



Wireless/Serial Transceiver (RZC-110)

RZC-110 Characteristics

The RZC-110 is a wireless to serial (RS-485) transceiver which is designed to control a wide-array of building, industrial, and manufacturing devices. Ideal for wireless communication with printers, building control, scales, alarm and security devices, manufacturing machinery and most other general and industrial serial devices. Each module has a transmit and a receive unit and can be configured for point-to-multi-point networks and point-to-point communication which makes upgrading your existing network an easy task. Expand your existing limited RS485 multi-drop network to an unlimited multi-drop network. This approach has the following advantages:

- Save from pulling hundreds of feet of shielded twisted pair cable.
- Termination resistors at the end of the network are no longer a problem
- No need to worry about configuring end point addresses or inadvertently having two endpoints with the same address.

The wireless interface is implemented using an Ember EM250 SoC, providing a low-power 2.4GHz ISM-band transceiver with an integrated omni-directional antenna. This device can act as either a gateway for a controlling system, or as a bridge for a controlled device, within a wireless network. When paired together, or with a compatible device, a wireless network can be formed to remove the need for direct wiring between controlling and controlled devices.

The RZC-110 can also serve as a platform for developing ZigBee applications by utilizing the ZigBee features of the Ember EM250 SoC. The optional ModBus and AT-style command sets facilitate quick integration with a variety of serial communicating devices to make them wirelessly enabled.



Technical Support

If you have questions about the installation or operation of this device, call Autani technical support at: 443-320-2233.

Warning! There are no serviceable parts within the RZC-110 and no attempt should be made to disassemble the device other than for device programming purposes.

Warning! Improper connection of the device may result in permanent damage to the device. Follow installation instructions carefully.

Caution! Using this product in any manner other than outlined in this document is not supported and voids any warranty. Autani is not responsible for any damages or injuries incurred as a result of misuse or abuse of this product.

Device Installation

The RZC can be mounted on or in the interior wall of a structure within proximity of the device to which it is attached.

- 1) Mounting the RZC-110 is most easily accomplished using double-sided tape. The device may also be placed within a wall cavity or other enclosure provided that the enclosure does not block RF transmissions. Note that the strain relief for the cable assembly will support the RZC-110's own weight.
- 2) Connect the wires from the RZC-110 cable assembly to the controlled or interfaced device as shown in the wiring table in the *Specifications* section of this document.
- 3) Prior to closing the work area, make sure the RZC-110 can join an established network. See *Device Operation* instructions for the procedure.

Serial Interface Communications

An RS-485 to RS-232 converter is required for communicating to this device from a common PC serial port. These devices are commonly provided by serial cable and test equipment providers.

AT-style Command Set (Optional)

The RZC-110 provides an AT-style command set to enable shorter development times when using this device. This command set can be invoked over the serial connection, and will facilitate interaction with the wireless interface. Refer to the AT-style command set reference for details on using this interface.

ModBus Command Set (Optional)

The RZC-110 provides a ModBus interface for communicating and controlling the device. The supported command set can be invoked over the serial connection, and will facilitate interaction with the wireless interface. Refer to the ModBus command set reference for details on using this product.

Device Operation

The RZC-110 firmware images provided by Autani have a standard set of procedures that communicate system operational status via the device's two LEDs.

LED 1: A flashing green indicates the node is properly communicating with the network. In this mode the LED may occasionally flash red. This is normal and is an indication of wireless network activity. These flashes of red will be brief and the predominant color will be green.

If this LED is blinking red the node is attempting to locate a wireless network to join.

LED 2: Not currently used.

Switch 1: Causes the node to leave the network and begin to look for a commissioning node to join. To activate this mode the button should be depressed until LED 1 begins to blink red. This may require the button to be held down for a few seconds.

A custom firmware implementation must provide its own set of operational status indication using the supplied LEDs. Autani provided custom firmware images will generally subscribe to the aforementioned methods unless other requirements dictate such a deviation.

ZigBee Compatibility

This device has not been certified as ZigBee compatible by a certified testing house. Use of the term ZigBee in reference to this device is intended to imply the capabilities provided by the Ember EM-250 ZigBee chip. Certification of ZigBee can be obtained by purchasers who wish to program the RZC-110 with their own firmware image by:

- 1) Becoming at least an adopting member of the ZigBee Alliance; and,
- 2) Certifying ZigBee compliance with an approved test house.

Device Programming

Optional reprogramming of the RZC-110 with custom firmware is supported using the Ember development kit or Ember's EZSP. The following procedures may be followed to program the device:

- 1) Turn the RZC-110 over to view the four screws on the bottom of the case.
- 2) Remove all four screws from the case and carefully separate the case. Note that the clam-shell design of the case is such that it interlocks, but does not snap together.
- 3) Carefully remove the RZC-110 from the case by helping the cable assembly through the cable assembly cutout. Place on an anti-static table top, following proper electronics handling procedures.
- 4) A 10-pin programming header is provided on the board for easy firmware re-programming of the device.

Autani Firmware Services

Autani designs, manufactures, and supplies this device for use in the Autani E4 product platform. All of the necessary product literature required to develop custom firmware for this device is provided, or can be obtained directly from Autani Corporation. Autani also provides custom firmware implementation services for this device. If you are interested in custom firmware development services from Autani, or would like to license an already developed image, please contact your sales representative to discuss your project requirements.

Specifications

The RZC-110 provides a wireless communications interface to two-wire serial communicating devices. The command sets supported by this device are currently AT-style and ModBus.

Power:
12VAC to 24VAC
9VDC to 24VDC

Wired Communications:
Five wire RS-485 electrical interface

Wireless Communications:
2.4 GHz, 16 channel spread spectrum. IEEE 802.15.4 or ZigBee as provided by the Ember EM-250 SoC or like part.

Operating Temperature:
Operating temperatures range from -40C to +85C. The rated loads are in accordance with an ambient temperature of 25 degrees Celsius.

Dimensions:
3.00"(L) x 1.25"(W) x 1.00"(H)

Colors:
White (opaque) is the standard case color. Custom colors are available upon special request.

Device Identification:
The RZC-110 is provided in several revisions. All revisions are based on Autani part # 1000110.

Cable Assembly Wiring

| WIRE | FUNCTION |
|---------------------|---------------------------------|
| Solid Brown | Common |
| Solid Orange | Power, per specification |
| White, Brown Stripe | Communications reference |
| Solid Green | Tx+, positive transmit terminal |
| White, Green Stripe | Tx-, negative transmit terminal |
| Solid Blue | Rx+, positive receive terminal |
| White, Blue Stripe | Rx-, negative receive terminal |

LIMITED WARRANTY

This limited warranty is extended by Autani Corporation (Autani) to the original purchaser. This limited warranty provides 100% parts coverage for defects in materials or workmanship for the product under normal use and service for a period of one (1) year from the date of purchase through an authorized reseller. There shall be no explicit or implied warranty after the expiration of the warranty period. In all cases, at the option of Autani, serviceable parts that are equivalent to the original in performance may be supplied to replace defective parts. All replaced products and parts supplied under this warranty will become the property of Autani. All replaced parts and products are covered for the duration of the original warranty. This limited warranty is only valid within the country in which the product was purchased.

This limited warranty does not extend to any Autani product not purchased through an authorized reseller, nor does it extend to any product that has been damaged or rendered defective: (a) as a result of accident, misuse, or abuse; (b) by operation outside the usage parameters stated in product documentation; (c) by modification of the product in any way; (d) as a result of service by anyone other than Autani or its authorized agent.

Autani is not responsible for failure of the product, which results from accident, abuse, misuse, misapplication, or alteration of the product, and Autani assumes no liability as to consequence as to consequence of such events under the terms of this warranty. Incidental or consequential damages as a result of the use of this product with respect to any breach of this warranty are not the responsibility of Autani.

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This device complies with Part 15 of 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.

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

*This Class B digital apparatus complies with Canadian ICES-003.
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FCC ID:V8NRZC1000110
Product code: 1000110 Rev A*