



Data Sheet

2303
Stabilock®
TETRA Mobile
Station Tester



Boosting wireless efficiency

Willtek 2303 Stabilock® – performance you can rely on

Users of TETRA radios in the police, fire brigades, paramedics, railways fully rely on their communication device in critical situations. TETRA radios are heavily used and exposed to an aggressive environment such as heat, vibration, shock or liquids. The lifetime and the performance of TETRA mobiles may heavily be affected by this usage, as frequency stability and receiver sensitivity are degrading. These effects result in failing radio connections.

In order to help these organisations provide maximum safety and reliability to their users, Willtek designed the 2303 Stabilock®. It is the first TETRA mobile station tester which was specifically made for testing TETRA radios in the service environment.

Complete measurement functionality to provide the full picture

In order to be able to test as close as possible to real life operation, the Willtek 2303 Stabilock TETRA Mobile Station Tester supports the testing of all major communication modes in modern TETRA networks: Trunked Mode (TMO), Direct Mode (DMO, optional), SDS and LIP. Depending on the type of MS under test, the receiver sensitivity can be measured precisely by either single ended or loopback BER in the TETRA Test (TT) mode. Paging sensitivity provides an easy workaround if an MS cannot be put into test mode.

All TETRA call types and call setup types are supported for detailed tests similar to the real application. The instrument is capable of sending and receiving SDS in different formats: User-defined, Status SDS (TETRA MoU) and Location Information Protocol (LIP) messages.

The Generator-Analyzer mode of the 2303 forms a useful tool for aligning mobile radios in production or service. Users can select between eight different TETRA test signals on the downlink while the 2303 analyses the incoming continuous TETRA carrier.



Necessary TETRA measurements defined in ETSI standard EN 300 394 include:

Transmitter measurements

- RF power
- Carrier frequency offset
- Burst power profile over time
- Timing error
- Residual carrier power
- Unwanted output power
- Error vector magnitude (RMS, Peak)
- Modulation spectrum
- Constellation diagram

Receiver measurements

- Single ended BER (bit error rate)
- Loopback BER
- Paging sensitivity

Highlights

- Supports TETRA radio tests relevant for service
- Intuitive and failsafe user interface
- Made for the PMR service environment
- Bright screen and robust case
- Portable, lightweight and compact
- Optional battery operation
- Proven Stabilock® quality and precision with a 40-year tradition

Future-proof interfaces

The 2303 Stabilock has a full set of interfaces which can be used to connect it with a PC and other equipment: USB flash memory can be connected through the USB connectors; remote control and firmware updates from a PC are enabled over the LAN through a TCP/IP connection; and a standard RS-232 port enables communication with other instruments. Files with test results, MS type information and screenshots can easily be stored on an internal or external drive.

For maximum frequency accuracy, the 2303 can either be connected to an external reference frequency standard or equipped with the 2360 OCXO Option. A frame sync output allows triggering of other instruments precisely on the active time slot for further analysis or for synchronisation of two testers.

With its wide AC power supply range, the 2303 Stabilock is a universally deployable tester. Users gain additional flexibility with the DC voltage input as it allows them to connect the 2303 to a car battery. With the optional battery, the Stabilock can be operated in the field, making it possible to take measurements any time, anywhere.



Options

Expand testing capabilities to TETRA Direct Mode Operation

With the **2330 DMO Option** installed, the 2303 Stabilock also understands and analyses the TETRA DMO protocol for direct communication between two TETRA radios. This enables the user to test the single-frequency operation and approve correct MS performance for this mode.

Efficient and time-saving checks through automated tests

Willtek offers a set of automatic test capabilities for the 2303 Stabilock. The **2331 Autotest Option** allows to run typical test sequences automatically on the instrument. So you can run tests with the mere push of a button!

Test sequences can easily be defined in just a few steps directly on the user interface of the instrument. For Auto-test operation, no extra hardware is required, as tests are running on the 2303 and the test results are either stored on the internal or an external flash memory. The Autotest result file contains all the information required to trace the quality of a specific TETRA radio. This file can be archived and printed straight away.

Increasing frequency accuracy

TETRA radios are usually running a reliable AFC (Automatic Frequency Correction) to match frequency offset to the base station. For tests on mobile stations which do not have this feature, Willtek offers the **2360 OCXO Option** to make the reference frequency of the 2303 Stabilock even more accurate.

Lightweight and mains power-independent

No need to spend time dismounting radios installed into vehicles: Take the tester on the road with the **2361 Battery Option**! Using the high-capacity Li-Ion type battery, the 2303 Stabilock becomes independent from other power sources for about two hours. And with accessories like the desk charger and extra batteries, engineers are always prepared for a quick emergency mission.

Specifications

Specifications valid after 30 minutes warm-up time at ambient temperature, specified environmental conditions and typical measurement range, within a period of one year after calibration.

The published accuracies are determined in accordance with GUM (Guide to the Expression of Uncertainty in Measurement) and EA (European Co-operation for Accreditation) application document EA4/02: "Expressions of the Uncertainty of Measurements in Calibration".

Basic RF data

Frequency range	350 to 470 MHz 800 to 960 MHz
Duplex spacing	0 MHz (DMO), 10 MHz, 45 MHz
Input connector	N-type, female
Input impedance	50 ohms
Input VSWR	< 1.5
Reference frequency uncertainty	< 1×10^{-6}
Reference frequency aging	< 1×10^{-6} /year

External reference frequency

Input	BNC, female
Level	0 dBm
Frequencies	5/10/13 MHz $\pm 10^{-5}$

2360 OCXO Option

Reference frequency uncertainty	< 1×10^{-7}
Reference frequency aging	< 1×10^{-7} /year

TETRA signal generator

RF output level range	-120 to -40 dBm
RF output level resolution	0.1 dB
RF output level accuracy	
-40 to -100 dBm	± 0.8 dB, typ. ± 0.5 dB
-100 to -120 dBm	± 1.3 dB, typ. ± 1 dB
Maximum vector error (RMS)	3%
Maximum vector error (peak)	10%
Maximum residual carrier power	1%
2 nd harmonic suppression	40 dBc

TETRA analyser

RF input level range	-20 to +40 dBm
Max. RF input level	+43 dBm
RF power measurement uncertainty	± 0.8 dB
EVM measurement uncertainty	typ. 1.5%
(at test signal with 10.7 % EVM)	

Ordering information

General data

Power supply	
AC	100 to 240 V
DC	11 to 15 V
Power consumption	< 50 W
Operating temperature range	+5 to +45°C
Dimensions	
Width	37.7 cm (14.8") (28.7 cm without handles)
Height	16.1 cm (6.3")
Depth	25.9 cm (10.2") (20.5 cm without handles)
Weight	3.5 kg (7.7 lb)
Screen	6.5" TFT

Battery Option

Nominal battery voltage	7.4 V
Nominal battery capacity	7.2 Ah
Operational time in idle mode with fully charged battery	> 2h

2303 Stabilock	M 100 203
TETRA Mobile Station Tester	

Hardware Options

2360 OCXO Option	M 248 715
2361 Battery Option	M 205 015

Software Options

2330 DMO Option	M 897 400
2331 Autotest Option	M 897 401

Accessories

Battery Module, 7.2 Ah	M 205 012
12 V Car Adapter	M 860 389
Power Supply	M 248 328
1500 Battery Charger	M 204 097
External Charger Bundle (Battery Module, Power Supply, 1500 Battery Charger)	M 248 972
Trolley Carrying Case	M 300 871

Visit www.willtek.com/tetra for more information on Willtek's TETRA products!



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