

2201R

Mobile Service Tester for GSM-R Applications
Data Sheet

COBHAM

The most important thing we build is trust



Highlights

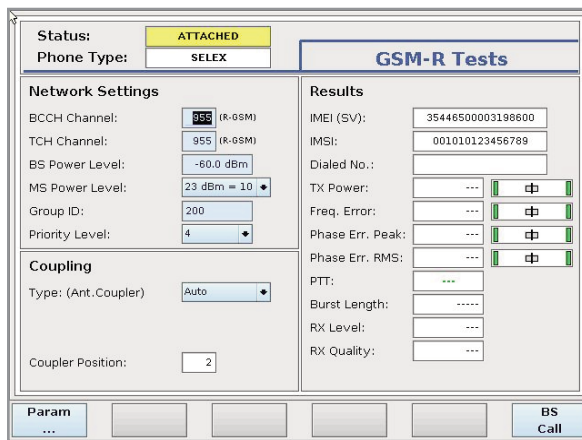
- Mobile Tester for GSM-R applications
- Supports voice group call service (VGCS)
- Ability to define Group ID and priority level for VGCS
- Reads out the SW version number from the terminal (IMEISV)
- GSM-R Emergency calls
- Covers GSM-R frequency range in addition to GSM 850/900/1800/1900
- Optional battery pack (typical 2.5 hours operating time)
- Features remote control and built-in AUTOTEST

2201R Ensures Railway Communications Systems Work

The Cobham Wireless 2201R Mobile Service Tester is designed to address the specific features and frequency bands introduced by GSM-R, the railway communication system, based on GSM. The specific design of the 2201R RF front-end allows direct connection to GSM-R device types including the high powered Power Class 2 radios.

The 2201R features the simulation of group calls (VGCS) at various priority levels. This includes emergency calls based on group calls to verify not only the performance of cab radios but also of peripherals, such as optical and acoustical alarms. These tests ensure proper performance of the overall radio system and help to verify safety functions in an emergency case.

The 2201R Mobile Tester is designed to meet the requirements of installation teams, maintenance teams, service centres and manufacturers of GSM-R terminals who want to perform fault analysis and diagnosis. Based on the popular 2200 Series Mobile Service Tester, it performs fast and accurate RF measurements and offers a full range of features, including voice, data and SMS testing functions for GSM-R mobile handsets and cab radios.



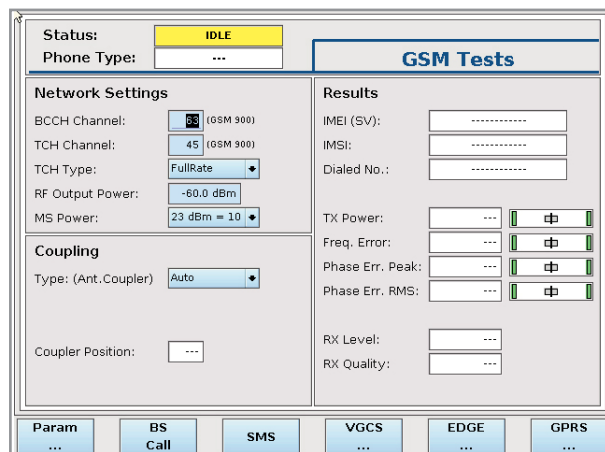
The test set enables users to validate the correct operation of GSM-R radios through an easy to use interface. It allows the setting for the group ID and the priority level, which will be used when performing a voice group call (VGCS). Depending on the priority level and the group ID this will either be a standard call or an emergency call.

The test set allows voice group calls to and from the mobile to validate bi-directional communication. For the mobile originated call, the tester decodes the group ID and priority level, while performing measurements.

The short message service (SMS) function in the 2201R takes testing further by focusing on retrieving all the necessary parameters used by the phone for transferring messages, which will help the technician to analyse faulty behaviour.

Testing Made Simple

The 2201R can be used either in manual mode, in Autotest mode or under remote control with the 7310 Lector & Scriptor product family.



In manual mode, the large high contrast colour display and the straightforward operating software simplify manual measurements. With just a few clicks on the high quality, click-type keyboard, measurements can be set up, started and switched.

Under remote control, the automated tests of the 7311 Lector Basic or 7212 Lector Enhanced can be performed with the 2201R using a Windows PC. The convenient and user friendly PC software runs user defined scripts and automatically generates easy to read test reports that are stored for later reference. The test scripts can be generated or edited using Scriptor software and are often distributed by an administrator.

Within Lector, a utility to convert existing .cfg test scripts used for the Cobham Wireless 4202R is available to generate 2201R-compatible scripts (.cfg to .rbt converter). This utility will save time and make the migration easier for users who have test scripts written in the original .cfg files used with the 2201R's predecessor.

The on-board Autotest Option enables the 2201R to run comprehensive tests without a PC. This makes a self-contained test station; it can still be connected to a PC via Ethernet to centrally store test results and distribute test scripts, limits, configuration settings and coupling factors (if applicable). The Autotest option is an alternative to the 7310 Lector-Scriptor, the choice between the two will depend on which approach fits the user's needs better. Where portability is required, the Autotest approach is recommended to reduce the amount of test equipment required in the field. Lector and Scriptor, and Autotest use the same scripts and coupling values, making maintenance very simple and avoiding doubling of effort.

Universal Interfaces

The 2201R comes with multiple USB connections to connect a mouse, a keyboard and a flash drive at the same time. The instrument easily connects as well to the Ethernet; the built-in support of the Dynamic Host Configuration Protocol (DHCP) avoids the need for manual IP address handling.

The RF connector is located at the back of the instrument and has been engineered to support GSM-R signals.

A Choice of Portability

The 2201R is used in multiple test environments some of which require a portable instrument to perform tests where mains connections are not necessarily available and battery operation is a must. The battery option can be added at the time of purchase or as an upgrade to existing units. The battery is neatly added to the back of the instrument and can be easily clipped on and off in case a replacement is needed. Batteries can be charged in the instrument and desktop chargers are also available if users want to carry additional charged batteries for extra-long work journeys.



SPECIFICATIONS

Specifications valid after 60 minutes warm-up time at ambient temperature specified environmental conditions and typical measurement range, within a period of one year after calibration.

BASIC RF DATA

Input/Output Impedance

50 Ω

VSWR

<1.4

RF Connector

N-type, female

Frequency Resolution

100 kHz step

Signal Bandwidth

6 MHz switchable 250 kHz

Narrow band

Maximum Input Level

+41 dBm Peak GSM

+36 dBm Average Power

INTERNAL TIME BASE

Reference Frequency

10 MHz

Aging

1 ppm/year

EXTERNAL TIME BASE (INPUT)

Sync Input

BNC, 50 Ω

Frequency

10 MHz

Input Level

0 to 17 dBm

FREQUENCY RANGE

GSM 900	(channels 1 to 124)
E-GSM	(channels 0, 975 to 1023)
GSM-R	(channels 955 to 974)
ER-GSM	(channels 940 to 974)
GSM 1800	(channels 512 to 885)
GSM 1900	(channels 512 to 810)
GSM 850	(channels 128 to 251)

RF OUTPUT

Output Level

-110 to -40 dBm

Resolution

0.1 dB

Absolute Accuracy

Level \geq -60 dBm \pm 1.5 dB

Level <-60 dBm \pm 2.0 dB

GSM MEASUREMENTS

POWER MEASUREMENTS

Range (In-burst meas.)

-30 to +41 dBm

Absolute Accuracy

Transmit power \geq -23 dBm \pm 1.0 dB

Transmit power <-23 dBm \pm 1.5 dB

PHASE ERROR MEASUREMENT

Accuracy (Residual Phase Error)

1.5° RMS

Range

Peak Measurement

1.0° to 45°

RMS Measurement

1.0° to 20°

FREQUENCY ERROR

Accuracy

20 Hz

Resolution

1 Hz

Range

\pm 50 kHz

SUPPORTED PROCEDURES

Registration
Mobile originated call
Mobile terminated call
Speech loopback
Call clearing by MS
Call clearing by BS
Channel and band handover

MEASUREMENTS

Output power
RMS phase error
Peak phase error
Frequency error

Power vs. time

BER, BLER measurements

Reported RSSI

DATA INTERFACES

USB Interface

USB 1.1 (full speed)

Serial Interface

RS-232 (115, 200 kbit/s)

Network Interface

Ethernet, 100 Mbit/s, TCP/IP

POWER SUPPLY

AC Voltage Range

100 to 250 V

Mains Frequency

50 to 60 Hz

Power Consumption

Non-battery version <45W

Battery version <100W

DC Connector

5.5 mm/2.5 mm, current rating >8 A

DC Voltage

11-15 V

Nominally 12 V

BATTERY POWER OPTION

Technology

11.25 V/8850 mAh Lithium-Ion Smart battery

9 cells (3S3P)

SMBus 1.1 compliant

Charger

Instrument or optional desktop charger

Nominal Capacity

99.6 W-hr

Battery Life (25°C)

Typically 2.5 hours (new battery)

Typically 2 hours (after 300 charges)

Charge Time (25°C)

Typically 4 hours

Low Battery Indication

Power LED flashes at <15% remaining capacity

Bar-graph charge level indicator included on battery pack

ENVIRONMENT

Storage Temperature

-20°C to +50°C

Store batteries below +25°C for best life

Operating Temperature

+5°C to +40°C (40°F to 105°F)

Humidity

<80%

CONFORMANCE

Safety

EB61010-1

EMC

EN61326-1

Battery Pack

UN/DOT 38.3

IEC62133

UL2054

EN60950

PHYSICAL

Size (W x H x D)

310 x 170 x 250 mm

(12.2 x 6.7 x 9.8")

Weight

5.8 kg (excluding battery)

Battery 0.5 kg

STANDARD DELIVERY

Mains power supply

AC power cord

GSM-R Test SIM card

ORDERING INFORMATION

2201R Mobile Tester 2201R
(includes GSM, GSM-R software, Auto-test function and GSM-R test USIM card)

Hardware Options

Battery Operation 46885/721
Battery Retrofit for existing 2201R units 46885/721

Software Options

2232 GPRS option AG 897 453
2233 EDGE option AG 897 454

Accessories

1101 GSM-R Test USIM Card AG 860 174
Mains Power Supply Spare 23725/657
Spare Battery 43113/024
Desktop Battery Charger 23725/529
Soft Bag AG 241 017
Trolley Carrying Case AG 300 871
Remote Control Software
Individual Licenses
7312 Lector Enhanced AG 897 310
7315 Scriptor AG 897 311
Scriptor Upgrade from 7312 to 7315 AG 897 314

2201R Extended Standard Warranties

Extended Standard Warranty 12 Months AG 270 503
Calibration Report AG 298 010
(to be ordered with new units only)

