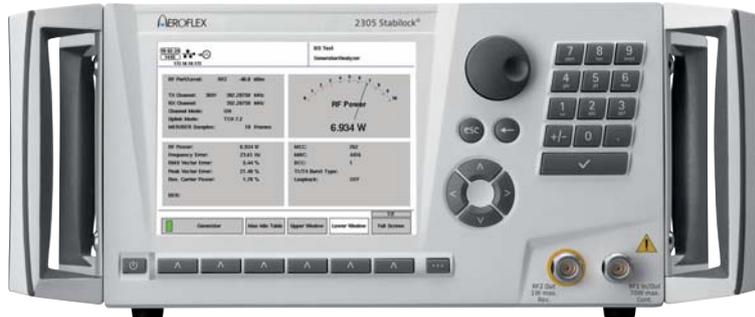


2305 Stabilock®

TETRA Test Set

AEROFLEX
A passion for performance.



Users of TETRA radios in the police, fire brigades, paramedics and railways fully rely on their communication devices 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.

Also, the vitally important communication link can only be guaranteed with properly working base stations. The transmitter should transmit at the specified power level and with unimpaired modulation quality. Similarly, the receiver should be able to adapt to the receive level over a high range. However, variations of temperature and humidity affect the quality of the base station over time.

In order to help these organizations provide maximum safety and reliability to their users, Aeroflex designed the 2300 Stabilock® Series, the first radio test sets specifically designed for TETRA. These testers help to prove the sustained quality of the network components or detect flaws at an early stage before the communication service is heavily affected.

Highlights

- Supports TETRA mobile station and base station 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

A Handy Tester – Tailor-Made for TETRA Field Service

The 2305 Stabilock delivers precise results the fast way. It is based upon a TETRA-dedicated hardware with software options for different applications: The 2332 Base Station Test Option and the 2333 Mobile Station Test Option. No matter in which application or frequency band the test set is used: After setting up network parameters and frequency range, the tester is ready for operation.

The large, high contrast color display is split into four sections for clear reading of test results in numeric or graphic format. All settings and commands are accessible via six softkeys or with one-hand operation using the turn-and-push dial. Reducing TETRA complexity to what is really needed in service – with this operational concept, users can operate the instrument easily by just pressing a few keys on the Stabilock's high-quality click-type keyboard.

Other than the 2303 Stabilock, the 2305 has two RF ports for duplex measurements on separate receiver and transmitter modules, which are common in TETRA base stations. The second RF connector is configured as RF out port and provides enough RF level to perform RX blocking tests while the main "RF1 in/out" port accepts high levels from the base station's power amplifier.

Complete Mobile Station Measurement Functionality to Provide the Full Picture

In order to be able to test as close as possible to real life operation, the Aeroflex 2305 Stabilock TETRA Test Set 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 TETRA Test (TT) mode. Paging sensitivity provides an easy work around if a MS cannot be put into test mode.

For the very latest specifications visit www.aeroflex.com

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 2305 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 2305 analyzes the incoming continuous TETRA carrier.



The Precise Match for All Base Station Measurement Needs

If the mobile stations are critical to high service quality, so are the base stations. For state of the art network operation, regular maintenance of base stations will be necessary. Due to its compact size and weight and the possibility to operate the instrument independently of mains power, the 2305 perfectly matches the requirements of BS field engineers.

The 2305 is fully featured with all test signals and channel modes, which are based on the TETRA standard test instructions. The instrument has been tested and approved by leading TETRA base station manufacturers.

Necessary TETRA measurements defined in ETSI standard EN 300 394:

Transmitter Measurements

- RF power
- Carrier frequency offset
- Burst power profile over time (for mobile stations)
- Timing error (for mobile stations)
- Residual carrier power
- Unwanted output power

- Error vector magnitude (RMS, Peak)
- Modulation spectrum
- Constellation diagram

Receiver Measurements

- Single ended and loopback Bit Error Rate (BER) and Message Erasure Rate (MER)
- Test signals: T1 with TCH7.2, TCH2.4, SCH/F, with and without Frame 18
- Paging sensitivity (for mobile stations)

Future-Proof Interfaces

The 2305 Stabilock has a full set of interfaces, connecting it with a PC and other equipment: USB flash memory can be attached through the USB connectors; remote control and firmware updates from a PC are enabled over the LAN via TCP/IP and a standard RS-232 port enables communication with other instruments or base station control in pre-defined test scenarios. Files with test results, MS type information and screenshots can easily be stored on an internal or external drive.

For maximum frequency accuracy, the 2305 can either be connected to an external reference frequency or equipped with the 2360 OCXO Option. A bidirectional frame sync connector allows precise triggering on the active time slot and can be used for synchronization either of other instruments for further analysis, of two testers or of the test set with a BS for RX measurements without transmitters being active.

With its wide AC supply voltage range, the 2305 Stabilock is a universally deployable tester. Users gain additional flexibility with the DC voltage input as it allows them to connect the 2305 to a car battery. With the optional battery, the Stabilock can be operated in the field, enabling measurements anytime, anywhere.

Options

Expand Testing Capabilities to TETRA Direct Mode Operation

With the 2330 DMO Option installed, the 2305 Stabilock also understands and analyzes the TETRA DMO protocol for direct communication between two TETRA radios. This enables the user to test this mode of operation and approve correct MS performance for this mode. As the TETRA Direct Mode is only specified for communication between mobile stations, the 2330 DMO option is only available in conjunction with the 2333 Mobile Station Test option.

Efficient and Time-Saving Checks Through Automated Tests

Aeroflex offers a set of automatic test capabilities for the 2305 Stabilock. The 2331 Autotest option allows typical mobile station test sequences to run on the instrument automatically. So you can run tests with the push of a button. Test sequences can easily be defined in just a few steps directly on the front panel. For Autotest operation, no extra hardware is required, as tests are running on the 2305; test results are either stored in 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.

Looking for more flexibility in mobile station test automation? Aeroflex's Lector and Scriptor family of remote control applications provides you with the right tools. Lector enables you to generate and run complex test programs on a PC, controlling the tester remotely and taking care of all testing documentation automatically. For more information on Lector and Scriptor, please ask your Aeroflex sales representative or visit Aeroflex's website for the separate data sheet.

Increasing Frequency Accuracy

TETRA mobiles are running a reliable AFC (Automatic Frequency Correction) to match frequency offset to the base station. For all tests requiring highest frequency accuracy, Aeroflex offers the 2360 OCXO option to further improve accuracy of the Stabilock's reference frequency. Aeroflex recommends this option for all test sets which are used for base station testing.

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 2305 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

Freely definable (supporting all the values specified in ETSI TS 100 392-15 [version 1.3.1] Chapter 6)

Input Connector

N-type, female

Input Impedance

50 ohms

VSWR, RF1 In/Out port

<1.5

VSWR, RF2 Out port

<1.5

Reference Frequency Uncertainty

$<1 \times 10^{-6}$

Reference Frequency Aging

$<1 \times 10^{-6}/\text{year}$

2360 OCXO OPTION

Reference Frequency Uncertainty

$<1 \times 10^{-7}$

Reference Frequency Aging

$<1 \times 10^{-7}/\text{year}$

External Reference Frequency

Input

BNC, female

Level

0 dBm

Frequencies

5/10/13 MHz $\pm 10^{-5}$

TETRA SIGNAL GENERATOR

RF Output Level Range, RF1 Out port

-122 dBm to 0 dBm

RF Output Level Range, RF2 In/Out Port

-122 dBm to -40 dBm

RF Output Level Resolution

0.1 dB

RF Output Level Accuracy

0 to -100 dBm ± 1.0 dB

-100 to -120 dBm ± 1.3 dB

Maximum Vector Error (RMS)

3%

Maximum Vector Error (peak)

10%

Maximum Residual Carrier power

1%

TETRA ANALYZER

RF Input Level Measurement Range

-40 dBm to +50 dBm

Max. Continuous RF Input Level Below 30°C RF1 In/Out Port

70 W

Derating Above 25°C (See figure below)

1.5 W/°C

Max. RF Input Level

RF1 In/Out Port

+50 dBm

RF2 Out Port

+30 dBm

On-off Duty Factor

1:5

Maximum On-Cycle Time

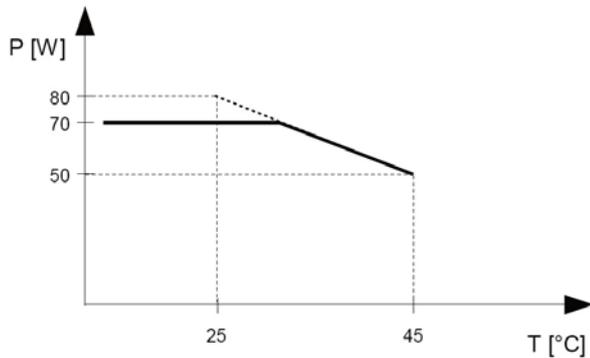
1 min

RF Power Measurement Uncertainty

±1.0 dB

EVM Measurement Uncertainty (at test signal with 10.7 % EVM)

Typ. 1.5%



Maximum allowable continuous input power as a function of temperature

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 and heat sink)

Weight

3.8 kg (7.7 lbs.)

Screen

6.5" TFT

BATTERY OPTION**Nominal Battery Voltage**

7.4 V

Nominal Battery Capacity

9 Ah

Operational Time in Idle Mode with Fully Charged Battery

>2 h

ORDERING INFORMATION

2305 Stabilock TETRA Test Set M 100 205

Signalling Options (select one or both)

2332 TETRA Base Station Test Option M 897 403

2333 TETRA Mobile Station Test Option M 897 405

Hardware Options

2360 OCXO Option M 248 715

2361 Battery Option M 205 015

Software Options

2330 DMO Option (for MS test only) M 897 400

2331 Autotest Option (for MS test only) M 897 401

Accessories

Battery Module, 9 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

Soft Carrying Bag M 241 017

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Our passion for performance is defined by three attributes represented by the icons pictured above: solution-minded, performance-driven and customer-focused.

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