# D.C. Milli-Ohm Meter

GOM-804 & GOM-805

**USER MANUAL** 



ISO-9001 CERTIFIED MANUFACTURER



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# **SAFETY INSTRUCTIONS**

This chapter contains important safety instructions that you must follow when operating the GOM-804/805 or when keeping it in storage. Read the following before any operation to insure your safety and to keep the GOM-804/805 in the best possible condition.

# Safety Symbols

These safety symbols may appear in this manual or on the GOM-804/805.

WARNING	Warning: Identifies conditions or practices that could result in injury or loss of life.	
	Caution: Identifies conditions or practices that could result in damage to the instrument or to other properties.	
<u>/</u>	DANGER High Voltage	
<u>^</u>	Attention Refer to the Manual	
	Protective Conductor Terminal	
<u>_</u>	Earth (ground) Terminal	
	Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.	

# Safety Guidelines

General Guideline	<ul> <li>Do not place any heavy objects on the instrument.</li> <li>Avoid severe impact or rough handling that leads to damaging the instrument.</li> <li>Do not discharge static electricity to the instrument.</li> <li>Use only mating connectors, not bare wires, for the terminals.</li> <li>Do not disassemble the instrument unless you are qualified as service personnel.</li> </ul>
	<ul> <li>(Note) EN 61010-1:2010 specifies the measurement categories and their requirements as follows. The GOM-804/805 doesn't fall under category II, III or IV.</li> <li>Measurement category IV is for measurements performed at the source of low-voltage installation.</li> <li>Measurement category III is for measurements performed in the building installation.</li> <li>Measurement category II is for measurements performed on the circuits directly connected to the low voltage installation.</li> </ul>
Power Supply	<ul> <li>AC Input voltage: 100 - 240 V AC, 50 - 60Hz, 25VA</li> <li>The power supply voltage should not fluctuate more than 10%.</li> <li>Connect the protective grounding conductor of the AC power cord to an earth ground, to avoid electrical shock.</li> </ul>
Cleaning the GOM-804/805	<ul> <li>Disconnect the power cord before cleaning.</li> <li>Use a soft cloth dampened in a solution of mild detergent and water. Do not spray any liquid into the instrument.</li> <li>Do not use chemicals or cleaners containing harsh material such as benzene, toluene, xylene, and acetone.</li> </ul>
Operation Environment	<ul> <li>Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (Note below)</li> <li>Temperature Range: 0~35°C, Relative Humidity: &lt;80%RH; &gt;35°C, Relative Humidity: &lt;70%RH</li> <li>Altitude: &lt; 2000m</li> <li>Operating Environment: 0°C to 40°C (operation)</li> <li>Pollution Degree 2</li> </ul>

	<ul> <li>(Note) EN 61010-1:2010 specifies the pollution degrees and their requirements as follows. The GOM-804/805 falls under degree 2. Pollution refers to "addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity".</li> <li>Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.</li> <li>Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.</li> <li>Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected. In such conditions, equipment is normally protected against exposure to direct sunlight, precipitation, and full wind pressure, but neither temperature nor humidity is controlled.</li> </ul>
Storage Environment	<ul> <li>Location: Indoor</li> <li>Storage Conditions: -10°C to 70°C</li> <li>Temperature Range: 0~35°C, Relative Humidity: &lt;90%RH; &gt;35°C, Relative Humidity: &lt; 80%RH</li> </ul>
Disposal	Do not dispose this instrument as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased. Please make sure discarded electrical waste is properly recycled to reduce environmental impact.

#### Power cord for the United Kingdom

When using the instrument in the United Kingdom, make sure the power cord meets the following safety instructions.

NOTE: This lead / appliance must only be wired by competent persons

WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in this lead are coloured in accordance with the following code:

Green/ Yellow: Earth

Blue: Neutral

Brown: Live (Phase)

As the colours of the wires in main leads may not correspond with the coloured marking identified in your plug/appliance, proceed as follows:

The wire which is coloured Green & Yellow must be connected to the Earth terminal marked with either the letter E, the earth symbol or coloured Green/Green & Yellow.

The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Blue or Black.

The wire which is coloured Brown must be connected to the terminal marked with the letter L or P or coloured Brown or Red.

If in doubt, consult the instructions provided with the equipment or contact the supplier.

This cable/appliance should be protected by a suitably rated and approved HBC mains fuse: refer to the rating information on the equipment and/or user instructions for details. As a guide, a cable of 0.75mm<sup>2</sup> should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.

Any exposed wiring from a cable, plug or connection that is engaged in a live socket is extremely hazardous. If a cable or plug is deemed hazardous, turn off the mains power and remove the cable, any fuses and fuse assemblies. All hazardous wiring must be immediately destroyed and replaced in accordance to the above standard.

# **G**ETTING STARTED

This chapter describes the GOM-804/805 in a nutshell, including its main features as well as its front and rear panels. After going through the panel overview, follow the Power-up sequence before attempting to use the instrument.

Please note the information in this manual was correct at the time of printing. However as GW Instek continues to improve its products, changes can occur at any time without notice. Please see the GW Instek website for the latest information and content.



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## GOM-804/805 Characteristics

GOM-804 and GOM-805 are modern high precision programmable DC Milli-ohm meters suitable for low resistance measurements of switches, relays, connectors, PCB tracks and a variety of other devices. The meters feature a color TFT-LCD screen with easy-to-read measurement results. With the easy-to-use features, superior performance and automatic test interfaces, these meters are dependable instruments for resistance measurements.

Easy to Use Features	Each test function on the GOM-804/805 can be easily activated by pressing a single front panel key. All the settings and measurement results are displayed and set on the TFT-LCD panel at the same time making each function naturally intuitive to use.
	Each primary and secondary measurement result is displayed prominently on the display along with any corresponding settings. For sequential measurement results, such as those from the scan or binning function, are tabulated in an intuitive and easy-to-read format.
	In addition, the meters can recall previously used settings upon startup, allowing the meter to be ready the next time it used in a matter of moments. The meters can also save or recall up to 20 sets of function settings.
Performance	The GOM-804/805 has nine selectable measurement ranges from $5m\Omega$ to $5M\Omega$ , a constant current source of 1uA to 1A, an accuracy of up to 0.05%, a 0.1u $\Omega$ resolution and performs measurements using four wire Kelvin connections for accurate, consistent measurements.
	The ability to choose between high accuracy measurements at 10 samples/sec (full scale at 50000 counts) or high speed measurements at 60 samples/sec (full scale at 50000 counts), allows the GOM-804/805 the flexibility to fulfill a number of different measurement roles.

Advanced Temperature Measurements	The GOM-804/805 has a number of advanced temperature functions that can be used with the optional temperature probe, PT-100.
	The temperature compensation function can extrapolate what the resistance of a DUT will be at a desired temperature, if the temperature coefficient of the DUT and the resistance of the DUT at ambient temperature are known.
	The temperature conversion function can be used to extrapolate what the temperature rise of a DUT will be at specified resistance if the initial resistance, initial temperature and the constant for the DUT are known.
Drive Signals	The GOM-805 can select a number of different drive signals to suit a number of different measurement scenarios, for example the Pulse setting can be used to cancel the effects of thermoelectric EMF on the measurement results.
Dry Circuit Testing	Dry circuit testing allows the GOM-805 to measure the contact resistance of switches and connectors according to the DIN IEC 512 and ASTM B539 standards. The open circuit voltage will not exceed 20mV in this mode to prevent the oxidization layer on metal switches and connector points from breakdown. GOM-805 only.
Automatic Testing	For automatic testing The GOM-804/805 has a handler interface designed for automatic testing. The handler interface outputs the status of PASS, FAIL, HI, LO, READY and EOT signals and inputs a trigger control signal. Automatic testing is used with the binning, compare and scan functions.
	For computer control applications, RS-232 and USB are standard remote interfaces, with GPIB as standard only for the GOM-805 and GOM-804G.

Applications	• Production testing for contact resistance of switches, relays, connectors, cables and printed circuit boards and other low resistance devices.
	• Component testing of resistors, motors, fuses and heating elements.
	• Incoming inspection and quality assurance testing.
	• Conductivity evaluation for product design.

### **Key Features**

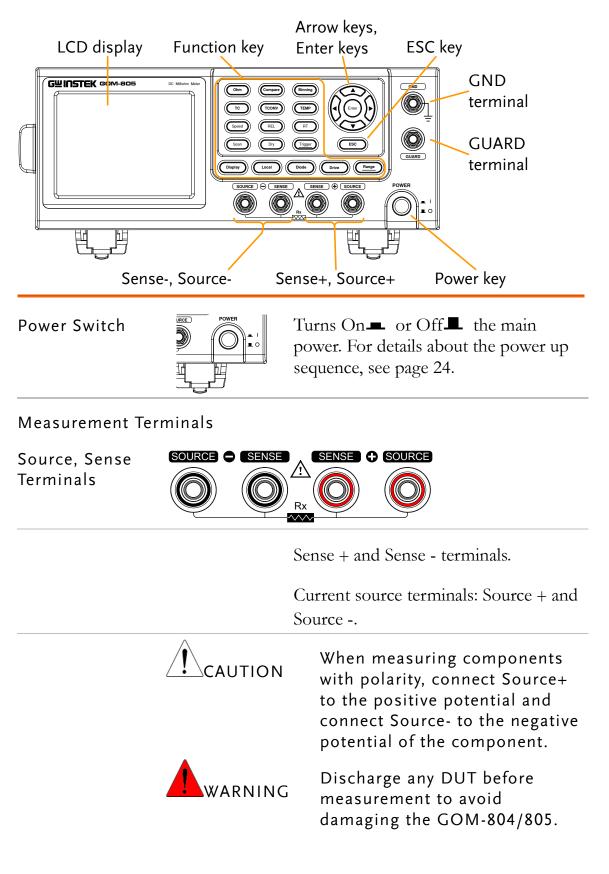
- 50,000 counts
- Measurement Range:  $5m\Omega \sim 5M\Omega$
- Accuracy of up to 0.05%
- Compare function
- Binning function
- Manual or Auto-ranging
- Continuous or Triggered measurement modes
- Temperature measurement, temperature compensation and temperature conversion
- Four-wire Kelvin measurement method
- Selectable power-on settings
- Diode test
- Alarm settings for function-specific PASS/FAIL test results
- Sampling rate: 10 or 60 sampling/sec
- Standard interfaces: USB/RS232/Scan/Handler/GPIB(GOM-805, GOM-804G)
- Save/Recall settings: 20 memory sets
- External I/O logic function

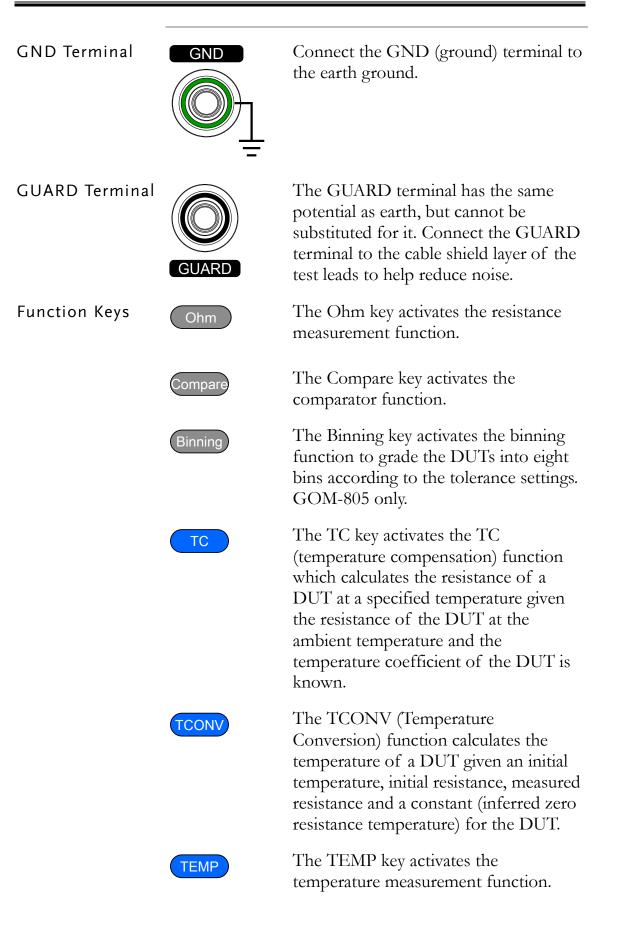
## Model Lineup

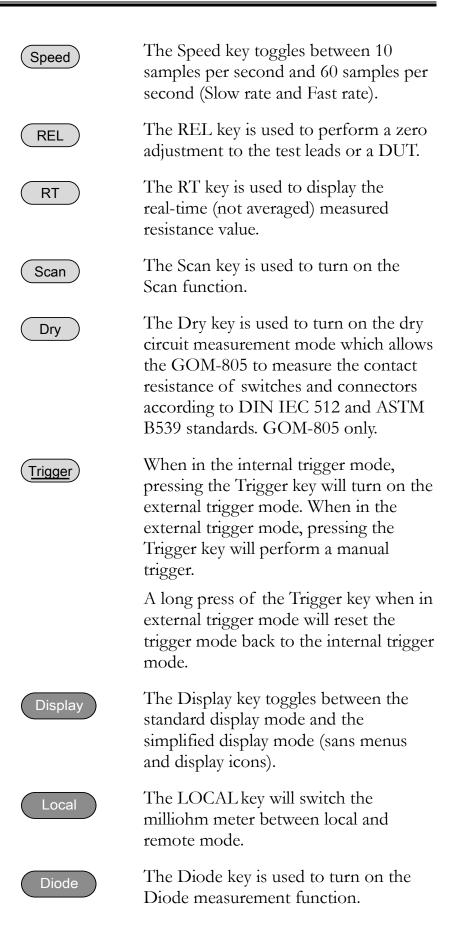
Feature / Model	GOM-804	GOM-804G*	GOM-805
Ohm Measurement	<b>v</b>	<b>~</b>	~
Compare Function	<b>/</b>	<ul> <li>✓</li> </ul>	~
Diode Measurement	<b>~</b>	<ul> <li></li> </ul>	~
Temp. Compensation	<b>~</b>	<ul> <li></li> </ul>	~
Temp. Conversion	<b>v</b>	<b>/</b>	~
Temp Measurement	<b>v</b>	<b>v</b>	~
Dry Circuit	×	×	~
Drive Selection	×	×	~
Binning Function	×	×	~
Interface			
GPIB Interface	×	<b>v</b>	~
RS-232 Interface	<b>v</b>	<b>/</b>	~
USB Device Interface	<b>~</b>	<ul> <li></li> </ul>	~
Handler/EXT IO/Scan Interface	~	r	~
Temperature Sensor Interface	~	r	~

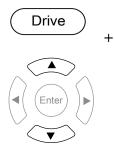
GPIB option. Please note that the GPIB option cannot be user-installed on the GOM-804. The option must be ordered prior to purchase.

## Front Panel Overview





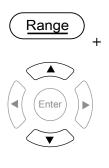




The Drive key in conjunction with the up/down arrow keys is used to select the measuring signal: DC+, DC-, Pulse, PWM, Zero and Standby. In particular, the Zero setting can be used as a +/-10mV DC voltmeter to measure the EMF of passive components. The Standby, on the other hand, is used to break off Relay of Force+/- without outputting test current, and none of measurements will be executed.

See page 33 for details. GOM-805 only. The drive signal is fixed to DC+ and Standby on the GOM-804.





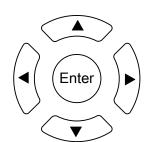
ESC

Long pressing the Range key will activate the auto ranging mode.

The <u>Range</u> key in conjunction with the up/down arrow keys is used to select the resistance measurement range.

When in auto ranging mode, pressing the Range key will activate the manual ranging mode.

The ESC key cancels the current setting and returns the cursor to its default location or returns to the previous menu, depending on the circumstances.



The arrow keys and Enter key are used to edit parameters, to navigate the menu system and to select parameter ranges.

#### Arrow Keys, Enter Key

## **TFT-LCD** Overview

Function mode	Range	Trigger mode	Rate	Remote mode
Ave	erage value Dr	ry circuit Remot	te error	Drive signal
REL value Function contro	unc : Comp 50 Ω el : 0.8995 mΩ Avg : 4 35 4 35 4 35 4 30 4 30 4 30 4 30 4 30 4 30 4 30 4 30	.859	Prive : DC+ Mem No. : 03	Memory number Main measurement display
R	35.860 Ω eference : 061.8000 Ω pper : +001.00 % ower : -001.00 %	2 Mode : Δ%	s	Function mode settings
M	leas.Setup System	Memory		0
	Seco	ondary menus		

Function ControlThe function control indicators show all the currentlyIndicatorsactive settings for the selected function mode:

Func	Currently selected function mode	
Range	The measurement range. Auto indicates that auto ranging is active	
Trigger mode	Int/Ext	
Rate	Slow/Fast	
Drive:	DC+, DC-, Pulse, PWM, Zero, Standby	
Rel	Shows the relative (nominal) reference value	
Avg	Number of samples used for the Average function.	
Dry	Indicates that the dry circuit function is active	
Err	Indicates a remote command error	

	RMT	Indicates that the unit is in remote control mode
	Mem No.	Indicates which memory setting has been recalled
Main Measurement Display	Shows all measurement results for the selected function mode.	
Function Mode Settings	Shows any function mode-specific settings.	
Secondary Menus		menus show global menus (Meas. Setup), y) as well as function-specific secondary
	Meas. Setup	Goes to the global Measurement Setup menu.
	System	Goes to the global System menu
	Memory	Allows you to save, recall and clear memory settings.
	View	Shows the all results for all the channels when a scan has finished.
	Clear	Clears the measurement results in the Binning function when the display mode is set to Count.

Rear Pane	l Overvie	W
GPIB port	RS232 port	Handler/Scan/Ext I/O
AC 100 - 2007 ~ 50 - 60Hz E C C C C C C C C C C C C C	WARNING TO VOID SMOCK, REMOVE INPUTS BEFORE OPENING.	HANDLER / SCH / EXT IO USB B port SENSOR S
AC Input	AC 100 - 240V ∼ ,50 - 60Hz 25VA MAX	<ul> <li>Accepts the power cord. AC 100 - 240Vac; 50 - 60Hz.</li> <li>For the power up sequence, see page 24.</li> </ul>
RS-232 Port		Accepts an RS-232C cable for remote control; DB-9 male connector. For remote control details, see page 93.
GPIB Port	GPIB	Accepts a GPIB cable for remote control. See page 94 for details.
USB Device Port	~~	USB device port for remote control. See page 91 for details.
Handler / Scan / EXT I/O Port		The Handler / Scall / EAT I/O

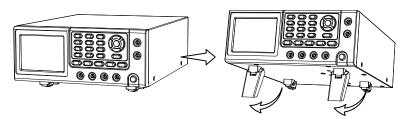
Temperature Sensor Port	TC SENSOR	The temperature sensor input is for the optional PT-100 temperature probe.
Note	Sense - Source Source - Source Source	<ul> <li>The pin definition of Temperature</li> <li>Sensor Port.</li> </ul>

## Set Up

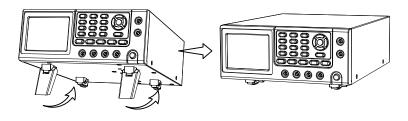
#### Tilt Stand

Tilt

To tilt, pull the legs forward, as shown below.



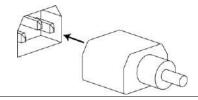
Stand Upright To stand the unit upright, push the legs back under the casing as shown below.



#### Power Up

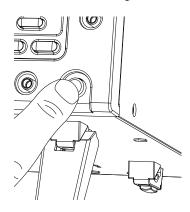
1. Connection Ensure that the input AC power voltage is within the range of 100~240 V.

Connect the power cord to the AC Voltage input.



Ensure the ground connector of the power cord is connected to a safety ground. This will affect the measurement accuracy.

1. Power up Press the main power switch on the front panel.



The display will light up and show the last setting used before the last shut down.

 Func : Ohm
 5 MΩ
 Auto Int
 Slow
 Drive : DC+

 •
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 •
 •
 •

 •
 •
 •
 •
 •

Example: Resistance measurement mode

#### 4 Wire Kelvin Connection

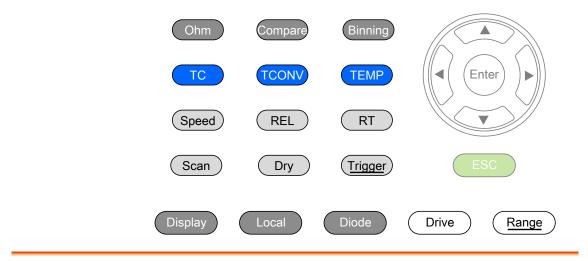
Background	The GOM-804/805 uses 4 wire Kelvin connections for
	accurate measurements.

Connection Diagram		SENSE C SOURCE GUARD +
Description	Source +	The Source + terminal carries the measuring current source. It is connected to the + side of the DUT.
	Source -	The Source - terminal accepts the signal return current and connects to the – side of the DUT.
	Sense +	Monitors the positive (+) potential.
	Sense -	Monitors the negative (-) potential.
	Guard	Grounds the shielding layer of the test lead cables to reduce noise.
	GND	Provides a reference ground for the GOM-804/805.

#### Zeroing (Relative Function)

Background	The Relative fur adjustment on t	nction is used to perform a zero he test leads.
		ve value is pre-set, each measurement that qual to the actual value minus the relative
Note	The Relative fur Diode functions	nction cannot be used with the Scan or s.
1. Short the cables	Short the test ca below:	ables together as shown in the diagram
	SOURCE C SENSE	SENSE COURCE
2. Set the Reference value	Press the REL	🕞 key.
3. Relative mode display appears	0.3	e REL o Int Slow Drive : DC+ D D D O After REL Func : Ohm 50 mΩ Auto Int Slow Drive : DC+ Rel : 0.319 mΩ - 0.0000 mΩ
	Rel:	Indicates the Relative function is active

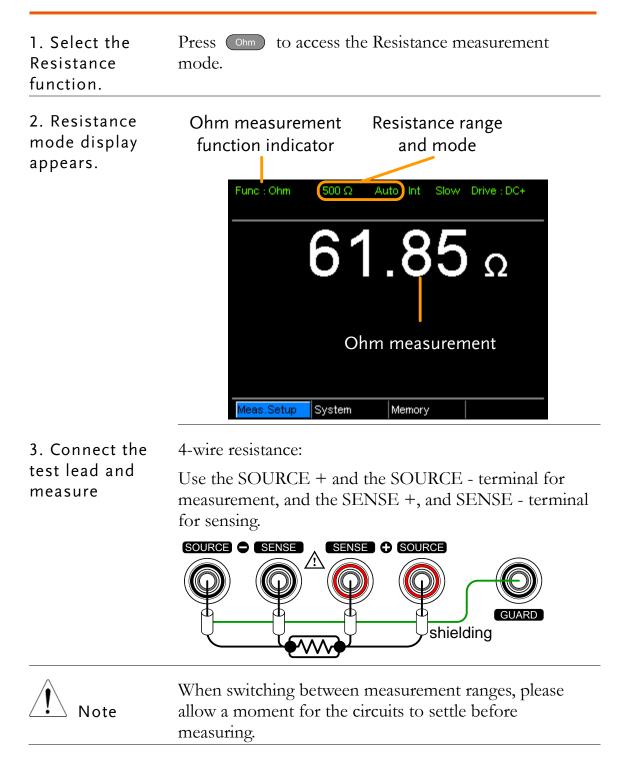
# **MEASUREMENT**



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#### **Resistance Measurement**



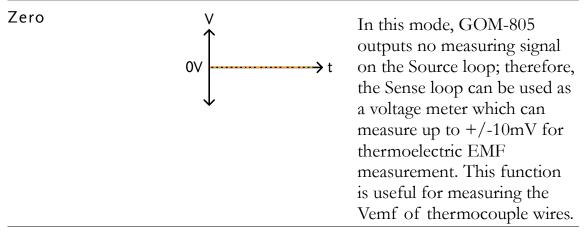
### Select the Resistance Range

Background	The resistance range can be used with normal resistance measurement as well as the temperature compensation function.	
Manual	Press the Range key and use the up and down arrow keys to manually select the resistance range.	
	Meas.Setup Syste	em Memory (500 Ω 🗢 Set range
		Range select 🔍 🔻
Auto Range	Long press the Range key to turn on automatic ranging.	
	Range,	Auto range
	Func : Ohm 500	Ω Auto Int Slow Drive : DC+
Selection List	Range	Resolution
	5mΩ	0.luΩ
	50mΩ	luΩ
	500mΩ	10uΩ
	5Ω	100uΩ
	50Ω	lmΩ
	500Ω	10mΩ
	5kΩ	100mΩ
	50kΩ	1Ω
	50kΩ 500kΩ	1Ω 10Ω

### Measuring Signal (Drive) Overview

Background		•
Note	and the open circuit voltage than 20mV when Drive fur	applicable to the GOM-805 e is a maximum of no greater nction is activated. The Drive fixed to DC+ and Standby.
DC+	~+6.25V $\downarrow$	pen circuit Default drive voltage signal.
DC-	~ -h /jV	Negative drive signal. voltage
Pulse	~+6.25V 0V ~-6.25V 50ms	This mode can be used to eliminate the thermoelectric <sup>t</sup> EMF formed on the contact between a test lead and a DUT.
PWM	~+6.25V OV	This mode can be used to avoid heating up the DUT <sup>t</sup> and thus avoid having the measurement accuracy compromised on temperature-sensitive DUTs.
Standby	$v \rightarrow t$	The Standby is used to break off Relay of Force+/- without outputting test current, and none of measurements will be executed.

Note: Standby mode only applies to hardware with the latest PCB board. Refer to page 69 for details.

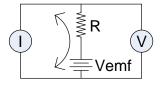


A note about Thermoelectric EMF

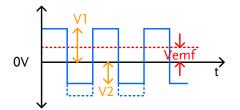
When making low resistance measurements, thermoelectric electromotive force (Vemf) can affect measurement accuracy. Vemf is created at the junction of two dissimilar metals, such as the contact point of a test lead and the pin of a DUT. Vemf adds a small but measurable voltage to the measurement.

There are primarily two different methods to compensate for Vemf in low resistance measurements: Offset Compensation and Vemf Cancelling. The GOM-805 uses Vemf Cancelling with the pulse drive signal setting (see page 33).

The Pulse drive mode supplies a positive and a negative measurement current source.



This produces a positive and negative measurement voltage across the DUT, which also includes the Vemf (V1+Vemf & V2+Vemf).



To cancel the Vemf, V2 is deducted from V1 and divided by 2 to get the average measurement, as shown in the formula below:

$$Vx = \frac{(V1 + Vemf) - (V2 + Vemf)}{2}$$

Where Vx = measured voltage sans Vemf.

#### Select Measuring Signal (Drive)

Background	Resistance measurement has 6 different measuring signals that can be applied to obtain a resistance measurement: DC+, DC-, Pulse, PWM, Zero and Standby.	
Note	The Dive function is only applicable to the GOM-805. The drive signal for the GOM-804 is fixed to DC+ and Standby.	
	The Drive function cannot be used with the Scan or Diode functions. In addition, the "Zero" drive setting is only available with the Ohm measurement function.	
1. Select Drive	Press the Drive key and use the up and down arrow keys to select a drive signal.	
	Drive mode	
	.Setup System Memory DC+ → Set drive signal Drive selection	
	indicator	
	Drive Range DC+, DC-, Pulse, PWM, Zero, Standby	

#### Select Measurement Rate

Background	The resistance measurement speed has 2 ranges: slow and fast. Slow speed is the most accurate with 10 measurements/second. Fast speed has 60 measurements/second. Both have the same measurement resolution.	
	The rate selection function is not applicable in Diode measurement mode. When the PWM drive signal is used or when the Scan function is activated, the only available rate setting is fast.	
1. Select Rate	rate setting is fast. Press the speed key to toggle between the Slow and Fast rates. Measurement rate Func : Ohm 500 mΩ Int Fast Drive : DC+	

Display Mode	
Background	The Display key can be used to toggle between the normal and the simplified display mode. The simplified display mode clears all text, menus and function indicators from the screen except for the measurement and measurement mode indicators.
1. Toggle Display mode	Press the Display key to toggle the display between normal and simplified. The display will change accordingly.
Simplified Display Mode Example	Measurement mode

display

#### View Real-Time Measurement

Background When measurements are smoothed using the averaging function, the RT key can be used to view the real-time results in addition to the averaged results.

See page 60 for Average configuration.

1. TogglePress theRTkey to toggle the real-time display onReal-Timeor off.

The real-time measurement will appear in the bottom left-hand corner.



### Dry-Circuit Measurement

Background	The Dry Circuit measurement function is used where the maximum open-circuit voltage must be kept to a minimum for applications such as measuring the contact resistance of switches, relays and connectors. The GOM-805 provides a maximum of up to 20mV in this mode.			
Note	Dry circuit testing is for switch and connector contact resistance. Switch and connector contact resistance measurement is in accordance with DIN IEC 512 and ASTM B539 which requires that the open circuit voltage of the measuring device should not exceed 20mV DC. Voltage at such low levels avoids the breakdown of any oxides that may be present on the contacts. In this mode the open circuit measuring voltage is limited <20mV, while modes like DC+ or pulse mode can have an open circuit measuring voltage as high as 6.25V.			
	The Dry Circuit function cannot be used with the Scan or Diode functions. In addition, when the Dry Circuit function is turned on, only 3 drive settings are available: DC+, DC- and Pulse.			
Dry Limitations	on, the measu	y Circuit measuremen arement range is redu		
	Range	Dry Mode	Rate	
	$5 \mathrm{m} \Omega$	×		
	$50 \mathrm{m} \mathbf{\Omega}$	×		
	500m <b>Ω</b>	<b>v</b>	Slow/Fast	
	5Ω	~	Slow/Fast	
	50 <b>Ω</b>	<b>v</b>	Slow/Fast	
	500 <b>Ω</b>	×		
	5k $\Omega$	×		
	$50k\Omega$	×		
	500k $\Omega$	×		

#### G≝INSTEK

	5ΜΩ 🗶		
1. Toggle Dry mode on or off	Press the <b>D</b> ry key to toggle the dry circuit measurement mode on or off.		
	The DRY function indicator will appear in the middle of the display when active.		
	Dry Circuit measurement mode indicator		
	Func: Ohm 500 m Auto Int Fast Drive: DC+ Dry $11.91 \text{ m}\Omega$		

## Using the Trigger Function

Background	The GOM-804/805 can use internal or manual triggering for the Resistance, Temperature, Temperature Compensation, Temperature Conversion, Binning, Handler and Scan modes. By default the GOM-804/805 is set to internal triggering mode.
1. Select Manual Trigger	Short press Trigger to switch to manual triggering mode.
	The Ext indicator will be shown on the display when the manual trigger is active.
	Trigger source
	Func:Ohm 500 Ω Auto Ext Fast Drive:DC+

Memory

System

Meas.Setup

2. Manually Triggering Measurements	Short press the Trigger key each time you want to start a single measurement (when in the manual mode).		
3. Internal Triggering	Long press Trigger to return the triggering mode back to internal mode. The Int indicator will be shown on the display.		
	Internal trigger source		
	Func : Ohm 500 Ω Int Slow Drive : DC+		

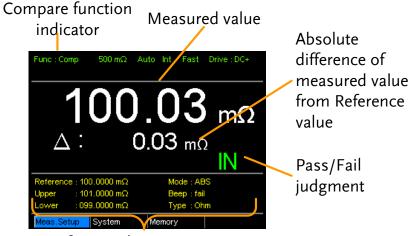
Diode Functio	n	
Background	The Diode function can be used to measure the forward bias voltage of a diode under test.	
1. Select the Diode function.	Press Diode to access the Diode measurement mode.	
2. Diode mode appears.	Diode function indicator	
	Func : Diode     Int       O.7028 v       Forward bias voltage	
3. Connect the test lead and measure	Connect the Sense+, Source+ to the anode. Connect the Sense-, Source- to the cathode.	

# **Compare Function**

Background The compare function compares a measured value to a "Reference" value that has an upper (HI) and lower (LO) limit. If the measured value is within the upper and lower limit, then the measured value is judged as IN.

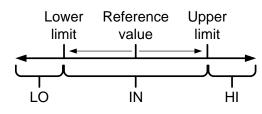
There are three compare modes that can be used to make a judgment: ABS,  $\triangle$ % and % modes.

The ABS mode displays the absolute difference between the measured and the reference gvalue (shown as  $\triangle$ ) and compares the measured value to the upper (HI) and lower (LO) limit. The upper and lower limits are set as absolute resistance values.

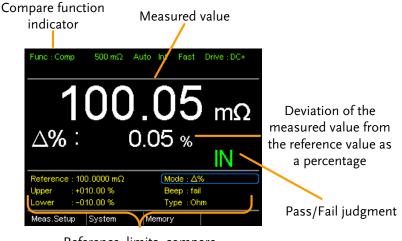


Reference, limits, compare mode and beep mode

A measured value that falls within the upper and lower limits is considered IN (pass), a value that falls below the lower limits is considered LO, and a value that falls over the upper limit is a HI.



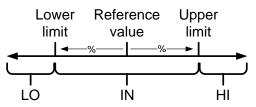
[Note that the reference value in the ABS mode is only for reference purposes and is not used to make a judgment.] The  $\triangle$ % compare function displays the deviation of the measured value from the reference value as a percentage. {[(Measured Value-Reference)/Reference]%}.



Reference, limits, compare mode and beep mode

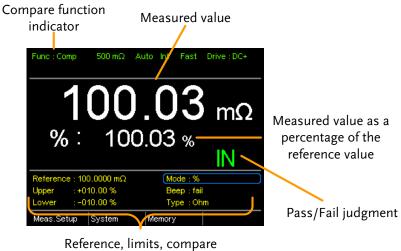
The upper (HI) and low (LO) limits are set as a percentage *from* the reference value. (Identical to the % compare mode)

A measured value that falls within the upper and lower limits is considered IN (pass), a value that falls below the lower limits is considered LO, and a value that falls over the upper limit is a HI.



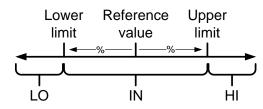
The % compare mode displays the measured value as a percentage of the reference value [(Measured Value/Reference Value)%].

The upper (HI) and low (LO) limits are set as a percentage *from* the reference value. (Identical to the  $\triangle$ % compare mode)



mode and beep mode

A measured value that falls within the upper and lower limits is considered IN (pass), a value that falls below the lower limits is considered LO, and a value that falls over the upper limit is a HI.



For all the compare modes, IN, HI or LO will be shown on the display for each judgment.

1. Select the Press Compare to access the compare mode, as shown compare function above.

3. ReferenceUse the arrow keys to navigate to the Reference settingvalue settingand press Enter.

Use the left and right arrow keys to select a digit. Use the up and down arrow keys to edit the value of the selected digit and the unit. Press Enter to confirm the setting.

	Move and edit Select and confirm Move total total tot	
	Range: $000.0001 \sim 999.9999$ $(m\Omega/\Omega/k\Omega/M\Omega)$	
Note	After setting the Reference value, the displayed $\triangle$ , % or $\triangle$ % values will be changed to reflect the new Reference value setting.	
4. Upper & lower limit setting	Use the arrow keys to navigate to the Upper or Lower limit setting and press Enter. Use the left and right arrow keys to select a digit. Use the up and down arrow keys to edit the value of the selected digit. Press Enter to confirm the setting. Repeat for the other limit (Upper or Lower).	
	Setting Range: ABS mode: $000.0000 \sim 999.9999$ (m $\Omega/\Omega/k\Omega/M\Omega$ ) $\triangle$ % and % mode: -999.99 ~ +999.99	
Note	The upper limit must be higher than the lower limit. Not setting the upper limit higher than the lower limit is not allowed. Likewise the lower limit cannot be set higher than the upper limit.	

5. Beep setting Use the arrow keys to navigate to the Beep setting.Press Enter to toggle the beep setting.

	These Enter to togget the beep setting.		
	Reference : 100.0000 mΩ     Mode : %       Upper : +010.00 %     Beep : fail       Lower : -010.00 %     Type : Phm       Meas.Setup     System       Memory     Enter       Beep setting		
	Beep Setting: Off, Pass, Fail		
Note	The Beep setting can also be set from the System>Utility>Beep>Compare menu.		
6. Type setting	Use the arrow keys to navigate to the Type setting.		
	Press Enter to toggle the type setting.		
	Reference : 100.0000 mΩ         Mode : %           Upper         : +010.00 %         Beep : fail           Lower         : -010.00 %         Type : Ohm           Meas.Setup         System         Memory		
	Type setting		
	Type Setting: Ohm, TC		
Note	The measured value is displayed according to Type setting is selected.		
	For TC function comparison, please make sure the relative TC setting is done. See page 52 respectively for details.		

compare mode

## **Binning Function**

BackgroundThe Binning function is used to grade DUTs into eight<br/>different bins according to 8 sets of upper and lower<br/>limits. Two compare modes can be used in this function,<br/>ABS and  $\triangle$ % modes.

Binning functi indicator Func : Bin		Grading re uto Int Fast	esults Drive : DC+	
61	. <b>84</b> Ω	1 2 5 6	3 4 7 8	
Bin Upper 1 062,0000 Ω 2 061,9000 Ω 3 061,8000 Ω 4 061,7000 Ω	061.8000 Ω 061.7000 Ω	Bin         Upper           5         061.6000 Ω           6         061.5000 Ω           7         061.4000 Ω           8         061.3000 Ω	Lower 061.5000 Ω 061.4000 Ω 061.3000 Ω 061.0000 Ω	Upper and lower limits for the 8 bins
Reference : 06 Beep : 01 Meas.Setup		Mode : ABS Disp : Con		

1. Select the<br/>Binning functionPress the Binning<br/>key to access this function.

2. Select the Use the arrow keys to go to the Mode setting.

Press Enter to toggle between ABS or  $\triangle$ % compare modes.

modes.	
2         061.9000 Ω         061.8000 Ω           3         061.8000 Ω         061.7000 Ω           4         061.7000 Ω         061.6000 Ω           Reference : 061.5000 Ω         Beep         : Off	6 061.5000 Ω 061.4000 Ω 7 061.4000 Ω 061.3000 Ω 8 061.3000 Ω 061.0000 Ω Mode : ABS Disp : €omp
Meas.Setup System	Memory
	Mode setting Toggle
ABS Mode	The ABS mode allows you to set the upper and lower limits of each bin as absolute resistance values.
△% The Delta % mode allows you to set the upper and lower limits of each bin as percentage value from the reference value.	

For further details on the ABS or $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$		
Although the 8 bins have their own upper and lower limits, they still share a common reference value.		
Use the arrow keys to go to the Reference setting and press Enter.		
Use the left and right arrow keys to select a digit. Use the up and down arrow keys to edit the value of the selected digit and the unit. Press Enter to confirm the setting.		
Move and edit         2         061.9000 Ω         061.8000 Ω         6         061.5000 Ω         061.4000 Ω           *         • <t< td=""></t<>		
Enter Select and confirm Reference		
Range         000.0001~           999.9999(mΩ/Ω/kΩ/MΩ)		

4. Upper & lower Use the arrow keys to go to the upper limit of the first limit settings bin and press Enter.

Use the Left and Right arrow keys to select a digit. Use the Up and Down arrow keys to edit the value of the selected digit and unit. Press the Enter key to confirm the setting.

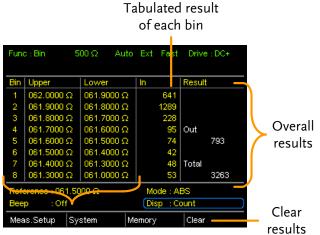
Repeat for the lower setting.

Repeat for the remaining bins.

Upper, lower		5 6	7 8
reference Move	Bin         Upper         Lower           1         062,0000 Ω         061,9000 Ω           2         061,9000 Ω         061,8000 Ω           3         061,8000 Ω         061,7000 Ω           4         061,7000 Ω         061,6000 Ω	Bin         Upper           5         061.6000 Ω           6         061.5000 Ω           7         061.4000 Ω           8         061.3000 Ω	Lower 061,5000 Ω 061,4000 Ω 061,3000 Ω 061,0000 Ω
Enter Select and confirm	Reference :061.5000 Ω Beep :Off Meas.Setup System	Mode : AB Disp : Co Memory	
Setting range	ABS mode: 00 $(m\Omega/\Omega/k\Omega/M$ $\triangle$ % mode: -9	$M\Omega)$	

Note	The upper limit must be higher than the lower limit. Not setting the upper limit higher than the lower limit is not allowed. Likewise the lower limit cannot be set higher than the upper limit.		
5. Beep setting	Use the arrow keys to navigate to the Beep setting.		
	Press Enter to toggle the beep setting.		
	2       061.9000 Ω       061.8000 Ω       6       061.5000 Ω       061.4000 Ω         3       061.8000 Ω       061.7000 Ω       7       061.4000 Ω       061.3000 Ω         4       061.7000 Ω       061.6000 Ω       8       061.3000 Ω       061.0000 Ω         Reference : 061.5000 Ω       Mode : ABS       Mode : ABS       Image: Comp       Image: Comp		
	Beep setting		
	Beep Setting: Off, Pass, Fail		
Note	The Beep setting can also be set from the System>Utility>Beep>Binning menu.		
6. To start binning	The binning function starts automatically if you are in internal trigger mode.		
	If you are using the manual triggering mode, press the <b>Trigger</b> button or apply a pulse on the trigger pin of the Handler interface to start binning.		
	See page 38 to set the triggering modes.		
7. Display the	There are two different display modes to view results.		
binning results	The Comp (Compare) display mode is the default display mode. This mode will display the currently measured value and displays which of the bins (if any) the measured value is graded as.		
	Grading results: Green = IN Red = OUT Func : Bin 500 Ω Auto Int Fast Drive : DC+		
	Measurement 61.84 Ω 1 2 3 4 5 6 7 8 Bin Upper Lower Bin Upper Lower		

The Count display mode tabulates the results on the right-hand side of the display and shows the bin settings on the left.



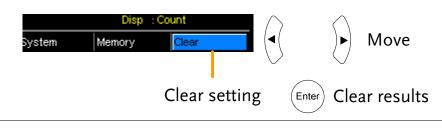
Upper and lower limits of Bin 1~8

To toggle the display mode, go to the Disp setting and press Enter.



8. How to clear the result count

When in the Count display mode, press the ESC key. Go to the Clear setting and press Enter. The accumulated results will be cleared from the display.



# Temperature Measurement

Background	The temperature measurement function uses the optional PT-100 temperature probe. The measured temperature is displayed on the display. For more information on the optional PT-100 sensor, see the appendix on page 151.		
	There is only one range for the temperature function. However the resistance measurement range can still be changed when in the temperature function.		
Note:	The temperature measurement function is used in conjunction with the Ohm measurement function. The two measurements share the same display, so the Ohm readings stay on the display even after the temperature measurement function is activated. Thus when the Temperature function is selected, "Ohm+T" is shown as the selected function.		
1. Select the Temperature function	Press TEMP to enter the temperature measurement function. Temperature + Ohm function indicator Resistance measurement		
	Func: Ohm+T 500 Ω Auto Int Fast Drive: DC+ 61.83 Ω 23.8 °C (Ambient) temperature source Ambient		
	Meass Setup       System       Memory         The temperature is displayed on the Ohm display.		
2. Select the temperature units	From the bottom menu, go to Meas. Setup>Temperature Unit and select °C or °F.		

See page 65 for setting details.

3. Ambient Temperature	The Ambient temperature setting should be turned off when using the temperature function.	
	From the bottom menu go to Meas. Setup > Ambient Temperature and turn the Ambient Temperature setting off.	
	See page 66 for setting details.	
4. Temperature mode connection	The temperature sensor uses the rear panel TC Sensor port for input.	
	PT-100 temperature sensor	

## **Temperature Compensation**

Background

If the resistance of a DUT at a particular temperature is needed, the compensation function can be used. This function can simulate the resistance of a DUT at a desired temperature. If the ambient temperature and the temperature coefficient of the DUT are known, it is possible to determine the resistance of a DUT at any temperature.

The Temperature Compensation works on the following formula:

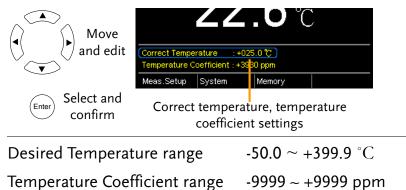
$$R_{t0} = \frac{R_t}{1 + \alpha_{t0}(t - t_0)}$$

Where:  $R_t = \text{Measured resistance value } (\Omega)$   $R_{t0} = \text{Corrected resistance value } (\Omega)$   $T_0 = \text{Inferred absolute temperature}$   $t_0 = \text{Corrected temperature } (^{\circ}\text{C})$   $t = \text{Current ambient temperature } (^{\circ}\text{C})$   $a_{to} = \text{Temperature coefficient of resistance at the correct}$ temperature.  $a_{to} = \frac{1}{|T_0| + t_0|}$ .

<ol> <li>Select the Temperature Compensation mode</li> </ol>	Press TC to access the Temperature Compensation function. The temperature-compensated resistance measurement will appear on the display.		
2. Ambient Temperature	The ambient temperature can be either measured with the PT-100 sensor or be set manually.		
	If using the PT-100 sensor the Ambient temperature setting should be turned off. If the PT-100 probe is not used, then the ambient temperature needs to be manually set.		
	From the bottom menu, go to Meas. Setup > Ambient Temperature and set the ambient temperature.		
	See page 66 for setting details.		
	Range Off, -50.0 °C ~ 399.9°C		

3. Temperature Use arrow keys to go to Correct Temperature or to Temperature Coefficient and press Enter to select the setting.

To edit the setting values use the left and right arrow keys to select a digit and use the up and down arrow keys to edit the digit. Press Enter to confirm the setting.

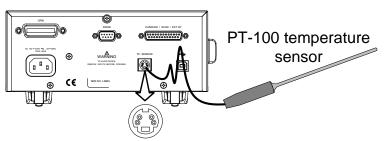


Below are the inferred zero resistance temperatures of some common conductors:

Material	Inferred Absolute Temperatures
Silver	-243
Copper	-234.5
Gold	-274
Aluminium	-236
Tungsten	-204
Nickel	-147
Iron	-162

3. Temperature compensation connection

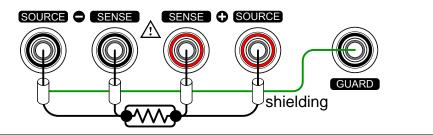
Sensor Connection:



Note: If the sensor is not connected, then the Ambient temperature needs to be manually set.

DUT connection:

4 wire Kelvin:



# **Temperature Conversion**

Background	The Temperature Conversion function allows you to determine the temperature change of a DUT at any given resistance, if the initial temperature, the inferred zero resistance temperature for the DUT and the initial resistance of the DUT are known. The displayed result can also be the extrapolated to calculate the final temperature (T) or the extrapolated temperature difference $(\bigtriangleup T)^*$ .		
	Temperature Conversion function works on the following formula:		
	$\frac{R_2}{R_1} = \frac{t_0 + t_2}{t_0 + t_1}$		
	Where: $R_2$ = resistance @ temperature $t_2$ $R_1$ = resistance @ temperature $t_1$ $t_0$ = inferred zero resistance temperature in °C** $t_1$ = temperature at $R_1$ $t_2$ =temperature at $R_2$		
	The temperature conversion function is can be used to determine the temperature of transformer windings, electric motors, or other materials where it may not be practical to embed a temperature sensor.		
	*(T) Final temperature = $t_2 = \triangle T + T_A$		
	( $T_A$ ) Ambient temperature = Ambient temperature when $R_2$ is measured. $T_A$ can either by manually measured with the PT-100 sensor or it can be manually set.		
	$(\triangle T)$ Extrapolated temperature difference = T - T <sub>A</sub>		
	**"Constant" setting on the panel display is equivalent to the absolute value of the inferred zero resistance		

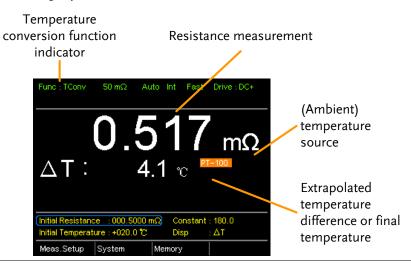
temperature.

Common inferred Metallic conductors show increased resistivity when zero resistance temperatures is increased, and likewise show reduced resistivity when temperature is reduced. Inferred zero resistance temperature is simply the inferred temperature at which the material will have no resistance. This value is derived from the temperature coefficient of the material. Note: the inferred zero resistance temperature is an ideal value, and not a real-world value.

Material	Inferred zero resistance temp. in °C
Silver	-243
Copper	-234.5
Gold	-274
Aluminium	-236
Tungsten	-204
Nickel	-147
Iron	-162

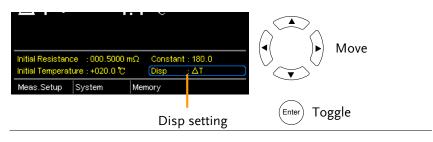
1. Select the Temperature compensation mode. Press TCONV to access the temperature compensation function.

The temperature-converted measurement will appear on the display.



2. Initial Resistance, Initial Temperature and Constant settings	Use the arrows keys to go to Initial Resistance, Initial Temperature or Constant (inferred initial resistance temperature) and press Enter.	
	0	nrrow keys to select a digit and use w keys to edit the digit. Press Enter
	V V Initial Ta Meases	esistance :000.5000 mΩ) Constant : 180.0 mperature +020.0 ℃ Disp : ΔT etup System Memory Il Resistance, Initial Temperature and Constant settings
	Initial Resistance	<b>000.0001~999.9999 m</b> Ω, Ω,kΩ, MΩ
	Initial Temperature	-50.0 ~ +399.9 °C
	Constant	000.0~999.9

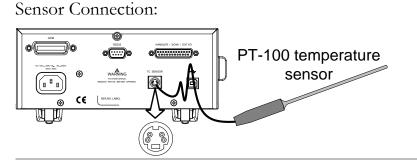
**3.** Display mode Use the arrow keys to go to Disp. Press Enter to toggle between the T and  $\triangle$ T modes.



T displays the extrapolated temperature at the measured resistance of the DUT.

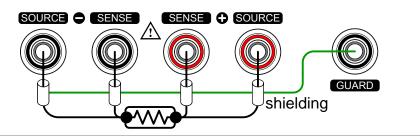
 $\triangle$ T displays the difference from the extrapolated temperature at the measured resistance of the DUT and the ambient temperature. Please refer to page 56 for further details.

3. Temperature compensation connection.



DUT connection

4 wire Kelvin:



# Measurement Settings

Background	The following measurement settings are used to
	configure the various measurement modes.

### Average Function

Background	The average function smoothes measurements using a moving average. The average function sets the number of samples used for the moving average; a higher number results in smoother measurement results. The average function is turned off by default.		
1. Select Average setting	From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus. Go to Meas. Setup and press Enter. Go to Average and press Enter. Go to Average and press Enter.		
2. Average setting appears	Use the arrow keys to turn Average on and set the average number. Press Enter to confirm the setting. Average settings Measure Setup Average Measure Delay		
	Average OFF, ON: 2~100		

Pressing ESC before pressing ENTER will exit the AverageNotefunction settings.

#### Measure Delay

The Measure Delay setting inserts a delay time between Background each measurement. Measure delay is turned off by default. Measurement start with Measure delay time Test signal Measure delay time Default Measurement start time The measure delay setting is useful for measuring components that need some time to charge if the default measurement start time is not adequate. An adequate delay time allows the meter to avoid the effects of transient disturbances that are usually seen when measuring reactive DUTs with a current source. 1. Select Measure From one of the main screens, press Meas. Setup Delay setting the **ESC** key so that the menu menu icon system at the bottom of the display system Me has focus. Move Go to Meas. Setup and press Enter. Go to Measure Delay and press Select menu Enter. Ente or setting

2. Measure Delay Use the arrow keys to turn Measure Delay on and set the setting appears delay time. Press Enter to confirm the setting.

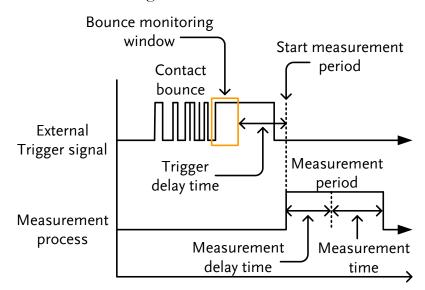
	Average
	OFF
Measure delay	Measure Delay
setting	ON 100.000 s
	Trigger Delay
Measure Delay	* OFF, ON: 000.000 ~ 100.000s
* When the set	value is $> 0.1$ s, the resolution is 0.1s.
When the set v	alue is $< 0.1S$ , the resolution is 1mS.



Pressing ESC before pressing ENTER will exit the Measure Delay settings.

#### Trigger Delay

Background The Trigger Delay setting adds a delay to when an external trigger signal is recognized. Normally the external trigger is recognized when there is no contact bounce in the signal for a fixed length of time, this time is known as the bounce monitoring window. This ensures that the external trigger signal is stable before it is recognized. The Trigger Delay time starts right after the bounce monitoring window ends.



The Trigger Delay setting is turned off by default.

Pin 2 of the Handler/Scan/Ext I/O interface is used for<br/>external triggering, See page 77 for pinout details.

1. Select Trigger Delay setting	From one of the main screens, press the ESC key so that the menu	Meas. Setup menu icon
	system at the bottom of the display	Meas.Setup System Memo
	has focus.	
	Go to Meas. Setup and press Enter.	(     Move
	Go to Trigger Delay and press	
	Enter.	Enter Select menu or setting

2. Trigger Delay setting appears

Use the arrow keys to turn Trigger Delay on and set the delay time. Press Enter to confirm the settings.

	Trigger Delay setting	ON 100.000 s Trigger Delay ON 0000 ms Trigger Edge	
	Trigger Delay	OFF, ON: 0 ~ 1000ms	
Note	Pressing ESC before pressing ENTER will exit the Trigg Delay settings.		Trigger

#### Trigger Edge

Background	The Trigger Edge setting sets the external trigger edge as rising or falling. By default the trigger edge is set to rising.	
1. Select Trigger Edge setting	From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus. Go to Meas. Setup and press Enter. Go to Trigger Edge and press Enter.	Meas. Setup menu icon Meas.Setup System Mema System Move Enter Select menu or setting

2. Trigger Edge Use the arrow keys to set the Trigger Edge. Press Enter setting appears to confirm the setting.

	Trigger Edge setting	ON 0000 ms Trigger Edge RISING
	Trigger Edge	Rising, Falling
Note	Pressing ESC be Edge settings.	fore pressing ENTER will exit the Trigger

### Temperature Unit

Background	Temperature units can be set to Fahrenheit or Celsius for all temperature measurements.	
1. Select Temperature Unit setting	From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus. Go to Meas. Setup and press Enter. Go to Temperature Unit and press Enter. Heas. Setup ystem Move Enter Select menu or setting	
2.Temperature Unit setting appears	Use the arrow keys to set the Temperature Unit. Press Enter to confirm the setting.	
	Temperature Unit Fahrenheit, Celsius	
Note	Pressing ESC before pressing ENTER will exit the Temperature Unit setting.	

Background	The Ambient Temperature setting is used to set the
	ambient (room temperature) for the Temperature
	Compensation or Temperature Conversion function in
	the absence of the PT-100 temperature sensor. See page
	52 and 56 respectively for details.

1. Select Ambien Temperature setting	t From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus.	Meas. Setup menu icon Meas.Setup
	Go to Meas. Setup and press Enter.	(
	Go to Ambient Temperature and press Enter.	Select menu or setting
2.Ambient Temperature	Use the arrow keys to set the Ambie Press Enter to confirm the setting.	nt Temperature.
setting appears	Ambient Ambient Temperatur	e
	Ambient Temperature Off, On: -50°	°C ~ 399.9°C

Note	Pressing ESC before pressing ENTER will exit the Ambient
∠! Note	Temperature setting.

### Line Frequency

Background	The Line Frequency setting selects the appropriate line filter to reduce the influence of the AC line frequency on the milliohm measurements. This setting is set to AUTO by default.	
1. Select Line Frequency setting	<ul> <li>From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus.</li> <li>Go to Meas. Setup and press Enter.</li> <li>Go to Line Frequency and press Enter.</li> </ul>	Meas. Setup menu icon Meas.Setup Eystem Memo Move Enter Select menu or setting

2.Line Frequency Use the arrow keys to set the Line Frequency. Press Enter to confirm the setting.

		+399.9 চ ne Frequency অ VM	
	Line Frequency	Auto, 50Hz, 60Hz	
Note	Pressing ESC before pressing ENTER will exit the Line Frequency setting.		

PWM Setting			
Background		g will set the duty of the PWM Drive is set with ON and OFF times for the	
	OFF ON time	time	
	See page 31 for I	Drive setting details.	
1. Select PWM setting	the ESC key	main screens, press so that the menu tom of the display	
	Go to Meas. Setup and press Enter. ( Move		
	Go to PWM and	press Enter.	
2.PWM setting appears		ys to set the ON and OFF time for the to confirm the setting.	
	PWM	: 0100 ms	
	ON OFF	03 ~ 99 time units* 0100 ~ 9999 ms	
	*The ON time setting is set in "time units", not milliseconds. The amount of time in a time unit depends on the line frequency settings (see page 67).		
	Line frequency	1 Time Unit	
	60Hz	16.6mS	
	50Hz	20mS	
Note	Pressing ESC before setting.	ore pressing ENTER will exit the PWM	

# System Settings

Background	The System settings are used to view the system
	information, set the power on state, the remote interface,
	screen brightness, external interface and beep settings as
	well as access the calibration menu.

### System Information

Background	The System Information will show the manufacturer, model, software version and serial number of the unit. The system information is the equivalent of the return string from the *idn? query (page 137).	
1. View System Information	From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus. Go to System and press Enter. System information will be displayed at the top of the System menu.	
	System Information of hardware with the old PCB board     System       VER : GWINSTEK. GOMBOS. V3.01 / 3.01     S/N : 726A06192       Power On Status Setup	
	System Information of hardware with the latest PCB board       System         System Information VER : GWINSTEK, GOM805, V3.017 3.01A, S/N : 796A05162 Power On Status Setup	
	Note: From the screenshot above where <b>"A"</b> from the 3.01A indicates it is equipped with the latest PCB board, which empowers the features of HVP and Standby mode. Refer to page 77 for details of HVP and page 31 for details of Standby mode.	
$\wedge$	Pressing ESC will exit from the System menu.	



Pressing ESC will exit from the System menu.

### Power On Status Setup

Background	The Power On Status Setup allows you to either load the previous settings or the default settings on startup.			
1. Select Power On Status setting	system at the bottom has focus. Go to System and pre	hat the menu of the display ss Enter.	System menu icon Meas.Setup System Memo	
	Go to Power On Statu press Enter.	is Setup and	Enter Select menu or setting	
2. Power On Status Setup appears	Use the arrow keys to set Power ON Status Setup. Press Enter to confirm the setting. System Information FW VER : GWINSTEK.GOMBOS.VO. 10 S/N : GEI123456 Power On Status Setup RECALL PREVIOUS SETTINGS Utility			
	Power On Status Recall Previous Settings, Load Default			
Note	Pressing ESC before p On Status Setup.	ressing ENTER	will exit the Power	

## Interface

Background	The remote interface can be set to RS232, GPIB or USB.		
Note	The GPIB interface is only available on the GOM-804G and the GOM-805.		
1. Select Interface setting	the ESC key	press Enter.	
2. Interface setting appears	Use the arrow keys to choose an interface and to set the baud rate (RS232) or primary address (GPIB). The EOL (end of line) character can also be set. Press Enter to confirm the settings.		
	Interface	GPIB, Primary Address (1 ~ 30) RS232, Baud Rate (1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200) USB	
	DATA OUT	ON, OFF	
	EOL	LF, CR, CR+LF, LF+CR (default = LF) See page 105 for further details.	
Note	<ul> <li>Pressing ESC before pressing ENTER will exit from the Interface settings.</li> <li>After DATA OUT is turned on, the measured value will be automatically sent back, via communicating interface, to the connected PC.</li> <li>The DATA OUT function is only available when Trigger Mode is selected in EXT.</li> </ul>		

-			
Background	The Brightness setting sets the backlight brightness of the TFT-LCD panel.		
1. Select Brightness setting	From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus. Go to System and press Enter. Go to Utility and press Enter. Go to Brightness and press Enter.	System menu icon Meas.Setup System Ne Move Enter Select menu or setting	
2. Brightness setting appears	Use the arrow keys to set the brightness level. Press Enter to confirm the setting. Brightness Brightness Total I/O		
	Brightness 01 (dim) ~ 05	5 (bright)	
Note	Pressing ESC before pressing ENTER will exit from the Brightness settings.		

## Brightness

#### User Define Pins

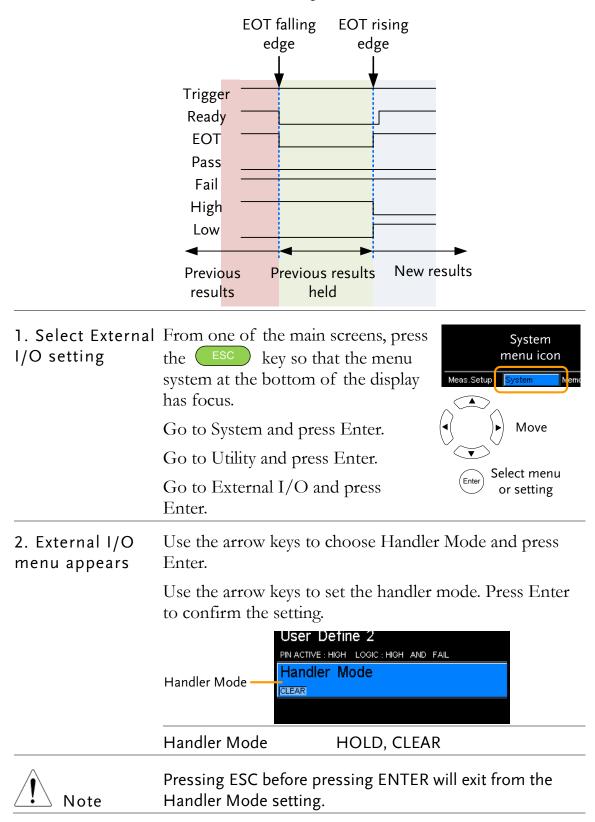
Background	The External I/O and the active leve the Handler/Scan External I/O pins functions. The log fail, high, low or b function.	el for the Define /EXT I/O port s are used with th gic settings can be	1 and Define on the rear p e compare o e based on th	e 2 pins on panel. The pr bin ne pass,
1. Select External I/O Setting		so that the menu		System menu icon System
	Go to System and	l press Enter.		Move
	Go to Utility and	press Enter.	$\overline{\mathbf{v}}$	
	Go to External I/ Enter.	O and press	(Enter)	elect menu or setting
2. External I/O Menu Appears	Use the arrow key User Define 2 and		r User Defin	ne 1 or
	Use the arrow keys to set the active level of the pint the logic conditions are true and to set the logic setti Press Enter to confirm the settings.			<b>^</b>
		External I	/0	1
	User Define 1	ser Define 1		
		active:[High] Logic:High_a ser Define 2	ND FAIL	
		ACTIVE:HIGH LOGIC:HIGH AI	ND FAIL	
	User Define 1/2:	Pin Active: High	ı, Low	
		Logic:		
		Operand1	Operator	Operand2
		Fail		Fail
		Pass	Logical OR,	Pass
		Low	Logical	Low
		High	AND,	High
		Bin O**	OFF*	Bin O**
		Bin 1 ~ 8		Bin 1 ~ 8

\*The OFF operator sets the Logic as true when Operand1 is true.

** Bin O is defined	as outside bin 1~ 8.
---------------------	----------------------

Â	The Bin logic settings are not available for the GOM-804.			
∠ <b>!</b> → Note	Pressing ESC before pressing ENTER will exit from the selected External I/O setting.			
Handler Mode				
Background	The Handler Mode setting determines the behavior of the result signals from the handler interface. There are two settings, Clear and Hold. The Clear setting will clear the results of the previous test before starting the succeeding one and the Hold setting will keep the test result of the previous test until the succeeding test has completed.			
	The timing diagrams below are used as examples. All the result signals in the examples are active high.			
Clear example	Clear: All result signals (PASS, Fail, High and Low) are cleared at the falling edge of EOT and the results from the current test are output at the rising edge of the EOT signal.			
	EOT falling EOT rising edge edge 1 1			
	Trigger Ready EOT Pass Fail High Low Previous results Cleared New results			

Hold example Hold: The results of the previous tests are held until the current test has completed.



Веер				
Background	The Beep setting will configure the beeper sound for the key presses, the Compare function and the Binning function.			
	For the Compar configured to be		0	•
1. Select Beep setting	From one of the the ESC key system at the bo has focus.	y so that the	menu	System menu icon as.Setup System Memo
	Go to System ar	nd press Ent	er.	↓ Move
	Go to Utility and	d press Ente	er.	Select menu
	Go to Beep and	press Enter		or setting
2. Beep menu appears	Use the arrow ke Enter.	eys to choos	e a beep sett	ing and press
Use the arrow keys to set the selected setting as Enter to confirm.			ting and press	
			Веер	
	Key Click Setting —	Key Click		
	Compare Setting —	Compare		
	Binning Setting —	OFF Binning		
		OFF		
	Beep Settings:	Key Click	On, Off	
		Compare	Off. Pass,	Fail
		Binning	Off. Pass,	Fail
Note	Pressing ESC be selected Beep se	• •	g ENTER will	exit from the

#### High Voltage Protect

Background	This page is to enable or disable the function of HVP (High Voltage Protect), which promptly interrupts output to DUT with warning note present when high voltage is carried by the DUT. If, on the other hand, HVP is tuned Off, output test will keep going without interruption in any case.		
Note	The HVP function is enabled by default and can be deactivated by user manually. When HVP is disabled, user need to, however, particularly pay attention to if any high voltage occurs from the connected DUT, which may cause devastated result on GOM series.		
1. Select High Voltage Protect setting	From one of the main screens, press the ESC key so that the menu system at the bottom of the display has focus.		
	Go to System and press Enter. (•) Move		
	Go to Utility and press Enter.		
	Go to High Voltage Protect and press Enter.		
2. High Voltage Protect menu appears	Use the up and down arrow keys to change the High Voltage Protect setting followed by pressing the Enter button to confirm and take effect.		
	Utility		
	High Voltage Protect		
	High Voltage Protect Setting: On, Off		
	When high voltage is detected from DUT, the warning message will prompt as the screenshot shown and will disappear only after the high voltage withdraws.		
Note	<ul> <li>HVP is turned ON by default and reboot will restore the unit back to the factory default setting.</li> <li>Pressing ESC before pressing ENTER will exit from the High Voltage Protect setting.</li> </ul>		

# ANDLER/SCAN

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## Handler Overview

Background	The Handler interface is used to help grade components based on the Compare or Binning function test results. The appropriate pins on the handler interface are active when the Compare or Binning function is used. There are 17 TTL outputs and 1 TTL inputs. The Handler interface is only applicable with the Binning function or Compare measurement modes.		
Note	Please see following pages for related functions and settings: Compare function: 41 Binning function: 45 Ext I/O settings: 73 Handler mode settings 74		
Interface and pin assignment	25-Pin D-SUB (Female)	HANDLER / SCAN / EXT I/O	
Pin assignment	TRIGGER	Starts the trigger for a single measurement.	
	READY	High when the measurement has finished. The instrument is ready for the next trigger.	
	EOT	High when the AD conversion has completed. The DUT is ready to be changed.	
	BIN 1~8	High when the sorting result is in one of the eight bin grades. Bin1~8 (pass).	
	BIN OUT	High when the sorting result is out of all the eight bin grades (Bin1~8). The status of this pin reflects either a HI or LO result (fail).	
	LOW	High when the compare result is deemed LO.	
	HIGH	High when the compare result is deemed HI.	

FAIL	High when the compare result is either HI or LO (fail).	
PASS	High when the compare result is IN (pass).	

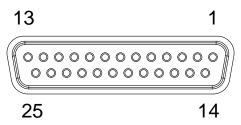
For the full pin definition, please refer to the table listed below.

	The output current from all the pins and the VINT(+5V)
└── Note	pin cannot exceed 60mA.

# Pin Definitions for the Handler Interface

As this interface is used for the handler and scan functions, the interface pinout depends on the function mode. The following pinout is only applicable when using the Binning or Compare function.

HANDLER / SCAN / EXT I/O



#### Handler Interface for Binning and Compare Functions

Pin	Name	Description	Active modes	In/ Out
1, 17		Reserved		
2	Trigger	Trigger for a single measurement.	All	In
3, 14, 18		Ground.		
4	Fail	High when the compare result is either HI or LO (fail).	Compare	Out
5	High	High when the compare result is deemed HI.	Compare	Out
6	Pass	High when the compare result is IN (pass).	Compare	Out
7	EOT	High when the AD conversion has completed. The DUT is ready to be changed.	Ext trigger mode	Out
8	VINT	Internal DC Voltage +5V.		Out
9	Bin1	High when the binning sorting result is within the bin1 setting range.	Binning	Out
10	Bin2			Out
11	Bin3	<u>00</u>		Out
12	Bin4	High when the binning sorting result is within the bin4 setting range.	Binning	Out

#### G≝INSTEK

13	Bin5	High when the binning sorting result	Binning	Out
	151115	is within the bin5 setting range.	Diminig	Out
15	Userdefine2	High or low when the user define2	Compare,	Out
		logic conditions are met.	Binning	
16	Userdefine1	High or low when the user define1	Compare,	Out
		logic conditions are met.	Binning	
19	VEXT	External DC Voltage, acceptable		In
		range is +5V.		
20	Ready	High when the measurement has	Ext	Out
		finished. The instrument is ready for	trigger	
		the next trigger.	mode	
21	Bin6	High when the binning sorting result	Binning	Out
		is within the bin6 setting range.		
22	Low	High when the compare result is	Compare	Out
		deemed LO.		
23	Bin7	High when the binning sorting result	Binning	Out
		is within the bin7 setting range.		
24	Bin8	High when the binning sorting result	Binning	Out
		is within the bin8 setting range.		
25	Bin Out	High when the binning sorting result	Binning	Out
		is out of all the bin setting ranges.		

For backwards compatibility with the GOM-802 handler interface, please see page 90.

### Scan Overview

Background	The Scan function is used to automatically bin groups of up to 100 components. The associated pins in the handler interface are active when the Scan function is activated. There are a total of 6 outputs, 3 inputs as well as a GND and power (+5V) pin.		
Interface and pin assignment	25Pin D-SHELL HANDLER / SCAN / EXT I/O (Female)		
Pin Assignment	Relay	Controls the relay output.	
	Pass	Pass signal. Indicates the compare result is IN(pass).	
	Low	Low signal. Indicates a LO compare result.	
	High	High signal. Indicates a HI compare result.	
	Clock	The clock signal will pulse high when each group of output signals (Relay, Pass, Low, High) are ready. There are up to 100 groups of output signals	
	STRB	After all (100) output groups are ready, the STRB signal will pulse high.	

#### Pin Definitions for the SCAN Interface

As this interface is used for the handler and scan functions, the interface pinout depends on the function mode. The following pinout is only applicable when using the Scan function.

HANDLER / SCAN / EXT I/O 13 1 0000000000000000 000000000000000 25 14

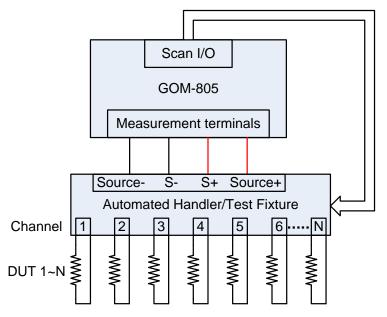
#### Scan Interface

Pin	Name	Description	In/Out
1,9-13,15-17,21,23 -25	Name	Reserved	III/Out
2	Trigger	Start for Scan measurement.	In
3,14,18	GND	Ground.	
4	High	High signal. Indicates a HI compare result.	Out
5	Clock	The clock signal will pulse high when each group of output signals (Relay, Pass, Low, High) are ready. There are up to 100 groups of output signals.	Out
6	Low	Low signal. Indicates a LO compare result.	Out
7	Pass	Pass signal. Indicates an IN compare result (pass).	Out
8	VINT	Internal DC Voltage +5V.	Out
19	VEXT	External DC Voltage, acceptable range is +5V.	In
20	Relay	Controls the relay output.	Out
22	STRB	After all (up to 100) output groups are ready, the STRB signal will pulse high.	Out

For backwards compatibility with the GOM-802 scanner interface, please see page 90.

#### Scan Setup

Background The Scan function sequentially scans up to 100 channels and grades the resistance of the DUT on each channel to a reference value. An automated handler or test fixture is required to interface the DUTs to the measurement terminals and the scan interface that controls the timing of each scan.



Note: The automated handler/test fixture is user-supplied. Please see your distributor for support and technical details.

Grading of each DUT is essentially the same as the compare function (page 41), the difference being the Scan function will compare up to 100 DUTs sequentially, whereas the Compare function will compare only one DUT at a time.

The scan function compares a measured value to a "Reference" value that has an upper (HI) and lower (LO) limit. If the measured value is within the upper and lower limit, then the measured value is judged as IN.

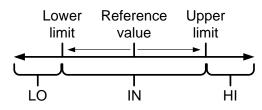
There are two modes that can be used to make a judgment: ABS and  $\triangle$ % modes.

The ABS mode compares the measured value to the upper (HI) and lower (LO) limits. The upper and lower limits are set as absolute resistance values.

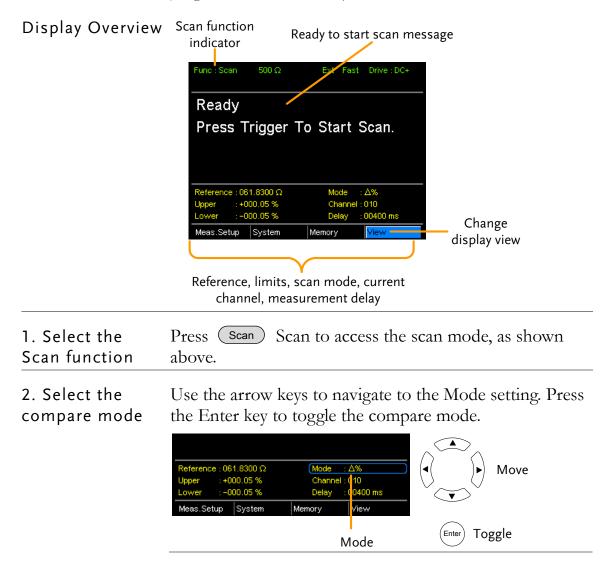
The  $\triangle$ % compare function compares the deviation of the measured value from the reference value as a percentage.

{ [(Measured Value-Reference)/Reference]%}.

A measured value that falls within the upper and lower limits is considered IN (pass), a value that falls below the lower limits is considered LO, and a value that falls over the upper limit is a HI.

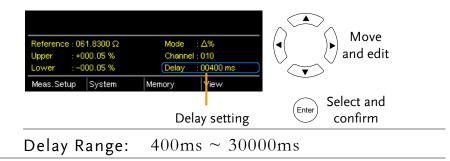


For both scan modes, the IN, HI or LO will be shown on the display for each judgment (if the time between each judgment is not too fast).

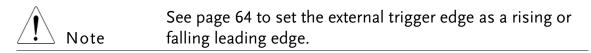


	Range Abs, $ riangle \%$	
3. Channel setting	The Channel setting sets the number of DUT channels that are used.	
	Use the arrow keys to navigate to the Channel setting and press Enter.	
	Use the left and right arrow keys to select a digit. Use the up and down arrow keys to edit the value of the selected digit. Press Enter to confirm the setting.	
	Reference : 061.8300 Ω       Mode : Δ%       Move and edit         Upper : +000.05 %       Channel : 010       Delay : 01400 ms         Lower : -000.05 %       Delay : 01400 ms       Select and	
	Channel setting Confirm	
	Channel Range: 01 ~100	
4. Delay setting	The Delay setting adds a pause between each channel measurement.	
	The Use the arrow keys to navigate to the Delay setting and press Enter.	

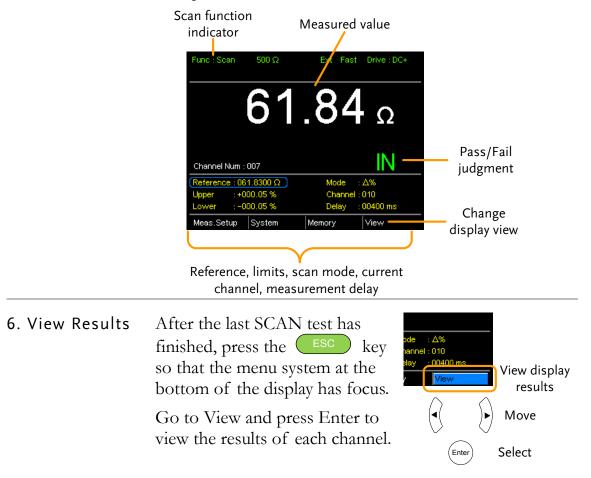
Use the left and right arrow keys to select a digit. Use the up and down arrow keys to edit the value of the selected digit. Press Enter to confirm the setting.



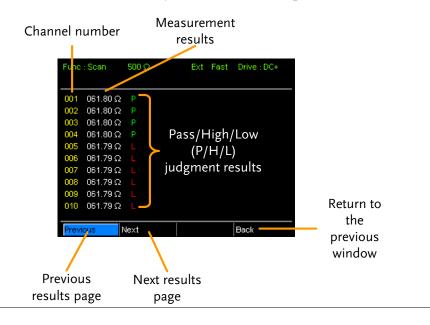
5. Start the scan. Press the Trigger key or input a pulse signal on the Trigger pin of the SCAN interface port to start a scan test.



The results will be displayed on the screen as each test is performed. The results will also be output through the scan port until the scan has finished.

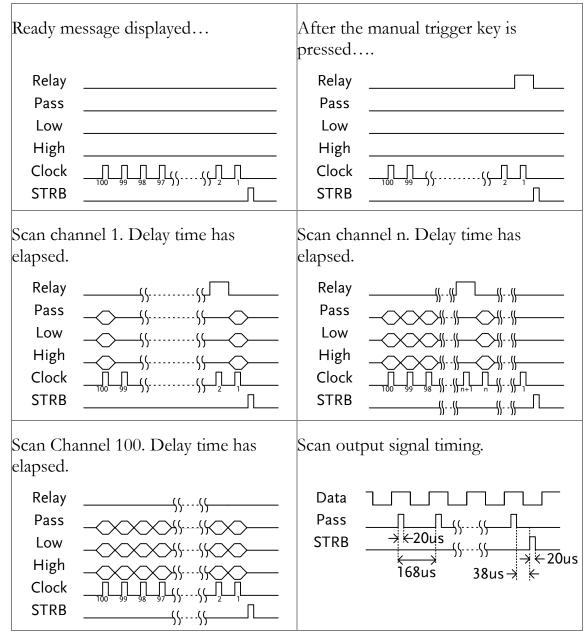


Use the Previous and Next soft-keys to view each page. Use the Back soft-key to return to the previous window.



#### Scan Output

Background The timing diagrams for the scan output under different conditions are shown below.



#### GOM-802 Compatibility for Scan and Handler Interfaces

As the handler interface on GOM-802 is a 9-pin D-sub and the GOM-805 is a 25-pin D-sub, the GOM-805 handler interface cannot be used with existing GOM-802 ATE equipment or environments without modification.

For backwards compatibility with the GOM-802 handler interface, please refer to the chart below:

GOM	805 Handler I	nterface		GOM	-802 Handler II	nterface
Pin	Handler	Scan		Pin	Handler	Scan
1, 17	Reserved	Reserved				
2	Trigger	Trigger	$\rightarrow$	3	Start	NC
3, 14,	GND	GND	$\rightarrow$	2	GND	GND
18						
4	Fail	High	$\rightarrow$	7	Fail	High
5	High	Clock	$  \rightarrow$	8	High	Clock
6	Pass	Low	$\rightarrow$	6	Pass	Low
7	EOT	Pass	$\rightarrow$	5	EOT	Pass
8	VINT	+5V	$\rightarrow$	1	+5V	+5V
9	Bin1					
10	Bin2					
11	Bin3					
12	Bin4					
13	Bin5					
15	Userdefine2					
16	Userdefine1					
19	VEXT	VEXT				
20	Ready	Relay	$\rightarrow$	4	Ready	Relay
21	Bin6					
22	Low	STRB	$ \rightarrow$	9	Low	STRB
23	Bin7					
24	Bin8					
25	Bin Out					

#### GOM-805 to GOM-802 Handler/Scan Interface

# **Configure Interface**

Overview	The RS-232 and USB interfaces are standard for all models, however the GPIB interface is only applicable for the GOM-804G and GOM-805. The remote control interfaces allow the GOM-804/805 to be programmed for automatic testing. For more information on remote control programming, please see the Command Overview chapter on page 103.		
Interface	USB	USB Device	
	RS-232	DB-9 male port	
	GPIB	24 pin female GPIB port (GOM-804G, GOM-805 only)	

#### Configure USB Interface

Background	The Type B USB port on the rear panel is used for remote control. This interface creates a virtual COM port when connected to a PC.	
Note	The USB interface requires the USB driver to be installed. See page 92 to install the USB driver.	
1. Connect and configure to USB.	Configure the interface to USB in System>Utility>Interface menu.	Page 71
	Connect the Type A-B USB cable to the rear panel USB B port on the GOM-804/805.	•
	Connect the other end to the Type A port on the PC.	

#### Install USB Driver

Background	The USB driver needs to be installed when using the USB port for remote control. The USB interface creates a virtual COM port when connected to a PC.				
1. Select the USB driver.	Configure the interface to USB in Page 71 System>Utility>Interface menu.				
	Connect the Type A-B USB cable to the rear panel USB B port on the GOM-804/805. Connect the other end to the Type A port on the PC.				
	Go to the Windows Device Manager. For Windows 7 go to: Start Menu > Control Panel > Hardware and Sound > Device Manager				
	The GOM-804/805 will appear as an unknown Virtual Com Port under "Other Devices".				
	<ul> <li>Monitors</li> <li>Network adapters</li> <li>Other devices</li> <li>Virtual COM Port</li> <li>Virtual COM Port</li> <li>Virtual COM Port</li> <li>Portable Devices</li> <li>Update Driver Software</li> <li>Ports (COM &amp; LP</li> <li>Processors</li> <li>Smart card reade</li> </ul>				
	Right-click Other Devices and select "Update Driver Software".				
	Select "Browse my computer for driver software" and select the driver on the User Manual CD.				
	The GOM-805 and the COM port that it is assigned to will now appear in under the Ports (COM & LPT) node.				
	<ul> <li>Portable Devices</li> <li>Ports (COM &amp; LPT)</li> <li>GOM-804/5 CDC (COM34)</li> <li>Processors</li> <li>Smart card readers</li> <li>Sound, video and game controllers</li> </ul>				

#### Configure RS-232 Interface

Background	The GOM-804/805 can also use an RS-232C connection for remote control. When connecting to a PC ensure the correct baud rate, parity, data bits, stop bit and data control settings are used.		
Settings	Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	
	Parity	None	
	Data bits	8	
	Stop bit	1	
	Data flow control	None	
1. Select the RS-232 baud rate	Configure the interface to RS232 and Page 71 set the baud rate in System>Utility>Interface menu.		
	Connect the RS- panel RS232 por	232C cable to the rear $\mathbb{R}^{S232}$	
RS-232 pin assignment	Pin 2: RxD Pin 3: TxD Pin 5: GND Pin 1, 4, 6 ~ 9: N	o Connection	
PC – GOM RS-232C connection		PC RxD Pin2 TxD Pin3 GND Pin5	

#### Configure GPIB Interface

Background	The GPIB interface is SCPI-1994, IEEE488.1 and IEEE488.2 compliant.		
Note	The GPIB interface is only available on the GOM-804G and GOM-805.		
1. Select the GPIB address	Configure the interface to GPIB and set Page 71 the GPIB address in System>Utility>Interface menu.		
	Connect one end of the GPIB cable to the computer and the other end to the GPIB port on the GOM-805.		

#### RS232/USB Function Check

Operation	Invoke a terminal application such as Realterm.
	For RS-232, set the COM port, baud rate, stop bit, data bit and parity accordingly.
	To check the COM settings in Windows, see the Device Manager. For example, in WinXP go to the Control panel $\rightarrow$ System $\rightarrow$ Hardware tab.
	Run this query from the terminal.
	*idn?
	This should return the Manufacturer, Model number, and Firmware version.
	GWINSTEK,GOM805,GXXXXXXX,V1.00
Note	If you are not familiar with using a terminal application to send/receive remote commands from the serial port or via a USB connection, please page 95 (Using Realterm to Establish a Remote Connection) for more information.

#### Using Realterm to Establish a Remote Connection

Background	Realterm is a terminal program that can be used to communicate with a device attached to the serial port a PC or via an emulated serial port via USB.	
	The following instructions apply to version 2.0.0.70. Even though Realterm is used as an example to establish a remote connection, any terminal program can be used that has similar functionality.	
Note	Realterm can be downloaded on Sourceforge.net free of charge.	
	For more information please see http://realterm.sourceforge.net/	
1. Install Realterm	Download Realterm and install according to the instructions on the Realterm website.	
2. Configure connection	Connect the GOM-804/805 via USB (page 91) or via RS232 (page 93).	
	If using RS232, make note of the configured baud rate.	
	Go to the Windows device manager and find the COM port number for the connection. For example in Windows 7, go to the Start menu > Control Panel > Hardware and Sound > Device Manager	
	Double click the Ports icon to reveal the connected serial port devices and the COM port for each connected device.	
	<ul> <li>Portable Devices</li> <li>Ports (COM &amp; LPT)</li> <li>GOM-804/5 CDC (COM34)</li> <li>Processors</li> <li>Smart card readers</li> <li>Sound, video and game controllers</li> </ul>	
	If using USB, the baud rate, stop bit and parity settings can be viewed by right-clicking connected device and selecting the Properties option.	

2. Run Realterm Start Realterm on the PC as an administrator. Click:

Start menu>All Programs>RealTerm>realterm

Tip: to run as an administrator, you can right click the Realterm icon in the Windows Start menu and select the Run as Administrator option.

After Realterm has started, click on the Port tab.

Enter the Baud, Parity, Data bits, Stop bits and Port number configuration for the connection.

The Hardware Flow Control and Software Flow Control options can be left at the default settings.

Press Open to connect to the GOM-804/805.

spley For	Canture	Pins Send Fcbo Port	120 1120-2 120Mise 1	Misc I <b>\n</b> Clear Freeze	4 9
splay (Port	Capture	Pins Send Echo Port	12C   12C-2   12CMisc   1	Status	2
			I2C I2C-2 I2CMisc I	je 🔽 Status	onne
aud 115200	• Eorl 3	Ē		je 🔽 Status Disco	conne ) (2)
oud 115200 P <u>o</u> nty	Eori 3			je Status Disco RXD 7	:on ne ) (2) ) (3)
aud 115200 P <u>a</u> nty I None	Eori 3		<u>□pen</u> <u>py</u> ✓ <u>Phang</u> Software Flow Control E Receive Xan Char [1]	Je V Status Jesot PXD TXD CTS	:onne ) (2) ) (3) ; (8)
oud 115200 Ponty None C Odd	Eort 3 Data Bits 8 bits 7 bits	Stop Bits I bit C 2 bits Hardware Flow Control	Qpen ):px ✓ ⊆hang Software Flow Control	Jew         Status           Jieco         PXD           7         TXD           9         DCD	:onne ) (2) ) (3) } (8) ) (1)
None	Eori 3	Stop Bits 1 bit C 2 bits Herdware Flow Control None C RTS/CTS	<u>□pen</u> <u>py</u> ✓ <u>Phang</u> Software Flow Control E Receive Xan Char [1]	Performance Status	:onne ) (2) ) (3) } (8) ) (1)
eud 115200 Ponty © None © Odd © Even	Eort 3 Data Bits 8 bits 7 bits	Stop Bits I bit C 2 bits Hardware Flow Control	Open (px)  Software Row Control Receive Xon Char 11 Receive Xon Char 11 Transmit Xoff Char 11 (C Row	Status         Direct           0         0         0           7         0         1         20           9         0         0         0         0           (is:         0         0         0         0	:onne ) (2) ) (3) ( (8) ) (1) 3 (6)
eud 115200 Ponty C Odd C Even C Mark	Eort 3 Data Bits © 8 bits C 7 bits C 6 bits	Stop Bits 1 bit C 2 bits Herdware Flow Control None C RTS/CTS	Open tox ✓ Chang Software Flag Control Fleceive Xan Char [1 ☐ Transmit Xaif Char, [1]	Status         Direct           0         0         0           7         0         1         20           9         0         0         0         0           (is:         0         0         0         0	:onne ) (2) ) (3) ) (1) } (6) } (9)

3. Test remote	Click on the Send tab.
command	Le the EOL configuration

In the EOL configuration, check on the +CR and +LF check boxes.

Enter the query: \*idn?

Click on Send ASCII.

RealTerm: Serial Capture Program				1
LING LER, GOHOND V. 32 STORATE SHOT SH				
isplay Port Capture Pins Se	end Echo Port 12C	12C-2 12CMisc Mis	c In Clear	Freeze 🤉
			6.4	Status
idn?	Send Numbe	ers Send ASCI		Disconne
				RXD (2)
	Send Numbe		CP After	TXD (3)
0 1°C LF Repeats 1	1	and the second se	F RECEIPTION F	] CTS (8)
	J 🗌 Literal	Strip Spaces	cic	DCD (1)
Dump File to Port		10		DSR (6)
c/temp/capture.txt	👻 Send	Eile 🗙 Stop De	ays 0 🗘 0 🌻	Fling (9)
				BREAK
		<u>R</u> epeats	0 \$	Enor
		TENT NO 1972	Long born	

The terminal display will return the following:

GWINSTEK,GOM805,GXXXXXXX,V1.00

(manufacturer, model, serial number, version)

4. Errors or	If Realterm fails to connect to the GOM-804/805, please
Problems	check all the cables and settings and try again.

#### **GPIB** Function

Background	Please use the National Instruments Measurement & Automation Controller software to confirm GPIB/LAN functionality.	
	See the National Instrument website, http://www.ni.com for details.	
1. Operation	Start the NI Measurement and Automation Explorer (MAX) program. Using Windows, press:	

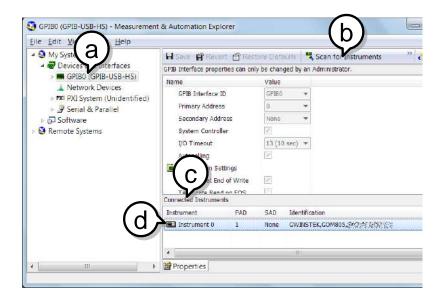
Start>All Programs>National Instruments>Measurement & Automation



Step a. From the Configuration panel access;

My System>Devices and Interfaces>GPIB0

- Step b. Press the Scan for Instruments button.
- Step c. In the Connected Instruments panel the GOM-804/805 should be detected as Instrument 0 with the address the same as that configured on the unit.
- Step d. Double click the Instrument 0 icon.



Step e. Click on the Attributes tab at the bottom.

Step f. Click on Communicate with Instrument.

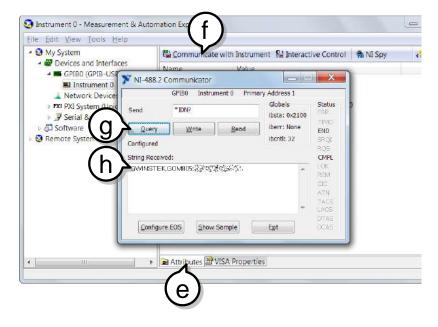
Step g. In the NI-488.2 Communicator window, ensure \*IND? is written in the Send String: text box.

Click on the Query button to send the \*IDN? query to the instrument.

Step h. The String Received text box will display the query return:

GWINSTEK,GOM805,GXXXXXXX,V1.00

(manufacturer, model, serial number, version)



The function check is complete.

# SAVE/RECALL

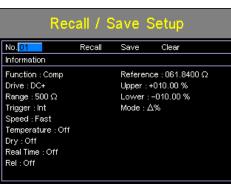
The settings for all the major functions can be saved and recalled from 20 memory slots.

Settings can saved/recalled for the following functions: Ohm, Compare, Binning, TC, TCONV, TEMP, Scan, Diode.

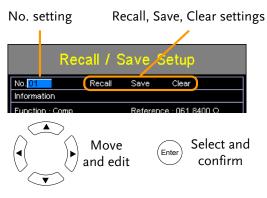
#### Save/Recall Settings

Background	The save function saves the current function as well the settings related to that function. There are 20 memory slots that can be used to save and recall settings on the GOM-804/805.
1. Enter the Memory menu	recall settings on the GOM-804/805. When you are in the desired function mode, press the key (if necessary) to so that the menu system at the bottom of the display has focus. Use the arrow keys to navigate to the Memory setting and press Enter. Function mode Func: Comp 500 Ω Auto Int Fast Drive: DC+ 61.855 Ω A/6 : 0.01 % Node: Δ% Upper :+010.00 % Memory setting Move
	Enter Select menu or setting

The Recall/Save Setup menu will appear.



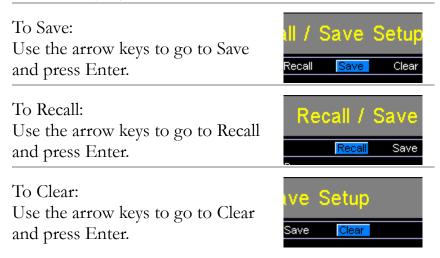
2. Save/ Recall/Clear Memory The No. setting should be already highlighted when entering the Recall/Save Setup menu. If not, use the Left/Right arrow keys to highlight the No. setting.



Use the up and down arrow keys to select a memory space.

Range	01~20	
*lf a mamany	space has been used before	+ho

\*If a memory space has been used before, the settings for that memory slot will also be shown on the display.



	Press Enter again when asked to confirm the selected operation.
	After saving the settings, press ESC to return to the current function mode.
	After recalling settings, the unit will automatically go to the recalled setting function.
Note	Pressing ESC before pressing Enter will exit the Save/Recall/Clear operation.
View memory slot availability	Press the Enter key when the No. setting is highlighted to see which memory slots are empty.
	The status of memory slots $01 \sim 20$ are shown at the bottom of the display.
	Memory slots in red are empty slots while those in black have already been used.
	Press Enter again to exit from this view.
	Recall / Save Setup         No       Recall / Save Clear         Information       Recall Save Clear         Function: Comp       Reference: 061.8400 %         Drive: DC+       Press Enter         Press Enter       %         Speed : Fast       Mode: 20%         Trigger: Int       Mode: 20%         Speed : Fast       Mode: 20%         Trigger: Int       Mode: 20%         Speed : Fast       Mode: 20%         Trigger: Int       Mode: 20%         Speed: Fast       Settings in selected         Into 2 03 06 05 06 07 08 09 10 Red Empty       Mode: Empty         Available memory slots in red.       Used memory slots in black.
	The memory number can also be selected when in the



The memory number can also be selected when in the above view using the arrow keys.

# **COMMAND OVERVIEW**

The Command overview chapter lists all the programming commands in alphabetical order. The command syntax section shows you the basic syntax rules you have to apply when using commands.

## Command Syntax

Compatible	IEEE488.2	Partial compatibility	
Standard	SCPI, 1994	Partial compatibility	
Command Structure	SCPI (Standard Commands for Programmable Instruments) commands follow a tree-like structure, organized into nodes. Each level of the command tree is a node. Each keyword in an SCPI command represents each node in the command tree. Each keyword (node) of an SCPI command is separated by a colon (:).		
	For example, the diagram below shows an SCPI sub-structure and a command example. • BINNing		
	BINNing:LIMit:DIS	P •:LIMit	
	:BI	EEPer :DISP :MODE	
Command Types	and queries. A c	aber of different instrument commands command sends instructions or data to the receives data or status information from	
	Command Typ	es	
	Simple	A single command with/without a	

parameter

Example

SENSe:FUNCtion OHM

	Query	A query is a simple command followed (?). A parameter (da	by a question mark	
	Example	SENSe:RANGe?		
Command Forms	and short. The o	queries have two dif command syntax is w nmand in capitals and ower case.	ritten with the short	
	lower-case, just	can be written either so long as the short o complete command	or long forms are	
	Below are exam	ples of correctly writ	ten commands.	
	Long form	CALCulate:COMPare:BEEPer		
		CACLULATE:CO	TE:COMPARE:BEEPER	
	calculate:compare:beeper			
	Short form	CALC:COMP:BEE calc:comp:beep	EP	
Command Format	CALCulate:	SCAN:DELay 5	00 	
	1. Command he	ader		
	2. Space			
	3. Parameter			
Common Input	Туре	Description	Example	
Parameters	<boolean></boolean>	boolean logic	0,1	
	<nr1></nr1>	integers	0,1,2,3	
	<nr2></nr2>	decimal numbers	0.1,3.14,8.5	
	<nr3></nr3>	floating point with exponent	4.5e-1,8.25e+1	

	<nrf></nrf>	Any of NR1,2,3	1,1.5,4.5e-1		
	<string></string>	ASCII text string	TEST_NAME		
Message Terminator (EOL)	IessageMarks the end of a command line. The followingerminator (EOL)messages are in accordance with IEEE488.2 standard.				
	Remote Command	LF, CR, CR+LF, LF+CR	The most common EOL character is CR+LF		
	Return Message	LF	User configurable (excluding GPIB) See page 71.		
Message Separator	EOL or ;	Command separato	r.		

# Command List

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CALCulate:COMPare:PERCent:LOWer	
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BINNing:COUNt:OUT11	18
BINNing <x>:COUNt:RESult11</x>	18
BINNing <x>:LIMit:LOWer11</x>	19
BINNing <x>:LIMit:UPPer</x>	
BINNing <x>:PERCent:LOWer12</x>	
BINNing <x>:PERCent:UPPer12</x>	
BINNing:LIMit:BEEPer	
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SYSTem:MDELay:STATe	
SYSTem:MDELay:DATa	
TRIGger:DELay:STATe	
TRIGger:DELay:DATa	
TRIGger:EDGE	
TEMPerature:UNIT	
TEMPerature:AMBient:STATe	
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#### IEEE 488.2 Common Commands

*CLS	
*ESE	
*ESR	
*OPC	
*RST	
*SRE	
*STB	
*TRG	

## General Commands

SENSe:FUNC	ion	Set →
		→(Query)
Description	Sets or return	s the function mode.
Syntax	SENSe:FUNC {OHM COMP	tion P BIN TC TCONV SCAN DIODE}
Query Syntax	SENSe:FUNC	tion?
Parameter/	ОНМ	OHM MODE
Return parameter	СОМР	COMP MODE
	BIN	BIN MODE
	тс	TC MODE
	TCONV	TCONV MODE
	OHM+T*	TEMP MODE*
	SCAN	SCAN MODE
	DIODE	DIODE MODE
Example	SENS:FUNC OHM Sets ohm mode on.	
Note *	For set to TEMP (OHM+T) function, please use command at Temperature commands section.	
SENSe:AUTo		Set Query
Description	Sets or return	s the auto-range state.
Syntax Query Syntax	SENSe:AUTo - SENSe:AUTo?	<nr1>   {OFF ON}</nr1>
Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.
	OFF	Auto-Range is off.
	ON	Auto-Range is on.
Example	SENS:AUT ON Sets auto-rang	

	Set →
SENSe:RANGe	

Description	Sets or returns the range of the present function.	
Syntax Query Syntax	SENSe:RANGe <nrf> SENSe:RANGe?</nrf>	
Parameter	<nrf></nrf>	5E-3~ 5E+6
Return parameter	<nr3></nr3>	$5E-3 \sim 5E+6$
Example	SENS:RANG 0.005 Sets range to 5mC SENS:RANG? >5.0000E-3 Returns the range	).

#### SENSe:SPEed

(	Set	_ر	→
	<b>→</b> Q	uer	y

Set )

Query

Description	Sets or returns the measurement speed.	
Syntax Query Syntax	SENSe:SPEed {SLOW FAST} SENSe:SPEed?	
Parameter/	SLOW	Measurement speed is slow.
Return parameter	FAST	Measurement speed is fast.
Example	SENS:SPE FAST	t speed to the fast rate

Sets measurement speed to the fast rate.

#### SENSe:REL:STATe

Description	Sets or returns the relative function state.		
Syntax Query Syntax		SENSe:REL:STATe <nr1>   {OFF ON} SENSe:REL:STATe?</nr1>	
Parameter/ Return parameter <nr1>0:OFF. 1:ON.</nr1>			
	OFF	Turn the relative function off.	
	ON	Turn the relative function on.	
Example	SENS:REL:STAT OFF Sets the relative function off.		

Note The SENS:REL:STAT can only be turned ON when measured vale is displayed.

#### SENSe:REL:DATa

 $\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}_{}$ 

Description	Sets or returns the	e relative value for the relative function.	
Syntax Query Syntax	SENSe:REL:DATa SENSe:REL:DATa?		
Parameter	<nrf></nrf>	0.0000~500.00 The unit will be auto set by the present range.	
Return parameter	<nr3></nr3>	±0.0000~5.1000E±X	
Example	Sets the relative fu SENS:REL:DAT? >4.9032E+2		
Note	The SENS:REL:DAT can only be set when measured vale is displayed.		
SENSe:REALti		Set Query	
Description		e real time function state.	
Syntax Query Syntax	SENSe:REALtime: SENSe:REALtime:	STATe <nr1>   {OFF ON} STATe?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.	
	OFF	Turn the real time function off.	
	ON	Turn the real time function on.	
Example	SENS:REAL:STAT Turns the real time		
SENSe:DISPla	у	Set → Query	
Description	Sets or returns the display mode. There are two display modes, normal and simple.		

Syntax Query Syntax	SENSe:DISPlay <i SENSe:DISPlay?</i 	NR1>   {OFF ON}	
Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.	
	OFF	Display mode is normal.	
	ON	Display mode is simple.	
Example	SENS:DISP OFF Sets the display mode to normal.		
TRIGger:SOU	Rce	→Query)	
Description	Sets or returns cu	rrent trigger source.	
Syntax Query Syntax	TRIGger:SOURce {INT EXT} TRIGger:SOURce?		
Parameter/	INT	Internal trigger mode.	
Return parameter	EXT	External trigger mode.	
Example	TRIG:SOUR EXT Sets the current trigger source to external trigger.		
READ			
Description	Returns the meas	urement value.	
Query Syntax	READ?		
Return parameter	<nr3></nr3>	±0.0000~5.1000E±X	
Example	READ? >+2.2012E+0 Returns the measurement.		
Note	+9.0000E+9: it indicates measure value is OverRange. +9.9999E+9: it indicates the HVP is detected.		

# Compare Commands

CALCulate:CO	MPare:TYPE	Set → →Query	
Description	Sets or returns th	e compared function.	
Syntax Query Syntax		are:TYPE {OHM TC}	
Parameter/	ОНМ	OHM function.	
Return parameter	тс	TC function.	
Example	CALC:COMP:TYPE TC Sets the compare to TC function.		
CALCulate:CO	MPare:LIMit:F	$\begin{array}{c} & & \\ & \\ Set \end{array} \rightarrow \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\$	
Description	Sets or returns the limit reference value for the compare function.		
Syntax Query Syntax	CALCulate:COMPare:LIMit:REFerence { <nrf>[,<string>]} CALCulate:COMPare:LIMit:REFerence?</string></nrf>		
parameter	<nrf></nrf>	000.0001~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0001~999.9999E±X	
Example			
CALCulate:CO	MPare:LIMit:N		
Description	Sets or returns the function.	e compare mode for the compare	

Syntax Query Syntax	CALCulate:COMPare:LIMit:MODE {ABS DPER PER} CALCulate:COMPare:LIMit:MODE?		
Parameter/ Return parameter	ABS	The test results are judged from absolute values.	
	DPER	The test results are judged from a reference value ± a percentage offset. (delta percentage)	
	PER	The test results are displayed as a percentage of the reference value.	
Example	CALC:COMP:LIM: Sets test results as function.	s absolute values for the compare	
CALCulate:CO	MPare:LIMit:L	.OWer $\rightarrow$ Query	
Description	Sets or returns the lower limit value for the compare function.		
Syntax Query Syntax		CALCulate:COMPare:LIMit:LOWer { <nrf>[,<string>]} CALCulate:COMPare:LIMit:LOWer?</string></nrf>	
Parameter	<nrf></nrf>	000.0000~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If the unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0000~999.9999E±X	
Example	CALC:COMP:LIM: Sets the lower lim CALC:COMP:LIM: >0.9500E+3 Returns the lower	it value to 0.95kΩ. LOW?	
Note	This command is set to ABS for com	only applicable when compare mode is pare function.	
CALCulate:CO	MPare:LIMit:U	JPPer →Query	
Description	Sets or returns the function.	e upper limit value for the compare	

Syntax Query Syntax	CALCulate:COMPare:LIMit:UPPer { <nrf>[,<string>]} CALCulate:COMPare:LIMit:UPPer?</string></nrf>		
Parameter	<nrf></nrf>	000.0000~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0000~999.9999E±X	
Example	Sets the upper CALC:COMP:L >0.1230E+6	CALC:COMP:LIM:UPP 0.123,maohm Sets the upper limit value to 0.123MΩ. CALC:COMP:LIM:UPP? >0.1230E+6 Returns the upper limit as 0.123MΩ.	
Note	This command is only applicable when compare mode is set to ABS for compare function.		
CALCulate:CO	MPare:PER	Cent:LOWer →Query	
Description	Sets or returns the lower limit percent value for the compare function.		
Syntax Query Syntax		MPare:PERCent:LOWer <nrf> MPare:PERCent:LOWer?</nrf>	
Parameter	<nrf></nrf>	000.00~999.99	
Return parameter	<nr2></nr2>	000.00~999.99	
Example	CALC:COMP:PERC:LOW 10.00 Sets the lower limit percent value to -10.00%. CALC:COMP:PERC:LOW? >10.00 Returns the lower limit as -10.00%.		
Note		d is only applicable when compare mode is <sup>r</sup> PER for compare function.	
CALCulate:CO	MPare:PER	Cent:UPPer $\rightarrow$ Query	
Description	Sets or returns compare funct	s the upper limit percent value for the tion.	
Syntax Query Syntax	CALCulate:COMPare:PERCent:UPPer <nrf> CALCulate:COMPare:PERCent:UPPer?</nrf>		

Parameter	<nrf></nrf>	000.00~999.99	
Return parameter	<nr2></nr2>	000.00~999.99	
Example	Sets the upper CALC:COMP:P >90.00	CALC:COMP:PERC:UPP 90.00 Sets the upper limit percent value to +90.00%. CALC:COMP:PERC:UPP? >90.00 Returns the upper limit as +90.00%.	
Note	This command	-	vhen compare mode is
CALCulate:CO	MPare:BEEF	<sup>D</sup> er	$\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}_{}$
Description	Sets or returns	the compare function	on beeper mode.
Syntax Query Syntax		MPare:BEEPer {OFF MPare:BEEPer?	PASS FAIL}
Parameter/	OFF	Turns the beepe	er off.
Return parameter	PASS	The beeper will sound on a pass test result.	
	FAIL	The beeper will result.	sound on a fail test
Example	CALC:COMP:B Sets the beepe	BEEP FAIL r on when the test re	esult is a fail.
CALCulate:CO	MPare:MAT	H:DATa	
Description	Returns the de	<b>H:DATa</b> eviation value for the MPare:MATH:DATa?	e compare function.
CALCulate:CO Description Query Syntax Return parameter	Returns the de	eviation value for the	e compare function.
Description Query Syntax	Returns the de CALCulate:CO <nr3> CALC:COMP:N &gt;+0.3658E+2</nr3>	eviation value for the MPare:MATH:DATa? ±0.0000~9.9999	e compare function.
Description Query Syntax Return parameter	Returns the de CALCulate:CO <nr3> CALC:COMP:N &gt;+0.3658E+2 Returns the de</nr3>	eviation value for the MPare:MATH:DATa? ±0.0000~9.9999 MATH:DAT? viation as 36.58%.	e compare function.
Description Query Syntax Return parameter Example	Returns the de CALCulate:CO <nr3> CALC:COMP:N &gt;+0.3658E+2 Returns the de</nr3>	eviation value for the MPare:MATH:DATa? ±0.0000~9.9999 MATH:DAT? viation as 36.58%.	e compare function. 9E±X. →Query

Return parameter	<nr1></nr1>	0: LO 1: IN
		2: HI
Example	CALC:COMP:LIM:RES? >2 Indicates that the test result is HI.	

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## **Binning Commands**

Binning commands are only applicable to GOM-805.

BINNing:COU		
Description	Clear all bin sorti	ng function test result counts.
Syntax	BINNing:COUNt:	CLEar
Parameter/	<none></none>	
BINNing:COU	INt:TOTal	
Description	Returns the total	number (count total) of test bin results.
Query Syntax	BINNing:COUNt:	:TOTal?
Return parameter	<nr1></nr1>	0~999999999
Example	BINN:COUN:TO	1.
BINNing:COU	results (pass and	total number (count total) of test
·	Indicates that the results (pass and INt:OUT	total number (count total) of test fail) is 150. Query per of failed (judged OUT) test results
BINNing:COU	Indicates that the results (pass and UNT:OUT Returns the numb	total number (count total) of test fail) is 150. Query ber of failed (judged OUT) test results g function test.
BINNing:COU	Indicates that the results (pass and INt:OUT Returns the numb for the bin sorting	total number (count total) of test fail) is 150. Query ber of failed (judged OUT) test results g function test.
BINNing:COU Description Query Syntax	Indicates that the results (pass and INT:OUT Returns the numb for the bin sorting BINNing:COUNt: <nr1> BINN:COUN:OU &gt;50</nr1>	total number (count total) of test fail) is 150. Query Der of failed (judged OUT) test results g function test. :OUT? 0~99999999
BINNing:COU Description Query Syntax Return parameter Example	Indicates that the results (pass and INT:OUT Returns the numb for the bin sorting BINNing:COUNt: <nr1> BINN:COUN:OU &gt;50</nr1>	total number (count total) of test fail) is 150. Query Der of failed (judged OUT) test results g function test. OUT? 0~99999999 T? number of failed test results is 50.

Query Syntax	BINNing <x>:COUNt:RESult?</x>		
Parameter	<x></x>	1~8	
Return parameter	<nr1></nr1>	0~99999999	
Example	>100	INN1:COUN:RES? 100 dicates that bin1 has a pass count of 100.	
BINNing <x>:1</x>		$\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}_{}$	
Description	Sets or returns t the selected bin	the lower limit value (absolute value) for	
Syntax Query Syntax	BINNing <x>:LII BINNing<x>:LII</x></x>	Mit:LOWer { <nrf>[,<string>]} Mit:LOWer?</string></nrf>	
Parameter	<x></x>	1~8	
	<nrf></nrf>	000.0000~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If the unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0000~999.9999E±X	
Example	BINN1:LIM:LOW 23.8,kohm Sets the bin1 lower limit value to 23.8kΩ. BINN1:LIM:LOW? >23.8000E+3 Returns the lower limit as 23.8kΩ.		
BINNing <x>:I</x>	LIMit:UPPer	$\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}_{}$	
Description	Sets or returns the upper limit value (absolute value) for the selected bin.		
Syntax Query Syntax	BINNing <x>:LIMit:UPPer {<nrf>[,<string>]} BINNing<x>:LIMit:UPPer?</x></string></nrf></x>		
Parameter	<x></x>	1~8	
	<nrf></nrf>	000.0000~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If the unit is not set, the unit will be automatically set by the present range.	

Return parameter	<nr3></nr3>	000.0000~999.9999E±X	
Example	BINN1:LIM:UPP 0.95,maohm Sets bin1 upper limit value to 0.95MΩ. BINN1:LIM:UPP? >0.9500E+6		
	Returns the uppe	r limt as 0.95MΩ.	
BINNing <x>:1</x>	PERCent:LOW	$er \qquad \underbrace{Set}_{Query}$	
Description		Sets or returns the lower value percentage value for the selected bin. The value is a percentage offset from the reference value.	
Syntax Query Syntax	-	BINNing <x>:PERCent:LOWer <nrf> BINNing<x>:PERCent:LOWer?</x></nrf></x>	
Parameter	<x></x>	1~8	
	<nrf></nrf>	000.00~999.99	
Return parameter	<nr2></nr2>	000.00~999.99	
Example	BINN1:PERC:LOW 10.15 Sets the bin1 lower limit percent value to -10.15%. BINN1:PERC:LOW? >10.15 Returns the lower limit percentage value as -10.15%.		
BINNing <x>:1</x>	PERCent:UPPe	$(Set) \rightarrow \qquad $	
Description	Sets or returns the upper value percentage value for the selected bin. The value is a percentage offset from the reference value.		
Syntax Query Syntax	BINNing <x>:PERCent:UPPer <nrf> BINNing<x>:PERCent:UPPer?</x></nrf></x>		
Parameter	<x></x>	1~8	
	<nrf></nrf>	000.00~999.99	

Example	BINN1:PERC:UPP 150.95 Sets the bin1 upper limit percent value to +150.95%. BINN1:PERC:UPP? >150.95 Returns the upper limit percentage value as +150.95%.		
BINNing:LIMi	t:BEEPer	Set Query	
Description	Sets or returns beeper mode for the bin sorting function.		
Syntax Query Syntax	BINNing:LIMit:BE BINNing:LIMit:BE	EPer {OFF PASS FAIL} EPer?	
Parameter/	OFF	Turns the beeper off.	
Return parameter	PASS	The beeper will sound on a pass test result.	
	FAIL	The beeper will sound on a fail test result.	
Example	BINN:LIM:BEEP OFF Turns the beeper off.		
BINNing:LIMi	t:DISP	Set → Query	
Description	Sets or returns the bin sorting function display mode.		
Syntax Query Syntax	BINNing:LIMit:DISP {COMP COUNT} BINNing:LIMit:DISP?		
Parameter/	СОМР	The display is set to compare mode.	
Parameter/ Return parameter	COMP COUNT	The display is set to compare mode. The display is set to count mode.	
,	COUNT BINN:LIM:DISP C	The display is set to count mode.	
Return parameter	COUNT BINN:LIM:DISP C	The display is set to count mode. OMP	
Return parameter	COUNT BINN:LIM:DISP C Sets the bin sortin	The display is set to count mode. OMP g function display mode to compare.	
Return parameter Example	COUNT BINN:LIM:DISP C Sets the bin sortin t:MODE	The display is set to count mode. OMP g function display mode to compare. $\underbrace{Set}_{}$  Query e setting mode for upper and lower	

Parameter/ Return parameter	ABS	The test results are judged from absolute values.	
	DPER	The test results are judged from a reference value ± a percentage offset. (delta percent)	
Example	BINN:LIM:MODE DPER Sets the mode to $\Delta$ %.		
BINNing:LIMi	it:REFerence $\bigcirc$ Query		
Description	Sets or returns the limit reference value for the bin sorting function.		
Syntax Query Syntax	BINNing:LIMit:REFerence { <nrf>[,<string>]} BINNing:LIMit:REFerence?</string></nrf>		
Parameter	<nrf></nrf>	000.0001~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If the unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0001~999.9999E±X	
Example	BINN:LIM:REF 100 Sets the limit reference value to $100\Omega$ . BINN:LIM:REF? >100.0000E+0 Returns the reference as $100\Omega$ .		

#### BINNing:LIMit:RESult

Description	Returns the bin sorting function test result.	
Query Syntax	BINNing:LIMit:RESult?	
Return parameter	<nr1></nr1>	1~8: Bin1~Bin8 9: Bin Out
Example	BINN:LIM:RES? >1 Indicates a pass fo	or bin1.

## Temperature Compensate Commands

TEMPerature:	COMPensate:C	ORRect	$\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}$
Description	Sets or returns the reference temperature for the temperature compensation function.		
Syntax Query Syntax		TEMPerature:COMPensate:CORRect <nrf> TEMPerature:COMPensate:CORRect?</nrf>	
Parameter	<nrf></nrf>	-50.0~399.9 (Unit	: °С)
Return parameter	<nr2></nr2>	-50.0~399.9 (Unit	: °C)
Example TEMP:COMP:CORR 25.5 Sets the reference temperature to 25.5°C. TEMPerature:COMPensate:COEFficient Query			
Description	Sets or returns the temperature coefficient for temperature compensation function.		
Syntax Query Syntax	TEMPerature:COMPensate:COEFficient <nr1> TEMPerature:COMPensate:COEFficient?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	-9999~+9999	
Example	TEMP:COMP:COEF 3930 Sets the temperature coefficient to 3930ppm.		

### **Temperature Conversion Commands**

TEMPerature:	CONVersion:R	ESistance $\xrightarrow{\text{Set}}$
Description	Sets or returns the initial resistance for the temperature conversion function.	
Syntax Query Syntax	TEMPerature:CONVersion:RESistance { <nrf>[,<string>]} TEMPerature:CONVersion:RESistance?</string></nrf>	
Parameter	<nrf></nrf>	000.0001~999.9999
	<string></string>	mohm/ohm/kohm/maohm,unit If the unit is not set, the unit will be automatically set by the present range.
Return parameter	<nr3></nr3>	000.0001~999.9999E±X
Example	TEMP:CONV:RES 10.00,maohm Sets initial resistance value to $10.00M\Omega$ . TEMP:CONV:RES? >10.0000E+6 Returns the initial resistance as $10.00M\Omega$ . Set $\rightarrow$ e:CONVersion:TEMPerature $\rightarrow$ Query	
TEMPerature:		Set →
TEMPerature: Description	CONVersion:TI	EMPerature $\xrightarrow{\text{Set}}$ e initial temperature for the temperature
	CONVersion:T Sets or returns the conversion functio TEMPerature:CON	EMPerature $\xrightarrow{\text{Set}}$ e initial temperature for the temperature
Description Syntax	CONVersion:T Sets or returns the conversion functio TEMPerature:CON	EMPerature $\overbrace{Query}^{\text{Set}}$ e initial temperature for the temperature on. NVersion:TEMPerature <nrf></nrf>
Description Syntax Query Syntax	CONVersion:TI Sets or returns the conversion functio TEMPerature:CON TEMPerature:CON	EMPerature $\overbrace{Query}^{\text{Set}}$ e initial temperature for the temperature on. Version:TEMPerature <nrf> Version:TEMPerature?</nrf>
Description Syntax Query Syntax Parameter	CONVersion:TI Sets or returns the conversion functio TEMPerature:CON TEMPerature:CON <nrf> <nr2> TEMP:CONV:TEM</nr2></nrf>	EMPerature Set →Query e initial temperature for the temperature on. Version:TEMPerature <nrf> Version:TEMPerature? -50.0~399.9 (Unit: °C) -50.0~399.9 (Unit: °C)</nrf>
Description Syntax Query Syntax Parameter Return parameter Example	CONVersion:TI Sets or returns the conversion functio TEMPerature:CON TEMPerature:CON <nrf> <nr2> TEMP:CONV:TEM</nr2></nrf>	EMPerature $\overbrace{Query}^{Set}$ e initial temperature for the temperature on. Version:TEMPerature <nrf> Version:TEMPerature? -50.0~399.9 (Unit: °C) -50.0~399.9 (Unit: °C) -50.0~399.9 (Unit: °C) -50.0~399.9 (Unit: °C) Set <math>\rightarrow</math></nrf>

Syntax Query Syntax	TEMPerature:CONVersion:CONStant <nrf> TEMPerature:CONVersion:CONStant?</nrf>	
Parameter	<nrf> 0.0~999.9</nrf>	
Return parameter	<nr2></nr2>	0.0~999.9
Example	TEMP:CONV:CONS 235 Sets the temperature constant to 235.	
TEMPerature:	CONVersion:D	$\begin{array}{c} \text{Set} \rightarrow \\ \rightarrow \\ \text{Query} \end{array}$
Description	Sets or returns the temperature display mode for the temperature conversion function.	
Syntax Query Syntax	TEMPerature:CONVersion:DISPlay <nr1> TEMPerature:CONVersion:DISPlay?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	1: ΔT 2:Т
Example	TEMP:CONV:DISP 1 Sets the temperature display mode for the temperature conversion function is $\Delta T$ .	

TEMPerature:CONVersion:MATH:DATa	
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Description	Returns conversion function deviation value.	
Query Syntax	TEMPerature:CONVersion:MATH:DATa?	
Return parameter	<nr3></nr3>	±0.000~9.999E±X
Example	TEMP:CONV:MATH:DAT? Returns 1.250E+2.	

## **Temperature Commands**

TEMPerature:	STATe	Set Query
Description	Sets or returns the temperature function state.	
Syntax Query Syntax	TEMPerature:STATe { <nr1> OFF ON} TEMPerature:STATe?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	0:OFF 1:ON
	OFF	Turn the temp function off.
	ON	Turn the temp function on.
Example TEMPerature:	TEMP:STAT ON Sets the TEMP (Ohm+T) function on.	
Description	Returns the PT-100 sensor temperature measurement in degrees Celsius.	
Query Syntax	TEMPerature:DATa?	
Return parameter	<nr3></nr3>	-50.0~399.9
Example	TEMP:DAT? >0.250E+2 Returns the tempe	erature as 25°C.

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## Scan Commands

			Set
CALCulate:SC	AN:CHANnel		
Description	Sets or returns the channel for the scan function.		an function.
Syntax Query Syntax	CALCulate:SCAN:CHANnel <nr1> CALCulate:SCAN:CHANnel?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	1~100	
Example	CALC:SCAN:CHAN 5 Sets the channel to 5.		
CALCulate:SCAN:DELay →Query			
Description	Sets or returns the interval delay for the scan function.		
Syntax Query Syntax	CALCulate:SCAN:DELay <nr1> CALCulate:SCAN:DELay?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	400~30000 Unit:ms	
Example	CALC:SCAN:DEL 500 Sets interval delay of the scan to 500ms.		
CALCulate:SCAN:LIMit:REFerence			
Description	Sets or returns the reference limit for the scan function.		
Syntax Query Syntax	CALCulate:SCAN:LIMit:REFerence { <nrf>[,<string>]} CALCulate:SCAN:LIMit:REFerence?</string></nrf>		
Parameter	<nrf></nrf>	000.0001~999.999	99
	<string></string>	mohm/ohm/kohr If unit is not set,th automatically set b	, ,
Return parameter	<nr3></nr3>	000.0001~999.999	99E±X

Example	CALC:SCAN:LIM:REF 10.00,mohm Sets the reference limit to 10.00mΩ. CALC:SCAN:LIM:REF? >10.0000E-3 Returns the reference limit as 10.00mΩ.		
CALCulate:SC	AN:LIMit:MOE	$\begin{array}{c} & \underbrace{\text{Set}} \rightarrow \\ \rightarrow & \underbrace{\text{Query}} \end{array}$	
Description	Sets or returns the	e scan function compare mode.	
Syntax Query Syntax	CALCulate:SCAN: CALCulate:SCAN:	LIMit:MODE {ABS DPER} LIMit:MODE?	
Parameter/ Return parameter	ABS	The test results are judged from absolute values.	
	DPER	The test results are judged from a reference value ± a percentage offset. (delta percent)	
Example	CALC:SCAN:LIM:MODE ABS Sets compare mode to absolute values.		
CALCulate:SC	AN:LIMit:LOW		
Description	Sets or returns the	Sets or returns the lower limit value for the scan function.	
Syntax Query Syntax		CALCulate:SCAN:LIMit:LOWer { <nrf>[,<string>]} CALCulate:SCAN:LIMit:LOWer?</string></nrf>	
Parameter	<nrf></nrf>	000.0000~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0000~999.9999E±X	
Example	CALC:SCAN:LIM:LOW 1.37,kohm Sets the lower limit value to $1.37k\Omega$ . CALC:SCAN:LIM:LOW? >1.3700E+3 Returns the lower limit as $1.37k\Omega$ .		
	Sets the lower lim CALC:SCAN:LIM:I >1.3700E+3	it value to 1.37kΩ. LOW?	

Description	Sets or returns upper limit of the scan function.		
Syntax Query Syntax	CALCulate:SCAI CALCulate:SCAI	N:LIMit:UPPer { <nrf>[,<string>]} N:LIMit:UPPer?</string></nrf>	
Parameter	<nrf></nrf>	000.0000~999.9999	
	<string></string>	mohm/ohm/kohm/maohm,unit If unit is not set, the unit will be automatically set by the present range.	
Return parameter	<nr3></nr3>	000.0000~999.9999E±X	
Example	Sets the upper li CALC:SCAN:LIN >0.1230E+6	CALC:SCAN:LIM:UPP 0.123,maohm Sets the upper limit to $0.123M\Omega$ . CALC:SCAN:LIM:UPP? >0.1230E+6 Returns the upper limit as $0.123M\Omega$ .	
CALCulate:SC			
Description	Sets or returns lower limit percent value for the scan function.		
Syntax Query Syntax	CALCulate:SCAN:PERCent:LOWer <nrf> CALCulate:SCAN:PERCent:LOWer?</nrf>		
Parameter	<nrf></nrf>	000.00~999.99	
Return parameter	<nr2></nr2>	000.00~999.99	
Example	CALC:SCAN:PERC:LOW 10.00 Sets the lower limit percent value to -10.00%. CALC:SCAN:PERC:LOW? >10.00 Returns the lower limit as -10.00%.		
CALCulate:SC	Returns the low	er limit as -10.00%.	
CALCulate:SC	Returns the low	er limit as -10.00%.	
	Returns the low AN:PERCent: Sets or returns t function. CALCulate:SCAN	er limit as -10.00%. Set → UPPer → Query	
Description Syntax	Returns the low AN:PERCent: Sets or returns t function. CALCulate:SCAN	er limit as -10.00%. UPPer $\rightarrow$ Query the upper limit percent value for the scan N:PERCent:UPPer <nrf></nrf>	
Description Syntax Query Syntax	Returns the low AN:PERCent: Sets or returns to function. CALCulate:SCAN CALCulate:SCAN	er limit as -10.00%. UPPer $\rightarrow$ Query the upper limit percent value for the scan N:PERCent:UPPer <nrf> N:PERCent:UPPer?</nrf>	

Example	CALC:SCAN:PERC >90.00	nit percent value to +90.00%.
MEASure <x></x>		
Description	Returns the results of the selected channel in the scan mode, including HI/LO/IN and value.	
Query Syntax	MEASure <x>?</x>	
Parameter	<x></x>	Channel 1~100
Return parameter	0 1 2, <nr3></nr3>	0:LO 1:IN 2:HI <nr3>: Measurement result.</nr3>
Example	MEAS1? >1,+0.9978E+1 Returns channel 1 is IN as 9.978Ω.	
SHOW		
Description	Returns the judgments of all (up to 100) channels in the scan mode.	
Query Syntax	SHOW?	
Return parameter	<string></string>	100 characters 0:LO 1:IN 2:HI _:Channel not active
Example	SHOW? Returns 1111111111	

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Query

### Source Commands

Source commands are only applicable to GOM-805.

SOURce:DRY		$\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}_{}$
Description	Sets or returns the dry circuit test mode. Only applicable to the GOM-805.	
Syntax Query Syntax	SOURce:DRY { <nr1>   {OFF ON} SOURce:DRY?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.
	OFF	Turn dry circuit test mode off.
	ON	Turn dry circuit test mode on.
Example	SOUR:DRY On Turns the dry circ	uit test mode on.

#### SOURce:DRIVe

Description	Sets or returns the drive mode.	
Syntax Query Syntax	SOURce:DRIVe <nr1> SOURce:DRIVe?</nr1>	
Parameter/	<nr1></nr1>	1: the DC+ mode.
Return parameter		2: the DC- mode.
		3: the PULSE mode.
		4: the PWM mode.
		5: the ZERO mode.
		6: the STANDBY mode
Example	SOUR:DRIV 3	

Example

SOUR:DRIV 3 Sets the drive mode to pulse.

# Meas. Setup Commands

SYSTem:AVER	age:STATe	Set → →Query	
Description	Sets or returns the average function state.		
Syntax Query Syntax	SYSTem:AVERage:STATe <nr1>   {OFF ON} SYSTem:AVERage:STATe?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.	
	OFF	Turn the average function off.	
	ON	Turn the average function on.	
Example SYSTem:AVER	Example SYST: AVER: STAT OFF Turns the average function off. SYSTem: AVERage: DATa $\rightarrow$ Query		
Description	Sets or returns the number of measurements used for the average function.		
Syntax Query Syntax	SYSTem:AVERage:DATa <nr1> SYSTem:AVERage:DATa?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	2~100	
Example	SYST:AVER:DAT 5 5 measurements are used to perform the average function.		
SYSTem:MDELay:STATe →Query			
Description	Sets or returns the measurement delay function state.		
Syntax Query Syntax	SYSTem:MDELay:STATe <nr1>   {OFF ON} SYSTem:MDELay:STATe?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.	

	OFF	Turn the measurement delay off.
	ON	Turn the measurement delay on.
Example	SYST:MDEL:STAT OFF Turns the measurement delay function off.	
SYSTem:MDE	Lay:DATa	Set → Query
Description	Sets or returns	the measurement delay time.
Syntax Query Syntax	SYSTem:MDEL SYSTem:MDEL	,
Parameter/ Return parameter	<nrf></nrf>	0.000~100.000 Unit:ms For values under 1s, the unit resolution is 1ms. For values above 1s, the unit resolution is 0.1s.
Example	SYST:MDEL:DAT 1.105 Sets the delay time of measure is 1.1s. SYST:MDEL:DAT? >001.100 Returns the measurement delay as 1.1s.	
TRIGger:DELay:STATe		
Description	Sets or returns the trigger delay function state.	
Syntax Query Syntax	TRIGger:DELay:STATe <nr1>   {OFF ON} TRIGger:DELay:STATe?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	0:ON 1:OFF
	OFF	Turn the trigger delay function off.
	ON	Turn the trigger delay function on.
TRIGger:DELay:DATa		
Description	Sets or returns	the trigger delay time.

TRIGger:DELay:DATa <nr1> TRIGger:DELay:DATa?</nr1>			
<nr1></nr1>	0~1000 Unit:ms		
TRIG:DEL:DAT 100 Sets the trigger delay time to 100ms.			
	Set → →Query		
Sets or returns the	e trigger edge (falling or rising edge).		
TRIGger:EDGE {R TRIGger:EDGE?	SING FALLING}		
RISING	Select rising trigger.		
FALLING	Select falling trigger.		
TRIG:EDGE FALLING Sets the trigger to falling edge.			
TEMPerature:UNIT $(Set) \rightarrow$ Query			
Sets or returns the temperature unit. (Only used for the display readback.)			
TEMPerature:UNIT {DEGC DEGF} TEMPerature:UNIT?			
DEGC	۰C		
DEGF	۰F		
TEMP:UNIT DEGF Sets temperature unit to °F (Fahrenheit).			
TEMPerature:AMBient:STATe $\bigcirc$ Query			
Sets or returns the state of the user-set ambient temperature.			
TEMPerature:AMBient:STATe <nr1>   {OFF ON} TEMPerature:AMBient:STATe?</nr1>			
	TRIGger:DELay:DA <nr1> TRIG:DEL:DAT 100 Sets the trigger de Sets or returns the TRIGger:EDGE {RI TRIGger:EDGE {RI TRIG:EDGE FALLI Sets the trigger to JNIT Sets or returns the display readback.) TEMPerature:UNIT DEGC DEGF TEMP:UNIT DEGF Sets temperature to MBient:STATE Sets or returns the temperature:AME</nr1>		

Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.
	OFF	Disables the user-set ambient temperature.
	ON	Enables the user-set ambient temperature.
Example	TEMP:AMB:STAT OFF Disables the user-set ambient temperature.	
TEMPerature:	AMBient:DATa	Set → Query
Description	Sets or returns the user-set ambient temperature value for the temperature compensation and the temperature conversion function.	
Syntax Query Syntax	TEMPerature:AMBient:DATa <nrf> TEMPerature:AMBient:DATa?</nrf>	
Parameter	<nrf></nrf>	-50.0~399.9 (Unit: °C)
Return parameter	<nr2></nr2>	-50.0~399.9 (Unit: °C)
Example	TEMP:AMB:DAT 25.6 Sets the user ambient temperature value to +25.6°C. TEMP:AMB:DAT? >25.6 Returns the set ambient temperature as 25.6°C.	
SYSTem:LFRequency		$\underbrace{\text{Set}}_{} \rightarrow \underbrace{\text{Query}}_{}$
Description	Sets or returns the frequency setting for the line filter.	
Syntax Query Syntax	SYSTem:LFRequency {AUTO   50   60} SYSTem:LFRequency?	
Parameter/ Return parameter	AUTO	The frequency setting for the line filter is automatically detected.
	50	The frequency is 50Hz.
	60	The frequency is 60Hz.

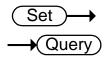
Example	SYST:LFR 60 Sets the line frequ SYST:LFR? >60Hz Peturns the line fr	
	Returns the line fr	Set
SYSTem:PWM	:ON	
Description	Sets or returns the duty ON period for the PWM drive mode.	
Note	PWM drive mode is only available for the GOM-805.	
Syntax Query Syntax	SYSTem:PWM:ON <nr1> SYSTem:PWM:ON?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	3~99 Unit: time units. For 60Hz LF, each unit is equal 16.6ms. For 50Hz LF, each unit is equal to 20.0ms.
Example	SYST:PWM:ON 5 Sets the duty ON time to 5 adc units.	
SYSTem:PWM:OFF Set →Qu		Set → Query
Description	Sets or returns the duty OFF period for the PWM drive mode.	
Syntax Query Syntax	SYSTem:PWM:OFF <nr1> SYSTem:PWM:OFF?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	100~9999 Unit:ms
Example	SYST:PWM:OFF 200 Sets the duty OFF period to 200 ms.	

# System Commands

*IDN		-	
Description	Returns the manufacturer, model No., serial number and system version number.		
Query Syntax	*IDN?		
Return parameter	<string></string>	31 characters	
Example	*IDN? >GWINSTEK,GOM805,GXXXXXXX,V1.00.		
SYSTem:SERia	I	-	
Description	Returns the serial	number.	
Query Syntax	SYSTem:SERial?		
Return parameter	<string></string>	9 characters	
Example	SYST:SER? > GXXXXXXXX		
SYSTem:BRIG	ntness	_	Set → →Query
Description	Sets or returns the	brightness level.	
Syntax Query Syntax	SYSTem:BRIGhtne SYSTem:BRIGhtne		
Parameter/ Return parameter	<nr1></nr1>	1(dim)~5(bright)	
Example	SYST:BRIG 4 Turns the brightne	ss level to 4.	
USERdefine <x< td=""><td>&gt;:ACTive</td><td></td><td><math display="block">\underbrace{\text{Set}}_{\rightarrow}</math></td></x<>	>:ACTive		$\underbrace{\text{Set}}_{\rightarrow}$
Description	Sets or returns the Userdefine pin.	active output state of	of the selected

Syntax Query Syntax	USERdefine <x>:ACTive <nr1> USERdefine<x>:ACTive?</x></nr1></x>	
Parameter/	<x></x>	Userdefine pin 1~2
Return parameter	<nr1></nr1>	1:active low state 2:active high state
Example	USER1:ACT 1 Sets the userdefine1 pin IO to active low state.	
USERdefine <x< td=""><td>&gt;:FIRStdata</td><td>Set Query</td></x<>	>:FIRStdata	Set Query
Description	Sets or returns the first operand for the selected user define pin.	
Syntax Query Syntax	USERdefine <x>:FIRStdata <nr1> USERdefine<x>:FIRStdata?</x></nr1></x>	
Parameter/ Return	<x></x>	Userdefine pin 1~2
parameter	<nr1></nr1>	1~8:bin1~bin8 state 9:bin out state 10:hi state 11:low state 12:pass state 13:fail state
Example	USER1:FIRS 12 Sets first operand of userdefine1 as pass state.	
USERdefine <x< td=""><td>&gt;:LOGic</td><td>Set Query</td></x<>	>:LOGic	Set Query
Description	Sets or returns operator for the selected user define pin.	
Syntax Query Syntax	USERdefine <x>:LOGic <nr1> USERdefine<x>:LOGic?</x></nr1></x>	
Parameter/	<x></x>	Userdefine pin 1~2
Return parameter	<nr1></nr1>	1:off(only judge first data) 2:logical and. 3:logical or.
Example		of userdefine1 to off. (I.e., only the first nes the output of userdefine1.)

#### USERdefine<X>:SEConddata



Description	Sets or returns the second operand for the selected user define pin.		
Syntax Query Syntax	USERdefine <x>:SECondata <nr1> USERdefine<x>:SECondata?</x></nr1></x>		
Parameter/	<x></x>	1~2	
Return parameter	<nr1></nr1>	1~8:bin1~bin8 state 9:bin out state 10:hi state 11:low state 12:pass state 13:fail state	
Example	USER1:SEC 3 Sets the last operand of userdefine1 as the state of the bin3 result.		
SYSTem:HANI	Dler	(Set)→ →Query)	
Description	Sets or returns the	e handler state.	
Syntax Query Syntax	SYSTem:HANDler {CLEAR   HOLD} SYSTem:HANDler?		
Parameter/ Return parameter	Clear	It clears the last result before executing measurement.	
	HOLD	It holds the test result and changes when a different result appears.	
Example	SYST:HAND HOLD Sets the test result to the hold state.		
SYSTem:KEYC	lick:BEEPer	Set → →Query	
<b>D</b>			
Description	Sets or returns the	e keyclick beeper state.	

Parameter/ Return parameter	<nr1></nr1>	0:OFF. 1:ON.	
	OFF	Turn the keyclick beeper off.	
	ON	Turn the keyclick beeper on.	
Example	SYST:KEYC:BEEP OFF Sets the keyclick beeper off.		
SYSTem:VOLT	age:PROTec	$\begin{array}{c} \underbrace{\text{Set}} \rightarrow \\ \rightarrow \\ \hline \\ \hline \\ \hline \\ \hline \\ \\ \hline \\ \\ \\ \\ \\ \\$	
Description	Sets or returns the HVP function state.		
Syntax Query Syntax	SYSTem:VOLTage:PROTect <nr1>   {OFF   ON} SYSTem:VOLTage:PROTect?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	0: OFF. 1: ON.	
	OFF	Turn the HVP function off.	
	ON	Turn the HVP function on.	
Example	SYST:VOLT:PROT OFF Sets the HVP function off.		

Description	Returns the current system error, if any.		
Query Syntax	SYSTem:ERRor?		
Return parameter	<pre><string> Error number,"Error message"</string></pre>		
Example	SYST:ERR? >0,"No error". Indicates that there is no error message.		
Error Message List	0,"No error" 1,"Command error"		

4,"Data out of range"

SYSTem:LOCa	∣
Description	Enables local control (front panel control) and disables remote control.

Syntax	SYSTem:LOCal	
Parameter	<none></none>	

#### SYSTem:VERSion



Description	Returns the SCPI version of the device.	
Query Syntax	SYSTem:VERSion?	
Return parameter	<string></string>	10 characters
Example	SYST:VERS? >SCPI1994.0. SCPI version: 1994	

## Memory Commands

Mory:SAVe <n R1&gt; M:SAV 1 es the settings</n 	to the selected memory slot. R1> $1\sim 20$ to memory slot 1. Set $\rightarrow$ rs from the selected memory slot.	
R1> M:SAV 1 es the settings	$1 \sim 20$ s to memory slot 1.	
M:SAV 1 es the settings	s to memory slot 1. Set →	
es the settings	(Set)→	
alls the setting		
alls the setting	rs from the selected memory slot	
MEMory:RECall <nr1></nr1>		
R1>	1~20	
M:REC 1 all the settings	s from memory slot 1.	
	(Set)	
ars the data fro	om the selected memory slot.	
Mory:CLEar <n< td=""><td>NR1&gt;</td></n<>	NR1>	
R1>	1~20	
M:CLE 1 ar data from m	iemory slot 1.	
urns the status	s of all the memory slots.	
urns the status Mory:STATe?	s of all the memory slots.	

Example	MEM:STAT?
	> NFFNN-NNNNN-NNNNN-NNNN
	Indicates that memory slots 2 and 3 have data and that all
	other memory slots are empty.

### Status Commands

STATus:PRESe	t		Set
Description	Sets the QUESTionable enable register to zero.		
Syntax	STATus:PRESet <n< td=""><td>ONE&gt;</td><td></td></n<>	ONE>	
Parameter	<none></none>		
STATus:QUES <sup>-</sup>	tionable:ENAB	e	Set → Query
Description	Sets or returns the Questionable Data Enable register.		
Syntax Query Syntax	STATus:QUEStionable:ENABle <nr1> STATus:QUEStionable:ENABle?</nr1>		
Parameter/ Return parameter	<nr1></nr1>	0~32767.	
Example	STAT:QUES:ENAB 2560 Sets the Questionable Data Enable register to 000101000000000.		
STATus:QUES <sup>-</sup>	tionable:EVENt		
Description	Returns the contents of the Questionable Data Event register.		
Query Syntax	STATus:QUEStiona	STATus:QUEStionable:EVENt?	
Return parameter	<nr1></nr1>	0~32767	
Example	STAT:QUES:EVEN	) the Questionable [	Data Event

512 indicates that the Questionable Data Event register=0000001000000000.

# IEEE 488.2 Common Commands

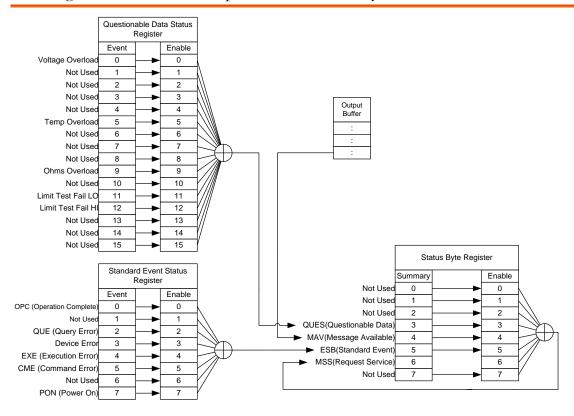
*CLS		(Set)		
Description	Clears the Event Status register (Output Queue, Operation Event Status, Questionable Event Status, Standard Event Status).			
Syntax	*CLS			
Parameter	<none></none>			
*ESE		Set → Query		
Description	Sets or returns the contents.	ESER (Event Status Enable Register)		
Syntax Query Syntax	*ESE <nr1> *ESE?</nr1>			
Parameter/ Return parameter	<nr1></nr1>	0~255		
Example	*ESE 65 Sets the ESER to 0 *ESE? >130 ESER=10000010	1000001		
*ESR				
Description	Returns SESR (Sta	Indard Event Status Register) contents.		
Syntax Query Syntax	*ESR?			
Return parameter	<nr1></nr1>	0~255		
Example	*ESR? >198 SESR=11000110			

*OPC		Set → Query
Description		e operation complete bit (bit0) in SERS tatus Register) when all pending npleted.
Syntax Query Syntax	*OPC *OPC?	
Parameter	<none></none>	
Return parameter	<nr1></nr1>	0:operation not complete 1:operation complete
Example	*OPC? Returns 1.	
*RST		(Set)
Description	Recalls default par	nel setup.
Syntax	*RST	
Parameter	<none></none>	
*SRE		Set → Query
Description	Sets or returns the Register) contents	e SRER (Service Request Enable
Syntax Query Syntax	*SRE <nr1> *SRE?</nr1>	
Parameter/ Return parameter	<nr1></nr1>	0~255
Example	*SRE 7 Sets the SRER to 0 *SRE? >3 SRER=00000011	0000111

*STB		
Description	Returns the SBR (	Status Byte Register) contents.
Query Syntax	*STB?	
Return parameter	<nr1></nr1>	0~255
Example	*STB? >81 SESR=01010001	
*TRG		Set →
Description	Manually triggers t	he instrument.
Syntax	*TRG	
Parameter	<none></none>	

# Status system

The diagram below is a description of the status system.



For the following command sets, please refer to the diagram above:

STAT: QUES: EVEN? STAT: QUES: ENAB STAT: QUES: ENAB? \*ESR? \*ESE \*ESE? \*STB? \*SRE \*SRE

# FAQ

- What are the different measurement speeds?
- The GOM-804/805 performance does not match the specifications.

#### What are the different measurement speeds?

There are two measurement speeds for both resistance and temperature measurement. At the slow measurement rate, the measurement speed is 10 samples/s and at the fast measurement rate the measurement speed is at 60 samples/s.

#### The GOM-804/805 performance does not match the specifications.

Make sure the device is powered on for at least 30 minutes, is operated at the slow measurement rate and is within  $+18^{\circ}C^{+}+28^{\circ}C$  with a humidity not exceeding 80%. This is necessary to stabilize the unit to match the specifications.

If there is still a problem, please contact your local dealer or GWInstek at <u>marketing@goodwill.com.tw</u>.



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# **Function Selection Combinations**

## Function Combination Table

Overview		The following table shows which functions can be used with the Relative, Drive and Dry Circuit functions.				
Function	Rel	Dry( <sup>*1</sup> ) Drive( <sup>*2</sup> )				
Ohm	<b>v</b>	~	$\checkmark$			
Comp	<b>v</b>	V	$\checkmark$			
Bin	<b>v</b>	<b>v</b>	<b>v</b>			
ТС	<b>v</b>	V	<b>v</b>			
Tconv	<b>v</b>	V	<b>v</b>			
Temp	<b>v</b>	~	<b>v</b>			
Scan	×	×	×			
Diode	×	×	×			

\*1. When the Dry Circuit measurement function is turned on, only the DC+, DC- and Pulse signals can be selected. Please refer to page 37 for limitations on the range selection when using the Dry Circuit measurement function.

\*2. The "Zero" drive setting is only available for the Ohm measurement function.

## Temperature Measurement

## Reference Temperature Table

Overview The International Temperature Scale (ITS) is based on the following table. The table has 17 fixed calibration points as of 1990.

			Temperatu	re
Element		Туре	°К	°C
(H2)	Hydrogen	Triple point	13.8033	-259.3467
(Ne)	Neon	Triple point	24.5561	248.5939
(O2)	Oxygen	Triple point	54.3584	218.7916
(Ar)	Argon	Triple point	83.8058	-189.3442
(Hg)	Mercury	Triple point	234.325	-38.8344
(H2O)	Water	Triple point	273.16	+0.01
(Ga)	Gallium	Melting point	302.9146	29.7646
(In)	Indium	Freezing point	429.7485	156.5985
(Sn)	Tin	Freezing point	505.078	231.928
(Zn)	Zinc	Freezing point	692.677	419.527
(Al)	Aluminum	Freezing point	933.473	660.323
(Ag)	Silver	Freezing point	1234.93	961.78
(Au)	Gold	Freezing point	1337.33	1064.18

## **RTD Sensors**

Resistive Thermal Devices (RTDs) are commonly used as temperature sensors. RTDs change resistance linearly over a specific range of temperature. The table below shows some of the inherent features of RTDs compared to thermocouples.

Feature	Description
Accuracy	Higher accuracy
Resolution	0.1~1.0°C, higher resolution
Speed of response	Slower
Self-heating	Yes
Long term stability	Good
Output characteristics	Approx. 0.40hm/°C, near linear

## Optional Platinum Sensor

Introduction	The optional platinum sensor is a PT-100 sensor. The PT-100 sensor meets the German DIN43760: 1968 3 wire measurement specification.				
	These sensors are one of the most common temperature sensors used in industry. These sensors have a nominal resistance of $100\Omega$ at 0°C.				
	The relationship between temperature and resistance for the PT-100 sensor can be described with the Gallendarvan Dusen equation shown below:				
	$R_{RTD} = R_0[1 + AT + BT^2 + CT^3(T-100)]$				
	Where: RRTD is the calculated resistance of the RTD.				
	Ro is the known RTD resistance at 0°C.				
	T is the temperature in °C				
	A=alpha [I+(delta/100)]				
	B=-I(alpha)(delta)(le-4)				
	C=-I(alpha)(beta)(Ie-8)				
	The Alpha (A), Beta (B), Delta (D) values for the				

		P1-100	senso	or are listed t	below:		
Туре РТ-100	Standard ITS90	Alpha 0.0038	50	Beta 0.10863	Delta 1.49990	Ω@0°C 100Ω	
P1-100	11390	0.0038	50	0.10805	1.45550	10022	
Temperature Calculation Example		Example—Calculating the resistance of a PT-100 RTD at 100°C (T). The following $R_0$ ( $\Omega$ at 0°C), alpha, beta, and delta values are used for the PT-100 RTD:					
		-	T=100	D°C			
		I	Ro (Ω	2 at 0°C) =	100Ω		
			Alpha	=0.003850			
		l	Beta=0.10863				
		l	Delta	=1.49990			
		A, B, and C are calculated according to equations listed above:				equations	
		A=0.00391					
		I	B=5.77e-7				
	(	C=4.18e-12					
	The resistance of the RTD at $100^{\circ}$ C (R <sub>100</sub> ) is the calculated as follows:			$R_{100}$ ) is then			
		R100: =	=R0[1	Ro[1+AT+BT <sup>2</sup> +CT <sup>3</sup> (T-100)]			
					) (100)]+[(-5.7 ³) (100-100)]}	7e-7) (100 <sup>2</sup> )]	
		:	=138.	5Ω			

PT-100 sensor are listed below:

# Specifications

Conditions Background	The specifications are applicable under the following conditions:
	<ul> <li>A 1-year calibration cycle.</li> <li>An operating temperature of 18 to 28 °C (64.4 to 82.4 °F).</li> <li>Relative humidity not exceeding 80%.</li> <li>Accuracy is expressed as ±(percentage of reading + percentage of range).</li> <li>The instrument requires 30 minutes warm-up time and must be operated at the slow measurement rate to achieve rated accuracy.</li> <li>The power cord protective grounding conductor must be connected to ground.</li> </ul>

## Resistance Measurement

50000 counts				
Range	Resolution	Measuring Current	Accuracy	Open-Termi nal Voltage
$5 m \Omega$	0.1μΩ	1A	±(0.1%+0.2%)	~6.25V
50mΩ	1 μΩ	1A	±(0.1%+0.02%)	~6.25V
500mΩ	10 μΩ	100mA	±(0.05%+0.02%)	~6.25V
5Ω	100 μΩ	100mA	±(0.05%+0.02%)	~6.25V
50Ω	$1 m\Omega$	10mA	±(0.05%+0.02%)	~6.25V
500Ω	$10 \text{m}\Omega$	1mA	±(0.05%+0.008%	)~6.25V
5kΩ	100m $\Omega$	100μΑ	±(0.05%+0.008%	)~6.25V
50kΩ	1Ω	100μΑ	±(0.05%+0.008%	)~6.25V
500kΩ	10Ω	10μΑ	±(0.05%+0.008%	)~6.25V
GOM-805 Only				
5ΜΩ	100Ω	1μA	±(0.5%+0.008%)	~6.25V
GOM-804 Only				
5ΜΩ	100Ω	1μA	±(0.2%+0.008%)	~6.25V
	• •		11 1	1 1 .

\*When use  $5m\Omega$  range, in order to obtain a stable value, it is recommended to use 10 times average and fixed connection method such as lock. \*When the instrument is set to  $5m\Omega$  or  $50m\Omega$  or  $500m\Omega$  ranges, the

resistance value will be changed while connecting or disconnecting the test

lead to the panel due to the different temperature between internal and external parts of the instrument. Therefore, please wait 1 minute in order to obtain an accurate value after the test leads have been connected or disconnected.

\* When Kelvin clips are used to resume testing after a long period of time, please wait for a short time to stabilize the measurement.

\*Fast and Slow measurement rates have the same specifications. However, the Slow rate is more accurate as it will correct for any errors associated with temperature drift that occurs from the difference between the measurement temperature and the calibration temperature.

Measurement	Four-terminal method.	
Auto-ranging	Provided.	
Over input range	"" indicates over range	
Maximum Applied voltage*	5m~5 $\Omega$ range: 30VpDC Other range: 100VpDC	
Comparator	20 sets of comparator status can be selected.	
Buzzer mode switchable	OFF, PASS, FAIL	
*Only when HVP (High Voltage Protect) function is enabled, can Maximum		

\*Only when HVP (High Voltage Protect) function is enabled, can Maximum Applied voltage be available. Refer to page 77 for details.

#### Dry Resistance Measurement

Range	Measuring Current	Accuracy
500m $\Omega$	100mA	±(0.3%+0.05%)
5Ω	10mA	±(0.3%+0.05%)
50Ω	1mA	±(0.3%+0.05%)

### Temperature Measurement

Temperature sensor (option)	Platinum resistor. Lead length: 1.5m approx.
-10°C ~40°C	0.3%±0.5°C
Other	0.3%±1.0°C

## **Temperature Correction Function**

Reference temperatur	e -50.0°C~399.9°C
range	
Thermal coefficient	±9999 ppm
range	
Temperature range	Accuracy of temperature compensation for 3930 ppm/Cu wire.*
-10°C~40.0°C	0.3%+resistance measurement accuracy.

Other 0.6%+resistance measurement accuracy.

\*The temperature coefficient for the other settings must be calculated individually according to different conditions.

\*If the temperature coefficient or the difference between the environmental temperature and the required temperature exceeds normal operation, after calculating the compensation, the variation to the reading value will be significant.

\*When using the PT-100 temperature sensor for temperature measurements, the accuracy of the sensor (typical accuracy of  $<\pm0.5$ °C) should also be taken into account and calculated for.

## Interface

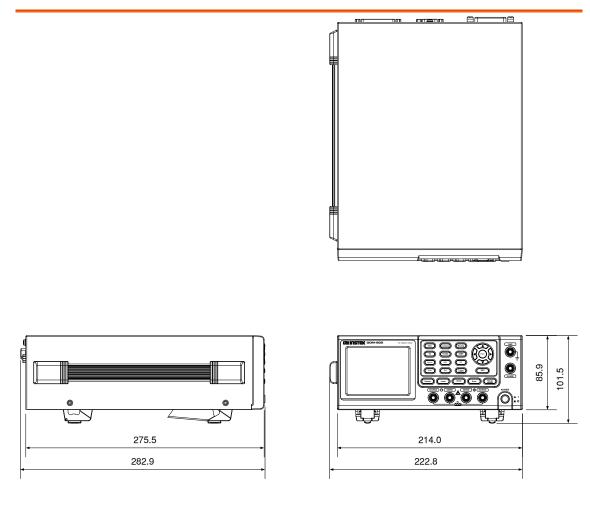
Handler interface*	Signal: Trigger: TTL input Signal: LOW, HIGH, FAIL, PASS, EOT, READY, BIN 1~8, BIN OUT: total 15 TTL outputs.
Scan*	Signal: RELAY, PASS, LOW, HIGH, CLOCK, STRB total 6 TTL outputs.
Communication Interfaces	GOM-804: USB/RS-232 GOM-804G: USB/RS-232/GPIB GOM-805: USB/RS-232/GPIB *The Scan and Handler interface use the same connector.
Environmental	
Operation Environment	Indoor use, altitude up to 2000m. Operation Environment: 0°C to 40°C. Temperature Range: 0 ~ 35°C, Relative Humidity: <80%RH; >35°C, Relative Humidity: <70%RH. Pollution Degree 2
Storage Conditions	-10°C to 70°C.

## Temperature Range: 0 ~ 35 °C, Relative Humidity: <90%RH; >35 °C, Relative Humidity: <80%RH

### General

Power source	AC 100-240V±10%, 50-60Hz, 25VA
Accessories	Power cord x1
	Test lead: GTL-308 x1
	User manual x1 (CD)
	Safety instruction sheet x1
	USB cable (option): GTL-246
	Temperature sensor (option): PT-100
Dimension	223 (W)×102(H)×283 (D) mm
Weigh	Approx. 3 kg

# Dimensions



# Declaration of Conformity

#### We

#### GOOD WILL INSTRUMENT CO., LTD.

declare, that the below mentioned product

#### Type of Product: **DC Milliohm Meter**

Model Number: GOM-804, GOM-805

satisfies all the technical relations application to the product within the scope of council:

**Directive:** 2014/30/EU; 2014/35/EU; 2011/65/EU; 2012/19/EU

The above product is in conformity with the following standards or other normative documents:

#### ©EMC

Electrical equipment for measurement, control and		
laboratory use EMC requirements (2013)		
adiated Emission	Electrical Fast Transients	
A1:2010	EN 61000-4-4: 2012	
CS	Surge Immunity	
14	EN 61000-4-5: 2006	
n	Conducted Susceptibility	
13	EN 61000-4-6: 2014	
harge	Power Frequency Magnetic Field	
09	EN 61000-4-8: 2010	
у	Voltage Dip/ Interruption	
06+A1: 2008+A2: 2010	EN 61000-4-11: 2004	
	laboratory use EMC re adiated Emission A1:2010 cs 14 m 13 harge 09	

#### **O** Safety

Low Voltage Equipment Directive 2014/35/EU	
Safety Requirements	EN 61010-1: 2010
	EN 61010-2-030: 2010

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