HOLLAND
Electronics LLC

ST-4000

SIGNAL LEVEL METER

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FEATURES

* **Select Channels**   **2 – 136 CATV (NTSC)**   * **12 Hour Rechargeable Ni-MH Battery**
                        2 – 69 Off-Air (NTSC)

* **Select Frequency**   **46-870 MHz**   * **Auto Shut Off**

* **Measures Video, Audio, or V-A**   * **Charging LED**
     dBmV or dBuV (selectable)

* **Scan Selected Channels and Store Signal Level Data**

SPECIFICATIONS

Frequency and Level
     Range: 46 to 870MHz in 10 kHz steps
     Resolution Bandwidth: 280KHz ± 50KHz
     Channels: All user designated NTSC Channels
     Level Range: -28 dBmV to +55 dBmV (32dBµV to- 115dBµV)
     Accuracy: ±2.5dB
     Input impedance   75Ω
     Wave detection   Peak value

AUTO SCAN TESTING
     Max Channel Scan: 135 Channels
     Scan Range: All Frequencies: 46 to 870MH**z**
     Scan Speed: 30 Channels/Min
     Memory Groups   12 Groups (01--12)
                                        Each group stores up to 135 Channels

OTHERS
     Dimensions: 214mm x 94mm X 47mm
     Weight: 1.4 kg (with charger)
     Working Temperature: -10℃ to + 40℃
     Display LCD: 16X2 LCD with back light

POWER
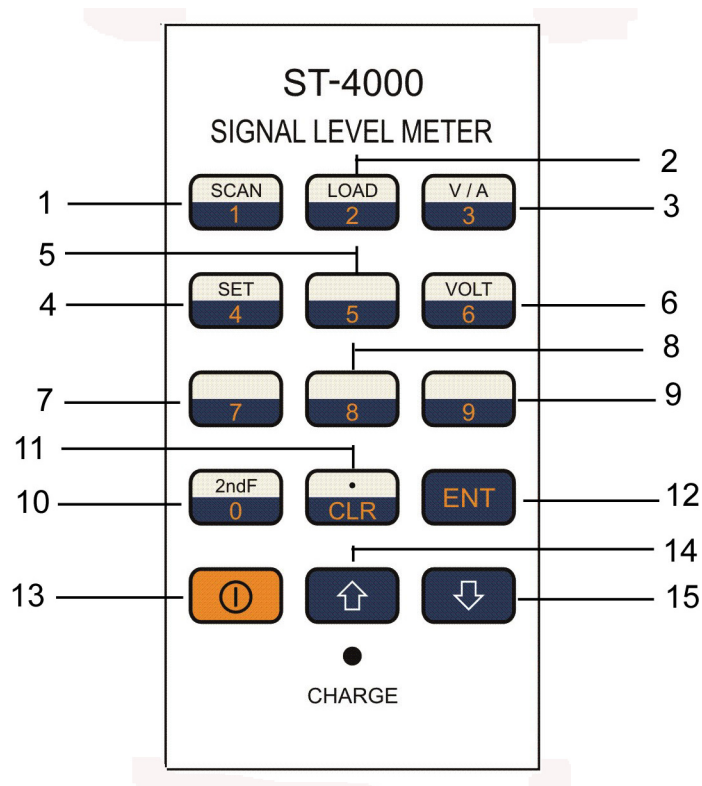   Battery: 7.2V/1.6AH Ni-MH
     Power Supply / Battery Charger   AC 110V/60Hz ±10%
     Battery Life: 5 hours of continuous operation
     Recharging Time: 12 hours

STANDARD ACCESORIES
     Battery Charger: 1 pc
   Carrying Case w/strap   1 set
     Barrel Connector: G-F81F*   2 pcs
     Operators Manual   1 copy
     Quick Users Guide   1 copy

Electronic copies of the Users Manual & Quick Users Guide are available
on our website: www.hollandelectronics.com/support.html

KEYPAD ILLUSTRATION

KEYPAD CONTROLS

1. Numerical 1 / 2nd Operation **SCAN** – Scan and save signal level values for selected channels in a memory group

2. Numerical 2 / 2nd Operation **LOAD** - View data previously stored in a memory group

3. Numerical 3 / 2nd Operation **V/A** – Select Video, Audio or V/A carrier display screens

4. Numerical 4 / 2nd Operation **SET** – Access the meter Settings menu screens

5-9. Numerical 5-9 / **Volt** Function (keypad 6) **_Not_** Available on This Model

10. Numerical 0 / **2nd Operation Function Key** – Pressing 2nd F activates the secondary programmed function of the next key that is pushed

11. **CLR** / **.** Pressing this key while in a menu screen will return to the previous menu. This key is also used as both a decimal point and the final key after entering a frequency value, before pressing ENT.

12. **ENT** Pressing **ENT** allows for entering desired function or setting

13. (**I**) **On/Off** – Turn meter power on or off

14-15. ▲ ▼ **UP** Arrow – Increase the displayed channel or frequency. Also used to navigate through the Settings menu. **DOWN** Arrow - Decrease the displayed channel or frequency. Also used to navigate through the Settings menu

16. LED Indicator AC Power / Battery Charging Indicator

Getting Started

Powering the Meter

The ST-4000 can be powered either by the internal rechargeable Ni-MH batteries or by use of the included power supply/battery charger.

- A) **Using the external AC power supply:** Make sure that the available AC line voltage is 110-120V, 60 Hz. Connect the DC output plug from of the adapter / charger to the DC receptacle on the bottom of the ST4000 meter.
- B) **Powering the meter with internal batteries:** In order for the ST4000 meter to operate from the internal batteries, a sufficient charge must exist on the batteries. The recommended time to fully charge the batteries is 12 hours. Only use the power supply / battery charger included with the meter. The batteries charge whether the meter is switched on or off. The Red LED on the meter will illuminate whenever the power supply / battery charger is attached and plugged into an 110VAC source.

Warning: Use Only The Power Supply / Battery Charger Supplied With The Meter. Use Of Any Other Will Void Warranty and Can Cause Damage Or Injury.

Quick Use Instructions

To become familiar with the basic operation of the meter it is suggested that the user initially try the following:

1) Charge the batteries using the supplied power supply/charger unit.
2) Turn the meter on by pressing the **On/Off** key and check settings in the Set Up menu as described in Section 1.
3) Check and set the meter to read either CATV or VHF/UHF channels as follows:
   - i) From any menu screen Press **CLR** then Press **2,** then Press **ENT**. The display will show **CH002** if the meter is set for CATV channels or **CH02** for VHF/UHF channels. To switch back and forth between CATV and VHF/UHF channels, perform the following steps below, otherwise skip to step 4:
   - ii) Press the **On/Off** key to turn the meter off
   - iii) Press and hold the **SCAN** key while pressing the **On/Off** key
   - iv) The meter has turned back on and switched between the CATV and VHF/UHF channels. Repeating steps ii and iii will switch the selected channels again.
4) Carefully align the threads and connect the G-F81 type adapter to the RF Signal input port on the meter. Hand tighten until the adapter is fully seated. Over tightening the adapter with a tool can seriously damage the input port on the meter.
5) Connect the CATV or VHF/UHF signal source (cable line, antenna, etc) under test to the meter.
6) Press "▼" or "▲" to scroll through the available channels and note the measured video signal levels.
7) To switch and display the measured Audio level or V/A differential level values instead of the Video level, press the **0/2ndF** key and then press the **3/ V/A** key.

MAIN USER INSTRUCTIONS

1 Meter Set-Up Features

Each of the following set-up functions is activated by first pressing the **0/ 2ndF** key followed by the **SET** key.

1.1 AUTO OFF TIME
The meter can be set to turn off after 5 minutes of inactivity or to remain on continuously.
Press "▼" or "▲" to point "→" to "Auto Off Time". Press **ENT** key.
Use "▼" or "▲" to choose desired mode. Press **ENT** key.
LCD will display:

```
   5 Minutes off
    Always On
```

1.2 AUDIO SET
Enable or disable the speaker to monitor the audio while measuring audio carrier signal levels.
Press "▼" or "▲" to point "→" to Volume Set. Press **ENT** key.
Use "▼" or "▲" to choose desired mode. Press **ENT** key.
LCD will display:

```
     Audio On
     Audio Off
```

1.3 LEVEL UNIT
Select the desired measurement scale of dBµV or dBmV
Press "▼" or "▲" to point "→" to "Level Unit". Press **ENT** key.
Use "▼" or "▲" to choose desired mode. Press **ENT** key.
LCD will display:

```
   dBµV   Enable
   dBm V  Disable
```

2 Selecting CATV or VHF/UHF Channels

The meter can be switched between CATV channels and VHF/UHF channels. To determine how the meter is currently configured or to make a change, do the following:

From any menu screen Press **CLR** then Press 2, and then Press **ENT**.
Check to see whether the displayed channel is **CH002** (CATV) or **CH02** (VHF/UHF).

To switch back and forth between CATV and VHF/UHF channels, perform the following steps:
  i. Press the **On/Off** key to turn the meter off
  ii. Press and hold the **SCAN** key while pressing the **On/Off** key
  iii. The meter has turned back on and switched from either CATV to VHF/UHF or from VHF/UHF to CATV channels. Repeating steps i and ii will switch the selected channels again.

3 Configuring Channel Line Up

The meter is factory programmed to read CATV channels 2-136 and VHF/UHF channels 2-69. Customized CATV and VHF/UHF channel plans within these ranges can also be saved in the "User Plan" mode.

In order to select or edit the "User Plan" channels, the meter must first be set to the proper channel format (CATV or VHF/UHF). If you are unsure which channel format is currently selected or want to change the selection, refer to Section 2.

3.1 CHANNEL PLAN
Select the factory programmed channel plans "NTSC CATV" or the custom "User Plan"
Press the **0/2ndF** key and then the **SET** key.
Press "▼" or "▲" to point "→" to "Channel Plan". Press **ENT** key.
Use "▼" or "▲" to select the desired plan. Press **ENT** key.
LCD will display:

→ NTSC CATV
User PLAN

NTSC Channel Plan – CATV or VHF/UHF
User defined Channel Plan

3.2 CHANNEL EDIT
Specific channels can be included or removed from the "User Plan".
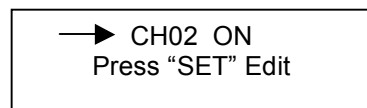Press the **0/2ndF** key then the **SET** key.
Press "▼" or "▲" to point *"→"* to "Channel Edit". Press **ENT** key.
Use "▼" or "▲" to select the desired channel. Pressing **SET** will toggle the display between ON (including the channel in the plan) and OFF (eliminating the channel from the plan).
Press "▼" or "▲" to move to the next channel. Press **ENT** key.
Repeat the process with the **SET** key to toggle the channel ON/OFF setting
LCD will display:

→ CH02 ON
Press "SET" Edit

Select CH02 (ON) or don't select (OFF)
Press key "SET" to edit

4 Meter Calibration

This meter has been factory calibrated. The user can recalibrate each individual channel by connecting a CATV or VHF/UHF signal source with a known RF level to the meter input. The factory calibration of all channels can also be restored at any time.

4.1 CORRECT CH dB (Calibration)

Adjust the displayed power level to match the input signal source level as follows:
Press the **0/2ndF** key then the **SET** key.
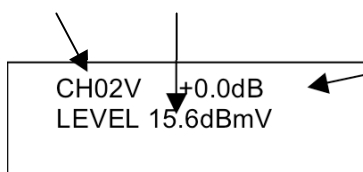Press "▼" or "▲" to point "→" to "Correct CH dB". Press **ENT** key.
Use "▼" or "▲" to adjust the displayed **LEVEL** value to match the input signal source.
Press **SET** to save the calibration. Press "▼" or "▲" and repeat for the next channel.
LCD will display:

CH to correct Video Carrier (V)   Current correction (offset) value

```
   CH02V  +0.0dB
   LEVEL 15.6dBmV
```
                                         CH02 Video Carrier modified value (offset)
                                         Measured Level value after modification

The displayed CH02V is the channel to be modified. The displayed mode is the video carrier. The calibration adjustment is applied to both the video carrier and audio carrier readings.
NOTE: User is not able to modify audio carrier calibration independently.

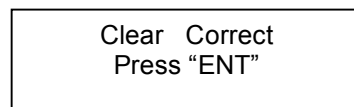Press **CLR** when all channel calibration changes have been completed

4.2 CLEAR CORRECT

Restore to the factory preset calibration values.
Press the **2ndF** key then the **SET** key.
Press "▼" or "▲" to point "→" to "Clear Correct". Press **ENT** key.
LCD will display:

```
   Clear   Correct
     Press "ENT"
```

NOTE: If you have entered this menu by error and do not want to restore the factory calibration values, press CLR key to escape the operation and return to testing mode

Press **ENT** key again to confirm and restore the factory preset calibration values.
This function will take a few seconds. All the modifications are cleared (correct value =0dB)

5 Scanning Channels – Saving and Viewing Data

Channels within the CATV or the VHF/UHF tables can be scanned and saved into one of the meter memory groups and then viewed at any time.

Prior to scanning channels there are two set-up steps:
1. The meter should be set for either CATV or VHF/UHF channels – Refer to Section 2
2. The customized "User Plan" or the factory preprogrammed channel plan "NTSC CATV" should be selected - Refer to Section 3

5.1 SCANNING and SAVING DATA
The designated channels within the CATV table or the VHF/UHF table can be scanned and saved into one of the memory groups.

Press the **0/2ⁿᵈF** key and then the **SCAN** key
LCD will display:

Scan No.00 Press "↑,↓, ENT"	Scan groups NTSC VHF/UHF 1-6 NTSC CATV 7-12

Press "▼" or "▲" to select a storage location - Groups 01-06 (VHF/UHF) or 7-12 (CATV).
After selecting the desired Group, press the **ENT** key to confirm.
The meter will now scan and save all channels. To escape operation, press **CLR** key.

Note: Data stored into any memory group during automatic scanning can be overwritten by running automatic scanning again.

5.2 VIEWING STORED DATA
Data measured and stored into a memory group during a SCAN operation can be viewed.
Press the **0/2ⁿᵈF** key. Press the **LOAD** key
LCD will display:

CH02 V LOAD01 LEVEL 18.7dBmV	CH No. 2 Video from Group:01 Stored video carrier signal level

Press the "▼" or "▲" key to select the memory group to display. Press **ENT** key
Press the "▼" or "▲" key to view all scanned channels. To escape press **CLR** key.

If no data is stored,
LCD will display:

No Channel Saved	No Channel Level Stored (Meter will auto escape to channel measurement mode)

6 Measuring Signal Levels

6.1 SINGLE CHANNEL SIGNAL LEVEL MEASUREMENT - VIDEO, AUDIO or V/A
(Select CATV or VHF/UHF channels first – Refer to Section 2)
Press the **0/2ndF** key. Press the **V/A** key to enter this measurement mode.
To change between Video, Audio and V/A, press the **0/2ndF** key and then the **V/A** key.
Press the "▼" or "▲" key to view desired channel.
LCD will display:

CH002V 55.25MHz
LEVEL: 18.7dBmV

VIDEO Test Mode

CH002A   59.75MHz
LEVEL: 5.0dBmV

AUDIO Test Mode

CH002V   55.25MHz
△V/A: 13.7 dBmV

V/A Test Mode

6.2 FREQUENCY BASED SIGNAL LEVEL MEASUREMENT
To measure the signal level of a specific frequency between 46MHz and 870MHz
Use the numerical keys and the **CLR/ .** decimal point key to enter the desired frequency.
Press the **ENT** key to confirm.
LCD will display:

FREQ   87.50MHz
LEVEL: 10.0dBmV

Selected Frequency
Measured Signal Level

HOLLAND ELECTRONICS LLC
LIMITED WARRANTY

Holland Electronics LLC warrants that the product enclosed with this Limited Warranty statement will conform to the manufacturer's specifications and be free of defects in the workmanship and material for a period of one-year (1) from the date of original purchase.

WARRANTY PROCEDURE:

If the product appears to be defective contact Holland Electronics LLC at (805) 339-9060. We will analyze the problem and offer solutions to prevent removing the unit from service. If no solution is found, and the unit must be returned for repair, you will be issued a Return Authorization (RA) number.

Holland Electronics LLC will, at its option, repair or replace the defective unit under warranty, without charge for parts or labor. This repair will be subject to charges if signs of tampering or misuse are detected. Incoming shipping costs will be the customer's responsibility. Returns will not be accepted without an RA number.

The warranty and remedy provided above are exclusive and in lieu of all other express warranties and unless stated herein, any statements or representations made by any other person or firm are void. The duration of any implied warranties of merchantability or fitness for a particular purpose on this product shall be limited to the duration of the warranty set forth above. Except as provided in this written warranty, Holland Electronics LLC shall not be liable for any loss, inconvenience, damage, including direct, special, incidental, or consequential damages, resulting from the use or inability to use this product, whether resulting from breach of warranty or any legal theory.

Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

The warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

To arrange for warranty service: Call Holland Electronics LLC (805) 339-9060

Return Address with appropriate Return Authorization Number:

2935 Golf Course Drive
Ventura, CA 93003