



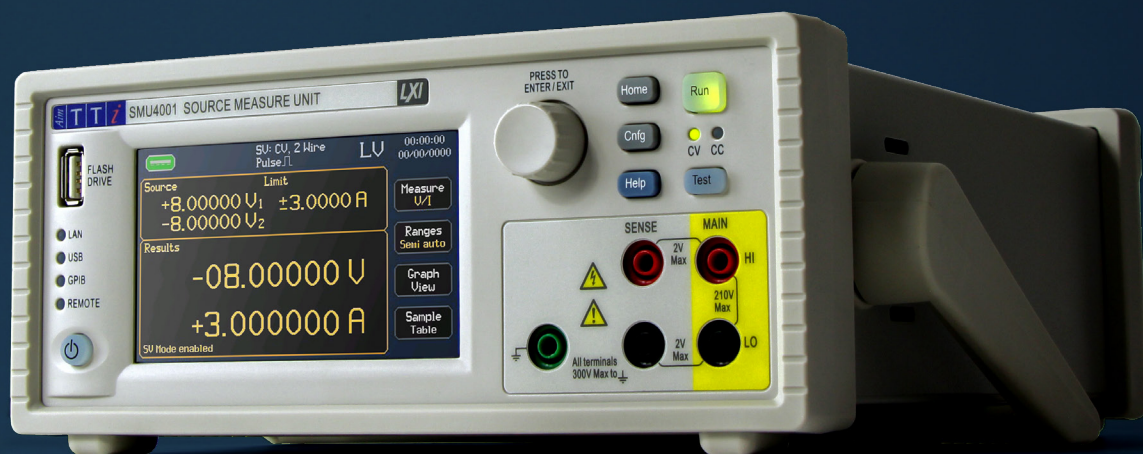
Measurably better value

4-quadrant Source, Sink & Measure

Powerflex technology  $\pm 200\text{V}/\pm 20\text{V}$ ,  $\pm 3\text{A}$ , 25W

6½ digit, 0.1 $\mu\text{V}$  & 100fA resolution

Fast measurement speeds up to 200 $\mu\text{s}$  (5k/s)



## SMU4000 SERIES

$\pm 200\text{V}$  &  $\pm 20\text{V}$  models  
Source Measure Units

# CLASS LEADING PERFORMANCE

4-quadrant Source, Sink & Measure

0.1µV & 100fA, 6½ digit resolution

Continuous or pulsed high speed outputs with Linear/Log or arbitrary list sweeps

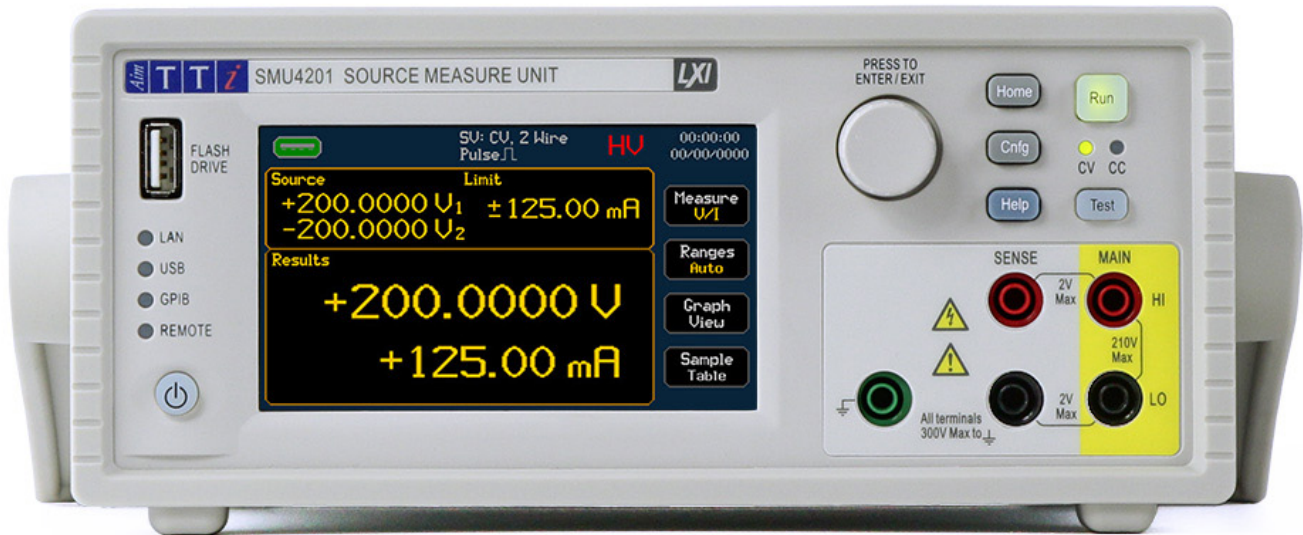
Compact size (A4 footprint)\*

Powerflex technology ±200V / ±20V, ±3A ,25W

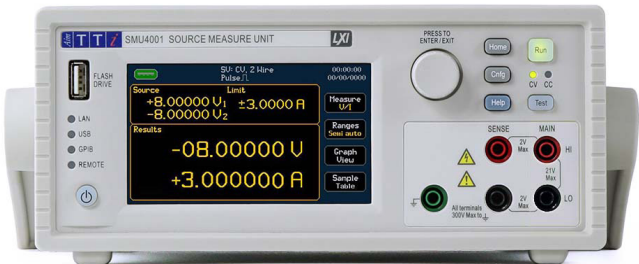
Fast measurement speeds up to 200µs (5k/s)

Internal memory, up to 100k measurements, up to 100k steps

'SMU Link' allows two SMUs to be linked together and controlled simultaneously



	SMU4001	SMU4201
Maximum Voltage	±21V	±210V
Voltage ranges	20mV to 20V	20mV to 200V



The SMU4000 Series provides class leading performance at a new and affordable price point for a four quadrant SMU. Combining touch screen technology with an intuitive graphical user interface provides a clear and natural flow through the test and measurement process.

Integrating a fast and agile, high power four quadrant Voltage/ Current source and advanced precise Voltage/ Current meters in a compact half rack 2U casing, capable of precisely supplying positive and negative voltages, sourcing or sinking power, while simultaneously measuring both current and voltage for I-V characterising.

With high current and power combined with fast measurements and low glitch auto ranging speed, it is the ideal solution for industrial development as well as educational environments, identifying the SMU as the all-in-one solution for simplifying test applications such as battery charging/discharging, I-V characterising, semiconductor testing and much more.

\* Bumpers removed.\*\*GPIB Optional

# KEY FEATURES

## CLASS LEADING PERFORMANCE

- ▶ Powerflex technology achieves full instrument output power across the majority of the voltage range.
- ▶ 0.015% basic accuracy with 6½ digit resolution.
- ▶ High speed, low glitch auto ranging capability.
- ▶ Sense terminals for 4 wire operation and guard capabilities.

## ULTIMATE USER EXPERIENCE

- ▶ User friendly front panel GUI with on screen numeric or graphical results.
- ▶ Internally calculated resistance and power measurements.
- ▶ User settable bipolar compliance limits.
- ▶ Variable slew rate control.
- ▶ High voltage safety interlock, user interface password protected, rear panel interlock control.
- ▶ Quiet operation.
- ▶ Context sensitive help button.

## ADVANCED FEATURES

- ▶ Advanced sweep engine.
- ▶ Advanced math features for data handling.
- ▶ Tolerance band result sorting.
- ▶ Advanced load modes [LC, LR & LP] with integral voltage dropout setting.

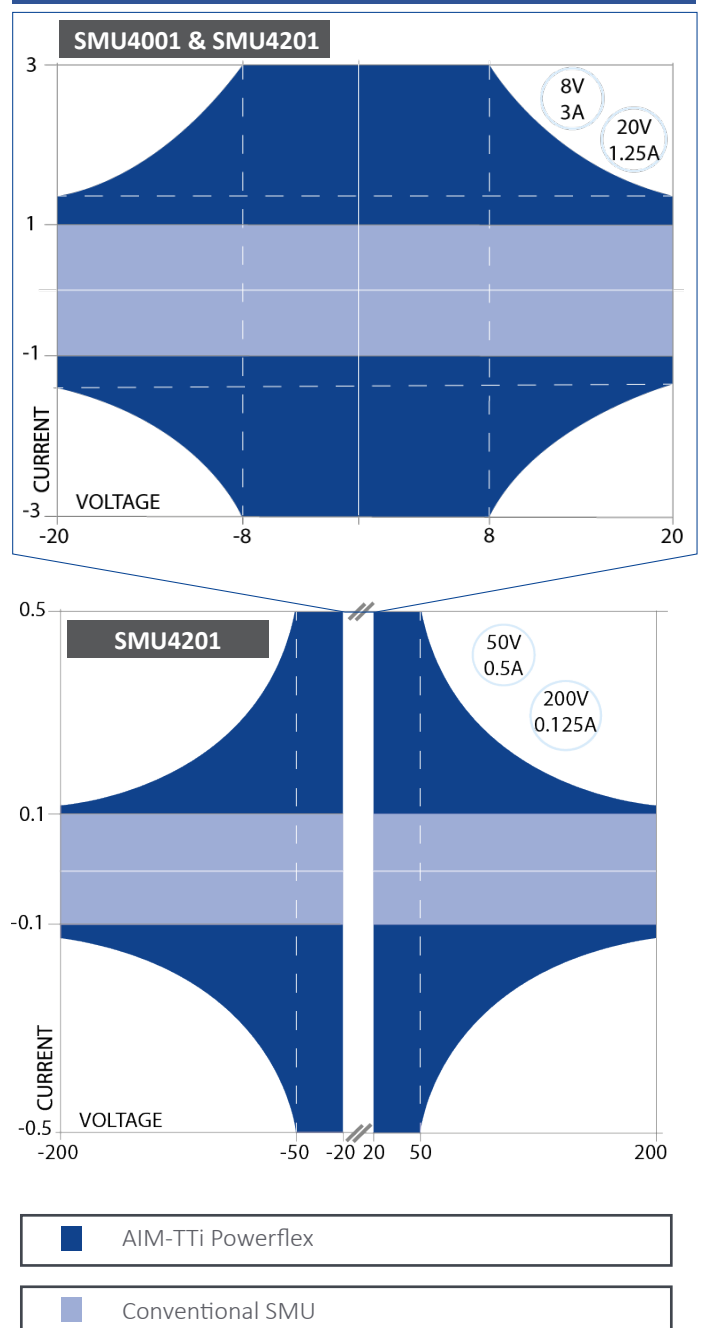
## SIMPLIFY TEST SETUPS

- ▶ Advanced sequencing mode.
- ▶ SCPI compliant digital remote interfaces.
- ▶ 'SMU-Link' Link two SMUs together to perform simultaneously via a handshake triggering system.
- ▶ Advanced global triggering available via external DIO and remote commands.

## UNIQUE POWERFLEX DESIGN

The Aim-TTi PowerFlex system provides a semi constant power characteristic so that the current capability rises as the voltage falls.

The SMU achieves full instrument output power across the majority of the voltage range, unlike conventional SMUs where the maximum power can only be achieved at the top of each voltage range.



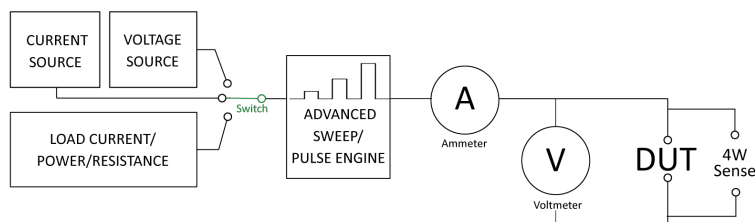
# ULTIMATE USER EXPERIENCE

## GRAPHIC USER INTERFACE (GUI)

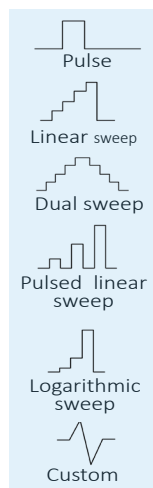
The modular based architecture allows all operational settings to be accessed from one central 'mode' menu. For each mode, all settings are visible and directly editable on one screen- showing the whole test setup without the need to navigate through sub-menus, as seen with other SMUs.

Single press auto fit graph automatically scales the primary measurement data to best fit onto the display, allowing quick and efficient analysis of measured data.

## MULTIPLE INSTRUMENTS IN ONE



There are many source, load and measure operational modes to choose from, each one allows advanced user settable configurations to be created based around the specifics for that mode. 8 EasySet pre-sets are also included to allow instant use of the SMU in the simplest form, including: Power Supply, Current Source, Load, Voltmeter, Ammeter, Ohmmeter, Insulation resistance meter and Leakage current meter. These setups form a convenient base, from which settings can be edited using the manual setup mode configuration.

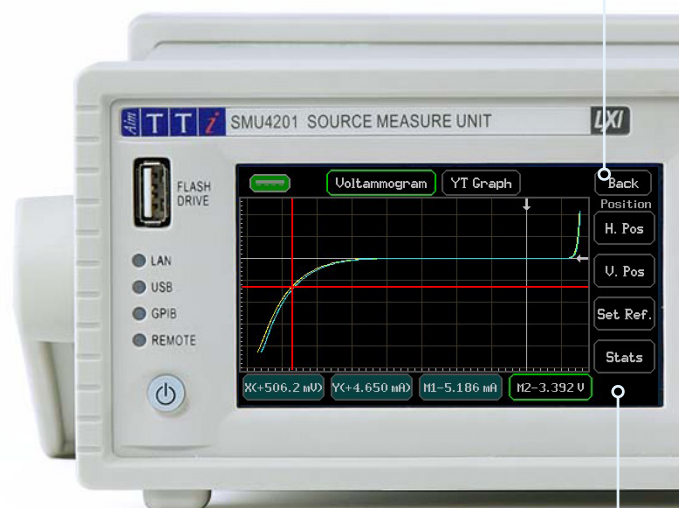


### ► ADVANCED SWEEP ENGINE

As well as a high precision DC and pulsed source and measure capabilities, the SMU4000 Series has a built-in sweep setting that supports standard sweep parameters; such as:

Constant and pulsed sweep operation, double sweep functions and linear & logarithmic modes that are fully functional from the front panel with a simple setup process involving only a few steps, providing full graphical results on screen.

Arbitrary list sweeps of up to 100K points can be directly uploaded to the instrument via the flash drive.



### ► DATA HANDLING

Advanced math features, including: Deviation, % Deviation, % Ratio and  $mx + b$ , alongside measured tolerance band sorting, can be applied to live data readings.

### ► MEASUREMENT STATISTICS

Real time calculated information for the primary and secondary measurements, including minimum/maximum samples, average, span and standard deviation are available to view at any time.

## ADVANCED ON SCREEN GRAPHICAL RESULTS

A graphical representation of the buffered measurement results can be viewed and explored on screen using the advanced graph menu. Voltage or Current data can be viewed as voltammograms for producing I-V curves and YT graphs to analyse a primary measurement against time, in a linear formats. The flexible graphing feature provides manual scaling alongside auto-range, as well as an option to compare live data against a saved trace and adjustable X and/or Y axis markers to pin-point a specific point in the measured data on the graph.

## COMPACT- SMALLEST BENCH TOP SMU ON THE MARKET







#### CONTEXT SENSITIVE HELP KEY

Provides direct assistance with menus, settings and parameters; reducing the need to interrupt the working process by viewing the Instruction manual.

#### CONVENIENT TEST FUNCTION

Performs a quick internal self-calibration and measurement zero, allowing for confidence in the following measurement results.

### SENSE TERMINALS

Sense terminals are provided for 4 Wire operation and guard capabilities. 4 Wire measurements are important when it is essential to measure the voltage delivered to a load, independent of any voltage drops in the connecting supply wires or contacts. The guard capabilities can be utilised for very low current and high impedance applications where potential unwanted leakage, stray capacitance or magnetic coupling may be a problem.

### WHY CHOOSE AN SMU?

An SMU is effectively multiple instruments in one, but with many added benefits over selecting individual instruments to create a test setup.



Besides the obvious cost and bench space savings, the SMU provides many advantages over selecting a traditional power supply, load, DMM and true arb generator, including:



**STABILITY-** The SMU has the ability to keep the output stable during unexpected load changes due to precisely measuring its own voltage and current and feeding this back to the source.



**SPEED-** Interconnection of all of the individual elements in a single unit increases the timing accuracy and speed of communications between the source and measurement circuitry.



**ACCURACY-** Measurement error is considerably reduced when compared to individual instruments in one setup, close integration of the source and measurement elements achieves a far more reliable performance and far superior synchronisation.

### USER SETTABLE LIMITS AND PROTECTION

Various methods of protection are provided to protect the test setup from damage by unexpected occurrences.

#### ► LIMITS

A dual polarity limit (also known as compliance) can be set to ensure that the instrument cannot source or sink a voltage or current beyond the set value, preventing potential damage to a device under test. If a limit is reached, the SMU will continue to function in a limited state and will recover if the source level is reduced or the load changes accordingly.

Alongside this, OVP, OCP and OPP protection trips are also available; shutting the output off if a limit is reached.

#### ► HIGH REACTANCE MODE

When attempting to source into a highly reactive load which may be capacitive or inductive there may be visible overshoot, ringing or even in some cases instability. High Reactance mode helps to compensate for and reduce the risk of these issues.

#### ► PROTECTION

Source voltages higher than 42V can be password protected\* as a safety precaution to prevent any unwanted high voltages being set, A high voltage interlock is also available via the DIO pins\*.

Passwords can be added to a range of settings, which can be particularly useful to prevent any unwanted changes being made during longer tests or in education environments.

\*SMU4201 only

# SIMPLIFY TEST SETUPS

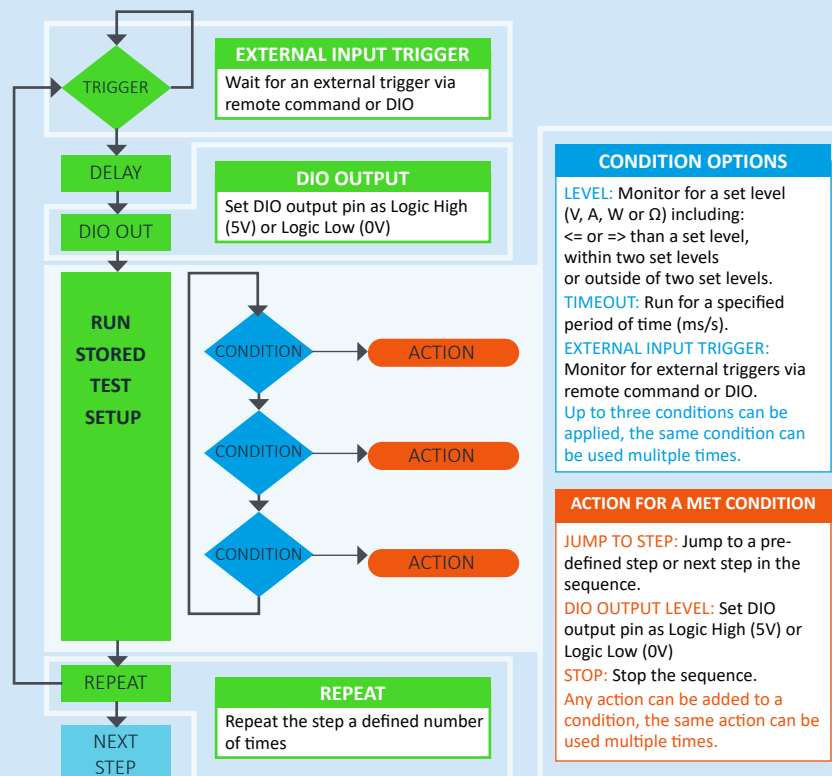
## DATA STORAGE

A convenient front mounted flash drive port allows configurations, results and screen shots to be directly extracted from the instrument for further analysis. The direct upload of complex test configurations enables simplification of the of the most advanced test scenarios. Measurement data can be automatically recorded to the flash drive on completion of a test run – thus allowing for virtually unlimited measurement data storage.

## ADVANCED SEQUENCING MODE

Sequence mode is an advanced sequencing feature for creating and performing complex test routines. Stored test configuration setups can be imported into up to 25 individual steps inside one test routine, allowing complete synchronisation of the instrument via advanced triggering capabilities and features. Synchronisation of two instruments or additional test equipment can be achieved through the use of the DIO port under the control of the sequence mode engine.

### EXAMPLE OF A SINGLE STEP INSIDE A SEQUENCED TEST ROUTINE



## SCPI COMPATIBLE

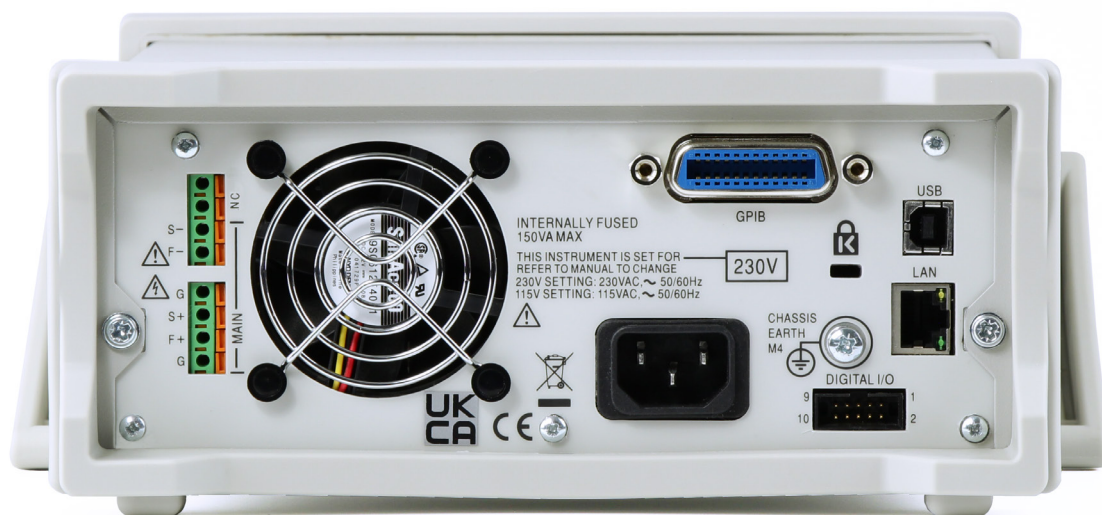
The SMU can be integrated into existing systems using the universal SCPI command set. An extensive library of commands can be used to simplify setups and automate systems, increasing productivity and reducing costs.

## LABVIEW & IVI DRIVER

An IVI-COM/IVI-C driver for Windows is included. This provides support for common high-level applications such as LabView\*, LabWindows\*, and Keysight VEE\*.

## ACCESSORIES

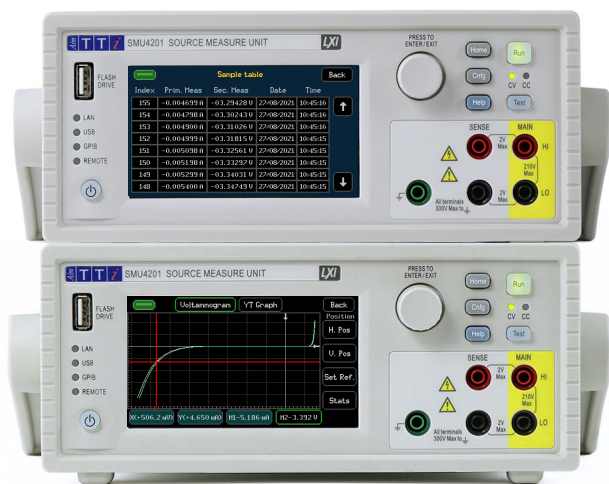
This instrument can be rack mounted, a suitable 2U 19" rack kit is available from the manufacturers or their overseas agents. Contact TTI for test fixture requirements.



\* LabView and LabWindows are trademarks of National Instruments  
 Keysight VEE is a trademark of Keysight Technologies. Windows is a trademark of Microsoft.

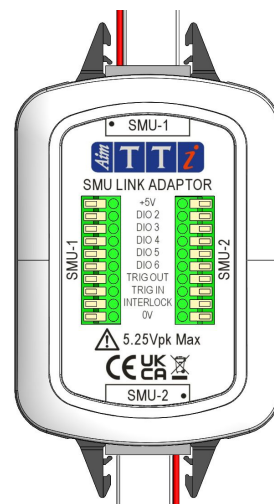
\*\* GPIB optional



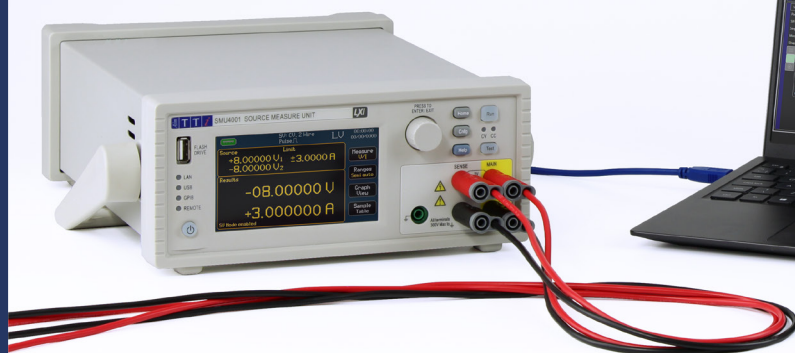


## NEED 2 CHANNELS?

'SMU LINK' is an accessory that can be used to connect two SMUs together to perform simultaneously via a handshake triggering system, effectively creating a fully functioning 2 channel SMU, useful for testing three leaded components such as small signal BJT's, FET's and more.



## TEST BRIDGE SMU



- ▶ Full instrument control of multiple SMU's.
- ▶ Build complex sequences with full access to configuration settings.
- ▶ Arbitrary waveform creation with built in preset options.
- ▶ Linear and logarithmic, X/Y, Y/T graphing functions.
- ▶ Advanced zooming and panning functions.
- ▶ Split view option for steps and repeats on sequenced data.
- ▶ Full access to remote commands with documentation for each command.

## TEST BRIDGE SMU - PC SOFTWARE

Test Bridge SMU is free downloadable software that provides full programmable control of multiple SMU's alongside additional enhanced features.

The graphical interface allows advanced setups, lists and sequences to be created and directly applied to the SMU. Quick and efficient data download means results can be saved and exported for further analysis as a .CSV file then further viewed in a tabular or graphical format from within the Test Bridge SMU software.

The advanced graphing feature provides an array of options to view the results in multiple formats such as: Assign result sets to graphs with customised axis definitions, compare different sets of results on a single graph, split by step and repeat for sequenced data, alongside viewing in a linear or logarithmic format.

# TECHNICAL SPECIFICATIONS

Settling Time and Accuracy specifications are valid after a minimum of 60 minutes warm-up followed by self-calibration execution and measurement zero. Ambient temperature change of less than  $\pm 3^{\circ}\text{C}$  after self-calibration and measurement zero. Calibration Period: 1 Year, Temperature:  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , Measurement Period:  $\geq 10$  PLC

## KEY SPECIFICATIONS OF SMU4000 SERIES

	SMU4001	SMU4201
Maximum Voltage	$\pm 21\text{V}$	$\pm 210\text{V}$
Voltage ranges	20mV to 20V	20mV to 200V

## OPERATING MODES

Source Voltage (SV), Source Current (SC), Load Current (LC), Load Resistance (LR), Load Power (LP), Measure Voltage (MV), Measure Current (MC), Measure Resistance (MR), Measure High Resistance (MHR), Sequence.

## VOLTAGE MEASUREMENTS (ALL MODES EXCEPT MC)

Range	Resolution	Accuracy (%reading + offset)
20mV	10nV	$\pm 0.06\% \text{rdg} \pm 50\mu\text{V}$
200mV	100nV	$\pm 0.015\% \text{rdg} \pm 50\mu\text{V}$
2V	1uV	$\pm 0.015\% \text{rdg} \pm 50\mu\text{V}$
20V	10uV	$\pm 0.02\% \text{rdg} \pm 5\text{mV}$
200V <sup>1</sup>	100uV	$\pm 0.02\% \text{rdg} \pm 5\text{mV}$

1) 200V range only available on SMU4201

## CURRENT MEASUREMENTS (ALL MODES EXCEPT MV)

Range	Resolution	Accuracy (%reading + offset)
200nA <sup>2</sup>	100fA	$\pm 0.04\% \text{rdg} \pm 300\text{pA}$
2uA	1pA	$\pm 0.03\% \text{rdg} \pm 300\text{pA}$
20uA	10pA	$\pm 0.02\% \text{rdg} \pm 2\text{nA}$
200uA	100pA	$\pm 0.02\% \text{rdg} \pm 2\text{nA}$
2mA	1nA	$\pm 0.02\% \text{rdg} \pm 200\text{nA}$
20mA	10nA	$\pm 0.02\% \text{rdg} \pm 2\mu\text{A}$
200mA	100nA	$\pm 0.02\% \text{rdg} \pm 20\mu\text{A}$
1A	1uA	$\pm 0.07\% \text{rdg} \pm 100\mu\text{A}$
3A <sup>3</sup>	1uA	$\pm 0.2\% \text{rdg} \pm 300\mu\text{A}$

2)Typical Accuracy

3)Only available by Manual range selection when in modes that utilize the current source

## MEASUREMENT SUPPLEMENTARY CHARACTERISTICS

Measurement Period		User settable 200μs to 20s (10μs resolution), or 0.01 to 100PLC (0.001PLC resolution).  If set to integer PLC: synchronized to actual mains supply period Accuracy: $\pm (50\mu\text{s} + 0.01\%)$ .  Typically, $< \pm 0.5\mu\text{s}$ delay between measured Voltage and Current signal measurements.
Temperature coefficient ( $5^{\circ} - 18^{\circ}\text{C}$ and $28^{\circ} - 40^{\circ}\text{C}$ )		$\pm (0.15 \times \text{accuracy spec}) / ^{\circ}\text{C}$
Burden	Voltage Measurement	$> 10\text{G}\Omega \pm 80\text{pA}$
	Current Measurement	4-wire sense: $< \pm 100\mu\text{V}$ 2-wire sense (front terminals): $< 0.1\Omega$ 2-wire sense (rear terminals): $< 0.05\Omega$
External Guard offset Voltage		$< \pm 100\mu\text{V}$ from SENSE or MAIN HI terminal.
4-wire Sense Capability		Up to $\pm 2\text{V}$ between respective MAIN and SENSE Terminals.



## RESISTANCE MEASUREMENTS (ALL MODES EXCEPT MV AND MC)

Resistance is internally calculated from measured Voltage and Current.

Resistance errors (in Ohms) may be calculated from respective voltage and current measurement results and specified errors as follows –

$$(\text{Current} \times \text{Voltage error} + \text{Voltage} \times \text{Current error}) / \text{Current}^2$$

Where Voltage is the Voltage reading in Volts (without polarity).

Voltage error is the specified Voltage measurement error in Volts.

Current is the Current reading in Amps (without polarity).

Current error is the specified Current measurement error in Amps.

## POWER MEASUREMENTS (ALL MODES EXCEPT MV AND MC)

Power is internally calculated from measured Voltage and Current.

Power errors (in Watts) may be calculated from respective voltage and current measurement results and specified errors as follows –

$$(\text{Current} \times \text{Voltage error} + \text{Voltage} \times \text{Current error} + \text{Voltage error} \times \text{Current error})$$

Where Voltage is the Voltage reading in Volts (without polarity).

Voltage error is the respective specified Voltage error in Volts.

Current is the Current reading in Amps (without polarity).

Current error is the respective specified Current error in Amps.

## VOLTAGE SOURCE (SV AND MHR MODES)

Accuracy		Same as voltage measurement accuracy.
Source Limit <sup>4</sup>	SMU4001	±21V
	SMU4201	±210V
Maximum Slew Rate	SMU4001	User settable 21V/s to 0.12V/μs
	SMU4201	User settable 210V/s to 1.2V/μs
Settling Time (typical)		To reach within 0.5% of change, open load, max slew rate, manual ranges, High Reactance disabled.
		300μs
		Maximum current limit slew applied equivalent to: 1uV/us per 1nA current limit setting.
		SMU4201 only : Add 280ms if changing from (>+21V to <-21V) or (<-21V to >+21V) (polarity reversal)
Output Impedance (typical)		<10μΩ (4-wire, steady state)
Overshoot (typical)		<0.5% + 1mV (resistive load)
High Reactance Load Stability	Disabled	0 to 0.2μF
	Enabled	>0.2uF to 200μF typical (inductive loading is also accommodated)

4) Limits include 105% overrange

## CURRENT SOURCE (SC AND MR MODES)

Accuracy		Same as current measurement accuracy.
Source Limit		±3.15A
Maximum Slew Rate		User settable 3A/s to 36mA/μs
Settling Time (typical)	To reach within 0.5% + 1nA of change, shorted load, max slew rate, manual ranges, High Reactance disabled.	
	200nA, 2uA, 20uA, 200uA ranges	2.5ms
	2mA range	600μs
	20mA, 200mA, 1A, 3A ranges	200μs
	SMU4201 Only	Add 280ms if changing from (>+21V to <-21V) or (<-21V to >+21V) (polarity reversal).
Overshoot (typical)		<0.5% + 10nA (shorted load)

## CURRENT LOAD (LC, LR AND LP MODES)

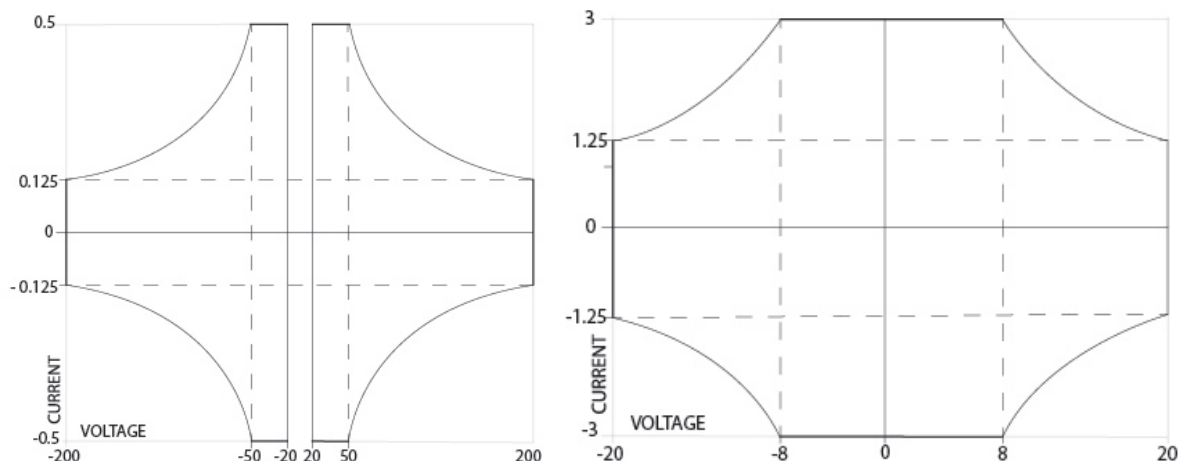
Accuracy	LC mode	Same as current measurement accuracy.
	LR mode	Same as resistance measurement accuracy.
	LP mode	Same as power measurement accuracy.
Load Limit	LC mode	3.15A
	LR mode	100mΩ to 250MΩ
	LP mode	26.25W
Maximum Slew Rate	LC, LR modes	User settable 3A/s to 36mA/μs
	LP mode	User settable 25W/s to 0.25W/μs

## SOURCE SUPPLEMENTARY CHARACTERISTICS

Temperature coefficient (5° – 18°C and 28° – 40°C)	$\pm (0.15 \times \text{accuracy spec}) / ^\circ\text{C}$	
Output power	25W four quadrant source or sink operation.	
Overrange	105% of source and measure range.	
Voltage Limits (compliance)	Bipolar limit with single setting. Maximum includes 105% overrange, minimum is 10% of selected manual range, accuracy same as voltage measurement, 5 digit Resolution.	
	SMU4001	User settable 2mV to 21V
	SMU4201	User settable 2mV to 210V
Current Limits (compliance)	Bipolar limit with single setting, user settable 20nA to 3.15A. Maximum includes 105% overrange, minimum is 10% of selected manual range, accuracy same as current measurement, 5 digit Resolution.	
Voltage Dropout (load modes)	Accuracy same as voltage measurements $\pm 1$ digit, 5 digit Resolution, 5% Hysteresis (1mV minimum) Only available in load modes (LC, LP, LR) Voltage range forced to auto in load modes.	
	SMU4001	User settable up to 21V
	SMU4201	User settable up to 210V
Pulse Width	User settable 200 $\mu\text{s}$ minimum with 10 $\mu\text{s}$ resolution.	
Wideband Noise (Voltage source)	SMU4001	<2mV (RMS, 10Hz – 20MHz) typical into a resistive load.
	SMU4201	<21V: <2mV (RMS, 10Hz – 20MHz) 21V to 210V: <3.5mV (RMS, 10Hz – 20MHz) typical into a resistive load.
Source Settling Time Delay	User settable 100 $\mu\text{s}$ minimum with 10 $\mu\text{s}$ resolution.	

## OUTPUT POWER, VOLTAGE AND CURRENT CAPABILITY

### PowerFlex



PowerFlex technology enables the instrument to achieve full instrument output power across the majority of the voltage range. 3A current limit, limits power at absolute voltages < |8.33V|. Absolute voltages above |21V| are only achievable on the SMU4201. Output current limited to 0.5A at absolute voltages > |21V|.

## PROTECTION

Over Current Protection (OCP)	Bipolar protection limit with single setting, user settable 10 $\mu\text{A}$ to 3.15A, accuracy same as current measurements $\pm 1$ digit or can be disabled. 5 digit Resolution, setting independent of current range.	
Over Voltage Protection (OVP)	Bipolar protection limit with single setting, accuracy same as voltage measurements $\pm 1$ digit or can be disabled, 5 digit Resolution, setting independent of voltage range.	
	SMU4001	User settable 10mV to 21V
	SMU4201	User settable 10mV to 210V
Over Power Protection (OPP)	Bipolar protection limit with single setting, user settable 1 $\mu\text{W}$ to 26.25W, accuracy same as power measurements $\pm 3$ digits or can be disabled, 5 digit Resolution.	
Over Temperature Protection (OTP)	Internal Temperature safety trip. Not user settable, cannot be disabled.	
Trip Delay (typical)	$\leq 200\mu\text{s}$	
Trip Status	Output is disabled, off condition is set to OPEN.	

## MEASUREMENT RESULT BUFFER

Contents (each entry)	Index, Primary Measurement, Secondary Measurement, Date, Time (1 second resolution).
.CSV file contents	Index Active Mode Output state Measurement results (V and A) Calculated results (R and W) System Date System Time Measurement Timestamp Sequence Mode Step and Iteration
Length	Maximum of 100000 entries, FIFO style.

## DIGITAL INPUT/OUTPUT (DIO)

Signals	5 user definable signal pins, HV interlock (SMU4201 only), Global Trigger In, Global Trigger out (self-resetting based on trigger input), Ground and +5V (fuse limited to 500mA).	
Voltage Reference	Chassis ground referenced.	
Input Levels	Logic zero:	-0.25V to +1V (diode clamped to 0V)
	Logic one:	+1.75V to +5.25V (diode clamped to +5V)
Output Levels	Logic zero:	open-drain MOS, typically 0.2ohm, 100mA maximum sink.
	Logic one:	nominally 4.7kohm pull-up to +5V
Logic	Active High / Low global port selection.	

## REMOTE CONTROL INTERFACES

LAN	Ethernet 100/10 base-T hardware connection.
LXI Conformance	1.5 LXI Device Specification 2016.
USB	Standard USB 2.0 hardware connection. Operates as a virtual COM port.
GPIB (optional)	Conforming with IEEE488.1 and IEEE488.2
Remote Command Processing Time	Typically < 5ms between receiving the command terminator for an output change at the instrument and the output beginning to change.

## SYSTEM SPEEDS

Measure to Memory	Up to 5k/s sustained.
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## ENVIRONMENTAL

Operating Range	+5°C to +40°C, 20% to 80% RH non-condensing.
Operating Mains	220V-240V or 110V-120V AC ±10%, 50/60Hz, by internal selection; 150VA maximum demand. Installation Category II.
Environmental	Indoor use at altitudes up to 2000m, Pollution Degree 2.
Storage Range	-20°C to +60°C, 10% to 90% RH non-condensing.
EMC	EN61326-1 and EN61326-2-1, group 1, class A.
Safety	EN61010-1 and EN61010-2-030 (uncategorized measurements). MAIN and SENSE terminals rated for voltages up to 210V to ground and between terminals. Front panel CHASSIS terminal intended for ground reference purposes only.
Security	Kensington security slot incorporated.

## MECHANICAL

Size (nominal)	Bench Use: 250mm(W) x 97mm(H) x 295mm(D) Rack Mount: 213.5mm(W) (½ rack) x 86.5mm(H) (2U) x 269mm(D)
Weight (nominal)	4.25kg

# PRECISION MEASUREMENT RANGE



SMU4001

SOURCE MEASURE UNIT

POWERFLEX ± 20V, 3A, 25W

6½ DIGIT RESOLUTION

FAST MEASUREMENT SPEEDS

USB, LAN & GPIB\*



SMU4201

SOURCE MEASURE UNIT

POWERFLEX ± 200V, 3A, 25W

6½ DIGIT RESOLUTION

FAST MEASUREMENT SPEEDS

USB, LAN & GPIB\*



1908

MULTIMETER

5½ DIGIT RESOLUTION

0.02% VDC ACCURACY

AC LINE OR BATTERY POWER

RS-232, USB, LAN, GPIB\*



I-PROBER

POSITIONAL CURRENT PROBE

NON-CONTACT TRACK PROBING

DC TO 5MHz BANDWIDTH

10mA TO 2A DYNAMIC RANGE

-



LCR400

COMPONENT MEASUREMENT

0.1% BASIC ACCURACY

BUILT-IN COMPONENT FIXTURE

BUILT-IN LIMITS COMPARATOR

RS-232



BS407

COMPONENT MEASUREMENT

0.1% BASIC ACCURACY

1μΩ to 20kΩ range

RECHARGEABLE BATTERY  
OPTION

-



TF900 SERIES

FREQUENCY MEASUREMENT

DC TO 3GHz/6GHz RANGE

VARIOUS MODES

RECHARGEABLE BATTERIES

USB



PFM300

FREQUENCY MEASUREMENT

3Hz TO 3GHz RANGE

HAND-HELD

LONG BATTERY LIFE

-



LD400/P

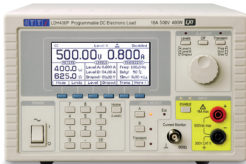
ELECTRONIC DC LOAD

400W

UPTO 80V OR 80A

CI, CR, CV, CP & CG MODES

RS-232, USB, LAN, GPIB\*



LDH400/P

ELECTRONIC DC LOAD

400W

UP TO 500V OR 16A

CI, CR, CP & CG MODES

RS-232, USB, LAN, GPIB\*

\* GPIB OPTIONAL

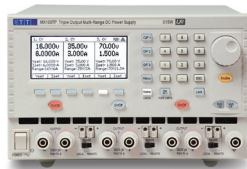


# OTHER RANGES AVAILABLE

## POWER SUPPLIES



LINEAR  
POWER SUPPLIES



MIXED-MODE  
POWER SUPPLIES



POWERFLEX  
POWER SUPPLIES



MULTI-OUTPUT  
POWER SUPPLIES

- ▶ 30w to 1200w Single and Multi channel PSUs for bench-top or remote control and system use.

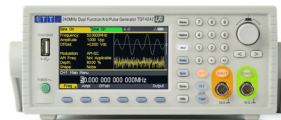
## WAVEFORM GENERATORS



PULSE GENERATORS



ANALOG  
FUNCTION GENERATORS



DIGITAL  
FUNCTION GENERATORS



ARBITRARY GENERATORS

- ▶ Analog and Digital (DDS) function generators with frequency capability up to 240MHz.
- ▶ Dedicated pulse generators with true pulse capability.
- ▶ True variable-clock arbitrary generators with up to four channels.

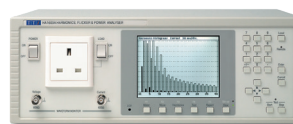
## RF & EMC TEST EQUIPMENT



SIGNAL  
GENERATORS



SPECTRUM  
ANALYSERS



HARMONICS  
ANALYSERS



LOW-DISTORTION  
SOURCE

- ▶ RF signal generators with frequency capability up to 6GHz.
- ▶ Handheld RF spectrum analyzers with frequency up to 6GHz.
- ▶ EMC analyzers for power Harmonics and Flicker.