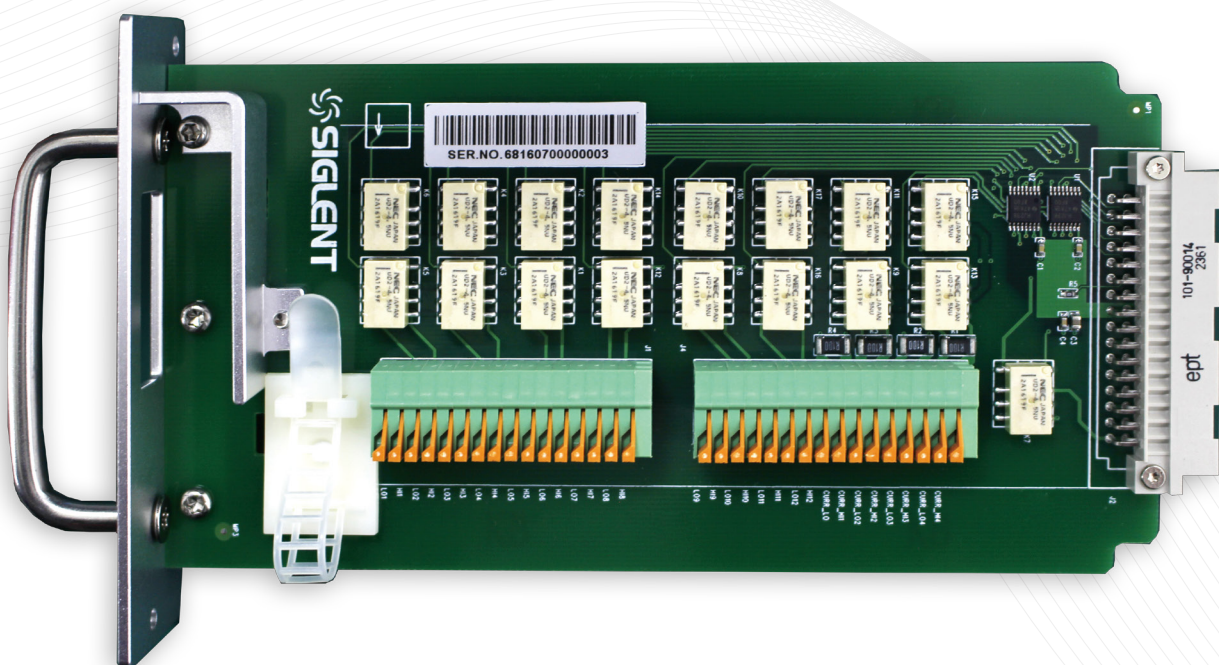


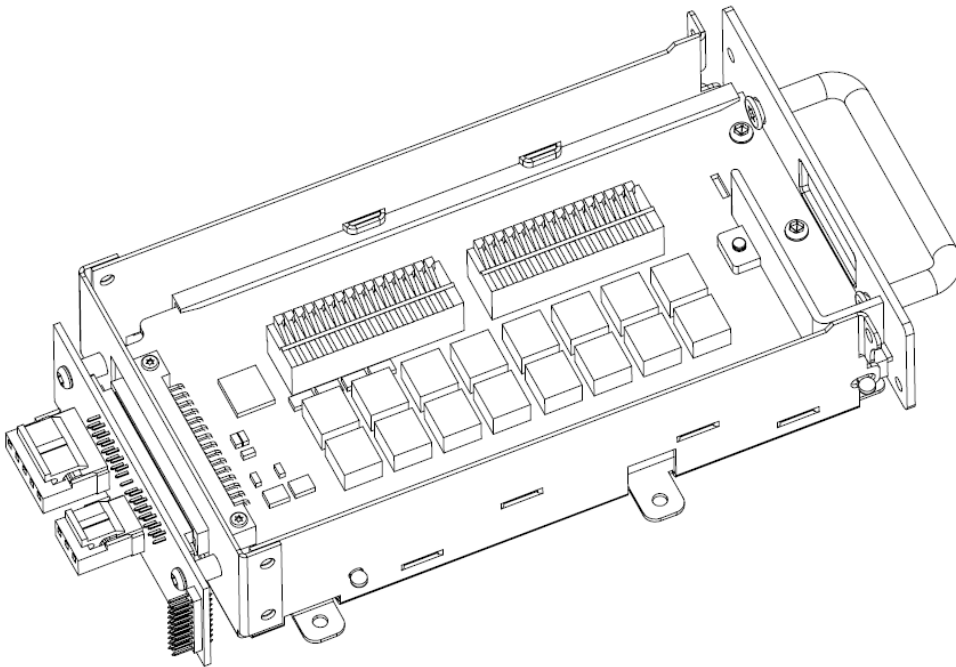
# Scanner Card SC1016 User's Guide



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## Product Overview

The SIGLENT Scanner Card SC1016 is a multiplexer that provides multi-point measurement capabilities to the SDM3000 series of digital multimeters. The scanner features 12 multi-purpose + 4 current channels and supports the following measurement functions: DCV, ACV, DCI, ACI, 2WR, 4WR, CAP, FREQ, DIODE, CONT and TEMP (RTD and Thermocouple). It provides a convenient and versatile solution for test applications that require multiple measurement points or signals and is an ideal tool for R&D burn-in and production testing.



## Safety

SIGLENT thanks you for purchasing the Scanner Card SC1016 module. To achieve the best performance from the product, please read this guide carefully. To avoid electrical shock and personal injury, please don't use the product to measure signals that exceed the published specification.

## Specifications

Max AC Voltage	125V rms or 175V peak, 100kHz,
	0.3 A switched, 125VA (resistive load)
Maximum DC Voltage	110V, 1A switched, 30VDC (resistive load)
Contact Life	> 100000 operations, at 1A 30VDC(at 0.5 Hz)
	> 100000 operations, at 0.3A 125VDC (at 0.5 Hz)
Contact Resistance	75 mΩ (maximum at 6VDC, 1A)
Actuation Time	5ms maximum on/off
Maximum switching voltage	250 VAC, 220 VDC
Maximum switching power	62.5VA / 30W
Insulation Resistance	Minimum 1 GΩ (500VDC)
Connector Type	Clamp terminal, #24 AWG wire size

Prevention: To avoid breaking the product, please do not pull it away from multimeter when measurement is executed.

## Channel Capabilities

Item	No. of wires	No. of channels
DCV, ACV <sup>[1]</sup>	2 wires (H, L)	12 (CH1~CH12)
DCI, ACI <sup>[2]</sup>	2 wires (H, L)	4 (CH13~CH16) 2A Range Only
2W Resistance	2 wires (H, L)	12 (CH1~CH12)
4W Resistance	4 wires (Input H, L + sense H, L)	6 pairs (CH1 [input] & CH7 [sense], 2&8, ●●●, 6&12)
Capacitance	2 wires (H, L)	12 (CH1~CH12)
Diode/Continuity	2 wires (H, L)	12 (CH1~CH12)
Period/Frequency	2 wires (H, L)	12 (CH1~CH12)
Temp(Thermocouple)	2 wires (H, L)	12 (CH1~CH12)
Temp (RTD)	2 wires (H, L)	12 (CH1~CH12)

Remarks:

[1]Voltage range : <125VAC, 110VDC

[2] For continuous current < 2.2A, Accuracy ± (% 3 (reading) + 0.02% (range)).

## Steps

### 1. Operations

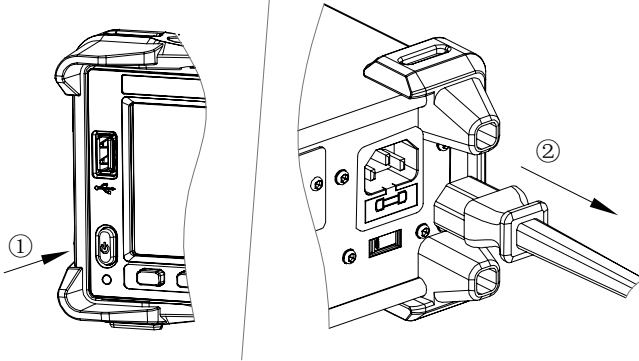
#### WARNING

The SC1016 module a factory installed option. It cannot be added after purchase. Please order the option when purchasing an SDM3055 or SDM3065X.

It is not designed to be "hot swappable". Remove power from all inputs and turn the instrument power off before installation or removal of the SC1016 Card Hot swapping the card could cause damage and is not covered under the warranty.

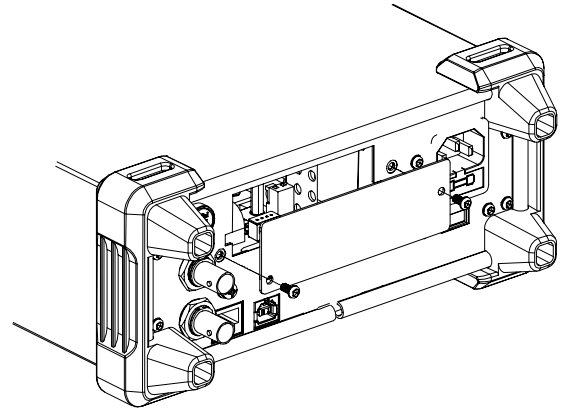
#### 1. Power Off

Turn the Power Off and take out the power cord



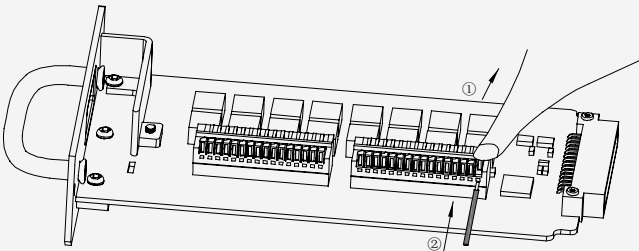
#### 2. Open the SDM rear panel slot

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



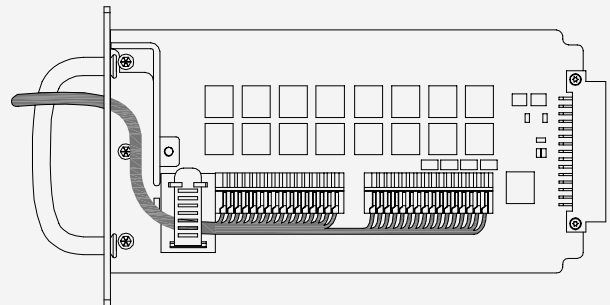
#### 3. Connection

Turn the clamp and insert the wire.



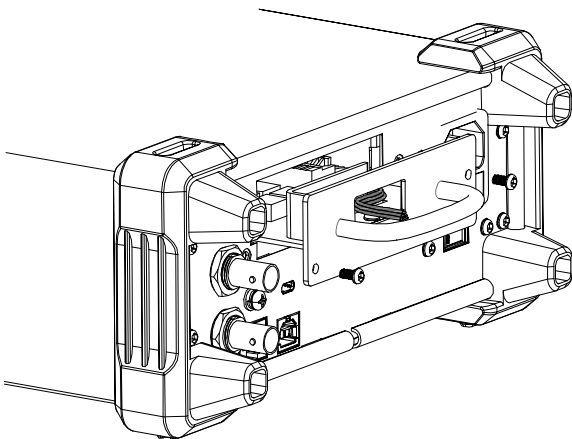
#### 4. Tighten cable

Route wiring through strain relief and Cable tie wrap



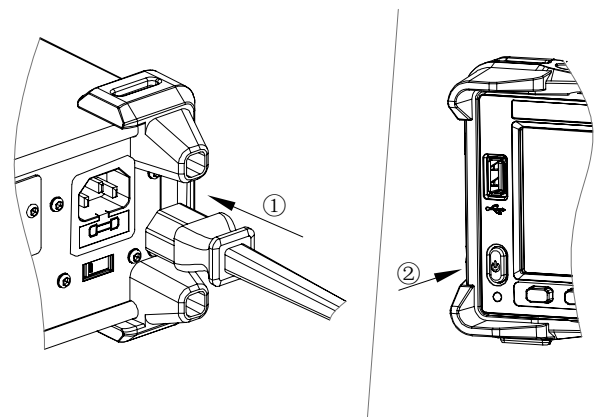
#### 5. Insert the SC1016

Insert the SC1016 bottom-side-up. Close the cover by tightening the screws.



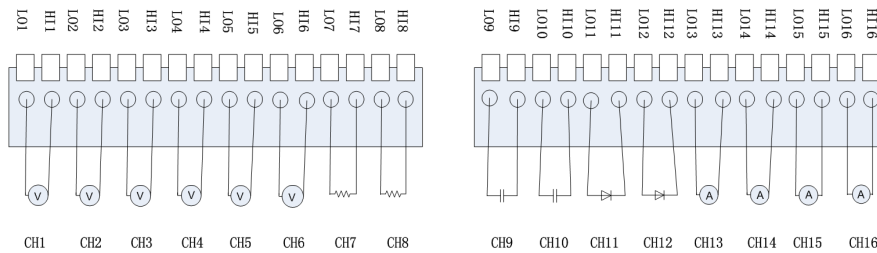
#### 6. Power On

Connect the power cord and turn On the power



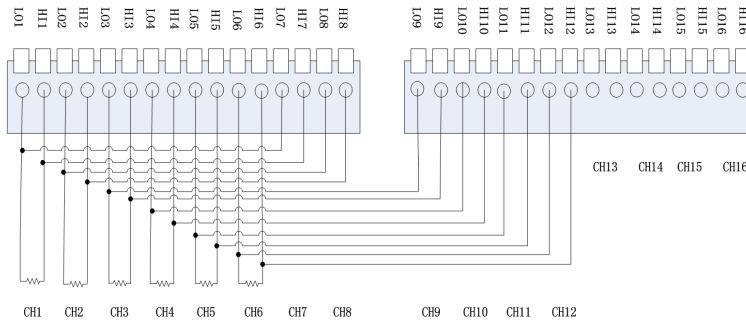
## 2. Application of 16 Channels

(1) 2-Wired Application<sup>[1]</sup>(DCV/ DCI/ ACV/ ACI 2WR/ 4WR/ CAP/ FREQ/ DIODE/ CONT / TEMP)



Remarks: [1] CH1 to CH12 can be used to measure DCV /ACV/ 2WR/ 4WR/ CAP/ FREQ/ DIODE/ CONT / TEMP. CH13 to CH16 can only be used for current measurements, less-than < 2.2A

(2) 4-Wire Resistance Applications<sup>[1]</sup>



Remarks: [1] To minimize voltage errors, the remote sense connections (CH7,CH8 etc..) should be made as close to the device-under-test (DUT) as possible.

## 3. Front Panel operations

Press **Shift** and **Temp** to enter the operating menu of Utility function, as the following diagram shows.

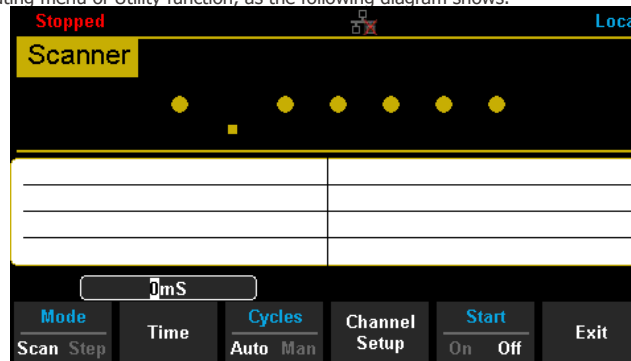


Table 1. Scanner Function Menu Description

Function Menu	Settings	Description
Mode	Scan/Step	Set the operation mode
Time	0ms~999.999s	Sets the duration between each scan loop (Scan mode) or between each scanned channel (Step mode)
Cycles	Auto/Man	Sets the number of scan operations
Channel Setup		Sets the scanned channel range, measurement function, and measurement parameters
Start	On/Off	Start or stop scan operation
Exit		Exit the scanner function

### 1. Operation mode setup

- Scan: Measures all specified channel ranges (Channel MIN~MAX) for each trigger event. Time settings are applied between each scan for the whole channel range.
- Step: Measures a single channel in the specified range (Channel MIN~MAX) at each trigger event. Time settings are applied for each channel.

### 2. Time setup

Use the direction keys to set the duration between each scan loop (Scan mode) or between each scanned channel (Step mode)

### 3. Cycles

•Auto: The instrument will scan specified channel circularly after the scan operation start and you should stop the operation manually.

•Manual: Sets the number of scan operations by direction keys. The range of the setting is from 1 to 999. After starting the scan operation the instrument will not stop scanning until reaches cycle number.

#### 4.Channel setup

Press the [Channel Setup] to enter the setup interface.

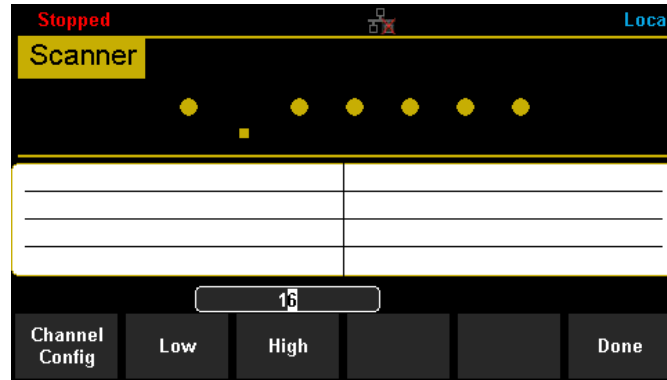


Table 2. Scanner Function Menu Description

Function Menu	Description
Channel Config	Open/close the channel and set the measurement function, measurement parameters of specified channel.
Low	Set the low value of scanned channel range.
High	Set the high value of scanned channel range.

Press the [Channel Setup] to enter the channel configuration interface and set the channel switch, function, range and speed..

Scanner Channel Configure :				
Channel	Switch	Function	Range	Speed
1	Open	DCV	Auto	Slow
2	Open	DCV	Auto	Slow
3	Open	DCV	Auto	Slow
4	Open	DCV	Auto	Slow
5	Open	DCV	Auto	Slow
6	Open	DCV	Auto	Slow
7	Open	DCV	Auto	Slow

The range setting is applicable for the following functions: DC/AC Voltage (DCV/ACV), 2/4 Wire Resistance (2W/4W), Capacitance (CAP), Frequency (FRQ).

Table 3. Available Range for different measurement function

Measurement Function	Available Range
DCV/ACV/ FRQ	Auto, 200mV, 2V, 20V, 200V
DCI/ACI	2A (fixed)
2W/4W	Auto, 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ(1MΩ for SDM3065X), 10MΩ, 100MΩ
CAP	Auto, 2nF, 20nF, 200nF, 2μF, 20μF, 200μF, 10000μF (2mF, 20mF, 100mF for SDM3065X)

The scanner function provides two measurement speeds: Fast (50 reading/s) and Slow (5 reading/s). (Fast: 1PLC, Slow: 10 PLC for SDM3065X)

The speed setting is applicable for the following functions: DC/AC Voltage (DCV/ACV), 2/4 Wire Resistance (2W/4W)

#### Operating instructions:

- Move the cursor to choose the wanted parameter by direction keys and the background color of cursor's position turns to gray.
- Select the current item by pressing "OK" key and the background color of the selected item turns to green.
- Set the parameter by up and down direction keys.
- Press "OK" key again to store the setting of the selected item of which the background turns back to gray. Move the cursor and repeat the prior steps to set the next parameter.
- Press [Done] to save the current settings and return to the higher level menu.

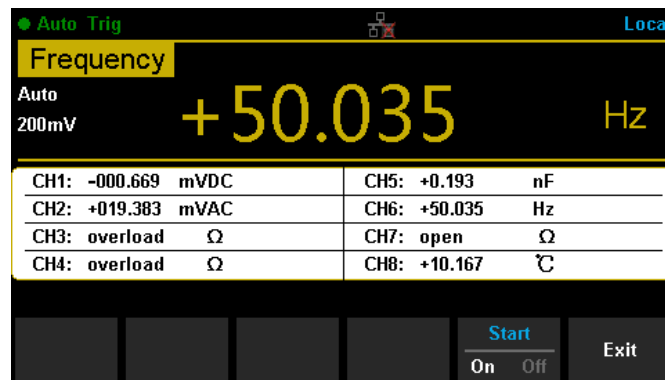
#### 5.Channel range setting

Select [High] or [Low] and then input numerical value by direction keys.

Note: The upper limit value should be always bigger than the lower limit value.

### 6.Start scan operation

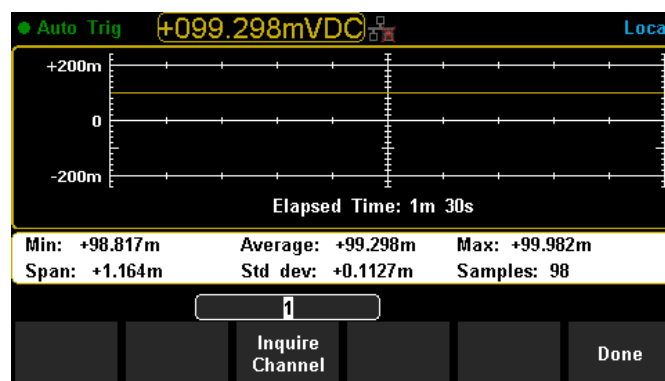
Set the [Start] to on to start the scan operation



The upper part of the interface displays the function, range, and result of the current channel. The table below records the measurement result of each channel.

### 7.Enter trend chart and statistics mode (optional operation)

Press **Shift** and **Math** to open trend chart and statistics function.



Set the [Inquire Channel] by direction keys and the interface displays the minimum, average, maximum, span, standard deviation, samples and trend chart of measurement results of the setting channel during the scan operation.

Press [Done] to return to higher level menu.

### 8.Stop scan operation

Set the [Start] to off to stop the scan operation.

If the [Cycles] is set to manual, then the instrument will stop scan when it reaches the cycle number

### 9.Store measurement data (optional operation)

Press **Shift** and **Dual**, then Select [Store/Recall] → [Store Settings] to enter the storage function interface.

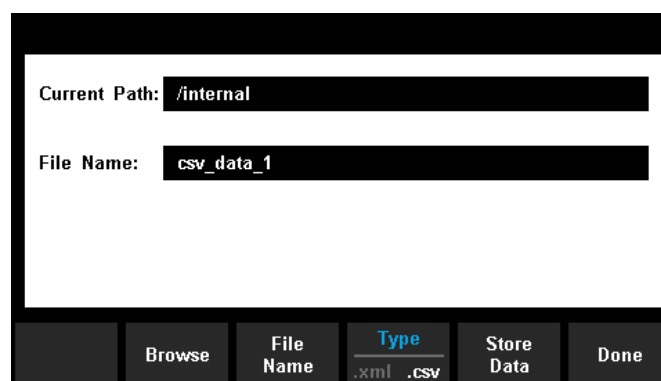


Table 4. Storage Function Menu Description

Function Menu	Settings	Description
Browse		Choose the location that file will be saved.
File Name		Input a file name.
Type	.xml / .csv	Choose the type that the file is saved. .xml: configuration of scan function .csv: measurement data
Store Data		Save the file with the file name input to the current selected location.
Done		Return to the higher level menu.

## Remote operations

The SDM3000 series can be controlled remotely by using the SIGLENT EasyDMM software. It allows users to easily select the measurement function and range for each channel and start acquiring measurement data. With a rich online help system, the user is able to create a virtual instrument on the PC for data collection and instrument control. During the scanning period, the measurement data can be viewed directly on the screen or viewed graphically using trend chart, bar and histogram graph types. The data can then be automatically or manually saved to a database or exported as a CSV files

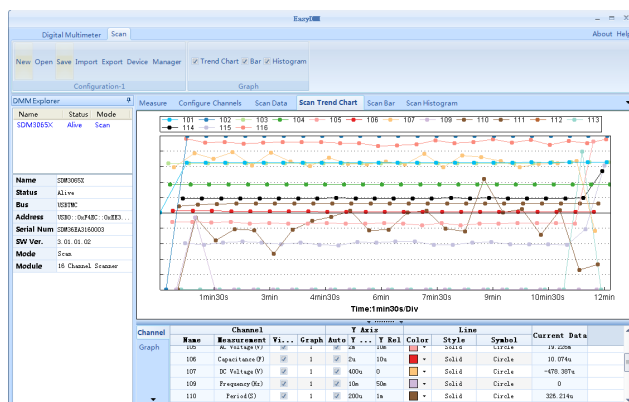
## Channel Configuration

Name	Status	Mode	Instrument	Channel	Measurement	Range	Speed	Range	Gain	Offset	Alarm Limit
SDM3000	Alive	Scan	SDM3000	101	Temperature	Auto	2500	1	0	0	0
SDM3002	Alive	Scan	SDM3002	102	4 Wire Resistance	Auto	2500	1	0	0	0
SDM3003	Alive	Scan	SDM3003	103	Temperature	Auto	2500	1	0	0	0
SDM3004	Alive	Scan	SDM3004	104	2 Wire Resistance	Auto	2500	1	0	0	0
SDM3005	Alive	Scan	SDM3005	105	AC Voltage	Auto	2500	1	0	0	0
SDM3006	Alive	Scan	SDM3006	106	Capacitance	Auto	2500	1	0	0	0
SDM3007	Alive	Scan	SDM3007	107	DC Voltage	Auto	2500	1	0	0	0
SDM3008	Alive	Scan	SDM3008	108	4 Wire Resistance	Auto	2500	1	0	0	0
SDM3009	Alive	Scan	SDM3009	109	Frequency	Auto	2500	1	0	0	0
SDM3010	Alive	Scan	SDM3010	110	Period	Auto	2500	1	0	0	0
SDM3011	Alive	Scan	SDM3011	111	Continuity	Auto	2500	1	0	0	0
SDM3012	Alive	Scan	SDM3012	112	Diode	Auto	2500	1	0	0	0
SDM3013	Alive	Scan	SDM3013	113	AC Current	2A	2500	1	0	0	0
SDM3014	Alive	Scan	SDM3014	114	DC Current	2A	2500	1	0	0	0
SDM3015	Alive	Scan	SDM3015	115	AC Current	2A	2500	1	0	0	0
SDM3016	Alive	Scan	SDM3016	116	DC Current	2A	2500	1	0	0	0

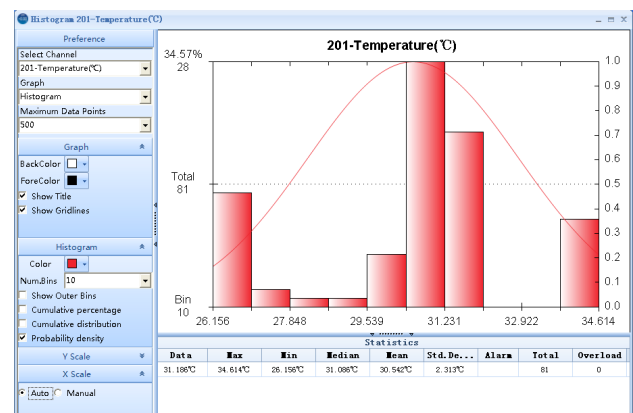
## Data Acquisition

Instrument	Channel	Measurement	Data	Min	Max	Average	Total	Alarm
SDM3002	102	Temperature(°C)	0.97%	0.97%	0.97%	0.97%	1	
SDM3005	105	4 Wire Resist...	0	0	0	0	1	
SDM3002	102	Temperature(°C)	31.988	31.988	31.988	31.988	1	
SDM3004	104	2 Wire Resist...	6.804k	6.804k	6.804k	6.804k	1	
SDM3005	105	AC Voltage(V)	0.707k	0.707k	0.707k	0.707k	1	
SDM3006	106	Capacitance(F)	33.204k	33.204k	33.204k	33.204k	1	
SDM3007	107	DC Voltage(V)	1.10k	1.10k	1.10k	1.10k	1	
SDM3009	109	Frequency(Hz)	0	0	0	0	1	
SDM3010	110	Period(s)	1.917k	1.917k	1.917k	1.917k	53	
SDM3011	111	Continuity(C)	0.924k	0.924k	0.924k	0.924k	53	
SDM3012	112	Diode(V)	1.105k	1.105k	1.105k	1.105k	53	
SDM3013	113	AC Current(A)	96.858k	96.811k	100.732k	94.100k	53	
SDM3014	114	DC Current(A)	90.599k	97.917k	96.895k	97.879k	53	
SDM3015	115	AC Current(A)	90.802k	97.923k	95.665k	97.879k	53	
SDM3016	116	DC Current(A)	89.705k	96.725k	95.962k	97.402k	53	

## Trend Chart



## Histogram



The latest version of EasyDMM can be downloaded for free from the SDM3000 series of digital multimeter. Take a look at [www.siglent.com](http://www.siglent.com) for more information.



# Scanner Card SC1016 User's Guide



## About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, function/arbitrary waveform generators, digital multimeters, DC power supplies, spectrum analyzers, isolated handheld oscilloscopes and other general purpose test instrumentation. Since its first oscilloscope, the ADS7000 series, was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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