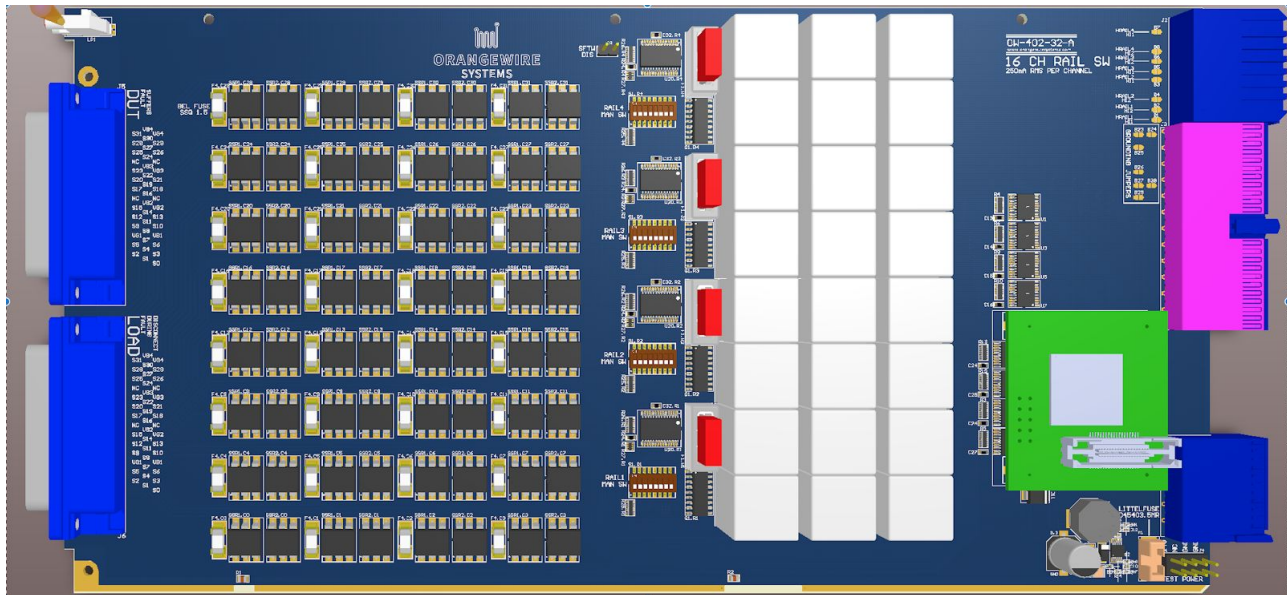# ORANGEWIRE
SYSTEMS

32 Channel Sensor and Small Load Failure Insertion Unit (FIU)

OW-402-32

Overview

The OW-402-32 is a 32-channel Failure Insertion Unit (FIU) card that provides the ability to simulate electrical faults of small loads and simulated signals with ability to support up to 1A per channel.

The OW-402-32 is designed for the National Instruments (NI) Switch Load Signal Conditioning (SLSC) system, to be used in Hardware-In-the-Loop (HIL) simulators. This card is used to test prototype or production Electronic Control Units (ECUs or generically Devices Under Test or DUTs) for the purposes of developing, verifying, and validating ECU software and hardware.

The 32 channel board has four banks of 8 channels. Each bank has a fault bus. Through software (NI Veristand, LabVIEW, TestStand), the fault bus can be connected to reference rails available on the backplane or the front panel. This allows channels to fault to primary and secondary power buses, ground, and to channels on other cards. This board may also be used for generic power switching applications.

- 32-channel FIU
- For NI SLSC system
- 250mA per channel
- 8 fault types per channel
- Switch simulated/real loads
- 0-58V operational range
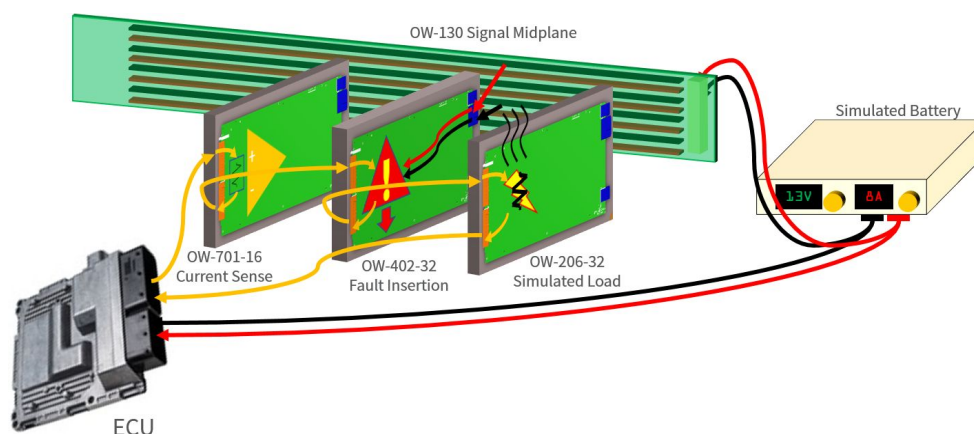- Use with NI PXI or CompactRIO

The fault states possible per channel are:

- Continuous Open Circuit
- Continuous Short Circuit to Ground (fault bus connected to ground)
- Continuous Short Circuit to Battery (fault bus connected to power)
- Continuous Short Circuit to Channel (fault bus connected to another channel)
- Intermittent Open Circuit
- Intermittent Short Circuit to Ground (fault bus connected to ground)
- Intermittent Short Circuit to Battery (fault bus connected to power)
- Intermittent Short Circuit to Channel (fault bus connected to another channel)

In addition, the OW-402-32 can input simulated load signals through the rear panel from a real-time National Instruments analog or digital source.

The OW-402-32 installs in the NI SLSC chassis and provides I/O interfacing to the DUT and loads through connectors on the front panel. It can be used with all OW load and simulation modules, or it can be connected to real devices.

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Application

The OW-402-32 is used to programmatically insert electrical failures of simulated and real loads connected to ECU outputs. The intended functionality is to simulate a diagnostics failure event and test diagnostic software functions of the ECU. Enabling a fault condition on a channel will typically be part of an overall test routine to ensure that the ECU diagnostic function recognizes the fault correctly and takes the intended remedial action.

Specifications

Absolute Max Ratings	
Load Current Through Channel	1.5A (fused)
Fault Current	2A
Voltage	60V
Rear Panel Maximum Current	1mA

General	
Number of FIU Channels	32
Voltage Range	58V
Current per Channel	1A Continuous front panel, 1mA back panel
Switching Latency	.8ms
Modes	No Fault Open Circuit Intermittent/Sustained Fail Rail Intermittent/Sustained Ground Intermittent/Sustained
Load connections	Single Load Connection
Physical	
SLSC Chassis slots required	1
DUT I/O Connector	2 HD44 connectors
Safety	
Channel Overcurrent	1.5A fuses per channel
Fault Overcurrent	5A fuse

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