Analog Output Modules

An analog output (AO) module receives output signals from the main processor module on each of three channels. Each set of data is then voted and a healthy channel is selected to drive the eight outputs. The module monitors its own current outputs (as input voltages) and maintains an internal voltage reference to provide self-calibration and module health information.

Each channel on the module has a current loopback circuit which verifies the accuracy and presence of analog signals independently of load presence or channel selection. The module's design prevents a non-selected channel from driving an analog signal to the field. In addition, ongoing diagnostics are performed on each channel and circuit of the module. Failure of any diagnostic deactivates the faulty channel and activates the Fault indicator, which in turn activates the chassis alarm. The module Fault indicator merely indicates a channel fault, *not* a module failure. The module continues to operate properly with as many as two channels failed. Open loop detection is provided by a LOAD indicator which activates if the module is unable to drive current to one or more outputs.

The module provides for redundant loop power sources with individual power and fuse indicators called PWR1 and PWR2. External loop power supplies for analog outputs must be provided by the user. Each analog output module requires up to 1 amp @ 24-42.5 volts. A LOAD indicator activates if an open loop is detected on one or more output points. PWR1 and PWR2 are on if loop power is present. The 3806E High Current (AO) module is optimized for turbomachinery applications.

Analog output modules support hot-spare capability which allows online replacement of a faulty module.

The analog output module requires a separate external termination panel (ETP) with a cable interface to the Tricon backplane. Each module is mechanically keyed to prevent improper installation in a configured chassis.

Model Number	**3805E**	**3806E**
Type	TMR	TMR
Output current range	4-20 mA output (*+6% overrange)*	4-20 mA and 20-320 mA
Number of output points	8	6 (4-20 mA); 2 (20-320 mA)
Isolated points	No, commoned return, DC coupled	No, commoned return, DC coupled
Resolution	12 bits	12 bits
Output Accuracy	<0.25% (in range of 4-20 mA) of FSR (0-21.2 mA), from 32° to 140° F (0° to 60° C)	<0.25% (in range of 4-20 mA) of FSR (0-21.2 mA and 0-339.2 mA), from 32° to 140° F (0° to 60° C)
External loop power (reverse voltage protected)	+42.5 VDC, maximum +24 VDC, nominal	+42.5 VDC, maximum +24 VDC, nominal
Output loop power requirements		Max. load Vx external loop voltage
Load (Ohms)	Loop power required	*4-20 mA* *16-320 mA*
250	> 20 VDC (1 amp minimum)	20 VDC ≤ 275 ≤15
500	> 25 VDC (1 amp minimum)	24 VDC ≤ 475 ≤25
750	> 30 VDC (1 amp minimum)	28 VDC ≤ 650 ≤40
1000	> 35 VDC (1 amp minimum)	32 VDC ≤ 825 ≤50
Over-range protection	+42.5 VDC, continuous	< +42.5 VDC
Switch time on leg failure	< 10 ms, typical	< 10 ms, typical
Diagnostic Indicators		
Module status (one each per module)	PASS, FAULT, ACTIVE, LOAD, PWR1, PWR2	PASS, FAULT, ACTIVE, LOAD, PWR1, PWR2
Color code	Pea Green	Light Green