MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

TRICONEX

3806E

HIGH-CURRENT TMR ANALOG OUTPUT MODULE

Selected official pages follow this cover with source pagination retained.

REFERENCE PACKAGE

Source: Planning and Installation Guide for Tricon v9-v10 Systems

OFFICIAL MANUFACTURER DOCUMENT

Assembly 9700077-012

Analog Output Modules

This section describes the Analog Output Modules available for use with Tricon v9–v10 systems. For installation instructions, see Replacing I/O Modules on page 223.

Table 18 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 the 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.

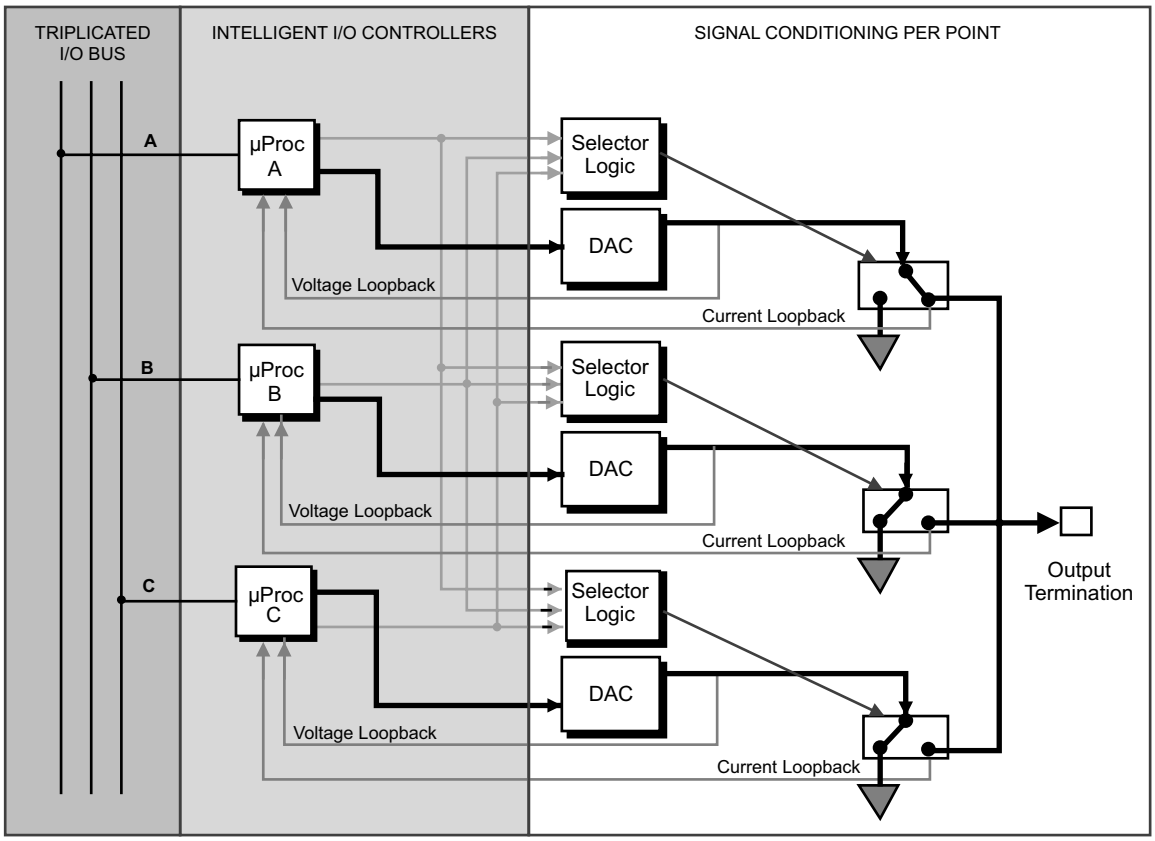

Figure 25 3805E, 3805H, and 3806E Simplified Schematic

Analog Output Front Panels

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

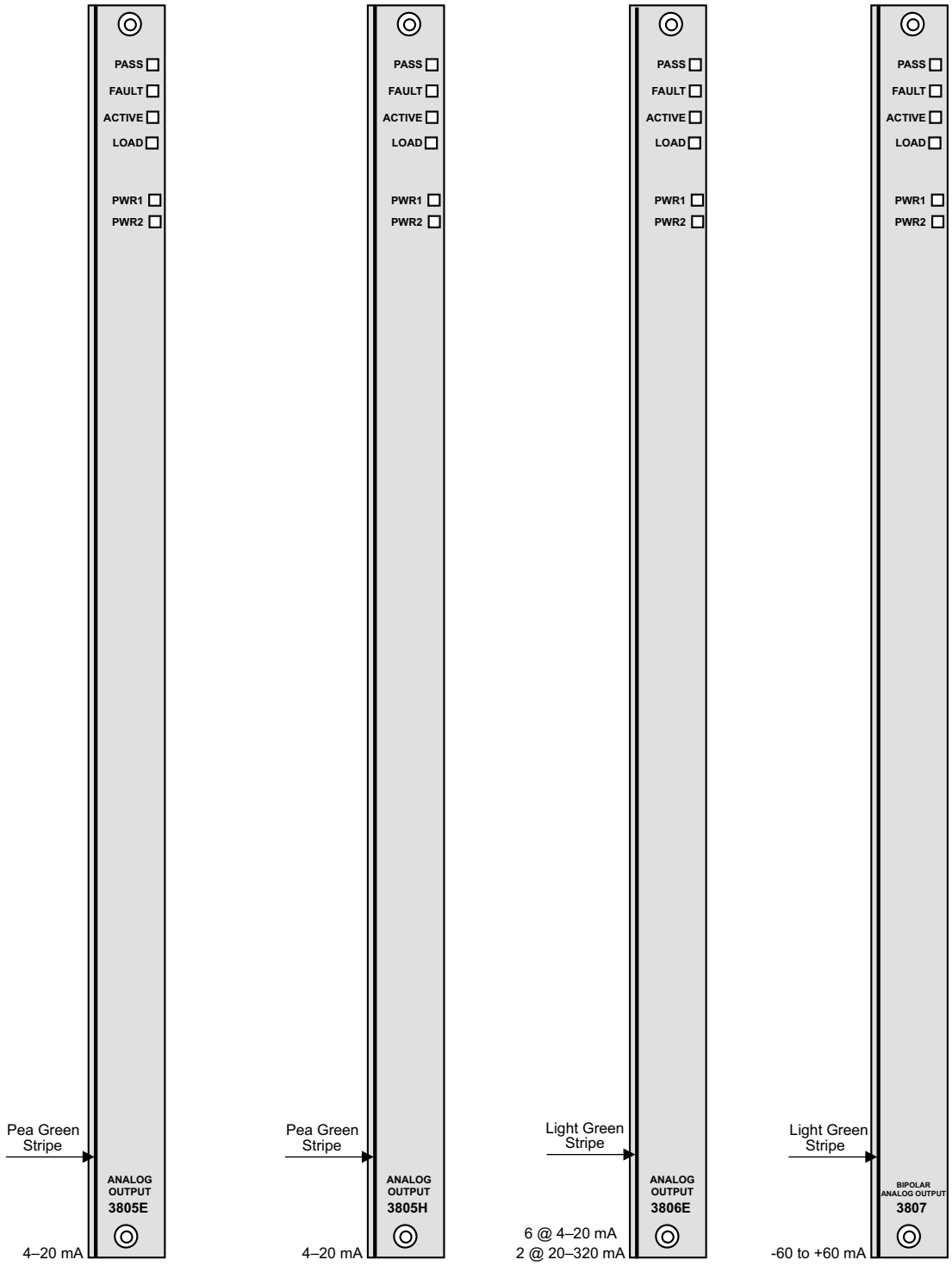

Figure 27 3805E, 3805H, 3806E, and 3807 Front Panels

3806E Specifications

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

Table 20 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 0° to 60° C
Maximum load vs. external loop voltage	≤ 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
Temperature de-rating vs. total output current vs. loop voltage	
836 mA (all points @ maximum over-range output), 32 VDC loop voltage	≤ 104° F (≤ 40° C), ambient (measured at bottom of chassis)
836 mA (all points @ maximum over-range output), 28 VDC loop voltage	≤ 126.5° F (≤ 52.5° C), ambient (measured at bottom of chassis)

Table 20 3806E Analog Output Specifications *(continued)*

Feature	Specification
836 mA (all points @ maximum over-range output), 24 VDC loop voltage	≤ 140° F (≤ 60° C), ambient (measured at bottom of chassis)
774 mA (sum of all points), 28 VDC loop voltage	≤ 140° F (≤ 60° C), ambient (measured at bottom of chassis)
760 mA (all points @ maximum output), 28.5 VDC loop voltage	≤ 140° F (≤ 60° C), ambient (measured at bottom of chassis)
677 mA (sum of all points), 32 VDC loop voltage	≤ 140° F (≤ 60° C) C, ambient (measured at bottom of chassis)
602 mA (sum of all points), 36 VDC loop voltage	≤ 140° F (≤ 60° C), ambient (measured at bottom of chassis)
Status indicator: Module status	Pass, Fault, Active, Load
Status indicator: Loop power status[1]	Pwr1, Pwr2
Output diagnostic fault coverage: Minimum input change Output change sample period Minimum period of mis-compares	 Not applicable Not applicable Not applicable
Switch time upon channel fault	10 ms (typical), 20 ms maximum
Logic power	< 15 watts

1. The loop-power detectors which drive the Pwr1 and Pwr2 indicators identify the presence of loop power (greater than 20 VDC), and do not verify adequate loop power for the attached load.

Table 74 I/O and Communication Module Slot Keys *(continued)*

Model	Module Name	Top Key	Bottom Key
3624	24 VDC Supervised Digital Output (TMR)	005	004
3625	24 VDC Supervised or Non-Supervised Digital Output (TMR)	006	007
3664/3674	24 VDC Digital Output (Dual)	006	007
3636R	Relay Output, N0 (SIMPLEX)	006	002
3700	0–5 VDC Analog Input (TMR)	003	004
3700A	0–5 VDC Analog Input (TMR)	003	006
3701	0–10 VDC Analog Input (TMR)	003	003
3703E	0–5, 0–10 VDC Isolated Analog Input (TMR)	005	006
3704E	0–5, 0–10 VDC High Density Analog Input (TMR)	006	008
3706A	Non-Isolated Thermocouple Input (TMR)	003	002
3708E	Isolated Thermocouple Input (TMR)	005	007
3720	0–5 VDC Single-Ended Analog Input (TMR)	006	008
3721	0 to 5 or -5 to +5 VDC Differential Analog Input (TMR)	003	004
3805E/H	4–20 mA Analog Output (TMR)	003	008
3806	6 outputs @ 4–20mA, 2 outputs @ 8–320 mA, Analog Output (TMR)	003	008
3807	-60 to +60 mA BiPolar Analog Output (TMR)	003	008
4119	Enhanced Intelligent Communication (EICM)	001	003
4119A	Enhanced Intelligent Communication (EICM)	001	003
4200-3	Primary RXM Multi-Mode Fiber-Optic Module Set	002	003
4201-3	Remote RXM Multi-Mode Fiber-Optic Module Set	002	003
4210-3	Primary SRXM Single-Mode Fiber-Optic Module Set	002	003
4211-3	Remote SRXM Single-Mode Fiber-Optic Module Set	002	003
4329, 4329G	Network Communication (NCM) and NCMG (GPS)	001	003
4351, 4351A, 4351B, 4352, 4352A, 4352B, 4353, 4354	Tricon Communication Module (TCM)	001	003
4409	Safety Manager Module (SMM)	001	003
4509E	Hiway Interface Module (HIM)	001	004
4609	Advanced Communication Module (ACM)	001	003