Scanner Card

GDM-SC1A

INSTALLATION GUIDE

REV. 01

ISO-9001 CERTIFIED MANUFACTURER

The information in this manual was correct at the time of printing. However, Good Will continues to improve products and reserves the right to change specifications, equipment, and maintenance procedures at any time without notice.

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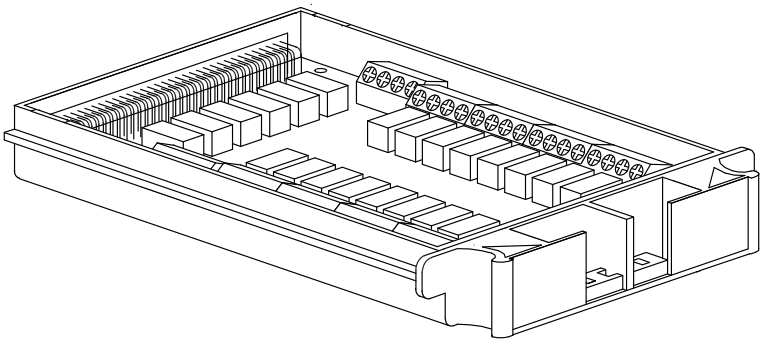
SCANNER CARD

The optional scanner, GDM-SC1A, lets you effectively measure multiple channels when connected to a GDM-8255A, GDM-8261 or GDM-8261A multimeter. Up to two GDM-SC1A scanner cards can be installed into the GDM-8255A or one GDM-SC1A into the GDM-8261 or GDM-8261A. If two scanner cards are installed, one can be selected as the master scanner, and the other as the slave.



GDM-SC1A Basic Specifications

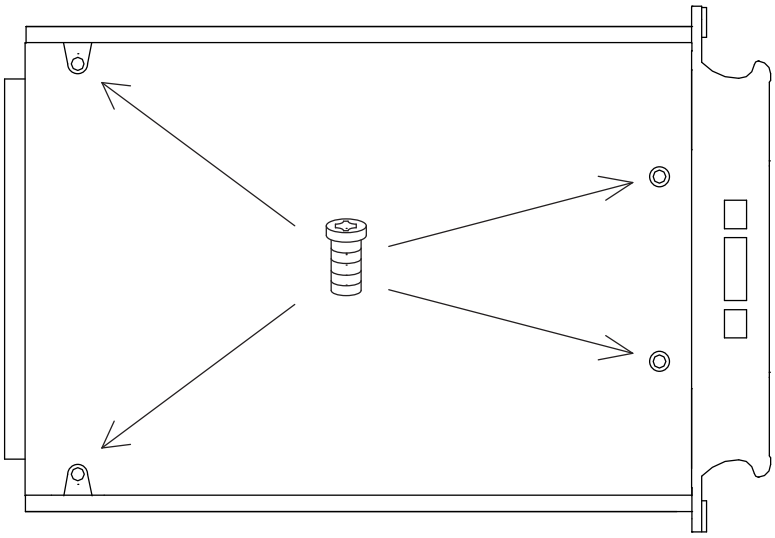
2-wire channel	16 pairs	Maximum current	2A (ch17, ch18)
4-wire channel	8 pairs	Resistance	2/4 wire
Single wire channel	N/A	Cold junction	Temperature Sensors (Analog)
Maximum voltage	250V	Connection	Screw terminal

Scanner Installation

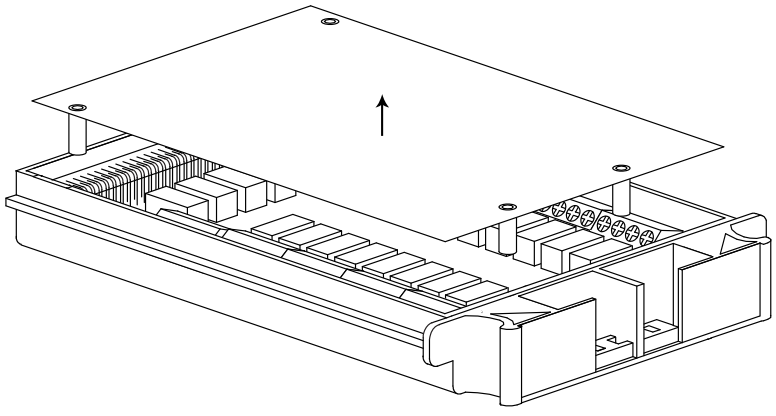
Configure scanner

Open Scanner cover

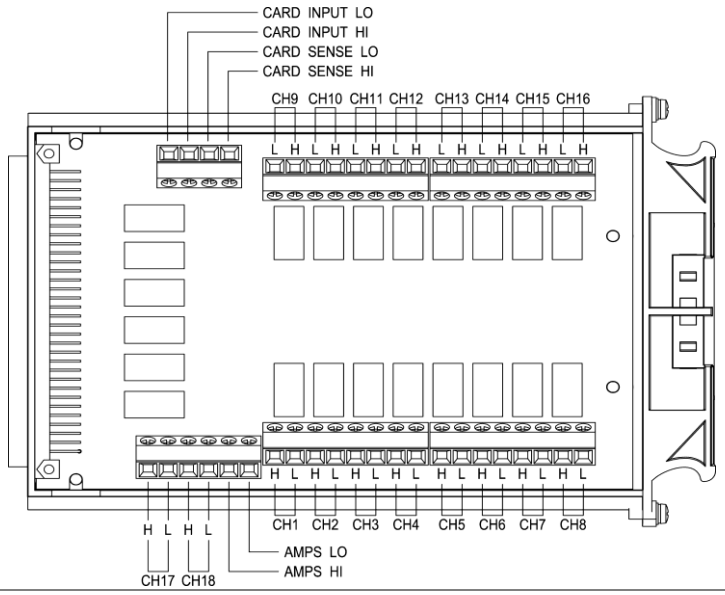
1. Take off four screws from the bottom panel of the scanner.



2. Remove the top panel.



3. Note the connection terminals.



Overview

16 general purpose channels are available, 8 on the left row, 8 on the right row. Current (ACI, DCI) measurement uses 2 extra channels. All channels are fully isolated (Hi and Lo).

Scan/Step connection

Refer to the below table for measurement and test line connection. Note: Not all items can be used with GDM-8255A.

Item	No. of wires	No. of channels
DCV, ACV Diode/Continuity Period/Frequency	2 wires (H, L)	16 (CH1 ~ 16)
DCI, ACI	2 wires (H, L)	2 (CH17, 18) Maximum current : 2A
Temperature simulation	2 wires (H, L)	16 (CH1 ~ 16) for temperature
Cold junction (Separate Chapter)	2 wires (H, L)	15 (CH2 ~ 16) for temperature, CH1 for Cold junction
2W Resistance Temp. 2W RTD	2 wires (H, L)	16 (CH1 ~ 16)
4W Resistance Temp. 4W RTD	4 wires (Input H, L + Sense H, L)	8 pairs (CH1 [input]& 9[sense], 2&10,....8&16)

Select Channel group and enable scanner

Background

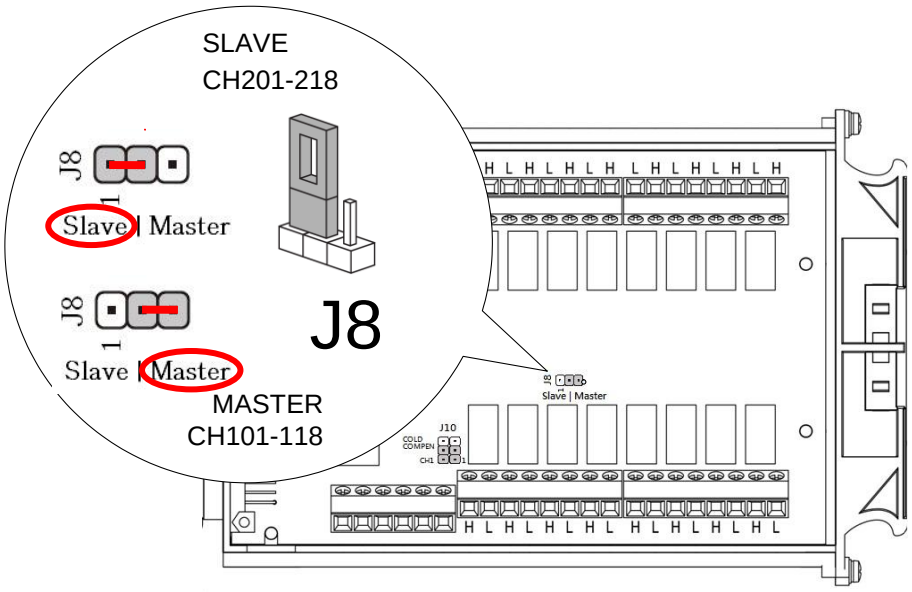
When 2 scanner modules are installed in the GDM-8255A, 2 groups of 18 channels each are available. The scanner modules have a jumper to configure which scanner is for which group. If only one scanner is installed, the scanner should always be configured to group 1(CH101~CH118).

The GDM-8255A can have up to 2 scanner modules installed, whilst the GDM-8261/GDM-8261A can have only 1 scanner module installed.

Group1	CH101 ~ 118
Group2	CH201 ~ 218

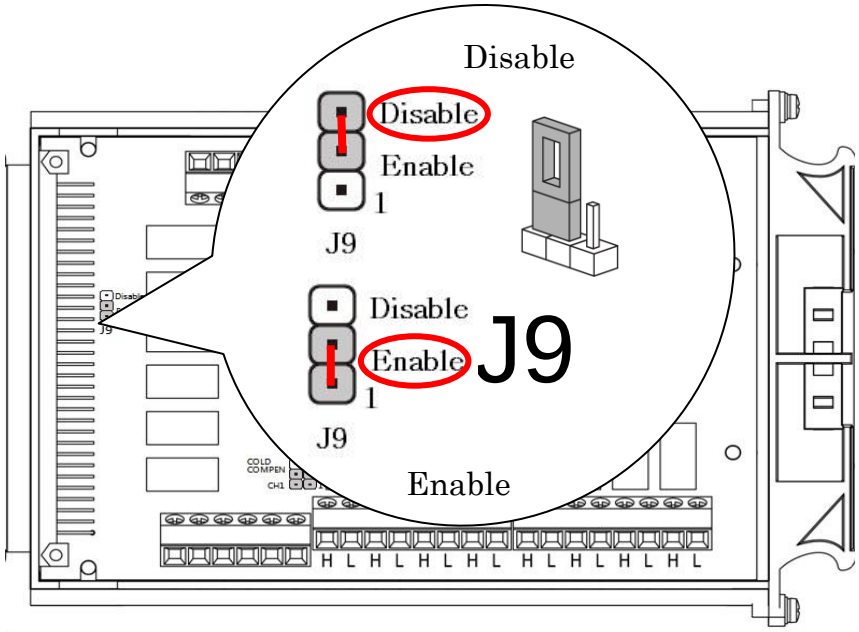
Select group (Jumper J8) (Preset MASTER)

Set the jumper J8 in the center of the board accordingly. Move the jumper to the right for selecting CH1xx (101 ~ 118), and move to the left for selecting CH2xx (201 ~ 218). If two scanners are installed, set one scanner to Master (CH1xx) and the other to Slave. If only one scanner is installed, set the jumper to Master.



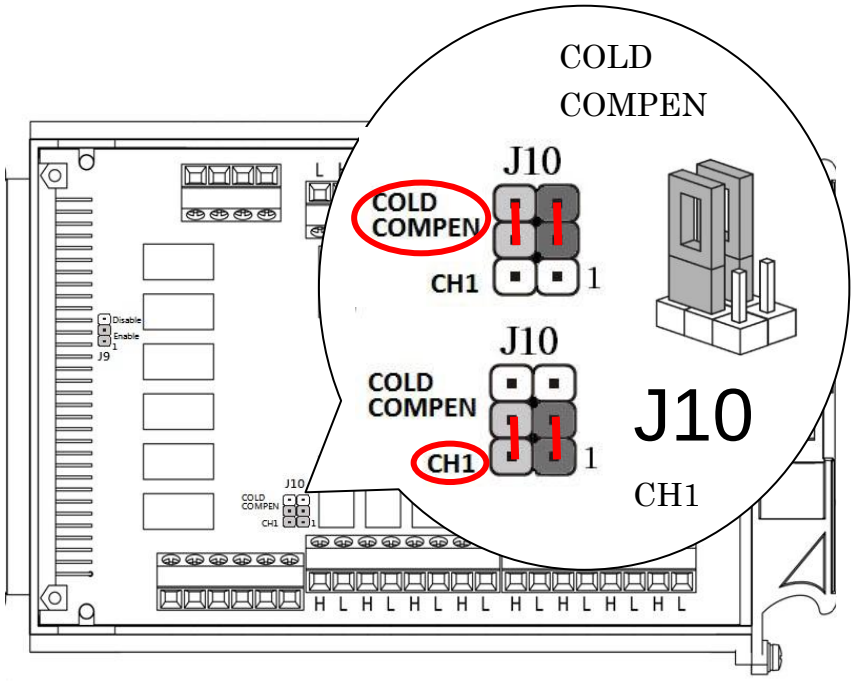
Enable scanner (Jumper J9) (Preset Enabled)

Set the jumper J9 on the rear side of the board accordingly. Move the jumper up to disable the scanner, and down to enable the scanner.



Enable cold junction points (Jumper J10) (Preset Disabled)

Set the jumper J10 on the Bottom left of the board accordingly. Move the jumper up (COLD COMPEN) for selecting CH1 to Enable the Cold Junction, or down(CH1) for selecting CH1 to Disabled the Cold Junction.



Note

Do Not set the jumpers horizontally as the figure below shown, which will Not enable the target functions.

Erroneous example

Temperature sensor Calculation

Overview	The temperature sensor provides a positive slope output of 10 mV / °C
Equation	The temperature sensor voltage output (Vout) calculates given temperature (Ta): Ta = (Vout – Voffs) / Tc (Equation) where • Vout is the temperature sensor voltage output for a given temperature • Ta is the given temperature °C • Tc is the temperature coefficient 10mV/ °C • Voffs is the temperature sensor voltage offset = 500mV Example The temperature sensor voltage 0.785V Ta = (0.785 – 0.5) / 0.01 = 28.5°C The calculates given temperature 28.5°C

Connect wire

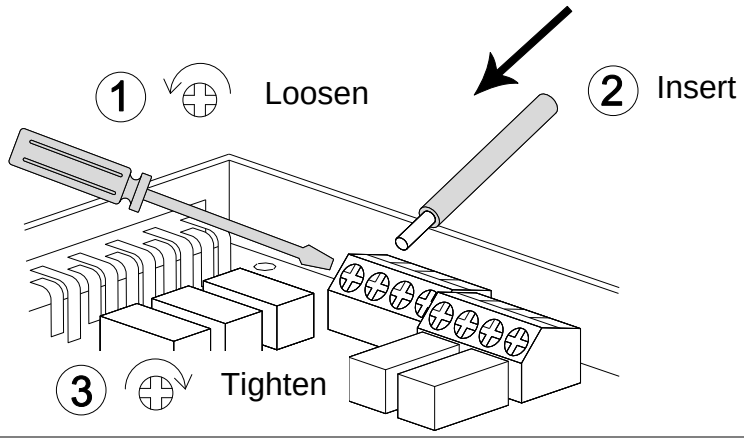
Wire selection

Make sure the wires have at least the same Voltage and Current capacity as the maximum ratings in the measurement.

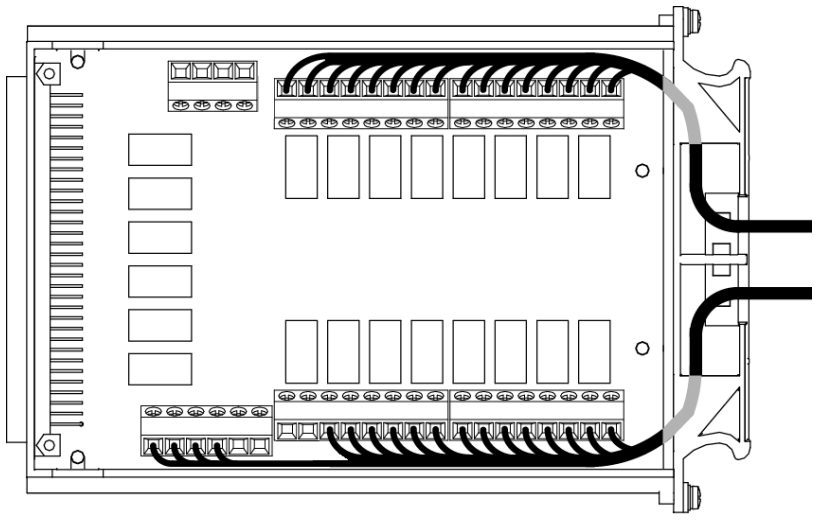
When measuring TC, it has the possibility that CH1 is being regarded as cold junction. In order to prevent conflicts, it is suggested initiating from CH2 for wiring.

Connection

1. Turn the screw left (loose) using the screw driver and insert the wire. Turn the screw right (tight) and secure the connection.

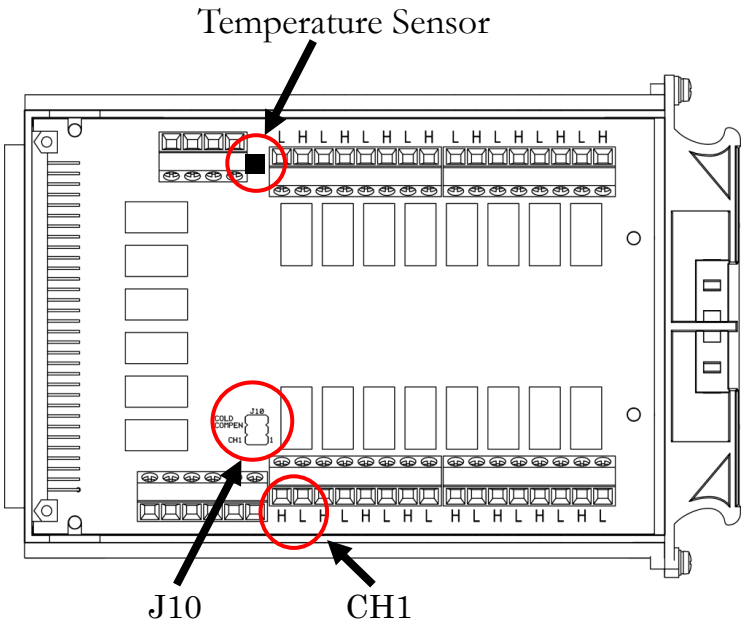


2. Route the wires as follows, using the two openings (left and right) at the front cover.



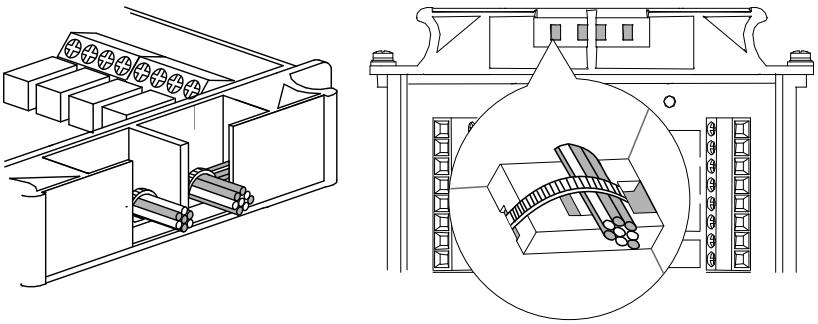
Note

When using thermocouple measurement, The temperature sensor inside the scanner box. Move the J10 JUMP to cold compensation, and the CH1 value is switched to the temperature sensor value. You can use this temperature as a cold junction compensation.

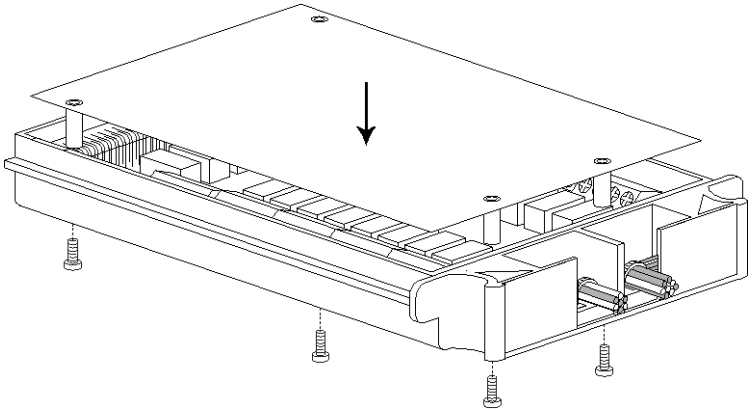


When J10 JUMP is set to cold compensation, CH1 original connection external signal will lose its function, Change to the temperature sensor

3. Tightly bundle the wires with cable ties which go through the bottom holes at the front cover as the following figures shown.



4. Close the top cover and tighten the screws from the bottom.



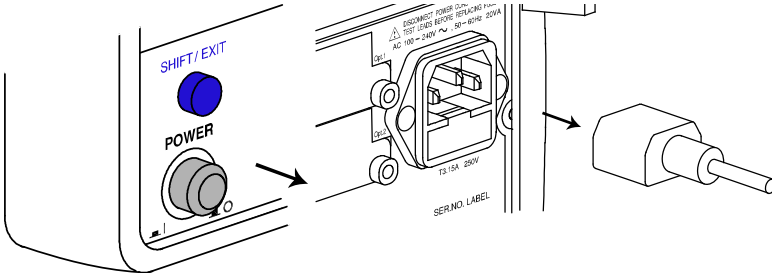
Configuration Record

Print out the configuration record list on page14, fill in the details, and keep it with the DMM.

Insert scanner

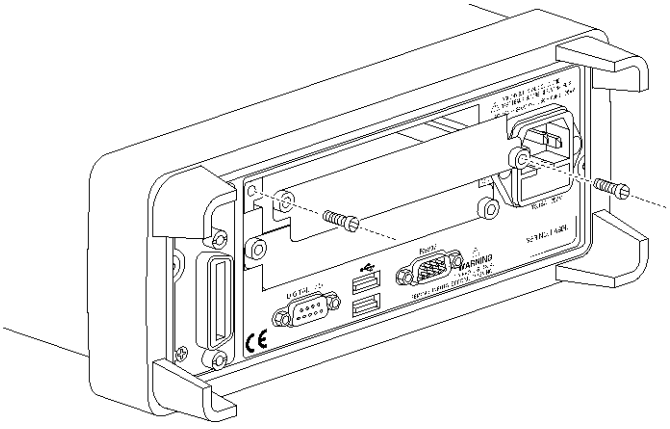
Power Off

Turn the Power Off and take out the power cord.



Open the rear panel slot

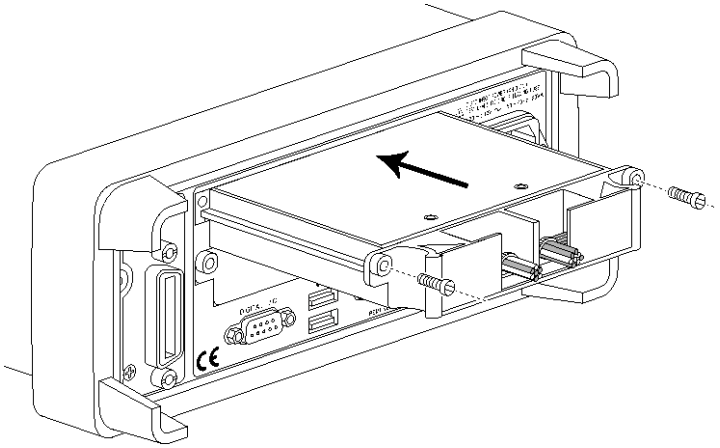
Take out the two screws on the slot corners to remove the optional slot cover. Keep the screws for later reuse.



GDM-8255A shown

Insert the scanner

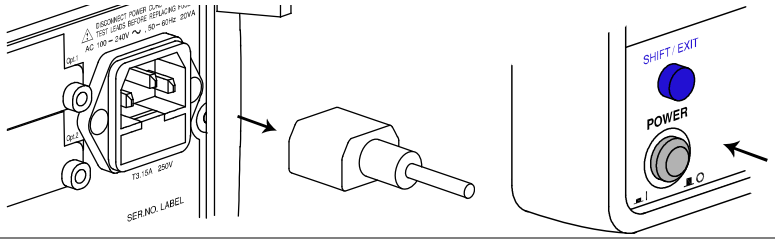
Insert the scanner (already configured according to the procedures on page4) to either the top or bottom slot (GDM-8261/GDM-8261A only has 1 slot). Close the cover by tightening the screws.



GDM-8255A shown

Power On

Connect the power cord and turn On the power.



CAUTION Do not input voltages exceeding 250V to the front input terminals whilst the scanner module is installed.

WARNING Do not connect any leads to the front input terminals while the scanner is active. Input signals scanned by the scan module also appear on the front terminals.

Scanner Configuration Record

Channel	Wire color		Measure type	Note
CH1	H	L		
CH2	H	L		
CH3	H	L		
CH4	H	L		
CH5	H	L		
CH6	H	L		
CH7	H	L		
CH8	H	L		
CH9	H	L		
CH10	H	L		
CH11	H	L		
CH12	H	L		
CH13	H	L		
CH14	H	L		
CH15	H	L		
CH16	H	L		
CH17	H	L		
CH18	H	L		
CARD INPUT	H	L		
CARD SENSE	H	L		
AMPS	H	L		

Specifications

General

Note	• All specifications are ensured only under a single display. • At least 30 minutes of warm-up time is required before applying these specifications.
General measurement channels	16 channels of 2-pole relay input, which are configurable to be 8 channels of 4-pole inputs
Dedicated current measurement channels	2 (Channel 17,18)
Maximum Signal Level	Channels 1-16: 250V DC or rms, 1A switched, 30 W, 62.5VA (resistive load) Channels 17-18: 60V DC or 30V rms, 2A switched, 30 W, 62.5VA (resistive load)
Resistance Measurement	2/4 Wire
Cold Junction Compensation	Temperature Sensor Tmp235
Contact Resistance	<1Ω at the end of contact life
Contact Life	$>10^5$ operations of rated load (resistive loads only) $>10^8$ operations of cold switching
Relay Actuation Time	<6ms
Isolation between any two channels	$>10^{10}$Ω,<100pF
Input Differential Isolation	$>10^{10}$Ω,<75pF
Connection	Screw Terminal
Operation Environment	Ambient Temperature 0°C~40°C, Relative Humidity<75% (For full accuracy: 18°C ~28°C)
Temperature Coefficient	<0.2 x applicable accuracy per degree (°C) (for 0°C ~18°C and 28°C ~40°C)
Storage	Ambient Temperature -10°C ~70°C

Environment	Relative Humidity: 0°C ~35°C <75%, 35°C ~50°C <50%
Dimension	121(W) x 22(H) x 178(D) mm
Weight	260 grams

GDM-8255A Reading rates (readings/sec)

Note

- Test conditions: Auto mode off, auto range off, in simple mode with default delays.
- The test items listed below may require proper delay to obtain in-spec reading.

Function	Rate(readings/sec)		
	S	M	F
DCV	5	7.5	11
DCI	5	7.5	11
ACV	0.3	0.4	0.4
ACI	0.3	0.4	0.4
2/4WΩ (10M/100MΩ)	1.1	1.7	2.3
ACV+DCV	1.2	1.8	3.5
ACI+DCI	0.3	0.5	0.6
Diode	7.9	7.9	13

GDM-8261/GDM-8261A Reading rates (readings/sec)

Note

- Test conditions: Auto Range Off, Auto Zero/Gain Off, ADC Speed: Quick, Count: 10, All Delays are set to zero.
- The test items listed below may still need proper delay to obtain in-spec reading.

Function	Rate(readings/sec)			
	S	M	F	Comments
DCV	4.35	16.4	29	
ACV	0.3125	0.53	0.7	AC BW=3~300kHz
DCI	2.5	5	10	
ACI	0.32	0.53	0.625	AC BW=3~300kHz
2/4 WR	4.31	16.4	30.5	
Diode/Cont	11.23	18.5	23.35	

GDM-8255A Reading rates-Frequency (readings/sec)

Note

- The signal being measured must be:
  - ≥ 0.1V rms when its frequency is lower than 100kHz
  - ≥1V rms when its frequency is lower than 600kHz
  - ≥2.5V rms when its frequency is lower than 800kHz
- Bandwidth of frequency measurement: 10Hz ~ 800kHz
- * Signal frequencies lower than 150Hz may need proper delay to obtain in-spec reading.

Frequency	Rate(reading/sec)
Under 150Hz	1.1*
150Hz ~ 1.5kHz	1.8
1.5kHz ~ 15kHz	2.6
15kHz ~ 150kHz	4.5
Above 150kHz	12

GDM-8261 Reading rates-Frequency (seconds/reading)

Note

- Test Conditions: Auto Range Off, Filter Off, Auto Zero/Gain Off, Count: 10, All Delays are set to zero, D-Shift: On
- Bandwidth of Frequency Measurement: 3Hz~300kHz

Speed	Signal Level	Rate (Second/Reading)	
Slow	100mV rms	2.62 Sec@3Hz	2.18 Sec@300kHz
Mid	100mV rms	552 mSec@20Hz	500 mS @300kHz
Fast	100mV rms	236 mSec@200Hz	200 mS @300kHz

GDM-8261A Reading rates-Frequency (seconds/reading)

Note

- Test Conditions: Auto Range Off, Filter Off, Auto Zero/Gain Off, Count: 10, All Delays are set to zero, D-Shift: On
- Bandwidth of Frequency Measurement: 3Hz~300kHz

Speed	Signal Level	Rate (Second/Reading)	
Slow	100mV rms	2 Sec@3Hz	1.8 Sec@300kHz
Mid	100mV rms	552 mSec@20Hz	548 mS @300kHz
Fast	100mV rms	332 mSec@200Hz	332 mS @300kHz

DC Voltage

Note

- *: 250V is the maximum input voltage limitation of GDM-SC1A Scanner card though it is in fact used in the 1000.00V range.
- Maximum Input: 250V DC or Peak on all ranges

Rate	Range	Accuracy ±(% of reading + digits)
Slow	100mV	0.015%+10
	1V	0.015%+7
	10V	0.015%+7
	100V	0.015%+7
	250V*	0.015%+7

2W Resistance

Note

- Maximum Input: 250V DC or 250Vrms AC
- *: Ranges on which residual resistance needs to be manually offset from readings when measuring.

Rate	Range	Accuracy ±(% of reading + digits)
Slow	100Ω	0.125%+10*
	1kΩ	0.1%+7*
	10kΩ	0.075%+7*
	1000kΩ	0.075%+7
	1MΩ	0.075%+7
	10MΩ	0.375%+7
	100MΩ	3.75%+10

4W Resistance

Note

- Maximum Input: 250V DC or 250Vrms AC
- *: Ranges on which residual resistance needs to be manually offset from readings when measuring.

Rate	Range	Accuracy ±(% of reading + digits)
Slow	100Ω	0.0625%+10*
	1kΩ	0.0625%+7*
	10kΩ	0.0625%+7*
	100kΩ	0.0625%+7
	1MΩ	0.0625%+7
	10 MΩ	0.375%+7
	100MΩ	3.75%+10

DC Current


Note

- Maximum Input: : 2A
- When GDM-SC1A scanner card is used, 1A & 10A ranges are protected with a 3A/125V fuse
- Current ranges smaller than 1A are not selectable when GDM-SC1A scanner card is used.
- (*): Input <2A. 2A is the maximum input Current of GDM-SC1A Scanner card even though it is used in the 10A range

Rate	Range	Accuracy ±(% of reading + digits)
Slow	2A(*)	0.25%+7

AC Voltage


Note

- Maximum Input: AC 250V rms
- The specifications are only applicable for sinusoidal signals with amplitudes greater than 5% of the Full Scale reading.
- (*)Input <200V for 20~45Hz. 250V is the maximum input voltage limitation of GDM-SC1A Scanner card even though it is used in the 750.00V range.

Rate	Range	Accuracy (reading%+digits)			
		20~45Hz	45~10kHz	10k~30kHz	30k~100kHz
Slow	100mV	1.25%+125	0.25%+125	1.875%+375	6.25%+375
	1V	1.25%+125	0.25%+125	1.25%+125	3.75%+250
	10 V	1.25%+125	0.25%+125	1.25%+125	3.75%+250
	100V	1.25%+125	0.25%+125	1.25%+125	3.75%+250
	250V(*)	1.25%+125	0.25%+125	1.25%+125	3.75%+250

AC Current


Note

- Maximum Input: : 2A
- The following specifications are only applicable for sinusoidal signals with amplitude greater than 5% of the Full Scale reading
- 2A & 10A ranges protected with a 3A/125V fuse
- 2A/10A range specifications are verified for < 5kHz

Rate	Range	20~50Hz	50Hz~ 10kHz	10kHz~ 20kHz
S	1A	--	1.25%+125	--

AC Frequency

Note
- Maximum Input: 250Vrms or 330V peak.

Rate	Sensitivity	10Hz~100kHz	100k~600kHz	600k~800kHz
Slow	2.5V	0.0625%+19	0.0625%+4	0.0625%+4
	1V	0.0625%+19	0.0625%+4	--
	0.1V	0.0625%+19	--	--

Diode/Continuity

Note
- Max. Input: 250V DC or 250 V rms AC

Diode	Range
	Approx. 2V, (8255A) Approx. 1.4V, (8261A)
Continuity	1 ~ 1000Ω

Temperature

Note
- The associated errors in temperature measurement include temperature sensor (thermocouple), wire and error measured by DMM and SCANNER CARD. In temperature measurement, the largest source of error is usually the temperature sensor (thermocouple) itself

GDM-8255A Temperature Characteristics

Note Sensor errors excluded from Temperature specifications

Type	Measurement Range	Resolution
J, K, T	-200 ~ +300˚C	0.01˚C

GDM-8261A Temperature Characteristics

Note

(Display in °C, °F, Exclusive of probe errors.) RTD [1] (Accuracy based on PT100):

- (100Ω platinum [PT100], D100, F100,PT385, PT3916, or user type)

Range	Resolution	1 Year (23˚C ±5˚C)	Temperature Coefficient 0˚-18˚C & 28˚-55˚C
-200˚C~ -100˚C	0.001˚C	0.27˚C	0.012 ˚C / ˚C
-100˚C~-20˚C	0.001˚C	0.24˚C	0.015 ˚C / ˚C
-20˚C~20˚C	0.001˚C	0.18˚C	0.015 ˚C / ˚C
20˚C~100 ˚C	0.001˚C	0.24˚C	0.015 ˚C / ˚C
100˚C~300 ˚C	0.001˚C	0.36˚C	0.021 ˚C / ˚C
300˚C~600 ˚C	0.001˚C	0.66˚C	0.027 ˚C / ˚C

Thermocouples [2] (Accuracy based on ITS-90):

Type	Range	Resolution	90 Day/1 Year (23˚C±5˚C)*	Temperature Coefficient 0˚-18˚C & 28˚-55˚C
E	-200 to +1000˚C	0.002 ˚C	0.6 ˚C	0.09 ˚C / ˚C
J	-210 to +1200˚C	0.002 ˚C	0.6 ˚C	0.09 ˚C / ˚C
T	-200 to +400˚C	0.002 ˚C	0.9 ˚C	0.12 ˚C / ˚C
K	-200 to +1372˚C	0.002 ˚C	0.9 ˚C	0.12 ˚C / ˚C
N	-200 to +1300˚C	0.003 ˚C	1.2 ˚C	0.15 ˚C / ˚C
R	-50 to +1768˚C	0.01 ˚C	3 ˚C	0.42 ˚C / ˚C
S	-50 to +1768˚C	0.01 ˚C	3 ˚C	0.42 ˚C / ˚C
B	+350 to +1820˚C	0.01 ˚C	3 ˚C	0.42 ˚C / ˚C

*Relative to simulated junction

[1] The error of cold junction ±2˚C is not included within the specifications.

[2] Specifications do not include probe accuracy

[3] All speeds need A-Zero=off, A-Gain=off, Fixed range and Trigger Delay=0.

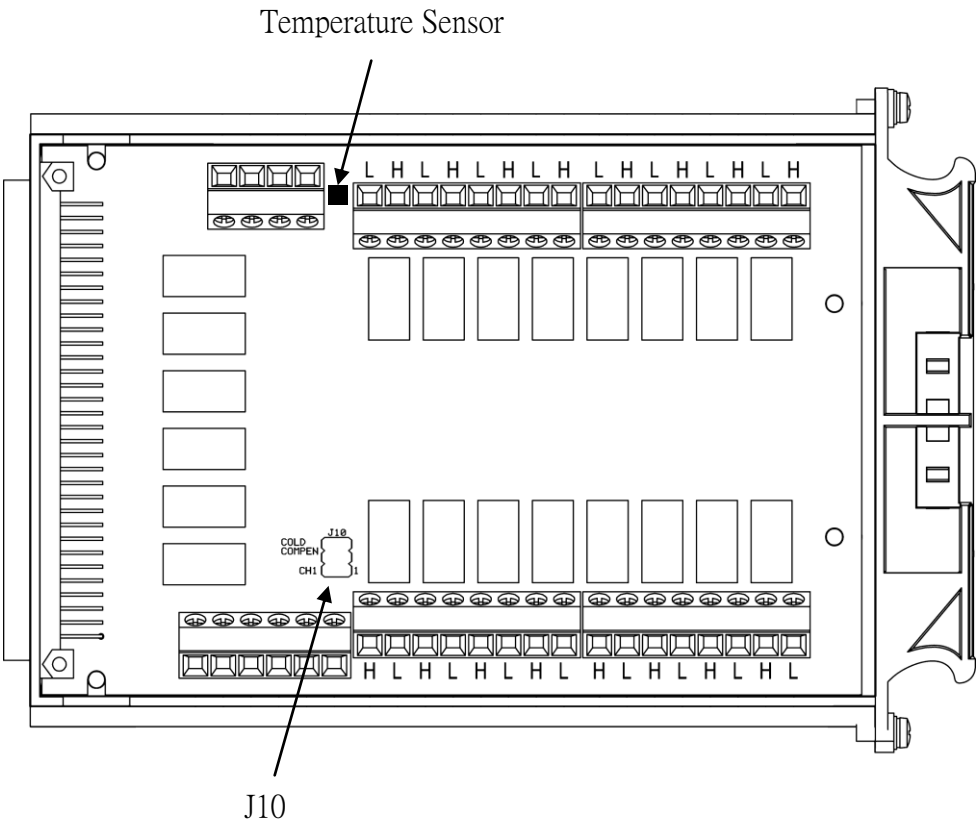
HOW TO THERMOCOUPLE MEASUREMENT

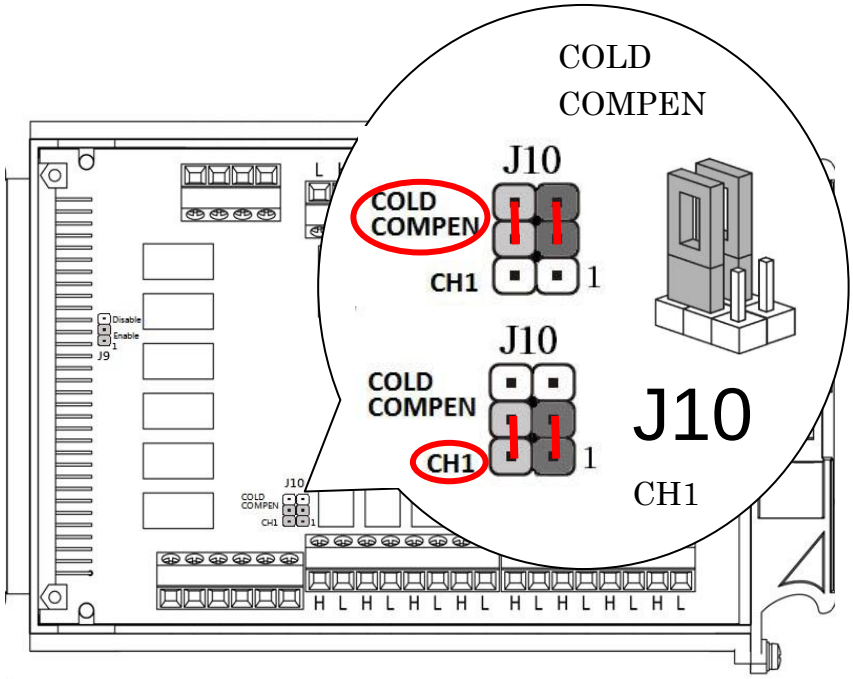
Basic work	Thermocouples consist of two spot-welded wires of different metals or alloys. The thermoelectric effect at the contact surface is used to measure temperatures. A relatively small thermoelectric voltage is caused, which depends on the temperature difference between the measuring point and the connecting terminals. The resulting voltage is a function of temperature. As the temperature changes, the voltage changes. The thermocouple voltage is equal to the temperature function
Reference junctions	A reference junction is the cold junction in a thermocouple circuit which is held at a stable, known temperature. It is at the cold junction where dissimilar wire connections must be made. As long as the temperature of the cold junction is known, can factor in the reference temperature to calculate the actual temperature reading at the thermocouple.
standard reference temperature	The standard reference temperature is the ice point (0°C). The ice point can be precisely controlled and the National Bureau of Standards uses it as the fundamental reference for its voltage-to-temperature conversion tables. However, other known temperatures can be used.

Scanner Card architecture

Background

The GDM-SC1A incorporates a temperature sensor (TMP235) in the box, which combines a direct thermocouple measurement with a reference junction compensation using a temperature IC to effectively compensate the temperature for the cold junction to calculate the actual temperature reading of the thermocouple.





J10 is preset to CH1, please switch J10 to COLD COMPEN when cold junction compensation.

It is recommended to start with CH2 when wiring.

Software

Background

This software is suitable for the GDM-SC1A scanner card. This manual is to be used with all versions of Excel from 2007 onwards with Windows PCs (Windows XP, Windows 7/8/10: 32 bit or 64 bit). Please note that Macros must be enabled for the Add-In to function.

Installation

Up to three items need to be installed, the USB driver (not needed if using the RS232 interface), the SCAN Card Excel Addin Software and the NI VISA Run-Time.

Installing the USB driver

1. Connect the DMM to the PC using the supplied USB.
2. The Windows **Found New Hardware Wizard** will detect the DMM as a new device and ask for the device driver.

   Direct the Wizard to the **USB_DRIVER** directory on the User Manual CD, or download the USB driver from the GW Instek Website.

Installing the Excel Add-In

1. On the User Manual CD, go to the Excel Add-in subdirectory under the **Software** directory and execute the Setup.exe file.
2. If the Microsoft **User Account Control** Shield appears, allow the setup file to be executed.
3. Follow the InstallShield Wizard to install the SCAN Card Excel Addin.

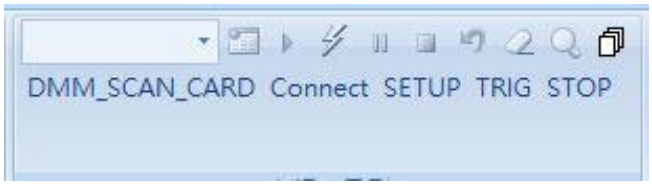
Installing the NI VISA Run-Time

1. The NI VISA Run-Time must be installed to use the Excel Add-in software. This is available on the NI website, http://www.ni.com/download/ni-visa-run-time-engine-5.4/4231/en/.
2. Please follow the instructions on the NI website for installation details.

SCAN operation

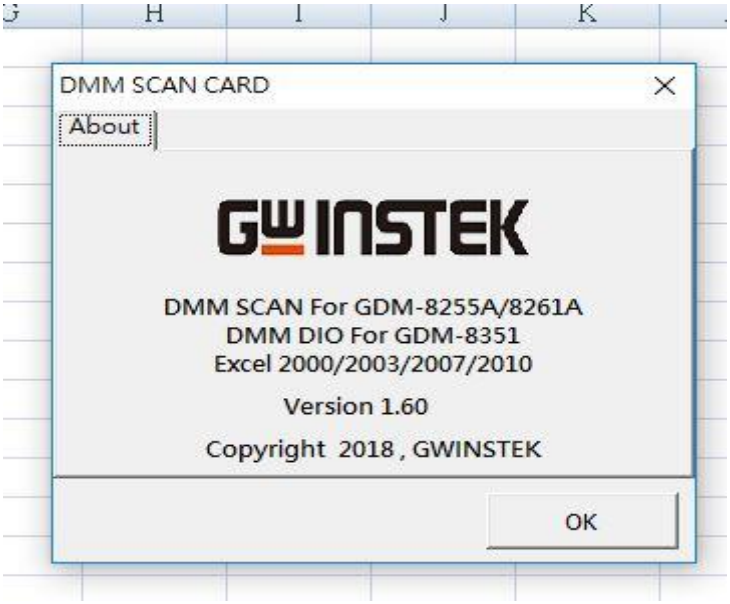
Run

1. Run DMM_SCAN_CARD software.
2. Enable office Excel macros.
3. The gain set will add a custom toolbar.



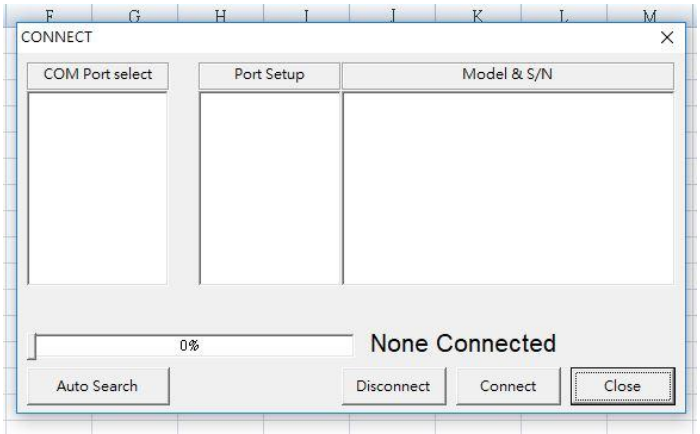
1. Press DMM_SCAN_CARD

About DMM SCAN CARD version information (GDM-SC1A requires DMM SCAN Version 1.60 or higher to provide COLD Junction function)

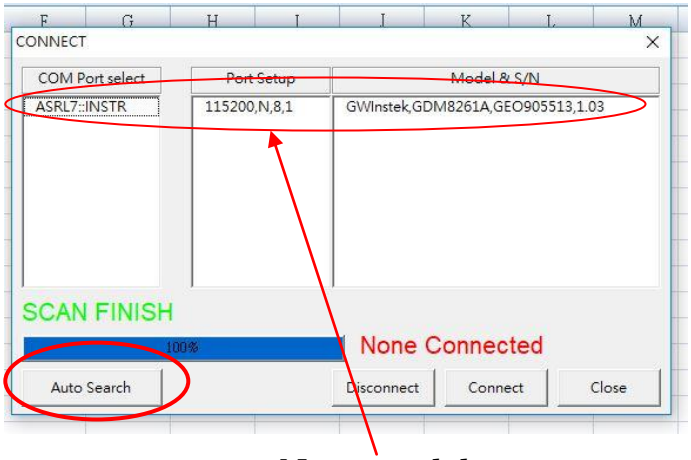


2. Press Connect

1. Show Connect UI

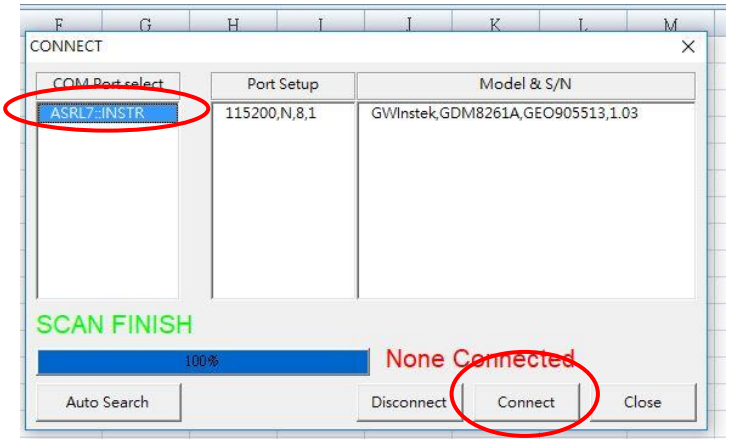


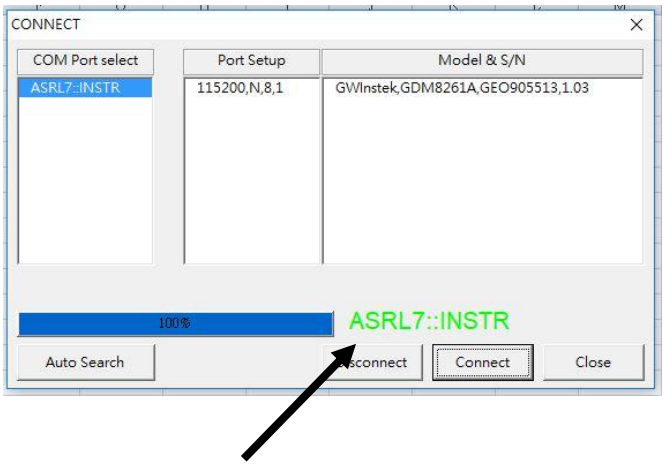
2.Press Auto Search to automatically find connected devices



ASRL7:INSTR 115200,N,8,1 model GWInstek, GDM8261A, GEO905513,1.03

3. Click COM Port select, press Connect to connect the device, press Disconnect to disconnect the device.

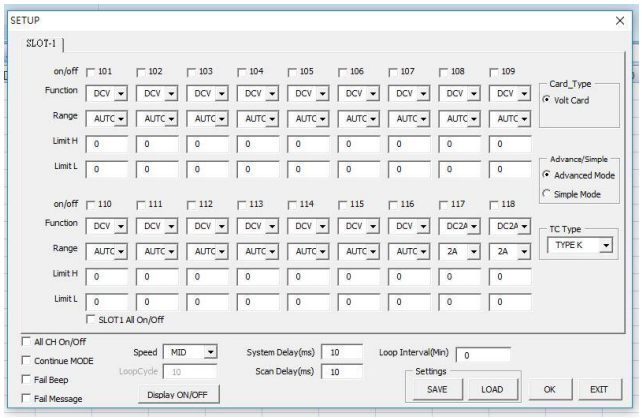




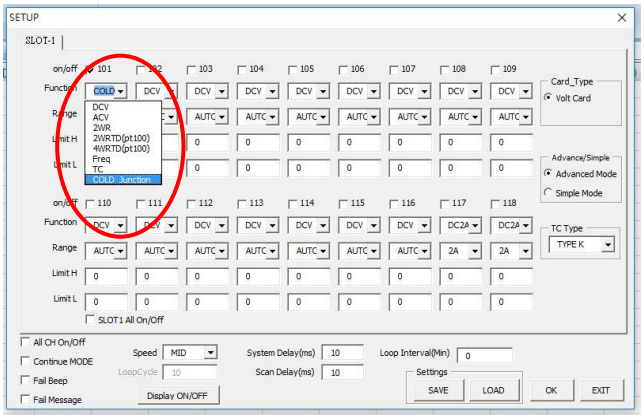
If the display is green, the connection is successful.

3. Press SETUP

1. Set measurement channel, Function, Range, Hi limit, Low limit, etc.



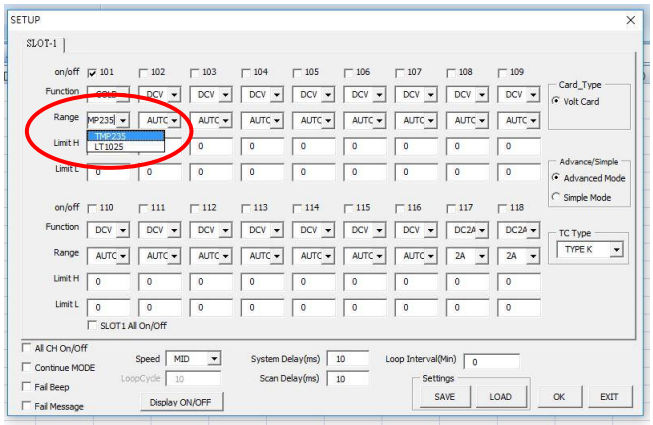
2. Cursor moved to ON/OFF ☐101 , Press ▽101
Cursor moved to Function, Press ▼



Select COLD Junction (Switch jumper 10 from CH1 to COLD Junction from Scanner Card).

3. Cursor moved to Range, Press ▼

GDM-SC1A use TMP235

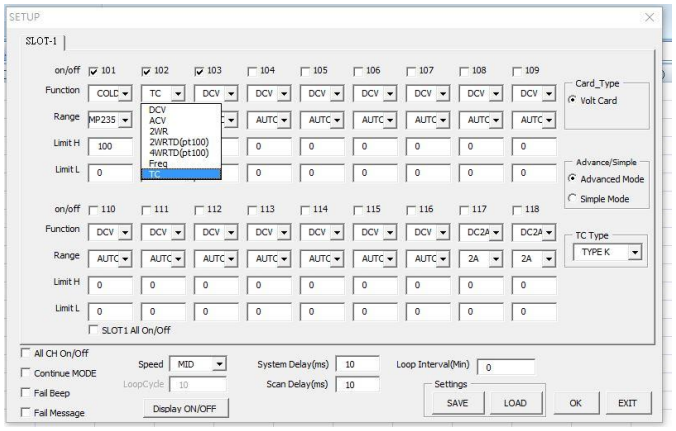


Set Hi / Low limit.

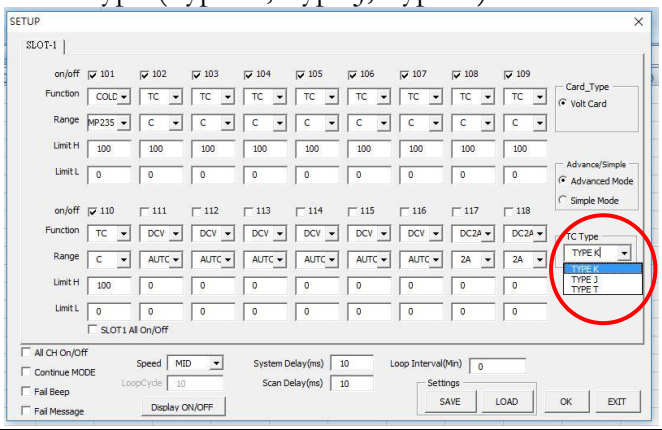
Note

When both Master and Slave scanner cards are being utilized by 8255A simultaneously, it is demanded to set CH1 as cold junction for both CH101 & CH201, and to initiate from CH2 for both CH102 & CH202 in terms of channels.

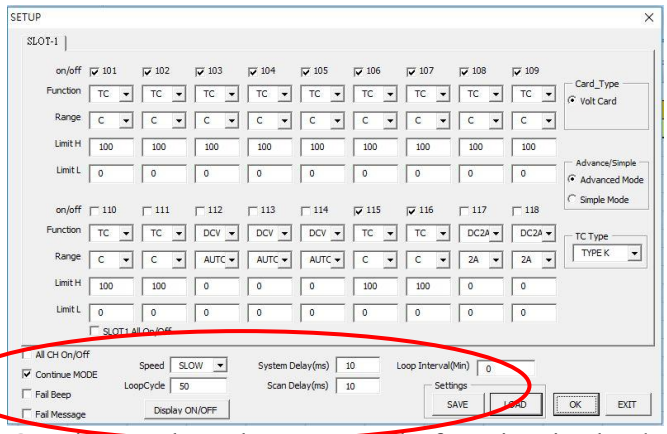
4. Set tick to measure other channels, and set the channel Function, Range, Hi limit, Low limit Low limit.



5. Set TC Type (Type K, Type J, Type T)



6. Set scan conditions



Continue When the LoopCyde function is checked, the number of scans can be set.

7. EXIT end setting

4. Press TRIG

Run scan

	A	B	C	D	E	F	G	H	I	J
1	TEST NO#	SCAN CH				CH101_C	CH102_T	CH103_T	CH104_T	CH105
2	50	11	PASS/NG	S/N	Limit H	100	100	100	100	1
3	NO#	TIME			Limit L	0	0	0	0	
4	1	##########	PASS			30.870	22.270	24.839	23.369	23.8
5	2	##########	PASS			30.880	30.144	32.687	31.253	31.7
6	3	##########	PASS			30.890	30.125	32.668	31.246	31.7
7	4	##########	PASS			30.880	30.108	32.643	31.251	31.7
8	5	##########	PASS			30.890	30.063	32.609	31.233	31.7
9	6	##########	PASS			30.900	30.066	32.604	31.246	31.7
10	7	##########	PASS			30.920	30.044	32.577	31.253	31.7
11	8	##########	PASS			30.920	30.039	32.572	31.259	31.7
12	9	##########	PASS			30.930	30.010	32.545	31.263	31.7
13	10	##########	PASS			30.930	29.992	32.528	31.264	31.7
14	11	##########	PASS			30.940	29.955	32.499	31.251	31.7
15	12	##########	PASS			30.960	29.926	32.474	31.249	31.7
16	13	##########	PASS			31.010	29.919	32.460	31.259	31.7

Note: The first pen is uncompensated when first executed, and the cold offset value is calculated after the second pen.

	A	B	C	D	E	F	G	H	I	J	K
1	TEST NO#	SCAN CH				CH101_T	CH102_T	CH103_T	CH104_T	CH105_T	CH106_
2	50	11	PASS/NG	S/N	Limit H	100	100	100	100	100	1
3	NO#	TIME			Limit L	0	0	0	0	0	
4	1	#########	NG		,CH101_	########	20.157	22.689	21.850	22.287	22.4
5	2	#########	NG		,CH101_	########	20.167	22.689	21.847	22.289	22.4
6	3	#########	NG		,CH101_	########	20.182	22.699	21.857	22.292	22.4
7	4	#########	NG		,CH101_	########	20.217	22.714	21.865	22.312	22.4
8	5	#########	NG		,CH101_	########	20.227	22.719	21.872	22.302	22.4
9	6	#########	NG		,CH101_	########	20.249	22.739	21.880	22.327	22.4
10	7	#########	NG		,CH101_	########	20.267	22.746	21.885	22.317	22.4
11	8	#########	NG		,CH101_	########	20.249	22.734	21.862	22.299	22.4
12	9	#########	NG		,CH101_	########	20.289	22.761	21.894	22.329	22.4
13	10	#########	NG		,CH101_	########	20.269	22.756	21.882	22.317	22.4

When CH1 is not set as cold junction, the CHs of the other channels remain the original simulation temperature without any alteration.