



ESI RF BRIDGE

User Guide — DRAFT, rev 4

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Introduction

The ESI RF Bridge translates between ESI RF communication and serial ASCII strings via an RS-232 connection. The messages can be similar to RQ Bridge, which allows ESI RF products to be controlled by Home Automation Systems, Building Management Systems, or other RS-232 sources with existing ESI RQ drivers. The ESI RF Bridge communicates to ESI RF devices (motors and the RF Switch Interface) and RQ devices (motors and motor controls) using the ESI RF RQ Transceiver interface.

Parts and Accessories

Included:

- ESI RF Bridge.
- ESI RF Antenna 2.4 GHz (onboard).
- External power supply 5 volt DC, 1A (with interchangeable domestic / international AC plugin adapters).
- USB to Mini-B cable, 3 feet (for external power supply).

Usage:

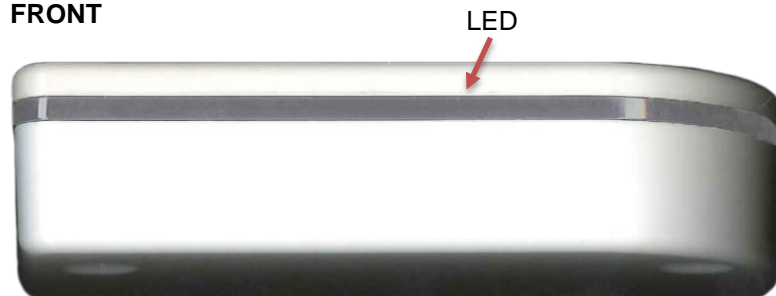
- Indoor Use in Dry Locations Only.

Not Included:

- SUITE remote.
- PC computer.
- RS-232 serial cable.



FRONT



BACK



USB Port:

- The USB port is only for power, not data.
- Use only the 5 volt DC external power supply provided.

ESI RF Bridge — Factory Defaults

Power Up	Observe the ESI RF Bridge LED for initialization during power-up: 9 Yellow, 7 Blue (Beta)
Baud rate	9600 8N1
Flow Control	Xon/Xoff
Echo received characters	Off
End-of-line sequence	CR (carriage return)
Flip position when using RQ	Yes
RQ Address	BSB (may be reassigned)

NOTE: RTS/CTS (hardware flow control) is not available for Beta versions of the ESI RF Bridge but will be supported in the Production release.

Setup

Hardware Requirements

- ESI RF Bridge (with 5 volt DC power supply and USB to Mini-B cable).
- PC computer or laptop with DB-9 style (DE-9) serial port, or USB port for a USB Serial Adaptor cable.
 - Terminal program for the PC, such as HyperTerminal or Tera Term.
 - RS-232 male to female cable **or** USB Serial Adaptor cable (USB with DB-9 style male connector).
- **OPTIONAL:** SUITE remote, to provide an additional method of motor administration and control, in addition to the automation system.

Terminal Emulator Settings

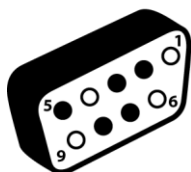
- Serial Port Settings: 9600 baud, 8 bits, 1 stop bit, no parity
- Flow Control: Software Xon/Xoff
- Local Echo: off
- Do not insert a linefeed after CR.

RS-232 Cable and Pinout

Standard DB-9 style to DB-9 style RS-232 serial cables are used to connect a PC/laptop or automation system to the ESI RF Bridge.

NOTE: the CTS and RTS wires can be omitted when using Xon/Xoff flow control.

ESI RF Bridge RS-232 connector, DE-9 female



pin 2 = Tx
 pin 3 = Rx
 pin 5 = SigGnd
 pin 7 = CTS
 pin 8 = RTS

1. Hook it up. (also, see the *Specifications and Installation Instructions* document)

- Turn on PC and configure terminal program to the correct terminal emulator settings.
- Connect the RS-232 cable (or USB Serial Adaptor cable) from the PC to the RS-232 port on the ESI RF Bridge.
- Connect the "USB to Mini-B" cable from the 5 volt DC external power supply to the ESI RF Bridge.
NOTE: The USB ports are only for power, not data. Plug the cable into the power supply provided.

2. Apply power to the ESI RF Bridge.

- a. Plug in the 5 volt DC external power supply to AC power.
- b. Observe the ESI RF Bridge LED for initialization during power-up.
Version blink: **9 Yellow, 7 Blue (Beta)**
- c. A serial string is sent to the PC or automation system.
Serial string: **!BSBv0.9.7.1** (NOTE: version "0.9.7.1" is shown; the beta version number may be different.)

3. Configure the ESI RF Bridge.

Use the terminal emulator to configure the ESI RF Bridge and send commands to the RQ devices and RF devices in the network.

In the Terminal Emulator:

- a. Press **Ctrl-C** to launch the Configuration Menu (see the "Configuration Menu items" table below for an explanation of the Configuration Menu settings).
 - Only the last item in the Configuration Menu shows in the terminal emulator. To see all of the menu items, turn on the Echo and Linefeed characters using the next two steps.
- b. Press the "2" key.
 - Sets Echo to "on" to see Rx characters on the screen.
- c. Press the "3" key.
 - Sets the line termination character to CR+LF (carriage return and line feed).

Configuration Menu:

```

Configuration Menu
0. Exit Configuration
1. Baud rate                9600
2. Bridge echoes Rx'd characters on
3. Line termination character(s) CR+LF
4. Semicolon action        Terminates command
5. Flip position when using RQ Yes
6. Pass Device Information Frame Never
  
```

- d. OPTIONAL: change the Baud Rate.
 1. Press the "1" key **OR** use an arrow key to choose the "1." entry in the Configuration Menu, then press the Enter key.
 2. In the Baud Rate sub-menu, press the "1" "2" or "3" key **OR** use an arrow key to choose the "1." "2." or "3." entry, then press the Enter key.

Baud Rate sub-menu:

```

Baud rate
0. Up
1. 9600
2. 19200
3. 115200
-
  
```

3. Change the Baud Rate in the terminal emulator program on the PC to match the ESI RF Bridge.
4. Power-cycle the ESI RF Bridge.
NOTE: the Baud Rate does not change until power is turned off, then turned on.

To return to the Configuration Menu from the Baud Rate sub-menu:

- Press the "0" key **OR** use an arrow key to choose the "0." entry, then press the Enter key.

- e. **OPTIONAL:** change other settings, by choosing the item in the Configuration Menu, and making a selection in the sub-menu that appears.
- f. **Exit Configuration:** Press the “0” key **or** use an arrow key to choose the “0.” entry in the Configuration Menu, then press the Enter key.

Configuration Menu items

Configuration Menu Entry	Default Setting	Description
0. Exit Configuration	n/a	Exits the ESI RF Bridge configuration menu.
1. Baud rate	9600	Choices: 9600, 19200, 115200
2. Bridge echoes Rx'd characters	off	Choices: off = do not echo characters to the display. on = echo characters to the display.
3. Line termination character(s)	CR	Choices: CR = moves the cursor to the beginning of the same line. CR+LF = moves the cursor to the beginning of the next line.
4. Semicolon action	Terminates command	Choices: Terminates command = parses and transmits single commands each time a semicolon or CR is received. Separates commands = allows multiple commands to be received before processing. Commands are parsed and transmitted after a CR is received.
5. Flip position when using RQ	Yes	Choices: <i>See NOTE 1 below.</i> Yes = position reports from RF devices are flipped to match the position reporting scheme of RQ devices. No = position reports from RF devices are not flipped.
6. Pass Device Information Frame	Never	Choices: <i>See NOTE 2 below.</i> Never = do not transmit Device Information Frames over the serial interface. When using RF = transmit Device Information Frames over the serial interface when the last command received was an RF command and not an RQ command. Always = transmit Device Information Frames over the serial interface whenever one is received from an RF device.

NOTE 1

- By default, RQ devices report 99 percent when at the fully closed limit, and 0 percent when at the fully open limit, with the exception of the FOREST Shuttle® motor, where 0 percent is the fully closed limit.
- By default, RF devices report 0.0 percent when at the fully closed limit, and 99.9 percent when at the fully open limit.
- When the RQ protocol is used, the position is reported as two digits (0-99) from RQ devices that use the ESI RF RQ Transceiver.
- When the RF protocol is used, the position is reported as two digits (0-99) from RQ devices, and as three digits (0.0-99.9) from RF devices.

NOTE 2

- A Device Information Frame is an RF protocol message that contains detailed information about an RF device.

Create an ESI RF Network

The ESI RF Bridge communicates with all ESI RF devices as well as RQ motor controls or Q motors that are connected to ESI RF RQ Transceivers.

Initial Conditions

ESI RF Bridge

Powered up, connected to a PC or automation system, and configured.

ESI RF Devices

To use ESI RF commands from the terminal emulator or automation system, the motor can be in either of the following two conditions:

- motor at factory defaults and unplugged, **or**
- motor with limits set, network information cleared, and unplugged.

To use RQ commands from the terminal emulator or automation system, the motor must be in this condition:

- motor with limits set, network information cleared, and unplugged.
NOTE: you can use the motor head buttons or a SUITE remote to set limits on an ESI RF motor.

SUITE remote at factory default and asleep.

For details about using a SUITE remote in an ESI RF network, see the *M40/50RF System Quick Setup Guide* on the ESI website: [SUITE Arc web page](#).

RQ Devices

Prepare RQ devices for incorporation into an ESI RF network, but do not plug in the ESI RF RQ Transceiver.

1. The RQ device must be in the following state before connecting to an ESI RF RQ Transceiver:
 - a. **Factory Default — all options set to factory default.**
 - b. **Limits set:**
 - i. **If RQ control, limits on the motor being controlled must be set and the control calibrated.**
 - ii. **If RQ motor, the limits must be set.**
 - c. **Calibrated.**
2. Follow the setup instructions in the *ESI RF RQ Transceiver Install Guide* on the ESI website: [ESI RF RQ Transceiver web page](#).
3. The RQ device — motor or motor control — must be powered up. The ESI RF RQ Transceiver will be connected in a later step. A motor control must have a motor connected, to provide feedback (jog), as an ESI RF network is set up.

Definitions

ESI RF Bridge	ACTION	RESULTS
Hub Device Designation for the ESI RF Bridge when powered up.		IMPORTANT: The ESI RF Bridge is always the Hub Device in an ESI RF network. No other device can be the Hub Device.
Jog Once		Device moves a short distance in one direction.
Jog Twice		Device moves a short distance in one direction, then moves a short distance in the opposite direction.
Join a Network	While Network Invite is active on the SUITE remote and ESI RF Bridge: <ul style="list-style-type: none"> • Plug in each ESI RF motor. • Plug in each ESI RF RQ Transceiver to a powered RQ device. 	Device jogs once to indicate the ESI RF or RQ device successfully joined the network.
Network Button	Triple press within 1 second	A reset that clears network information. The Yellow LED blinks

ESI RF Bridge	ACTION	RESULTS
		twice, then the Blue LED blinks twice (indicates the ESI RF Bridge is a Hub Device). A serial string with the version number is sent to the PC or automation system.
	Single press	Starts Network Invite. Use only when the Yellow LED is off, and you want to join a ESI RF devices and a SUITE remote to the ESI RF network. <ul style="list-style-type: none"> The Yellow LED flashes indefinitely. Single-press the Network Button again to turn off Network Invite (Yellow LED stops flashing).
	Press and hold for 10 seconds , until Yellow LED blinks once, then release.	A partial reset that resets the Baud Rate and Terminal Emulator settings for the ESI RF Bridge.
Reset Button	Single press	A full reset of the ESI RF Bridge to factory default. <ul style="list-style-type: none"> The Blue LED blinks twice to indicate the ESI RF Bridge is a Hub Device. A serial string with the version number is sent to the PC or automation system.
Network Invite	Press Network Button on ESI RF Bridge. Press STOP button on SUITE remote.	The time frame while the Hub Device allows other ESI RF devices to join the network. ESI RF Bridge: Yellow LED flashes indefinitely. SUITE Remote: Green LED flashes for 60 seconds.
Network Search	Press PRESET, UP, STOP, or DOWN button on SUITE remote when remote is at factory default and asleep.	The 30 second time frame while a remote looks for ESI RF devices to join when no network is present. On the remote, the Green LED is on solid.

Steps

1. Verify that no devices are currently joined to the ESI RF network:
 - a. In the terminal emulator, press **Ctrl-T** to show the Device List.
 - b. If the Device List is empty, continue with Step 2.

Empty Device List:

```

Query Network Information
Channel: 22
IEEE Address: 00267400FFFFAD0B
PAN Id: AFB9
Short Address: 0000

Device List
-----
| RQ | Short Addr | IEEE Address | Type | Role
-----
    
```

- c. If the Device List contains devices, then triple-press (within 1 second) the **Network Button** on the ESI RF Bridge.
 - The Yellow LED blinks twice, then the Blue LED blinks twice.
 - A serial string with the version number is sent to the PC or automation system.
- d. In the terminal emulator, press **Ctrl-T** to show the Device List, which should be empty. Continue with Step 2.

2. On the ESI RF Bridge, press the **Network Button** once, to start Network Invite.
 - a. The Yellow LED is flashing (and remains flashing until the **Network Button** is pressed again).
3. On the SUITE remote:
 - a. Press the PRESET, UP, STOP, or DOWN button to “wake up” and initiate Network Search.
 - Green PRESET LED is on solid.
 - b. After a few seconds, the SUITE remote joins the ESI RF network.
 - The Group 1 LED is on solid, and the Red PRESET button is on solid.
4. On the SUITE remote:
 - a. Press and release the STOP button to initiate Network Invite.
 - Green LED under PRESET flashes for up to 60 seconds while Network Invite is active.
5. **While** Network Invite is active on **both** the SUITE remote and ESI RF Bridge, apply power to each ESI RF motor and if there are RQ devices, plug in an ESI RF RQ Transceiver to each RQ device, until all devices are joined to the network.
 - a. Each device will jog once when it joins the network (within a few seconds).
6. On the ESI RF Bridge, press the **Network Button** once to stop Network Invite.
 - a. Yellow LED turns off.
7. In the terminal emulator, press **Ctrl-T** to show the Device List. Verify that all devices successfully joined the network. Below is an example of a Device List with six devices. The ESI RF Bridge does not show in the Device List.

NOTE: The RQ address of each device is automatically reassigned, to 3 digit numbers in ascending order, for example: 001, 002, 003, and so on.

NOTE: For the **Type** of device: **01** is a SUITE remote, and **06** is an ESI RF motor or ESI RF RQ Transceiver (connected to a Q motor or RQ motor control).

Populated Device List:

```

Query Network Information
Channel: 22
IEEE Address: 00267400FFFFAD0B
PAN Id: AFB9
Short Address: 0000

Device List
-----
| RQ | Short Addr | IEEE Address      | Type | Role
-----
| 001 | 0001      | 00267400FFFE601F | 01   | 01
| 002 | 0002      | 00267400FFFE8048 | 06   | 02
| 003 | 0003      | 00267400FFFE6000 | 06   | 02
| 004 | 0004      | 00267400FFFE804A | 06   | 02
| 005 | 0005      | 00267400FFF804B  | 06   | 02
| 006 | 0006      | 002674000030863  | 06   | 02
    
```

8. Configure the ESI RF network:
 - a. Use the SUITE remote to **configure** the ESI RF network (Set Limits and so on), **OR**
 - b. In the terminal emulator or automation system, use the RQ commands listed in the next section to **configure** the ESI RF network.

IMPORTANT: If you are **not** using a SUITE remote in the ESI RF network, you must set limits on ESI RF motors first, in order to use RQ commands from the terminal emulator to configure and control those motors.

9. If the ESI RF Bridge will be connected to an automation system after the ESI RF network is set up, then you must reverse the Echo (On) and Line Termination character (CR+LF) that were turned on previously in the Configuration Menu. In the terminal emulator:
 - a. Press **Ctrl-C** to enter the Configuration Menu.
 - b. Press the "2." key.
 - c. Press the "3." key.
 - d. Press the "0." key to exit the Configuration Menu.
10. Disconnect the PC from the ESI RF Bridge.
11. Connect the ESI RF Bridge to an Automation System.
12. Put the SUITE remote into User Mode, for handoff to the customer.

RQ Message Format — Overview

An RQ message always begins with a Start Character "!" (a.k.a. Bang) and ends with an End Character ";", (semicolon). There will always be an Address (3 ASCII characters) and a Command (1 ASCII character) as shown in the table below. In some cases, the Data field is a variable number of characters or no Data. A "?" (question mark) in the Data field signifies a request message. For Downlink messages, the End Character is ";" or <CR> (both are treated the same). For Uplink messages, the End Character can be set using the ESI RF Bridge Configuration Menu to be ";" or <CR>.

RQ Addressing is always three ASCII characters composed of only 0-9 and A-Z. For the case where an address is 000 — the global command — all RF nodes networked to the ESI RF Bridge are being addressed and for that reason, no node can have 000 as its address. The ESI RF Bridge is factory addressed at BSB. RQ devices are given random addresses from the factory (first character will be between "C" and "Z").

Uplink

Messages from the RF nodes, relayed to the PC/automation system via the ESI RF Bridge.

Downlink

Messages from the PC/automation system, relayed to the RF nodes via the ESI RF Bridge.

The following is an example of a Downlink message from the PC/automation system to the ESI RF Bridge requesting its version. The literal command string is "**!BSBv?;**"

Start Character	Address	Command	Data	End Character
!	BSB	v	?	;

Improperly formatted Downlink messages or message content that is out of range will cause the message to be discarded by the ESI RF Bridge and an Uplink error message generated.

Valid RQ Commands

The RQ commands/messages in the table below are valid when sent to the ESI RF Bridge from a PC or automation system, or received by the ESI RF Bridge from an RF node.

BSB = the default RQ address of the ESI RF Bridge.

!BSBU; U = undefined or invalid message.

RQ Command	Data	Description	Example	Response	Notes
@	3 characters (0-9 or A-Z)	Re-address the ESI RF Bridge	!BSB@RF1;	Address change report	Change the address from BSB to RF1.

RQ Command	Data	Description	Example	Response	Notes
A	3 characters (old address)	Acknowledge address change		!RF1ABSB; (address report)	This device's address was changed from BSB to RF1.
v	?	Report version	!BSBv?;	!BSBv0.9.7.1;	The ESI RF Bridge's firmware version is 0.9.7.1
v	?	Report version	!002v?;	!002v1.3.4.1;	This device's firmware version is 1.3.4.1 NOTE: the SUITE remote is not a node, and will not report it's firmware version number.
o		Move open	!002o;	No report.	No report if RF device does not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
c		Move close	!002c;	No report.	No report if RF device does not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
s		Stop	!002s;	No report.	No report if RF device does not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
i		Identify	!002i;	No report. Motor jogs once.	Used to identify which motor is assigned to an RQ address.
m	destination* (00-99)	Move to intermediate position (2 digit)	!002m23;	No report.	Moves to 23% away from reference. No report if RF device does not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
M	destination (000-999)	Move to intermediate position (3 digit)	!002M237;	No report.	Moves to 23.7% away from reference. No report if RF device does not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
r	?	Request 2 digit position now	!002r?;	2 digit position report if stopped.	!002r23; Motor is stopped 23% away from reference. No report if RF device does not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
R	?	Request 3 digit position now	!002R?;	3 digit position report if stopped.	Not supported in Beta, but will be supported in Production release. No report if RF device does

RQ Command	Data	Description	Example	Response	Notes
					not have limits set or RQ device connected to ESI RF RQ Transceiver is not calibrated.
NOTE: Scenes cannot be "defined" while the motor is moving.					
d	scene ^s	Define a scene	!002dC23;	No report.	RQ device jogs twice and does not move to the scene. RF motor jogs twice, then jogs twice again, and does not move to the scene. NOTE: By default, Scene "0" is used for the PRESET button on the SUITE remote. A different scene number for the PRESET button can be used.
g	scene ^s	Execute scene	!000gC;	All motors go to scene C (if they are included in the scene).	If the scene is selected, no response if already at position. No response if the scene is not selected.

* 00 means at reference (for RQ, default = open), 99 means at limit away from reference (closed). The percents can be flipped when using the "Flip position" option in the Configuration Menu of the ESI RF Bridge.

NOTE: positions may not be evenly spaced depending on method of lift and motor response to load.

NOTE: 2 digit positions repeat the 1st digit as the 3rd digit to evenly space the fractional part. For example: 27% is converted to 27.2%. When a position is reported as 2 digits, the 3rd digit is ignored (not rounded).

^s Scene number is one of 62 possible: from 0 to 9, A to Z, a to z

Global RQ Command

The ESI RF Bridge responds to a global version request and then passes the message Downlink and all RF nodes will respond with a version report.

000 = the global address to all RF nodes.

BSB = the default RQ address of the ESI RF Bridge.

RQ Command	Data	Description	Send	Response	Notes
v	?	Report version	!000v?;	!BSBv0.9.7.1; (ESI RF Bridge reports first ... followed by reports from all RF nodes)	The ESI RF Bridge's firmware version is 0.9.7.1, followed by the address and firmware version of all RF nodes. NOTE: the SUITE remote is not a node, and will not report it's firmware version number.

Unsupported RQ Commands

These RQ commands are not supported when sent to an ESI RF Bridge from a PC or automation system.

RQ Command	Data	Description	Send	Response	Notes
~		Randomize the ESI RF Bridge's RQ address	!BSB~;	!BSBU;	Not allowed.
~		Randomize the RQ address of all RQ devices	!000~;	!BSBU;	Not allowed.
~		Randomize the RQ address of one RQ device	!002~;	!BSBU;	Not allowed.
@	3 characters (0-9 or A-Z)	Re-address all nodes	!000@AAA	!BSBU;	Illegal command.
d	scene ^s NS	Clear a scene	!002dCNS;		Currently not implemented. Do not act on scene "C".
d	- (minus sign)	Clear all scenes	!002d-;		Currently not implemented. Do not act on any scene.
N	?	Request the ESI RF Bridge's default name	!BSBN?;	!BSBU;	Not allowed. The name parameter is not supported on the ESI RF Bridge or on RF nodes networked to the ESI RF Bridge.
N	1-16 characters	Assign a name to the ESI RF Bridge	!BSBNrf_bridge;	!BSBU;	Not allowed. Cannot assign a name to the ESI RF Bridge.

Valid RF Commands

NOTE: RF commands will be fully supported in the Production release.

Specifications

No serviceable parts are included.

Usage	Indoor Use in Dry Locations Only. Ordinary Protection (not protected against harmful ingress of moisture).
Power	USB power draw from the USB 5VDC Power Supply: 5VDC 1A max (<0.1A typical)
Frequency	2.4 GHz
Operating Temperature Range	+41°F to +95°F (+5°C to +35°C)
Transportation and Storage Temperatures	0°F to +120°F (-18°C to +49°C)
Maximum Altitude	0 to 13,500 ft (4,115 m)
Weight	ESI RF Bridge: 0.26 lb (0.12 kg)
Dimensions	ESI RF Bridge: Width: 3.81 in (96.7 mm) Height: 3.81 in (96.7 mm) Depth: 0.93 in (23.6 mm)
Listed Accessories	<ul style="list-style-type: none"> • External USB 5VDC power supply. • USB cable. • Interchangeable AC plugin adaptors (domestic and international).
Cleaning Instructions	<p>ESI RF Bridge:</p> <ol style="list-style-type: none"> 1. Disconnect power. 2. Unplug cable and power cord. 3. Wipe the device's outside surface lightly with a clean, soft cloth dampened with water. <p>Optional Remote Control:</p> <ol style="list-style-type: none"> 1. Wipe the device's outside surface lightly with a clean, soft cloth dampened with water.

Safety Instructions

Also, see the *Installer's Manual & Instructions* before using this product.

WARNING:

Important safety instructions. It is important for the safety of persons to follow these instructions. Save these instructions.

- Do not allow children to play with fixed controls. Keep remote controls away from children.
- Frequently examine the installation for imbalance and signs of wear or damage to cables. Do not use if repair or adjustment is necessary.
- Please instruct the Operator to disconnect the external power supply, remove the plug of the power supply cord of the external power supply from the AC Mains Outlet (or remove the wall-mount power supply from the AC Mains Outlet): please ensure that the Mains Outlet is easily accessible for this purpose.

Regulatory Compliance

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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003. This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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.

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

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

FCC ID: P7RRFBRIDGE 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.

IC: 7206A-RFBRIDGE This Class B digital apparatus complies with Canadian ICES-003.



This symbol means that this product complies with the European Union Harmonised Standards for the Low Voltage Directive and EN 60335-1: 2012



This symbol means that this product complies with International Standard EN 55011: 2007 and AS/NZS 4268: 2008



This symbol cautions the user to refer to all of the instructions and warnings specified in the User Guide and the Installer's Manual & Instructions before using this product.



This symbol indicates an RS-232 port.



This symbol means that this product must be disposed of separately from household waste and must be disposed of according to local laws and regulations for electrical and electronic waste.

Disclaimer

Information in this document is subject to change without notice. The manufacturer does not make any representations or warranties (implied or otherwise) regarding the accuracy and completeness of this document and shall in no event be liable for any loss of profit or any commercial damage, including but not limited to special, incidental, consequential, or other damage.