- **Up to 4 Channels of 5/6-Wire LVDT/RVDT or Resolver, or 8 Channels of 4-Wire LVDT/RVDT Simulation**
- **Input & Output Isolation Transformers**
- **Measurement & Display of Each Input Frequency & Amplitude**
- **Wide Operational Frequency Band**
- **External or Internal Excitation**
- **Independent or Shared Excitation Signal to Each Channel**
- **Programmable phase delay**
- **Open & Short Circuit Simulation on Inputs & Outputs**
- **VISA, IVI & Kernel Drivers Supplied for Windows Including Soft Front Panel**
- **Supported by PXI or LXI Ethernet Chassis**
- **Customization Available**
- **3 Year Warranty**

The 41-670 is ideal for the simulation of variable differential transformers (VDT), both linear (LVDT) and rotary (RVDT) types as well as resolvers. Available with up to four banks, each bank is capable of simulating the output of a single 5 or 6-wire VDT or resolver, or dual 4-wire utilising a shared excitation signal. This allows the module to simulate up to 4 channels of 5 or 6-wire, or 8 channels of 4-wire.

Each VDT bank has an independent excitation input, as well as the ability to use an internally generated excitation signal. The module also has the ability to take a single input and distribute to all banks, reducing the load on the source and easing cabling. Due to the use of transformers, each input and output is galvanically isolated.
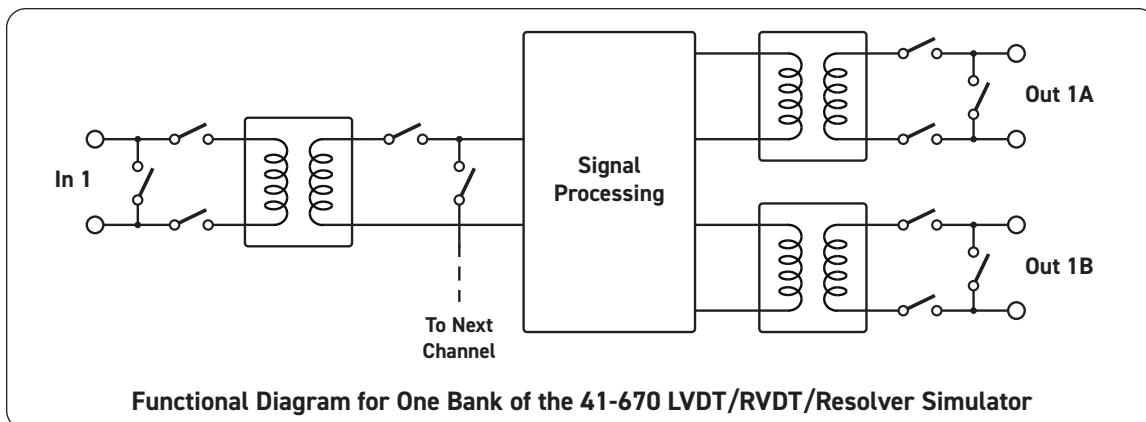
The 41-670 is designed for a wide band of excitation frequencies, with 300Hz to 20kHz as standard, while also offering input voltages up to 38V and output voltages up to 31V. Each excitation input frequency and amplitude can also be independently read back.

The phase relationship between the input and output signals is automatically adjusted to lag one cycle, the result of which means the phase delay can be negated. In applications where this is not acceptable, one of the outputs can be used to propagate the input signal resulting in an in phase signal with the output which can then be used for demodulation.

With the addition of built in relays, the 41-670 can also provide short or open circuits for each channel's inputs and outputs, reducing the need for external switching for fault insertion requirements. The programmable phase delay can also be used for simulating imperfect sensors and cabling, artificially offsetting a single or multiple outputs.

The output amplitude is programmed using a number of options, these include Vsum and Vdiff when operating in 5/6 wire, percentage displacement and independent voltage outputs. Vsum can be set as an absolute value or relative to the input amplitude. Phase relationship is controlled via a programmable propagation delay.

Additionally, the module can be programmed with an actuator response, meaning rather than going from one position to the next directly, it can change at a constant rate defined by the user.

Functional Diagram for One Bank of the 41-670 LVDT/RVDT/Resolver Simulator

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Specification

Number of Channels	Up to 8 channels for 4-wire LVDT/RVDT, 4 channels for 5/6-wire LVDT/RVDT/Resolver

Excitation Input Characteristics		-01xxxx	-02xxxx	-03xxxx	-04xxxx	-05xxxx
		Module Version's Part Number Suffix				
Voltage	Min	0.25Vrms	0.5Vrms	1Vrms	2.7Vrms	5.2Vrms
	Max	1.8Vrms	3.6Vrms	7.2Vrms	19Vrms	38Vrms
Frequency	Min	300Hz				
	Max	20kHz				

Output Characteristics		-xxxx01	-xxxx02	-xxxx03	-xxxx04	-xxxx05
		Module Version's Part Number Suffix				
Voltage	Min	0.45Vrms	0.9Vrms	1.8Vrms	3.5Vrms	7Vrms
	Max	1.8Vrms	3.8Vrms	7.7Vrms	15.5Vrms	31Vrms
Update Rate		50kHz (single channel)*				
Precision Setting Resolution		16bit (degrading to 1% @20kHz)				
In-Out Delay		<20µs				
Programmable Delay Offset		555ns (3.5ms max)				

*The output sample rate is 360kHz, the rate at which successive commands can be sent is dependent on the host system.

Power Requirements

+3.3V	+5V	+12V	-12V
0.15A	1.5A	0.15A	0.15A

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
3D models for all versions in a variety of popular file formats are available on request.

Module weight: 340g

Connectors

PXI bus via 32-bit P1/J1 backplane connector.

Front panel signal connector: 50-pin male D-type

Operating/Storage Conditions

Operating Conditions

Operating Temperature:	0°C to +55°C
Humidity:	Up to 90% non-condensing
Altitude:	5000m

Storage and Transport Conditions

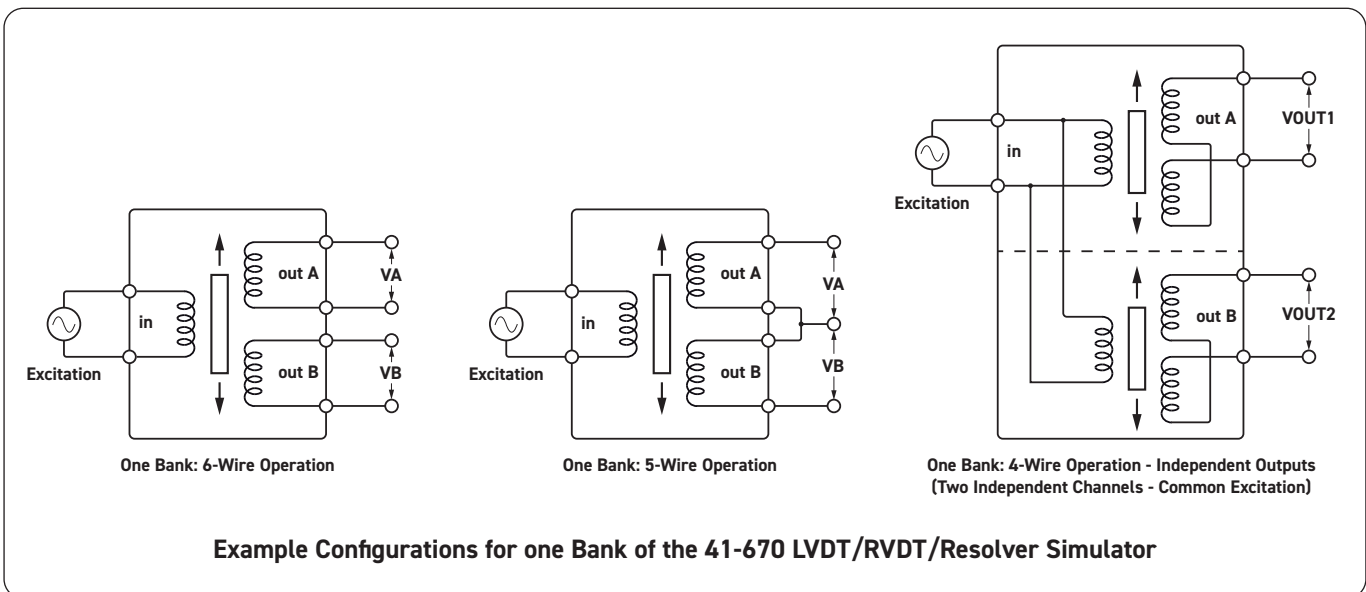|	
Storage Temperature:	-20°C to +75°C
Humidity:	Up to 90% non-condensing
Altitude:	15000m

PXI & CompactPCI Compliance

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented.

Uses a 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2010, EMC Immunity EN61326-1:2013, Emissions EN55011:2009+A1:2010.

One Bank: 6-Wire Operation

One Bank: 5-Wire Operation

One Bank: 4-Wire Operation - Independent Outputs
(Two Independent Channels - Common Excitation)

Example Configurations for one Bank of the 41-670 LVDT/RVDT/Resolver Simulator

Product Order Codes

PXI LVDT/RVDT/Resolver Simulator Module	41-670-XYZ-AABBCC

Note: This module is also available in PXIe versions, please contact the factory for details.

Product Order Code - Key

X = Functionality	**0** = LVDT/RVDT/Resolver **1** = LVDT/RVDT only **2** = Resolver only
Y = Reserved	**0**
Z = Density	**1** = 4 banks **3** = 2 banks
AA = Input Voltage Range	**01** = 1.8V **02** = 3.6V **03** = 7.2V **04** = 19V **05** = 38V
BB = Reserved	**00**
CC = Output Voltage Range	**01** = 1.8V **02** = 3.8V **03** = 7.7V **04** = 15.5V **05** = 31V

Example Part Numbers:

41-670-001-020002
(LVDT/RVDT/Resolver Simulator with 4-Banks, 3.6V Input, 3.8V Output)

41-670-001-030003
(LVDT/RVDT/Resolver Simulator with 4-Banks, 7.2V Input, 7.7V Output)

41-670-001-040004
(LVDT/RVDT/Resolver Simulator with 4-Banks, 19V Input, 15.5V Output)

Mating Connectors & Cabling

For connection accessories for the 41-670 module please refer to the 90-005D 50-pin D-type Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Product Customization

Pickering PXI modules are designed and manufactured on our own flexible manufacturing lines, giving complete product control and enabling simple customization to meet very specific requirements.

All customized products are given a unique part number, fully documented and may be ordered at any time in the future. Please contact your local sales office to discuss.

Chassis Compatibility

This PXI module must be used in a suitable chassis. It is compatible with the following chassis types:

- All chassis conforming to the 3U PXI and 3U Compact PCI (cPCI) specification
- Legacy and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis
- Pickering Interfaces LXI or LXI/USB Modular Chassis

Chassis Selection Guide

Standard PXI or hybrid PXIe Chassis from any Vendor:

- Mix our 1000+ PXI switching & simulation modules with any vendor's PXI instrumentation
- Embedded or remote Windows PC control
- Real-time Operating System Support
- High data bandwidths, especially with PXI Express
- Integrated module timing and synchronization

Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

- Ethernet or USB control enables remote operation
- Low-cost control from practically any controller
- LXI provides manual control via Web browsers
- Driverless software support
- Power sequencing immunity
- Ethernet provides chassis/controller voltage isolation
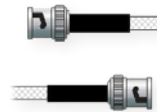- Independence from Windows operating system

Connectivity Solutions

We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules.
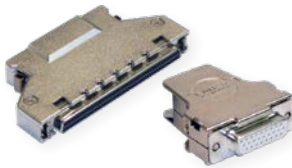
Connectors & Backshells   **Multiway Cable Assemblies**   **RF Cable Assemblies**   **Connector Blocks**

We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.
Visit: pickeringtest.com/cdt to start your design.

Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for a PXI or LXI based test system. Our modules are fully supported by both Virginia Panel and MacPanel.

Pickering Reed Relays

We are the only switch provider with in-house reed relay manufacturing capability via our Relay Division. These instrument grade reed relays feature *SoftCenter™* technology, ensuring long service life and repeatable contact performance.

To learn more, please go to: pickeringrelay.com

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Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions. For a list of all supporting operating systems, please see: pickeringtest.com/os

The VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW RT. For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **MTQ Testsolutions** Tecap Test & Measurement Suite

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help you develop test routines with ease.

To learn more about software drivers and development environments, please go to: pickeringtest.com/software

Signal Routing Software

Our signal routing software, Switch Path Manager, automatically selects and energizes switch paths through Pickering switching systems. Signal routing is performed by simply defining test system endpoints to be connected together, greatly accelerating Test System software development. To learn more, please go to: pickeringtest.com/spm
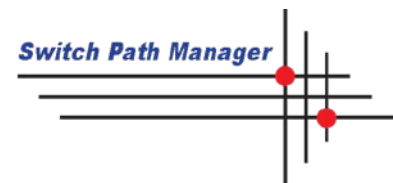
Diagnostic Relay Test Tools

eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

To learn more, please go to: pickeringtest.com/ebirst

Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for a period of three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available for all our modules and systems with various levels to suit your requirements. Although we offer a 3-year warranty as standard, we also include guaranteed long-term support—with a history of supporting our products for typically 15-20 years. To learn more, please go to: pickeringtest.com/support

Available Product Resources

We have a large library of product resources including success stories, product and support videos, articles, as well as complete product catalogs and product reference maps to assist when looking for the switching, simulation and cable and connector solutions you need. We have also published handy reference books on Switching Technology and for the PXI and LXI standards.
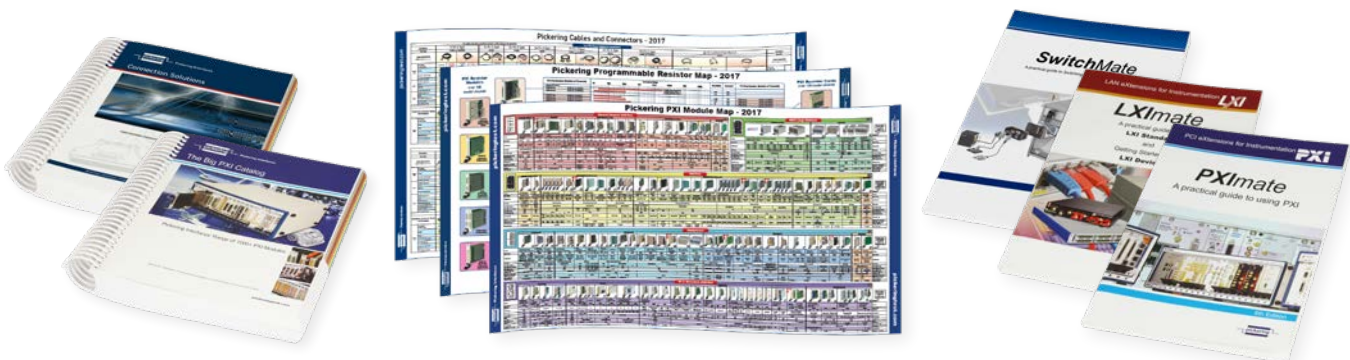
To view, download or request any of our product resources, please visit: pickeringtest.com/resources

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