Switch Path Manager Signal Routing Software from Pickering Interfaces

When programming one of our switch modules as part of an automated test system, the software driver is typically applied within an Application Programming Interface (API) such as LabVIEW[™], C or .NET. Simple CLOSE and OPEN commands operate the specific relays required to set a signal path between, for example, a Digital Multimeter (DMM) and the Device Under Test (DUT).

Selecting the correct relays to operate, however, requires a detailed understanding of the switch modules and the test system interconnections. Care must also be taken to avoid unintended short-circuits, and the switch programming becomes increasingly complicated as the system complexity rises.



Our signal routing software, **Switch Path Manager (SPM)**, takes a different approach. SPM replaces any complexity of Pickering switching system with a "Virtual Switch Box", as illustrated below. Simply specifying the DMM and DUT points to be connected (e.g., Connect (DMM+, R3a) is all that is then needed to achieve the required signal routes, with no chance of any accidental short-circuits.



Four Steps to Simple Signal Routing using Switch Path Manager

Consider the following switching system example of two interconnected Pickering switch modules:



Step 1

Auto-detect the modules within the network and define the virtual instrument names.

🖼 Modules										
🕂 Add 🛛 🔚 Replace 🕀 Auto-Detect	«	🗸 Apply	/ 」 Duplicat	e 🚎 Remove	Remove all 🛛 🕌 Driver On	'Off 🚇 All Drivers On/Off				
1880										
Pickering Interfaces Digital IO		ç	Active	Instrument Type	Device 🛆	Virtual Instrument Name	Unit	Driver Init	Interface	Address
PI-LXI-Chassis	1	► 1	✓	PI-LXI-Chassis	LXIChassis-> Chassis1	LXIChassis	1	✓	LXI Chassis	LXICHASSIS::192.168.2.106
Precision Resistor Switch Module		2	✓	PIM40-510-021	matrix-> Module1	matrix	1	✓	LXI Chassis Module	LXI::LXIChassis[1]::PXI:1:2
 ● PIM40-100-001 ● PIM40-110-021 		3	•	PIM40-635-009	mux->Module1	mux	1		LXI Chassis Module	LXI::LXIChassis[1]::PXI:1:1

Step 2

Detail the module interconnections.

From Pin	To Pin
mux -> Module1 :: MUX1_1.1	matrix -> Module1 :: Y1 = [bus1]
mux -> Module1 :: MUX1_2.1	matrix -> Module1 :: Y3 = [bus3]
mux -> Module1 :: MUX2_1.1	matrix -> Module1 :: Y2 = [bus2]
mux -> Module1 :: MUX2_2.1	matrix -> Module1 :: Y4 = [bus4]



Step 3

Define the required Signal Endpoints.

Connector	Endpoint Name
MUX-> MODULE1::MUX1_C1	A
MUX->MODULE1::MUX2_C1	В
MATRIX-> MODULE1::X2	С
MATRIX-> MODULE1::X4	D
MATRIX-> MODULE1::X6	E

STEP 4

Connect and Disconnect the Signal Endpoints as required.

For example, to connect Endpoints A, B and C together would simply require the following commands: C Function: SPM_Switch_ConnectEndpointsCsv ("A", "B, C");



The result is as follows:



One simple SPM statement controls four relays automatically with no software driver or detailed switch module knowledge required.



Switch Path Manager Signal Routing Software

- Manages Complex Switching Systems
- Reduces Switching Software Development Effort
- Debug Monitor and Manual Control Capability
- Supports all Pickering PXI, LXI and PCI Switching
- APIs available for C, C++, .NET, LabWindows™/CVI and LabVIEW™
- Windows 32-bit or 64-bit Compatible
- Free 90-Day Evaluation License
- Provides Switching Safety Features, including Short Circuit Detection and Endpoint Protection:



Short Circuit Detection avoids shorting the yellow path with the green path when trying to apply the red path via the 2-pole relay.

Endpoint Protection prevents accidental connection of critical nodes such as Power and Ground. (Y1, X2, X3) and (X5, X6, X7) are attributed to different Protection Groups in SPM. The software will not allow pins in different groups to be connected together.



Direct Sales & Support Offices

Pickering Interfaces Inc., USA Tel: +1 781-897-1710 | e-mail: ussales@pickeringtest.com

Pickering Interfaces Ltd., UK Tel: +44 (0)1255-687900 | e-mail: sales@pickeringtest.com

Pickering Interfaces Sarl, France Tel: +33 9 72 58 77 00 | e-mail: frsales@pickeringtest.com

Pickering Interfaces GmbH, Germany Tel: +49 89 125 953 160 | e-mail: desales@pickeringtest.com

Pickering Interfaces AB, Sweden Tel: +46 340-69 06 69 | e-mail: ndsales@pickeringtest.com

Pickering Interfaces s.r.o., Czech Republic Tel: +420 558 987 613 | e-mail: desales@pickeringtest.com

Pickering Interfaces, China Tel: +86 4008-799-765 | e-mail: chinasales@pickeringtest.com

Pickering Interfaces, Malaysia Tel: +60 12 833 7980 | e-mail: aseansales@pickeringtest.com

Local Sales Agents in Australia, Belgium, Canada, China, India, Indonesia, Israel, Italy, Japan, Malaysia, Netherlands, New Zealand, Philippines, Singapore, South Africa, South Korea, Spain, Taiwan, Thailand, Turkey, Vietnam and throughout the USA.

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