General Description

The WIZ-869-TRS radio transceiver represents a simple solution to the problem of wireless data transmission: the employment of an embedded microprocessor allows a transparent TTL RS-232 throughput without any need of packaging and data coding to balance them, avoiding user writing complex software routines for the transmission management. Data forwarding takes place in an half duplex way.
The input data stream enters at 9600, 19200 and 38400 bps: different speed means also a different way of automatically coding the transmitted data, each one with a different degree of redundancy and protection. With 10 mW RF power and adopting frequency modulation (FSK), it is possible to cover a distance of 150 m in open air with PCB antenna. The module looks smaller in size then the WIZ-xxx-SML-IA's family radiomodems. The module timing guarantees a max delay of 10 ms between data sending and their real reception: this minimum delay includes the necessary time for the device to start up and settle down and transmit a synchronization header.
The WIZ-869-TRS can be used with no time limit: on this band it is allowed a full time use. Supply voltage is 5V stabilized.

General features

- **No data coding and no preamble required**
- **No data packaging**
- **Transparent throughput of RS-232 signals**
- **HyperTerminal* compatible**
- **Embedded Microprocessor**
- **PCB antenna**
- **TTL logic levels 0-5V**
- **Connection with PC serial port by means of AUR°EL W232 ADAPTER**
- **Frequency: 869,85 MHz**
- **Bit rate: 38400, 19200 e 9600 bps**
- **Supply voltage 5 V stabilized**
- **Emitted power: max 5 mW ERP**
- **Covering range: 150 m**
- **Small dimensions (40x60 mm)**

Applications

- **Data acquisition**
- **Instruments monitoring**
- **Telemetry**
- **Access control**
- **Domestic automation**
- **Security**
- **POS terminals**

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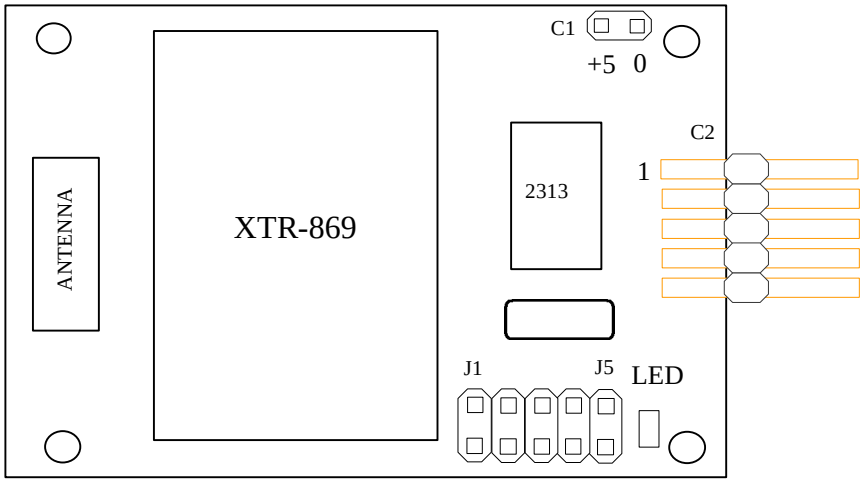
Technical features

	Min.	Tip.	Max.	Unit	Note
DC Levels					
Supply voltage	4.75	5	5.25	V	
Supply current (rx mode)		13	18	mA	
Supply current (tx mode)		29	34	mA	
Input/output logic level “1”	0.7xVcc		Vcc	V	
Input/output logic level “0”	0		0.3xVcc	V	
RF					
Frequency		869.85		MHz	
Modulation type		FSK			
Receiver sensitivity		-105		dBm	
RF power out (tx)		5		dBm	
Spurious emissions			-30	dBm	
Other					
Max. packet length	0		16	KByte	
Operating temperature	-20		+70	°C	
Data speed	9600, 19200, 38400			bps	Different coding systems
Size		40 x 60		mm	

Layout

Components and connectors layout on WIZ-869-TRS board.

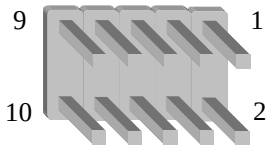


Supply connector C1

In normal operating mode, WIZ-869-TRS is +5V supplied by the connector C1. Pin 10 of connector C2 (see below) provides supply to an eventual logic level adapter connected with it. Otherwise it's possible to supply the module through input pin 10: in all cases, however, it's recommended to not exceed the values indicated in the technical features table. The red LED lights on when the module is power supplied.

Serial connector C2

Pin out of the serial data connector. The terminal 1 is recognizable on the board by means of the pad of squared soldering.

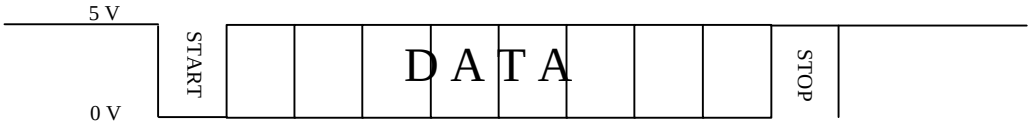


Frontal view

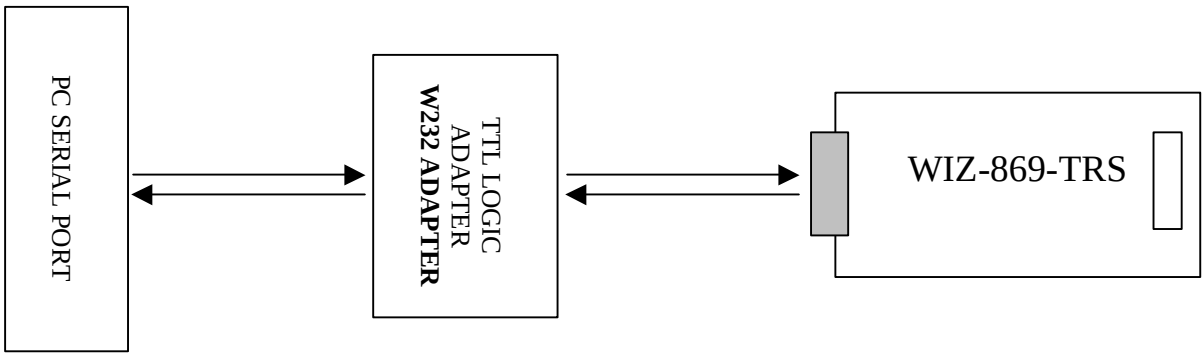
Pin No.	Pin Name	Description	Logic levels
Pin 1	**RX DATA (IN)**	Serial data input.	START bit '0' STOP bit '1'
Pin 2	/	/	-
Pin 3	**GND**	Connections to GND.	-
Pin 4	**GND**	Connections to GND.	-
Pin 5	**TX DATA (OUT)**	Serial data output.	START bit '0' STOP bit '1'
Pin 6	/	/	-
Pin 7	/	/	-
Pin 8	/	/	-
Pin 9	/	/	-
Pin 10	**Vcc**	Provides 5V to the W232 ADAPTER.	-

Signal logic levels

The WIZ-869-TRS module requires that serial data forwarding occurs in TTL logic. TX/RX DATA lines are normally high level with START bit low level (0 V) and STOP bit high level (5 V).



In order to connect the WIZ-869-TRS module with the serial port of a PC, it's necessary to adapt the electrical levels of signals from TTL to (-12V, +12V) and vice versa, using for example the W232 ADAPTER AUR°EL.



Jumper J1-J5

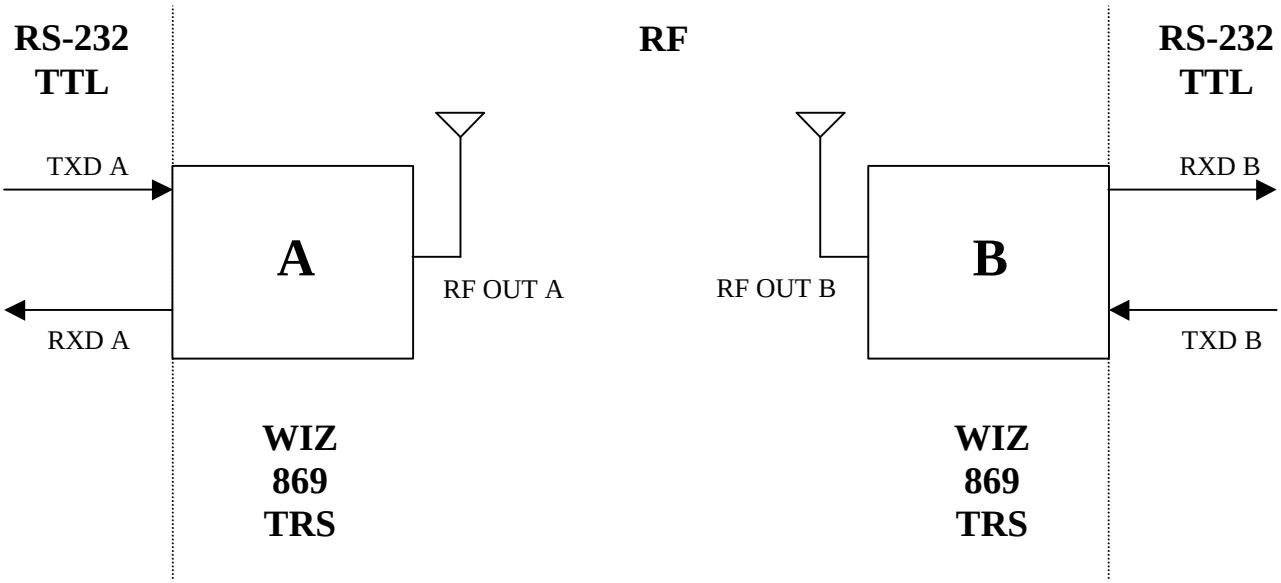
In the following table it is reported the jumper set up to work with different serial speed. Jumper J1 is the closest to RF module XTR-869. At the actual moment jumpers J3 and J4 are not used; J5 has to be set always open (its use is for testing purpose in Aurel).

J1	J2	Speed
Close	Open	9600
Open	Open	19200
Open	Close	38400

Device usage

Most of RF devices need a data coding (Manchester typically) in order to obtain a balanced signal, that is a 50% duty-cycle signal. Moreover, the user is required to implement a syncronization protocol between transmitter and receiver.
WIZ-869-TRS is designed to provide an integrated solution to all these problems, that make often complex and not immediate the use of RF modules, thanks to the employment of an embedded microcontroller which carries out all these features.

The transceiver allows througput of RS232-TTL signals coming from a microprocessor or a PC serial port, with no need for the user to work out data for adapting them to RF. So transmission becomes totally transparent, permitting the forwarding of no limited length packets* with a time delay not greater than 10 ms between data sending and their effective reception: apart this minimum delay for connection opening, then, communication takes place at a real 9600, 19200 or 38400 bps bit rate.



Example of WIZ-869-TRS connection.

* Max packet length entering the module is related to the precision of data bit rate. This is generally not bigger than 16 KBites.

Serial speed

The RF forwarding mode of input serial data is 'TRanSparent', this means that all data entering the input pin of connector is packed and forwarded, in theory without packet length limit; there isn't any checksum or CRC: discrimination between valid packets and corrupted ones is user's goal.
Each serial speed offered by WIZ-869-TRS is linked to a different redundancy degree of RF packet. This chance allows the best configuration for all data transmission environments according to their particular RF propagation quality.

Speed	Coding
38400	Every single Byte of the packet is balanced by a pseudo-random code. User is not given the guarantee that the received data is not corrupted.
19200	Manchester: every single Byte is balanced with an equal number of '0' and '1' bits. Module recognizes single bit errors and in that case stops the serial forwarding of received data via RF.
9600	Manchester + Hamming: Hamming coding system allows the recovering of single bit errors over each data nibble. This system is surely the most reliable as it tries to correct eventual errors.

HyperTerminal ä * Compatibility

Compatibility with the well known HyperTerminal™* software has been checked by using the following half-duplex protocols: XMODEM, 1K-XMODEM, Y MODEM, Y MODEM-G, KERMIT. It's possible to test the WIZ-869-TRS features by setting a communication on the desired serial port (COM 1, COM2, etc.), without handshacking and the speed in according to jumper J1 and J2. It will be possible to transfer data files, images, etc... between two PCs. In according to the chosen protocol, HyperTerminal™* will guarantee the goodness of forwarding through checksum, CRC or eventual retries in case of data packet corrupted.

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Reference Rules

The WIZ-869-TRS transceiver is CE certified and in particular it complies with the European set of Rules **EN 300 220-3,** and **EN 300 489**. The equipment has been tested according to rule **EN 60950** and it can be utilized inside a special insulated housing that assures the compliance with the above mentioned rule. The transceiver must be supplied by a very low voltage safety source protected against short circuits.
The use of the transceiver module is foreseen inside housings that assure the overcoming of the provision EN 61000-4-2 not directly applicable to the module itself..
The device can be used with no time limits, so the hourly duty-cycle is 100%.

Mechanical Dimensions