz.</p> <p><b>Syntax:</b></p> <pre>"IRMODE #"</pre> <p><b>Variables:</b></p> <p># = 455 or 38</p> <p><b>Example:</b></p> <pre>"IRMODE 455"</pre> <p>Sets the IR transmission frequency to 455KHz.</p>  |
| SLEEP-#         | <p>Force the device into screen saver mode.</p> <p><b>Syntax:</b></p> <pre>"'SLEEP-#'" (timed sleep; a persistent command)</pre> <p><b>Variables:</b></p> <p># = 0 - 60 in seconds; time to wait before going to sleep. Default is 30. 0 sets the device to never sleep.</p> <p><b>Example:</b></p> <pre>SEND_COMMAND Panel, "'SLEEP-45' "</pre> <p>Forces the device into screen saver mode after 45 seconds.</p>  |



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