Introduction and Product Specification

Contents

1 General

Radio Base Unit 3 (BRU3) is a complete one-channel compact radio base station which uses 8 kbps data signalling and is designed for the 400, 800 and 900 MHz band. The BRU3, which may be installed outdoors and indoors, is a link between the mobile terminals (MOB) and the area exchanges (MOX) in the Mobitex Network.

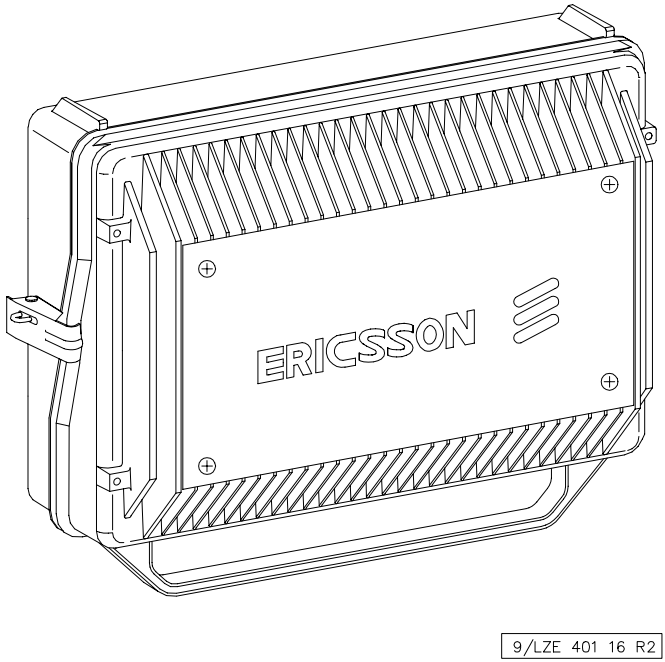

Figure 1 The front of Base Radio Unit 3 (BRU3).

1.1 Description

The BRU3 consists of two main mechanical parts:

FE Case Bottom Frame	FBF	(1)
FE Case Top Frame	FTF	(5)

The FBF comprises:

Weather-protected throughputs for the cabling

FE Connection Board	FNB	(11)
FE Power Supply Unit	FPU	(2)
FE Battery Unit, for power supply backup	FBU	(3)
FE Adaptation Board	FAB	(4)

The FTF is hinged to the bottom part and works as a cover as well as a cooling flange, thus offering good thermal management for the BRU3. The FTF comprises:

FE Computer Board	FCB	(6)
FE Modem Board	FMB	(7)
FE Radio Board	FRB	(8)
FE Filter Module	FFM	(9)
FE Heating Unit	FHU	(10)

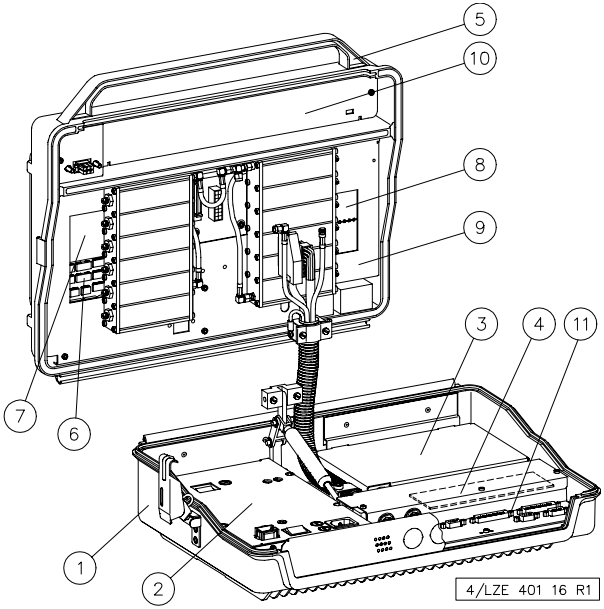

Figure 2 Base Radio Unit 3 (BRU3).

2 About this Manual

The BRU3 Manual, is designed for engineering personnel who are familiar with data communications terminology and protocols and who will work on site with the BRU3.

The Manual is intended for:

- Operation and Maintenance personnel
- Installation and Commissioning personnel
- System engineers
- Training

BRU3 units may be damaged by mismanagement. Therefore, read the documents included in this manual carefully before you start operating the BRU3, especially the *Safety Instructions* section. It is important that this manual be available to all personnel working with the BRU3, and that the BRU3 is operated only by trained personnel.

The manual provides the necessary information for installation, commissioning and operation of the BRU3. It is divided into four main parts:

- *BRU3 - Installation* module
- *BRU3 - General* module (including the *Commissioning Procedure* section)
- *BRU3 - Operation and Maintenance* module
- *BRU3 - Functional Description* module

The following sections are also included in the *BRU3 - General* module:

- *Safety Instructions*
- *Site Requirements*
- *FBTEST Reference Manual* - complementary to the *Commissioning Procedure* section.
- *Telephone Modem Settings* - complementary to the modem operation information in the *Operation and Maintenance* module.

3 Using this Manual

Before using this manual, you should have an overall understanding of how the Mobitex system operates as a wide-area packet switching network. If not, first refer to the *System Manual*.

3.1 Safety Instructions

This section contains safety instructions for handling the BRU3 during installation and maintenance.

Please read the *Safety Instructions* section before reading the other sections or starting any kind of installation or maintenance work.

3.2 Site Requirements

This section covers the site preparations required, in terms of space, power, environment, cables, grounding, etc., before installing the BRU3.

Normally, this kind of document is not included in hardware documentation but has been included in this manual as a complement to the *Installation Instructions* in the *BRU3 - Installation* module.

3.3 Installation

This module contains the information required for a safe installation of the BRU3.

3.4 Commissioning Procedure

This section includes two parts, the hardware and the software commissioning procedures.

Hardware Commissioning describes how to put the BRU3 into operation after installation has been completed.

Software Commissioning gives the necessary information for the commissioning of the BRU3 software.

3.5 FBTEST Reference Manual

This section includes the reference manual for the FBTEST test program which is used for the BRU3 hardware commissioning and some maintenance operations.

3.6 Operation and Maintenance

This module informs about first-line operation and maintenance of the BRU3, i.e. actions at site.

The *Design, Function and Operation* part describes the design, function and operation of the BRU3 and its constituent parts.

The *Maintenance* part describes how to carry out visual and preventive maintenance on the BRU3.

The *Troubleshooting* part describes how to act if problems occur when operating the BRU3. Trouble shooting is always carried out in agreement with the NCC operator personnel.

3.7 Functional Description

This module describes the functions of the BRU3. To understand the sections dealing with radio equipment, the reader must have a knowledge of radio frequency practice.

The *BRU3 in the Mobitex Network* and the *Logic and Radio System* sections provide a functional description of the BRU3 and the associated mobile terminal interface. The level of detail has been chosen to provide suitably qualified readers with a logical understanding of how the BRU3 functions as a system, together with a clear appreciation of the functional role of each board.

The *Mechanical Design* section describes the BRU3 hardware in practical engineering terms.

The information provided should enable engineering personnel to trouble-shoot in a logical and systematic manner, and repair the system down to module replacement level.

3.8 Telephone Modem Settings

This section can be used as a quick reference guide when configuring the BRU3 telephone modem. The configuration is done using the *FBTEST Reference Manual*. For further information about the telephone modem, please refer to the *Modem Configuration* section in *System User Guides*.

Note! The information regarding telephone modem in this manual may not be applicable to all BRU3 variants.

4 Technical Data

4.1 Power Requirements and Dimensions

Power Requirements

	Title	Product No.	Rated Voltage (V AC)	Operation Voltage (V AC)	Rated Current (A rms)	Nominal Freq. (Hz)	Power Consumption (W)
39xx	BRU3 39xx-D/T	HRB 104 43/Cn	110 - 130 or 220 - 240	90 - 140 or 198 - 254	3	50/60	<500
38xx	BRU3 38xx-D/T	HRB 104 43/Cn	220 - 240	198 - 254	3	50	<500
34xx	BRU3 34xx-D/T	HRB 104 43/Bn	220 - 240	198 - 254	9	50	<900

Dimension

	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
39xx	345	472	202	18
38xx	345	472	202	18
34xx	345	472	202	19

4.2 Radio Parameters

Radio data transmission speed	= 8 kbps
Modulation	= Modified GMSK, BT = 0.3
Deviation	= 2.0 kHz
Traffic mode	= Duplex
Channel bandwidth	= 12.5 kHz
Sensitivity	= -117 dBm at 1% BER
Antenna impedance	= 50 ohm
Blocking ratio	= Better than 90 dB
Cx	= C2, C4 - C8
Cy	= C20, C23
Bn	= B3, B6 - B9, B20, B21
Bx	= B10 - B13, B18, B19, B32, B33
By	= B14, B15
Bz	= B16, B17
Bm	= B24, B25
Bw	= B40, B41
Bv	= B46, B47
Bq	= B22, B23

	Product No.	Frequency Range (MHz)	Duplex Spacing (MHz)	Frequency Stability (ppm)	Antenna Output Power
39xx	HRB 104 43/Cx	TX: 935.0125 - 940.9875 RX: 896.0125 - 901.9875	39	+/- 0.1	3 W (Duplex Filter) 3 W (TXBP Filter)
38xx	HRB 104 43/Cy	TX 819.0000 - 825.0000 RX 864.0000 - 870.0000	45	+/- 0.1	6 W (Duplex Filter) 6 W (TXBP Filter)
34xx	HRB 104 43/Bn	TX: 426.6000 - 429.5000 RX: 416.6000 - 419.5000	10	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/Bx	TX: 423.9000 - 426.6000 RX: 413.9000 - 416.6000	10	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/By	TX: 440.0000 - 440.6000 RX: 425.5000 - 426.1000	14.5	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/Bz	TX: 453.1000 - 453.4000 RX: 459.6000 - 459.9000	6.5	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/Bm	TX: 415.7000 - 418.0000 RX: 406.2000 - 408.5000	9.5	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/Bw	TX: 421.0000 - 423.9000 RX: 411.0000 - 413.9000	10	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/Bv	TX: 419.5000 - 420.5000 RX: 412.5000 - 413.5000	7	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)
	HRB 104 43/Bq	TX: 421.2500 - 421.7500 RX: 428.2500 - 428.7500	7	+/- 0.2	6 W (Duplex Filter) 6 W (TXBP Filter)

4.3 Battery

4.3.1 Battery Operation

Battery discharge: Ambient temperature within ±0 °C to +55 °C.

	Product No.	Battery Discharge [min]
39xx	HRB 104 43/Cn	> 30 @ 3 W output power > 30 @ 6 W output power
38xx	HRB 104 43/Cn	> 15 @ 6 W output power
34xx	HRB 104 43/Bn	> 15 @ 6 W output power

4.4 Environmental Classifications

Water resistance:

Europe: class IP 43 according to IEC 529

US: class 3R according to UL 50

Weather Protected Locations:

ETS 300 019-1-3: Environmental Class 3.3, with extended temperature range for 34xx.

39xx: -25 °C to +60 °C

38xx: -25 °C to +60 °C

34xx: -33 °C to +60 °C

Non-Weather Protected Locations:

ETS 300 019-1-4: Environmental Class 4.1, with extended temperature range for 34xx.

39xx: -25 °C to +40 °C

38xx: -25 °C to +40 °C

34xx: -33 °C to +40 °C

Humidity:

10 - 100%

Storage:

-40 °C to +60 °C
ETS 300 019-1-1: Class 1.3 for storage.

Transport:

ETS 300 019-1-2: Class 2.3 for public transportation when packed in Ericsson supplied packaging material or equivalent.

4.5 Electromagnetic Compliance and Radio Standards

34xx: ETS 300 279
ETS 300 113 (according to EU Directive 1999/5/EC)
CE marked

38xx: ETS 300 279
ETS 300 113 (according to EU Directive 1999/5/EC)
CE marked

39xx: UL1950, UL listed
CAN/CSA-C22.2 No. 950-95
FCC part 68, FCC part 90

4.6 Electrical Safety

34xx: IEC 950:1991 with Amendments No. 1:1992 and 2:1993 in accordance with the EC Low Voltage Directive

AS/NZS3260 1992 (Australia/New Zealand)

38xx: IEC 60 950

39xx: CAN/CSA-C22.2 No. 950-M89 and UL50, Tenth Edition, Type 3R Enclosures

4.7 Surge Immunity

Antenna input: 4 kV, according to ENV 50142.

Power input: Line - neutral 4 kV
Line/neutral - protection ground 2 kV according to IEC 801-5

422 input: 2 kV, according to IEC 801-5

232 input: 2 kV, according to IEC 801-5

Tel input: 2 kV, according to CCITT 17

Alarm input: 2 kV, according to CCITT 17