BSR75 USER AND INSTALLATION MANUAL

PRODUCT: BSR75

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CONTENTS:

1. INTRODUCTION

The BSR75 is a digital RF transceiver with a transmitter output power of 75 W. It is manufactured following a robust mechanical modular design which allows simple and economic maintenance.

The BSR75 is available in the following frequency bands:

- 380 - 400 MHz
- 409 - 430 MHz
- 450 - 470 MHz
- 763 - 806 MHz ($*_1$)
- 806 - 870 MHz ($*_2$)

($*_1$) Note: For Industry Canada, the frequency range is 768-776 MHz and 798-806 MHz.
For FCC, the frequency range is 769-775 MHz and 799-805 MHz.
($*_2$) Note: For Industry Canada, the frequency range is 806-824 MHz and 851-869 MHz.
For FCC, the frequency range is 809-824 MHz and 854-869 MHz.

Frequency configuration is only allowed and controlled directly by the grantee (TELTRONIC, S.A.U.).

The modules that form the BSR75 are:

- RPS75 (Repeater Power Supply)
- RPA75 (Repeater Power Amplifier)
- RTX75 (Repeater Transmitter)
- RRX (Repeater Receiver)
- BSYNC (BSR75 Synchronism) - OPTIONAL
- RCPU (Repeater Control Processing Unit)

The proper operation of any electronic device depends on its correct use. It is therefore recommended to follow the instructions in this manual.

CAUTION: Switch the BSR75 off before inserting/removing any of its modules.

2. UNPACKING AND CHECKING

The following elements are supplied in the box:

BSR75
Power Supply Cable
Maintenance Cable
Two Ethernet Cables

The equipment is supplied with all the modules already assembled in the rack. The modules in the basic configuration are: Power Supply module (RPS), Power Amplifier (RPA75), Transmitter (RTX75), Receiver (RRX) and Control (RCPU). Synchronism module (BSYNC) is necessary for testing purposes.

IMPORTANT: if any of these elements is missing or damaged, contact your dealer and / or installer.

3. PREVIOUS CONSIDERATIONS

This manual contains information on instructions for installation, maintenance and use. Read the following pages before using this equipment.

Do not switch on the BSR75 without having previously connected the TX antenna. The equipment may be seriously damaged. It is important to use an antenna adjusted to the BSR75 transmitter frequency band.

4. LABELLING AND INFORMATION ON SAFETY AND ELECTROMAGNETIC COMPATIBILITY

The equipment is supplied with an identification label where the model, the IC Certificate number and the FCC ID are displayed depending on the frequency work band.

The equipment has been designed to fulfil the applicable compliance regulations.

The equipment complies with the applicable Parts of the FCC Title 47 of the Code of Federal Regulations and Industry Canada (IC) RSS-119 Standard.

This device complies with part 15 of the FCC Rules and Industry Canada ICES-003. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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

5. FCC RF EXPOSURE REQUIREMENTS:

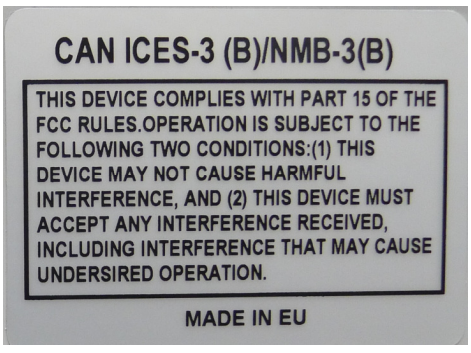
CAUTION:

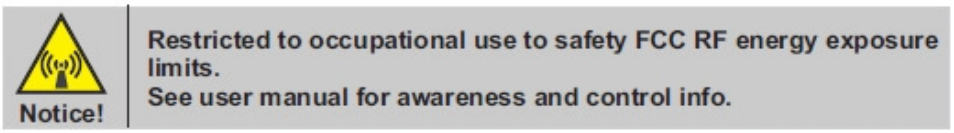
The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Antennas used for this transmitter must not exceed an antenna gain of 20 dBi and be located at least 525 cm, away from any person(s) in order to comply with the FCC RF exposure requirements.

Failure to observe these restrictions will result in exceeding the FCC RF exposure limits.

The following labels will be placed in conspicuous view on the BSR75 depending on the frequency work band of the equipment:



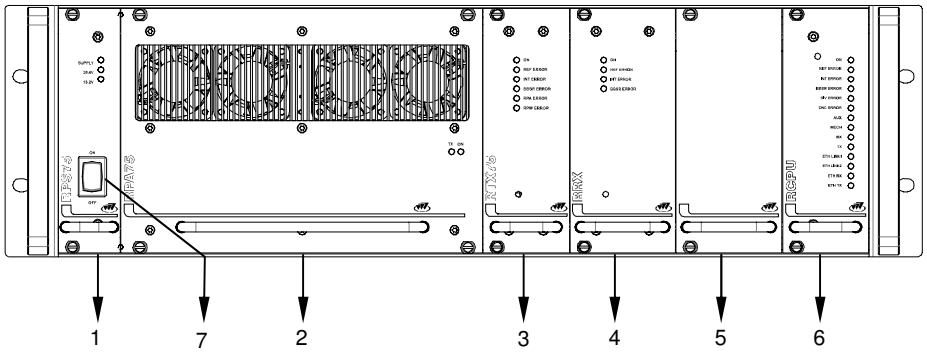


In any case, take the following points into consideration:

- Most electronic equipments are susceptible to electromagnetic interference if they are not duly protected. If the BSR75 is placed near unprotected electronic devices, they may malfunction.
- The BSR75 must not transmit without its antenna connected.
- When installing the antenna, follow the guidelines for exposure of the human body to high and low frequency electromagnetic fields. Follow the supplier's / manufacturer's instructions.
- Burns may be suffered if the antenna connector output of the power module (RPA75) is touched by bare skin when the BSR75 is transmitting with the antenna disconnected.
- Take care when handling the BSR75. It has sharp edges, which may cut if handled incorrectly.
- Maintenance and repair of these repeaters must be carried out by qualified personnel only.
- Connect the BSR75 chassis to the earth intake in the cabinet where it is to be installed.
- Switch off the BSR75 before inserting/removing any of its modules

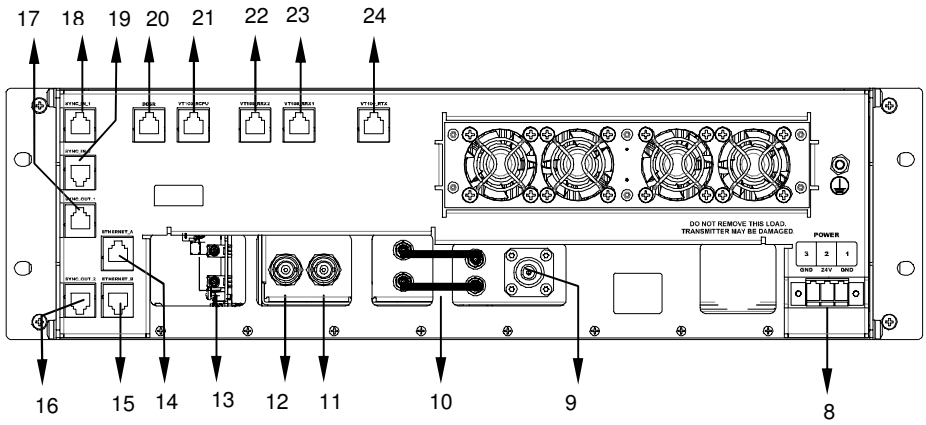
6. EQUIPMENT DESCRIPTION

6.1. FRONT VIEW



1.- RPS (Repeater Power Supply).
2.- RPA75 (Repeater Power Amplifier).
3.- RTX75 (Repeater Transmitter).
4.- RRX (Repeater Receiver).
5.- BSYNC (BSR75 Synchronism) - OPTIONAL
6.- RCPU (Repeater Control Processing Unit).
7.- Power Supply switch.

6.2. REAR VIEW



8.- Power Supply Connector.
9.- TX Antenna Connector (type N).
10.- RF cables between RTX75 and RPA75.
11.- RX Antenna Connector (type BNC).
12.- RX Diversity Antenna Connector (not used).
13.- BSYNC Connectors (not used).
14.- Ethernet Connector “ETHERNET_A”.
15.- Ethernet Connector “ETHERNET_B”.
16.- Synchronism Output Connector “SYNC_OUT_2”.
17.- Synchronism Output Connector “SYNC_OUT_1”.
18.- Synchronism Input Connector “SYNC_IN_1”.
19.- Synchronism Input Connector “SYNC_IN_2”.
20.- Bus BSR maintenance connector.
21.- RCPU maintenance connector (VT-100).
22.- RRX2 maintenance connector (Not used).
23.- RRX maintenance connector (VT-100).
24.- RTX75 maintenance connector (VT-100).

6.3. MODULES

1.- RPS75 (REPEATER POWER SUPPLY)

LEDs to indicate module status.

LED	TYPE	NORMAL STATUS	FUNCTIÓN
SUPPLY	Green	On	There are 27.4V at the RPS75 input
26.4V	Green	On	There are 27.4V at the RPS75 output
13.2V	Green	On	There are 13.2V at the RPS75 output

Power Supply switch (Ref. 7): ON/OFF switch to connect to and disconnect from the BSR75.

2.- RPA75 (REPEATER POWER AMPLIFIER)

LEDs to indicate module status.

LED	TYPE	NORMAL STATUS	FUNCTIÓN
ON	Green	On	Power supply correct
TX POWER	Green	On	Module transmitting

3.- RTX75 (REPEATER TRANSMITTER)

LEDs to indicate module status.

LED	TYPE	NORMAL STATUS	FUNCTIÓN
ON	Green	On	Power supply correct
REF. ERROR	Red	Off	Failure in the 10 MHz reference
INT. ERROR	Red	Off	Internal failure
BBSR ERROR	Red	Off	Communication failure with the RCPU module
RPA ERROR	Red	Off	RPA75 failure
RPW ERROR	Red	Off	Reflected power failure

4.- RRX (REPEATER RECEIVER)

LEDs to indicate module status.

LED	TYPE	NORMAL STATUS	FUNCTIÓN
ON	Green	On	Power supply correct
REF. ERROR	Red	Off	Failure in the 10 MHz reference
INT. ERROR	Red	Off	Internal failure
BBSR ERROR	Red	Off	Communication failure with the RCPU module

5.- SLOT OPTION: BSYNC (BSR75 SYNCHRONISM)

LEDs to indicate the status of option BSYNC.

LED	TYPE	NORMAL STATUS	FUNCTIÓN
ON	Green	On	Power supply correct
REF. ERROR	Red	Off	Failure in the 10 MHz reference
WARM UP	Red	Off	Oscillator in warming up phase
TIME GPS	Green	Flashing	There is NMEA signal from GPS
PPS GPS	Green	Flashing	There is PPS signal from GPS
TIME LOCAL	Green	Flashing	There is NMEA local signal (without GPS)
PPS LOCAL	Green	Flashing	There is PPS local signal (without GPS)

NOTE: this slot is not used in the BSR75 basic configuration.

6.- RCPU (REPEATER CONTROL)

LEDs to indicate the module status.

LED	TYPE	NORMAL STATUS	FUNCTIÓN
ON	Green	On	Power supply correct
REF. ERROR	Red	Off	Failure in the 10 MHz reference
INT. ERROR	Red	Off	Internal failure
BBSR ERROR	Red	Off	BSR75 bus failure
DIV ERROR	Red	Off	Diversity failure
CNC ERROR	Red	Off	Communication failure with the Site Controller
AUX	Green	Off	Not used
MCCH	Green	Off / On	Main carrier indicator
RX	Green	Flickering	Information received
TX	Green	On	Information transmitted
ETH LINK1	Yellow	On	Link between the local network switch and the RCPU module in Ethernet port 1
ETH LINK2	Yellow	Off	Link between the local network switch and the RCPU module in Ethernet port 1
ETH RX	Green	Flashing	Reception of an Ethernet packet
ETH TX	Green	Flashing	Transmission of an Ethernet packet

7. INSTALLATION GUIDE

The following recommendations must be followed closely before starting up the BSR75 module.

7.1. LOCATION

The BSR75 has been designed in the standard format of 19" / 3 units high and it must be installed in cabinets with this format.

The BSR75 site must be permanent, well-ventilated and without vibrations.

7.2. POWER SUPPLY CONNECTION

DC power supply: check that the power supply source and/or the battery to be used meets the voltage and current requirements necessary to supply the equipment:

- Nominal voltage: $27.4V_{DC}$
- Minimum source current: 20 A.
- There is a power control circuit in the RPS75 module in order to avoid an over-current condition.
- If lead batteries are used, they are to be placed as far from the BSR75 as possible to prevent corrosion in the repeater due to battery vapours. They should be situated in a well-ventilated place.
- Use the power supply connector provided (D013000) to connect the BSR75 to the power supply source. Use a cable with 2.5 mm^2 minimum diameter (or AWG-12). Ensure that the connection is made with the correct polarity.
- Ensure that the earth connection is made. Make this connection with a cable of maximum diameter and minimum length.

NEVER use a gas or electricity conduit as an earth.

7.3. ANTENNA CONNECTION

- Choose the most adaptable antenna for the installation. The antenna must have an impedance of 50 ohms to the equipment transmission frequency. Install the antenna in accordance with the manufacturer's instructions.
- Use a coaxial cable, avoiding as much as possible large cable lengths. Cable impedance is 50 ohms.
- Measure the VSWR of the installation. Never accept a VSWR greater than 2.
- If a duplexer module or a band pass filter is required, adjust them to the working frequency before starting up.

7.4. SWITCHING ON THE BSR75

- Check the connections between the modules.
- Check that the power supply source is connected correctly.
- Check that the RF SMB cables are connected correctly (see Rear View diagram Ref. 10).
- Check the connections of the antennas in the RPA75 and RRX modules.
- Check that the RPS75 module LED SUPPLY is on.
- Activate the power on switch on the RPS75 module.
- Check that the 26.4V LED and 13.2V LED on the RPS75 module are on and check that the LEDS "ON" are switched on in the other modules.
- Wait for the BSR75 to start up.

Note: See subclause 5.3 for more information on references for the different modules and LEDs.

8. CONFIGURATION

A BSR75 is configured via an NMS (Network Management System). To configure the BSR75, consult the NMS manual.

9. INCIDENTS

The repeater must be repaired by authorized technical personnel only. If a BSR75 failure occurs, the entire BSR75 must be replaced. If transmitter module is damaged and there is not an entire BSR75 available to replace, set RTX75 and RPA75 modules previously calibrated jointly. In last case and if is not possible to carry out one of the two previous options, replace one of these two modules and make the gain calibration again.

If an error or alarm occurs in the BSR75, this is indicated in the corresponding LED for each one of the modules. The following list shows the possible failures and their solutions.

9.1. ALARMS

	Led indication	*Status*	*Failure / Solution*
RPS75	SUPPLY	OFF	Power supply failure. Check that the source and the power supply cable are correctly connected. Check the internal fuse of the RPS75. Contact Technical Services if unsolved.
	26.4V	OFF	Power supply failure. Contact Technical services.
	13.2V	OFF	Power supply failure. Contact Technical services.

RPA75	ON	OFF	Power supply failure. Contact Technical Services.
	TX POWER	OFF	No power transmission in the antenna. Wait for BSR75 to be started up. Check other LED indications. Contact Technical Services if unsolved.

RTX75	ON	OFF	Internal power supply failure. Contact Technical services.
	REF. ERROR	ON	Failure in the 10MHz reference. Contact Technical services.
	INT. ERROR	ON	Internal failure. Contact Technical services.
	BBSR ERROR	ON	Communication failure with the RCPU module. Check that all the modules are correctly installed. Contact Technical services if still unsolved.
	RPA75 ERROR	ON	Failure in the RPA75 modules. Check that the RF SMB cables (Ref. 10) are properly connected. Contact Technical services if still unsolved.
	RPW ERROR	ON	Reflected power alarm. Check that the antenna is properly installed. Contact Technical services.

RRX	ON	OFF	Internal power supply failure. Contact Technical services.
	REF. ERROR	ON	Failure in the 10MHz reference. Contact Technical services.
	INT. ERROR	ON	Internal failure. Contact Technical services.
	BBSR ERROR	ON	Communication failure with the RCPU module. Check that all the modules are correctly installed. Contact Technical Services if still unsolved.

BSYNC	ON	OFF	Internal power supply failure. Contact Technical services.
	REF. ERROR	ON	Failure in the 10MHz reference. Contact Technical services.
	TIME GPS	ON	If GPS is activated, there is failure in the data frame. Contact Technical Services.
	PPS GPS	OFF	If GPS is activated, there is failure in the PPS signal of the GPS: - check that the starting up period has been exceeded (about 10 minutes after switching on) - check the GPS antenna connection. - check the correct positioning of the GPS antenna, in accordance with the manufacturer's instructions. Contact technical services if still unsolved.
	TIME LOCAL	OFF	If GPS is not activated, there is failure in the local reference data frame. Contact Technical Services.
	PPS LOCAL	OFF	If GPS is not activated, there is failure in the local PPS signal. Contact Technical Services.

RCPU	ON	OFF	Internal power supply failure. Contact Technical Services.
	REF ERROR	ON	Failure in the 10MHz reference. Check that the BSYNC module is installed or that the SYNC IN cable is correctly connected. Contact Technical services if still unsolved.
	INT ERROR	ON	Internal failure. Contact Technical Services.
	BBSR ERROR	ON	Communication failure by the BSR75 bus. Check that all the modules are correctly installed. Contact Technical services if still unsolved.
	DIV ERROR	ON	Error in diversity: occurs when the difference in received power between received paths exceeds a level (20 dBs by default) for a consecutive number of receptions. These receptions on the received paths which do not have sufficient power are not counted. This alarm does not disappear until there are no receptions with the sufficient power, and until the difference of received power between received paths does not exceed the level previously mentioned. Check diversity configuration in the NMS. Check that the reception antennas are correctly installed. Contact Technical services if still unsolved.
	CNC ERROR	ON	Communication failure with the Site Controller. Check the Ethernet connections. Check that the Site Controller is working properly. Contact Technical Services if still unsolved.
	RX	Continuous ON	Interference detection. Check the installation. Check that the work frequencies are correct.
	ETH LINK1	OFF	Failure in Ethernet link 1. Check Ethernet connection 1 and the Switch A.
	ETH LINK2	OFF	Failure in Ethernet link 2. Check Ethernet connection 2 and the Switch B.
	ETH RX	OFF	Packets are not received by Ethernet. Check the Ethernet connections.
	ETH TX	OFF	Packets are not sent by Ethernet. Check the Ethernet connections.

10. ANNEXE MANUEL D'UTILISATEUR ET D'INSTALLATION DE LA BSR75

GESTION DES DÉCHETS

L'apposition de ce symbole signifie que l'appareil doit faire l'objet d'une collecte sélective à la fin de son cycle de vie. Ne pas déposer les produits dans des décharges municipales sans les avoir triés.

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- dans l'article 5 de la directive du Conseil de l'Europe 2004/108/CE, du 15th décembre 2004
- Conseil de l'Europe 2006/95/CE, du 12th décembre 2006

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INTRODUCTION

Ce manuel est commun à tous les modèles de l'équipement, quels qu'en soient les options et accessoires installés.

Le fonctionnement approprié de tout équipement électronique dépend de sa bonne manipulation. Pour ce faire, il est préconisé de suivre les instructions de ce manuel.

ÉTIQUETAGE ET INFORMATION SUR LA SÉCURITÉ ET LA COMPATIBILITE ELECTROMAGNETIQUE

L'équipement est fourni avec une étiquette d'identification où le modèle, le numéro IC certificat et l'ID FCC sont affichés en fonction de la bande de fréquence de travail.

L'équipement a été désigné pour respecter aux réglementations de conformité applicables.

L'équipement est conforme aux parties de la FCC Titre 47 du Code de Fédéral Régulations et du standard de l'Industrie du Canada (IC) CNR-119.

L'équipement est conforme à la partie 15 des règles de la FCC et de l'Industrie du Canada NMB-003. Son fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne doit pas causer d'interférences et (2) cet appareil doit accepter toute interférence, inclus de l'interférence qui peuvent causer un mauvais fonctionnement de l'appareil.

Les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à utiliser l'équipement.

EXIGENCES DE L'EXPOSITION RF:

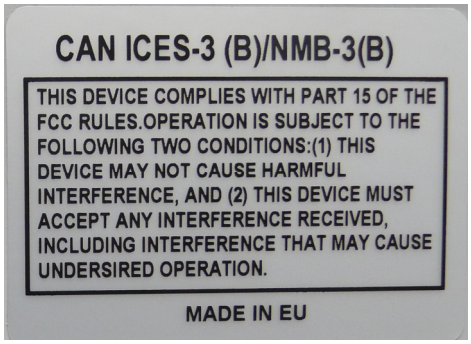
ATTENTION:

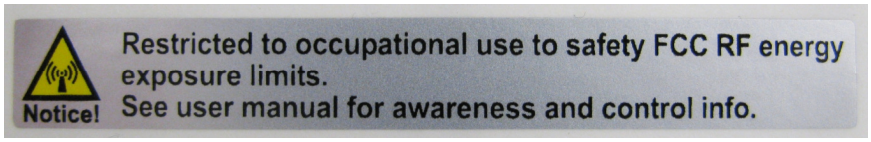
L'antenne(s) utilisée(s) pour ce transmetteur ne doit pas être co-localisées ou fonctionner en conjonction avec aucun autre antenne ou transmetteur.

L'Antenne(s) utilisée(s) pour ce transmetteur ne doivent pas dépasser un gain d'antenne de 20 dBi et être située à au moins 525 cm, loin de toute personne(s) afin de se conformer aux exigences de la FCC et de l'IC .

Le non-respect de ces restrictions entraînera à dépasser les limites d'exposition RF.

Les suivantes étiquettes seront placées dans évidence, sur laBSR75:





- La plupart des équipements électroniques sont susceptibles d'être soumis à des interférences électromagnétiques s'ils ne sont pas correctement protégés. Le montage de l'unité BSR75 à proximité d'équipements électroniques non protégés peut provoquer un dysfonctionnement de ces derniers.
- Il convient d'éviter que l'unité BSR75 n'émette sans que l'antenne ne soit branchée.
- Pour procéder à l'installation de l'antenne, tenir compte des directives qui contrôlent l'exposition du corps humain aux champs électromagnétiques basse et haute fréquence. Respecter les consignes du fournisseur/fabricant de l'antenne.
- Prendre garde aux brûlures susceptibles d'être provoquées par tout contact entre une partie du corps et la sortie du connecteur d'antenne lorsque l'unité BSR75 est en cours d'émission sans que l'antenne ne soit

branchée.

- Manipuler l'unité BSR75 avec soin. Cet équipement est pourvu d'arêtes qui peuvent être à l'origine de coupures en cas de mauvaise manipulation.
- La maintenance et la réparation de cet équipement doivent être prises en charge par du personnel qualifié.