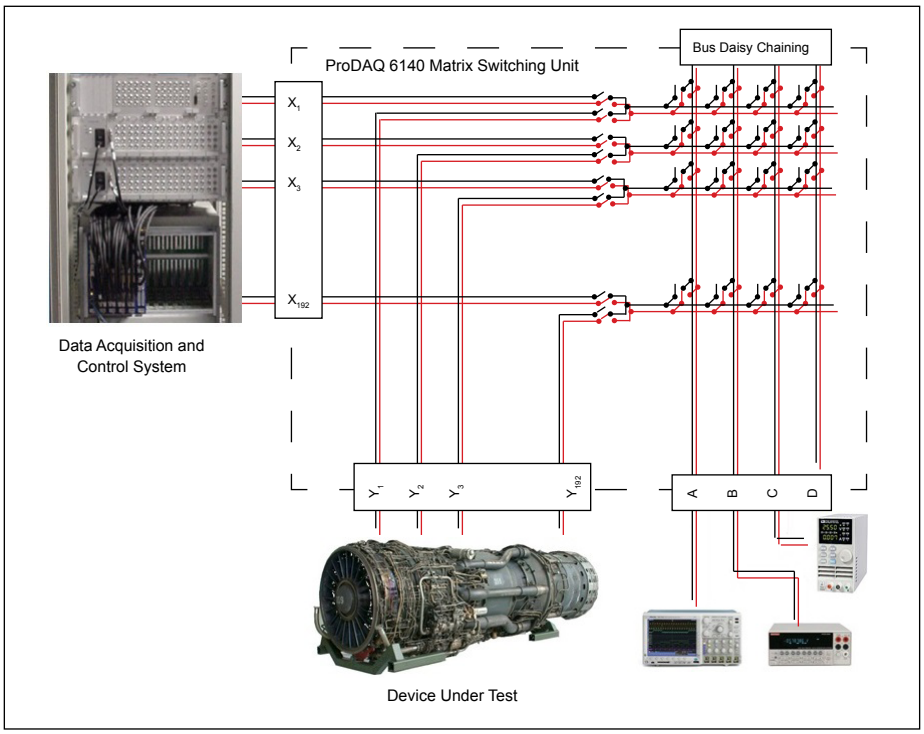
bustec
WHEN ACCURACY MATTERS

ProDAQ Relay Switching Units

ProDAQ 6140 LXI Matrix Switching Unit

OVERVIEW

The ProDAQ 6140 provides a relay matrix which can be fitted between the sensors and actuators on a device under test and the data acquisition and control system. It allows to separately connect/disconnect the signals from either side and concurrently to connect them to an internal bus. In this way signals can be routed via the bus to new destinations or the bus can be used to monitor or supply test signals. This allows calibrating and debugging the system without disconnecting and separating channels throughout the system wiring.



All relays are latching DPST type relays which keep their set connection even during power off. For the DAQ/DUT signals high-density connectors with Low Force Helix contacts are used. Test signals can be accessed via standard 4mm banana-style sockets on the front panel.

For scalability, the bus signals can be daisy-chained to additional ProDAQ 6140 units via D-Sub connectors on the rear panel.

The ProDAQ 3202 Voltage Reference Plug-In can be installed in the unit and can be connected to either one of the four bus lines.

The ProDAQ 6140 LXI Matrix Switching Unit is a fully compliant LXI device supporting all LXI core functions via a Gigabit LAN interface as well as a number of LXI extended functions like for example the LXI clock synchronization and optionally the LXI wired trigger bus.

LXI

Features & Benefits

- **19", 1U Solution for 96 or 192 Signal Channels and 4 Monitoring/Injection bussed Channels**
- **Signal Levels up to 100V and 1A**
- **Latching Relays** - connections remain during power on/off
- **Fully differential** - all connections via DPST relays
- **Scalable** - bus/matrix can be expanded via daisy-chain connectors

For more information, visit **www.bustec.com**.

Learn more about the **ProDAQ 6140** on our website by scanning the code below.

SPECIFICATIONS
ProDAQ 6140 LXI Matrix Switching Unit

GENERAL		
Number of signal channels	96 or 192	(“X” - “Y”)
No. of bussed channels	4	(“A”/“B”/”C”/”D”)

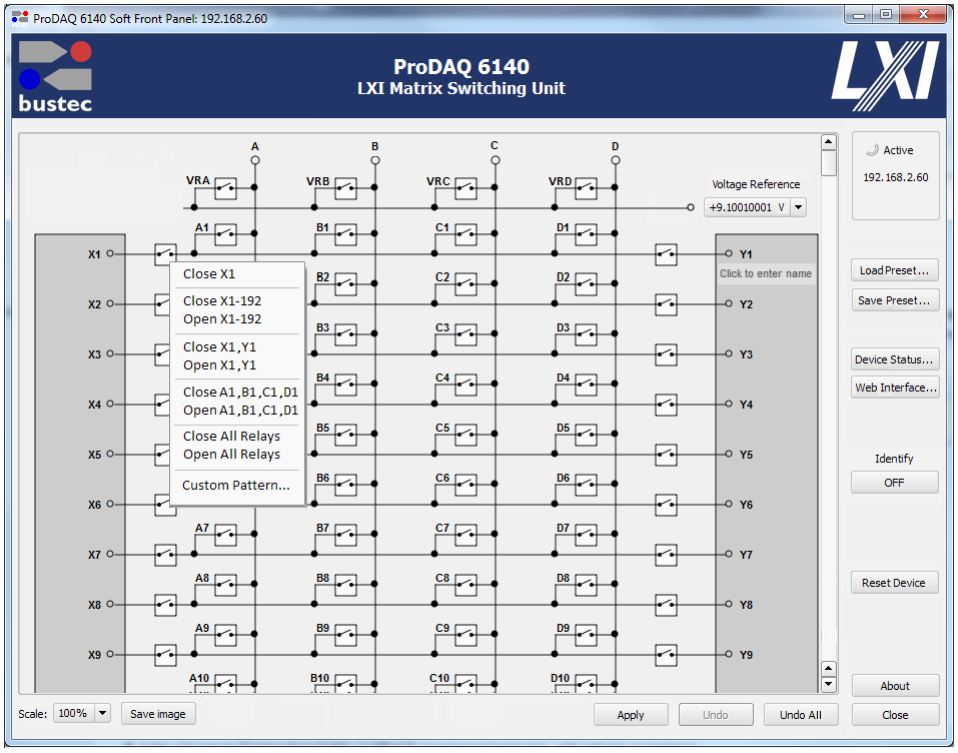
RELAY RATINGS	
Signal Levels	60 W (max. 1 A and/or 100 V)
Relay Type	Electro-mechanical, Latching DPST
Contact Type	PdRu +AU, covered
Electrical Endurance	min. 500,000 operations @ 30 VDC/1 A
Mechanical Endurance	10,000,000 operations

SIGNAL CONNECTORS	
Signal Connectors (X / Y)	Molex LFH 200-pin
Bussed Signal I/O	4 mm Banana Sockets
Bus Daisy-chaining	D-Sub (on rear)

CONTROL INTERFACE	
Interface Type	LXI Programmatic Interface via Ethernet
Speed	10/100/1000 TX
Driver	VISA-based drivers (compatible to LabVIEW, LabWindows/ CVI, MS Visual C++, MS Visual Basic, …)
Operating System Support	Windows XP, Windows 7, Linux

ENVIRONMENTAL	
Temperature	0 °C to +50 °C (operational) -40 °C to +70 °C (storage only)
Humidity	10 % - 90 % (non-condensing)

POWER SUPPLY	
Input Voltage	90 – 264 V AC, 47 - 63 Hz
Power	70 W max.



ProDAQ 6140 Soft Front Panel

Ordering Information

- **6140-AA** LXI Matrix Switching Unit for 96 Signal Channels and 4 Bussed Channels
- **6140-AB** LXI Matrix Switching Unit for 192 Signal Channels and 4 bussed Channels
- **6140-BA** LXI Matrix Switching Unit for 96 Signal Channels and 4 Bussed Channels; LXI Trigger Bus
- **6140-BB** LXI Matrix Switching Unit for 192 Signal Channels and 4 bussed Channels; LXI Trigger Bus

Related Products

- **ProDAQ 3202** Voltage Reference Plug-in
- **ProDAQ 8061** LFH Male to LFH Male Cable Assembly
- **ProDAQ 8062** LFH Male to four 50-pin D-SUB Male Cable Assembly

Contact Bustec

Europe
Bustec Ltd.
Bustec House
Shannon, Co. Clare
Ireland

T +353 61 707 100
F +353 61 707 106
E sales@bustec.com

North America
Bustec, Inc.
1507 East Valley Parkway
Suite 3-412
Escondido, CA 92027
U.S.A.

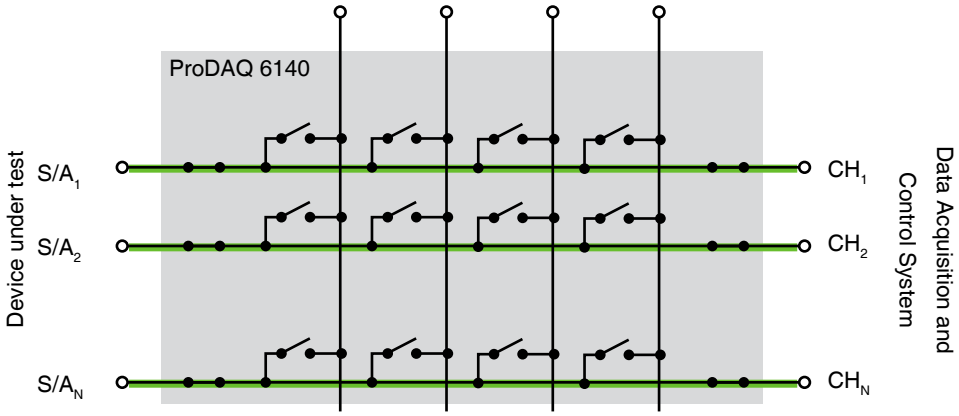
T 909. 797.0484
F 760. 751.1284
E sales@bustec.com

This datasheet (Rev. 1.2) is copyright of Bustec Ltd. All trademarks and registrations are acknowledged. The technical information herein is subject to change without notice.

Applications

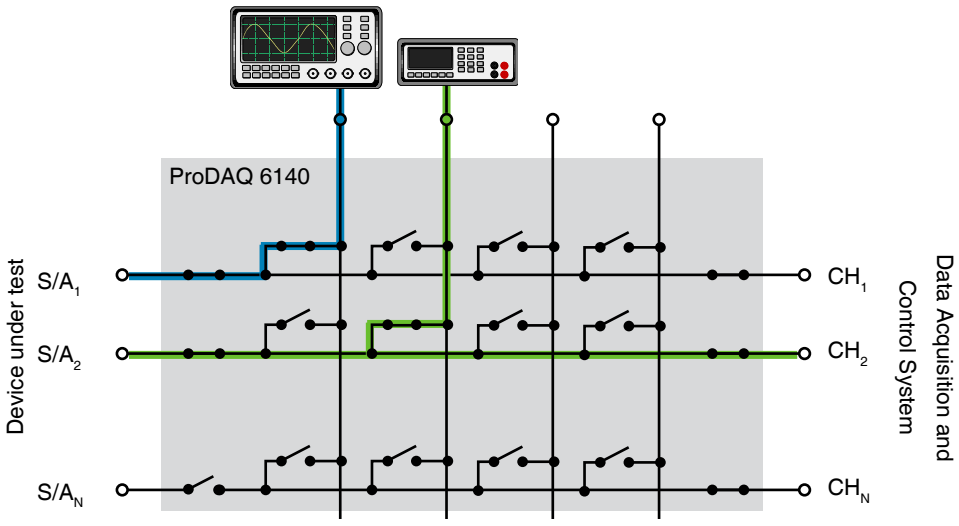
General

Located between a data acquisition and control system and the device under test (DUT), the ProDAQ 6140 LXI Matrix Switching Unit can be used for a variety of applications. In its default mode, the unit simply connects all channels of the data acquisition and control system to the sensors and actuators located at the device under test:



Monitoring

Signals generated by a sensor on the DUT or by a signal source in the DAQC system can be monitored by switching the signal on one of the four bussed lines and connecting a scope or a DMM to its connectors on the front panel. This can be done in parallel to the actual use of the signal in the DUT and the DAQC system or the connection can be opened on one side to check the signal without the influence of the other side.



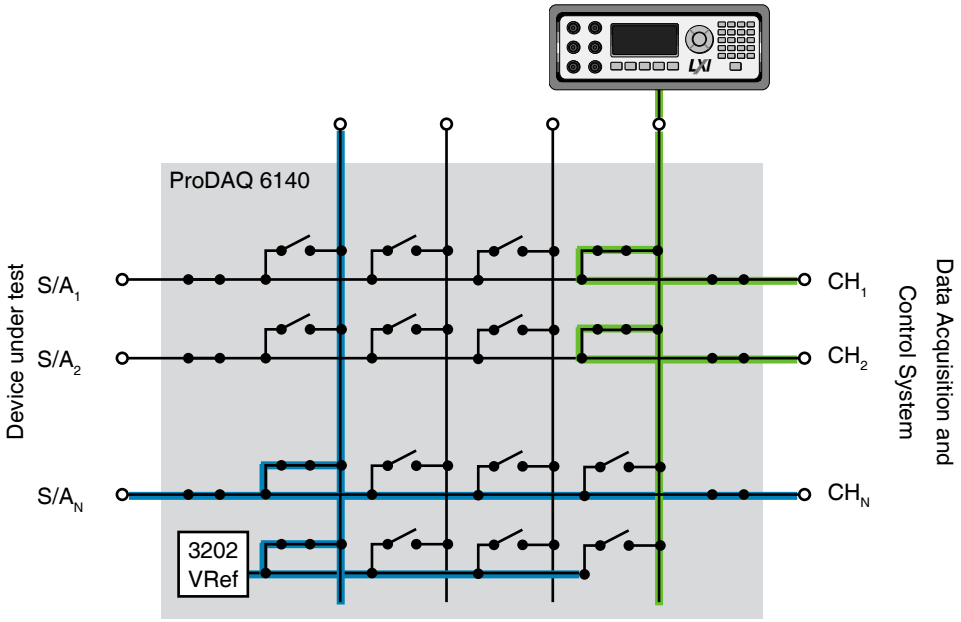
About the LXI Standard

- **LXI (LAN Extensions for Instrumentation)** combines the advantage of Ethernet with the simplicity of GPIB. LXI com-bines features of GPIB instruments with modular instrumentation by providing high performance test and measurement solutions based on a LAN interface. By utilizing the IEEE1588 Standard for A Precision Clock Synchronization Protocol, LXI Instruments allow you to build scalable distributed and fully synchronized networked measurement and control systems.

For more details visit: www.lxistandard.org

This datasheet (Rev. 1.2) is copyright of Bustec Ltd. All trademarks and registrations are acknowledged. The technical information herein is subject to change without notice.

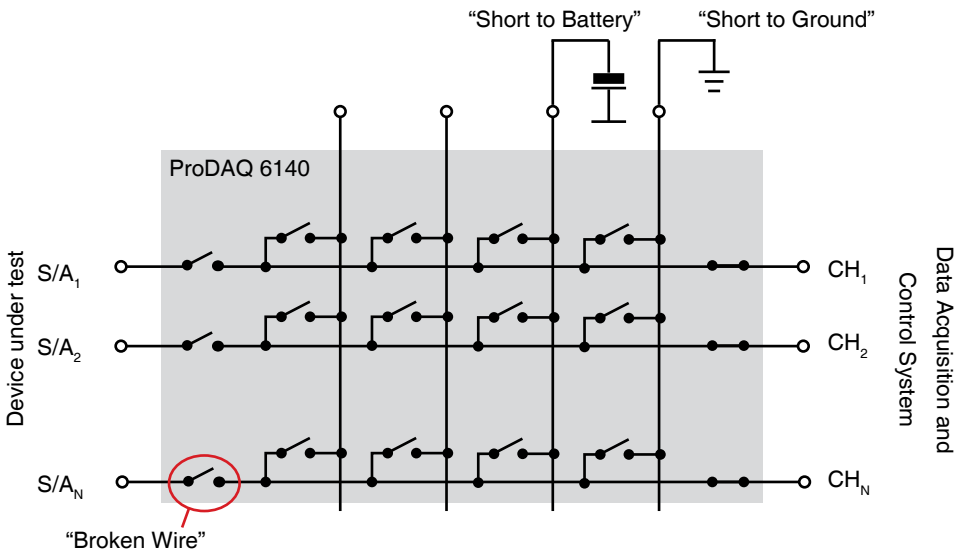
Calibration



When the optional 3202-AA Voltage Reference is installed in the ProDAQ 6140, highly stable voltages between 4.5 mV and 9V can be internally routed onto any of the four bus lines.

Fault Insertion

The ProDAQ 6140 can be used to create a number of hardware fault conditions commonly used in hardware fault insertion testing for mission critical systems where such fault conditions must lead to a known, deterministic response. Simply by opening one of the “X” or “Y” relays will simulate a broken wire condition, whereas the bussed lines again can be used to short channels to ground, against each other or to a certain potential.



3202-AA Volt. Reference

- The **ProDAQ 3202 Voltage Reference Card** is an option for the ProDAQ 3180 VXIbus Motherboard and the ProDAQ 6100 Series LXI Devices.

  The ProDAQ 3202 features a high-precision voltage source for 10 V, which is then divided down using high-precision dividers to generate reference voltages from ±9 V to ±4.5 mV. It features a temperature sensor to further enhance its except-ional initial temperature stability of 2 ppm/°C. The generated voltage is distributed differentially to avoid any noise pick-up.

About Fault Insertion

- **Hardware Fault Insertion** (also known as fault injection) is used in Data Acquisition and Control Systems, Hardware-in-the-Loop Systems and similar applications to create fault situations typically created by hardware failures such as broken wires, short to ground, shorts between channels etc. It is mainly used when it is imperative to have a known and deterministic response to such a failure like for example in systems where a loss of control capabilities would damage the DUT and/or endanger operators.

This datasheet (Rev. 1.2) is copyright of Bustec Ltd. All trademarks and registrations are acknowledged. The technical information herein is subject to change without notice.