

TEMPORARY OPERATING MANUAL XITRON TECHNOLOGIES INC 1594 MULTIPLEXING VOLTMETER

This is a temporary operating manual for the Xitron 1594 multiplexing voltmeter. When a full manual is released you will be shipped one copy for each 1594 which you have purchased.

Introduction

The 1594 is a wideband multiplexing differential voltmeter with a range of voltages from 10V to 1500V peak. Up to 16 inputs may be provided to the 1594, which measures the differential RMS and peak voltage between each possible pair formed between these connections.

The product gives the user numerical results of these measurements at the front panel and using a formatted printout on any PCL2 compatible printer.

Safety

- NEVER MAKE ANY CONNECTION TO THE 1594 WHILE ANY LIVE VOLTAGES ARE PRESENT ON ANY OF THE CONNECTIONS.
- ENSURE THAT A FULLY GROUNDED POWER CORD IS USED, AND THAT THE CORD IS PLUGGED INTO A RECEPTACLE HAVING A SECURE GROUND CONNECTION.

Using the 1594

Using the 1594 follows a few, simple, steps as outlined in the following paragraphs.

Configuring the Connections

Follow the steps shown below –

1. As necessary, press the NEXT key on the 1594 front panel until the WIRING display is shown.
2. The user may choose to store up to 29 different wiring configurations in the 1594. The first (uppermost) line of the display shows the currently selected configuration number.
3. Press the EDIT key. The wiring configuration number is now highlighted.
4. Optionally, the user may change the configuration number by which this configuration will be known in the future by pressing the CHANGE key (either holding depressed, or by repeatedly pressing).
5. Press the CURSOR key to move the highlighted portion of the display within the 16 wiring connections. For each one the CHANGE key may be used to select the configuration for each particular connection. The available

selections are –

DISABLED – indicates that this input is not to be measured by the 1594.

ENABLED – indicates that this input is to be measured by the 1594. In measurement results this input is referred to by its' connection number.

One of the several available color designations – indicates that this input is to be measured by the 1594. In measurement results this input is referred to by the configured color..

6. Press the DONE key when all connections have been correctly configured. The user may review the configuration by pressing the PAGE DOWN key, which displays the present configuration for several input at a time.

Generally there are a few commonly used connection configurations. The user should store these configurations in different wiring numbers. In this manner these configurations can be rapidly recalled from the non-volatile memory of the 1594 without the chance of entry errors.

Configuring the Measurements

Follow the steps below –

1. As necessary, press the NEXT key on the 1594 front panel until the measurement and general configuration display is shown.
2. Press the EDIT key. A portion of the display is now highlighted.
3. The user can change the location of the highlighted portion of the display by pressing the CURSOR key. This menu contains several configurable options.

Display Contrast

This should be adjusted to provide the best display contrast when the instrument is being used with the user in a normal operating position.

Measurement Speed and Continuous Operation Selections

These two multiple choice type selections enable the user to choose the period over which each differential pair measurement shall be made, and whether the entire set of differential measurements are to be automatically repeated (*Continuous*) or not (*Single*).

Measurement Bandwidth

Optionally, the user may select that all measurements shall be made with a bandwidth restricted to approximately 5KHz (-3dB), rather than the standard 200KHz.

Reversed Measurements

When measuring all possible differential pairs, there are a large number of measurements which are merely the reversal of previously made measurements. The user may choose between the following options –

Not Measured – if the same pair of connections has already been measured, but in the reverse, then another measurement is not made.

Average – after completion of the measurement of all possible differential pairs, all measurements which are simply the reverse of another measurement are replaced by the average of the two measurements.

Recorded – all possible differential pairs of connections are measured, and the results are recorded without modification.

IEEE488 Bus Address

The may select any address for the IEEE488 bus within the range 0 through 29 inclusive.

Time and Date

All printouts from the 1594 are denoted with the present date and time, this is maintained within the 1594 by a battery supplied real time clock. The user may adjust the date and time for the present geographical position and daylight savings conditions.

Calibration

The date on which the 1594 was previously calibrated is displayed. The PERFORM key may be pressed when this information is highlighted. This will initiate an external calibration procedure. **THIS PROCEDURE SHOULD ONLY BE CARRIED OUT BY TRAINED PERSONNEL, FOLLOWING THE INSTRUCTIONS PROVIDED ON THE FRONT PANEL DISPLAY OF THE 1594.**

Commanding the 1594 to Make the Required Measurements

Follow the steps below –

1. As necessary, press the NEXT key to display the measurement results screen.
2. Press the START key. All configured measurement are initiated, with the percentage completion of the present set of differential measurements displayed in the lower left portion of the display.
If the user has configured the 1594 for *Single* measurements, then the key used to START the measurement changes to STOP while the measurement is in progress, allowing the user to abort the measurements. When a Single measurement set has been completed, this key returns to its START designation, and the percentage completion is removed from the display.
If the user has configured the 1594 for Continuous measurements, then the key used to START the measurements changes to STOP and measurements are made repeatedly until this key is pressed again. The percentage completion of each set of measurements is continuously displayed in the lower left portion of the display.
3. The user may use the UP/DOWN and LEFT/RIGHT keys to change the selection of connections differential pairs being displayed.
4. The user may press the Vrms or Vpeak key to change the prevailing selection. When Vrms is shown, the displayed data is the differential RMS voltage. When Vpeak is shown, the displayed data is the peak differential voltage.

5. If the 1594 is connected to a parallel printer with PCL2 (or higher) capabilities (e.g. most HP DeskJet and LaserJet printers), the user may press the PRINT key after a complete measurement cycle has been completed. This will initiate the printing of the complete list of both RMS and Peak differential voltages measured between all configured pair of connections. If only a few connections are being measured, then the front panel display can easily be used to determine the results of these measurements. However, if a large number (as many as 16) connections are to be monitored, then a very large number of measurements are made (up to 240 differential pairs), and the user may wish to use the printout capability of the 1594. This provides an error free method to permanently record the results.

Controlling the 1594 from a Computer

Optionally, the 1594 can be controlled by a computer, and the measurement results can be read by the computer.

Commands from the Computer to the 1594

All command and data interchange between the 1594 and the computer, takes place by means of commands and responses. A complete list of available commands, and their responses (as applicable) are given in the following paragraphs. All commands to the 1594 should be terminated either with the Line Feed character, or by asserting the bus EOI line with the last character of the command. The user may freely interchange upper- and lower-case characters and may introduce non-printing space characters at any position.

MEASURE=n

These commands start (MEASURE=1) or stop (MEASURE=0) a complete set of measurements. Commanding MEASURE=0 when there are no measurements in progress has no affect.

PERIOD=n

Sets the period of time over which the 1594 shall take each differential measurement. The character designated by n above, may be 0 (100ms), 1 (200ms), 2 (400ms), 3 (800ms) or 4 (1.6sec). As an example, commanding PERIOD=2 sets that each differential measurement shall take place over a period of 400ms.

CONTINUOUS=n

These commands set that future measurement sets shall be made singly (CONTINUOUS=0) or repeatedly (CONTINUOUS=1).

BANDLIMIT=n

These commands set that measurements shall be made with the default 200KHz bandwidth (BANDLIMIT=0) or with a 5KHz nominal bandwidth (BANDLIMIT=1).

REVERSALS=n

These commands set that measurements of a differential pair which have been previously measured in this scan, will not be repeated (REVERSALS=0), will yield a result which is the average of the two results (REVERSALS=1), or shall separately measure and record these results (REVERSALS=2).

WIRING=integer

This sets the wiring configuration number which the 1594 shall use for its connection configuration. The integer may be any number between 1 and 29 inclusive.

COLOR=input/color

This sets that the specified input connection (an integer between 1 and 16 inclusive) shall be configured using the specified color, or measured using the default number, or not measured. The available color integers are as follows –

0 – not measured.

1 – measured using the default connection number as the designation.

2 – measured, uses the color Green as the designation.

3 - measured, uses the color White as the designation.

4 - measured, uses the color Black as the designation.

5 - measured, uses the color Green/Yellow as the designation.

6 - measured, uses the color Red as the designation.

7 - measured, uses the color Blue as the designation.

8 - measured, uses the color Yellow as the designation.

9 - measured, uses the color Brown as the designation.

10 - measured, uses the color Blue/White as the designation.

11 - measured, uses the color Orange as the designation.

12 - measured, uses the color Violet as the designation.

13 - measured, uses the color Purple as the designation.

As an example, COLOR=1/6, sets that connection 1 shall be measured, and will be designated as RED.

COMPLETE?

Commands the 1594 to respond with either the single character 0 if a measurement set has not been completed, or 1 if a measurement set have been completed. This would normally be used following a MEASURE=1 command, with the compute repeated issuing the COMPLETE? command and reading the response until a 1 character is obtained.

RMS?=input/input

Commands the 1594 to respond with the latest measured RMS differential voltage between the inputs defined by the integers defined after the equal character. As an example, after sending the command RMS?=1/2 to the 1594, the computer may read the differential RMS voltage between connections 1 and 2.

PEAK?=input/input

Commands the 1594 to respond with the latest measured peak differential voltage between the inputs defined by the integers defined after the equal character. As an example, after sending the command `PEAK?=1/2` to the 1594, the computer may read the differential peak voltage between connections 1 and 2.