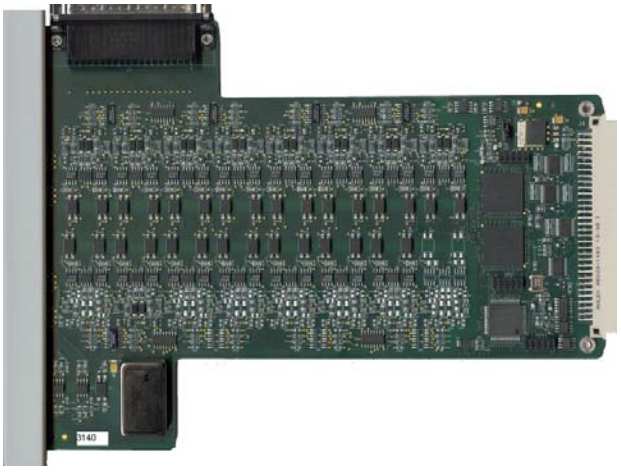
SIL-3 Fault Detecting Digital Output Card

3138/ 3139/ 3140

PRODUCT HIGHLIGHTS

- Safety/ Critical Control Applications
- 32, 24, 18 Digital Output Channels
- Line and Load checking
- Supports Source Voltages of 19 VDC 30 VDC
- Source up to 0.5 A per Channel
- Optically Isolated, Fuse Protected Outputs



3140 -18 Ch Fault Detecting Digital Output Card

PRODUCT OVERVIEW

The Fault Detecting Digital Output Card set is designed for use in safety and critical control applications. Depending upon your application's requirements, you can choose the 18, 24, or 32 channel option. The 3138, 3139, or 3140 Fault Detecting Digital Output Card can be used in any RTP3000 TAS family chassis to provide source voltages to an indicator lamp, solenoid valve, interposing relay, or any other discrete control device.

Active circuit testing provides line open and line short checking, on and off testing of FETs for stuck conditions and channel readback values. Any fault detected is reported in the integer status word for the card.

All channels are isolated from the RTP chassis ground. Voltages of 19V to 30V DC may be controlled by the output channels. Each channel can source up to 0.5 amp per channel.

When the channel is active, a positive voltage will be applied to the control device. Each channel is fuse protected by a 1.0 Amp slow active fuse located on the termination module. The MOSFET driver circuit also includes an over current detection circuit that will shut off the FET switch and report a fault if a current above 1.6 amps is detected.

The 3138 32-Channel card is rated for SIL-2 applications. The 3139 24-Channel and 3140 18-Channel cards are rated for SIL-3 applications.

The 3138 card is SIL-2 with high integrity of 32 output channels. Increased safety integrity to SIL-3 is achieved on the 3139 and 3140 cards. The 3139 cards have one safety switch per three output channels; the 3140 have two safety switches. The safety switch provides the diagnostics additional capability to de-energize the output channels in response to a fault condition or watchdog timer timeout. Diagnostics test each output channel's switch to verify operation and reports any faults detected.

RTP is the Best Technology for Your Investment,

Here's why:

The 3000 TAS is a multi-processor architecture that delivers exceptional Performance and Comprehensive Diagnostics. The results speak for themselves: A reaction time of 12 msec, true 1 msec SOE (Analog and Digital), an MBTF of greater than 50000 years an MTTFS of greater than 60000 years, and a PFDavg of $5x10^{-5}$. ***Compare these numbers to any other system.***

Built-in proof test diagnostics means it will never be necessary to shut down at the proof test interval. Unlimited online downloads of logic and configuration changes do not require a periodic shut down like other systems. ***Compare this functionality to any other system.***

NetSuite Software: One-time price includes unlimited use of Logic Development, Alarm Manager, Data Archive and Historian and HMI without hardware or software keys. ***Compare this functionality and price to all other systems.***

Finally, a Safety Instrumented System (SIS) should always take the process it protects to a safe state when it is required to do so, and it should never interfere with the operation of the process at the time. ***The 3000 TAS does this better than any other system.***

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SPECIFICATIONS

3138 18-Channel Fault Detecting Digital Output Card

Safety Integrity Level	SIL 2
Number of Channels	32
Maximum open circuit voltage	30VDC
Maximum closed circuit current per channel	0.5 Amp, Fuse protected to 1.0 Amps Slow Acting Total Current for all channels not to exceed 8 Amps
Maximum power dissipation per channel	0.63 Watts
Maximum voltage drop @ 0.5 Amps	1.25 Volts
Minimum Load	6 mA (Single card), 12 mA (Dual Redundant)
Maximum Leakage Current with Outputs off	250 µA
Maximum Test Pulse Width	200 µs
Output Configuration	32 Outputs
Switching Time (off-to-on)	<175 µs
Switching Time (on-to-off)	<175 µs
Isolation from RTP system	500V AC/DC
Backplane Power	5 VDC @ 200 mA 24 VDC @ 55 mA
Field Power	19 VDC to 30 VDC, 8.2 Amps maximum
Power Dissipation	14 Watts – 48 BTU/hr
Programmable Watchdog Timer	150 msec
Hardware Watchdog Timer	0.68 to 1.4 seconds

ENVIRONMENTAL SPECIFICATIONS

Temperature range:	-20°C to +60°C, operating, -20°C to +85°C, storage
Altitude:	Operation to 10,000 feet
Humidity range:	10 to 95 % relative humidity, non-condensing

TERMINATION MODULES

3099/48-001	Single Termination Module – 32 channel, 24 VDC sourcing (breaks the positive)
3099/48-000	Dual Redundant Termination Module – 32 Channel, 24 VDC sourcing (breaks the positive)

SPECIFICATIONS

3139 24-Channel Fault Detecting Digital Output Card

Safety Integrity Level	SIL 3
Number of Channels	24
Maximum open circuit voltage	30VDC
Maximum closed circuit current per channel	0.5 Amp, Fuse protected to 1.0 Amps Slow Acting Total Current for all channels not to exceed 8 Amps
Maximum power dissipation per channel	0.63 Watts
Maximum voltage drop @ 0.5 Amps	1.25 Volts
Minimum Load	6 mA (Single card), 12 mA (Dual Redundant), 18 mA (Triplel Redundant)
Maximum Leakage Current with Outputs off	250 μA
Maximum Test Pulse Width	<300 μs
Output Configuration	24 Output Channels with 8 safety switches, one for every 3 channels
Switching Time (off-to-on)	<175 μs
Switching Time (on-to-off)	<175 μs
Isolation from RTP system	500V AC/DC
Backplane Power	5 VDC @ 200 mA 24 VDC @ 55 mA
Field Power	19 VDC to 30 VDC, 8.2 Amps maximum
Power Dissipation	14 Watts – 48 BTU/hr
Programmable Watchdog Timer	150 msec
Hardware Watchdog Timer	0.68 to 1.4 seconds

ENVIRONMENTAL SPECIFICATIONS

Temperature range:	-20°C to +60°C, operating, -20°C to +85°C, storage
Altitude:	Operation to 10,000 feet
Humidity range:	10 to 95 % relative humidity, non-condensing

TERMINATION MODULES

3099/52-001	Single Termination Module – 24 channel, 24 VDC sourcing (breaks the positive)
3099/52-000	Triple Redundant Termination Module – 24 Channel, 24 VDC sourcing (breaks the positive)

SPECIFICATIONS

3140 18-Channel Fault Detecting Digital Output Card

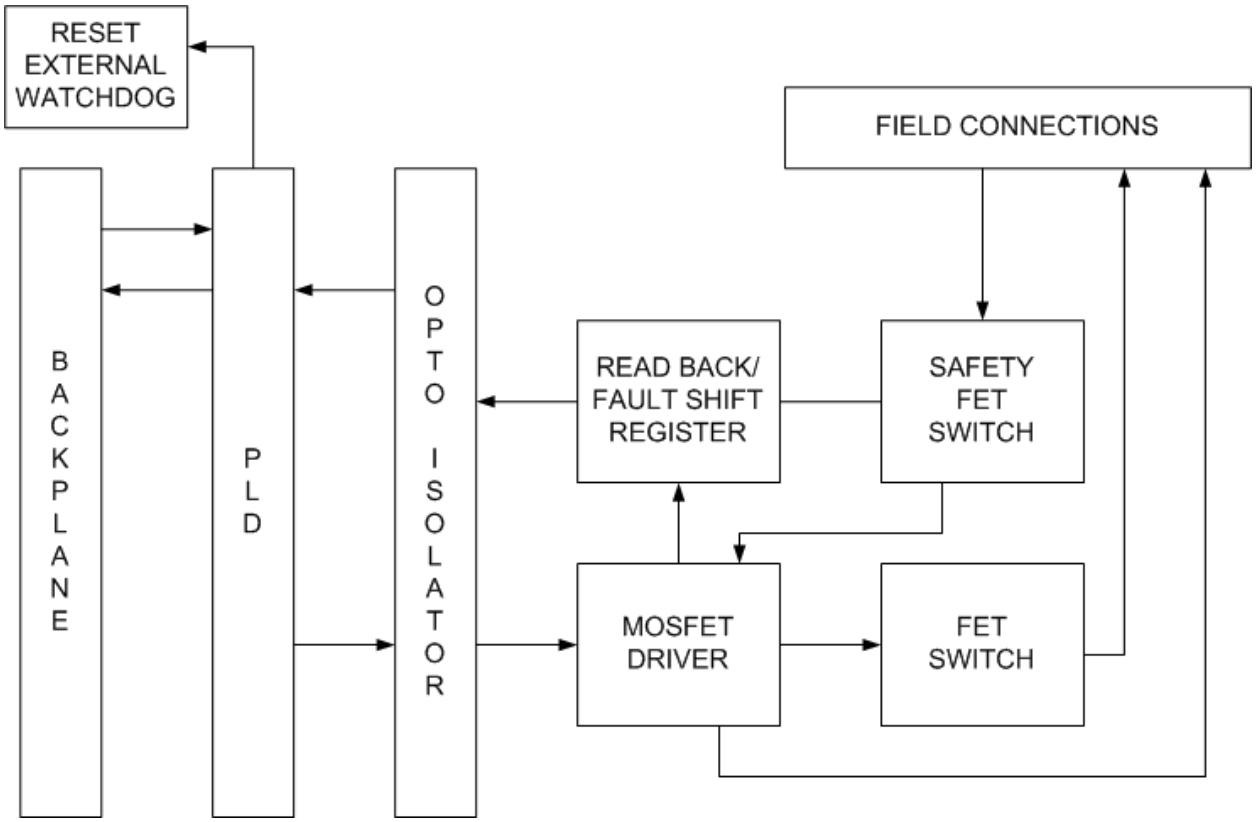
Safety Integrity Level	SIL 3
Number of Channels	18
Maximum open circuit voltage	30VDC
Maximum closed circuit current per channel	0.5 Amp, Fuse protected to 1.0 Amps Slow Acting Total Current for all channels not to exceed 8 Amps
Maximum power dissipation per channel	0.63 Watts
Maximum voltage drop @ 0.5 Amps	1.25 Volts
Minimum Load	6 mA (Single card), 12 mA (Dual Redundant), 18 mA (Triplel Redundant)
Maximum Leakage Current with Outputs off	250 μA
Maximum Test Pulse Width	300 μs
Output Configuration	18 Output Channels with 12 safety switches, two for every 3 channels
Switching Time (off-to-on)	<175 μs
Switching Time (on-to-off)	<175 μs
Isolation from RTP system	500V AC/DC
Backplane Power	5 VDC @ 200 mA 24 VDC @ 55 mA
Field Power	19 VDC to 30 VDC, 8.2 Amps maximum
Power Dissipation	14 Watts – 48 BTU/hr
Programmable Watchdog Timer	150 msec
Hardware Watchdog Timer	0.68 to 1.4 seconds

ENVIRONMENTAL SPECIFICATIONS

Temperature range:	-20°C to +60°C, operating, -20°C to +85°C, storage
Altitude:	Operation to 10,000 feet
Humidity range:	10 to 95 % relative humidity, non-condensing

TERMINATION MODULES

3099/53-001	Single Termination Module – 18 channel, 24 VDC sourcing (breaks the positive)
3099/53-000	Triple Redundant Termination Module – 18 Channel, 24 VDC sourcing (breaks the positive)



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