will'tek

Willtek
4100

Mobile Phone Tester

getting started manual
version 1

Ordering information   This guide is issued as part of the **4100 Series**. The ordering number for a published guide is M 295 012. The ordering number for the product depends on the exact model as follows:

Table 1   Models of the 4100 Series

Product name	Ording number
Willtek 4107 Mobile Fault Finder	M 101 207
Willtek 4107S Mobile Service Tester	M 101 217
Willtek 4107L Mobile Fault Finder	M 101 218

EMC Directive Compliance This product was tested and conforms to the EMC Directive, 89/336/EEC as amended by 92/31/EEC and 93/68/EEC for electromagnetic compatibility. A copy of the Declaration of Conformity is provided with this manual.

Low Voltage Directive Compliance This product was tested and conforms to the Low Voltage Directive, 73/23/EEC as amended by 93/68/EEC. Conformity with this directive is based upon compliance with the harmonized safety standard, EN60950. A copy of the Declaration of Conformity is provided with this manual.

Table of Contents

Appendix A   **Warranty and Repair**   **31**

Publication History   **37**

Table of Contents

About This Guide

This section contains the following basic information:

Purpose and scope

The purpose of this guide is to help you successfully use the 4100 features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the 4100. Additionally, this guide provides a description of Willtek's warranty and repair information.

This manual shall help you getting started. It provides an overview of the functions of the instrument, independent of the firmware version installed in your 4100. For more detailed information, please refer to the user guide (see below).

Assumptions

This guide is intended for novice users who want to use the 4100 effectively and efficiently. We are assuming that you are familiar with basic telecommunication concepts and terminology.

Related information

Use this guide in conjunction with the following information:

Willtek 4100 Series Mobile Phone Tester, User Guide, ordering number M 290 012.

Technical assistance

If you need assistance or have questions related to the use of this product, call or e-mail one of Willtek's technical assistance centers.

Table 1 Technical assistance centers

Region	Phone Number	Fax number, e-mail address
UK	+44 (0)20 8408 5720	+44 (0)20 8397 6286 support.uk@willtek.com
Europe, Middle East, Asia, Africa	+49 (0)89 99641 386 +49 (0)89 99641 227	+49 (0)89 99641 440 support.eu@willtek.com
Americas	+1 317 595 2021 +1 866 WILLTEK	+1 317 595 2023 support.us@willtek.com

Conventions

This guide uses naming conventions and symbols, as described in the following tables.

Table 2   Typographical conventions

Description	Example
User interface actions appear in this **typeface**.	On the Status bar, click **Start**.
Buttons or switches that you press on a unit appear in this **TYPEFACE**.	Press the **ON** switch.
Code and output messages appear in this `typeface`.	`All results okay`
Text you must type exactly as shown appears in this **`typeface`**.	Type: **`a:\set.exe`** in the dialog box.
Variables appear in this **\<typeface\>**.	Type the new **\<hostname\>**.
Book references appear in this **typeface**.	Refer to **Newton's Telecom Dictionary**
A vertical bar | means "or": only one option can appear in a single command.	`platform [a|b|e]`
Square brackets [ ] indicate an optional argument.	`login [platform name]`
Slanted brackets < > group required arguments.	`<password>`

Table 3   Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press **Ctrl+s**
A comma indicates consecutive keystrokes.	Press **Alt+f,s**
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click **Start > Program Files**.

Table 4   Symbol conventions

	This symbol represents a general hazard.
	This symbol represents a risk of electrical shock.
	NOTE This symbol represents a Note indicating related information or tip.

Table 5   Safety definitions

	WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Safety Issues

This chapter provides the safety notes for the 4100. Topics discussed in this chapter include the following:

Safety notes

⚠️ WARNING

Do not attempt to operate a Willtek 4100 if there is obvious damage to the device, the power supply unit or the accessories. Retain the packaging and contact the office who supplied the equipment.

AC power	Permissible line voltage: 100 V through 240 V (AC voltage; 47 Hz through 63 Hz). The power supply unit automatically adapts to the line voltage.
Use for intended purpose only	Use your Willtek 4100 only for its intended purpose for function testing and repairs on the radio telephones of a GSM mobile radio system.
Ambient conditions	Store and operate your Willtek 4100 only in a dry and dust-free environment. Operate your Willtek 4100 only in the permissible temperature range of 15 °C through 35 °C. Observe the permissible storage temperatures.
Breakable display	Do not press down on the display.
Air circulation	Keep the air vents free of obstruction.
Electromagnetic compatibility	The device emits RF radiation. For this reason, do not operate it in EMC-sensitive environments if this might result in danger (e.g. when traveling in automobiles or during flights). The EMC and Safety directives to which the device conforms are listed in the Declaration of EU Conformity (see page xvi).

Do not open	Do not make technical modifications to the device or its accessories. Do not open the device. There are no parts inside it which require maintenance or disposal.
	Do not open the device, otherwise you will lose your claim to warranty.
Original accessories only	Use original accessories only.
No solvents	Do not use agents which contain solvents to clean the equipment casing.
Handling	Avoid the following during operation and storage:

– strong direct sunlight
– vibrations, heavy impacts
– ingress of liquids or small objects into the device
– bending of the RF adapter cable
– contamination of the electrical contacts

Declaration of EU conformity

Manufacturer	Willtek Communications GmbH Gutenbergstr. 2 – 4 85737 Ismaning, Germany
Product designation	Series ACTERNA 4100 (Willtek 4100)
	The designated products conform to the following European directives:
Low voltage directive	**73/23/EEC** has been superseded by the directive **93/68/EEC**
EMC directive	**89/336/EEC**
	The conformity of these products to the above directives is demonstrated by application of the following standards:

EMC		
	EN 55022, Class B	1995
	EN 60801, Part 2, test level 4	1994
	ENV 50140, test level 3	1995
	ENV 50141, test level 3	1993
	ENV 50204, test level 3	1996
	IEC 1000–4–4, test level 3	1995

Safety	**EN 61010, Part 1**	1993

Ismaning,
January 16, 1997

Rudi Glotz, Quality Assurance Manager

This declaration is not a guarantee of features. Pay attention to the safety instructions in the product documentation.

4100 Overview

1

This chapter provides a general description of the 4100. Topics discussed in this chapter include the following:

About the 4100

Thank you for choosing a model in the Willtek 4100 series. The equipment will give you valuable assistance in functional testing and troubleshooting on GSM mobile phones.

Table 6   Supported frequency bands and network types

Model	Frequency band	Network
Willtek 4107 Willtek 4107S Willtek 4107L	0.9/1.8/1.9 GHz	GSM 900/1800/1900 single band
		GSM 900+1800 dual band
		GSM 900+1900 dual band
		GSM 900+1800+1900 multiband

NOTE

In the context of the 4100, the frequency band GSM 900 includes E-GSM and R-GSM.

– Enables accurate and rapid fault identification

– Separates faulty and no-fault-found (NFF) mobile phones to maximize revenues

– Provides improved specifications: RF power level accuracy better than 1 dB (4107S)

– Designed for different user types – the 4107 for shops and the 4107S for service centers

– Assures intuitive operation and AUTOTEST features to minimize training requirements

– Delivers remote operation and management via a standard PC

Features and capabilities

The Willtek 4100 Series quickly tests mobile handsets received by point of sale, service and repair depots. It provides two standard operating modes: AUTOTEST for fast PASS or FAIL results and FAULT FIND for troubleshooting mobiles. In AUTOTEST mode, the 4100 Series enables users to store pre-attenuation values for up to 50 different manufacturers´ mobile phones. This makes automated testing of a wide range of handsets straight forward without sacrificing test accuracy. The AUTOTEST mode also provides a comprehensive reporting capability that compares the mobile's performance against expected operating parameters.

In the second mode, FAULT FIND, the technician can simulate live network situations, such as a call from the mobile station, call from the base station or a handover. This provides troubleshooting features in a low-risk, simulated network, which accurately reflects the actual operating environment in which the handset is used.

The Willtek 4100 Series tester supports GSM 900/1800/1900, dual-band and triple-band key measurements:

– RX level

– RX qual

– Asynchronous mode (4107S)

– MS power

– BER/FER

– MS sensitivity

– Phase error

– Frequency error

– Burst shape

– Burst length

– Burst edge failure indicator (4107S)

Options

The following options, accessories and upgrades are available for the 4100 Series:

Table 7   Options, accessories and upgrade possibilities

Product designation	Ordering code
4190 Utility Software for 4100/4200	M 897 110
4192 GSM Phone Checker Software	M 897 132
4910 Universal Antenna Coupler	M 248 330
4924 RF Shield II	M 248 340
4926 RF Shield package (248 330 + 248 340)	M 248 399
Antenna, 900 MHz	M 860 261
Antenna, 1.8/1.9 GHz	M 860 262
Centronics adapter cable (2.5 m)	M 384 876
Serial adapter cable (D–sub 9; 2.5 m)	M 384 875
Universal adapter cable (RS–232, Centronics)	M 384 877
DC/DC Converter	M 860 078
Power Supply (standard accessory)	M 860 090
Willtek 1100 Test SIM (standard accessory)	M 860 188
Soft sholder bag	M 860 251
Carrying case	M 860 252
System Upgrade 4103/4/5 to 4107	M 897 121
System Upgrade 410x to 410xS	M 897 122
System Upgrade 4106 to 4107	M 897 123

Physical description
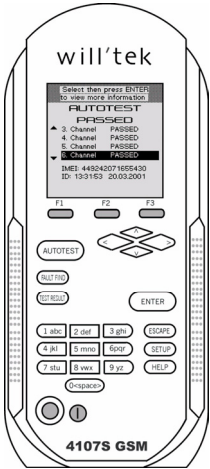
The main elements of the 4100 are the front panel with an LCD screen and keys, the power supply connector and the digital inter-face connector at the bottom and the RF connector at the top.

Front panel   The front panel is explained in more detail in section "Using the front panel" on page 12.

Power supply connector
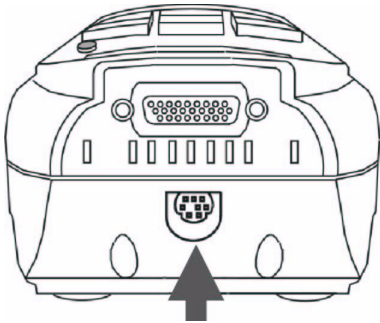
See section "Attaching the power supply unit" on page 14 for details on how the power supply is attached to the 4100.

RF connector
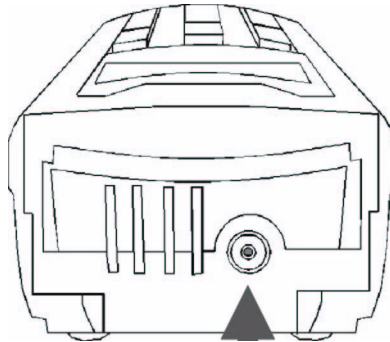
The mobile to be tested is connected either via an antenna, the Willtek Universal Antenna Coupler or a cable. Any of these devices must be connected to the TNC connector at the top of the 4100.

Digital interfaces
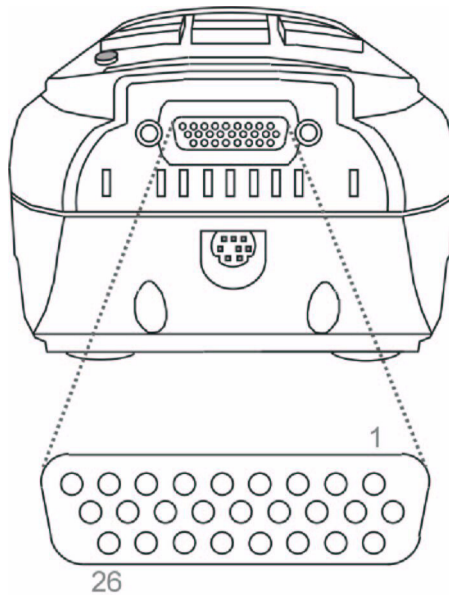
The 4100 includes an HD sub-26 socket to connect to a printer or a PC. An adapter for parallel and serial interface cables is available as an accessory. See the user guide for a description of different applications.

Specifications

Table 8   RF Generator

Parameter	Specification
Frequency spectrum	921 to 960 MHz (GSM 900, E-GSM, GSM-R) 1805 to 1880 MHz (GSM 1800) 1930 to 1990 MHz (GSM 1900)
Generator output level	
– 4107 model	GSM 900: –45 to –110 dBm (< 1.5 dB) GSM 1800/1900: –50 to –110 dBm (< 1.5 dBm)
– 4107S model	GSM 900: –45 to –110 dBm (< 1.0 dB) GSM 1800/1900: –50 to –110 dBm (< 1.0 dBm)
Generator frequency error	1 ppm

Table 9   TX measurements

Parameter	Specification
Frequency spectrum	876 to 915 MHz (GSM 900, E-GSM, GSM-R) 1710 to 1785 MHz (GSM 1800) 1850 to 1910 MHz (GSM 1900)
Frequency error measurement[1]	within 5 kHz offset from carrier GSM 900: < 25 Hz GSM 1800: < 50 Hz
RF power measurement (burst)	+39 to –20 dBm (< 1.5 dB) usable up to +45 dBm
Phase error measurement[1]	within measurement range 1.5 to 20° rms GSM 900: < 1.5° rms GSM 1800/1900: < 2.5° rms < 2.0° rms for 4107S model

[1] Average of ten measurements

4100 Series   version 1   **7**

Table 10 General data

Parameter	Specification
Size	250 mm x 110 mm x 95 mm
Weight	1.5 kg
Permitted storage temperature	−30 °C to +50 °C
Working temperature	+15 °C to +35 °C

Installation

2

This chapter explains what to keep in mind when unpacking the instrument.

Unpacking the instrument

– Do not throw the packaging of your Willtek 4100 away. It will make shipment easier if you want to have your model upgraded later.

– Check that the unit is undamaged.

– Check that the delivery is complete:

Table 11 Standard items supplied with the 4100

Ordering number	Quantity	Product designation
M 101 2XX	1	Willtek 410X
M 860 188	1	Test SIM, plug-in format
	1	CD with user guide
M 295 012	1	This getting started manual
M 860 090	1	Power supply unit with power cord and connecting cable
M 860 409	1	RF adapter cable

⚠️ WARNING

Do not attempt to operate a Willtek 4100 if there is obvious damage to the device, the power cord or the accessories. Retain the packaging and contact the office who supplied the equipment.

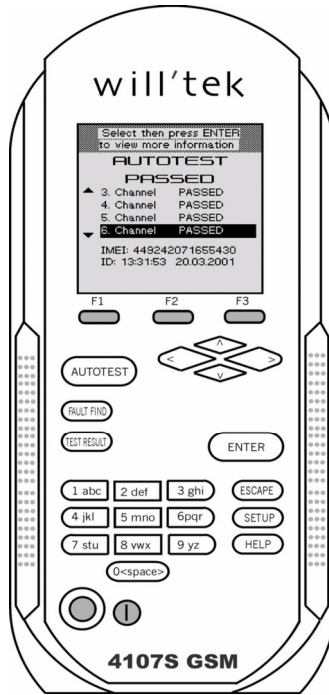# Operation

3

This chapter describes the functionality of the instrument. Topics discussed in this chapter are as follows:

Using the front panel

Keypad

Cursor keys

The cursor keys have two functions:

– selecting menu items

– when entering numbers/letters: moving to the required location

Other keys **AUTOTEST**

Switches to AUTOTEST mode (quick test of mobile phones)

FAULT FIND

Switches to FAULT FIND mode (troubleshooting)

TEST RESULTS

Displays a list of AUTOTEST logs you have stored (e.g. if you want to print a certain log)

ENTER

The Enter key has three functions:

– confirming input

– opening a submenu

– launching a program

1 ABC … 9 YZ

The number-and-letter keys have the following functions:

– entering the numbers 1 through 9 (e.g. phone numbers)

– entering the letters A through Z (e.g. comments)

0 SPACE

Enters the digit 0 or a space

ESCAPE

The ESCAPE key has two functions:

– returning to the next menu up

– aborting the current test

SETUP

Calls the setup menu (for basic parameter settings such as language and contrast)

HELP

Calls up brief explanations of the currently visible menu

⊚①
On/off button

Softkeys F1, **F2**, **F3**

The current function of a key is assigned by the currently visible menu. If no such assignment has been made, the softkey is irrelevant.

Attaching the power supply unit

All you need to do to start up your Willtek 4100 the first time round is connect it to the power via the accompanying power supply unit.
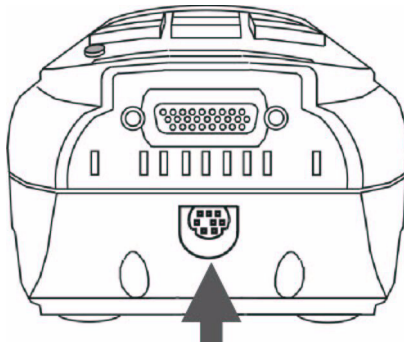
1   Plug the 8-pin connector coming from the power supply unit
into the matching socket on your Willtek 4100.

WARNING

When plugging the connector into the socket, be sure to
observe the mechanical coding on the socket and the connector.
If these do not match, the connector will not fit into the socket.
Do not use force! Use only the original power supply unit.

2   Connect the power supply unit to the wall power outlet.

3   Press the on/off button to switch your Willtek 4100 on.

Powering the unit

1   Ensure that the power supply unit is connected to the mains
outlet in the wall and to the 4100 (see above).

2   Push the ⊙ ① button.

Immediately after being switched on, the Willtek 4100 briefly
displays an initialization menu (in this period among other things
the operability of the device is checked).

The tester is fitted with a maintenance-free fan in order to keep
the semiconductor components cool. The level of noise produced
by the fan is normal.

Once you see the start menu (picture above), the device is ready for use.

The first time you start up the device, you should at this point press the **SETUP** key to adapt the basic configuration of your Willtek 4100 to match your specific requirements (see user guide).

Configuring basic settings

As a rule, the basic settings need only be configured once during initial startup. A powerful capacitor ensures that the settings and the stored test result are preserved when your Willtek 4100 is off.

NOTE

The tester should be on for about 4 hours at least every 14 days (for capacitor charging) to ensure that no data is lost.

Connecting test leads

A Willtek 4100 supports three methods of attaching a mobile phone for testing:

– wireless connection via antenna (extra accessory).

– connection via the Universal Antenna Coupler (extra accessory).

– Cable-based connection via RF adapter cable and an RF adapter which matches the phone (extra accessory).

Connection via antenna

max. approx. 50 cm

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Select then press ENTER
to view more information
AUTOTEST
PASSED
3. Channel   PASSED
4. Channel   PASSED
5. Channel   PASSED
6. Channel   PASSED
IMEI: 449242071655430
ID: 13:31:53 20.03.2001

F1   F2   F3

AUTOTEST

FAULT FIND

TEST RESULT   ENTER

1 abc 2 def 3 ghi   ESCAPE
4 jkl 5 mno 6 pqr   SETUP
7 stu 8 vwx 9 yz   HELP
0 <space>

4107S GSM

Points in favor Very quick to set up.

Any GSM mobile phone can be tested.

The entire RF signal path of the phone is tested (antenna included).

No RF adapter required.

Points to note Some tests call for clearly defined conditions (accurately known RF input level at the radio's antenna input). With a wireless connection, these particular test values cannot be correctly measured.

In order to keep RF signal attenuation in the space between the devices to within reasonable bounds, the distance between the tester and the mobile phone must not exceed 50 cm.

Make sure that no conductive objects are lying between the tester and the mobile phone (screening effect). The two devices must not be placed on a conductive surface.

Nearby base stations of a GSM mobile radio network may cause the test results to be distorted.

The radio is likely to get registered into a public mobile radio network (unintentionally). Additional measures must be taken at the start of a test run to ensure that this does not happen.

Connection
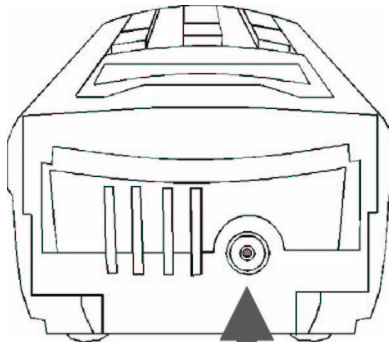
Select the correct antenna for the mobile radio system (extra accessory, see table on page 4) which matches the mobile phone frequency range and secure it to the TNC connection of your Willtek 4100 by tightening the coupling ring.

NOTE

Do not use the wrong antenna, as this will falsify the results of the test. The antenna for GSM 900/E-GSM mobile phones has an overall length of around 165 mm (6.5") and has two yellow rings at the end. The antenna for GSM 1800/1900 mobile phones is around 229 mm (9") in length and has no rings at all.

Connection via the Universal Antenna Coupler

The important feature with the Universal Antenna Coupler is that mobile phones of the same type are always placed in exactly the same position in the clamp.

Points in favor The Universal Antenna Coupler is suitable for all radio systems (GSM, PCN, PCS). It combines most of the benefits of wireless connection via antenna with those of cable-based connection. The more precisely defined test conditions mean that measurements and tests which were too inaccurate with the simple antenna connection method are more reliable.

Points to note The Universal Antenna Coupler can also react to changes in the environmental conditions (such as the proximity of a hand). Precision measurements can therefore still only be performed with a cable-based connection. RF interference from nearby base stations can also create problems.

Connection Connect the Universal Antenna Coupler to the Willtek 4100 with the RF adapter cable supplied.

Release the jaws of the clamp by pressing the small button and insert the mobile phone in such a way that its display points to the Willtek logo and the housing touches the bottom restraint. Press the jaws of the clamp together firmly.

NOTE

Make sure that mobile phones of one type are always mounted in exactly the same position. Only in this way can constant test conditions and appropriate test results be guaranteed. If you select an automatic start for an AUTOTEST, you must observe any special instructions for the test which may appear (e.g. fully extend the antenna or check size of battery pack).

Cable-based connection

The cable-based connection of the test unit is the ideal choice for precision measurements.

Points in favor RF adapter with cable coupling guarantees a set of defined testing conditions. That means that all tests produce results which can be correctly evaluated against specifications.

As all the tests are suitable for evaluation, the PASS/FAIL evaluation is more broadly based than with wireless connection.

It is not possible for the test unit to (unintentionally) register in a public mobile radio network.

There is no chance of interference from nearby GSM base stations.

Points to note Test preparation takes longer.

Only mobile phones which have an RF connection socket can be tested with this method.

Defects in the mobile phone's antenna circuit are not detected.

Connection Select the RF adapter (extra accessory) which matches the mobile phone. First securely attach the RF adapter cable (1.5 m) to the TNC connection on the Willtek 4100 and to the RF adapter.

Then attach the mobile phone to the RF adapter. Use original equipment only (otherwise you may risk false readings).

CAUTION

When attaching the RF adapter, take great care with the alignment of the contacts. Do not use force. If an adapter does not fit properly, you may have chosen the wrong one.

Make sure that there is good contact on all plug-in connections (loose contacts lead to errors in test results).

Installing the test SIM

Make sure that you insert the test SIM in the mobile phone before carrying out an AUTOTEST. This is because during the test, the Willtek 4100 will attempt to perform measurements which are not generally permitted by original SIMs. The test SIM is not absolutely necessary for FAULT FIND mode, although it is useful.

1 Make sure the mobile phone is switched off.

NOTE

Observe the equipment manufacturer's handling instructions.

2 Replace the original SIM with the test SIM. Plug-in SIMs are usually hidden behind a small flap that you see when you take out the battery.

Do not forget to remove the test SIM before returning an intact mobile phone. With the test SIM in the phone, the customer will no longer be able to check into a radio network; so even though the phone is intact, it will be of no use to the customer.

CAUTION

Please note that the SIM card has an embedded chip and the contacts to this can become damaged with repeated flexing or a very large number of insertions and removals from a mobile phone.

NOTE

If you insert a new SIM card that has never been used before, allow the phone to register with the network simulated by the 4100. Registration (location updating) is supported with any of the following keys in AUTOTEST mode: **MS CALL**, **LOC UPD**, **BS CALL**.

AUTOTEST mode

Overview An AUTOTEST performs a series of different measurements largely automatically. By comparing its measurements with stored target values, the Willtek 4100 detects faults in the mobile phone. The tolerances allowed with respect to the target values are used to decide PASS or FAIL of each measurement.

At the end of the AUTOTEST, an overall evaluation of PASSED or FAILED is derived from the evaluations of the individual tests.

AUTOTEST PASSED: The mobile phone is within the tolerances, and is in full working order. There is no need for further measurements in FAULT FIND mode.

AUTOTEST FAILED: The mobile phone is outside the tolerances. The test unit is defective. Further measurements in FAULT FIND mode can be used to identify the cause of the fault.

A group of test parameters can be assigned to any model of mobile phone and then stored. Once the parameters have been stored for a given model, these preparatory steps are no longer required if a further test is carried out on the same model. The AUTOTEST can be started immediately. In these cases, the two steps of preparing and running an AUTOTEST are totally separate. The advantage is that the two tasks can be carried out at different times and by people with different levels of expertise.

Running an AUTOTEST An AUTOTEST is always started in the same way: First call the MS TYPE menu, then select the entry which best matches the test unit.

1 With the cursor keys, select from the list exactly the model you want to test (for details on adding a model to the list, refer to the user guide). A Willtek 4100 can store up to

100 records of this type.

Fast search function: pressing a number key repeatedly immediately places the cursor on the first entries which start with the letters assigned to the key (for instance, **7 STU** places the cursor alternately on the first entry beginning with S, T or U).

2   Switch off the mobile phone and install the test SIM (refer to "Installing the test SIM" on page 22). If the name of the model as shown in the list already indicates the type of connection, then connect the test unit as indicated (refer to "Connecting test leads" on page 16).

CAUTION

AUTOTEST only returns correct results if the appropriate connection is used (antenna, coupler or cable).

3   Start AUTOTEST by pressing **ENTER**, switch on the mobile phone and wait until the display on the mobile phone shows the receiving signal strength or the ID of the test network (11 or 00101). Now follow the instructions on the display of the Willtek 4100. If the required connection type has not been clear up to now, it should be indicated at this point at the latest.

FAULT FIND mode

NOTE

The Willtek 4100L does not support the FAULT FIND mode.

Overview   In FAULT FIND mode you have access to all the tests that a Willtek 4100 is capable of performing. This includes those tests which are run automatically in AUTOTEST mode. You can also add further tests, and numerically displayed measurements help you to selectively identify important quality parameters of a mobile phone.

In FAULT FIND mode a Willtek 4100 shows its sophisticated test capability; but correct interpretation of the test results and measurements does demand a certain amount of expertise with GSM and measurement techniques.

In FAULT FIND mode as opposed to AUTOTEST mode there is no automatic PASSED/FAILED evaluation of the test results. That means that FAULT FIND tests are more suitable for experts who want to pinpoint the source of faults on the basis of individual test results and measurements.

Accessing FAULT FIND mode
Regardless of which menu is currently open, pressing the **FAULT FIND** key calls up the first menu of the FAULT FIND mode (provided that the tester is passive and is not maintaining a connection to a mobile phone). Which menu is the first depends on which model in the Willtek 4100 series you have (see below).

Willtek 4107   Willtek 4107S
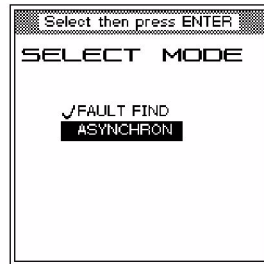
Access with the Willtek 4107S:

In the Willtek 4107S only, the additional SELECT MODE menu is used to access FAULT FIND mode:

Use the cursor keys to select the entry FAULT FIND and confirm your selection with **ENTER**.

Troubleshooting

4

This chapter describes how to identify and correct problems related to the 4100. Topics discussed in this chapter are as follows:

Troubleshooting

If you are unable to resolve problems related to the 4100, refer to "Technical assistance" on page ix.

When contacting Willtek for product support please call up **SETUP > Self check > System info** and have the information on this menu available. Press **Print** to start printing the menu.
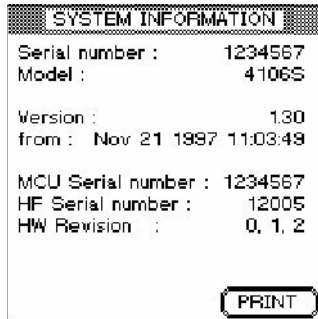
Solving problems

If you experience difficulties using the 4100, refer to the related topic. Each topic describes problems and solutions that may be pertinent to your task. If you are unable to resolve your problem, please contact "Technical assistance" on page ix.

Basic settings lost To store the basic settings, the 4100 series of testers use a powerful capacitor, not a battery. If a tester is left switched off for more than about 14 days, the energy reserves may drain away. The tester must be switched on in order to load the capacitor. Simply supplying power via the power supply unit whilst the tester is switched off is not sufficient. To restore lost settings, see chapter 2 of the user guide.

Display is blank Contrast correctly set?

Supply voltage present?

Mobile phone does not recognize tester Test SIM correctly mounted?

Battery in mobile phone OK?

Correct radio system (GSM/PCN/PCS)?

Tester's RF output level set to maximum value (BS Power Level)?

In the case of a wireless connection: is the distance between the tester and the mobile phone less than approx. 50 cm?

In the case of a cable-based connection: are you using the correct RF adapter and is this installed correctly?

Print problems See user guide.

Tests not reproducible Test channels (BCCH and TCH) are being used by nearby base stations?

Battery in mobile phone OK?

In the case of a wireless connection: are there any metallic objects lying between the tester and the mobile phone?

In the case of Universal Antenna Coupler: are there any nearby base stations on same channels as test frequencies? Is the mobile phone fitting snugly in the cradle/clamp?

Warranty and Repair

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This chapter describes the customer services available through Willtek. Topics discussed in this chapter include the following:

– "Warranty information" on page 32
– "Equipment return instructions" on page 33

Warranty information

Willtek warrants that all of its products conform to Willtek's published specifications and are free from defects in materials and workmanship for a period of one year from the date of delivery to the original buyer, when used under normal operating conditions and within the service conditions for which they were designed. This warranty is not transferable and does not apply to used or demonstration products.

In case of a warranty claim, Willtek's obligation shall be limited to repairing, or at its option, replacing without charge, any assembly or component (except batteries) which in Willtek's sole opinion proves to be defective within the scope of the warranty. In the event Willtek is not able to modify, repair or replace nonconforming defective parts or components to a condition as warranted within a reasonable time after receipt thereof, the buyer shall receive credit in the amount of the original invoiced price of the product.

It is the buyer's responsibility to notify Willtek in writing of the defect or nonconformity within the warranty period and to return the affected product to Willtek's factory, designated service provider, or authorized service center within thirty (30) days after discovery of such defect or nonconformity. The buyer shall prepay shipping charges and insurance for products returned to Willtek or its designated service provider for warranty service. Willtek or its designated service provider shall pay costs for return of products to the buyer.

Willtek's obligation and the customer's sole remedy under this hardware warranty is limited to the repair or replacement, at Willtek's option, of the defective product. Willtek shall have no obligation to remedy any such defect if it can be shown: (a) that the product was altered, repaired, or reworked by any party other than Willtek without Willtek's written consent; (b) that such defects were the result of customer's improper storage, mishandling, abuse, or misuse of the product; (c) that such defects were the result of customer's use of the product in conjunction with equipment electronically or mechanically incompatible or of an inferior quality; or (d) that the defect was the result of damage by fire, explosion, power failure, or any act of nature.

The warranty described above is the buyer's sole and exclusive remedy and no other warranty, whether written or oral, expressed or implied by statute or course of dealing shall apply. Willtek specifically disclaims the implied warranties of merchantability and fitness for a particular purpose. No statement, representation, agreement, or understanding, oral or written, made by an agent, distributor, or employee of Willtek, which is not contained in the foregoing warranty will be binding upon Willtek, unless made in writing and executed by an authorized representative of Willtek. Under no circumstances shall Willtek be liable for any direct, indirect, special, incidental, or consequential damages, expenses, or losses, including loss of profits, based on contract, tort, or any other legal theory.

Equipment return instructions

Please contact your local service center for Willtek products via telephone or web site for return or reference authorization to accompany your equipment. For each piece of equipment returned for repair, attach a tag that includes the following information:

– Owner's name, address, and telephone number.

– Serial number, product type, and model.

– Warranty status. (If you are unsure of the warranty status of your instrument, include a copy of the invoice or delivery note.)

– Detailed description of the problem or service requested.

– Name and telephone number of the person to contact regarding questions about the repair.

– Return authorization (RA) number (US customers), or reference number (European customers).

If possible, return the equipment using the original shipping container and material. Additional Willtek shipping containers are available from Willtek on request. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit. Willtek is not liable for any damage that may occur during

shipping. The customer should clearly mark the Willtek-issued RA or reference number on the outside of the package and ship it prepaid and insured to Willtek.

Room for your notes

Publication History

Revision	Changes
0301-100-A	First revision; excerpt from the user guide.

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