



# T1000

Multi - Function Tester



**DATA  
SHEET**

# T1000

Multi - Function Tester



Date (yyyy/mm/dd)	Version	Author	Company	Comment
2024/03/06	V1.0	Nicky	Aether-Tek	Initial Draft
2024/03/14	V1.1	Nicky	Aether-Tek	Detail Mechanical and Electrical Spec. Correct Typos.



## 1. Hardware Features of the T1000

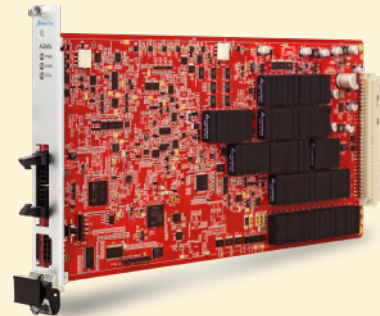
- Built - in MDA system
  - Open / Short Test
  - Clamping Diode Scan
  - Resistor / Capacitor / Inductor / Diode Test
  - Transistor / MOSFET Test
  - TestJet
- Common - Ground DC Voltage Measurement
- Frequency Measurement
- Programmable DC Power Supply Unit
- General Purpose I / Os
- Digital Communication Bus (Master : T1000 Tester, Slave : DUT)
  - SPI
  - I2C
  - UART
  - CAN
  - MIPI
- Tester Communication Interface
  - Ethernet
  - USB
- Support Fixture Control
  - 24V / 5V Power Supply
  - Press Type
  - In - Line / Automation Interface
- Customized Application Design
  - Isolated Potentiometer
  - Isolated DC / AC Voltage Measurement
  - Switches (General Purpose Relays)
- Operating System : Windows10 64 - bit
- Standard 6U, 19 - Inch Rack Mount Case



## 2. Standard T1000 Modules

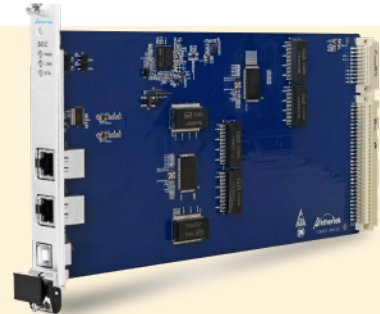
### Analog Source Measurement Unit (ASMU)

- MDA Kernel
- DC Voltage Source
- DC Current Source
- AC Voltage Source
- Voltage Measurement
- ADC



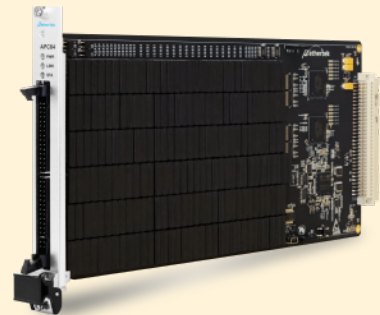
### System Control Card (SCC)

- System Control Card (SCC)
- Built - in Ethernet Switch
- System Communication Interface
- Backplane Traffic Control



### Analog Pin Card 64 - Channel (APC64)

- Reed Relays Base Design
- 6 - wire Measurement Connection
- Primary Bus (Force : MP, Sense : MS)
- Secondary Bus (Force : SP, Sense : SS)
- Guarding Bus (Force : GP, Sense : GS)
- Support Maximum Nodes : 1024



### Extended Application Card (EAC)

- Fixture Control
- General Purpose I / Os
- Frequency Measurement
- 24 V / 5 V Power Supply
- 1 - Programmable Power Supply
  - Max. Power 30 W
  - I<sub>max</sub> 5 A
  - Voltage Output 1.5 V~20 V
- OCP / OVP







### Digital Communication Board (DCB)

- Digital Communication Bus (Master)
  - SPI
  - I2C
  - UART
  - CAN
  - MIPI
- General Purpose I / Os
- 5 V / 3.3 V Power Supply



### Power Supply Unit (PSU)

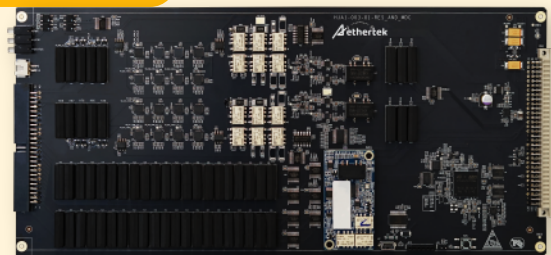
- 4-CH Programmable Power Supply
  - Max. 30W per Channel
  - I<sub>max</sub> 3 A
  - Voltage Output 1.5 V~20 V
  - OCP / OVP



## 3. Customized T1000 Modules

### Simulated Resistor and Measure DC Card (RES and MDC)

- 12 - CH Isolated DC measurement
  - Max. Input + / - 50 V
- 2 - CH Isolated Potentiometer
  - Max. Input + / - 10 V
  - Range : 10 ohm ~ 350K ohm
  - Per step : 10 ohm



### AC Load and Measure AC Card (AC Load and MAC)

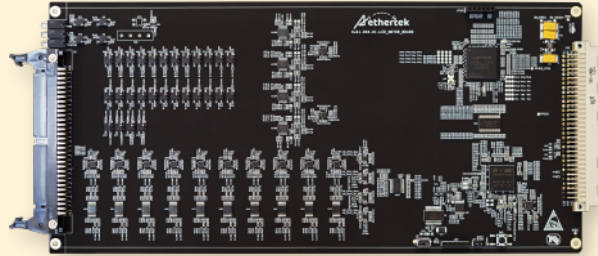
- 12 - CH Isolated AC measurement
  - Max. Input 350 Vrms
- 12 - CH AC Load
  - 10K ohm / 10W





### Switches and IO Expander

- 24 - CH Hi - Current SPST
  - 2 A Continuous Current
- Digital Communication Bus
  - I2C
- Isolation 3.3 V Power Supply



## 4. MDA Specification

### System Node Capability

Use Case	Specification
Node per APC64	64
Maximum Node (16 slots of APC64)	1024

### Resistance

Range	Accuracy
0.01 $\Omega$ ~ 10 $\Omega$	+ / - 1%
10 $\Omega$ ~ 10 k $\Omega$	+ / - 1%
10 k $\Omega$ ~ 10 M $\Omega$	+ / - 1%

### Capacitance

Range	Accuracy
10 pF ~ 10 nF	+ / - 5%
10 nF ~ 10 uF	+ / - 5%
10 uF ~ 1 mF	+ / - 5%



### Inductance

Range	Specification
10 uH ~ 10 mH	+ / - 10 %
10 mH ~ 10 H	+ / - 10 %

### Diode

Default Current : 1 mA

Programmable Current Range : 0.1 mA ~ 100 mA

Range	Accuracy
0 V ~ 8 V	10 % + 10 mV

### Bipolar Transistor

Default Current : 1 mA

Programmable Current Range : 0.1 mA ~ 100 mA

Vce Range	Accuracy
0 V ~ 8 V	2 %

### MOSFET

Programmable Voltage Range : 0 V ~ 8 V

Vds Range	Accuracy
0 V ~ 8 V	10 %

### TestJet

Sine Wave Voltage : 200 mVrms

Source Frequency : 65536 Hz

Beta Range	Accuracy
20 fF ~ 1200 fF	10 %



## 5. On - Power Specification

### Analog Source Measurement Unit – Source Parts

#### DC Voltage Source

Parameter	Specification
Programmable DC Voltage Range	-10 V ~ 10 V
Voltage Setting Resolution	1 mV
Voltage Output Accuracy	+ / - 1 %
Max. Current	+ / - 100 mA

#### DC Current Source

Parameter	Specification
Programmable Clamp Voltage Range	-10 V ~ 10 V
Voltage Setting Resolution	1 mV
Programmable Current Source Range	100 nA ~ 100 mA
Current Setting Resolution	10 nA
Current Output Accuracy	+ / - 1 %





## AC Voltage Source

Parameter	Specification
Programmable AC Voltage Range	-10 Vpp ~ 10 Vpp
Voltage Setting Resolution	10 mV
Voltage Output Accuracy	+ / - 1 %
Programmable Frequency Range	1 Hz ~ 100 KHz
Frequency Setting Resolution	1 Hz
Frequency Output Accuracy	+ / - 1%

## Analog Source Measurement Unit – Measurement Parts

### DC Voltage Measurement

Parameter	Specification
Input Impedance	1 MΩ
Input Voltage Range	-100 V ~ 100 V
Voltage Read Accuracy	+ / - (0.1 % + 5 mV)
Line Rejection Mode	Off or 50 Hz or 60 Hz

## Extended Application Card – Source Parts

### Fixed DC Voltage Source

Parameter	Specification
24V Power Supply Voltage Accuracy	+ / - 5%
Max. Current	1 A
5V Power Supply Voltage Accuracy	+ / - 5%
Max. Current	1 A



## 1 - Channel Programmable DC Voltage Source

Parameter	Specification
Programmable DC Voltage Range	1.5 V ~ 20 V
Voltage Setting Resolution	1 mV
Voltage Output Accuracy	+ / - 1 %
Current Read Accuracy	+ / - (1 % + 1 mA)
Max. Current	5 A
Max. Power	30W
Over Voltage Protection Range	2 V ~ 20 V
Over Current Protection Range	1 mA ~ 5 A

## General Purpose I / Os

Parameter	Specification
Channel	16
Input impedance	1 GΩ
Input Voltage Range	0 V ~ 24 V
Output Type	Open Drain
Max. Output Current Per CH	1.3 A to GND



## Extended Application Card – Measurement Parts

### Frequency Measurement

Parameter	Specification
Input impedance	50 $\Omega$
Input Voltage Range	3.3 V ~ 100 V
Input Capacitance	< 20 pF
Frequency Measurement Range	1 Hz ~ 10 MHz
Frequency Measurement Accuracy	+ / - (1 % + 10 Hz)

## Digital Communication Board – Source Parts

### Fixed DC Voltage Source

Parameter	Specification
5V Power Supply Voltage Accuracy	+ / - 5 %
Max. Current	1 A
3.3V Power Supply Voltage Accuracy	+ / - 5 %
Max. Current	1 A

### General Purpose I / Os

Parameter	Specification
Channel	16
Input impedance	1 G $\Omega$
Input Voltage Range	0.1 V ~ 24 V
Output Voltage Range	0.2 V ~ 12 V
Max. Output Current Per CH	30 mA



## Digital Communication Board – Interface Parts

### Interface List and Specification

Parameter	Specification
I2C Bus Channel	3
I2C Level Selection	1.8 V or 3.3 V
Max. I2C Clock Rate	1 MHz
SPI Bus Channel	2
SPI Level Selection	1.8 V or 3.3 V
Max. SPI Clock Rate	40 MHz
UART Bus Channel	2
UART Level Selection	1.8 V or 3.3 V
Max. UART Baudrate	230400 bps
CAN Bus Channel	1
CAN Level	3.3 V
Support Protocol	CAN protocol version 2.0 part A, B CAN FD protocol specification version 1.0
MIPI Bus Channel	1
Support Interface	MIPI® D-PHY



### Power Supply Unit – Source Parts

#### Programmable DC Voltage Source

Parameter	Specification
Source Channel	4
Programmable DC Voltage Range	1.6 V ~ 20 V
Voltage Setting Resolution	10 mV
Voltage Output Accuracy	+ / - 1%
Current Read Accuracy	Range1 : 1 mA ~ 3000 mA    + / - (1 % + 0.1 mA) Range2 : 1 uA ~ 2 mA        + / - (1 % + 0.5 uA)
Max. Current Per Channel	3A
Max. Power Per Channel	30W
Over Voltage Protection Range	1.6 V ~ 22 V
Over Current Protection Range	50 mA ~ 4 A

## 6. Customized Module Specification

### Simulated Resistor and Measure DC Card – Measurement Parts

#### DC Voltage Measurement

Parameter	Specification
Channel	12
Isolation	Independent between each channel
Input Impedance	290 kΩ (Range : -50 V ~ -5 V, 5 V ~ 50 V) 1 MΩ (Range : -5 V ~ 5 V)
Input Voltage Range	-50 V ~ 50 V
Voltage Read Accuracy	+ / - (0.1 % + 1 mV)



## Simulated Resistor and Measure DC Card – Resistor

Simulated Resistor Is Constructed with Potentiometer Matrix and Real Resistors

Parameter	Specification
Channel	2
Isolation	Independent between each channel
Resistor Range	Range1 : 10 $\Omega$ ~ 40 $\Omega$ Range2 : 50 $\Omega$ ~ 630 $\Omega$ Range3 : 640 $\Omega$ ~ 350 k $\Omega$
Max. Current Input	Range1 : 100 mA Range2 : 20 mA Range3 : 5 mA
Input Voltage Range	-10 V ~ 10 V
Resistor Resolution	10 $\Omega$
Resistor Accuracy	+ / - (1 % + 1 $\Omega$ )

## AC Load and Measure AC Card – Measurement Parts

AC Voltage Measurement

Parameter	Specification
Channel	12
Isolation	Independent between each channel
Input Impedance	100 k $\Omega$
Input Voltage Range	10 Vpp ~ 350 Vpp
Voltage Read Accuracy	+ / - (1.5 % + 10 mVpp)
Input Frequency Range	50 Hz ~ 60 Hz





## AC Load and Measure AC Card – AC Load Parts

AC Load Is Constructed with Real Resistor

Parameter	Specification
Channel	12
Isolation	Independent between each channel
Load Resistance	10 k $\Omega$
Max. Load Power	10 W

## Switches and IO Expander – Switch Parts

Parameter	Specification
Channel	40
Switch Type	SPST
Max. Continuous Current	2 A

## Switches and IO Expander – IO Expander Parts

External I2C Bus for IO Expander Usage

Parameter	Specification
I2C Bus Channel	3
I2C Level Selection	3.3 V
Max. I2C Clock Rate	400 kHz



Switches and IO Expander – Source Parts

Isolation 3.3V Power Source

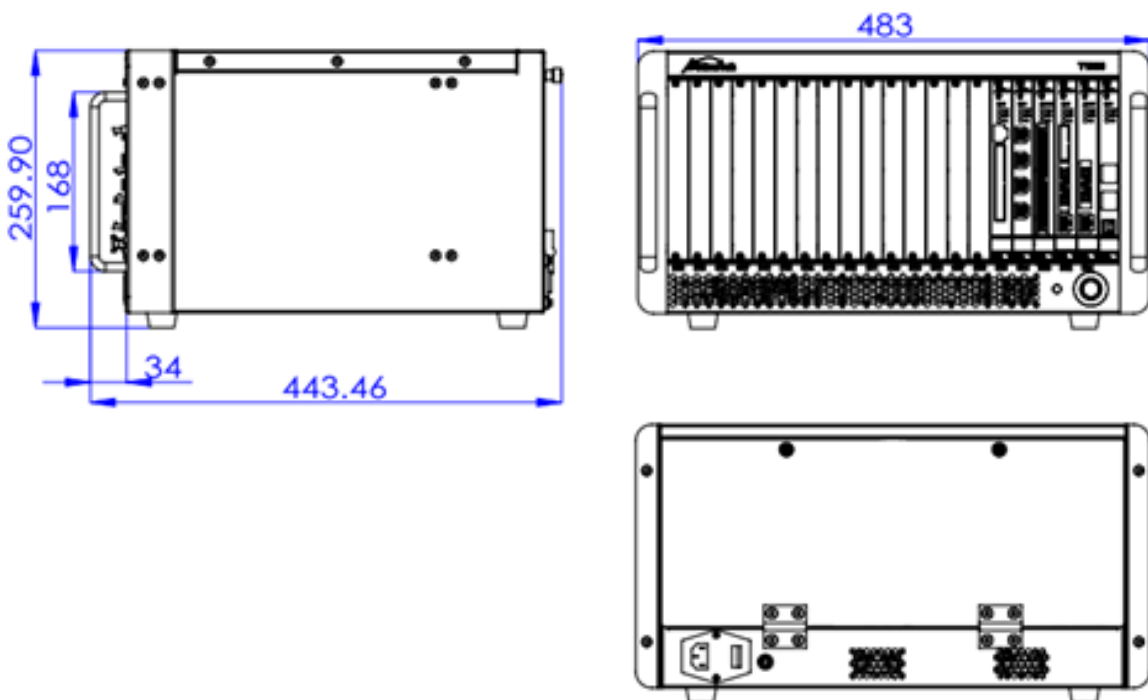
Parameter	Specification
3.3V Power Supply Voltage Accuracy	+ / - 5 %
Max. Current	1.5 A

## 7. System Specification

System Input Power

Parameter	Specification
Input Power Voltage	100 VAC ~ 250 VAC
Power Line Frequency	50 / 60 Hz
Max. Power Consumption	1000 VA

Dimensions



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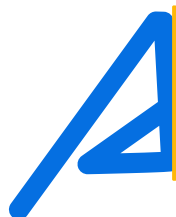
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