RADIOMODEM
D1 Series

ERE SRL
Via Ermanno Ge, 9/11 | I - 27049 Stradella (PV)
Phone +39 0385 48139 | Fax +39 0385 40288
e-mail:l info@erewireless.com
website: www.erewireless.com

Table of contents

Disclaimer

ERE reserves the right to change the technical specifications or functions of its products, or to discontinue the manufacture of any of its products or to discontinue the support of any of its products, without any written announcement and urges its customers to ensure, that the information at their disposal is valid.

ERE software and programs are delivered "as is". The manufacturer does not grant any kind of warranty including guarantees on suitability and applicability to a certain application. Under no circumstances is the manufacturer or the developer of a program responsible for any possible damages caused by the use of a program. The names of the programs as well as all copyrights relating to the programs are the sole property of ERE. Any transfer, licensing to a third party, leasing, renting, transportation, copying, editing, translating, modifying into another programming language or reverse engineering for any intent is forbidden without the written consent of ERE.

Technical support

Our website www.erewirless.com contains many useful information, user guides and configuration software and technical documents always update to the latest version.

If you have technical problems or cannot find the required information in the provided documents, contact our Technical Support by email at info@erewireless.com or by phone +39 0385 48139

Restrictions on use

ERE PRODUCTS HAVE NOT BEEN DESIGNED, INTENDED NOR INSPECTED TO BE USED IN ANY LIFE SUPPORT RELATED DEVICE OR SYSTEM RELATED FUNCTION NOR AS A PART OF ANY OTHER CRITICAL SYSTEM INCLUDED AERONAUTICAL / AEROSPACE APPLICATION.
ERE PRODUCTS ARE GRANTED NO FUNCTIONAL WARRANTY IF THEY ARE USED IN ANY OF THE APPLICATIONS MENTIONED.

ERE D110 Series radio modems have been designed to operate on frequency ranges as SRD (Short Range Device), the exact use of which differs from one region and/or country to another. The user of a radio modem must take care that the device is not operated without the permission of the local authorities on frequencies other than those specifically reserved and intended for use without a specific permit.

ERE D110 Series are allowed to be used in the following countries with E.R.P. and duty cycle limitation, either on licence free channels or on channels where the operation requires a licence. More detailed information is available at the local frequency management authority.

ERE D160, D161, D162, D163 and D164 radio modems have been designed to operate on not free frequency range, the user must require to local authorities the permission to use.

Allowed use according to ERC Recommendation 70-03						
Model	**Frequency (MHz)**	**Annex ([1])**	**E.R.P ([2])**	**Duty Cycle ([3])**	**Country allowed**	**Country with restriction of use**
D110	169,400 – 169,475	1e1	≤ 500 mW	≤ 1 %	AUT-BEL-BUL-CZE-CYP-DNK-EST-FIN-F-D-HRV-GRC-HNG-ISL-IRL-I-LVA-LIE-LTU-LUX-MLT-HOL-NOR-POL-POR-ROU-SVK-SVN-E-SUI-S-G-AND-ALB-AZE-BIH-BLR-GEO-MDA-MKD-MNE-RUS-SRB-TUR-UKR	GEO-RUS-UKR-BLR
D110	169,400 – 169,475	2b	≤ 500 mW	≤10 %		HOL-GEO-RUS-BLR-UKR

NOTE:
Before to install the device check always the latest version of ERC Recommendation 70-03 in order to verify any restriction and limitation in terms of E.R.P and Duty Cycle
([1]) Annex 1.xxx refer to SRD (Short Range Device), Annex 2 refer to Tracking, Tracing and Data Acquisition.
([2]) E.R.P. = Max Effective Radiated Power allowed from radiomodem and associated antenna takes into consideration transmitter power output, transmission line attenuation, RF connector insertion losses and antenna gain
([3]) Duty Cycle is defined as the ratio, expressed as a percentage, of the maximum transmitter "on" time on one carrier frequency, relative to a one hour period

Technical specification

Operating data							
		Value					
Label	*Description*	*D110*	*D160*	*D161*	*D162*	*D163*	*D164*
$V_{S\ (EXT)}$	Power supply	12 Vdc					
$P_{S\ (EXT)}$	Max power	4,2W	8,4W	4,2W	8,4W	8,4W	8,4W
P_{RF}	Max RF transmission power	500 mW	2 W	500 mW	2 W	2 W	2W
RX_{SENS}	Receiver sensitivity	≤ -118 dBm					
RF_{MOD}	Modulation mode	8K50F1D					
CH	Channels spacing	12,5					
BR Radio	Baud Rate on radio channel	2.400 bps or 4.800 bps					
$Z_{I/O\ ANT}$	Antenna impedance	50 **Ω**					
$I_{A,B\ LINES}$	Max current out at RS-485 serial port	± 60 mA					
BR DTE	Baud Rate RS-485 serial port	1.200 → 38.400 bps					

Operating band (MHz)					
D110	*D160*	*D161*	*D162*	*D163*	*D164*
169.400 169.475	430.000 450.000	436.000.25 436.093.75	390.000 410.000	410.000 430.000	450.000 470.000

WARNING

Exceed the maximum operating value below (continuous and/or temporary) can damage the device

Maximum operating data		
Label	*Description*	*Value*
$V_{S(EXT)}$	Max power supply voltage	12 Vdc
$V_{P\ RS-485}$	Max peak voltage at the ports A/B RS-485 (1)	± 32 Vdc
$I_{A,B\ LINES}$	Max peak current at the ports A/B RS-485 (1)	± 200 mA
$T_{OPERATING}$	Operating temperature range	-20°C +60 °C
$T_{STORAGE}$	Storage temperature range	-40°C +85 °C

NOTE:
(1) Impulse time < 100 millisecond.

Conformity declaration

English: Hereby, ERE S.r.l. declares that this D1 SERIES is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Finnish: ERE S.r.l. vakuuttaa täten että D1 SERIES tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Dutch: Hierbij verklaart ERE S.r.l. dat het D1 SERIES in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG. Bij deze verklaart ERE S.r.l. dat deze D1 SERIES voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.

French: Par la présente ERE S.r.l. déclare que l'appareil D1 SERIES est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Par la présente, ERE S.r.l. déclare que ce D1 SERIES est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables

Swedish: Härmed intygar ERE S.r.l. att denna D1 SERIES står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Danish: Undertegnede ERE S.r.l. erklærer herved, at følgende udstyr D1 SERIES overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF

German: Hiermit ERE S.r.l., dass sich dieses D1 SERIES in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi).
Hiermit erklärt ERE S.r.l. die Übereinstimmung des Gerätes D1 SERIES mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)

Greek: ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ ERE S.r.l. ΔΗΛΩΝΕΙ D1 SERIES ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ

Italiano: Con la presente ERE S.r.l. dichiara che D1 SERIES è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Spanish: Por medio de la presente ERE S.r.l. declara que el D1 SERIES cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE

Portuguese: ERE S.r.l. declara que este D1 SERIES está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Declaration of Conformity

We, the undersigned,

Company	ERE S.r.l.
Address, City	Via Ermanno Ge, 9/11 - 27049 Stradella (PV)
Country	Italy
Phone number	+39 0385 48139
Fax number	+39 0385 40288

certify and declare under our sole responsibility that the following equipment:

Product description / Intended use	169 MHz and 390-470 MHz Radiomodem for commercial and light-industrial use
EU / EFTA member states intended for use	**EU**: all members **EFTA**: all members
Member states with restrictive use	**EU**: all members **EFTA**: all members
Manufacturer	ERE S.r.l. | I-27049 Stradella (PV)
Brand name	ERE
Type/Model	D1 SERIES

is tested to and conforms with the essential requirements for protection of health and the safety of the user and any other person and Electromagnetic Compatibility, as included in following standards:

Art. of Directive	*Standard*	*Date of issue of the standard*
3.1(a) Health	EN 50401	2006 + A1(2011)
3.1(a) Safety	EN 60950-1	2006 + A11:2009 + A1:2010 +A12:2011 +AC:2011
3.1(b) EMC	EN 301 489-1	V1.9.2 (2011-09)
3.1(b) EMC	EN 301 489-3	V1.6.1 (2013-08)

and is tested to and conforms with the essential radio test suites so that it effectively uses the frequency spectrum allocated to terrestrial/space radio communication and orbital resources so to as to avoid harmful interference, as included in following standards:

Art. of Directive	*Standard*	*Date of issue of the standard*
3.2 Spectrum	*EN 300 220-2*	*V2.4.1 (2012-05)*

and therefore complies with the essential requirements and provisions of Art. 3.3 too, where applicable, of the **Directive 1999/5/EC** of the European Parliament and of the council of March 9, 1999 on Radio equipment and Telecommunications Terminal Equipment and the mutual recognition of their conformity and with the provisions of Annex II

CE

TCF reference nr.	D1 SERIES Rev.0
Data	18 febbraio 2015
Sign	
Name and position	Giovanni Soldo - CEO

Warranty - Liability of the Product

Supplier represents and warrants that products are manufactured in accordance with the applicable specifications and are free from defects in materials and workmanship. The warranty, valid for a period of 12 months of use, maximum 18 months from the date of delivery, shall not cover defects caused by accident, Buyer's negligence, improper use or maintenance or by any other reason beyond Supplier's control.

Buyer shall have 10 (ten) working days following receipt of products to inspect the products and to notify to Supplier in writing any defects or non-compliance. In the event that any shipment of products is not accepted by Buyer due to any non-conformity with the specifications, or as a result of a cause occurred prior to placement thereof with the carrier, Buyer shall, if so indicated in writing by the Supplier, promptly return some samples or the full shipment that was rejected by Buyer at Buyer's costs.

Supplier, at its own discretion, shall, within a reasonable period, considering the entity of the complaint: (i) send a replacement shipment of products conforming, or (ii) credit Buyer a sum equal to the value of the defective or non-conforming products. This warranty overwrites all legal warranties for defects and compliance and exempts Supplier from any other responsibility for the supplied products; in particular, Buyer shall not be entitled to any requests for compensation or price reductions.

If one of the products sold by the Supplier to the Buyer is defective, the Buyer will send it, at its own expense, at the headquarters of the Italian Supplier. The product will be repaired or replaced by the Supplier, at no costs to the Buyer.

The Buyer will pay all the shipping costs for the product repaired or replaced and sent back to the Buyer.

The Buyer will bear all costs related to disassembly, assembling and transportation of the product, and any damage caused by the "machinery inactivity".

Supplier shall indemnify Buyer against any liability of the products claims asserted by third parties relating to damages sustained as a result of a defective products. In such case Supplier shall reimburse Buyer exclusively within the limits, terms and conditions of the products liability insurance policy held by Supplier. Buyer shall not make any oral or written representations which vary from the specifications, operating instructions, labels or representations given or made by Supplier with respect to the products. If any liability is incurred because of such varying representations, Buyer holds Supplier harmless with respect to any such representations.

In no event shall Supplier be liable for any indirect, incidental, exemplary or consequential damages, including without limitation any claim for damages based on lost revenues or profits, however caused.

In no event shall the Supplier be liable for any costs or damages arising from any act or omission of Buyer, including, without limitation, relating to the modification, handling, storage and marketing of Products by Buyer or to Buyer's failure to provide its employees, agents and customers or other third parties with adequate instruction as to the proper handling and use of Products.
In this respect we hereby confirm that our products are not designed for nuclear applications neither for aircraft/aerospace industries. For the above mentioned applications both warranty and insurance coverage do not apply.

Warnings and safety instructions

-Read these safety instructions carefully before using the product:

-Warranty will be void, if the product is used in any way that is in contradiction with the instructions given in this manual, or if the radio modem housing has been opened or tampered with.

-The radio modem is only to be operated at frequencies allocated by local authorities, and without exceeding the given maximum allowed output power ratings and duty cycle. ERE and its distributors are not responsible, if any products manufactured by it are used in unlawful ways.

-The devices is complies with Directive 1999/5/EC as describe in our declaration of conformity above

-The devices mentioned in this manual are to be used only according to the instructions described in this manual. Faultless and safe operation of the devices can be guaranteed only if the transport, storage, operation and handling of the devices is appropriate. This also applies to the maintenance of the products.

-Do not install the equipment close to a heat source or in damp conditions and direct sunlight is also to be avoided.

-The device must not be exposed to aggressive chemical agents or solvents likely to damage the plastic or corrode the metal parts.

-The device must not be exposed directly to dusty environment.

-Maintenance should only be carried out by qualified persons.

-For your own safety, you must ensure that the equipment is switched off before carrying out any work on it.

-Any electrical connection of the product must be equipped with a protection device against voltage spikes and short-circuits

Disposal of waste by users in private households within the European Union

According to Directive 2012/19/EU of the European Union on waste electrical and electronic equipment (WEEE) this product must not be disposed off with your other household waste, it is your responsibility to dispose of your waste by taking it to a collection point designated for the recycling of electrical and electronic appliances.

Separate collection and recycling of your waste at the time of disposal will contribute to conserving natural resources and guarantee recycling that respects the environment and human health.

For further information concerning your nearest recycling centre, please contact your nearest local authority/town hall offices.

General description

The D1 Series (RMO) are radiomodems with RS232 and RS485 serial connections, configurable by software, either remotely or locally, on the fly by DTE.

Four operating modes that are software programmable: mirror point to point, point to multipoint, broadcasting, and digipeater which allows multipath data routes, to ensure data delivery.

The Low power design along with the power saving function, allows for extended battery life.

Robust construction with surface mounted components, ensure highly-stable electronics. Enclosure options allow the D1 Series to be located indoors or outdoors.
Optional antenna configurations can improve radio transmissions where radio coverage is critical

	Operating mode
	Radio modem
Radio	
Channel spacing	Yes
RF channel	Yes by DIP switch
Frequency Agility	Yes
Listen Before Talk	Yes
RF power	D110, D160, D162, D163 and D164
Porta Seriale	
RS485 or RS232	Configurable by DIP switch
Bit Rate	Yes
Parity bit	Yes
DTX Time	Yes
Data	
Routing Table	Standard 1, with address from DTE up to 8
Broadcasting	Yes
Address from DTE	Yes
Address to DTE	Yes
Rx address for Tx	Yes
Request of ACK	Yes
Set number of retries	Yes
NAK to DTE	Yes
Routing Table	Yes
Other	
Diagnostic	Yes
Power Save	Yes
Link Test	Yes

Installation

Mechanical

The device must be installed in a location that is sufficiently ventilated so that there is no risk of internal heating. Place the device against a flat, firm and stable surface. It is not recommendable to install the radio modem on a strongly vibrating surface. Suitable dampening and/or isolation materials should be used in cases where the installation surface will be subjected to vibration.

Electrical (wiring)

To prevent damage both the radio modem and any terminal devices must always be switched OFF before connecting or disconnecting the serial connection cable. It should be ascertained that different devices used have the same ground potential. Before connecting any power cables the output voltage of the power supply should be checked.

The product has no disconnecting device. An external disconnecting device must be installed. This must be close to the equipment.

To by supplied by class II (LPS) certified AC/DC adaptor.

JP1 Connector		
PIN	*Label*	*Description*
1	A RS485	RS-485 (line A)
2	RXD (OUT)	Data output (RS232)
3	TXD (IN)	Data input (RS232)
4	DTR	Data Terminal Ready (RS232)
5	GROUND	Ground (GND) (RS232)
6	N.C.	Not connected
7	RTS	Request To Send (RS232)
8	CTS	Clear To Send (RS232)
9	B RS485	RS-485 (line B)

JP3 Connector		
PIN	*Label*	*Description*
1	⊣|||	Ground (GND)
2	12V 0,7A	Power supply (12 VDC, 0.7A)
3	+ CONFIG	Enable software configuration

Antenna

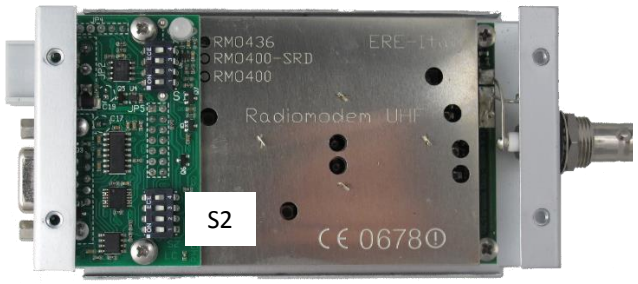
The device's antenna must be free and at least 10 cm away from any conducting material. When the antenna is installed outside, it is essential to connect the cable screen to the building's earth. We recommend using lightning protection. The protection kit chosen must permit the coaxial cable to be earthed (eg: coaxial lightning arrester with earthing of the cable at different places on the antenna at the base of pylons and at the entry, or just before entering the premises).

Configuration

Channel selection

The channel selection may be execute or in **Hardware Mode**, by using the Dip Switch bank or in **Software Mode** by using the linked DTE and the suitable procedure. An alternative procedure is the **Remote Channel Configuration** to change the operative channel parameters in a remote unit via the radio network.

1 – Hardware Channel Selection
The first three switches of the Dip Switch Bank **S1** on the radiomodem card are used to select manually the operative channel. The 4th switch is the power on switch for the entire apparatus and **must always be** in **ON** position.



Channel	S2 Dip 1	S2 Dip 2	S2 Dip 3
1	OFF	OFF	OFF
2	ON	OFF	OFF
3	OFF	ON	OFF
4	ON	ON	OFF
5	OFF	OFF	ON
6	ON	OFF	ON
7	OFF	ON	ON
8	ON	ON	ON

S2 Dip 4 must be always on ON position
Can be switch on OFF position only in case of using DTR (consult ERE for more details)

2 – Channel Selection by DTE
An alternative technique to change/select the operative channel is the **software setting by the DTE**. In this case the **Addr from DTE** mode **must be selected** for all operative modes including **Broadcasting mode**.
If all the eight available channel are configured, the channel selection between them is made possible following this procedure:
Send **3 bytes** from DTE to Radiomodem in the following order: **New Channel Number – 09h – New Channel Number**. All bytes must be sent in **hexadecimal code**.
After the change, a waiting time of at least 1 millisecond is necessary before start of the normal utilisation.
The string **00h – 09h – 00h restores the manual selection** via Dip Switches. Because the **channel change via DTE is not stored** in the radiomodem memory, whenever the supply line is disconnected the unit **resets** itself **in manual selection**.

3 – Channel Selection of a Remote Unit using the Master Unit and the Radio Network.
In the standard applications one or more peripherals may be placed in a "problematic" site essentially due to logistic difficulties.
To avoid this problems a Remote Programming/Channel selection utility is installed into the configuration software.
The programming procedure is exhaustively explained below under the **Remote Configuration** paragraph.

Serial port and reset timer setting

Automatic Reset Timer allows to re-initialise the entire radiomodem if, for any reason, the output data stops. The time interval before the complete unit reset may be of **15 seconds, 30 seconds, 1, 2, 4, 8 and 16 minutes**

Reset time	S1 Dip 1	S1 Dip 2	S1 Dip 3
Timer OFF	OFF	OFF	OFF
15 sec	ON	OFF	OFF
30 sec	OFF	ON	OFF
1 min	ON	ON	OFF
2 min	OFF	OFF	ON
4 min	ON	OFF	ON
8 min	OFF	ON	ON
16 min	ON	ON	ON

Serial port setting	S1 Dip 4
RS232	OFF
RS485	ON

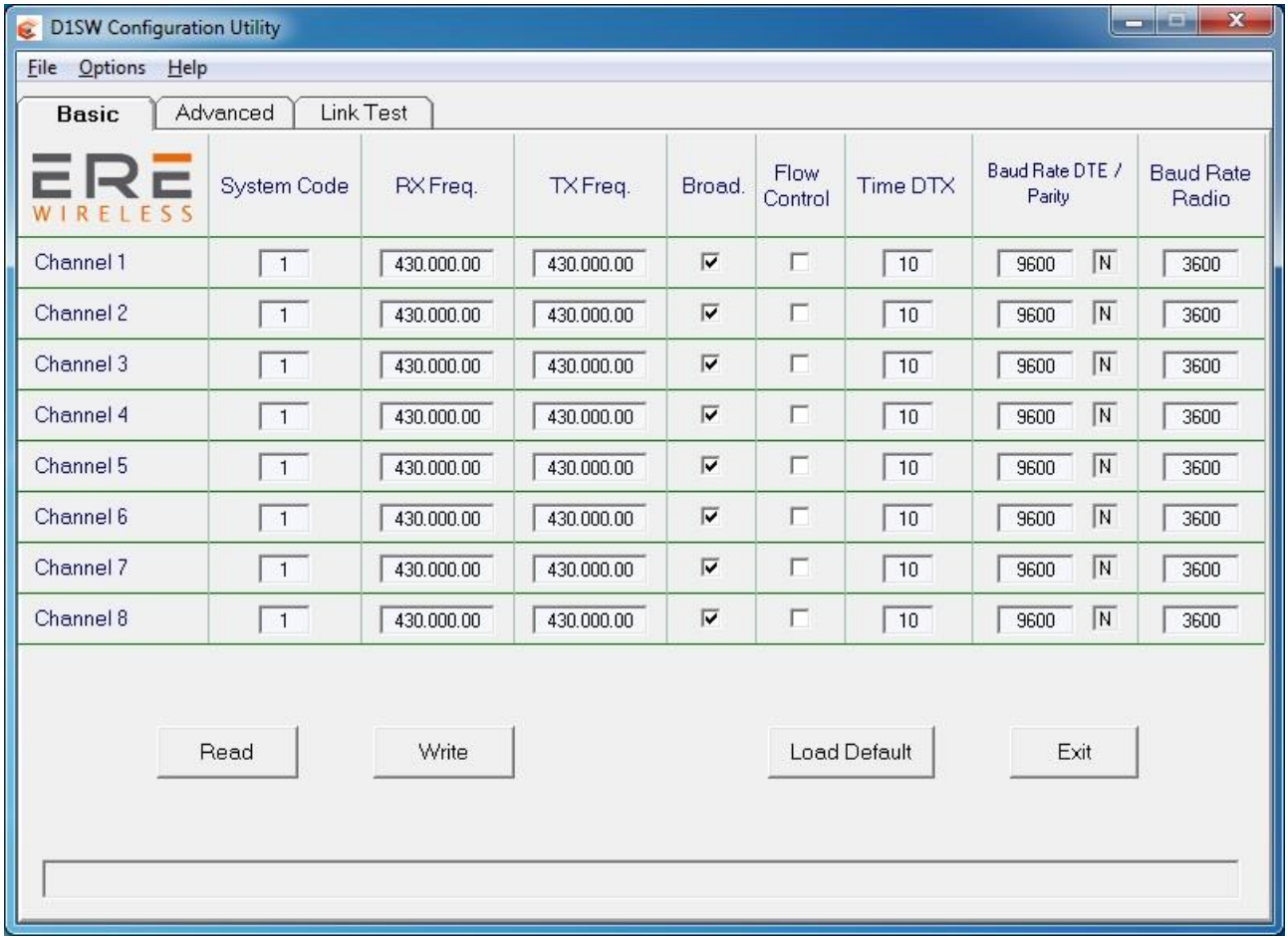
Software configuration

Download from ERE web site (www.erewireless.com) the latest version of configuration software (confSW_D1).
The configuration must be done through a RS232 interface

System Requirements
Operative System: Windows 98 SE, Windows ME, Windows2000, Windows XP, Windows Vista, Windows 7
Minimum screen resolution: 800 x 600 dpi.

Preliminary Operations:
1) Install the Configuration Software on your computer.
2) Connect the serial port of RMO 400 to the computer communication port with a **NO Null Modem** cable and open the configuration utility.
3) **In Options Menu** select the appropriate computer **Communication Port** and the **Operative Band** of D1.
Care attention to select the Operative Band in according to the model of the available radiomodem.
4) Link together **pin n° 1** and **pin n° 2**, respectively CONFIG and DC SUPPLY, of the 3-poles supply connector (JP3).
5) Connect, with the proper polarity, a stabilized supply then turn on to enter in Configuration Mode.
6) Use **TAB** key and **Up, Down, Left** and **Right Arrows** to move into the displayed fields.
7) A function may be activated choosing the relative box.
8) To leave the configuration process exit the program, disconnect the communication cable, turn off supply and disconnect pin n°1 from pin n°2 of the supply connector.
9) For normal operation connect the supply source between pin n°2 (positive) and pin n° 3 (negative) of the 3-poles supply connector (JP3)

Basic configuration



Fields explanation:
The values into [ ] bracket indicate the permissible range or the ON/OFF condition to be setted into the selected field. The value into ( ) bracket is the measure unit of the field parameter.

System Code [0….63]: Define the identification code of a group of radiomodems. Obviously all radiomodems of a specified group may have the **same** System Code.

RxFreq. (MHz): Operating frequency of the receiver section. This value may be compatible with the operative band and the variation step is **6.25 kHz**.

TxFreq. (MHz): Operating frequency of the transmitter section. All previous considerations are valid for TxFreq.
NOTE: The insertion format of operating frequencies contains both integer and decimal.
For example if frequencies is **434.15625** MHz the displayed format is **434.156.25**. If the inserted value is not an exact multiple of 6.25 kHz an internal routine in the configuration software shifts this value to the nearest multiple of 6.25 kHz. Function keys **F5** and **F6** respectively decrease/increase this value by a step of 6.25 kHz.

Broadcasting [ON/OFF]: Available only if both **ACK** and **Echo** functions are in **OFF Mode**. When selected all transmitted packet are received by all radiomodems having the same System Code independently by their target addresses. (See Advanced Help for more information).

Flow Control [ON/OFF]: When selected the **CTS** criteria (Clear to Send) of RS232 serial port controls the data flow from DTE. If inactive the CTS/RT485 output is the Rx/Tx switch of RS485 interface and in this case the correct management of the intervals between data packet is a specific duty of DTE.

TimeDtx [0....255] (msec): Define the waiting time between the stop of data flow on the communication port and the sending of packet by radio. If the data to be send presents one or more long pauses may be useful increase this time to masks this pause.

Baud Rate DTE [1200/2400/4800/9600/19200/38400] (bps): Communication Port Speed in bit per second.

Baud Rate Radio [2400/3600/4800] (bps): Radio communication Speed in bit per second. The maximum speed maybe used only in an high SINAD connection as an installation where both antennas are in optical view and/or quite elevated from ground.

Read Push-button: When selected read the data in all channels.

Write Push-button: When selected load the inserted data in all channels.

Exit Push-button: Quit to desktop.

Toolbar: The Toolbar on upper side of the screen contains the **File**, **Options** and **Help Menu**.
Each menu can be opened as a normal Windows menu using both mouse or keys.

FILE Menu:
- **Open** (path/filename): Load an existing file in the configurator utility.
- **Save** (path/filename): Update an existing file after a change in the parameters.
- **Save As** (path/filename): Create a new file containing all configuration data. The user can be select an adequate filename and choose the destination folder. The default destination folder is the same which contains the software.

Options Menu:
- **Local:** Configure the radiomodem linked up communication port.
- **Remote:** Configure a remote unit by the unit linked up communication port.
- **Serial port selector [COM1/2]:** Open the serial port selection box.
- **Band selector [1....8]:** Display the operative band of the unit. If not any operation of read/write was never done its possible change the operative band otherwise is imposed by radiomodem.

Help Menu:
- **Index F1:** Open this Help file permitting the Italian/English language choose.
- **About:** Display the information about the configuration software.

Channel Copy:
Its possible copy all the parameters of a channel in another by positioning the cursor over the channel to be copied, pushing the right button of the mouse to open the dialog box and choosing **Copy**. Now move the cursor over the channel to be updated push the right button of the mouse to open the dialog box and choose **Paste**. Press **Paste to all channels** to copy the data in all the other channels.

Link Test In this page it is possible verify the radio link. Connect the radio modem to the serial port of the computer and follow the shown instructions.

Advanced configuration

Its Addr [1....255]: Define own address. In a point-multipoint network the master's address must be 1.

Target [1....255]: Define the address of remote unit destination of the message.

Digip. [0....255]: Define the digipeater's address. Default value, **0**, shows the absence of any digipeaters.

ACK [ON/OFF]: Available only if **Echo** and **Broadcasting** functions are **inactive**. When active the transmitting modem wait an acknowledge from the remote unit. If this don't come in an adequate time interval the source modem repeats the last packet until specified in the **Repetition** field.

NAK to DTE [ON/OFF]: Available only with **ACK active**. When selected the modem send to DTE a NAK character (ASCII 21) at the expiry of Repetition cycle if no ACK have been received

Addr to DTE [ON/OFF]: If selected data send to remote DTE will be preceded by transmitting unit address so that shall be possible to identify the message source unit.

Rx Addr for TX [ON/OFF]: Available only if **Addr from DTE** function is **inactive**. If selected the target radiomodem save the address, complete of digipeaters if presents, of the source unit and use this to send the answer of its DTE.

Echo [ON/OFF]: Available only if **ACK** and **Broadcasting** functions are **inactive**. It's useful to verify the radio link, digipeaters included. When a modem receive an "Echo" packet don't send it to its communication port but repeat it to source modem that send this packet to its DTE.

Addr from DTE [ON/OFF]: Available only if **Rx Addr for Tx** function is **inactive**. If selected is a specific duty of DTE provide to the correct addressing of each packet. The addressing is made by some additional bytes preceding the message in the following order:
One System Code Byte [0...63] in which the two MSB bit 7 and bit 6 are the **Broadcasting** and **Echo** switches.
One **Unit Number** Byte [1...9] which contains both target and all the digipeaters if present. A maximum of 8 Digipeaters Addresses Bytes in the correct sequence of use.
One Target Address Byte and then the message to be send (maximum 256 bytes).

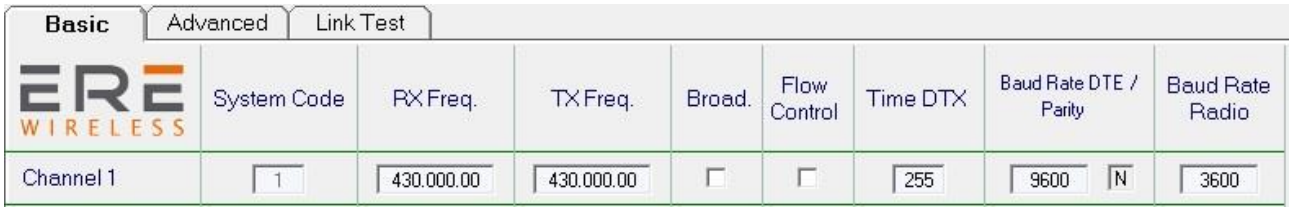
Repetition [0....255]: Available only if **ACK** function is **active**. Define the number of repetition of the last message packet when no acknowledge by target modem is received.

PwsavOff [0....240] (x 10 msec): Define the **OFF-Time** in the **Power Saving cycle**. The **On-Time** is **70 msec**. The **0** value keeps continuously turned-on the unit. This time is used to calculate the preamble length and all units of a network must have the same PwsavOff time.

PwSava [0....255] (x 100 msec): Define the waiting time before starting the Power Saving cycle after any operation. This time must be the same for any unit in the network. Maximum settable value is **254** while **255** is a reserved value that define unit as the **Master** of a point multi-point network where the master is continuously turned-on but the preamble length is defined by the **PwsavOff** time. As for PwsavOff time the **0** value blanks the Power Saving cycle.

Remote configuration

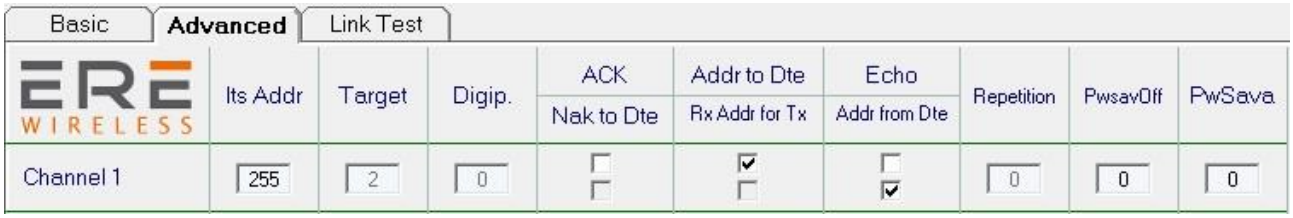
The Configuration software may be used for programming a remote unit by a radiomodem linked up a communication port of a personal computer.
To start the procedure is necessary connect the computer's communication port to the local unit, force it into Configuration Mode as explained in the Online Help of the software, know the operative frequencies and the Baud Rate Radio of the remote unit then in the Basic window of the configurator utility must be **unselected** both **Broad**. and **Flow Control** functions as shown in the following image.



Insert **255** in **TimeDTX** field and **9600** in **Baud Rate DTE** then choose for **Baud Rate Radio** the same value used in the remote unit.

Open the **Advanced** window and insert **255** in **Its Addr** field, **unselect ACK** and **Echo** functions, select **Addr to Dte** and **Addr from Dte** then insert the same values for **PwsavOff** and **PwSava** used in the remote unit.

If the remote unit is in **Power Saving and Broadcasting mode** in the **PwSava** field of the local unit **must be** inserted **20** as shown in the following image.



At the end of this process push the Write button to load this parameters in the local unit, turn-off the unit, disconnect pin n° 3 from pin n° 2 of the 3-poles supply connector, link the antenna, select the channel where was been wrote the above described parameters then turn-on the unit.

In the **Options Menu** of the configuration software choose **Remote**.

Push the Read button to show all the parameters of the remote unit.

A new dialog box must be shown on the screen and into this box the following remote unit parameters must be inserted:
- **System Code**
- **Digipeaters Addresses** in the exact sequence of use (if one or more digipeaters are presents)
- **Target Address**
- **PwsavOff** time value.

Push the **OK** button to send the reading request and in a few seconds the read values shall be shown in the configurator windows. At the end of this process the dialog box will be closed.

To write the new parameters in the remote unit push the **Write** button to open a dialog box, insert the requested parameters then push **OK**.

The new parameters shall be transmitted to the remote unit and after few seconds the remote unit will send back the update acknowledge.

It is important to remember that any update shall be saved in the remote unit after **30 seconds** since the end of programming process.

We recommend a "Read, Modify and Write" procedure to avoid mistakes in the programming of the remote units.

Remember that a change in the operative frequencies of remote unit involve a new setting of local unit if the waiting time before saving is expired.

Notice: If the remote unit is characterized with **Addr from DTE** function active the value to be inserted in **System Code** field must be **0 only if** no one message was be send otherwise must be the same used in the communication network, normally the value sent by DTE in normal operation.