A RF33
Data modem

User Guide

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Ref. 05-11-V5-ptr

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About this document

This guide describes the A^RF33 devices, their options and accessories.

Declaration of conformity

Manufacturer's name: **ADEUNIS R.F.**
Manufacturer's address Parc Technologique PRE ROUX IV
283 rue Louis NEEL
38920 CROLLES - FRANCE

declares that the product if used and installed according to the user guide available on our web site www.adeunis-rf.com

Product Name: **ARF33**
Product Number(s): **ARF7095B**

Product options:

Complies with the RTTE Directive 99/5/EC:

EMC: conformity is proven by compliance to the harmonized standard EN 301-489
Safety: conformity to the standard EN 60950-1/2001
Radio: conformity is proven by compliance to harmonized standard EN 300-220 covering essential radio requirements of the RTTE directive.

Exposure to radio frequency signals according to the council recommendation 1999/519/EC on the limitation of exposure of general public to electromagnetic field.

Notes: - Conformity has been evaluated according to the procedure described in Annex III of the RTTE directive.
- Receiver class (if applicable): 3.
Crolles, November 6th, 2007
VINCENT Hervé / Quality manager

Download of the user guide

Thank you for having chosen the ADEUNIS RF products.

User guides can be uploaded directly on our web site www.adeunis-rf.com
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Paragraph **Modems > Data modem**
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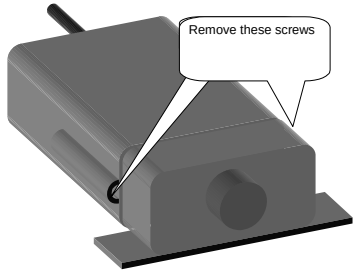
Overview

The modem converts data from a serial link into a radio frame to be sent to a similar piece of equipment.

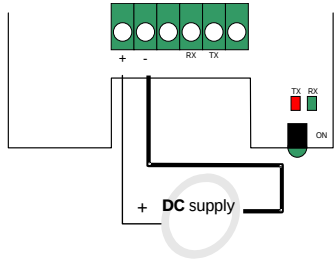
The operating parameters of these modems (serial link, radio management...) can be updated through commands on the serial link.
The products are available either in card version to be integrated in an assembly or as an IP65 chip. In IP65 case the products are fixed with the fixing lugs onto the top (antenna) and bottom (stuffing box) of the casing (4 screws not provided).

Product supply

To perform wiring of these products, the bottom part of the housing (part with stuffing box) has to be opened by unscrewing the two stainless steel screws on each side.



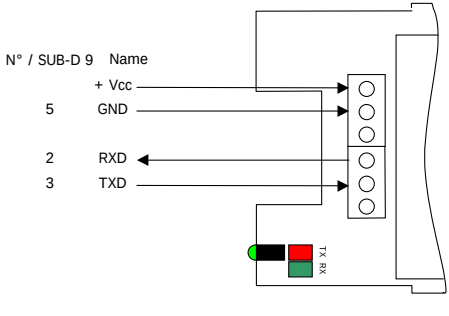
The ARF33 range products are supplied with a DC voltage source. This voltage source must be 8V minimum and must not exceed 40 Vdc.



Serial link wiring

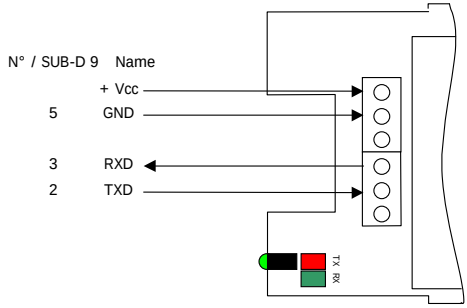
MODEM / DTE RS232

This is for example the case of a modem connected to a PC



DCE RS232

This is for example the case of a modem connected to a measuring device.



The wiring could be verified by sending a character on the serial link. The transmission is OK if the transmission red LED lights up.

Radio communication

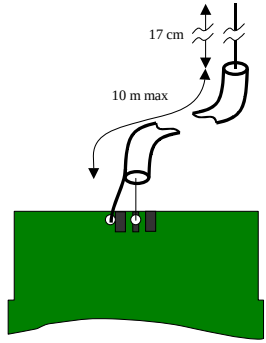
Communication channels

This modem has 10 channels that could be selected through commands

Channels	Frequencies
0	433,125 MHz
1	433,300 MHz
2	433,475 MHz
3	433,650 MHz
4	433,825 MHz
5	434,000 MHz
6	434,175 MHz
7	434,350 MHz
8	434,525 MHz
9	434,700 MHz

Antenna wiring

In daughter card version, an antenna has to be added to achieve correct communication between the products. This cable could also be directly soldered on the PCB or a SMA connector could be soldered on the edge.



This antenna should be a wire with a length of ¼ wave i.e. about 17 cm. This length is that which has to extend outside the housing if the latter is metallic.
This antenna can be located remotely by using a coaxial cable with its braid stripped over the last 17 centimeters.

Choice of mode

This modem has 2 working modes :

- Transparent mode
- Command mode

Transparent mode

In transparent mode, the modem acts as a wire serial link. It means that alternately, the modem sends on the radio the data received from the serial link and sends on it the data received from the radio.
The communication is half-duplex.
The modem is in transparent mode at power up. If no data are sent on the serial link, the modem is waiting for radio reception.
All radio frames sent by other modems are received and the data extracted from the radio frame are sent on the serial link.
All the data received on the serial link are encapsulated in a radio frame.

The radio frame is composed with a preamble, the data and a postambule. The preamble and the postambule are used for radio reception purpose only.

Command mode

The command mode is used to read and update the modem configuration registers. The registers are shared in 2 types: read only (R) or read/write (R/W) - see chapt. « registers description »
The command mode is entered by issuing a +++ sequence (<silence>+++<silence> - see chapt. « set of commands »)
To go back in transparent mode, use the ATO command <cr>.

Commands

O Commands are used to read and update the modem parameters:
A frame starts with the 2 ASCII 'AT' characters. 'AT' means 'Attention' followed with one or several characters or other data.
Each command is ended with <cr> (carriage return).
The only exception concerns the special command to go from transparent to command mode. ('<silence>+++<silence>'). The silence time must be equal to the time out (register S214).

Note: In the same command, the time between 2 characters must be less than 10s.

The response sent by the modem to each command on the serial link corresponds to the ASCII character '0'for an accepted command and ASCII character '3' for error.

Set of commands

Commands	Function mode
ATO	Transparent mode activation. To go back on the command mode use the '+++' sequence. When the transparent mode is activated, the modem is waiting for a radio frame excepted if data are received on its serial link
<silence>+++<silence>	Command mode activation. The silence time is a time out configured with S214 register. In command mode, the radio is inhibited (reception and transmission)
	Register management
ATSn?	Display the Sn register content where n represents the register number. The response has the following format: Sn=y<cr><lf>
ATSn=m	Set the Sn register value with 'm'. n represent the register number (example, selection of channel1 : ATS200=1).
AT/S	Display registers value. The response has the following format: Sxxx=y<cr><lf> for each registers.
AT/V	Software version display. The response has the following format: Adeunis RF : ARF33 Vxx.yy<cr><lf>
AT&W	To save the new configuration in EEPROM. Each time you switch on the modem, the EEPROM configuration will be loaded in the modem registers.
	Test mode
ATT0	Pure Carrier transmission using current channel. The output of this mode is achieved by reception of a any character on the serial link.
ATT3	Modulation using current channel. The output of this mode is achieved by reception of a any character on the serial link.

Register description

displayed using ATSn?<cr> command.
The value of the registers is saved in RAM. The parameters are lost in case of power shutdown. To save the registers, it is necessary to use the AT&W<cr> command.

Access	Regis-ters	Function	Description
	Radio		
R/W	S200	Channel number	Communication channel. Value between '0' and '9'. **Default value: '0'**
R	S210	Baudrate	Serial link data rate: **'4' : 9600 bits/s (default value)**
R	S211	Data lengh	Number of bits (serial link) **'8' : 8 bits (default value)**
R	S212	Parity	Parity (serial link) **'1' : none (default value)**
R	S213	Number of Stop bits	Number of stop bits (serial link) **'1 ' : 1 stop (default value)**
R/W	S214	Time out	Serial link time out in ms. Value between 1 and 255. **default value: '5' (5 ms)**

Specifications

Operating temperature:	-20°C to +70°C
Power supply:	8 to 40 VDC
Multichannel:	433.125 à 434.700 MHz.
Power:	+10 dBm / 50 Ω.
Sensitivity:	-100 dBm.
TX/RX Consumption:	50 mA (under 24V)

References

ARF7095A: ARF33 daughter board version
ARF7095B : ARF33 IP65 box version