

ControlSafe™ cIOU-DIO Module

16-port SIL4 Digital Input/Output Module for the ControlSafe™ Carborne Computer

Data Sheet

The Artesyn cIOU-DIO Module provides vital SIL4 digital input and output processing and pulse or frequency counters for the ControlSafe™ Carborne Computer.

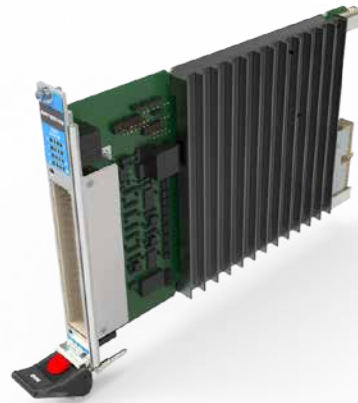
KEY FEATURES:

- 16 ports configurable as digital inputs or double-cut digital outputs
- Port status LEDs
- 24V (potential-free) inputs/ outputs
- Up to 4 ports configurable for frequency or pulse counting
- 1500V isolation
- EN 50155 compliance
- Designed to be certified to SIL4

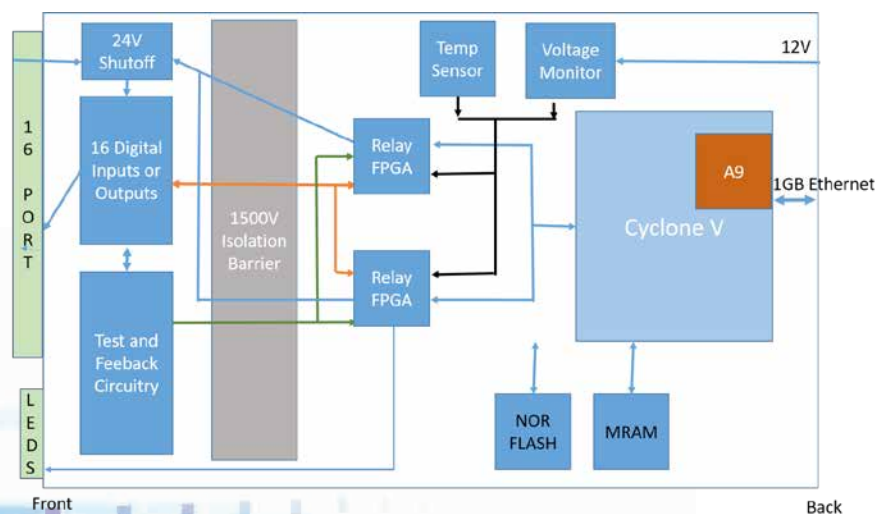
PRODUCT DESCRIPTION:

The Artesyn cIOU-DIO for the ControlSafe™ Carborne Platform provides 16 ports, which are configurable as 24V digital inputs or double cut 24V digital outputs (with integrated feedback). Up to 4 of these ports can be provisioned as frequency or pulse counters, supporting single channel (1 port) rate or continuous measurement mode, or dual channel (2 ports) up down counter mode or quadrature encoding. With front access I/O it is perfect for onboard applications such as Automatic Train Protection (ATP), Automatic Train Operation (ATO), and Positive Train Control (PTC).

This module supports Artesyn's remote management feature, which allows it to be fully provisioned and configurable by the application on the CPU module. All commands to and from the module are protected by a safety layer.



Designed to be fully certified to SIL4 according to EN 50126 for reliability, availability, maintainability and safety (RAMS) processes; EN 50128 for safety-related software; and EN50129 for safety-related electronic systems; and fully EN 50155 compliant with long term availability.



Technical Specifications

Non-Vital Supervisory Processor	Altera Cyclone V SoC with single ARM Cortex-A9	
Vital DI/DO FPGAs	MAX10 + Cyclone V E (2o02)	
Operating System	Linux 4.9	
Software Support	Application development and runtime software / firmware package. Includes: <ul style="list-style-type: none"> • Bootloader / POST binaries for Module, FPGAs, CPU Core • Linux binaries providing DIO<->ETH command/status protocol forwarding, supervisory, maintenance, and configuration functions • FPGA load images providing redundant, 2o02 Vital processing of all sensor input and command output • CPU API libraries for remote configuration / management of DIO • CPU API libraries for encoding / decoding DIO commands / responses • Safety layer protocol for all CPU<->DIO Ethernet communication 	
Memory	512 MB DDR3 with ECC support	
Flash	2 x 64MB NOR	
MRAM	1 x 512KB MRAM	
EEPROM	1 x 8KB	
Maintenance Ports	RS-232 onboard header	
Data Fabric	1 GigE link to backplane	
8 Front Ports	Port 0-7	24V digital in
8 Front Ports	Port 8-15	24V digital in or 24V digital output (high and low side switched) up to 4 digital inputs can be configured as single chl or 2 dual chl frequency counters (up to 10Khz)
Port Isolation	1500V	
Module Management	Voltage and temperature sensors	
Operating Temperature	-40 °C to 50 °C	In open rack or other environment with low impedance to convection cooling
	-40 °C to 70 °C	With a required airflow measured at the intake to the bottom of chassis; or with an optional integrated fan cooling solution
Power	12V@~8W typical	
Vibration	Compliant with EN 61373, Category 1, Class B (EN 50155 12.2.11)	
Shock	Compliant with EN 61373, Category 1, Class B (IEC 60068-2-27)	
Conformal Coating	ST1 rating for EN 50155 Section 12.2.10 (Salt Mist Test)	
Standards	Designed in accordance with EN50121, EN50124, EN50155, EN50126, EN50128, EN50129, EN55024, EN60529, EN60571, IEC61508. See documentation for specific compliances.	
Safety Certificates	Designed to be fully certified to SIL4	

SOLUTION SERVICES

Artesyn Embedded Technologies provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24x7 technical support. Renewal services enable product longevity and technology refresh.

WORLDWIDE OFFICES

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