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
Optional DC power supply option (7 to 32 V) and optional battery pack (2 or 4 hours operating time)
Features remote control and built-in AUTOTEST
The Willtek 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 Testers 4202R is designed to meet the requirements of installation teams, service centres 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.

**VOICE GROUP CALL SERVICE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCCH channel</td>
<td>0050</td>
</tr>
<tr>
<td>TCH channel</td>
<td>0050</td>
</tr>
<tr>
<td>BS Power Level (dBm)</td>
<td>-60.0</td>
</tr>
<tr>
<td>Group ID</td>
<td>000000293</td>
</tr>
<tr>
<td>Priority level</td>
<td>0</td>
</tr>
<tr>
<td>MS Power Level</td>
<td>25 dBm</td>
</tr>
<tr>
<td>Pre-attenuation (dB) RX</td>
<td>00.15</td>
</tr>
<tr>
<td>Pre-attenuation (dB) TX</td>
<td>00.15</td>
</tr>
</tbody>
</table>

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

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

Basic RF data
Input/output impedance 50 Ω
VSWR < 1.3
RF input/output N-type, female
Internal reference frequency 13 MHz
Aging 10⁻⁶/year
External ref. input BNC-type, female
5/10/13 MHz

RF Generator
Frequency range
GSM 900, E-GSM, GSM-R
935 to 960 MHz (Channel 1 to 124)
925 to 935 MHz (Channel 0, 975 to 1023)
921 to 925 MHz (Channel 955 to 974)
GSM 1800
1805 to 1880 MHz (Channel 512 to 885)
GSM 1900
1930 to 1990 MHz (Channel 512 to 810)
GSM 850 (optional)
869 to 894 MHz (Channel 0, 975 to 1023)

Reference frequency accuracy
(without external reference oscillator) < 10⁻⁶
Output level accuracy
For levels –110 to +38 dBm < 0.9 dB
Operating temperature range +20°C to +30°C
Output level range
GSM 900/900 –38 to –117 dBm
GSM 850/1900 –44 to –117 dBm
Resolution 0.1 dB

RF Analyzer
Frequency range
GSM 900, E-GSM, GSM-R
890 to 915 MHz (Channel 1 to 124)
880 to 890 MHz (Channel 0, 975 to 1023)
876 to 880 MHz (Channel 955 to 974)
GSM 1800
1701 to 1785 MHz (Channel 512 to 885)
GSM 1900
1850 to 1910 MHz (Channel 512 to 810)
GSM 850 (optional)
824 to 849 MHz (Channel 128 to 251)

Reference frequency accuracy
< 10⁻⁶
Output level accuracy
For levels –110 to +38 dBm < 0.9 dB
Operating temperature range +20°C to +30°C
Output level range
GSM 900/900 –38 to –117 dBm
GSM 1800/1900 –44 to –117 dBm
Resolution 0.1 dB

Power level measurement
Measurement range
-20 to +39 dBm
CW mode
-20 to +33 dBm
Async burst mode
-40 to +39 dBm

Measurement accuracy
< 0.9 dB

Dynamic range
Power/time template > 40 dB
I/Q alignment mask > 60 dB

Phase error measurement
Measurement range 1.5° to 20° rms

GSM 850/900 < 0.8° rms
GSM 1800/1900 < 1.4° rms

Timing advance accuracy ¼ Bit

General data
Serial interface D-Sub 9, female
4800, 9600, 19 200, 38 400 Baud

Print interface D-Sub 25, female
Printer interface D-Sub 9, female

Power level measurement
Measurement range
Burst mode
-20 to +39 dBm
Async burst mode
-20 to +33 dBm

Measurement accuracy
< 0.9 dB

Dynamic range
Power/time template > 40 dB
I/Q alignment mask > 60 dB

Phase error measurement
Measurement range 1.5° to 20° rms

GSM 850/900 < 0.8° rms
GSM 1800/1900 < 1.4° rms

Timing advance accuracy ¼ Bit

Ordering Information
Standard delivery
Willtek 4202R
Manual pack 4200 M 297 005
GSM-R Test SIM card M 860 174
RF connecting cable M 860 407
Power cable M 860 603
RS-232 cable M 860 379

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