

Bluetooth Connectivity Test Products



User's guide
Version 1.00

boosting wireless efficiency

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Ordering information This guide is issued as part of the **Bluetooth Connectivity Test Products**. The ordering number for a published user's guide is M 292 018. The ordering numbers for the products are as follows:

Table 1 Willtek's Bluetooth products and ordering numbers

Product designation	Ordering number
4941 Bluetooth Connectivity Hardware	M 248 511
4921 RF Shield	M 248 346
3189 Bluetooth Connectivity Test Package	M 248 512
4489 Bluetooth Connectivity Test Package	M 248 510

Federal Communications Commission (FCC) Notice

This product was tested and found to comply with the limits for a spread spectrum transmitter, pursuant to Part 15C of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

The authority to operate this product is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by Willtek.

EMC Directive Compliance This product was tested and conforms to the EMC requirements for electromagnetic compatibility as expressed in EN 301 489-1/-17.

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About This Guide

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- "Conventions" on page vii

Purpose and scope

The purpose of this guide is to help you successfully use the Bluetooth Connectivity Test solution features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the Bluetooth Connectivity Test solution. Additionally, this guide provides a description of Willtek's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the Bluetooth Connectivity Test solution effectively and efficiently. We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication concepts and terminology.

Related information

Use this guide in conjunction with the following information:

4921 RF Shield user's guide, ordering number M 292 016

3100 Mobile Fault Finder user's guide, ordering number M 290 111

4400 Mobile Phone Tester series user's guides:

4460 GSM and 4468 EDGE System Options, ordering number M 290 011

4463 GSM/GPRS and 4468 EDGE System Options, ordering number M 293 016

4464 CDMA System Option, ordering number M 292 010

WCDMA Options, ordering number M 294 249

TD-SCDMA Options, ordering number M 294 251

Technical assistance

If you need assistance or have questions related to the use of this product, call one of Willtek's technical assistance centers. You can also contact Willtek by e-mail at customer.support@willtek.com.

Table 1 Technical assistance centers

Region	Phone number	Fax number
Europe, Middle East, Asia, Africa	+49 (0) 89 996 41 386	+49 (0) 89 996 41 440
Americas	+1 973 386 9696	+1 973 386 9191
China	+86 21 5836 6669	+86 21 5835 5238

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.

Safety Notes

This chapter provides the safety notes for the Bluetooth Connectivity Test solution.

Electricity



Warning

Use only the supplied AC adapter. Use of unauthorized power adapter is not recommended. Electrical shock may result.



Warning

Do not kink or crease the power cable or place heavy objects on the power cable. Fire can result from damaged power cables.



Warning

Do not handle power plug and adapter with wet hands. Electrical shock may result.



Warning

Immediately power off the product and unplug the AC adapter if smoke or odors emit from the product and adapter. Fire can result from improper use.



Warning

Immediately power off the product and unplug the AC adapter if water or other liquids are present. Fire can result from improper use.

Product



Warning

The Bluetooth adapter meets the RS-232 standards. Do not wire with non-standard products. Damage to your products may result from improper use.



Warning

Keep away from harsh environments including humid, dusty, and smoky areas. Damage to your products may result from improper use.



Warning

Do not use excessive force on the buttons or attempt to disassemble the device. Damage to your products may result from improper use.



Warning

Do not drop or subject the device to impact. Damage to your products may result from improper use.



Warning

Do not place heavy objects on the product. Damage to your products may result from improper use.

Overview

1

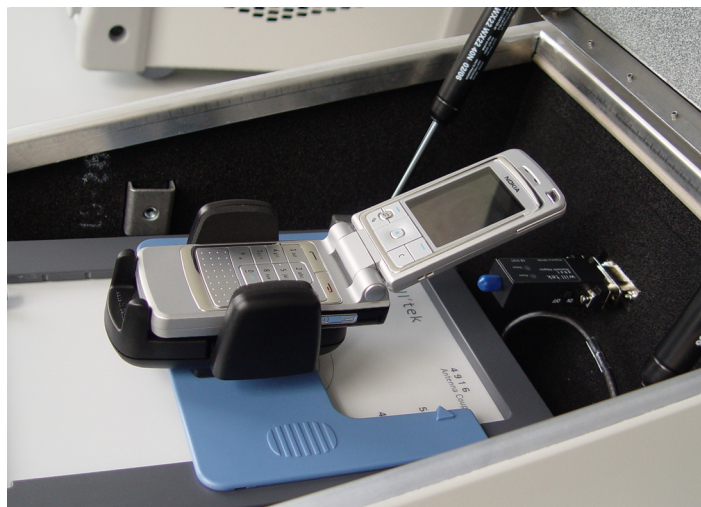
This chapter provides a general description of the Bluetooth Connectivity Test solution. Topics discussed in this chapter include the following:

- ["About the Bluetooth Connectivity Test solution" on page 2](#)
- ["Prerequisites" on page 2](#)
- ["Features and capabilities" on page 3](#)
- ["Physical description" on page 3](#)

About the Bluetooth Connectivity Test solution

The 4921 RF Shield equipped with the 4941 Bluetooth Connectivity Hardware allows you to carry out tests on both the cellular and the Bluetooth portion of the mobile phone. An RS-232 connector on the back plane of the RF Shield, together with properly shielded cables, allows you to control the Bluetooth adapter that is part of the Bluetooth Connectivity Hardware. A few simple commands and responses suffice to ensure that both the receiver and the transmitter of the Bluetooth portion in the mobile phone are working correctly.

Willtek also offers Bluetooth Connectivity Test Packages for the 4400 and the 3100. These include the hardware and enable software macros for Bluetooth testing from within the RAPID! evaluation tests delivered with the 4400 and the 3100.



Prerequisites

The 4941 Bluetooth Connectivity Hardware has been designed for use with the 4921 RF Shield.

The 4489 Bluetooth Connectivity Test Package (including the 4941 Bluetooth Connectivity Hardware) additionally requires a 4400 Series Mobile Phone Tester with software version 12.00 or higher.

The 3189 Bluetooth Connectivity Test Package (including the 4941 Bluetooth Connectivity Hardware) additionally requires a 3100 Mobile Fault Finder with software version 12.00 or higher.

Features and capabilities

Tests the function of the Bluetooth device within mobile phones.

Physical description

The 4941 Bluetooth Connectivity Hardware consists of a 4921 RF Shield back-plane with an RS-232 connector, the Bluetooth adapter with RS-232 connector, a power supply cable and a control cable.

The 4489 Bluetooth Connectivity Test Package consists of the 4941 Bluetooth Connectivity Hardware plus a software license for Bluetooth tests running on a 4400 (under remote control or RAPID!). The package is limited to usage on one 4400 series instrument.

The 3189 Bluetooth Connectivity Test Package consists of the 4941 Bluetooth Connectivity Hardware plus a software license for Bluetooth tests running on a 3100 (under remote control or 7310 Lector). The package is limited to usage on a single 3100 Mobile Fault Finder.

Installation

2

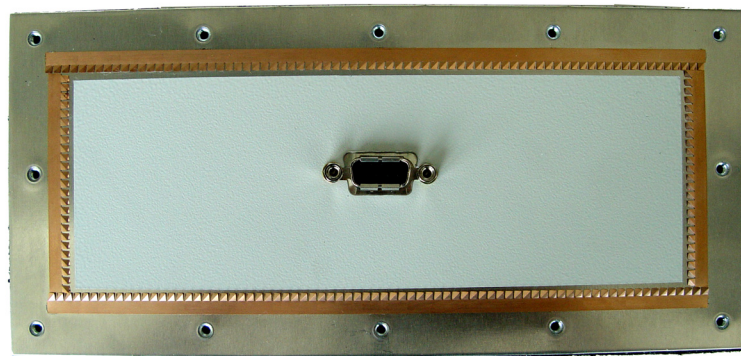
This chapter describes how to install the Bluetooth Connectivity Test solution. The topics discussed in this chapter are as follows:

- ["Scope of delivery" on page 6](#)
- ["Software requirements" on page 7](#)
- ["Hardware requirements" on page 7](#)
- ["Setting up the hardware" on page 7](#)
- ["Installing the software" on page 9](#)

Scope of delivery

When unpacking the Bluetooth Connectivity Test solution, ensure that you do not miss any of the following items:

- Bluetooth adapter
- Serial and power supply cable
- AC/DC power converter
- The backplane for the 4921 RF Shield with 15-pin D-sub connectors (female) on both sides (the backplane may already be installed if you ordered your Bluetooth Connectivity Test product with the 4921 RF Shield)
- Getting started manual
- User's guide (on CD)



Software requirements

In order to control the Bluetooth adapter from either the 3100 or the 4400, you will need software version 12.00 to be installed on these instruments.

To control the Bluetooth adapter directly from a PC, you will need appropriate driver software. This software is not included in the Bluetooth Connectivity Hardware and related products. The commands for direct control are described in [Chapter 5 "Direct access via RS-232"](#).

Hardware requirements

If you did not order the Bluetooth Connectivity Test product with a 4921 RF Shield, you need this product to install the associated backplane.

The 4489 Bluetooth Connectivity Test Package requires a 4400 Series Mobile Phone Tester.

The 3189 Bluetooth Connectivity Test Package requires a 3100 Mobile Fault Finder.

Setting up the hardware

- 1 If the Bluetooth Connectivity Test product did not come with a special backplane (including female RS-232 connectors) already installed in the 4921 RF Shield, proceed as follows:
 - a At the back of the 4921 RF Shield, unscrew the standard backplane (12 screws).

- b Detach the standard backplane and replace it by the special backplane with the RS-232 connectors. Ensure that the long end of the connector is at the top to ensure that the LEDs of the Bluetooth adapter are visible.

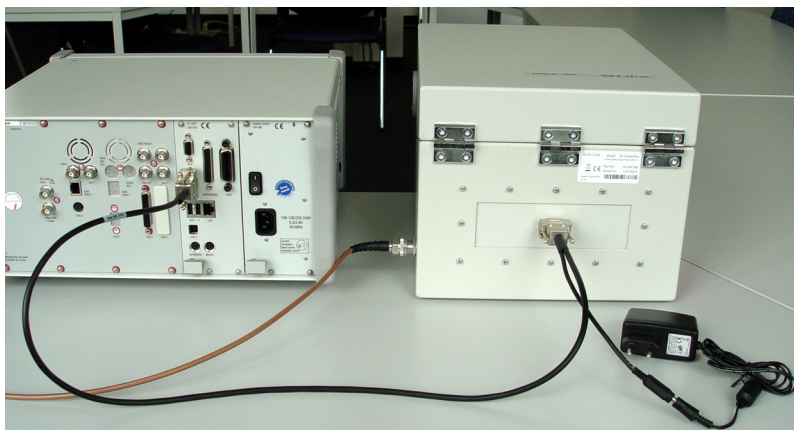


- c Fix the backplane by screwing it tight.

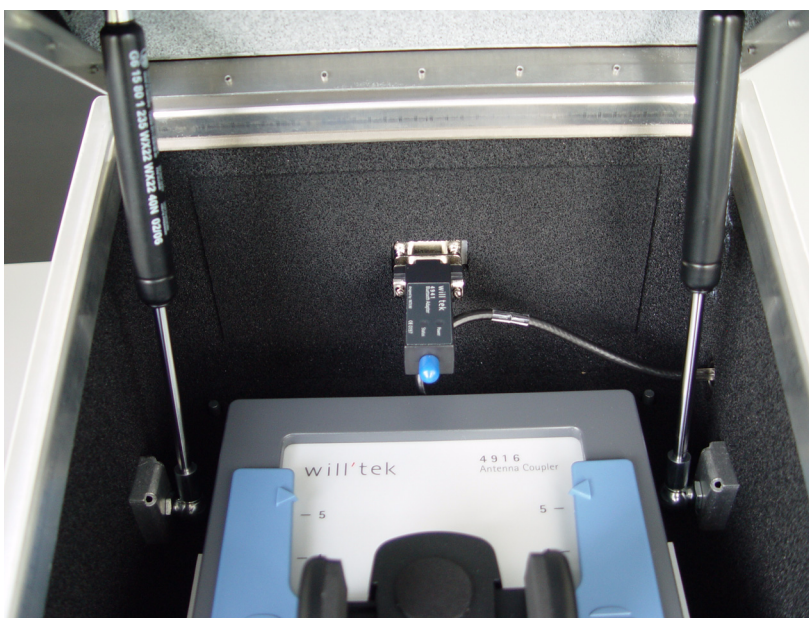


- 2 Connect the RS-232 cable as follows:
 - a Plug the connector with two cables into the RS-232 socket at the back of the 4921 RF Shield.
 - b If you are going to use the Bluetooth Connectivity Test product with a 3100 Mobile Fault Finder, plug the other D-type connector into the COM 1 port of the 3100.
If you are going to use the Bluetooth Connectivity Test product with a 4400 Series Mobile Phone Tester, plug the other D-type connector into the COM 1 port of the 4400.
If you are going to use Bluetooth Connectivity Test product with a PC, plug the other D-type connector into a free COM port of the PC.

- c Connect the AC/DC power converter to mains and to the remaining end of the RS-232 cable.



- 3 Plug the Bluetooth adapter into the D-type RS-232 connector inside the 4921 RF Shield.



Installing the software

4400 Mobile Phone Tester Series

If the 4489 Bluetooth Connectivity Test functionality is not already enabled in the 4400, enter the key code you received with the 4489 Bluetooth Connectivity Test Package in the **Tools > Configuration > Options > Option Key** menu of

the 4400.

For more detailed instructions, please refer to section "Installing additional options" in the 4400 user's guides.

Software drivers and application software for the 4489 Bluetooth Connectivity Test Package are integrated into the RAPID! Evaluation Test Software on the 4400 Series Mobile Phone Tester and also into the optional 7310 Lector software. For more detailed instructions, please refer to section "Installing new options in the 3100 Mobile Fault Finder" in the 7310 Lector user's guide.

3100 Mobile Fault Finder

If the 3189 Bluetooth Connectivity Test functionality is not already enabled in the 3100, enter the key code you received with the 3189 Bluetooth Connectivity Test Package in the **Options > Option Setting** menu of the Upgrade Utility within 7310 Lector.

Software drivers and application software for the 3189 Bluetooth Connectivity Test Package are integrated into 7310 Lector.

Using the Bluetooth Connectivity Test products with 7310 Lector

3

This chapter describes how to operate the Bluetooth Connectivity Test products with 7310 Lector and either the 4400 Series Mobile Phone Testers or the 3100 Mobile Fault Finder. Topics discussed in this chapter are as follows:

- ["Enabling and disabling Bluetooth tests in Lector" on page 12](#)
- ["Carrying out a Bluetooth test with Lector" on page 13](#)
- ["Troubleshooting Bluetooth tests with Lector" on page 14](#)

Enabling and disabling Bluetooth tests in Lector

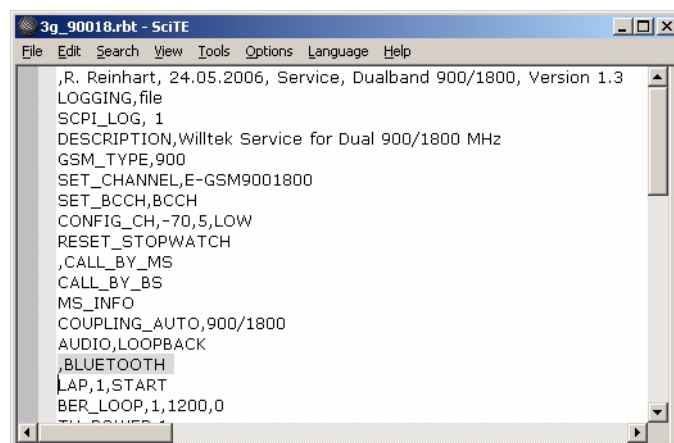
From version 1.30, Lector supports Bluetooth tests. However, the built-in test scripts have this feature disabled by default because not every user wants to perform Bluetooth tests on mobile phones.

Bluetooth testing can be enabled or disabled separately for each test script. In order to change the current setting for a test script, the respective test script file must be edited. Willtek already prepared the standard test scripts for Bluetooth testing, so enabling or disabling the feature is very easy.

Before changing the test script, you will have to find out the file name and location for that test script.

To enable or disable Bluetooth testing in the standard test scripts, proceed as follows:

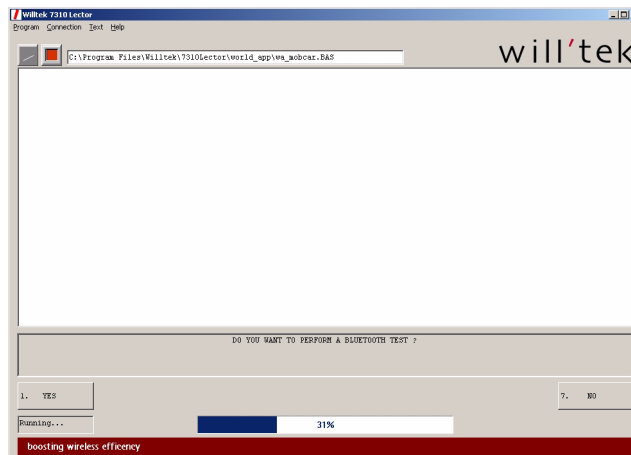
- 1 Open file world_app\wa_USER_MENU.rbs using WordPad or another advanced text editor. This file defines the top-level menu structure by softkey. (More information about the structure of this file can be found in the 7310 Lector user's guide.)
- 2 Look up the menu item that refers to the test you want to change, and note the file name and location.
Example: If wa_USER_MENU.rbs is located in C:\Program Files\Willtek\7310Lector\world_app and the script path is .\scripts\3g_85019.rbt, the file with the test script will be C:\Program Files\Willtek\7310Lector\world_app\scripts\3g_85019.rbt.
- 3 Open the file containing the test script with the text editor.
- 4 Find the line with the word "Bluetooth" as marked in the example below.



- 5 To enable Bluetooth testing, delete the comma before the word Bluetooth. To disable Bluetooth testing, ensure there is a comma in front of the word.
- 6 Save the file and close it.
A new test can now be started with Bluetooth testing included.

Carrying out a Bluetooth test with Lector

The Bluetooth test can be an integral part of the mobile phone test procedure. Typically after a connection (a call) between the phone and the tester has been established, Lector will ask if you want to perform a Bluetooth test (see picture below).



Follow the onscreen instructions. In particular, make sure that

- the Willtek Bluetooth dongle is switched on
- the Bluetooth function in the mobile phone is enabled
- the Bluetooth visibility in the phone is enabled

After completing the mobile phone tests, Lector shows or prints a test protocol that includes the RF measurements as well as the results of the Bluetooth connectivity test.

If successful, the Bluetooth test result consists of the MAC address of the Bluetooth device and the device name. The device name should be identical to the one that is set up in the phone.

Example:

```
Date: 28.06.2006                                TIME: 14:01:32

Willtek Service for Dual 900/1800 MHz
LECTOR-Release: 1e30
Test Equipment : "WILLTEK 3100, SN: 5811213, FW: 12a00.018"

Mobile      : Nokia 6260                        IMEI: 004400481623013
RF Connection : Willtek 4916 Antenna Coupler + 4921 RF Shield
Position    : 5

Coupling loss values (RX,TX) :
GSM 900   :    22.0, 20.8 / 22.0, 21.0 / 20.7, 20.4
GSM 1800  :    14.3, 19.5 / 14.3, 17.5 / 13.0, 14.0

GSM 900/1800
Speech Test .....:                               Pass
Bluetooth connect.....: 0002eefef1d4 : nokia 7610
-----
TV  ES...20 04E... MS...E  TCH...3      IT      III      MYU
```

Troubleshooting Bluetooth tests with Lector

If a Bluetooth test fails, this is indicated by asterisks on the right-hand side of the results printout.

```
GSM 1000 : 14.0, 17.0 / 14.0, 17.0 / 13.0, 14.0
GSM 900/1800
Speech Test .....: Pass
Bluetooth connect.....: ***** **
-----
TV PS-20 GPRx MS-E TCH-2 I I III MV
```

Test failure may occur for different reasons. It may be either because the test setup is not suitable or because the Bluetooth device in the mobile phone is defective. Here are a few possibilities:

- The Bluetooth testing adapter is switched off.
Switch on the adapter in the 4921 RF Shield.
- The phone under test does not have a Bluetooth device.
Repeat the test, but do not request a Bluetooth connectivity test.
- The Bluetooth function in the phone is disabled.
Turn on the Bluetooth feature in the phone.
- The Bluetooth function is enabled, but the visibility is disabled.
Enable the Bluetooth visibility in the phone.
- There are other Bluetooth devices around that make communication difficult.
Close the RF Shield before starting the Bluetooth test.

If none of these conditions are met, the Bluetooth device in the phone may indeed be defective!

SCPI Commands

4

This chapter describes the commands and responses for remote control of the Bluetooth Connectivity Test solution from the 4400 or 3100. The commands and responses are described in this chapter are as follows:

- ["Configuration commands" on page 16](#)
- ["Status commands" on page 17](#)
- ["Control commands" on page 17](#)

Configuration commands

:BLUetooth:CONFIg:DEFault

Syntax	:BLUetooth:CONFIg:DEFault
Parameters	None.
Description	This command sets the Bluetooth adapter back to the original configuration.
Query	Not supported.
Example	:BLUetooth:CONFIg:DEFault

:BLUetooth:CONFIg:BAUD

Syntax	:BLUetooth:CONFIg:BAUD <int>
Parameters	int is the bit rate on the serial interface. The parameter may take on one of the following values: 9600, 19200, 38400, 57600, 115200. The default is 9600.
Description	This command sets the baud rate of the instrument (i.e. the 4400 or 3100) at the interface to the Bluetooth adapter. Sets the baud rate for serial port COM1 (the interface to the Bluetooth adapter). The other serial parameter settings are fixed at 8 bits per char, 1 stop bit, no parity.
Query	Not supported.
Example	:BLUetooth:CONFIg:BAUD 9600 Sets the baud rate at the serial interface to the Bluetooth adapter to 9600 bps. :BLU:CONF:BAUD? Returns the following string: "9600"

:BLUetooth:CONFIg:INQUIry:TIMEout

Syntax	:BLUetooth:CONFIg:INQUIry:TIMEout <int1>
Parameters	int1 is the timeout in seconds. int1 may take on an integer value from 1 to 30, the default is 4.
Description	This command sets the response timeout (in seconds) in which the device under test must respond to the inquiry from the instrument.
Query	Returns the current timeout setting.
Example	:BLUetooth:CONFIg:INQUIry:TIMEout 10 Sets the timeout to 10 seconds. :BLUetooth:CONFIg:INQUIry:TIMEout? Returns "10"

Status commands

:BLUetooth:STATus?

Syntax	:BLUetooth:STATus?
Parameters	None.
Description	This command allows the user to query the current status of the adapter.
Query	Returns one of the following strings, depending on the current status of the Bluetooth adapter: "ok", "error"
Example	:BLUetooth:STATus? Returns "ok<CR>"

:BLUetooth:STATus:INFormation?

Syntax	:BLUetooth:STATus:INFormation?
Parameters	None.
Description	This command allows the user to query the current state of the adapter.
Query	Returns one of the following strings, depending on the current status of the Bluetooth adapter: "standby", "pending", "connect "
Example	:BLUetooth:STATus:INFormation? Returns "standby"

Control commands

:BLUetooth:CONTRol:CANCel

Syntax	:BLUetooth:CONTRol:CANCel
Parameters	None.
Description	This command cancels the current operation being performed by the Bluetooth adapter.
Query	Not supported.
Example	:BLUetooth:CONTRol:CANCel

:BLUetooth:CONTRol:INQuiry?

Syntax	:BLUetooth:CONTRol:INQuiry?
Parameters	None.
Description	This command performs an inquiry for all Bluetooth devices within the range of the adapter.
Query	For each device found, returns a string as follows: <address>, <name>, <class> where address is the Bluetooth device address, name is the device name set by the user, class is the Bluetooth class of the device.
Example	:BLUetooth:CONTRol:INQuiry? Response: "0002EE12CF21,mobile,847<CR>"

:BLUetooth:CONTRol:CONNect

Syntax	:BLUetooth:CONTRol:CONNect "<address>"
Parameters	address is the Bluetooth device address.
Description	This command sets up a connection between the specified address and the adapter. Depending if the command was successfully executed or not, the adapter will return either connect or error.
Query	Not supported.
Example	BLUetooth:CONTRol:CONNect "0002EE12CF21" Response: "connect 0002EE12CF21<CR>"

:BLUetooth:CONTRol:RELease

Syntax	:BLUetooth:CONTRol:RELease
Parameters	None.
Description	This command releases the connection between the DUT and the adapter. Once successful, the instrument will return a disconnect string.
Query	Not supported.
Example	:BLUetooth:CONTRol:RELease Reponse: "disconnect"

Direct access via RS-232

5

This chapter provides the commands and responses for direct control of the Bluetooth adapter. Topics discussed in this chapter are as follows:

- ["General" on page 20](#)
- ["Configuring the Bluetooth adapter" on page 20](#)
- ["Requesting device status information" on page 20](#)
- ["General control" on page 21](#)

General

The RS-232 commands should include a <CR> or <CR><LF> (carriage return, line feed characters) at the end of the line. The Bluetooth adapter returns strings with <CR><LF> at the end.

Configuring the Bluetooth adapter

AT+BTMODE

Syntax	AT+BTMODE, n
Function	Sets the operating mode of the Bluetooth adapter.
Response	OK
Description	<p>The Bluetooth adapter has four different operating modes. Depending on the operating mode currently set, the adapter behaves differently. The parameter n determines the mode.</p> <p>n=0: Mode 0 is the default configuration.</p> <p>n=1: In Mode 1, the adapter will try to set up a connection with the most recently connected Bluetooth adapter.</p> <p>n=2: In Mode 2, the adapter will wait for a connection setup from the most recently connected Bluetooth adapter.</p> <p>n=3: In Mode 3, the adapter will alternate between "Inquiry Scan" and "Page Scan".</p>

Requesting device status information

AT

Syntax	AT
Function	Checks the presence of the Bluetooth adapter.
Response	OK or ERROR
Description	In standard mode, you can check whether the Bluetooth adapter is connected to a host correctly by using this AT command.

AT+BTINFO

Syntax	AT+BTINFO?
Function	Returns the internal status of the Bluetooth adapter.
Response	<bd_addr>, <name>, <mode>, <status>, <auth>, <encryp> OK where bd_addr is the Bluetooth adapter address, name is the adapter name set by the user, mode is the operating mode, status is the operating status, auth is the authentication status (returns 1 when activated), encryp is the encryption status (returns 1 when activated).
Description	When you send this query to the Bluetooth adapter, the adapter returns its status and further information.

General control

AT+BTCANCEL

Syntax	AT+BTCANCEL
Function	Cancels the currently ongoing operation of the Bluetooth adapter.
Response	OK
Description	This command interrupts and stops the following commands: AT+BTSCAN, AT+ATD, AT+BTINQ?

AT+BTINQ

Syntax	AT+BTINQ?
Function	Lets the Bluetooth adapter search for other devices nearby.
Response	<address>, <name>, <class> <address>, <name>, <class> ...
Description	The enquiry process is carried out during the predefined time duration (30 seconds). The maximum number of enquiry results is 10.

ATD

Syntax	ATD <bd_addr>
Function	Sets up connection to the device in bd_addr, where bd_addr is the Bluetooth device address.
Response	OK CONNECT or OK ERROR
Description	This command is used to set up a connection with another Bluetooth device. The Bluetooth adapter tries for 5 minutes to connect with the Bluetooth device given by bd_addr. The connection setup fails when the Bluetooth device addressed is not in PAGE SCAN mode or already connected to another Bluetooth device.

ATH

Syntax	ATH
Function	Releases the current Bluetooth connection.
Response	OK DISCONNECT
Description	This AT command is used to disconnect the existing Bluetooth connection.

Warranty and Repair



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

- ["Warranty information" on page 24](#)
- ["Equipment return instructions" on page 25](#)

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 or reference number.

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.

End-User License Agreement



B

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Publication History

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0607-100-A	First version.
0609-100-A	SCPI commands updated.

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