

# 4202R Mobile Service Tester For GSM-R Applications



## Highlights

- Mobile Service 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)
- Covers GSM-R frequency range in addition to GSM 900/1800/1900
- including DC power supply and external power supply unit
- Features remote control and built-in AUTOTEST

VOICE GROUP CALL SERVICE		
BCCH channel		0060
TCH channel		0060
BS Power Level (dBm)		-80.0
Group ID		000000299
Priority level		0
MS Power Level	25dBm	09
Pre-attenuation (dB) RX		001.5
Pre-attenuation (dB) TX		001.5

MS CALL   LOC UPD   PARAMETER   BS CALL

## 4202R Ensures Railway Communications Systems

The 4202R Mobile Service Tester is dedicated to new features and frequency bands introduced by GSM-R, the railway communication system, based on GSM.

The 4202R allows 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 function in an emergency case.

The 4202R is based on the popular 4200S Series Mobile Service Tester and therefore provides all the necessary features for mid-level service activities, for example, performing board swaps, module exchanges and subsequent RF alignment. It performs fast and accurate RF measurements and offers a full range of features, including voice, data and the SMS testing functions for dual-band and triple-band mobile handsets.

The Mobile Service Tester 4202R is designed to meet the requirements of installation teams, service centers and manufacturers of GSM-R terminals who want to perform fault analysis and diagnoses.

The 4202R goes the extra mile, by offering high generator and measurement accuracy, along with one of the highest sensitivity levels in its class and a large dynamic range for I/Q alignment allowing optimal tuning of phones.

The test set 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 4202R is designed for the test and alignment of mobile phones in service centers and for final testing by manufacturers:

For the test of GSM-R cab radios during installation and maintenance.



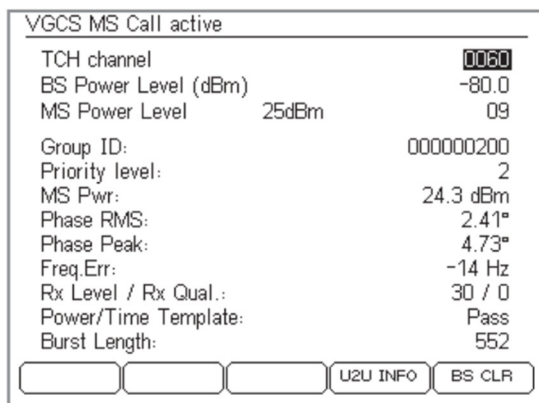
The paperless workbench is becoming a reality: The Result Upload Option offers transferring test results to virtually any location in the corporate network with a push of a button on the 4202R Series.

The built-in autotests allows the execution of automatic test routines, a pass/fail verdict at the end of the autotest tells the user whether the phone is good or bad, making it easy for even not so skilled technicians to test mobile phones.

The manual or "Fault Find" Mode distinguishes two different operating modes, the first is the synchronous mode, which allows the standard signaling, i.e. location update, call set-up procedures, in order to get a phone onto a traffic channel and perform RF testing. The other mode is asynchronous, which is dedicated to the service mode, where the phones are actually controlled by a manufacturer's service software. This mode is used to align mobile phones.

To take testing even further the 4202R offers testing of short message service. The focus here is on retrieving all the necessary parameters used by the phone for transferring messages, which will help the technician to analyze faulty behaviour.

The data mode is intended to test data modems, which do not support standard traffic channels but only data channels for RF testing.



The test set allows voice group calls from the mobile. For this call the tester decodes the group ID and priority level, while performing measurements.

## SPECIFICATIONS

### BASIC RF DATA

#### Input/Output Impedance

50 Ω

#### VSWR

<1.3

#### RF Input/output

N-type, female

#### Internal Reference Frequency

13 MHz

#### Aging

10<sup>-6</sup>/year

#### External Ref. Input BNC-type, female

5/10/13 MHz

## RF GENERATOR

### Frequency Ranges

GSM 900 (channels 1 to 124)

E-GSM (channels 0, 975 to 1023)

GSM-R (channels 955 to 974)

GSM 1800 (channels 512 to 885)

GSM 1900 (channels 512 to 810)

GSM 850 (optional) (channels 128 to 251)

### Reference Frequency Accuracy (without external reference oscillator)

<10<sup>-6</sup>

### Output Level Accuracy for Levels From -110 to +38 dBm

<0.9 dB

### Operating Temperature Range

+20°C to +30°C

### Output Level Range

GSM 850/900 -38 to -117 dBm

GSM 1800/1900 -44 to -117 dBm

### Resolution

0.1 dB

## RF ANALYZER

### Frequency Ranges

GSM 900 (channels 1 to 124)

E-GSM (channels 0,975 to 1023)

GSM-R (channels 955 to 974)

GSM-R II (channels 938 to 954)

GSM 1800 (channels 512 to 885)

GSM 1900 (channels 512 to 810)

GSM 850 (optional) (channels 128 to 251)

## FREQUENCY ERROR MEASUREMENT

### Measurement Range

±10 kHz off carrier

### Usable Range

±45 kHz

### Measurement Accuracy

GSM 850/900 <15 Hz

GSM 1800/1900 <25 Hz

## POWER LEVEL MEASUREMENT

### Measurement Range

### Burst Mode

-20 to +39 dBm

**CW Mode**

-20 to +33 dBm

**Async Burst Mode**

-40 to +39 dBm

**Measurement Accuracy**

&lt;0.9 dB

**Dynamic Range****Power/Time Template**

&gt;40 dB

**I/Q Alignment Mask**

&gt;60 dB

**PHASE ERROR MEASUREMENT****Measurement Range**

1.5° to 20° rms

**Measurement Accuracy**

GSM 850/900 &lt;0.8° rms

GSM 1800/1900 &lt;1.4° rms

**Timing Advance Accuracy**

¼ bit

**Measurements**

RX level/RX qual

MS power/sensitivity

BER/FER

Phase (RMS + peak)

Frequency error

Burst shape/length

I/Q modulation

Timing advance accuracy

Spectrum

**SIGNALING**

Location update

MS call/MS clear

BS call/BS clear

Channel change (handover)

Band handover

Broadcast message (index 0)

SMS point-to-point (MS/BS originated)

Data channel 9.6 transparent

Voice group call service (VGCS) – MS/BS originated (incl. call  
priority/emergency call)

VGCS BS clear

Asynchronous mode

**GENERAL DATA****Serial Interface**

D-Sub 9, female

4800, 9600, 19 200, 38 400 Baud

**Printer Interface**

D-Sub 25, female

**Mains Voltage Range**

100 to 250 V AC

**Mains Voltage Frequency**

50 to 60 Hz

**Power Consumption**

17 Watts

**Storage Temperature**

-30°C to +50°C

**Operating Temperature**

+15°C to +35°C

**Size**

310 x 170 x 165 mm (12.2 x 6.7 x 6.5")

**Weight**

2.4 kg (5.3 lbs.)

**ORDERING INFORMATION****Standard Delivery**

4202R mit DC-Option (refurbished)

External PSU + Cable

RS 232 Cable

ÖBB Autotest

DB-Autotest

RF Cable 1,5 m

Manual pack 4200

Data Exchange Software

4200 Result upload option