



SMU Link Adaptor Instructions

For use with the
SMU4000 Product Series:

SMU4001
SMU4201

Instruction leaflet 48591-1500 Issue 1

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IN THIS KIT:

- 1 x SMU Link Adaptor
- 2 x 280mm 10 way ribbon cable.
- 1 x Instruction leaflet

This SMU Link Adaptor is designed to connect two Aim-TTI SMUs together via the DIO terminal ports on the rear panel. It can also be used as a DIO Expander for one or two instruments, removing the need to wire each DIO terminal individually. See the back of this leaflet for more details on how to use the link as an DIO expander.



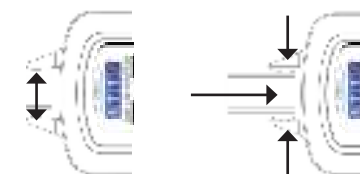
CONNECTING THE LINK ADAPTOR TO THE SMUs



The Link Adaptor mates with standard 10W (2 x 5 DIL) female 2.54mm pitch IDC ribbon cable.

Ensure the cable is fitted with the red stripe towards the black dot on the Link Adaptor and Pin 1 on the SMU.

Strain relief has been added to the SMU connection end of the ribbon cable to protect the cable from potential damage when removing.



Open the connector, insert the cable and push until the connector fully closes.

Instruction manuals and safety documentation for the SMU instruments are available to download from the Aim-TTI website.

www.aimtti.com/support

These are intended to be read before using the instrument for the first time.



SYNCHRONISING THE SMUs

A fully functioning two channel SMU can be created with two SMUs via a handshake triggering system using the Link Adaptor to connect the trigger DIO lines.

When using the Link adaptor to connect two SMUs, the adaptor *internally* connects the 'Trigger In' of each SMU to the 'Trigger Out' of the other. 'Trigger Out' will be set once all measurements associated with the level / shape are complete.

This combination of 'Trigger in' and 'Trigger Out' allows for the handshaking of multiple instruments without further wiring.

When synchronising two SMUs, consider the following settings within the 'Manual Setup' of the SMU:

To initialise the test, both SMUs must be 'RUN'.

The DIO must all be set to either active high or active low on both instruments.

CNFG > [System] Interfaces > [DIO] Pin Action

A trigger (either level or shape) must be set on both instruments.

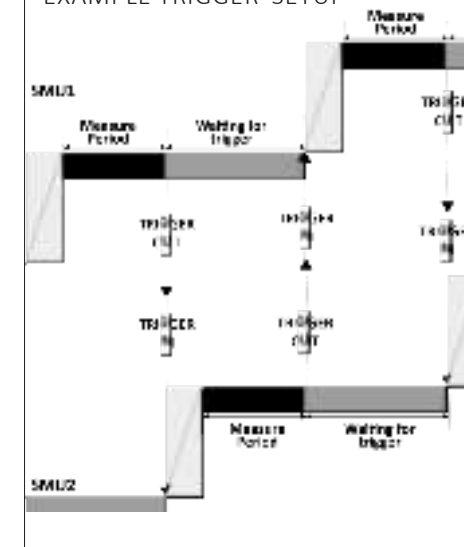
CNFG > [Source Measure Action] Manual Setup > [Timing] Trigger

TIPS

If both sets of results are intended to be plotted on one graph, the total number of measurements must match on both SMUs.

To maintain synchronisation, set the same number of levels/ shapes on both SMUs.

EXAMPLE TRIGGER SETUP



DIO EXPANSION

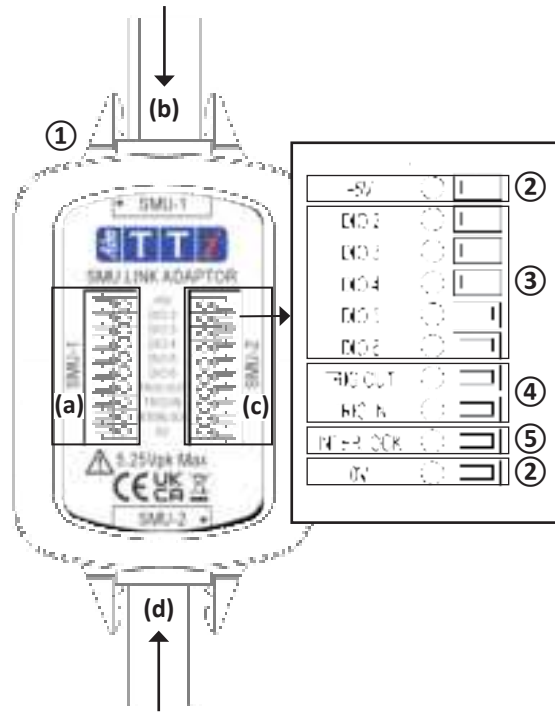
As well as connecting 2 SMUs together, the SMU Link Adaptor can be used with a single SMU as a DIO expander- removing the need to wire each DIO terminal individually.

① SMU-1 / SMU-2

The DIO terminal connections detailed in this section can be used for up to two SMUs via the SMU-1 and SMU-2 connections.

SMU-1 terminals **(a)** are extended from the connection labelled SMU-1 **(b)**.

SMU-2 terminals **(c)** are extended from the connection labelled SMU-2 **(d)**.



② +5V / 0V

These lines are provided for powering external control circuitry. The 5V supply is internally fused (resettable fuse) to 500mA.

③ DIO 2-6 (General)

DIO configuration is exclusively for use with sequence mode. Used for triggering input and output events from within a sequence, allowing a defined sequence to control or be controlled by external circuitry.

④ TRIG(ger) IN / OUT

Triggered control of the timing of shape waveforms. Used to step through the points of a shape waveform, or to repeat shape waveforms. Once the event has been triggered and all associated measurements to that event have been made, the instrument sets a global trigger output on the DIO port.

The adaptor connects the 'TRIG(ger) IN' of each SMU to the 'TRIG(ger) OUT' of the other.

⑤ INTERLOCK (High Voltage)

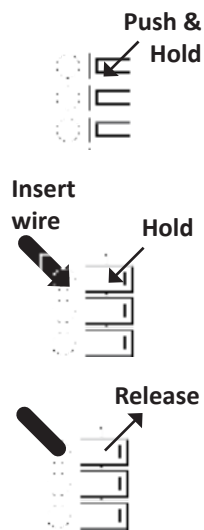
Controls the High Voltage (HV) interlock via external circuitry. When controlled via the DIO, the High Voltage Interlock works independently from the password protection; when activated or deactivated, the password protection is not required to be removed.

DIO TERMINAL CONNECTION

The minimum recommended cable diameter is 0.4mm, the maximum is 0.8mm.

Always use shrouded ferrules to prevent the risk of shock.

Press the orange actuators of the push terminals, insert the connecting wire and release the actuator to secure the connection.



DIO LINE SETUP

Each DIO line can be configured as an Input or an Output.

CNFG > [System] Interfaces > [DIO] Configure

5.25Vpk Max input voltage.

Input levels:

Input allows an external device to control the state of the line.

When using as an input, the resting state is always high (4.7kohm pull-up (internal) to +5V).

Logic Zero (low): -0.25V to +1V (diode clamped to 0V).
Logic One (high): +1.75V to +5.25V (diode clamped to +5V).

Output Levels:

Output allows the SMU to control the state of the line on external device.

When using as an output, the active high resting state will be low and the active low resting state will be high.

Logic zero (low): open-drain MOS, typically 0.2ohm, 100mA maximum sink.
Logic one (high): nominally 4.7kohm pull-up (internal) to +5V.

See *SMU4000 Series Instruction Manual* for further information on setting the DIO lines.

TEST BRIDGE - PC SOFTWARE

Test Bridge SMU simplifies the test setup when using multiple instruments allowing the complete control of one or two instruments from one place.

It also provides advanced graphing features which enable results from multiple SMUs to be plotted on a single graph, including options to split the data into steps and repeats for further analysis.

Test Bridge SMU is available to download from www.aimtti.com/support

