ROG/RGS100

GSM-R Handheld

Technical product literature
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SELEX Communications
Via Enrico Mattei, 21 • 66013 Chieti Scalo (Chieti), Italy
Tel. +39 0871 58541 • Fax +39 0871 5854249
www.selex-comms.com

SELEX Communications
A Finmeccanica Company

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ROG 100 / RGS100 - GSM-R Handheld

1. INTRODUCTION

SELEX Communications has developed a profound understanding of railway mobile technology, becoming member of GSM-R Industry Group and achieving a leading position in the GSM-R equipment design: thanks to extreme versatility of Operational Purpose Handheld (ROG100) - Operational Purpose Shunting handheld (RSG100) terminals, SELEX Communications can offer tailored solutions for GSM-R applications, at competitive cost.
ROG/RSG100 is compliant with EIRENE/MORANE standard features for mobile equipment, including Advanced Speech Call Items (ASCI) phase 2/2+.
The ROG100 is the GSM-R mobile equipment specially designed for track-side maintenance personnel. This specific use requires ruggedized MSs, with high resistance to shock, water and dust and with increased operational ranges, regarding to temperature, humidity, battery lifetime, etc.
The RSG100 is the GSM-R MS dedicated to shunting operations. It is based on ROG100 with specific SW implementations for the handling of specific SIM card and remote MMI; eventually, larger batteries, customised on shunters needs, is provided to keep into account consumption of the R-MMI and of the hand-free with loudspeaker too, during the whole working cycle.

The SELEX Communications product is a standard EIRENE/MORANE OPH/OPS GSM-R handheld. It is capable of operation in the GSM-R band, that includes the Public GSM (P-GSM) and the Extended GSM (E-GSM) bands, and in the DCS band.
Main differences respect to a standard GSM MS are:

- a MMI to manage all supported GSM-R functions,
- a dedicated key PTT (Push to talk) for voice group/broadcast calls;
- a dedicated key for the link assurance signal (LA – OPS);
- a dedicated key for the railway/shunting Emergency Call;
- four programmable keys for accessing, quickly, to specific functionality or in soft keys mode to select the icons shown on the display;
- ruggedized construction;
- handsfree with loudspeaker.

The power class of OPH handheld shall be the following:

- 4 (2 Watt) in GSM-R band;
- 1 (1 Watt) in the DCS band.

1.1 FUNCTIONALITY

1.1.1 Call related functions

- Call authorised users (including controllers)
- Railway/Shunting emergency calls
- Shunting calls
- Receive incoming calls
- Group and broadcast calls
- Terminate calls

1.1.2 Additional functions

- Radio functions (Switch radio on/off)
- Select language
- Select mobile radio network
- Adjust loudspeaker volume
- Register and de-register functional number
- Store/Retrieve numbers and their details
- Computer interface

1.1.3 Supported GSM services

The following classes of GSM Services Phase 2/2+ are supported:

1.1.3.1 Teleservices

- Speech: Telephony, Emergency call
- Short message: MT/PP, MO/PP, Cell Broadcast
- Fax: Automatic fax group 3
- Voice Group Service: Voice Group Call Service (VGCS), Voice Broadcast Service (VBS)

1.1.3.2 CS Bearer Services for data transmission

- Asynchronous 2.4 kbps (Transparent and Non Transparent connection mode)
- Asynchronous 4.8 kbps (Transparent and Non Transparent connection mode)
- Asynchronous 9.6 kbps (Transparent and Non Transparent connection mode)

1.1.3.3 PS Bearer services

- In Release 1 HW predisposition for GPRS class B MS is provided; the GPRS SW version is available in Release 2.
- Multi-slot capabilities: 4+1 max (class 8).

1.1.3.4 Supplementary Services (Phase 2/Phase 2+)

- Calling Line Identification Presentation (CLIP)
- Calling Line Identification Restriction (CLIR)
- Connected Line Identification Presentation (CoLP)

- Call Forwarding Unconditional (CFU)
- Call Forwarding on Mobile Subscriber Busy (CFB)
- Call Forwarding on No Reply (CFNRy)
- Call Forwarding on Mobile Subscriber Not Reachable (CFNRc)
- Call Waiting (CW)
- Call Hold (HOLD)
- Multi Party Service (MPTY)
- Closed User Group (CUG)
- Advice of Charge (Information) (AoCI)
- Advice of Charge (Charging) (AoCC)
- Unstructured Supplementary Service Data (USSD)
- Enhanced Multi-Level Precedence and Pre-emption (eMLPP)
- User-to-User Signalling (UUS1)

1.1.4 Supported GSM-R services

- Functional Addressing
- Railway Emergency Calls
- Location Dependent Addressing
- OTDI (Possible Configuration: Network depending / Active / Deactive)
- Extended Late Entry
- Confirmation of High Priority Calls
- Priority of presentation “FN Train ”Confirmation of High Priority Calls
- Presentation and Interpretation of Functional Numbers
- Registration, de-registration, interrogation of functional numbers.

1.1.5 AT command set

The ROG100 module can be driven booth via MMI and via the serial interface using standard AT commands and it is compliant with following sets:

1. ITU-T V.25 standard AT commands
2. ITU-T V.25 Ter standard AT command set
3. 3GPP 27.007 standard AT commands
4. ETSI GSM 07.05 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)
5. ITU-T T.31 for FAX Class 1 compatible AT commands.

Moreover the ROG100 module supports also proprietary AT commands for special functionality.

1.2 MECHANICAL ASPECTS

The terminal ROG/RSG100 has following additional keys:

- four programmable keys for accessing, quickly, to specific functionality or to select the icons shown on the display, in soft keys mode;
- two keys on the left side for PTT and LA (active for RSG100);
- one keys on top side of phone for the Railway/Shunting Emergency Call (with protection against accidental use);

- a rotary knob on the right side is used for direct volume control and direct activation and de-activation (toggling mode) of the built-in office hand-free by pressing;
- external antenna connector.

1.2.1 Display

ROG/RSG100 handheld is supplied with a full graphic display of 132*65 pixel, displaying at least 6 lines, each of 20 characters.

1.2.2 External interface

ROG/RSG100 handheld supports data connection through an RS232 standard interface. With an optional watertight data cable/adapter it can be easily hook up to PC to manage the SMS, personal agenda, data transmission and phone configuration. Connectors for external interfaces guarantee ROG/RSG100 environmental requirements also when plugged, with the exception of IP54 environmental condition. To meet EIRENE requirements on battery duration, larger batteries are used to keep into account consumption of the R-MMI and also of the hand-free with loudspeaker, during the whole working cycle. The R-MMI can be linked to the RSG100 through the external watertight data connector.
The pin-out of ROG/RSG100 connector includes:

- An antenna connector;
- Out-going power supply line for R-MMI;
- In-going power supply line for the battery charger;
- Data line to manage R-MMI;
- Data line for external PC connection ;
- Audio lines for an external hand-free ;
- Maintenance Serial Lines for serial applications (Trace Mobile);
- An External PTT line.

1.3 ROG/RSG100 VIEWS

In following photo ROG/RSG100 side view is illustrated:

Photo 1: ROG/RGS 100 handheld

1.3.1 Dimensions

- 137 mm (Height)
- 61 mm (Width)
- 33 mm (Depth)

1.3.2 Weight

Approx 300 grams for ROG100 and 700 grams for RSG100.

In the following table 1 is shown the Pinout of down side connector:

PIN#	NAME	FUNCTION
1	GND	Signal Ground
2	MIC	Input External MIC
3	SPK_EXT+	External Speaker (handsfree)
4	SPK_EXT-	External Speaker (handsfree)
5	SPK	Speaker
6	PTT	External PTT
7	ACC-CFG2	Accessory Configuration
8	TXD0	Primary Serial AT/OPS
9	RXD0	Primary Serial AT/OPS
10	VBOUT	Power Supply 3.3V for Accessory
11	SDA	Serial Data (I2C)
12	SCL	Serial Clock (I2C)
13	VCH	Input battery charger 5-6V
14	RTS	Request To Send
15	DCD	Data Carrier Detect
16	CTS	Clear To Send
17	RXD1	Maintenance Secondary Serial
18	TXD1	Maintenance Secondary Serial
19	+2V8	Power Supply 2.8V for RS232
20	GND	Signal Ground

Table 1: pinout connector

1.4 TECHNICAL CHARACTERISTICS

1.4.1 Power class

The power class of ROG/RSG100 handheld is the following:

- 4 (2 Watt) in GSM-R band
- 1 (1 Watt) in the DCS band

1.4.2 Sensitivity

- -102 dBm

1.4.3 Power supply

The nominal supply voltage for mobile equipment is 4.2V; the voltage specified is compatible with Li-Ion battery (3.57V to 4.2V). The ROG/RSG100 is equipped with rechargeable batteries compliant to EIRENE requirements.
The replacement of the battery can be effected easily and without the possibility of inversion; the system of replacement also exclude all injury and fall risks.
The RSG100 equipment is provided with a battery larger than the ROG100, capable of supporting the additional power consumption due to presence of the R-MMI module and the active internal hand-free loudspeaker for the whole working cycle.
The ROG/RSG100 is provided with universal AC/DC power supply battery charger (100 to240V); It is used as plug battery as well as table battery charger for simultaneous charging of the phone and one spare battery.
Optionally, a DC/DC battery charger is provided on specific request of railway operators (e.g. car adapter kit).

1.4.4 Audio

The ROG/RSG100 includes an internal hand-free with loudspeaker and it adequate to operate in noisy working environments. It produces a Sound Pressure Level more than 81db/0.5m/1kHz (typical 86dBA). The reference output for audio measurements may be considered 80db/0.5m/1KHz.
The performance of the built-in hand-free is compliant with requirements of the “office type handsfree MS”.
The handfree with loudspeaker involve risk of echo problems, when in Point to Point Calls (VBS and VCGS are half-duplex calls). In order to solve this problem a partial duplex capability is allowed also in PTP, using a VAD (Voice Activity Detection) driven circuit.
Direct activation and de-activation (toggling mode) of the built-in office hand-free performed by pressing the rotary knob provided for volume control.

1.4.5 Frequency band

Direction	UIC	E-GSM	DCS
Uplink (MHz)	876-880	880-915	1710-1785
Downlink (MHz)	921-925	925-960	1805-1880

1.4.6 SIM card

ROG/RSG100 supports ETSI 3V technology Phase 2+ SIM cards (up to 64K), operating at 3V and at 3/5V. ROG/RSG100 does not support 5V only SIM. According to MORANE FFFIS, the SIM Cards are application toolkit compliant and can be updated by OTA (Over The Air) messages.

1.4.7 Environmental conditions

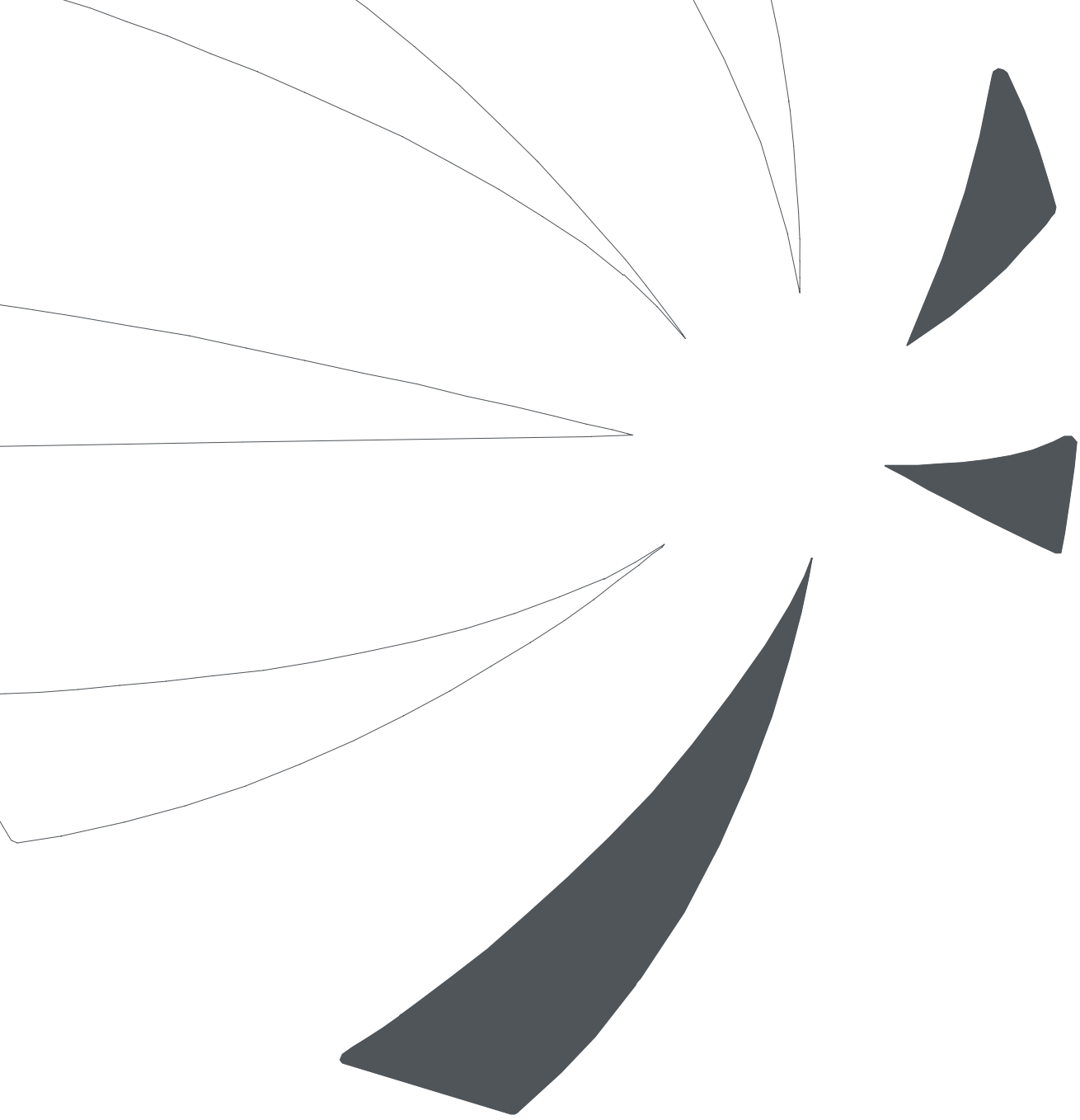
The ROG/RSG100 will withstand, without any permanent damage, to following additional EIRENE/MORANE conditions. Main climatic conditions are:

FEATURES	VALUE
Working temperature:	• +15 to +35 °C for normal conditions • -20 to +55 °C for extreme conditions
Storage (without being operational):	– 40 to + 70°C
Transportation:	The ROG/RSG100, inside the package, is Class 2.2 according to ETSI 300 019-1-2
Variation of temperature:	40°C with a maximum gradient of 3°C/s
Altitude:	-100m to +1800m referenced to sea level
Humidity :	• 100% for short periods, • 75% yearly expected average • 95% for 30 days per year • 75% maximum humidity for indoor (-5°C)
Solar radiation:	Maximum value of 1120 W/m2 (Solar Radiated Power Density)
Rain:	IEC 529/EN 60529
Snow and Hail:	max diameter of hailstone can reach 20mm.

The ROG/RSG100 is conforming to IP 54 as a minimum (IEC 529/EN 60529).

1.4.8 Certification

The ROG/RSG100 is compliant to Directive 1999/05/CE.



SELEX Communications is certified and operates in conformity to the following International Standards: ISO 9001 Quality System and ISO 14001 Environmental Management Systems

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