Analog Output Modules

This section describes the Analog Output Modules available for use with Tricon v9–v11 systems. For installation instructions, see Replacing I/O Modules on page 293.

Table 24 Analog Output Modules

Model	Module Description	Output Current	Type
3805E/H	Analog Output	8 outputs @ 4–20 mA	TMR
3806E	Analog Output	2 outputs @ 20–320 mA 6 outputs @ 4–20 mA	TMR
3807	Bipolar Analog Output	4 outputs @ –60 to +60 mA	TMR

Analog Output Modules receive output signals from the Main Processors on each of three channels. Each set of data is voted, and a healthy channel is selected to drive the outputs. The module monitors its own current outputs (as input voltages) and maintains an internal voltage reference that provides self-calibration and module health information.

Each channel on an Analog Output Module has two independent current loopback circuits per point that are readable by the other channels. The information from these circuits is used as part of the hardware voting process. The first circuit verifies the accuracy and presence of the analog signal for each point, independent of the load presence or channel selection. The second circuit verifies the actual current flow for each point from the selected channel. If a current flow is detected from any point on a non-selected channel, that channel is immediately shutdown. The Load alarm status indicator is annunciated if the module cannot drive current from any point—for example, open load.

Analog Output Modules provide for the connection of redundant field loop power sources with individual indicators on the module called Pwr1 and Pwr2. Field loop power supplies for analog outputs must be provided externally. Connection of the field loop power supplies is made on the termination panel. A Status indicator activates if an open loop is detected on one or more output points. The Pwr1 and Pwr2 indicators are On if loop power is present.

Each module sustains complete and ongoing diagnostics for each channel. Failure of any diagnostic test on any channel activates the module Fault status indicator and the chassis alarm signal. The Fault status indicator points to a channel fault, *not* a module failure. The module is guaranteed to operate properly in the presence of a single fault and may continue to operate properly with multiple faults.

Analog Output Modules include the hot-spare feature, which allows online replacement of a faulty module. Like all I/O modules, Analog Output Modules require a separate field termination assembly with a cable interface to the Tricon controller backplane. Each module is mechanically keyed to prevent improper installation in a configured chassis.

Analog Output Schematic

This figure is a simplified schematic for Models 3805E, 3805H, and 3806E TMR Analog Output Modules.

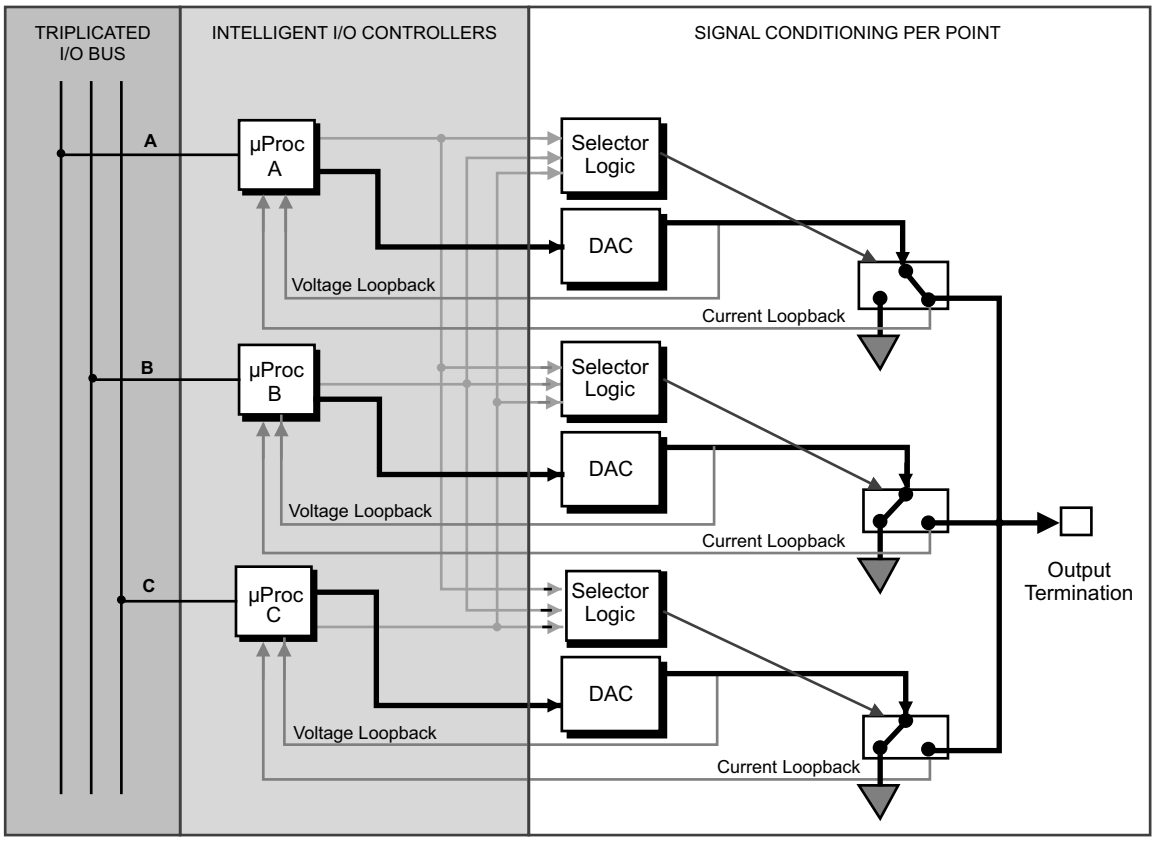

Figure 31 3805E, 3805H, and 3806E Simplified Schematic

Analog Output Front Panels

This figure shows the front panels of Models 3805E, 3805H, 3806E, and 3807.

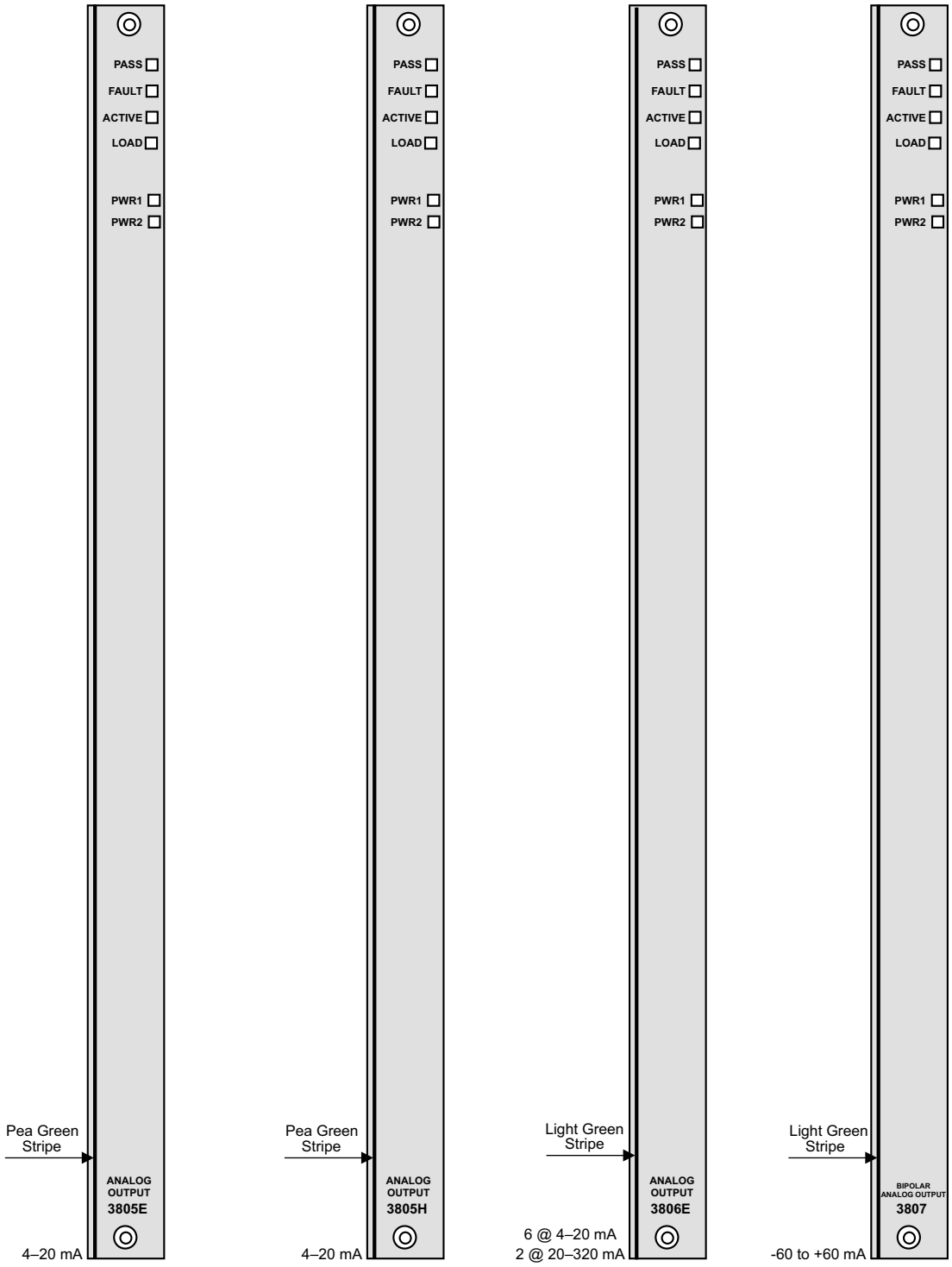

Figure 33 3805E, 3805H, 3806E, and 3807 Front Panels

3806E Specifications

This table lists the specifications for the Model 3806E TMR Analog Output Module.

Table 26 3806E Analog Output Specifications

Feature	Specification
Color code	Light green
Number of output points	6 outputs @ 4–20 mA 2 outputs @ 20–320 mA, commoned return, DC-coupled
Resolution	12 bits
Recommended operating voltage range	24–32 VDC, 3 amp minimum
Extended operating voltage range	20–36 VDC, 3 amp minimum
Over-voltage protection	< 42.5 VDC continuous
Points 2-4 and 6–8, 4–20 mA output:	
Output current range	4–20 mA
Output over-range capability	2–21.2 mA (+6% over-range)
Output accuracy	< 0.25% (in normal range of 4–20 mA) of FSR (2–21.2 mA), from 32° to 140° F (0° to 60° C)
Maximum load vs. external loop voltage (See Figure 28 on page 68 for more information on these specifications)	≤ 275 Ω @ 20 VDC ≤ 475 Ω @ 24 VDC ≤ 650 Ω @ 28 VDC ≤ 825 Ω @ 32 VDC
Points 1 and 5, 20–320 mA output:	
Output current range	20–320 mA
Output over-range capability	20–339.2 mA (+6% over-range)
Output accuracy	< 0.25% (in normal range of 20–320 mA) of FSR (20–339.2 mA), from 0° to 60° C
Maximum load vs. external loop voltage	≤ 15 Ω @ 20 VDC ≤ 25 Ω @ 24 VDC ≤ 40 Ω @ 28 VDC ≤ 50 Ω @ 32 VDC
External loop power (reverse voltage protected)	+42.5 VDC maximum; +24 VDC nominal