M3500-OPT01
10 Channel Scanner Card
USER'S GUIDE
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in Taiwan

PICOTEST CORP.

8F-1, 286-9, Hsin-Ya Rd., 80673, Kaoshiung, Taiwan
TEL: +886-7-815-7183
FAX: +886-7-815-8312
URL http://www.picotest.com.tw

Product Introduction

Picotest thanks you to purchase the "M3500-OPT01 10 channel Scanner Card". To reach the best performance from the product, please read this guide carefully.

1. Overview

The M3500-OPT01 supports the following measurements, such as for voltage 10 points, for current 2 points, for 2-wired resistance 10 points and for 4-wired resistance 5 points at most.

2. Inspection & Upkeep

Inspection:

Inspect the contents of the package carefully to be sure no damage occurred during shipping. Please contact your local reseller or PICOTEST representative for further assistance.

Cleaning:

To clean the card, use a damp cloth or mild, water based cleaner. Clean the surface of the cover only. Do not apply cleaner on the circuit board directly or allow liquids to enter or spill on it.

This safety information with the warning and danger marks on the user's guide reminds users to avoid risks as they are using it.

⚠ **Warning:** The triangle symbol in black indicates that incorrect operation might cause an injury to users or damage to the product.

⚠ **Danger:** The triangle symbol in red indicates that incorrect operation might cause an extreme hazard to users' life.

4. Prenotion

⚠ **Danger**
● To avoid electrical shock and personal injury, please don't measure the source out of specification.
● The maximum AC voltage is 125V rms or 175V peak, 100kHz, 1A switched 62.5VA (resistive load), and DC voltage is 110V, 1A switched, 30VA (resistive load).

⚠ **Warning**
● To avoid breaking the product, please do not pull it away when measurement is executed.

5. Specifications

Maximum AC Voltage	125V rms or 175V peak, 100kHz, 1A switched, 62.5VA (resistive load)
Maximum DC Voltage	110V, 1A switched, 30VA (resistive load)
Contact Life	>100000 operations at maximum signal level; >100000000 operations cold switching.
Contact Resistance	<1ohm at end of contact life
Actuation Time	5ms maximum on/off
Contact Potential	<±500nV typical per contact, 1µV max <±500nV typical per contact pair, 1µV max
Connector Type	Screw terminal, #22 AWG wire size
Isolation btw Any Two terminals	>10 Gohm, < 75pF

| Isolation btw Any Terminal and Earth	>10 Gohm, < 150pF
Common Mode Voltage	350V peak btw any terminal and earth
Max. Voltage btw Any Two Terminals	200V peak
Max. Voltage btw Any Terminal and M3500A Input LO	200V peak
Environmental	Meets all M3500A Environmental Spec.

6. Efficiency

Rate of the Scanner Card Measurement

AutoZero OFF, AutoGain OFF, AutoRange OFF, Scan Timer=0,60Hz

	NPLC	Take Time with 2000 Readings(sec)	rate(ch/s)
single function(VDC)	(Fast 4.5) 0.02	68	29.4
	(Slow 4.5 & Fast 5.5) 0.1	74	27.0
	(Slow 5.5 & Fast 6.5) 1	105	19.0
	(Slow 6.5) 10	408	4.9
Mix function (VDC+2WRES)	NPLC	Take Time with 2000 Readings(sec)	rate(ch/s)
	(Fast 4.5) 0.02	306	6.5
	(Slow 4.5 & Fast 5.5) 0.1	318	6.3
	(Slow 5.5 & Fast 6.5) 1	442	4.5
	(Slow 6.5) 10	1710	1.2

7. SCPI Commands

Command	Description
ROUTe:CLOSe <channel>	Close channels <1 ~ 10>.
ROUTe:CLOSe?	Query the closed channels
ROUTe:OPEN	Open all channels.
ROUTe:STATe?	Ask the state. The state 1 means Card inserted or 0 means Card not inserted.
ROUTe:SCAN:FUNCtion <channel>,{<function>|"VOLT:DC"|"VOLT:AC"|"FREQuency"| "RESistance"|"FRESistance" |"NONE"}	Set card states which might measure the VAC, VDC, Frequency, 2-Wire Resistance, 4-Wire Resistance or disabling the channel.
ROUTe:SCAN:FUNC? <channel>	Ask the channel's state of the card.
ROUTe:SCAN:TIMER?	Read the time interval of scanning.
ROUTe:SCAN:TIMER <value>	Set the time interval of scanning <The unit is second>.
ROUTe:SCAN:COUNT?	Read the number of times of scanning.
ROUTe:SCAN:COUNT <value>	Set the number of times of scanning.
ROUTe:SCAN:STATe?	Read the state of scanning. 1 means "finished". 0 means "not finished".
ROUTe:SCAN:SCAN	Run SCAN mode
ROUTe:SCAN:STEP	Run STEP mode

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8. Measurement

● **2-Wired Voltage Application**
  (ACV/Freq./DCV/Ohm)

Resistors under Test   Voltages unter Test
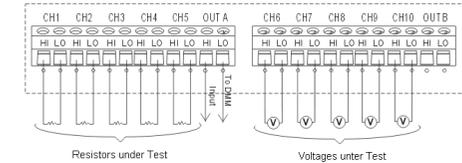
● **4-Wired Resistance Application**

Resistors Under Test

● **Current Application**

AC or DC Current   AC or DC Current
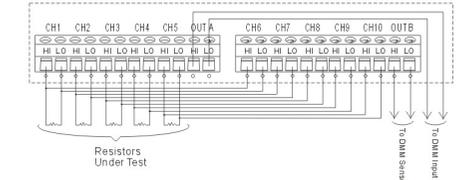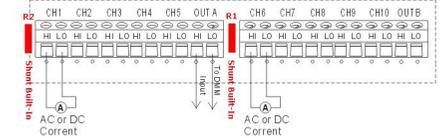
※ Note 1: CH1 & CH6 can be used on other measurement when the shunts are released.
※ Note 2: The current application is not the direct measurement from real current sources. So to use current measurement via the scanner card, users have to enable DCV/ACV and MX+B functions.

The measured current is calculated through the equation as follows. "I=V/R"
Where: I = Current being determined
V = Voltage measured by the DMM
R = Shunt resistance value

As to the MX+B setting, "M" stands for "1/R", "X" stands for "voltage measured by the DMM" and "B" stands for "Offset, 0". For more detailed information, refer to the M3500A user's manual.

● **Output Terminal Connection**
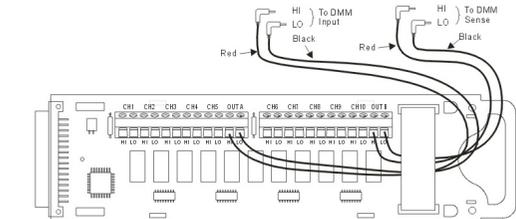
※ Note 3: Output B is only for 4-Wired resistance measurement.