

Scanner Card

GDM-SC1

INSTALLATION GUIDE

GW INSTEK PART NO. 82DM-SC100ED1



ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

December 2013

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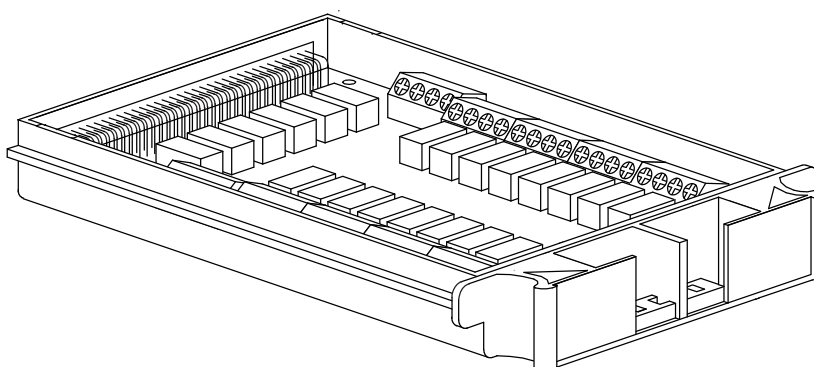
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S CANNER CARD

The optional scanner, GDM-SC1, lets you effectively measure multiple channels when connected to a GDM-8255A, GDM-8261 or GDM-8261A multimeter. Up to two GDM-SC1 scanner cards can be installed into the GDM-8255A or one GDM-SC1 into the GDM-8261 or GDM-8261A. If two scanner cards are installed, one can be selected as the master scanner (channel 1), and the other as the slave (channel 2).



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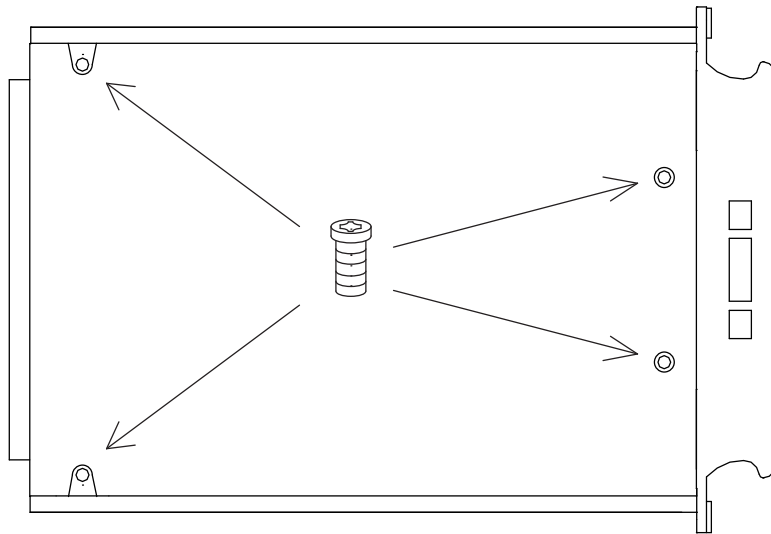
GDM-SC1 Basic Specifications

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	N/A (internal)
Maximum voltage	250V	Connection	Screw terminal

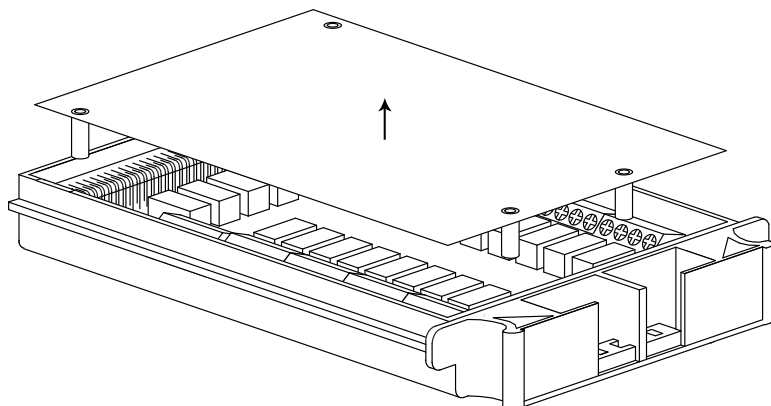
Scanner Installation

Configure scanner

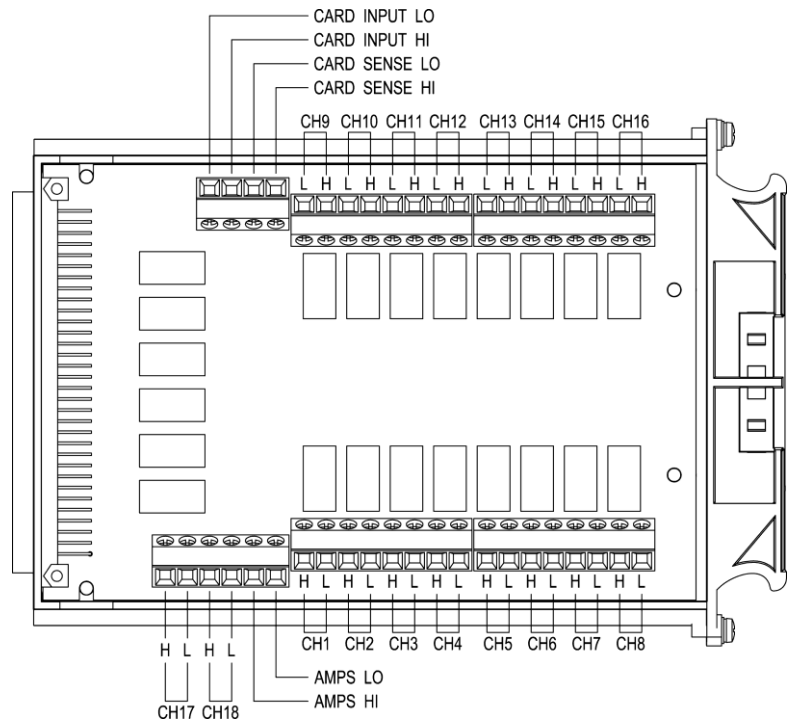
- Open Scanner cover
1. Take off four screws from the bottom panel of the scanner.



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 the GDM-8255A.

Item	No. of wires	No. of channels
DCV, ACV	2 wires (H, L)	16 (CH1 ~ 16)
DCI, ACI	2 wires (H, L)	2 (CH17, 18) (10A range only)
2W Resistance	2 wires (H, L)	16 (CH1 ~ 16)
4W Resistance	4 wires (Input H, L + Sense H, L)	8 pairs (CH1 [input]& 9[sense], 2&10,...,8&16)
Diode/Continuity	2 wires (H, L)	16 (CH1 ~ 16)
Period/Frequency	2 wires (H, L)	16 (CH1 ~ 16)
Temp. (Thermocouple)	2 wires (H, L)	16 (CH1 ~ 16)

Temp. 2W RTD	2 wires (H, L)	16 (CH1 ~ 16)
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).

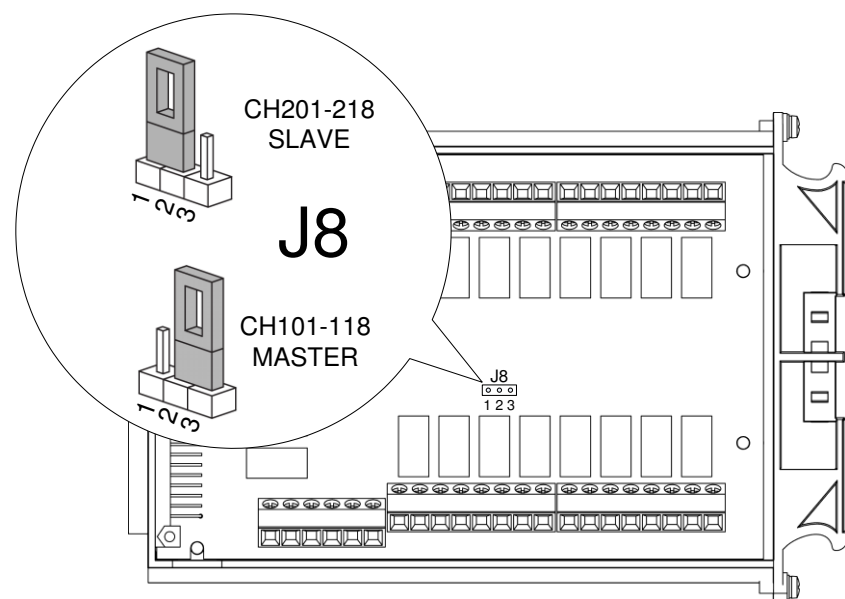
The GDM-8255A can have up to 2 scanner modules installed, whilst the GDM-8261/GDM-8261A can have only 1 scanner module installed.

Group1	CH101 ~ 118
--------	-------------

Group2	CH201 ~ 218
--------	-------------

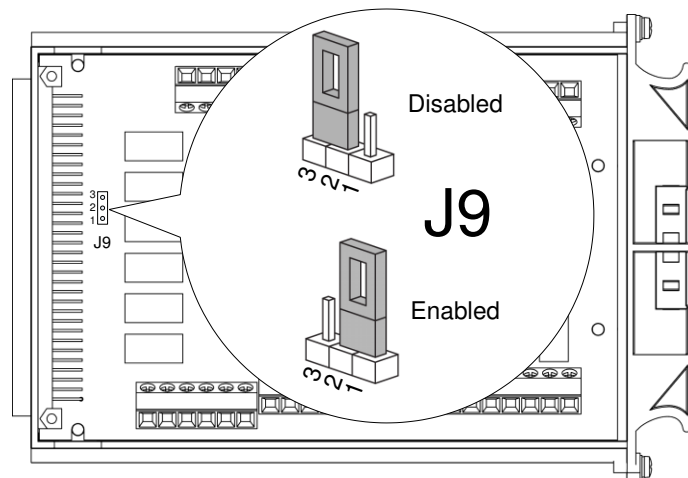
Select group (Jumper J8)

Set the jumper J8 in the center of the board accordingly. Move the jumper to the right (pins 2-3) for selecting CH1xx (101 ~ 118), and move to the left (pins 1-2) 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)

Set the jumper J9 on the rear side of the board accordingly. Move the jumper up (pins 3-2) to disable the scanner, and down (pins 2-1) to enable the scanner.



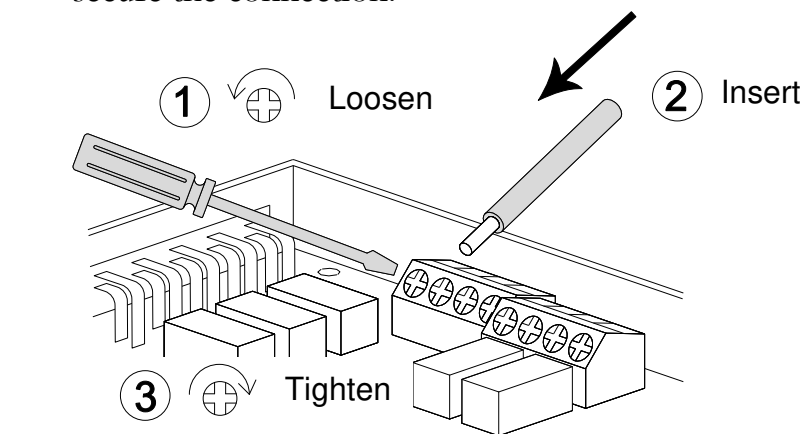
Connect wire

Wire selection

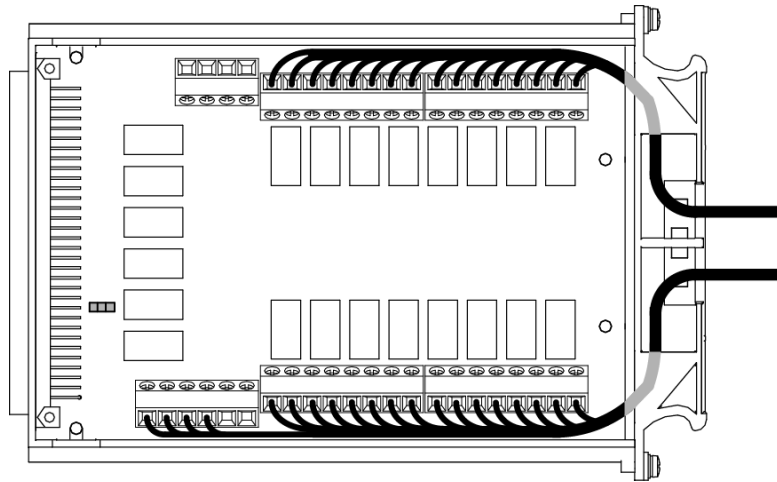
Make sure the wires have at least the same Voltage and Current capacity as the maximum ratings in the measurement.

Connection

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

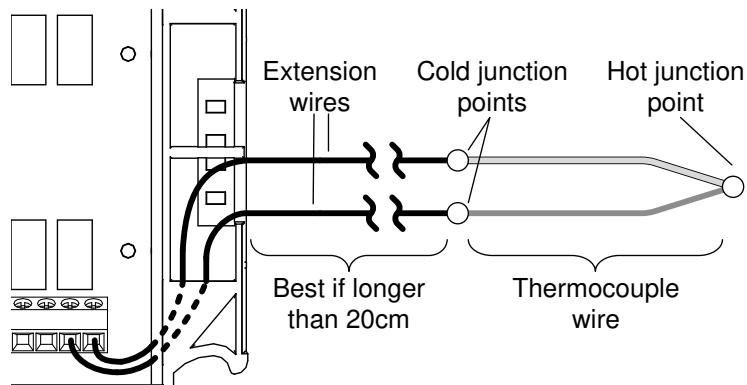


2. Route the wires as follows, using the two openings (left and right) at the front cover.

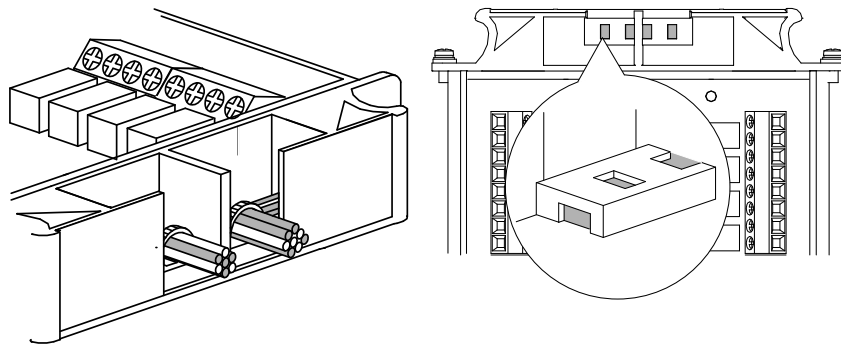


Note

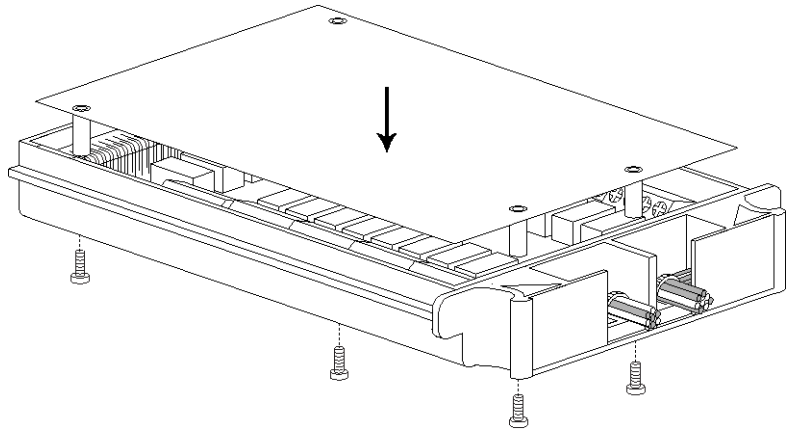
When using thermocouple wiring, please use extension wires so that the cold junction points are external to the scanner card. Connecting thermocouple wiring directly to the scanner box is not recommended due to the radiant heat from the internal components.



3. Bundle the wires at the front cover using the holes at the bottom.



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



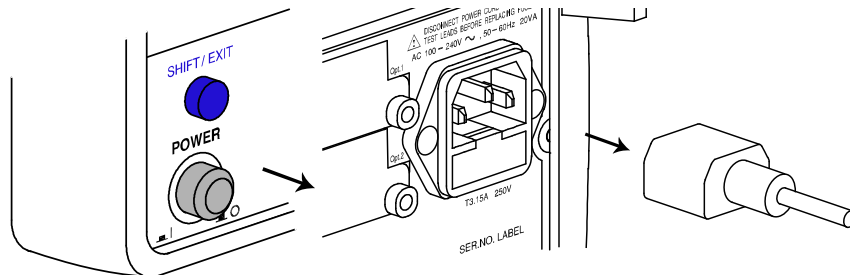
Configuration
Record

Print out the configuration record list on page12, fill in the details, and keep it with the DMM.

Insert scanner

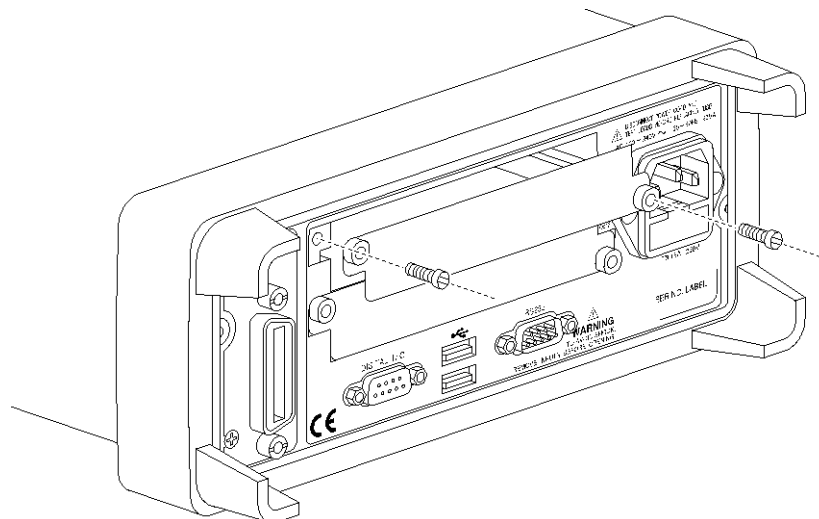
Power Off

Turn the Power Off and take out the power cord.



Open the rear panel slot

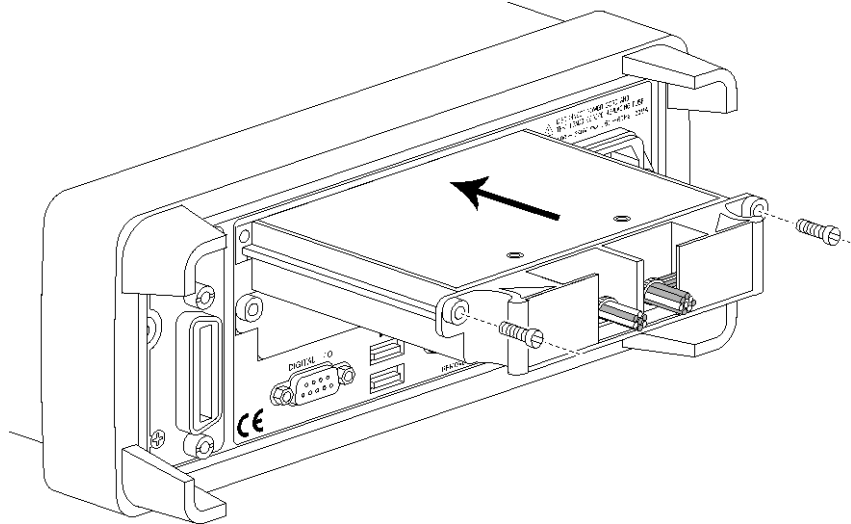
Take out the two screws on the slot corners to remove the optional slot cover. Keep the screws for later reuse.



GDM-8255A shown

Insert the scanner

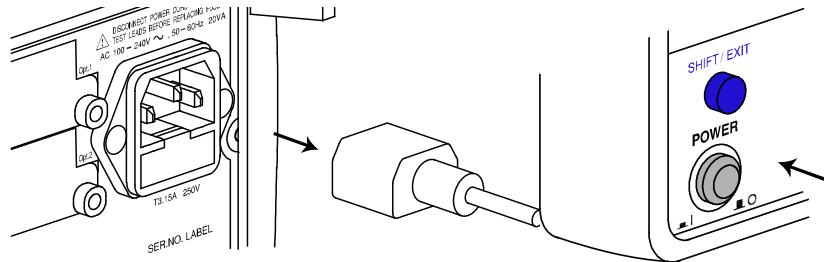
Insert the scanner (already configured according to the procedures on page 4) to either the top or bottom slot (GDM-8261/GDM-8261A only has 1 slot). Close the cover by tightening the screws.



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	Simulated
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 Environment	Ambient Temperature -10°C ~70°C 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)			Comments
	S	M	F	
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	
Frequency	0.45	2.04	4.31 (8261) 2.99 (8261A)	Gate Time=10ms

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



Note

- The signal being measured must be:
 - $\geq 0.1V$ rms when its frequency is lower than 100kHz
 - $\geq 1V$ rms when its frequency is lower than 600kHz
 - $\geq 2.5V$ 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-SC1 Scanner card though it is in fact used in the 1000.00V range.
- Maximum Input: 250V DC or Peak on all ranges

Rate	Range	Resolution	Full Scale	Accuracy \pm (% of reading + digits)
Slow	100.000mV	1uV	199.999mV	0.015%+10
	1.00000V	10uV	1.99999V	0.015%+7
	10.0000V	100uV	19.9999V	0.015%+7
	100.000V	1mV	199.999V	0.015%+7
	250.00V*	10mV	250.00V*	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	Full Scale	Accuracy \pm (% of reading + digits)
Slow	100.000Ω	199.999Ω	0.125%+10*
	1.00000kΩ	1.99999kΩ	0.1%+7*
	10.0000kΩ	19.9999kΩ	0.075%+7*
	100.000kΩ	199.999kΩ	0.075%+7
	1.00000MΩ	1.99999MΩ	0.075%+7
	10.0000MΩ	19.9999MΩ	0.375%+7
	100.000MΩ	199.999MΩ	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	Full Scale	Accuracy \pm (% of reading + digits)
Slow	100.000Ω	199.999Ω	0.0625%+10*
	1.00000kΩ	1.99999kΩ	0.0625%+7*
	10.0000kΩ	19.9999kΩ	0.0625%+7*
	100.000kΩ	199.999kΩ	0.0625%+7
	1.00000MΩ	1.99999MΩ	0.0625%+7
	10.0000MΩ	19.9999MΩ	0.375%+7
	100.000MΩ	199.999MΩ	3.75%+10

DC Current



Note

- When GDM-SC1 scanner card is used, 1A & 10A ranges are protected with a **3A** fuse
- Current ranges smaller than 1A are not selectable when GDM-SC1 scanner card is used.

Rate	Range	Resolution	Full Scale	Accuracy $\pm(\% \text{ of reading} + \text{digits})$
Slow	1.0000A	100uA	1.9999A	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-SC1 Scanner card even though it is used in the 750.00V range.**

Rate	Range	Resolution	Full Scale		
Slow	100.000mV	1uV	199.999mV		
	1.00000V	10uV	1.99999V		
	10.0000V	100uV	19.9999V		
	100.000V	1mV	199.999V		
	250.00V(*)	10mV	250.00V		
Rate	Range	Accuracy (reading%+digits)			
Slow		20~45Hz	45~10kHz	10k~30kHz	30k~100kHz
	100.000mV	1.25%+125	0.25%+125	1.875%+375	6.25%+375
	1.00000V	1.25%+125	0.25%+125	1.25%+125	3.75%+250
	10.0000V	1.25%+125	0.25%+125	1.25%+125	3.75%+250
	100.000V	1.25%+125	0.25%+125	1.25%+125	3.75%+250
	250.00V(*)	1.25%+125	0.25%+125	1.25%+125	3.75%+250

AC Current



Note

- The following specifications are only applicable for sinusoidal signals with amplitude greater than 5% of the Full Scale reading
- 1A & 10A ranges protected with a **3A** fuse
- 1A/10A range specifications are verified for < 5kHz

Rate	Range	Resolution	Full Scale	20~50Hz	50Hz~10kHz	10kHz~20kHz
S	1.0000A	100uA	1.9999A	--	1.25%+125	--

AC Frequency



Note

- Maximum Input: 250Vrms or 330V peak.

Rate	Sensitivity	10Hz~100kHz	100k~600kHz	600k~800kHz
	2.5V	0.0625%+19	0.0625%+4	0.0625%+4
Slow	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, 0.5mA
Continuity	1 ~ 1000Ω

Temperature



Note

- Sensor errors excluded from Temperature specifications

Thermocouple	Measurement Range
K	0 ~ +300°C
T	0 ~ +300°C
J	0 ~ +300°C
Resolution	0.01°C