TEXIO
Test and Measurement Solutions

INSTRUCTION MANUAL

Multiplex Scanner Box for STW-9000 Series

STW-S1 STW-S2

■ About Brands and Trademarks

"TEXIO" is the product brand name of our industrial electronic devices.

All company names and product names mentioned in this manual are the trademark or the registered trademark of each company or group in each country and region.

■ About the Instruction Manual

 Be aware that the product specifications and the contents of this manual are subject to change for the purpose of improvement.

CONTENTS

USING THE PRODUCT SAFELY

■ Preface

To use the product safely, read instruction manual to the end. Before using this product, understand how to correctly use it. If you read the manuals but you do not understand how to use it, ask us or your local dealer. After you read the manuals, save it so that you can read it anytime as required.

■ Pictorial indication

The manuals and product show the warning and caution items required to safely use the product. The following pictorial indication is provided.

Pictorial indication	
	Some part of this product or the manuals may show this pictorial indication. In this case, if the product is incorrectly used in that part, a serious danger may be brought about on the user's body or the product. To use the part with this pictorial indication, be sure to refer to the manuals.
 	If you use the product, ignoring this indication, you may get killed or seriously injured. This indication shows that the warning item to avoid the danger is provided. If you incorrectly use the product, ignoring this indication, you may get slightly injured or the product may be damaged. This indication shows that the caution item to avoid the danger is provided.

Please be informed that we are not responsible for any damages to the user or to the third person, arising from malfunctions or other failures due to wrong use of the product or incorrect operation, except such responsibility for damages as required by law.

USING THE PRODUCT SAFELY

■ Do not remove the product's covers and panels

Never remove the product's covers and panels for any purpose.
Otherwise, the user's electric shock or fire may be incurred.

■ Warning on using the product

Warning items given below are to avoid danger to user's body and life and avoid the damage or deterioration of the product. Use the product, observing the following warning and caution items.

■ Warning items on power supply

● Power supply voltage

The rated power supply voltages of the product are 100, 120, 220 and 240VAC. The rated power supply voltage for each product should be confirmed by reading the label attached on the back of the product or by the "rated" column shown in the instruction manual. The specification of power cord attached to the products is rated to 125VAC for all products which are designed to be used in the areas where commercial power supply voltage is not higher than 125VAC. Accordingly, you must change the power cord if you want to use the product at the power supply voltage higher than 125VAC. If you use the product without changing power cord to 250VAC rated one, electric shock or fire may be caused. When you used the product equipped with power supply voltage switching system, please refer to the corresponding chapter in the instruction manuals of each product.

● Power cord

(IMPORTANT) The attached power cord set can be used for this device only.

If the attached power cord is damaged, stop using the product and call us or your local dealer. If the power cord is used without the damage being removed, an electric shock or fire may be caused.

● Protective fuse

If an input protective fuse is blown, the product does not operate. For a product with external fuse holder, the fuse may be replaced. As for how to replace the fuse, refer to the corresponding chapter in the instruction manual. If no fuse replacement procedures are indicated, the user is not permitted to replace it. In such case, keep the case closed and consult us or your local dealer. If the fuse is incorrectly replaced, a fire may occur.

USING THE PRODUCT SAFELY

■ Warning item on Grounding

If the product has the GND terminal on the front or rear panel surface, be sure to ground the product to safely use it.

■ Warnings on Installation environment

● Operating temperature and humidity

Use the product within the operating temperature indicated in the “rating” temperature column. If the product is used with the vents of the product blocked or in high ambient temperatures, a fire may occur. Use the product within the operating humidity indicated in the “rating” humidity column. Watch out for condensation by a sharp humidity change such as transfer to a room with a different humidity. Also, do not operate the product with wet hands. Otherwise, an electric shock or fire may occur.

● Use in gas

Use in and around a place where an inflammable or explosive gas or steam is generated or stored may result in an explosion and fire. Do not operate the product in such an environment. Also, use in and around a place where a corrosive gas is generated or spreading causes a serious damage to the product. Do not operate the product in such an environment.

● Installation place

Do not insert metal and inflammable materials into the product from its vent and spill water on it. Otherwise, electric shock or fire may occur.

■ Do not let foreign matter in

Do not insert metal and inflammable materials into the product from its vent and spill water on it. Otherwise, electric shock or fire may occur.

■ Warning item on abnormality while in use

If smoke or fire is generated from the product while in use, stop using the product, turn off the switch, and remove the power cord plug from the outlet. After confirming that no other devices catch fire, ask us or your local dealer.

USING THE PRODUCT SAFELY

■ Input / Output terminals

Maximum input to terminal is specified to prevent the product from being damaged. Do not supply input, exceeding the specifications that are indicated in the "Rating" column in the instruction manual of the product. Also, do not supply power to the output terminals from the outside. Otherwise, a product failure is caused.

■ Calibration

Although the performance and specifications of the product are checked under strict quality control during shipment from the factory, they may be deviated more or less by deterioration of parts due to their aging or others.

It is recommended to periodically calibrate the product so that it is used with its performance and specifications stable. For consultation about the product calibration, ask us or your local dealer.

■ Daily Maintenance

When you clean off the dirt of the product covers, panels, and knobs, avoid solvents such as thinner and benzene. Otherwise, the paint may peel off or resin surface may be affected. To wipe off the covers, panels, and knobs, use a soft cloth with neutral detergent in it.

During cleaning, be careful that water, detergents, or other foreign matters do not get into the product.

If a liquid or metal gets into the product, an electric shock and fire are caused.

During cleaning, remove the power cord plug from the outlet.

Use the product correctly and safely, observing the above warning and caution items. Because the instruction manual indicates caution items even in individual items, observe those caution items to correctly use the product.

If you have questions or comments about the manuals, ask us or E-Mail us.

1. GETING STARTED

This chapter describes the scanner box in a nutshell, including its main features and front / rear panel introduction. After going through the overview, please read the safety considerations.

STW-S1

STW-S2

1-1. STW-S1/S2 Overview

The aim of these scanner boxes is to allow multiple DUTs to be tested either concurrently or in sequence using the STW-9900/9800 safety testers. The scanner boxes are particularly well suited for multi-point safety testing as well for volume testing on factory floors.
The STW-S1 has connections for ACW, DCW and IR testing, while the STW-S2 also includes support for GB testing.

Model	ACW	DCW	IR	GB	Outputs
STW-S1	✓	✓	✓		8 x HV
STW-S2	✓	✓	✓	✓	6 x HV, 2 x GB

1-1-1. Firmware Note

Please make sure the firmware is up to date before using the scanner boxes. Please see the user manual to check the firmware version.

STW-9800: firmware version V3.0 or higher
STW-9900: firmware version V2.0 or higher

Note

Throughout this user manual, the terms scanner box or STW will refer to either model (STW-S1/S2) unless specifically stated otherwise.STW-9000 will refer to any of the STW-9800, STW-9900 safety testers, unless stated otherwise.
HV and H will refer to High Voltage terminals, while LO and L will refer to the return terminal.

1-1-2. Main Features

Performance	• 8 HV outputs (STW-S1) • 6 HV outputs /2 GB outputs (STW-S2) • ACW: 5kV AC • DCW: 6kV DC • IR:1kV DC • GB: 40A (STW-S2 only)
Features	• PASS/FAIL LEDs • HI LO LEDs • Up to 4 scanner boxes can be connected
Interface	• RS-232C interface(Connect to STW-9000 only)

1-1-3. Accessories and Package Contents

Standard Accessories	Part number	Description	STW-S1	STW-S2
	N/A	User Manual CD	1	1
	Region dependent	Power cord	1	1
	GHT-108	Test lead	1	1
	GHT-109	GB Test leads		1
	GHT-116R	Scanner lead	8	6
	GHT-116B	Return lead	1	1
	GTL-116R	GB H leads		2
	GTL-116B	GB L leads		1
	GTL-235	RS-232C Cable	1	1

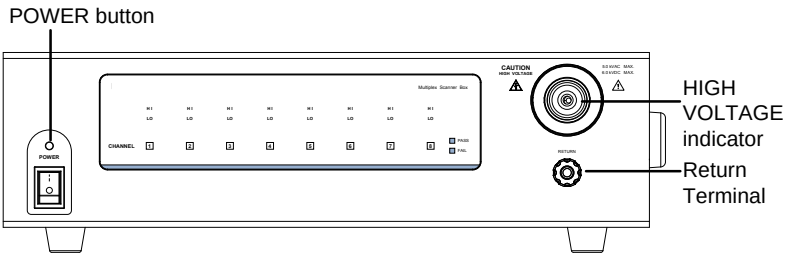
Note

Keep the packaging, including the box, polystyrene foam and plastic envelopes should the need arise to return the unit to us.

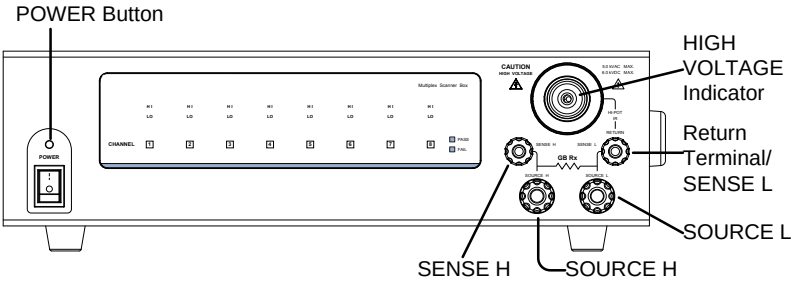
1-2. Appearance

1-2-1. Front Panel

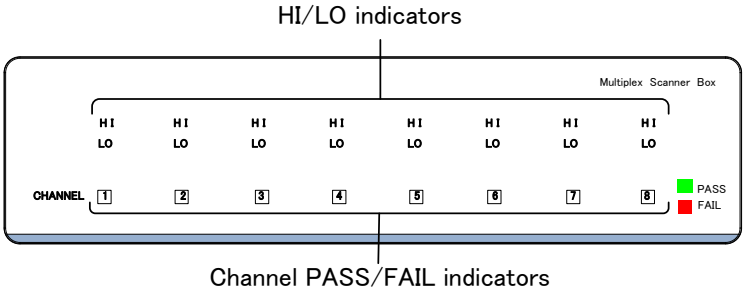
STW-S1 Front Panel



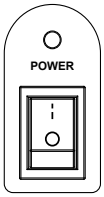
STW-S2 Front Panel



Display panel

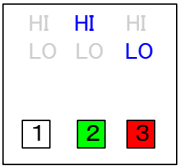


POWER switch



Turns the unit on or off. It is recommended that the unit is powered up before the connected safety tester is turned on.

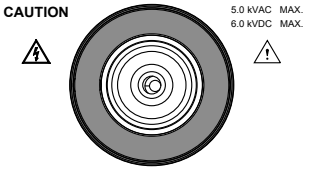
Channel Indicators / HI LO Indicators Pass Fail Indicators



The channel indicators indicate whether a channel is set to the HI or LO output.If neither HI nor LO is lit, it indicates that that channel is disabled. HI will be lit in the GB test.

The Channel Indicators will become lit green on a pass judgment or red on a fail judgment.

HIGH VOLTAGE terminal



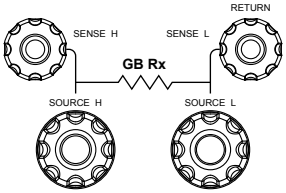
The HIGH VOLTAGE terminal is used for the testing voltage. The terminal is recessed for safety. This terminal is used in conjunction with the RETURN terminal.

WARNING **USE EXTREME CAUTION. Do not touch the HIGH VOLTAGE terminal during testing.**

RETURN terminal (STW-S1)

The RETURN terminal is used for IR, DCW and ACW tests.

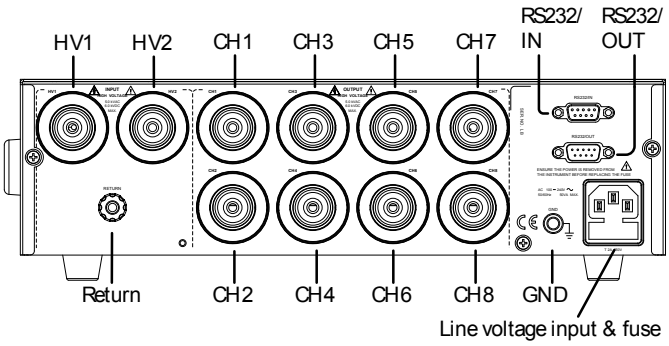
RETURN, SENSE and SOURCE terminals (STW-S2)



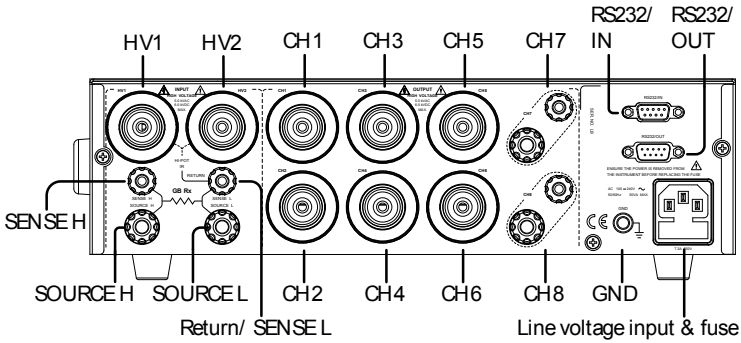
The RETURN terminal is used for IR, DCW and ACW tests.
The SOURCE H, SOURCE L, SENSE H and SENSE L terminals are used for GB tests.

1-2-2. Rear Panel

STW-S1



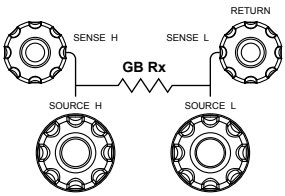
STW-S2



RETURN terminal (STW-S1)

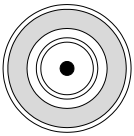
The RETURN terminal is used for IR, DCW and ACW tests.

RETURN, SENSE and SOURCE terminals (STW-S2)



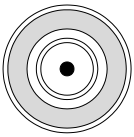
The RETURN terminal is used for IR, DCW and ACW tests.
The SOURCE H, SOURCE L, SENSE H and SENSE L terminals are used for GB tests.

HV1, HV2



The HV1 input terminal is used as the primary high voltage input for the scanner box. The HV2 output terminal is used to daisy chain the high voltage output to the next scanner when multiple scanner boxes are used together.

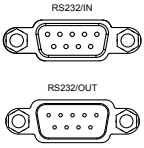
CH1 ~ CH8



These channels are connected to the DUTs that are to be tested. The output state is configured from the STW-9000 safety tester master.
Note: For the STW-S2 CH7 and CH8 are used for ground bond testing only.

RS232/IN

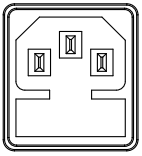
RS232/OUT



These two RS-232C interfaces are the communication links between the master (safety tester) to slave (scanner box). They are also used to connect multiple scanner boxes in a daisy chain.
In addition the RS232/IN port is also used to perform firmware updates.

Line voltage input

Line voltage fuse



Line voltage input: 90V - 264V AC, 50/60Hz.

Line voltage fuse:
T 2A/250V

GND

Connect the GND (ground) terminal to the earth ground to ensure operational safety.

1-3. Safety Considerations

1-3-1. Workplace Precautions

Background — The STW-9000 is a high voltage instrument that outputs dangerous voltages. The following section describes precautions and procedures that must be followed to ensure a safe work environment when STW-S1/STW-S2 is connected to the STW-9000 series safety testers.


WARNING — The STW-9000 generates voltages in excess of 5kVAC or 6kVDC. Follow all safety precautions, warnings and directions given in the following section when using the instrument with the scanner boxes.

1. Only technically qualified personnel should be allowed to operate the safety tester and scanner box(es).
2. The operating workplace must be fully isolated, especially when the instrument is in operation. The instruments should be clearly labeled with appropriate warning signage.
3. The operator should not wear any conductive materials, jewelry, badges, or other items, such as wrist watches.
4. The operator should wear insulation gloves for high voltage protection.
5. Ensure the earth ground of the line voltage is properly grounded.
6. Ensure any devices that are adversely affected by magnetic fields are not placed near the tester and scanner box(es).

1-3-2. Operating Precautions

Background — The STW-9000 is a high voltage instrument that outputs dangerous voltages. The following section describes precautions and procedures that must be followed to ensure that the tester along with any conned scanner boxes are operated in a safe manner.


WARNING — The STW-9000 generates voltages of up to 5kVAC or 6kVDC. Follow all safety precautions, warnings and directions given in the following section when using the instrument.

1. Never touch the safety tester, lead wires, terminals, probes, connected scanner box(es) or any other connected equipment when the tester is testing.

2. Do not turn the safety tester on and off quickly or repeatedly. When turning the power off, please allow a few moments before turning the power back on. This will allow the protection circuits to properly initialize.
   Do not turn the power off when a test is running, unless in an emergency.
3. Only use those test leads supplied with the instrument. Leads with inappropriate gauges can be dangerous to both the operator and the instrument. For GB testing, never use the Sense leads on the SOURCE terminals.
4. Do not short the HIGH VOLTAGE terminal with ground. Doing so could charge the chassis to dangerously high voltages.
5. Ensure the earth ground of the line voltage is properly grounded.
6. Only connect the test leads to the HIGH VOLTAGE/SOURCE H/SENSE H terminals before the start of a test. Keep the test leads disconnected at all other times.
7. Always press the STOP button when pausing testing.
8. Do not leave the safety tester unattended. Always turn the power off when leaving the testing area.
9. When remotely controlling the safety tester, ensure adequate safety measures are in place to prevent:
   - Inadvertent output of the test voltage.
   - Accidental contact with the instrument during testing. Ensure that the instrument and DUT are fully isolated when the instrument is remotely controlled.
10. Ensure an adequate discharge time for the DUT. When DCW or IR tests are performed, the DUT, test leads and probes become highly charged. The STW-9000 has discharge circuitry to discharge the DUT after each test. The time required for a DUT to discharge depends on the DUT and test voltage. Never disconnect the safety tester before a discharge is completed.

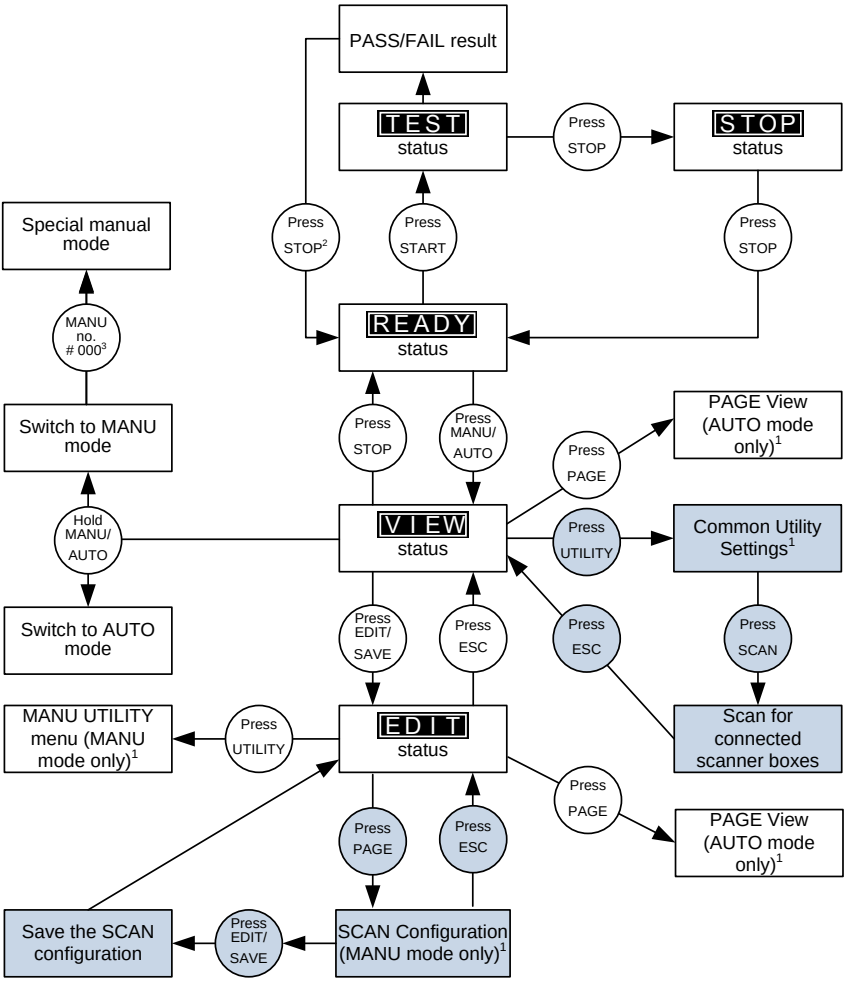
1-3-3. Basic Safety Checks

Background	The STW-S1/STW-S2 are used with high voltage devices and as such, daily safety checks should be made to ensure safe operation.
	1. Ensure all test leads are not broken and are free from defects such as cracks or splitting. 2. Ensure the scanner box(es) are always connected to an earth ground. 3. Test the operation of the safety tester + scanner box(es) with a low voltage/current output: Ensure the safety tester generates a FAIL judgment when the HIGH VOLTAGE and RETURN terminals are shorted (using the lowest voltage/current as the testing parameters).
 WARNING	Do not use high voltages/currents when the HIGH VOLTAGE and RETURN terminals are shorted. It may result in damage to the instrument.

2. OPERATION

2-1. Menu Tree Additions

When the scanner boxes are added to the STW-9000 safety tester the scan utility and the scanner configuration menu become available. These additional menu functions are highlighted in the menu tree below.



1 Press EDIT/SAVE to save settings, or ESC to cancel and return to the previous screen.
2 Press the STOP key twice for a FAIL result.
3 When in MANU mode, selecting MANU number 000 will enter the special manual mode.
4 The Sweep mode function is only accessible in the special manual mode.

2-2. Test Lead Connection

This section describes how to connect the STW-9000 to a number of scanner boxes. It is recommended that only models of the same type are connected together.

2-2-1. Connecting STW-S1 Units

Background

The following will describe how to connect scanner boxes to a STW-9000 safety tester. Up to 4 scanner boxes can be connected. In the examples below only 4 scanner boxes are connected.
When connected, all the high voltage and all the return terminals will have been connected in a daisy chain manner.

WARNING

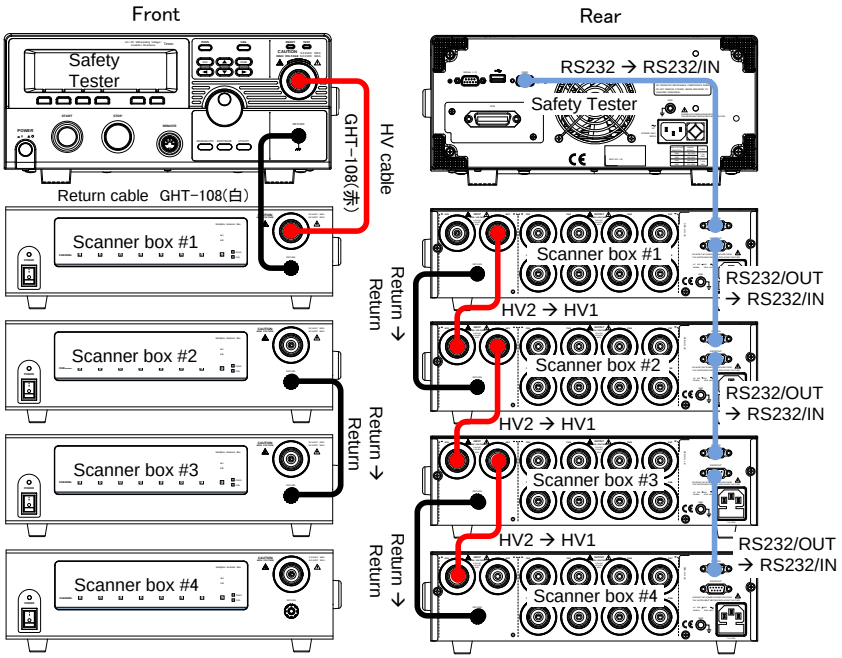
Ensure the safety tester is off when connecting the scanner boxes to the safety tester.

Front Panel

1. Connect the High Voltage terminal on the safety tester to the High voltage terminal on the 1st scanner box, as shown below.(GHT-108 Red)
2. Connect the return terminal on the safety tester to the return terminal on the 1st scanner box.(GHT-108 White)
3. Connect the return terminal on the 2nd scanner box to the return terminal on the 3rd scanner box.
   RETURN(box#2) → RETURN(box#3)

Rear Panel

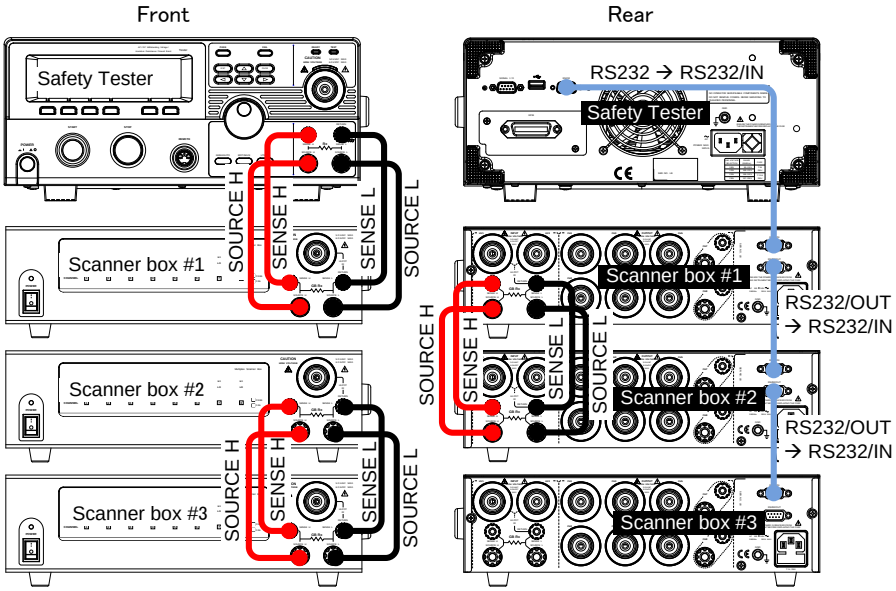
1. Connect the rear panel HV terminals on the scanners in a daisy chain manner.
   HV2 (box #1) → HV1 (box #2)
   HV2 (box #2) → HV1 (box #3)
   HV2 (box #3) → HV1 (box #4)
2. Connect the Return terminals in series to each connected scanner box.
   RETURN(box#1) → RETURN(box#2)
   RETURN(box#3) → RETURN(box#4)
3. Connect the RS232 ports from the safety tester to each scanner box in a daisy chain using the RS232C cables.
4. RS232 (STW-9000) → RS232/IN (box #1)
   RS232/OUT (box#1) → RS232/IN (box #2)
   RS232/OUT (box#2) → RS232/IN (box #3)
   RS232/OUT (box#3) → RS232/IN (box #4)



2-2-2. Connecting STW-S2

Background	The following will describe how to connect scanner boxes to a STW-9000 series safety tester with ground bond test support. Up to 4 scanner boxes can be connected. In the examples below only 3 scanner boxes are connected.
Front Panel	1. Connect the SOURCE H and SOURCE L terminals on the safety tester to the same terminals on the 1st scanner box. 2. Connect the SENSE H and SENSE L terminals on the safety tester to the same terminals on the 1st scanner box.
Rear Panel	1. Connect the SOURCE H and SOURCE L terminals on the 1st scanner box in series to the same terminals on the 2nd and 3rd scanner box. 2. Connect the SENSE H and SENSE L terminals on the 1st scanner box in series to the same terminals on the 2nd and 3rd scanner box.

3. Connect the RS232 ports from the safety tester to each scanner box in a daisy chain using the RS-232C cables.
   RS232 (safety tester) → RS232/IN (box #1)
   RS232/OUT (box#1) → RS232/IN (box #2)
   RS232/OUT (box#2) → RS232/IN (box #3)



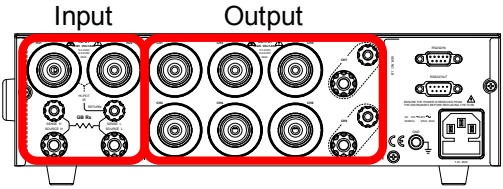
2-2-3. DUT Connection

Background

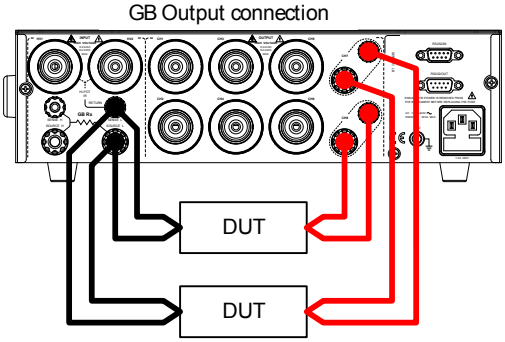
The terminals on the rear panel of the scanner boxes are divided into two sections, input and output.
The input section is used (as shown previously) to daisy chain scanner boxes together.
The output section is used to connect up to 8 DUTs.
The STW-S1 is only used for DCW, ACW and IR testing. The STW-S2 (shown) replaces two high voltage terminals with a pair of SENSE H/SOURCE H terminals for GB testing.
For all 8 channels (STW-S1) or channel 1~6(STW-S2) the terminals can be assigned as either HV or LO (High voltage or return) terminals on the STW safety tester. This allows the scanner boxes to be quite flexible to your testing needs.

NOTE

The GB outputs (channel 7 and 8) can only be configured as HI terminals or be disabled.

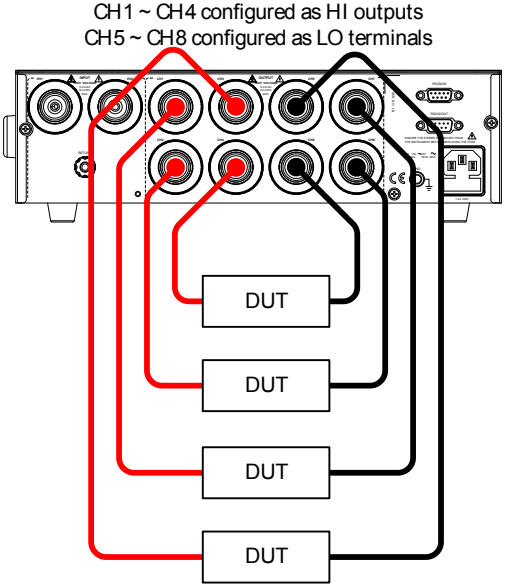
Input and Output Areas on the Rear Panel (STW-S2)	
Examples	Below are some possible DUT test setups as examples. Note that you are not limited to those shown below.

Example 1: GB connection with common LO terminals.



GTL-116B/GTL-116R/GTL-115

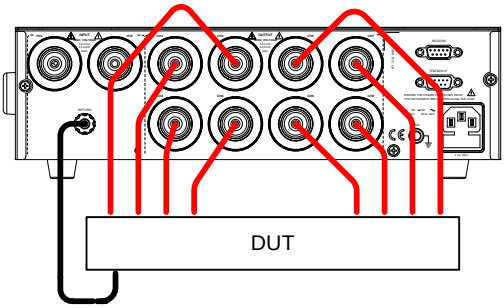
Example 2: IR, ACW, DCW connection with separately configured HI & LO terminals.



GHT-116R/GHT-116B

Example 3: IR, ACW, DCW connections with common return terminal.

CH1 to CH8 configured as HI



GHT-116R/GHT-116B

2-3. Start Up Procedure

2-3-1. Startup

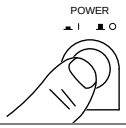
Background

The power up sequence as well as the connections between each scanner box and the safety tester are critical to operate the scanners correctly.

Steps

1. Make sure the safety tester and all scanner boxes are turned off.
2. Connect each scanner box to a master safety tester in a daisy chain, as shown on page 11.
   - Make sure the RS-232C cables are connected to the correct ports.
   - Make sure the Input and Output cables are connected properly.
3. Turn on the scanner boxes from the power switches. Each power LED will be lit red.

4. Turn the STW-9000 power on. It is essential that the STW-9000 is turned on after the scanner boxers.



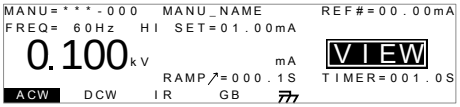
Startup Screen

2-3-2. Connection Check

Background The scanner connection can be checked in the Common Utility menu.

Steps

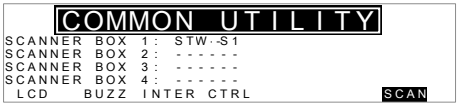
1. Ensure the tester is in VIEW status.



2. Press the UTILITY key.

3. Press the SCAN soft-key to view any connected scanner boxes. Any scanner boxes will be displayed in order from 1 to 4.

Example



In the example above, only one scanner box (model: STW-S1) is connected.

Note If the any connected scanners are not properly connected they will not appear in the Scan Utility.

2-4. Creating a Test Setup

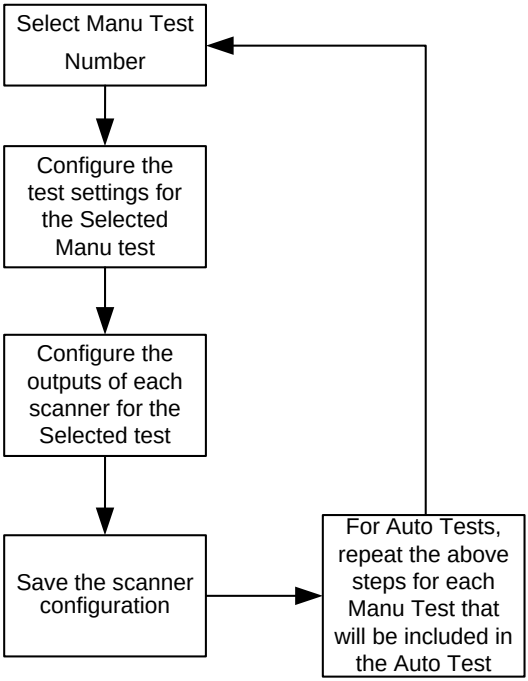
This section describes how to create, edit and run tests using the scanner box interfaces. In principal we will be showing you how to configure the output terminals on the scanner box rear panel. For the STW-S1, each terminal can be configured as either an HV output (hereafter referred to as HI) or as a return terminal (hereafter referred to as LO). For the STW-S2, channels 1 to 6 can be configured to HI or LO terminals as well. However for channels 7 and 8, the STW-S2 can also configure these channels into pairs of Source/Sense HI.
Thus each terminal on the scanner boxes must be configured based on the desired test setup, as referred to in the previous chapter on page 11.

Note Setting the test settings, test mode and general operation will not be discussed in this manual. Please see the STW-9000 User Manual for more operation details.

- Before operating the safety tester please read the safety precautions as outlined in the Safety Considerations chapter on page 7.

2-4-1. Scanner Box Test Creation Workflow

Background — The flowchart below shows the basic workflow for creating tests for the scanner boxes.



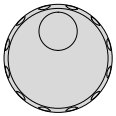
2-4-2. Select a Manual Test

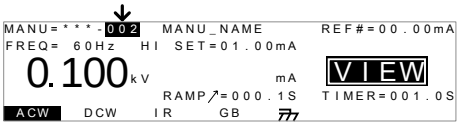
Background — To edit any of the manual test settings, the tester must be in EDIT status.
Any settings or parameters that are edited only apply to the currently selected MANU number.

Steps

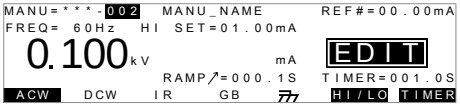
1. If the tester is in AUTO mode, press and hold the MANU/AUTO key for three seconds to switch to MANU mode.

2. The tester can only switch between AUTO and MANU mode when in the VIEW status.
3. Use the scroll wheel to set the MANU number.





4. Press the EDIT/SAVE key when in VIEW status to enter the EDIT status. This will enter the EDIT status for the chosen test number only.



5. The Status changes from VIEW to EDIT.

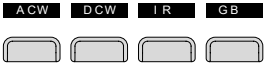
⚠ Note	Pressing the EDIT/SAVE key again will save the settings for the current test and return back to VIEW status.

2-4-3. Configure the Manual Test Settings

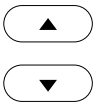
Background — After a MANU number has been chosen and the tester is in EDIT status, the settings for the current manual test can be configured.

Steps

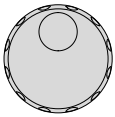
1. To choose the test function, press the ACW, DCW, IR or GB soft-keys.



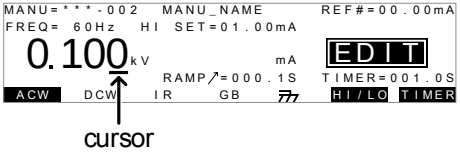
2. The test function soft-key is highlighted.
3. Press the UP / DOWN arrow keys to bring the cursor to a function setting.



4. Use the scroll wheel to set the value of the function setting.



Example



5. Repeat steps 3 and 4 for the remaining settings.
6. Press the EDIT/SAVE key to save and save the manual test and go back to VIEW status.

Note	For detailed instructions on how to set the various function settings, please see the user manual.

2-4-4. Configuring the Scanner Box Outputs

Background

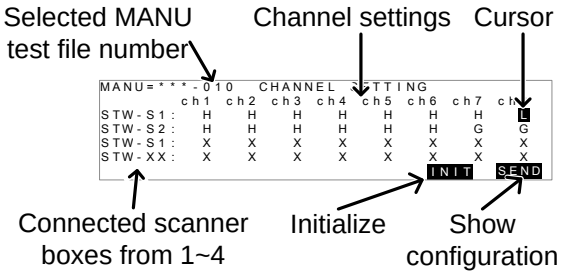
The scanner box output is configured separately for each manual test. This allows you to have one manual test to test multiple DUTs at the same time from a number of scanner boxes.

For automatic tests, each manual test can be seen as configuring the output of one step of the automatic test.

This section will assume that you are only configuring a single manual test. For automatic tests, repeat the instructions below for each manual test that is added to the automatic test.

Note	For the STW-S2, the GB outputs can only be set to G or disabled.
Note	The following settings will only apply to the current manual test.

Overview

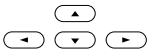


Steps

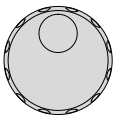
1. Press the EDIT/SAVE key when in VIEW status to enter the EDIT status. This will enter the EDIT status for the currently selected manual test.

2. Press the PAGE key to bring up the Scanner Configuration Page view for the currently selected manual test.

3. Press the UP/DOWN and LEFT/RIGHT arrows keys to move the cursor to the desired channel and scanner box.

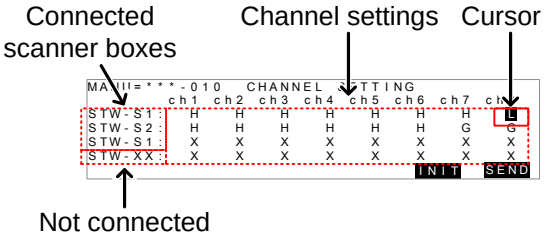


4. Use the scroll wheel to set the selected channel on the selected scanner box as H or L or G or X.



	H	Sets the channel as a HV terminal
	L	Sets the channel as a return terminal
	G	Source H/Sense H terminals for ch7/8 at STW-S2
	X	Disables the channel

Example



In the example above scanner box#1 has ch1~7 configured as H and ch8 configured as L. Scanner box#2 has ch1~8 configured as H.

5. Press the EDIT/SAVE key to save the scanner output settings for the current manual test.

6. A test can now be started, see page on 21 to get started.

Initialize

7. Pressing the INIT key will initialize all the channels to “X”, disabling all the channels.

Send

8. Pressing SEND will output the channel settings onto the connected scanner boxes.

Note

If a number of terminals are turned on at the same time, then the voltage/current that is set on the safety tester must be divided by the number of channels that are turned on for the test. For example, if channels 1 to 3 are turned on for an ACW test, then the test current must be divided by 3 to determine the result from each channel (assuming identical DUTs).

2-4-5. Running a Manual Test

Background A test can be run when the tester is in READY status.

Note

The tester cannot start to run a test under the following conditions:

- A protection setting has been tripped; when a protection setting has been tripped the corresponding error message is displayed on the screen.
- The INTERLOCK function is ON and the Interlock key is not inserted in the signal I/O port.
- The STOP signal has been received remotely.

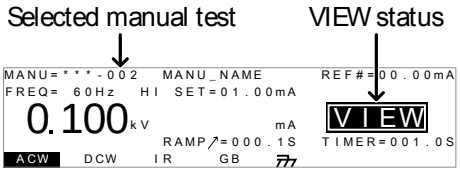
If Double Action is ON, ensure the START button is pressed immediately after the STOP button (<0.5s).

Note

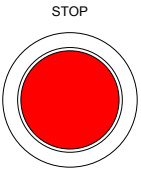
When a test is running the voltage output cannot be changed, unless the test is under the special manual mode.

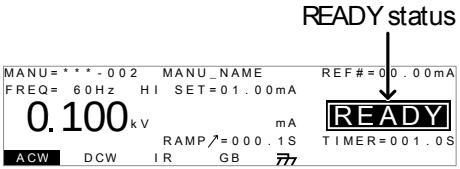
Steps

1. Ensure a MANU test is selected and the tester is in VIEW status.

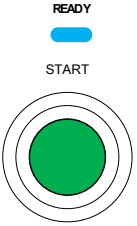


2. Press the STOP button to put the tester into the READY status.

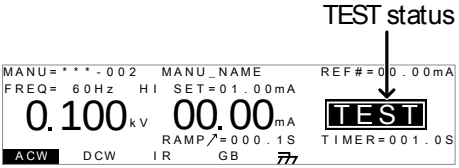




3. The READY indicator will be lit blue when in the READY status.
4. Press the START button when the tester is in the READY status. The manual test starts automatically and the tester goes into the TEST status.

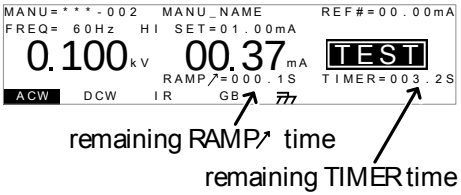


5. The TEST indicator will be lit orange when in the TEST status.



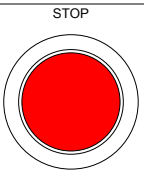
6. The HI or LO indicators of the channels that are turned on for the manual test will be shown on the respective scanner boxes.

7. The test will start by showing the remaining ramp up time, followed by the remaining test time. The test will continue unit the test is finished or the test is stopped.

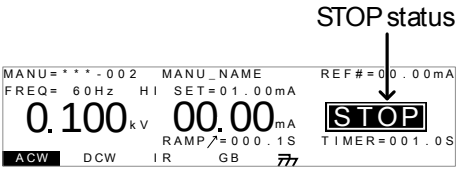


Stop the Test

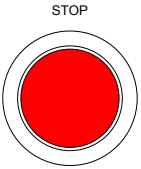
1. To stop the test at any time when it is running, press the STOP button. The test will stop immediately. When the STOP button is pressed, a judgment is not made on the test.



All panel keys except the STOP button are locked when the tester is in STOP status.

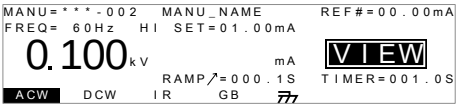


2. To put the tester back into READY status, press the STOP button again.



Exit TEST Status

To exit testing, press the MANU/AUTO key when the tester is in the READY status. The tester will revert to the VIEW status for the current test.



Note

Do not touch any terminals, test leads or any other connections when the test is on.

2-4-6. MANU Test Results

Background

If the test is allowed to run to completion (the test is not stopped or a protection setting is not tripped) then the tester will judge the test(s) as either PASS or FAIL.

The pass/fail result of the test(s) is shown on the safety tester display and the scanner box(s).

Please note that when multiple DUTs are tested simultaneously and a fail result is produced, it indicates that at least one DUT failed the test. It doesn't indicate which of the DUTs passed or failed. Each DUT would have to be tested separately to determine that.

Note

The test will be judged PASS when:

- The HI SET and LO SET limits have not been tripped during the test time.

The test will be judged FAIL when:

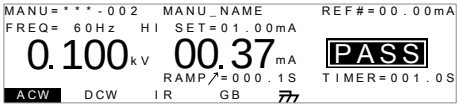
- Either the HI SET or LO SET limit has been tripped during the test time.
- A protection setting has been tripped during the test time.

Test may not finish if the scanner boxes are not properly connected.

PASS Judgment

1. When the test is judged as PASS, PASS will be displayed, the buzzer will sound, the PASS indicator will be lit green and the channel indicator will be lit green.

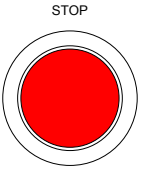
Safety tester example



Scanner display example

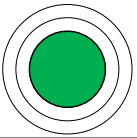
Pass

2. The PASS judgment will be held on both the safety tester and scanner displays until the STOP or START button is pressed.
3. Pressing the STOP button will return the tester to the READY status.



4. Pressing the START button will restart the test.

START



Note

The buzzer will only sound if the Pass Sound is set to ON.
The START button is disabled when the buzzer is beeping.

FAIL Judgment

1. When the test is judged as FAIL, FAIL will be displayed on the safety tester, the FAIL indicator will be lit red, the channel indicator on the scanner will be lit red and the buzzer will sound.
2. As soon as a test is judged FAIL, power is cut from the terminals.

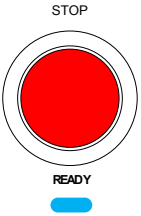
FAIL

Safety tester example

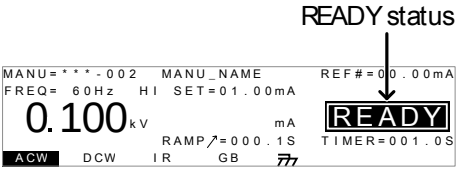
Scanner display example

Fail

3. The FAIL judgment will be held on the safety tester display and the scanner(s) until the STOP button is pressed. Pressing the STOP button twice will return the tester to the READY status.



4. The READY indicator will be lit blue in the READY status.



Note

The buzzer will only sound if Fail Sound is set to ON.

2-5. Automatic Tests

This section describes how to create and run automatic tests for the STW-S1/STW-S2 scanner boxes.

An automatic test comprises of up 16 MANU tests that are run sequentially. In order to run an automatic test using the STW-S1/STW-S2 scanner boxes, the *scanner outputs for each manual test must first be configured,* and then each manual test in the automatic test can be stepped through. In other words, the channel outputs are directed by the manual tests that comprise the automatic test.

It is assumed that you have read and understood how to create an automatic test on the STW-9000 safety tester. If you are not sure how to create and run an automatic test on the safety tester, please see the STW-9000 user manual.

Before operating the STW-9000 please read the safety precautions as outlined in the Set Up chapter on page 7.

2-5-1. Create an Automatic Test

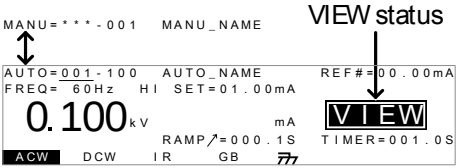
Background

It is assumed that you already know how to create an automatic test. This section will only give the essential instructions for creating an automatic test. For more comprehensive details, please see the GTP-9000 user manual.

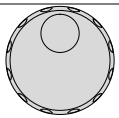
Steps

1. If the tester is in MANU mode, press and hold the MANU/AUTO key for three seconds. This will put the tester into Auto mode.

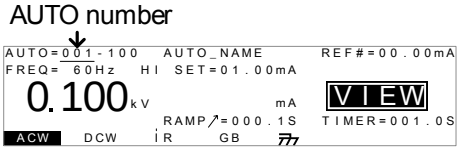
2. The tester can only switch between AUTO and MANU mode when in the VIEW status.



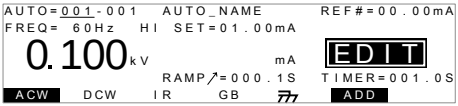
3. Use the scroll wheel to choose the AUTO number.



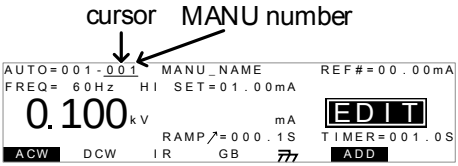
AUTO # 001~100



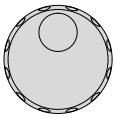
4. Press the EDIT/SAVE key when in VIEW status to enter the EDIT status. This will enter the EDIT status for the chosen AUTO number.



5. Press the DOWN arrow keys to bring the cursor to the MANU number, if it is not already.



6. Use the scroll wheel to choose a MANU number to add to the automatic test.



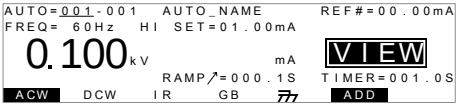
MANU number 001~100

7. Press the ADD soft-key to add the selected manual test to the automatic test as another step.

8. Repeat steps 5 and 6 for any other tests that you wish to add to the automatic test.
9. A maximum of 16 steps can be added. FULL will be displayed when 16 steps are added.

Note	The test order can be edited in the Page View menu after the AUTO test is saved. See the user manual for details.

10. When in EDIT status, press the EDIT/SAVE key to save the automatic test. After the test is saved the tester will revert back to VIEW status.



Note	Pressing the EDIT/SAVE key again will return the tester back to EDIT status for the selected AUTO test.

2-5-2. Running an Automatic Test

Background

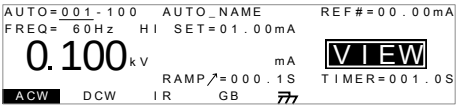
Running an automatic test with the STW-S1/S2 scanner boxes is the same as running an automatic test without them.

Note	The tester cannot start to run an AUTO test under the following conditions: • Any protection modes have been tripped. • The INTERLOCK function is ON and the Interlock key is not inserted in the signal I/O port. • The STOP signal has been received remotely. If Double Action is ON, ensure the START button is pressed immediately after the STOP button (<0.5s).

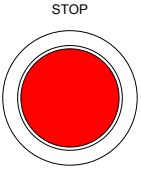
Warning	Do not touch any terminals, test leads or the DUT when a test is running.

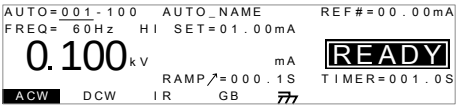
Steps

1. Ensure the tester is in VIEW status.



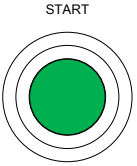
2. Press the STOP button to put the tester into the READY status.





3. The READY indicator will be lit blue when in the READY status.

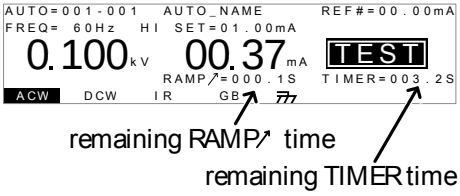
4. Press the START button when the tester is in the READY status. The AUTO test starts automatically and the display changes to TEST status.



5. The TEST indicator will be lit orange when in the TEST status.

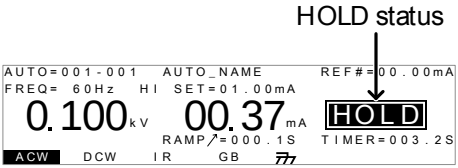
6. The HI or LO indicators of the channels that are turned on for the current step of the test will be shown on the respective scanner boxes.

7. Each test will start by showing the remaining ramp up time, followed by the remaining test time. Each manual test of the automatic test will be tested in sequence until the last test has finished or the test is stopped.



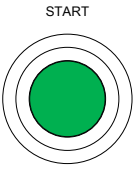
PASS/FAIL HOLD

1. If Pass Hold is set to ON or Fail Mode is set to HOLD for a manual test, then the tester will “hold” the testing after a Pass/Fail result for that particular test.

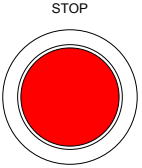


2. The PASS or FAIL indicator will also be lit on the safety tester and the corresponding channel indicator will be lit red or green on the scanner box(es). The buzzer will NOT sound.

3. To continue to the next test after HOLD is displayed on-screen, press the START button.



4. To stop the test when HOLD is displayed on-screen, press the STOP button.

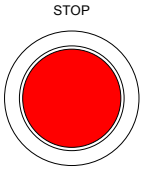


Note

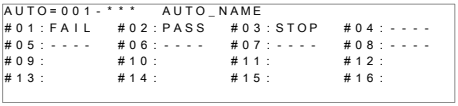
When in HOLD status, only the START and STOP buttons can be pressed, all other keys are disabled.

Stop a Running Test

1. To stop the AUTO test at any time when it is running, press the STOP button. The AUTO test will stop immediately. When the STOP button is pressed, a judgment is not made on the current test and any remaining tests are aborted.

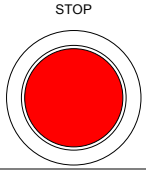


All panel keys except the STOP and START buttons are locked when the tester has been stopped. All the results up until when the AUTO test was stopped are shown on-screen.



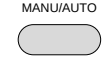
Example of an automatic test that has been stopped. Dashes (-) indicate aborted test steps.

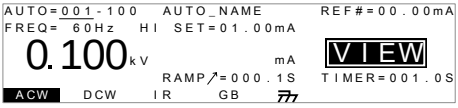
2. To put the tester back into READY status, press the STOP button again.



Exit Testing

To exit testing, press the MANU/AUTO key when the tester is in the READY status. The tester will revert to the VIEW status for the current automatic test.



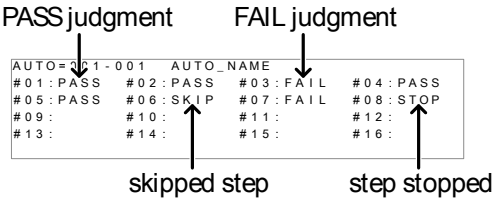


2-5-3. Automatic Test Results

Background

If all the test steps are allowed to run to completion (the AUTO test is not stopped or a protection setting is not tripped) then the tester will judge each step as either PASS or FAIL. This is shown as a table after the automatic test has finished running. If the test has been stopped, then any remaining tests will not be run and thus the AUTO test will not finish running.

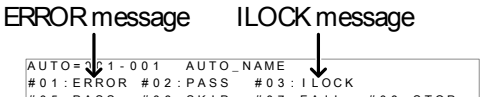
Overview



Note

The PASS/FAIL judgment for an automatic test as a whole depends on the results of all the steps (manual tests) that compose the automatic test:

- Each step must be passed for a PASS judgment (excluding skipped tests).
- A FAIL result for a single step will result in FAIL for the whole automatic test.
- A STOP. No step can be stopped for a PASS/FAIL judgment to be made. In other words, if a test is stopped, it is judged as neither PASS nor FAIL.
- No step can contain an ERROR or ILOCK message.

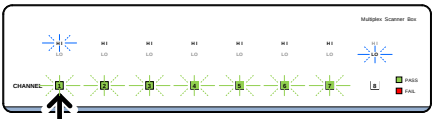


ERROR: Indicates that V, I or R is not correct. This usually occurs if the testing leads are not properly connected.

ILOCK: Indicates that the interlock key is disconnected (if configured to be used).

PASS Judgment

When all the tests have been judged as PASS, the PASS indicator will be lit green, each channel used in the test will be lit green and the buzzer will sound.



Green channel indicators, indicating a pass

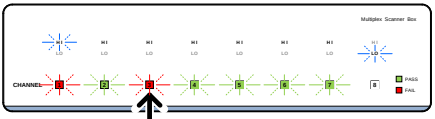
Example

```
AUTO=001-***   AUTO_NAME
#01:PASS   #02:PASS   #03:PASS   #04:PASS
#05:PASS   #06:PASS   #07:PASS   #08:PASS
#09:       #10:       #11:       #12:
#13:       #14:       #15:       #16:
```

Note The Pass Sound setting must to set to ON for the buzzer to sound.

FAIL Judgment

When any of the tests have been judged as FAIL, the FAIL indicator will be lit red, the channel indicator for the failed channel(s) will be lit red and the buzzer will sound.



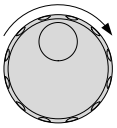
Red channel indicators, indicating a fail

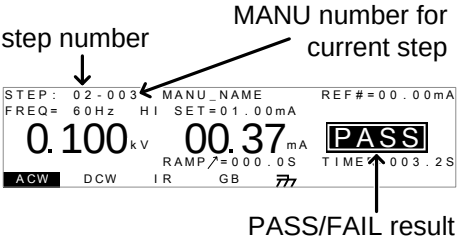
```
AUTO=001-***   AUTO_NAME
#01:FAIL   #02:PASS   #03:FAIL   #04:PASS
#05:PASS   #06:PASS   #07:PASS   #08:PASS
#09:       #10:       #11:       #12:
#13:       #14:       #15:       #16:
```

Note The Fail Sound setting must to set to ON for the buzzer to sound.

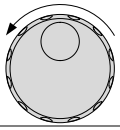
View Results

1. When the PASS or FAIL overview table is shown on the screen, turn the scroll wheel right to scroll through each test step.



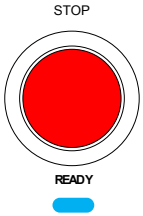


2. Turn the scroll wheel left to return back to the overview table.



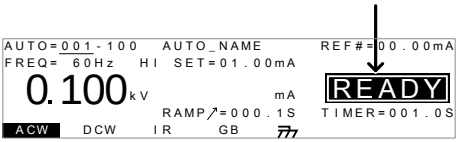
Return to Ready Status

1. The PASS/FAIL results will be held on the screen until the STOP button is pressed.
2. To put the tester back into READY status, press the STOP button (twice for a fail result).



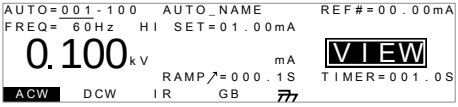
3. The READY indicator will be lit blue in the READY status.

READY status



Exit Testing

4. To exit testing, press the MANU/AUTO key when the tester is in the READY status. The tester will revert to the VIEW status.



2-6. Common Utility Settings

The Common Utility settings are system-wide settings that apply to both MANU tests and AUTO tests. The scanner boxes introduce one new interface setting.

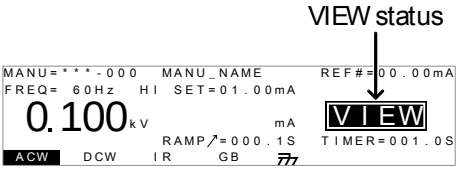
2-6-1. Scanner Box Interface Settings

Description

The interface settings choose the remote interface configuration. USB, RS-232C and GP-IB (optional) can be selected. With the scanner box(es) installed, remote control is only possible via USB.
The RS-232C interfaces are used to link the scanner boxes to the safety tester.

Steps

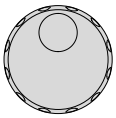
1. Ensure the tester is in VIEW status. Save the current test if necessary.



2. Press the UTILITY key.

3. Press the INTER soft-key to bring up the Interface Common Utility menu.

4. Use the scroll wheel to select SCANNER BOX.



5. Press EDIT/SAVE to save the settings and exit to VIEW status.

Note The baud rate setting is fixed to 115200 baud.

Note When Interface is set to SCANNER, the remote interface is automatically set to USB.

Note The ESC key can be pressed at any time to cancel and exit back to VIEW status.

2-7. REMOTE CONTROL

This chapter describes remote control commands for STW-S1/S2 via STW-9000.

Please refer to the instruction manual of the STW-9000 for remote control .

2-7-1. GSB:CLR

Set →

Description	Clear the configuration and LED results of the scanner box.	
Syntax	GSB:CLR	
Note	It works only in VIEW status or READY status.	

2-7-2. GSB:SCAN

→ Query

Description	Check connected scanner boxes.	
Query Syntax	GSB:SCAN?	
Return parameter	<string>	The data is returned in the following format. <1st>,<2nd>,<3rd>,<4th> 01:STW-S1,02:STW-S2,XX:Not connected
Example	GSB:SCAN? >01,02,XX,XX 1st:STW-S1,2nd:STW-S2,3rd::none,4th:none	
Note	It works only in VIEW status or READY status.	

2-7-3. GSB<x>:CHANnel

→ Query

Description	respond the setting state of the scanner boxes.	
Query Syntax	GSB<x>:CHANnel?	
Parameter	<X>	1～100 (MANU Number)
Return parameter	<string>	The data is returned in the following format. 12345678<cr><lf> STW-S2:HXXHXXXX<cr><lf> STW-S1:XLXXXLXX<cr><lf> STW-XX:XXXHXXXX<cr><lf> STW-XX:XXXHXXXX<cr><lf> Line1:Index,Line2 - Line5: Connection status. X:off H:Connect to HV/H L:Connect to Return G:Connect to GB Test

Note	It works only in VIEW status or READY status. It is five lines of response, please received until the last.

2-7-4. GSB:MEASure → Query

Description	It responds aggregation of test results in the scanner box when the test has been completed.	
Query Syntax	GSB:MEASure？	
Return parameter	<string>	The data is returned in the following format. 12345678<cr><lf> STW-S2:PXXPXXXX<cr><lf> STW-S1:XFXXXFXX<cr><lf> STW-XX:XXXXXXXX<cr><lf> STW-XX:XXXXXXXX<cr><lf> Line1:Index Line2 - Line5: test results. X:Test off P:PASS F:FAIL
Note	It works only in VIEW status or READY status. Result of PASS / FAIL for each channel will be overwritten. The test results can not be cleared by the "GSB: CLR" command. It is five lines of response, please received until the last.	

2-7-5. GSB<x>:HI → Set / → Query

Description	Make the HI or GB setting in channel settings of the scanner box that is set to MANU test.	
Syntax	GSB<x>:HI <string>	
Query Syntax	GSB<x>:HI?	
Parameter/ Return parameter	<X>	1～100 (MANU number)
	<string>	“S”+8 char HEX code from Binary data. HI:1,Other:0 1st:CH1,CH2・・CH8,2nd:CH1,・・4th:CH8
Example1	GSB1:HI S80000000 1st:CH1=HI,other= off	
Example2	GSB1:HI SFF000000 1st:ch1 – ch8 = HI or GB,other=off	
Note	It works only in VIEW status or READY status.	

Set →

2-7-6. GSB<x>:LOW

→ Query

Description	Make the LOW setting in channel settings of the scanner box that is set to MANU test.	
Syntax	GSB<x>:LOW <string>	
Query Syntax	GSB<x>:LOW?	
Parameter/	<X>	1～100 (MANU number)
Return parameter	<string>	“S”+8 char HEX code from Binary data. LOW:1,Other:0 1st:CH1,CH2・・CH8,2nd:CH1,・・4th:CH8
Example1	GSB1:LOW S80000000 1st:CH1=LOW,other= off (Setting of the Low by GSB<x>:HI command)	
Example2	GSB1:LOW SFF000000 1st:ch1 – ch8 = Low,other=off (Setting of the HI by GSB<x>:HI command)	
⚠ Note	It works only in VIEW status or READY status. If you want to set to LOW the specified channel, you must have a 0 in the corresponding bit of the HI.	

3. FAQ

- I get a scanner error when I run a test.
- The tester will stop testing midway through an automatic test.
- When I press the START button the tester will not start testing?

- **I get a scanner error when I run a test.**

  A scanner error indicates that the HV and return terminals haven't been properly connected between the safety tester and the scanner(s).

- **The tester will stop testing midway through an automatic test.**

  You may have PASS HOLD turned on or FAIL MODE set to HOLD. Press the Start button to continue to the next test. See the user manual for setting details.

- **When I press the START button the tester will not start testing?**

  The tester must first be in the READY status before a test can be started. Ensure the tester displays READY before pressing the START button.
  If "Double Action" is enabled, the START button must be pressed 0.5 seconds after the STOP button is pressed, otherwise the tester will not start testing.
  If "Interlock" is enabled, the interlock key must be inserted into the signal I/O port on the rear before a test can be started.
  Lastly, ensure that the Start Ctrl setting is correctly configured in the Common Utility menu. For example, to enable the START button to start a test, ensure that the Start Ctrl setting is set to FRONT PANEL.

  For more information, contact your local dealer or us.
  www.texio.co.jp / info@texio.co.jp

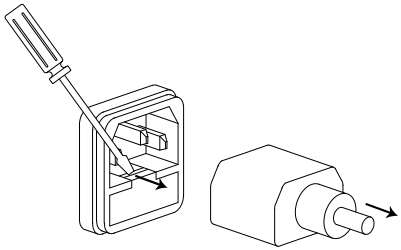
4. APPENDIX

4-1. Fuse Replacement

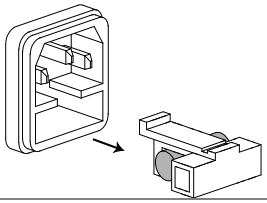
Steps

1. Turn the instrument off.

2. Take off the power cord and remove the fuse socket using a minus driver.



3. Replace the fuse in the fuse holder.



Rating	100V~240V	T2A 250V

4-2. Error Messages

The following error messages or messages may appear on the STW screen when configuring or running tests.

Error Messages	Description
SCANNER ERR	Indicates that there is a problem with the scanner connection.

4-3. Specifications

The specifications apply when the STW-S1/S2 is powered on for at least 30 minutes at 15˚C~35˚C.

Scanner

Model	STW-S1	STW-S2
High Voltage Rating	5kV AC/6kV DC	5kV AC/6kV DC
High Current Rating		40A AC
Number of HV channels	8	6
Number of GB channels	None	2
System Interface	RS-232C	
Power Source	AC 100-240V ±10%, 50/60Hz	50VA MAX

Other

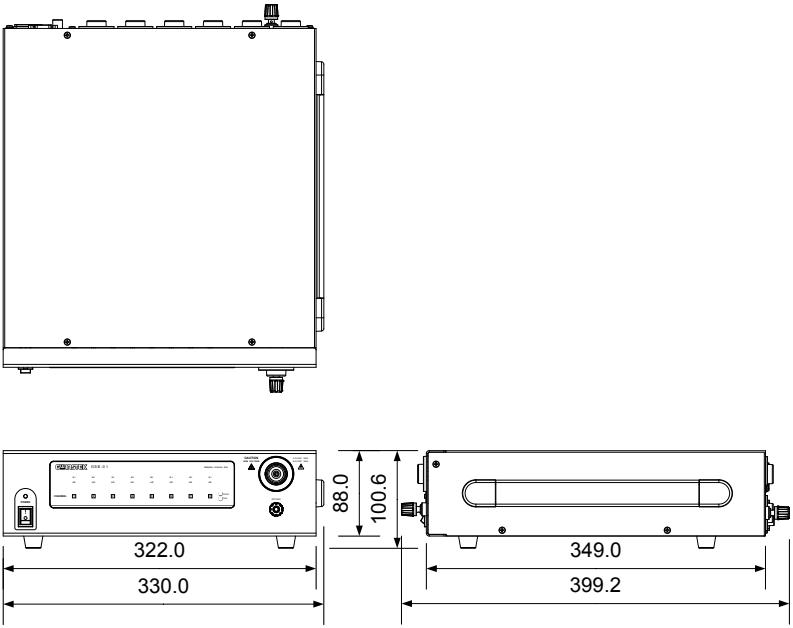
Operation Environment	Indoor use, altitude up to 2000m Ambient temperature 0°C to 40°C Relative humidity 70% Installation category II Pollution degree 2 Measurement category II	
Storage Temperature & Humidity	-10°C to 70°C, 85% RH	
Dimensions	330(W) x 101(H) x 399(D)	330(W) x 101(H) x 413(D)
Weight	Approx. 5.5kg	


Note

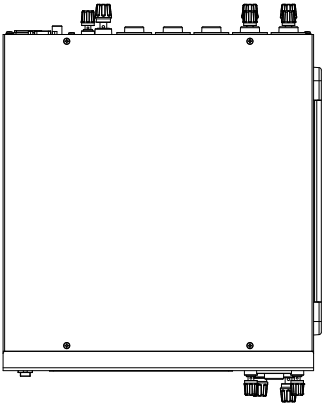
When using the scanner box outputs, IR tests support a maximum of 2000MΩ.

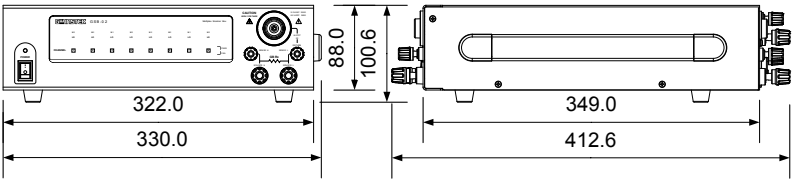
4-4. Dimensions

4-4-1. STW-S1



4-4-2. STW-S2





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