ABACOM Technologies

WIZ-SML-IA   115200bps Transceiver Modules

The WIZ-SML-IA transceiver modules are designed for half duplex point-to-point data transfer. In operation, the WIZ-SML-IA transceivers establish a transparent "virtual wire" link where all the required data formatting for RF communications is performed by the on-board microcontrollers. The user simply inputs serial data and the WIZ-SML-IA link will reproduce the original data at the remote end.

Features

- Up to 115200bps serial port data rates

- 12V, RS-232 and 5V, TTL versions

- Integral Tuned Loop Antenna

- Transparent operation—Virtual Wire

- Transmit data packets up to 96 bytes

- Automatic end-of-data detection

- RF Carrier Detect Output

- User Enabled Error Detection

- Small Size: 40mm x 90mm x 10mm

- 434MHz, 914.5MHz and 869MHz versions

- Up to 500ft range

- Power and Communication Status LED's

- Incorporates the ATRT-100 transceiver module

W232 Interface Cable

The special W232 interface cable is designed for use with the WIZ-SML-12V version and incorporates RS-232 level converter circuitry within the DB9 female connector. It enables the WIZ-SML-12V to be interfaced directly to RS-232 hosts.

The W232, although specifically designed as the transceiver's RS-232 interface, would serve well as a generic RS-232 interface for other designs or serve as a useful "workbench device".

WIZ-SML-IA Operation

Power Supply Connection

The WIZ-SML-IA 12V version accepts its supply via the DC jack. The centre pin is positive and the input voltage may be anywhere from 9V-15Vdc. Typical power supplies may include batteries or "wall transformers".

The WIZ-SML-IA 5V version accepts an external regulated 5Vdc power source connected to pins 10 (+V) and 4 (GND) of the 10 pin data/power connector.

Data/Power Connector

Holes view of the W232 data cable connector
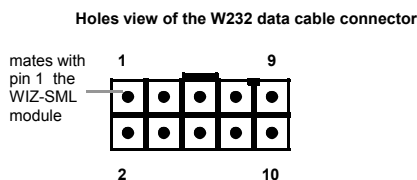
1. TX Data	2. Analog output
3. GND	4. GND
5. RX Data (out)	6. RF Carrier Detect (out)
7. CTS (not in use)	8. LED (out)
9. RTS (not in use)	10. 5Vdc (in/out) (see note*)

* Note: 5V input for the WIZ-SML-IA-5V version and 5V output for the WIZ-SML-IA-12V version

Pin Descriptions (WRT the Module)

[1] **TX Data Input-** requires RS-232 format serial data at a 0-5V logic level in the format of 1 start bit,8 data bits, no parity and one stop bit. The start should be in the standard form of a high to low transition.

[2] **Analog Output-** In the presence of a modulating signal this output will measure approximately 0.5Vpp. In the absence of a modulating signal or where the noise exceeds the p-p level of the modulating signal, a dc level of about 1.8V will be present on the analog output pin.

[3] **Ground**

[4] **Ground**

[5] **RX Data Output-** The serial data output is at a 0-5V logic level and in the same serial format as the TX Data Input. The Data output line is held high and then transitions to 0V for the start bit, followed by 8data bits, no parity and one stop bit.

[6] **RF Carrier Detect Output–** Normally held high and goes low in the presence of an RF carrier frequency. There is no distinction between noise (such as an in-band interfering signal) and an inten-

tional signal. The detect threshold at –96dBm, is higher than the maximum sensitivity of the receiver so consideration should be given to the use of this pin if the transceiver is to be operated down to its maximum sensitivity.

[7]   **CTS–** Not used in this version

[8]   Auxiliary LED– for remote RX/TX activity indication. An LED connected from pin 8 to GND will provide the same RX\TX activity indication as the on-board RTX LED

[9]   RTS– Not used in this version

[10] 5Vdc– This pin is the regulated 5V supply *input* for the WIZ-SML-IA-5V version. For the WIZ-SML-IA-12V version, this is a regulated 5V *output* which provides power to the integrated circuit built into the W232 adapter.

DIP Switch Configuration

DIP switch configuration changes should be carried out with the module switched off.

- **SW1** and **SW2:** configure the serial port data rates:

SW1	SW2	Speed
OFF	OFF	9600
OFF	ON	19200
ON	OFF	57600
ON	ON	115200

- **DS3:** In the ON position, all received data valid or invalid will be forwarded to the serial port. In the OFF position, the checksum verification is active and only valid data will be forwarded to the serial port.

- **DS4:** not assigned.

- **DS5:** not assigned.

- **DS6:** Do not change- for production use only.

All configuration changes must be carried out when the module is switched off.

Module Usage

The RS232 data format is 1 start bit, 8 data bits, no parity and one stop bit. Before sending data to the RF module, the user's software must reduce the packet size so that it does not exceed 96 bytes.

The RF module automatically detects the end of the incoming data string and therefore an end-of-message byte is not required. The WIZ-SML-IA considers an end of data string when there is no data for 1.5 byte time (and not less than 0.5ms) coming in from the serial port. Therefore the time delay varies according to the data rate chosen ie from a maximum of 1.6ms (@9600bps) to a minimum of 0.5ms (@115200bps).

The RF transmission starts when the incoming data string is terminated.

Before sending a new data packet to the serial port, it is necessary to wait until the previous packet's RF transmission is completed. Any data entering the serial port during the RF transmission forwarding phase will be lost. It is therefore suggested that when writing the data packetizing software, the user pays close attention to correct timing for sending data packets to the serial port, particularly when the packet length may be variable. For example if it is required to send a long packet followed by a shorter packet, it is necessary to wait for the time taken for the long packet to be transmitted over-the-air before sending the shorter packet to the serial port.

The packets RF transmission time is given by:

T= 3.6ms +[(# of Bytes + 2) x 0.156ms]

Example #1- Packet length: 1byte

Transmission time T = 4.1 milliseconds

Example #2- Packet length: 32bytes

Transmission time T = 8.9 milliseconds

Example #3– Packet length: 96bytes

Transmission time T = 18.9 milliseconds

As a precaution, it is recommended that a few milliseconds are added to the RF transmission time before sending the next data packet.

The receiving WIZ-SML-IA module will output the received data to the serial port (pin 5 of the Data Connector) immediately after the data packet is received over-the-air. If DIP switch 3 is in the ON position, the received data is forwarded to the serial port regardless of whether errors were detected. If DIP switch 3 is in the OFF position, data will only be forwarded to the serial port if the checksum is valid.