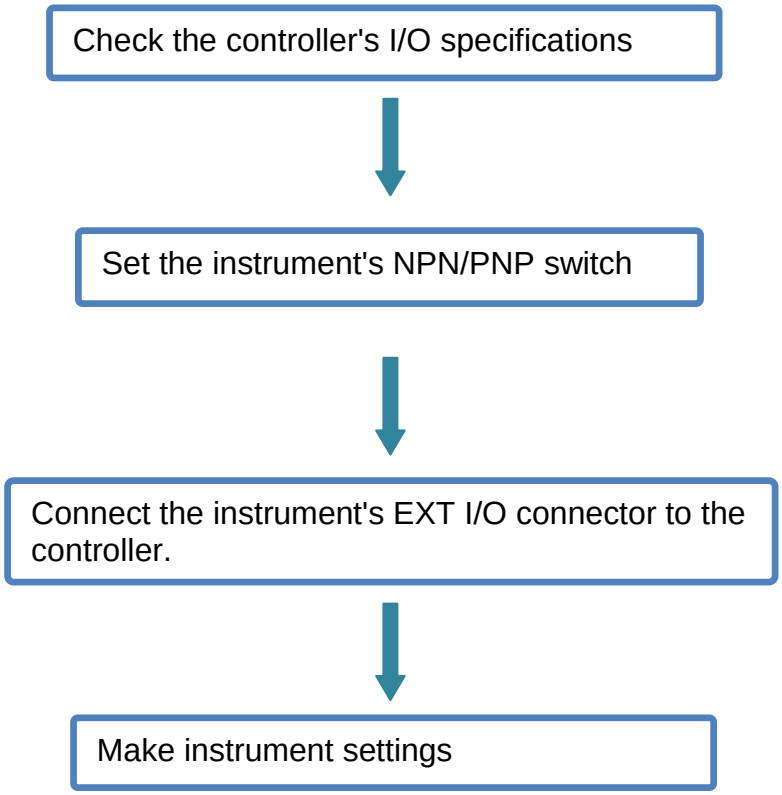
Chapter 6 EXT I/O Port (Handler)

The EXT I/O connector on the rear of the instrument supports external control by providing output of the EOM and comparator judgment signals, and accepting input of TRIG and KEY_LOCK signals. All signals are isolated from the measurement circuit and ground (I/O common pins are shared). Input circuit can be switched to accommodate either current sink output (NPN) or current source output (PNP).



6.1 EXT I/O port and signal

In this chapter, you will learn about the connection and introduction of EXT I/O.

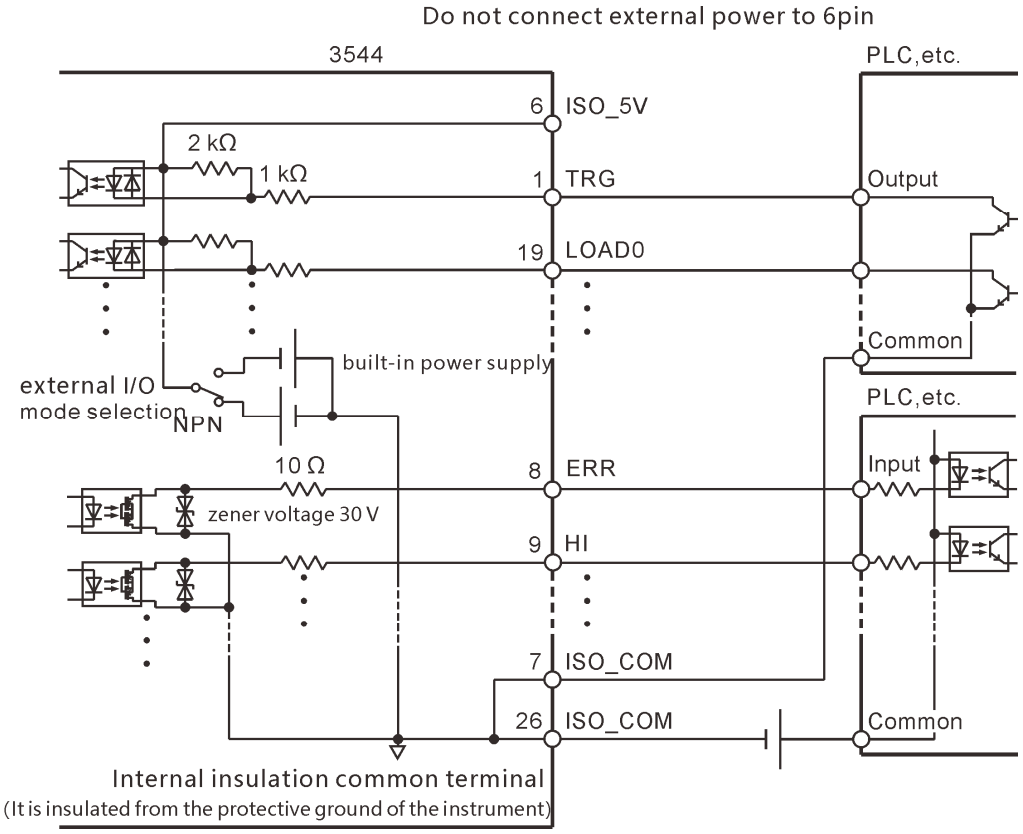
Do not plug or unplug EXT I/O ports during testing

Do not connect the IO port to the test end

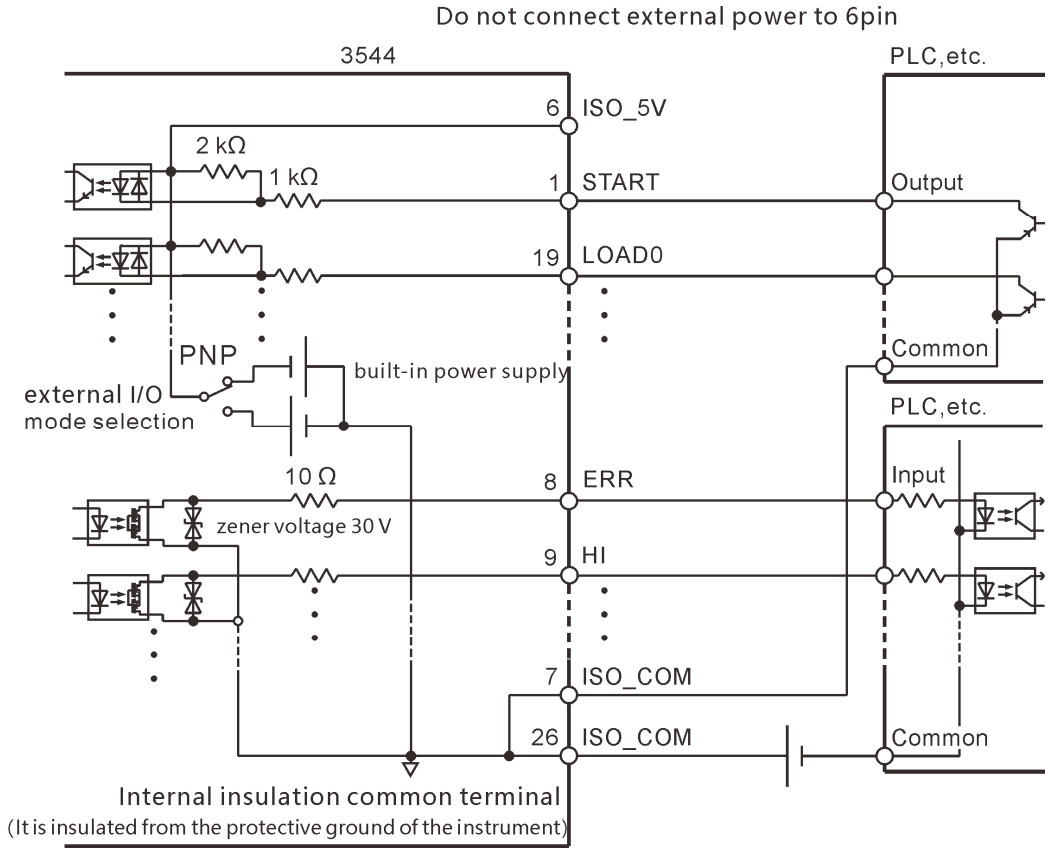
6.1.1 Level Mode Settings

Switching signal level mode NPN (current sink) and PNP (current source)

NPN (current sink) wiring

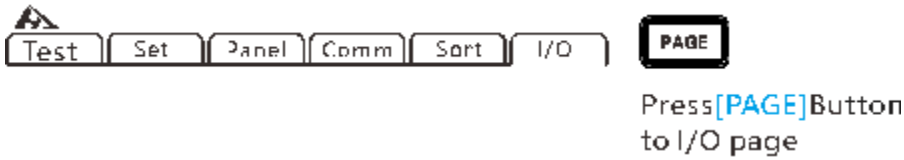


PNP (current source) wiring

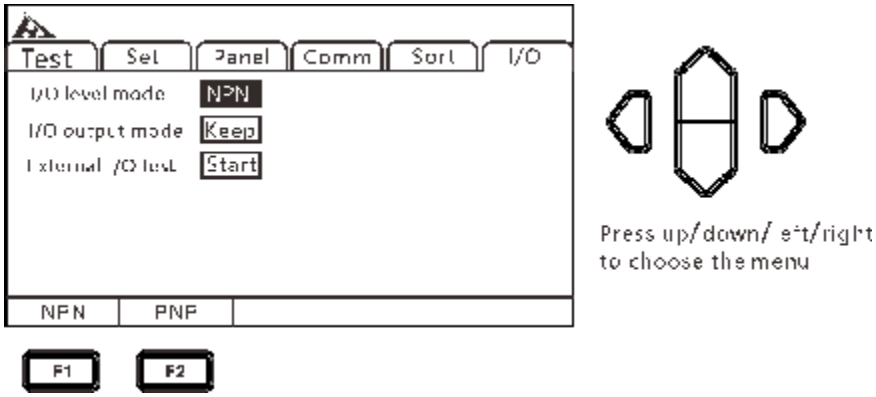


Level mode setting

Ø Select the I/O page

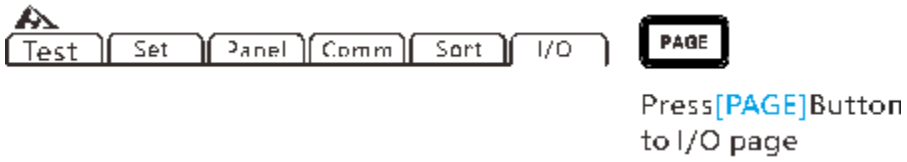


Ø Select I/O level mode

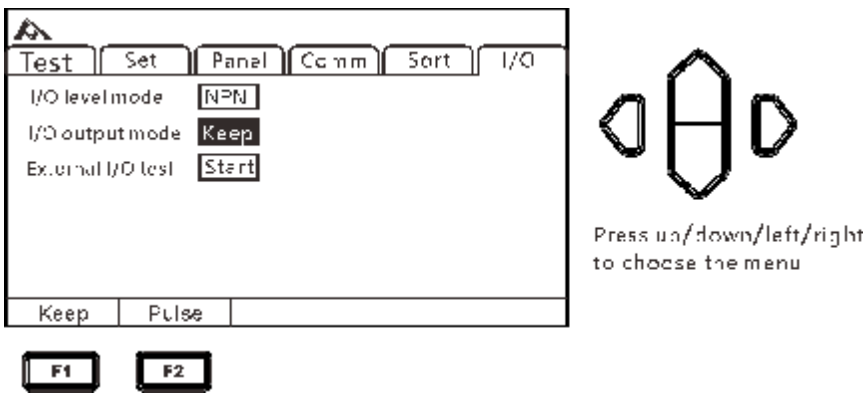


Ø Output mode setting

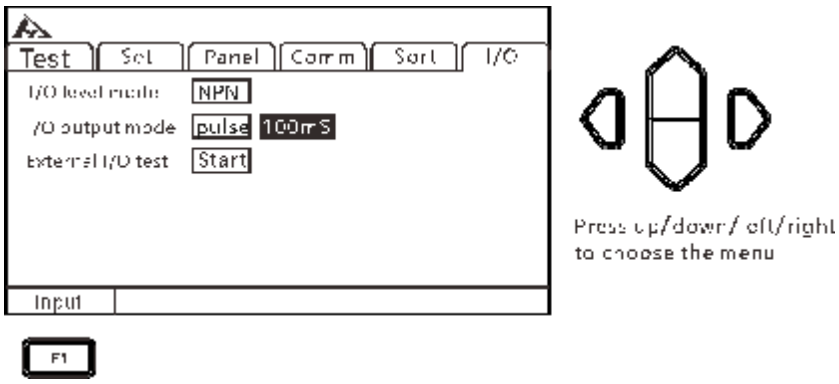
Ø Select the I/O page



Ø Select I/O output mode



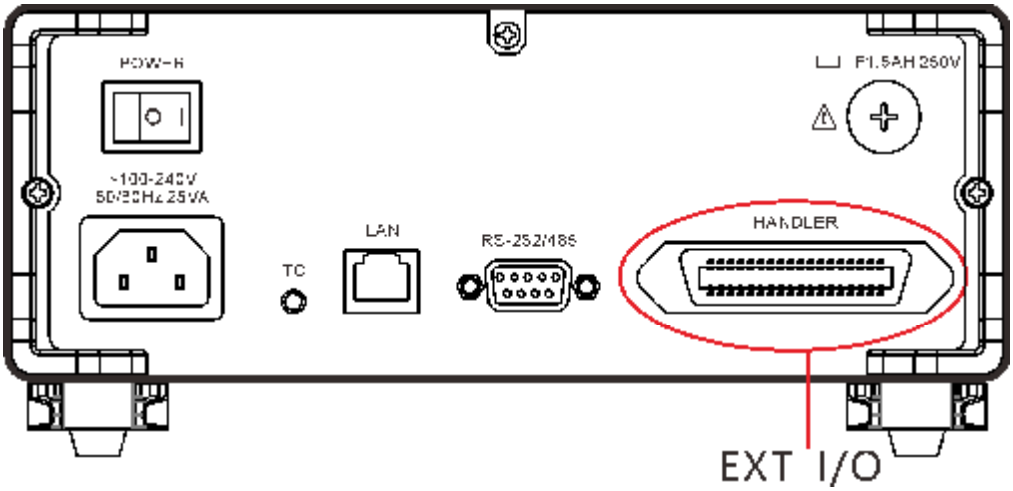
Ø Select pulse and set the output time



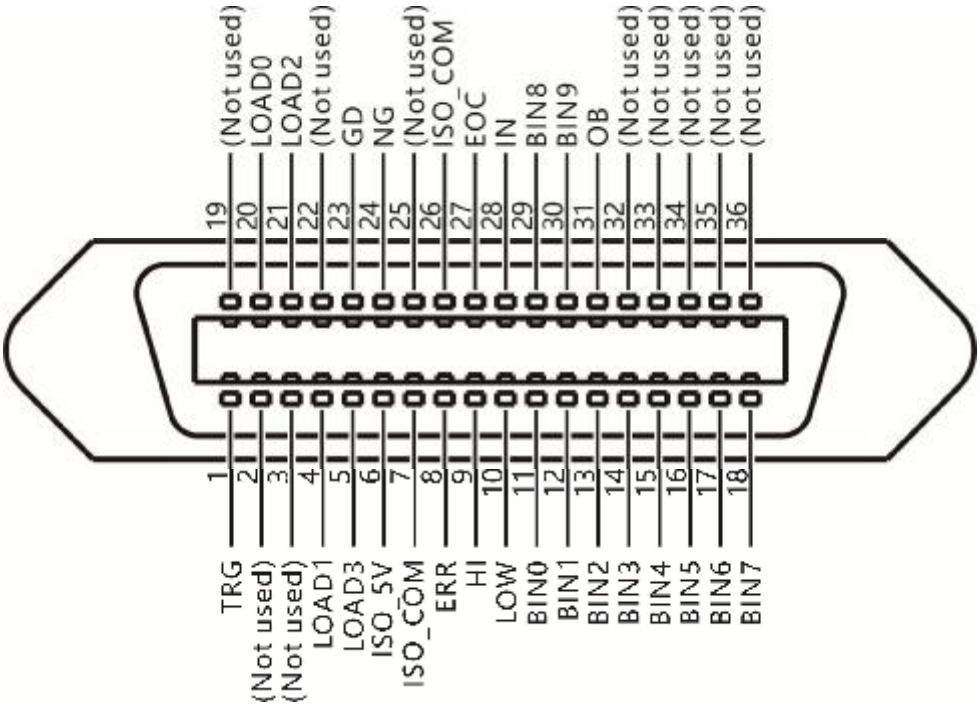
6.1.2 Port Signals description

Port and signal description

The EXT I/O port connector uses the D-SUB female terminal of the 36-PIN pin. Figure:



Port layout



(Instrument side)

Measure value > Upper limit value

Upper limit value ≥ Measure value ≥ Lower limit value

Measure value < Lower limit value

PIN	signal	Functions	I/O	Logic
1	TRG	Trigger test	I	Edge trigger
2	--	--	--	--
3	--	--	--	--
4	LOAD1	Panel selection	I	Level
5	LOAD3	Panel selection	I	Level
6	ISO_5V	Isolated power supply 5V	O	--
7	ISO_COM	Isolated power ground	O	--
8	ERR	Automatic protection open	O	Level
9	HI	Measure value>Upper limit value	O	Level
10	LOW	Measure value<Lower limit value	O	Level

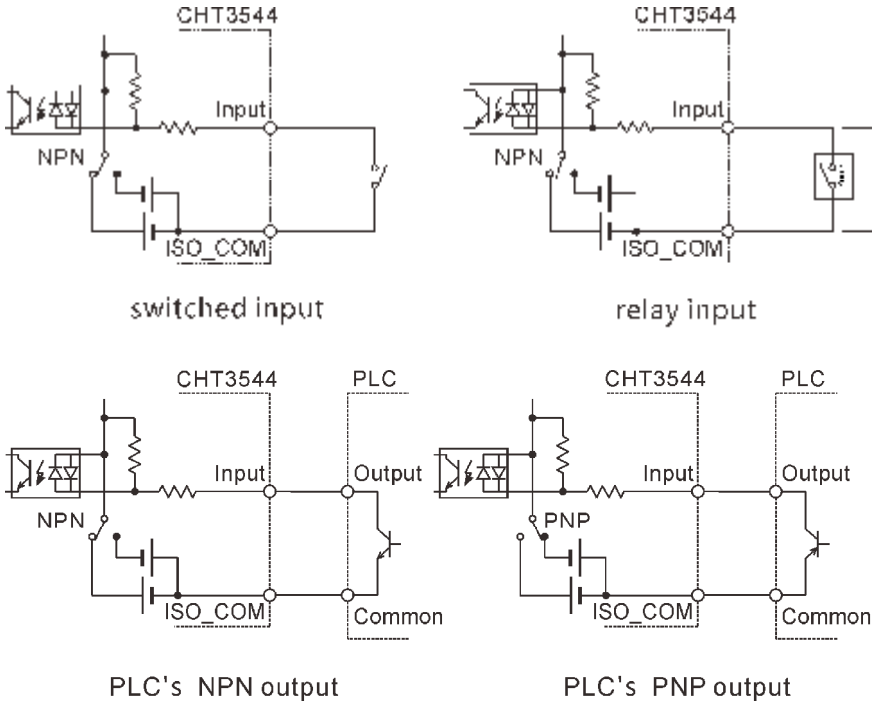
11	BIN0	Bin P0	O	Level
12	BIN1	Bin P1	O	Level
13	BIN2	Bin P2	O	Level
14	BIN3	Bin P3	O	Level
15	BIN4	Bin P4	O	Level
16	BIN5	Bin P5	O	Level
17	BIN6	Bin P6	O	Level
18	BIN7	Bin P7	O	Level
--	--	--	--	--
20	LOAD0	Panel selection	I	Level
21	LOAD2	Panel selection	I	Level
22	--	--	--	--
23	GD	Qualified output	O	Level
24	NG	Unqualified output	O	Level
25	--	--	--	--
26	ISO_COM	Isolated common signal ground	O	--
27	EOC	End of Level measurement	O	Level
28	IN	IN Sort	O	Level
29	BIN8	Bin P8	O	Level
30	BIN9	Bin P9	O	Level
31	OB	Bin NG	O	Level
32	--	--	--	--
33	--	--	--	--
34	--	--	--	--
35	--	--	--	--
36	--	--	--	--

6.1.3 Port Signal Connection Method

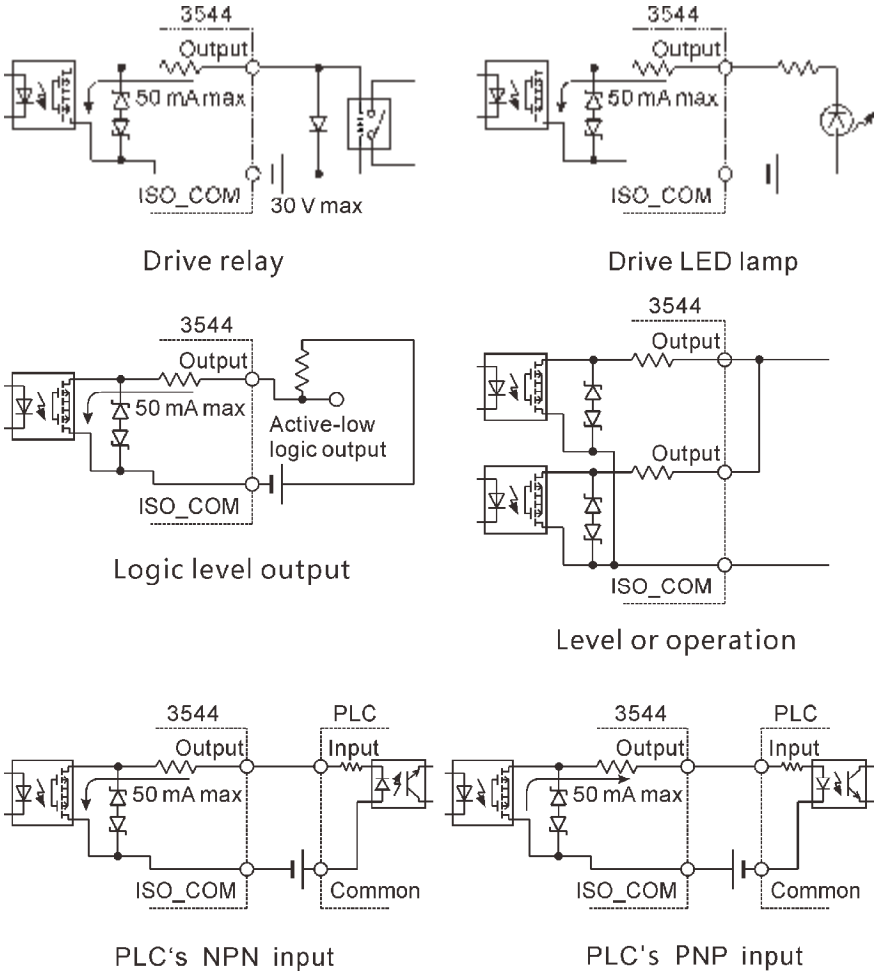
Electrical performance parameter

input signals	Type	Optocoupler input
	ON	Internal conduction current : 4mA or more the max voltage drop :1V
	OFF	Input current less than 100μA
output signals	Type	Optocoupler output, open drain output
	Maximum load voltage	30V DCMAX
	Maximum output circuit	50mA/channel
	Output voltage drop	1VMIN（at 50mA conditions）
Internal isolated current source	Rated voltage	+5V（NPN），-5V（PNP）
	Rated current	100mA
	Isolation condition	Isolated from internal circuitry, floating

Input circuit wiring



Output circuit wiring

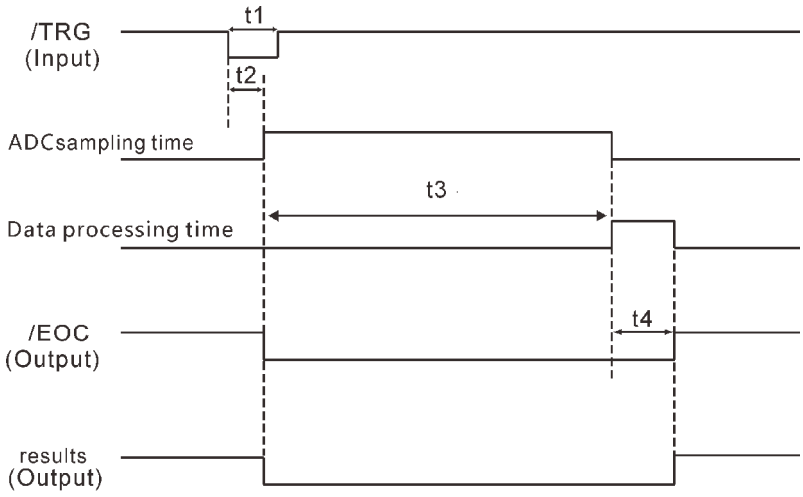


6.2 Timing Chart

Each signal level indicates the ON/OFF state of a contact. When using the current source (PNP) setting, the level is the same as the EXT I/O pin voltage level. When using the current sink (NPN) setting, the high and low voltage levels are reversed.

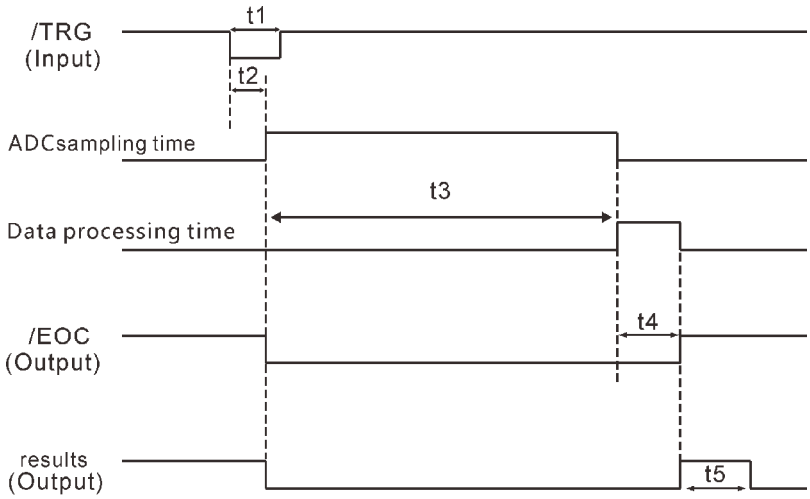
6.2.1 Timing chart for external triggering

External trigger [EXT] setting (EOC output hold)



	Item	Timing
T1	TRG, Signal pulse width	5msMIN
T2	delay	5msMAX
T3	ADC sampling time	Fast 20ms Medium 50ms Slow 500ms
T4	Data processing time	5msMAX

External trigger [EXT] setting (EOM output pulse)

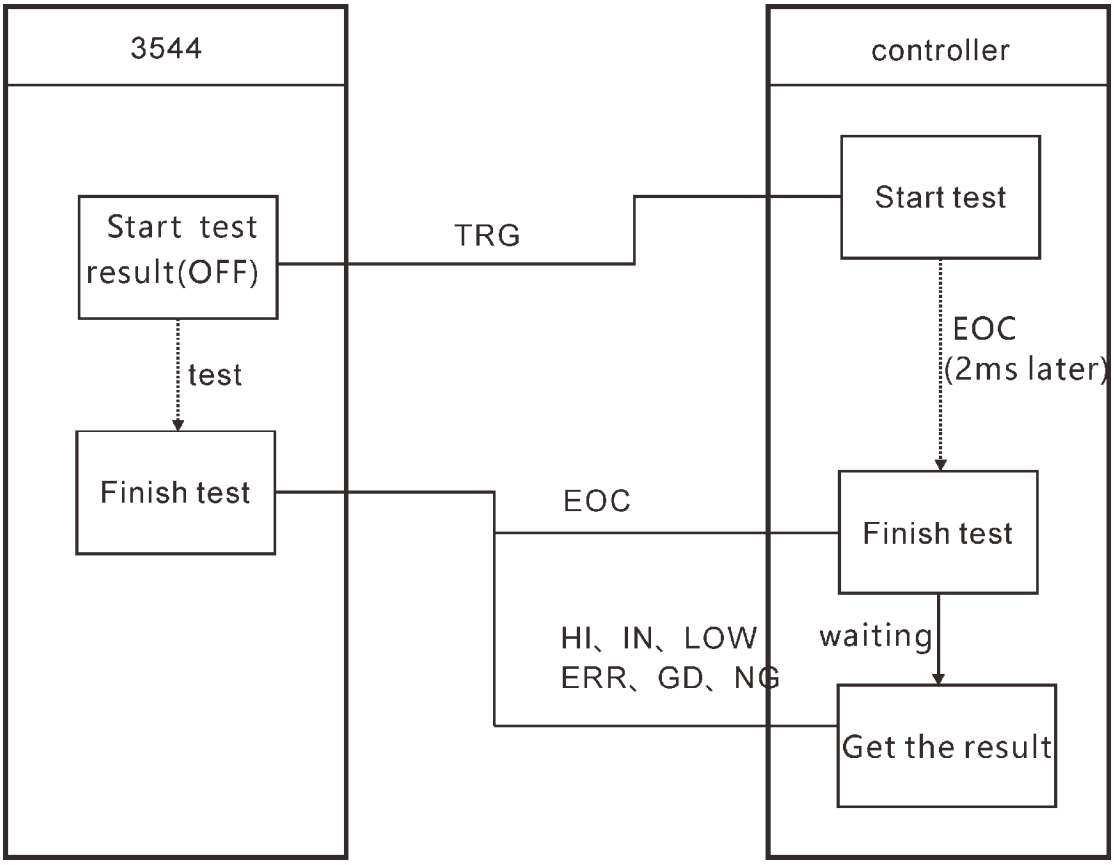


	Item	Timing
T1	TRG, Signal pulse width	5msMIN
T2	delay	5msMAX
T3	ADC sampling time	Fast 20ms Medium 50ms Slow 500ms
T4	Data processing time	5msMAX
T5	Judgment result pulse time	available (1ms~999ms)

6.2.2 Reading process at external triggering

The following table shows from start of measurement to acquisition of judgment results

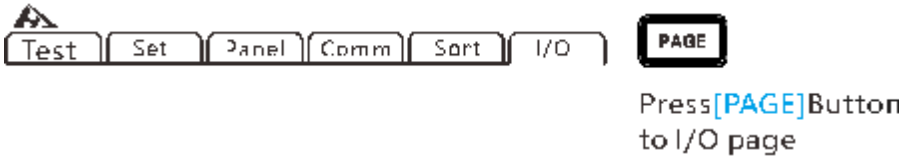
The EOC signal is output immediately after the instrument determines the judgment result (HI, IN, LOW, ER, GD, NG). f the controller's input circuit response is slow, it may be necessary to insert wait processing after EOM=ON is received until the judgment results are acquired



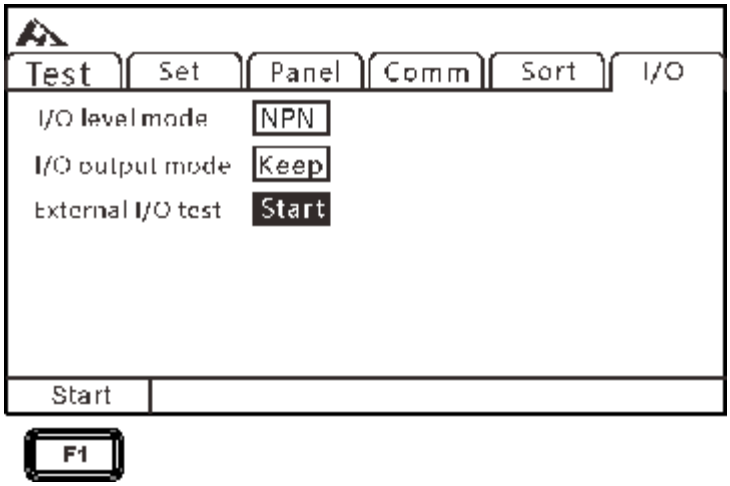
6.3 External Control Checking

In addition to switching output signals ON and OFF manually, you can view the input signal state on the screen.

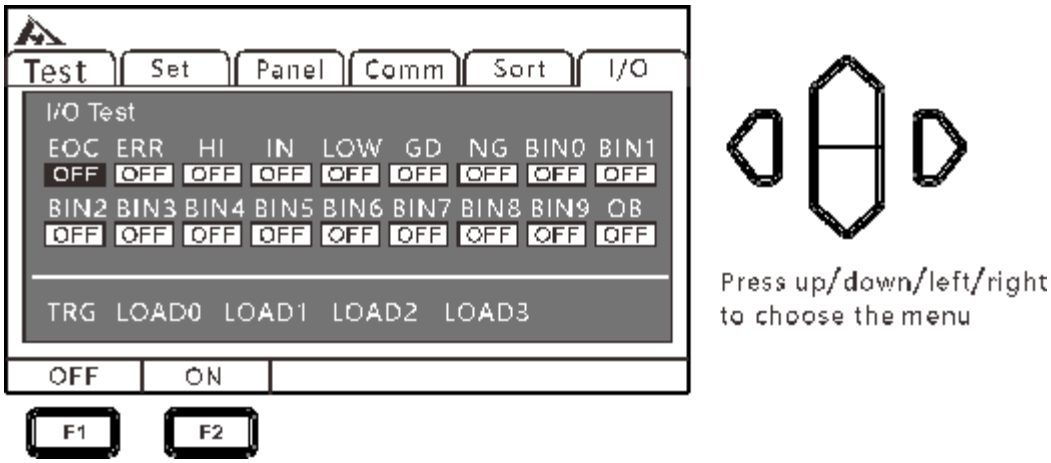
Ø Select the I/O page



Ø Select the I/O settings page



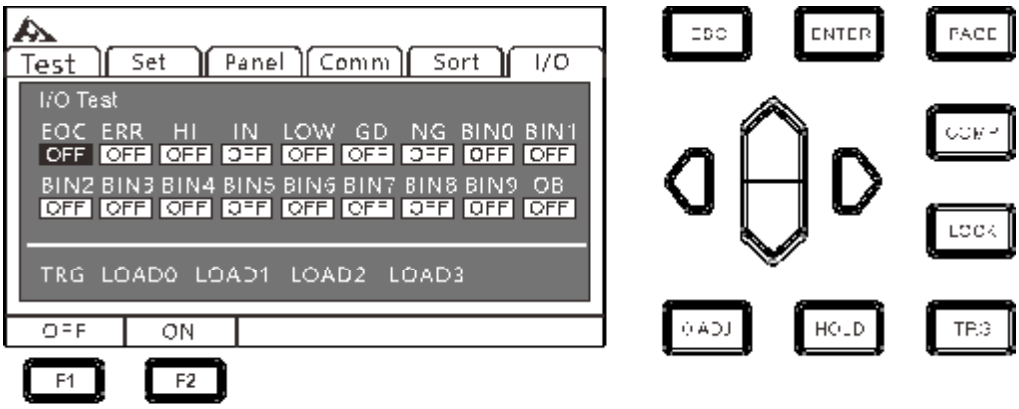
Ø Select the manually I/O test page



Output signal, operable signal (OFF: turn off the output ON: turn on the output)

Input signal, display the status of the signal (ON: reverse display OFF: normal display)

Ø Exit the I/O test page



Back to I/O setting.

Chapter 7 Communication

There are two communication modes,

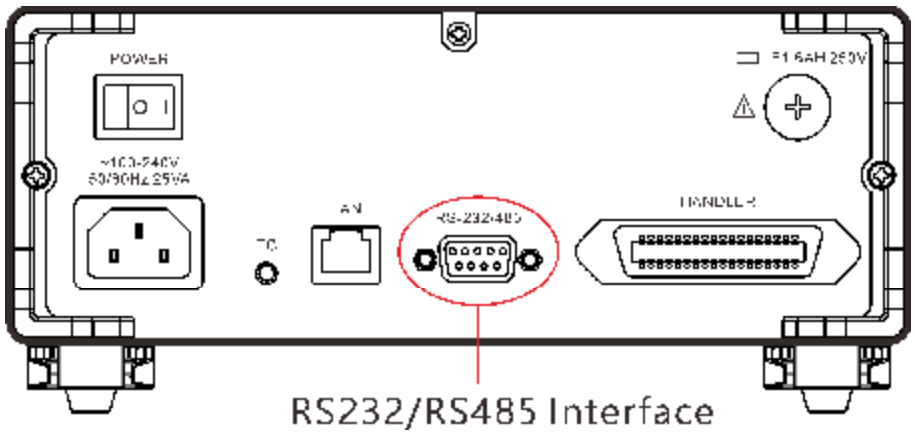
CHT3544 has two communication modes, one is RS232C communication, and the other is LAN (network protocol uses TCP protocol) communication mode. Both modes use the SCPI protocol.

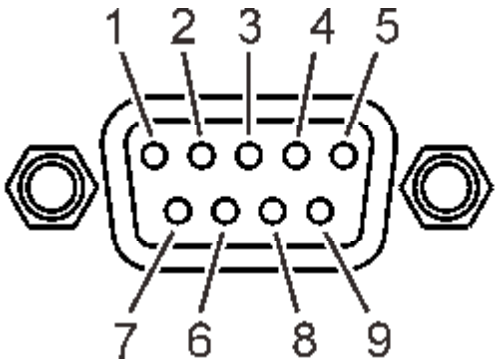
Do not connect the communication port to the measurement port, as this may damage the instrument.

7.1 RS232C communication

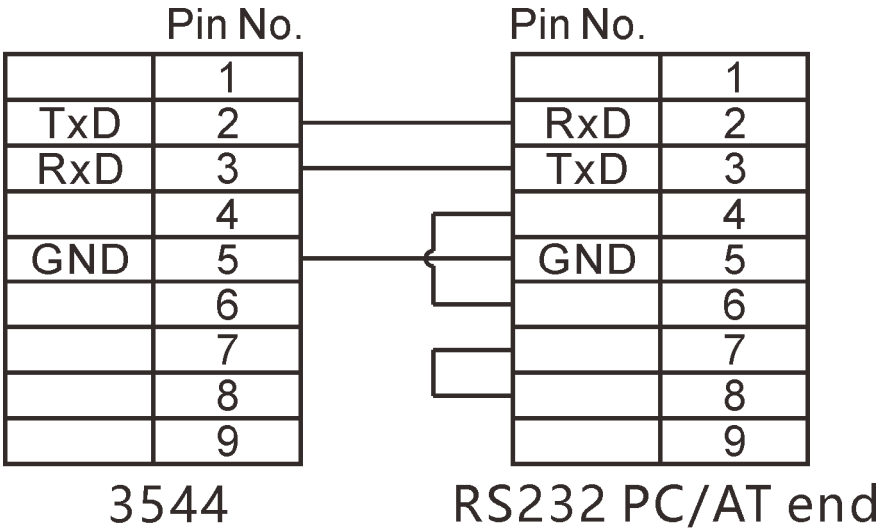
The RS232C communication uses a 3-wire communication method.

Interface and cable





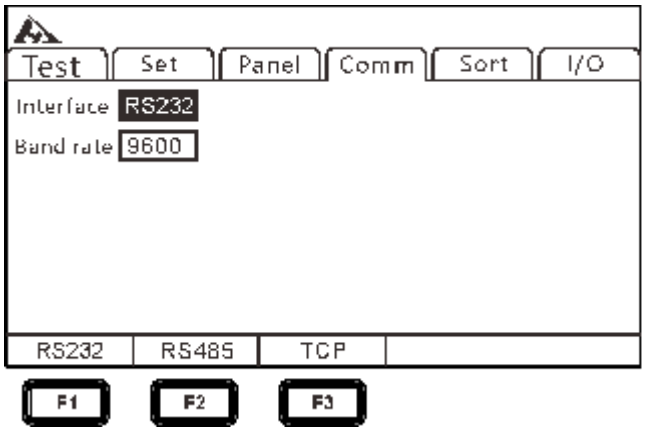
9-pin D-sub Famale port



Ø Select the Comm page

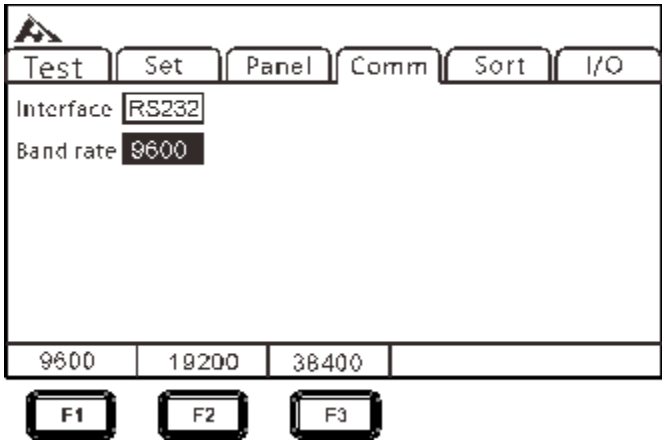
Press[PAGE]Button
to Comm page

Ø Select RS232 communication mode



Press up/down/left/right
to choose the menu

Ø Select the baud rate

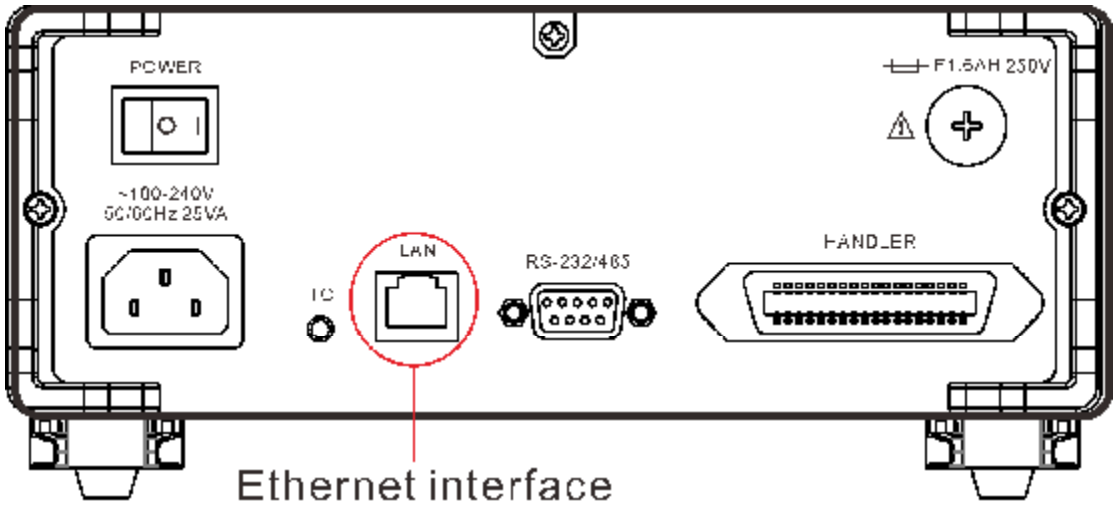


7.2 LAN communication

LAN port communication uses TCP protocol communication.

Interface and cable

The Ethernet uses the standard RJ45 port, and the cable uses Category 5 for the Internet cable.



Connection method

Instrument and computer connection

When the instrument is connected to a computer, the network cable uses a crossover cable.

Using T568B color code wiring standards to connect A side

Orange/White	Orange	Green/white	Blue	Blue/white	Green	Brown/white	Brown

Using T568A color code wiring standards to connect B side

Green/white	Green	Orange/White	Blue	Blue/white	Orange	Brown/white	Brown

Instrument and router connection

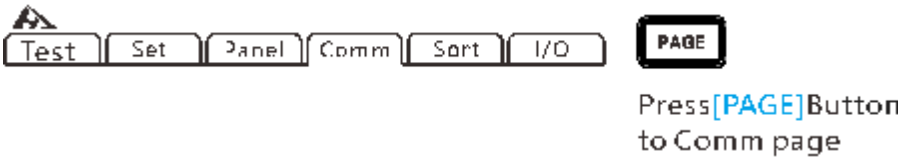
When the instrument is connected to the router, the network cable is directly connected.

Using T568B color code wiring standards to connect both A and B side

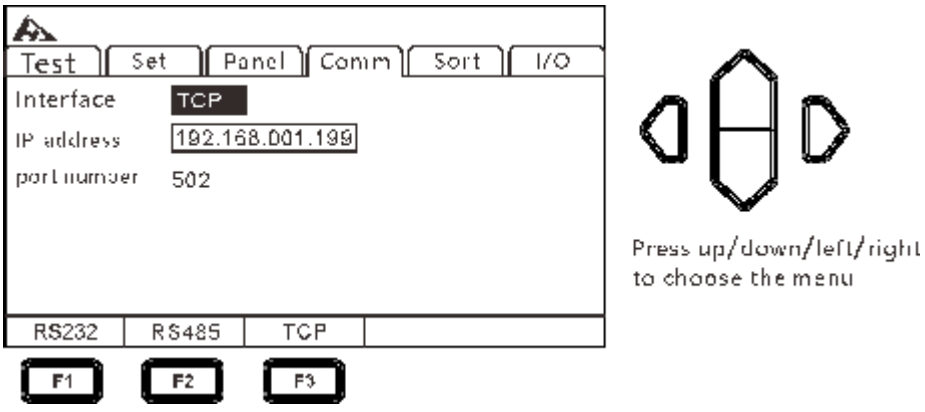
Orange/White	Orange	Green/white	Blue	Blue/white	Green	Green/white	Brown

Setting

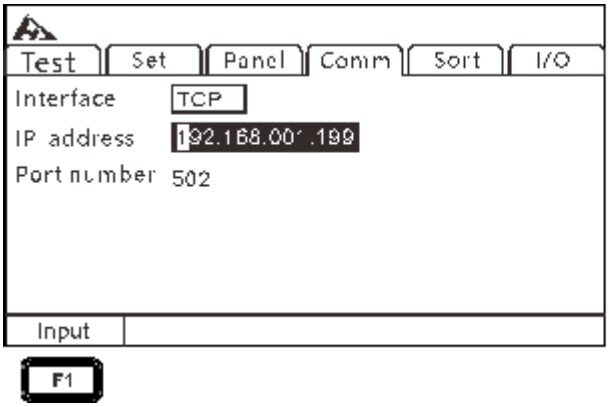
Ø Select the communication page



Ø Select TCP communication mode



Ø Set the communication page



Press up/down/left/right
to choose the menu

Chapter 8 Specification

8.1 General Specification

General function

Model	CHT3544
Measurement parameters	DC resistance
Basic parameters:	0~3.3MΩ (10 ranges) Max reading:33000 Min resolution: 0.1μΩ
Basic accuracy	0.1%±10 count(3mΩ,30mΩ,3MΩ) 0.05%±4 count(300kΩ) 0.02%±2 count(other range)
Measurement range	3mΩ/30mΩ/300mΩ/3Ω/30Ω/300Ω/3kΩ/30kΩ/300kΩ/3.3MΩ.
Measuring speed	FAST(50Hz:21ms, 60Hz:18ms) SLOW(200ms)
Signal Source	1A DC Max:5.5V
Temperature	Range:-10 °C~60 °C, Accuracy:1 °C
Calibration	Short-circuit reset for all ranges
Comparator	10-bin sorting, output signal HIGH/IN/LOW
Internal data storage	6000 group test data

Trigger mode	IO, bus, manual
Interface	External IO Analog LAN RS-232C
Other	Temperature compensation function Comparator(ABS/REF%) Lock(OFF/menu lock/all lock) Power frequency setting(auto/50Hz/60Hz), Zoom in/out Judge sound setting Auto-save Average function Panel storage/reading
Power supply	Voltage:100VAC ~ 240VAC; Frequency: 50Hz ~ 60Hz;Power: max 10
Dimension & weight	325 mm (L)x215mm (W)x96mm (D); Weight: 2kg
Max output current	1A
Automatic protection display	“Protet”
Display when Range over limit	Display OF
Input terminal	Banana plug
Operation key	Rubber key
Display screen	3.5 inch TFT
Precision guarantee period	1 year
Operating temperature and humidity	0℃ to 40℃ 80% RH or less (no condensation)
Storage temperature and	-10℃ to 60℃

humidity	80%RH以下
Operating environment	Indoor, the highest altitude is 2000m

8.2 Accuracy

The following indicators test conditions:

Temperature: 20±3°C

Humidity: <80% RH

Warm-up time is more than 15 minutes

Calibration time is less than 1 year

Resistance measurement accuracy:

range		Resolution	Fast speed	Medium speed, slow speed	Test current
1	3mΩ	0.1mΩ	0.1%±2 count	0.1%±2 count	1A
2	30mΩ	1mΩ	0.1%±2 count	0.1%±2 count	1A
3	300mΩ	10mΩ	0.1%±2 count	0.1%±2 count	300mA
			0.1%±2 count	0.02%±2 count	100mA
4	3Ω	100mΩ	0.1%±2 count	0.02%±2 count	100mA
5	30Ω	1mΩ	0.1%±2 count	0.02%±2 count	10mA
6	300Ω	10mΩ	0.1%±2 count	0.02%±2 count	1mA
7	3kΩ	100mΩ	0.1%±2 count	0.02%±2 count	1mA
8	30kΩ	1Ω	0.1%±2 count	0.02%±2 count	100uA
9	300kΩ	10Ω	0.1%±2 count	0.04%±2 count	10uA
10	3M	100Ω	0.3%±2 count	0.2%±2 count	1uA