

INSTRUCTION MANUAL



Sidekick[®] Plus Test Set with ADSL/VDSL Supplement



Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.

Register this product at www.greenlee.com

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Do not discard this product or throw away!

For recycling information, go to

www.greenlee.com.

KEEP THIS MANUAL

INTRODUCTION

Description

The Sidekick® Plus test set facilitates the technician's work in the field. By combining the functions of a volt-ohmmeter, longitudinal balance tester, and open meter with five transmission and noise tests, this tool reduces repeat reports and improves quality of service.

Added functions to the Sidekick® Plus test set include a time domain reflectometer (TDR) and a resistance fault locator (RFL).

The Sidekick® Plus test set's intuitive user interface and USB communication make it necessary equipment for field work.

This test set is a compact, battery-powered instrument that can be conveniently held in the technician's hand.

For questions on operation, requests for field training, or for additional service, call Greenlee in Vista, CA at 1-760-598-8900 or toll free 1-800-642-2155. Outside of North America, contact your local Greenlee distributor.

This manual describes the operation of the software at the time of publication. Minor changes and extensions may have been made to released software in the meantime, and updates may have been made to any particular unit. Please refer to the on-screen help (**Fn+F1**) where available, or contact Greenlee technical support for details of any updated software and the corresponding instruction manual.

Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

Purpose of this Manual

This instruction manual is intended to familiarize all personnel with the safe operation and maintenance procedures for the Greenlee Communications Sidekick® Plus Test Set.

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge at www.greenlee.com.

IMPORTANT SAFETY INFORMATION



SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

DANGER

Immediate hazards which, if not avoided, **WILL** result in severe injury or death.

WARNING

Hazards which, if not avoided, **COULD** result in severe injury or death.

CAUTION

Hazards or unsafe practices which, if not avoided, **MAY** result in injury or property damage.



WARNING

Read and understand this material before operating or servicing this equipment. Failure to understand how to safely operate this tool could result in an accident causing serious injury or death.



WARNING

Electric shock hazard:
Contact with live circuits could result in severe injury or death.

IMPORTANT SAFETY INFORMATION

WARNING

Explosion hazard:

Do not operate in an explosive atmosphere.

Failure to observe this warning could result in severe injury or death.

WARNING

Electric shock hazard:

- Do not expose this unit to rain or moisture.
- Do not use if the unit is wet or damaged.
- For measurement of Category I circuits only. For measurements on circuits NOT directly connected to mains. CAT I, 250 VAC, 300 VDC, 100 mA maximum.
- Never make measurements on CAT II, CAT III, or CAT IV circuits with this instrument.
- Use this unit for the manufacturer's intended purpose only as described in this manual. Any other use can impair the protection provided by the unit.
- Do not operate with the battery compartment open.

Failure to observe these warnings could result in severe injury or death.

CAUTION

Electric shock hazard:

- Do not attempt to repair this unit. It contains no user-serviceable parts.
- Do not expose to extremes in temperature or high humidity. Refer to "Specifications" in instruction manual 52063747.
- If the unit becomes visibly coated with condensation, allow its temperature to equalize with the surroundings and dry it thoroughly before use.
- Use of the unit while damp may affect high impedance measurements or may impair the unit's means of protection.
- Do not allow dust or dirt to build up.
- The supplied AC or mains charger is suitable for indoor use only.

Failure to observe these precautions may result in injury and can damage the unit.

Measurement Categories

These definitions were derived from the international safety standard for insulation coordination as it applies to measurement, control, and laboratory equipment. These measurement categories are explained in more detail by the International Electrotechnical Commission; refer to either of their publications: IEC 61010-1 or IEC 60664.

Measurement Category I

Signal level. Electronic and telecommunication equipment, or parts thereof. Some examples include transient-protected electronic circuits inside photocopiers and modems.

Measurement Category II

Local level. Appliances, portable equipment, and the circuits they are plugged into. Some examples include light fixtures, televisions, and long branch circuits.

Measurement Category III

Distribution level. Permanently installed machines and the circuits they are hard-wired to. Some examples include conveyor systems and the main circuit breaker panels of a building's electrical system.

Measurement Category IV

Primary supply level. Overhead lines and other cable systems. Some examples include cables, meters, transformers, and other exterior equipment owned by the power utility.

Warning

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used in accordance with the instructions in the user manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which are designated to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his or her expense, will be required to take whatever measures may be required to correct the interference.

xDSL TESTING

The Sidekick® Plus test set configured with the optional xDSL modem is used to perform line synchronization analysis on ADSL and VDSL digital subscriber lines.

Setup

Move the rotary knob to the ADSL/VDSL position. Choose between VDSL and ADSL modes by pressing the **Fn** key. The currently selected mode will be displayed in the top bar as shown.

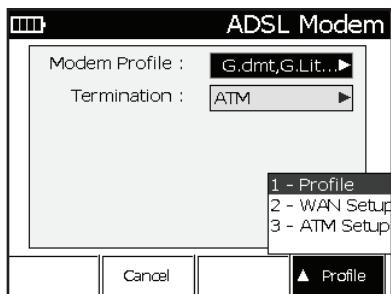
ADSL Modem			
Test	Up	Down	
Link Rate	n/a dh	n/a dh	
Max Rate	n/a dh	n/a dh	
Capacity	n/a dh	n/a dh	
SNR Margin	n/a dh	n/a dh	
Power	n/a dh	n/a dh	
Attenuation	n/a dh	n/a dh	
INP	n/a dh	n/a dh	
INT. Delay	n/a dh	n/a dh	
Setup	Connect		▲Showtime

VDSL Modem			
Test	Up	Down	
Link Rate	n/a dh	n/a dh	
Max Rate	n/a dh	n/a dh	
Capacity	n/a dh	n/a dh	
SNR Margin	n/a dh	n/a dh	
Power	n/a dh	n/a dh	
Attenuation	n/a dh	n/a dh	
INP	n/a dh	n/a dh	
INT. Delay	n/a dh	n/a dh	
Setup	Connect		▲Showtime

ADSL Setup

To configure the ADSL modem mode, press **F1 Setup** while the “ADSL Modem” view is active. After all configuration choices are made, press the **↶ (Back)** key to return.

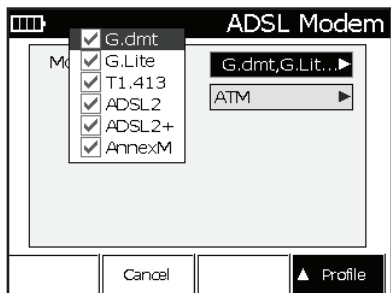
There are three configuration views for the ADSL modem setup. The active Setup view is changed by pressing the **F4** key until the desired view is highlighted.



Profile

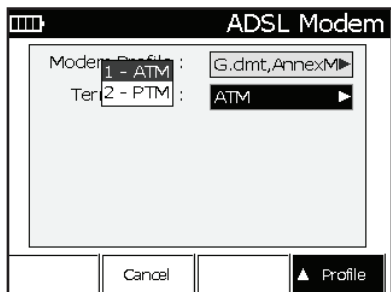
Press the **F4** key until “Profile” is highlighted.

The up (**2**) and down (**8**) arrows select the configuration parameter to change. To make a change, press the right (**6**) key to show the Profile selection pop-up window.



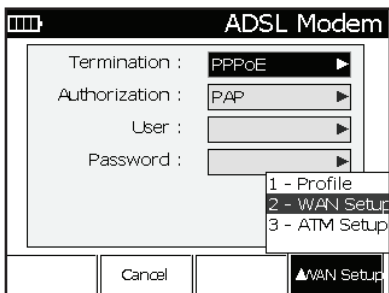
To select the active ADSL profiles, press the center (**5**) key to check or un-check the highlighted profile. After the selections are made, press the **↶ (Back)** key to save the selection and return to the Profile configuration view.

To configure the link termination, press the right (**6**) key to show the Termination selection pop-up window. The link termination can be either ATM or PTM.



WAN Setup

Press the **F4** key until “WAN Setup” is highlighted.



The up (**2**) and down (**8**) arrows select the configuration parameter to change. To make a change, press the right (**6**) key to show the selection pop-up.

For WAN Termination, select: PPPoA, PPPoE, BRIDGE, or IPoE.

PPPoA and PPPoE Setup

For Authorization, select: Auto, PAP, CHAP, or MSCHAP.

For User, enter the username for network authentication.

For Password, enter the password for network authentication.

Bridge Mode Setup

DHCP is the only mode available in Bridge Mode.

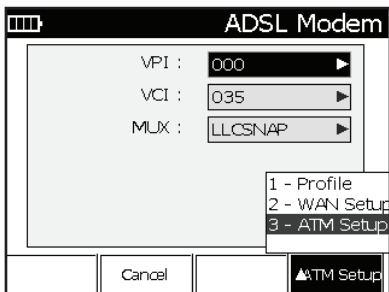
IPoE Setup

For Mode, select: STATIC IP or DHCP.

When STATIC IP is selected, the IP Address and Mask fields can be set.

ATM Setup

When ATM is selected for the Termination type in the Profile setup, the ATM setup page can be selected by pressing the **F4** key.



For VPI, enter the virtual path identifier number.

For VCI, enter the virtual circuit identifier number.

For MUX, select: LLC SNAP or VCMUX.

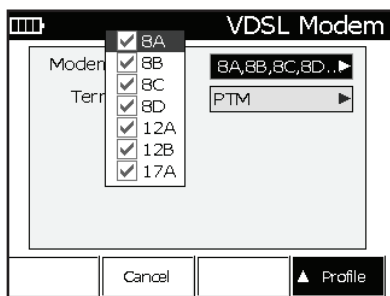
Note: The ATM Setup view is only available if the ADSL termination mode is set to ATM.

VDSL Setup

To configure the VDSL modem mode, press **F1 Setup** when the “VDSL Modem” view is active. After all configuration choices are made, press the ↵ (**Back**) key to return.

There are two configuration views for the VDSL modem setup. The active Setup view is changed by pressing the **F4** key, and then the number of the desired view.

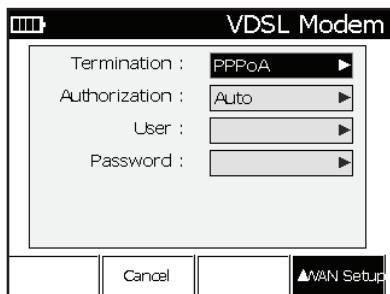
Profile



The up (2) and down (8) arrows select the configuration parameter to change. To make a change, press the right (6) key to show the selection pop-up.

To select the active VDSL profiles, press the center (5) key to check or un-check the highlighted profile. After the selections are made, press the ↵ (**Back**) key to save the selection and return to the Profile configuration view.

WAN Setup



This is the screen that will enable the PPP (point-to-point protocol) level of testing. The PPP level of testing requires the following information to be entered into the PPP setup screen:

- For WAN Termination, select: PPPoA, PPPoE, or BRIDGE.
- For Authorization, select: Auto, PAP, CHAP, or MSCHAP.
- For User, enter the username for network authentication.
- For Password, enter the password for network authentication.

Connecting to Telephone Line

Connect the test set's Black and Red test cord to the telephone line. Greenlee's TurTEL 6 or a RJ11 banjo can be used to connect a RJ11 jack to the Sidekick Plus® test set's Black and Red popper clips.

Synchronizing

Note: If Upper Layer tests will be done, be sure the WAN Setup is correct before modem synchronization.

Press the **F2 Connect** key to begin the synchronization process.

The title bar reports a status message indicating the current step in the synchronization process.

After the modem connection is established, the **F2 Disconnect** key will disconnect the modem.

Connection Parameters

After the connection is made, the default result page is "Showtime". The result page is changed by pressing the **F4** key, or the up (**2**) and down (**8**) keys. If the **F4** soft-key is used, any available page can be selected. The up (**2**) and down (**8**) keys step to the next and previous result pages.

Showtime

VDSL2 17a - Showtime		
Test	Up	Down
Link Rate	50000	104973
Max Rate	80970	114833
Capacity	61.8	91.4
SNR Margin	9.1	20.6
Power	14.2	8.9
Attenuation	0.0	0.0
INP	0.00	0.00
INT. Delay	0	0
Disconnect		▲Showtime

When connected, the title bar indicates the profile used to make the connection. The physical link characteristics are shown in the Showtime table.

Display	Description
Link Rate	Actual connection rate
Max Rate	Maximum calculated rate
Capacity	Percent usage of the DSL connection (Link Rate / Max Rate) * 100
SNR Margin	Signal-to-noise margin of the service
Power	Average signal power
Attenuation	Average attenuation
INP	The level of impulse noise protection set by the DSLAM
INT. Delay	Interleave delay set by the DSLAM

Press up (2) to advance to the Line Failure Monitor.

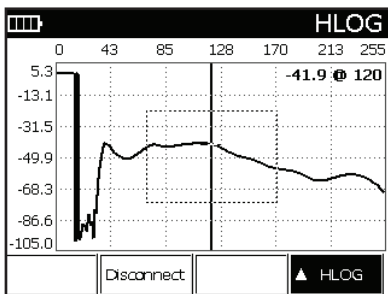
Line Failure Monitor

Line Failure			
Test	Near	Far	
FEC	0	0	
CRC	0	0	
ES	0	0	
UAS	46	46	
LOS	0	0	
LOF	0	0	
Reset Counters	Disconnect		▲ Line Failure

The Line Failure page shows the event counters and updates continuously. The counters can be reset to zero by pressing the **F1 Reset Counters** key.

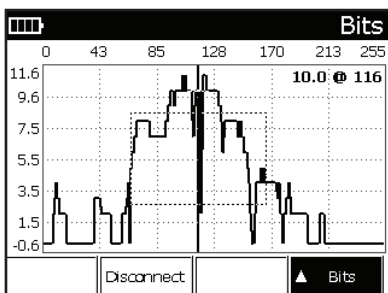
Display	Description
FEC	Number of frame error corrections
CRC	Number of cyclical redundancy check errors
ES	Number of error seconds
UAS	Number of unavailable seconds
LOS	Number of times there was a loss of signal
LOF	Number of times there was a loss of frame

Press up (2) to advance to the HLOG graph.

HLOG

The HLOG graph shows the attenuation per channel (frequency) between the DSLAM and the modem. The information is obtained when the modem and the DSLAM train up and can show issues with attenuation or bridge taps. The horizontal axis is the bin index, and the vertical axis is the attenuation value in dB.

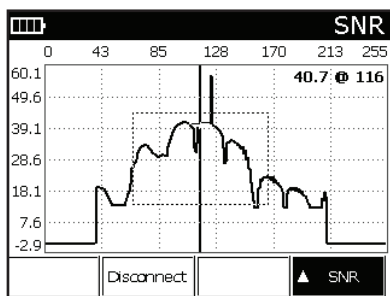
Press up (2) to advance to the Bits graph.

Bits per Tone

The Bits graph shows the actual number of bits that are carried over each separate channel (frequency). The graph can indicate issues with noise, bridge taps, or attenuation. The horizontal axis is the bin index, and the vertical axis is bits.

Press up (2) to advance to the SNR graph.

SNR per Tone

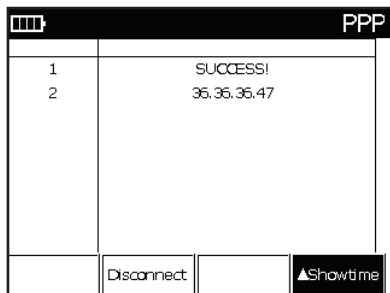


The SNR graph shows the signal-to-noise ratio of each channel (frequency). It can indicate typical noise issues with the line such as cross talk. The horizontal axis is the bin index, and the vertical axis is SNR in dB.

Press up (2) to advance to PPP authentication.

Upper Layer Testing

Upper Layer tests are performed after a successful user authentication is complete and an IP address is assigned to the modem. None of the following Upper Layer tests will provide results if the PPP function does not authenticate.



The parameters in the WAN Setup are used in authentication. The WAN Setup should be configured before modem training.

For WAN Termination, select: PPPoA, PPPoE, BRIDGE, or IPoE.

For Authorization, select: Auto, PAP, CHAP, or MSCHAP.

For User, enter the username for network authentication.

For Password, enter the password for network authentication.

Ping Test

Ping will ping the entered address and give the ping time and percent loss stats. The Ping function will not be enabled if PPP did not succeed in logging in.

Ping	
1	DST: 173.194.73.94
2	seq=6 : 150.735 ms
3	seq=7 : 150.171 ms
4	seq=8 : 158.369 ms
5	0% packet loss
<div style="display: flex; justify-content: space-between; align-items: center;"> Disconnect IP Address ▲ Ping </div>	

Ping test starts automatically using the last IP address used or factory default. To enter a new IP address for Ping, press **F3 IP Address**. Enter the IP address of the destination you wish to ping. Press **# (Enter)** when complete, and the unit will automatically start the Ping test.

Traceroute Test

Traceroute will give all of the IP address between the Sidekick Plus® test set and the entered IP address. The Traceroute function will not be enabled if PPP did not succeed in logging in.

Trace Route	
1	DEST: 64.78.1.188
2	75.36.47.254: 58 52 52 ms
3	63.200.206.195: 52 52 52 ms
4	12.83.70.169: 53 55 51 ms
5	12.122.129.97: 69 79 79 ms
6	192.205.34.78: 76 65 66 ms
7	208.178.246.162: 76 79 79 ms
8	206.40.48.87: 79 79 80 ms
<div style="display: flex; justify-content: space-between; align-items: center;"> Disconnect IP Address ▲ Trace Route </div>	

Trace test starts automatically using the last IP address used or factory default. To enter a new IP address for Trace, press **F3 IP Address**. Enter the IP address of the destination you wish to trace. Press **# (Enter)** when complete, and the unit will automatically start the Trace test.

HTTP Test

The HTTP test will download the entered web page while displaying the percent downloaded and current download rate. The HTTP function will not be enabled if PPP did not succeed in logging in.

HTTP	
1	200 OK
2	100%
3	36.74 kbit/s

Disconnect IP Address ▲ HTTP

HTTP test starts automatically using the last IP address used or factory default. To enter a new IP address for HTTP, press **F3 IP Address**. Enter the IP address of the destination you wish to download. Press **# (Enter)** when complete, and the unit will automatically start the HTTP test.

FTP Test

The FTP test will download the file specified in the FTP address while displaying the percent downloaded and current download rate. The FTP function will not be enabled if PPP did not succeed in logging in.

FTP	
1	FTP downloading...
2	2%
3	823.89 kbit/s

Disconnect IP Address ▲ FTP

FTP test starts automatically using the last IP address used or factory default. To enter a new IP address for FTP, press **F3 IP Address**. Enter the IP address of the destination you wish to download. Press **# (Enter)** when complete, and the unit will automatically start the FTP test.

Saving Test Results

To save a modem connection result:

1. Press the **9 (Save)** key after the connection is successful. The menu bar will change to display the following features:
 - **F1 Save** saves the current connection result.
 - **F2 Recall** displays a previously saved connection result.
 - **F3 Delete** deletes a previously saved connection result.
 - **F4 Exit** returns to the previous menu.
2. Press **F1 Save**. Enter a name for the result with the keypad. Press a key repeatedly to rotate through the letters and numbers of the key.
3. Press **F4 Done** when complete.

Note: The saved record only contains the link level results. Results from the Upper Layer tests are not saved.

Displaying Saved Results

Test		Up	Down
Link Rate		32	3350
Max Rate		132	3736
Capacity		24.2	89.9
SNR Margin		6.1	8.0
Power		16.9	8.8
Attenuation		46.5	31.5
INP		0.00	0.00
INT. Delay		0	0
		Show Live Data	▲ Showtime

To display a saved modem connection result:

1. Press the **9 (Save)** key to enter the Save/Recall menu. The menu bar will change to display the following features:
 - **F1 Save** saves the current connection result.
 - **F2 Recall** displays a previously saved connection result.
 - **F3 Delete** deletes a previously saved connection result.
 - **F4 Exit** returns to the previous menu.
2. Press **F2 Recall**. The unit will provide a list of saved results.
3. Select the correct result using the up (**2**) and down (**8**) keys.
4. Press **F4 Select** when complete. The previously saved result will be displayed on the screen.
5. The up (**2**) and down (**8**) keys step to the next and previous result pages.
6. When finished examining the data, press the **F3 Show Live Data** key to return to live data.

APPENDIX A – ACRONYMS

ADSL	asymmetric digital subscriber line
ATM	asynchronous transfer mode
CHAP	challenge-handshake authentication protocol
FTP	file transfer protocol
HTTP	hypertext transfer protocol
INP	impulse noise protection
INT delay	interleave delay
LLCSNAP	logical link control sub-network access protocol
PAP	password authentication protocol
PPPoA	point-to-point protocol over ATM
PPPoE	point-to-point protocol over Ethernet
PTM	packet transfer mode
RFL	resistance fault locator
TDR	time-domain reflectometer
USB	universal serial bus
VCI	virtual circuit identifier
VCMUX	virtual circuit multiplexing
VDSL	very-high-bit-rate digital subscriber line
VPI	virtual path identifier
WAN	wide area network



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