

will'tek

Willtek 4202R

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

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

4202R ensures railway communications systems work

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.

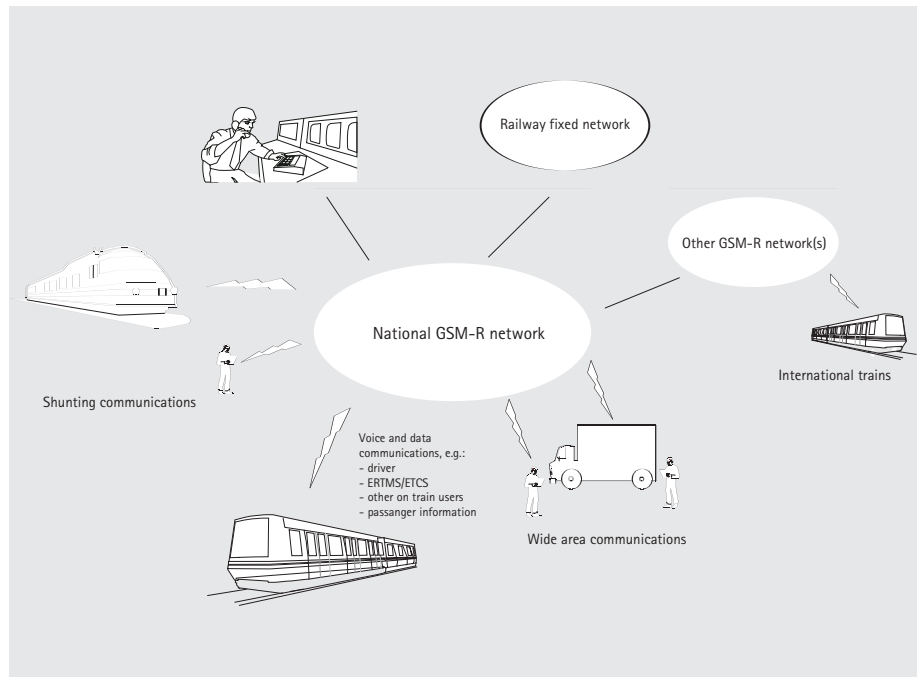
The 4202R goes the extra mile, by offering high generator and measurement accuracy, along with one of the highest sensitivity levels in its class and a large dynamic range for I/Q alignment allowing optimal tuning of phones.

VOICE GROUP CALL SERVICE

BCCH channel	0060
TCH channel	0060
BS Power Level (dBm)	-80.0
Group ID	000000299
Priority level	<input checked="" type="checkbox"/>
MS Power Level	25dBm 09
Pre-attenuation (dB) RX	001.5
Pre-attenuation (dB) TX	001.5

MS CALL LOC UPD PARAMETER BS CALL

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.



GSM-R network, making of different types of mobile phones, which can be tested with the 4202R

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.

VGCS MS Call active

TCH channel	0060
BS Power Level (dBm)	-80.0
MS Power Level	25dBm 09
Group ID:	000000200
Priority level:	2
MS Pwr:	24.3 dBm
Phase RMS:	2.41°
Phase Peak:	4.73°
Freq.Err:	-14 Hz
Rx Level / Rx Qual.:	30 / 0
Power/Time Template:	Pass
Burst Length:	552

U2U INFO BS CLR

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 ⁻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 128 to 251)
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 850/900	-38 to -117 dBm
GSM 1800/1900	-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	
1710 to 1785 MHz	(Channel 512 to 885)
GSM 1900	
1850 to 1910 MHz	(Channel 512 to 810)
GSM 850 (option)	
824 to 849 MHz	(Channel 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	< 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
Measurement accuracy	
GSM 850/900	< 0.8° rms
GSM 1800/1900	< 1.4° rms
Timing advance accuracy	1/4 Bit

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 VAC
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	310x170x165 mm
Weight	2.4 kg

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	
Signalling	
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	

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

Ordering details

Willtek 4202R	M 101 308
Willtek 4202R with DC option	M 101 309
4200 Soft Bag	M 241 014
4274 DC Power Supply Upgrade (for 4200)	M 248 410
4281 External battery kit	M 205 014
Battery	M 205 012
4272 Result Upload Option	M 897 136
4260 GSM 850 Option	M 248 418

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Note: Specifications, terms and conditions are subject to change without prior notice.

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