



SIL-3 Fault Detecting Digital Output Card

3138/ 3139/ 3140

PRODUCT HIGHLIGHTS

- Safety/ Critical Control Applications
- 32, 24, 18 Digital Output Channels
- Configurable Redundancy
Single, Dual, Triple, Quad
- Line and Load checking
- Redundant PLDs with voted Outputs
- Extensive Diagnostics

PRODUCT OVERVIEW

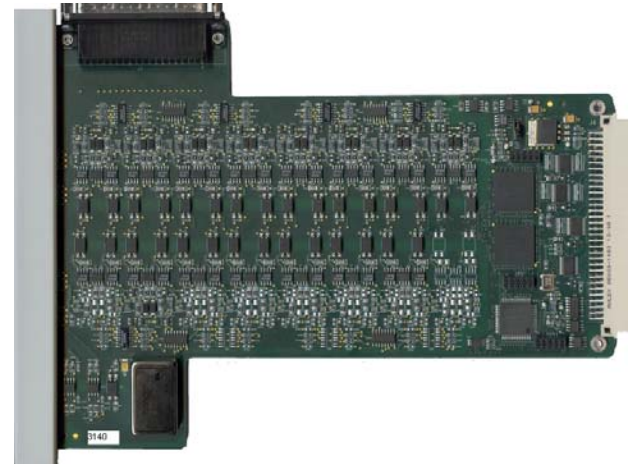
Compliant to the following standards: IEC61508:2010, IEC61511:2003, IEC61131-2, IEC61131-6, NFPA72, EN-54, NFPA85, ABS

Applications: The Fault Detecting Digital Output Card is well suited for use in safety and critical control applications, power industry, process control and rotating machinery.

Benefits: Configurable redundancy reduces costs as the redundant outputs are configured to the availability, integrity and system cost requirements. The flexible architectures allow redundant outputs to be on the same card or different cards. These cards may be placed in the same chassis or in different chassis.

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

Redundant PLDs with voted outputs. Each output channel has a switch controlled by the card's two PLDs, a "normal" PLD and an "inverse" PLD. All addressing, output data, status, and command transfers between the card and Chassis Processor are performed twice, with all the data bits in the second transfer inverted. The normal PLD receives and processes the non-inverted data, and the inverse PLD receives and processes the inverted data. Both transfers must match exactly before the PLDs will accept the data or command. One PLD drives the cathode side of the opto-isolators and the other drives the anode side of the opto-isolators. This configuration votes the outputs 1oo2. Both PLDs must send the correct command in order to activate the output switch.



3140 -18 Ch Fault Detecting Digital Output Card

Extensive diagnostics. These execute every scan to quickly diagnose and pin point faults precisely. Complete diagnostic coverage is provided from the field wiring, output channel circuits, PLDs to the backplane integrity. Temperature sensors on power supplies and on each card allow you to monitor if the system is operating inside the temperature range. Errors are reported in simple, easy to understand status messages and system logs.

RTP is the Best Technology for Your Investment, Here's Why:

The 3000 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 MTBF of greater than 50000 years, an MTTFS of greater than 60000 years, and a PFDavg of 5×10^{-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.**

Net Suite 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 any time. **The 3000 TAS does this better than any other system.**

Architecture:

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.

The FDDO card performs fault detection of the output load and field cabling: Diagnostics check for channel load faults and report open and short conditions.

Watchdog timers on the card can open all of the output channels in the event backplane communication errors persist.

Enhancements to the IO card can be accomplished quickly and easily in the field. PLD upgrades are done as a simple file download and re-start. Field updates are provided at no cost, the same as the RTP software updates.

Online repair. Never stop the process. Replace and/or re-configure the output card without shutting off power. The FDDO card is hot swappable. In a redundant system, just use NetArrays to disable the card to be replaced, remove the cable and card. Install the replacement, cable it and re-enable it in NetArrays. If adding a new channel or new card, make the configuration change in NetArrays and download the new file online. This allows existing logic and IO to continue processing undisturbed while the new logic and IO is initialized.

RTP has established a widely known reputation of manufacturing robust, quality systems that meet the latest and most rigorous standards. The Fault Detecting Digital Output cards are no exception. High performance, high availability and high integrity are all achieved in the extremely flexible design architecture. RTP is not your traditional system. RTP is the Technologically Advanced System.

Specifications:

3138/ 3139/ 3140 Fault Detecting Digital Output Cards	
Electrical:	
Safety level: 3138: 3139/ 3140:	SIL 2 SIL 3
Channels: 3138: 3139: 3140:	32 channels 24 channels 18 channels
Output Configuration 3138:	32 Outputs
Output Configuration 3139:	24 Outputs with eight safety switches, one for every three channels
Output Configuration 3140:	18 Outputs with twelve safety switches, two for every three channels
Isolation from RTP system	500V AC/DC
Maximum open circuit voltage	30VDC
Maximum closed circuit current	0.5 Amp, Fuse protected to 1.0 Amps Slow Acting
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 (Triple Redundant)
Power Requirements:	
Backplane Power	+5VDC @ 200 mA supplied by the RTP backplane
Backplane External	Not required
Field Power requirements	+19 VDC to +30 VDC, 8.2 Amps maximum
Power Dissipation	14 Watts – 48 BTU/hr

Environmental:	
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
Cooling	Forced Air Cooling not required
Termination Modules:	
3138:	3099/36-001 Single with diodes, DC only 3099/36-000 Triple redundant with diodes, DC only
3139:	3099/52-001 Single with diodes, DC only 3099/52-000 Triple redundant with diodes, DC only
3140:	3099/53-001 Single with diodes, DC only 3099/53-000 Triple redundant with diodes, DC only

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