

## Analog Output Term Panels

This section describes analog output term panels. Model numbers of these term panels are:

- 9863-710 (3806E module, 8 pts.)
- 9853-610 (current output, basic, 8 pts.)
- 9871-810 (3807 module, 4 pts.)

This figure represents a typical current output termination panel.

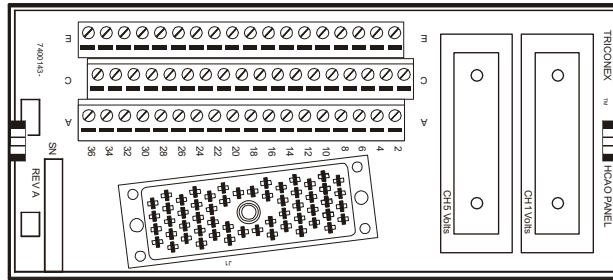


Figure 183 Typical Current Output Term Panel

This figure represents a typical basic current output termination panel.

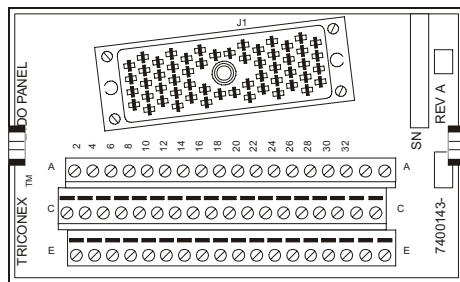


Figure 184 Typical Basic Current Output Term Panel

This figure represents a typical BiPolar Analog Output termination panel.

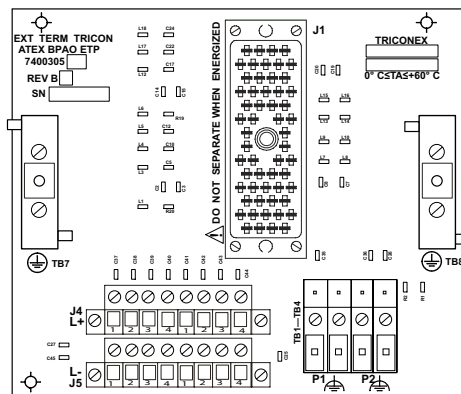


Figure 185 Typical BiPolar Analog Output Term Panel

## 9863-710 (3806E module, 8 pts.)

Termination panel 9863-710 is for use only with the 3806E analog output module. Each panel has:

- Two dual-coil 20–320 mA output terminals (OUT and RTN)
- Two 4–20 mA output terminals for monitoring dual-coil output voltages
- Two voltage/current converters
- Six 4–20 mA output terminals (OUT and RTN)
- Terminals for connecting redundant 24 VDC power supplies

### Specifications

This table describes specifications for 9863-710.

**Table 139 Specifications for Term Panel 9863-710**

Feature	Description
Panel type	Analog output
Points	8

### Compatible Modules

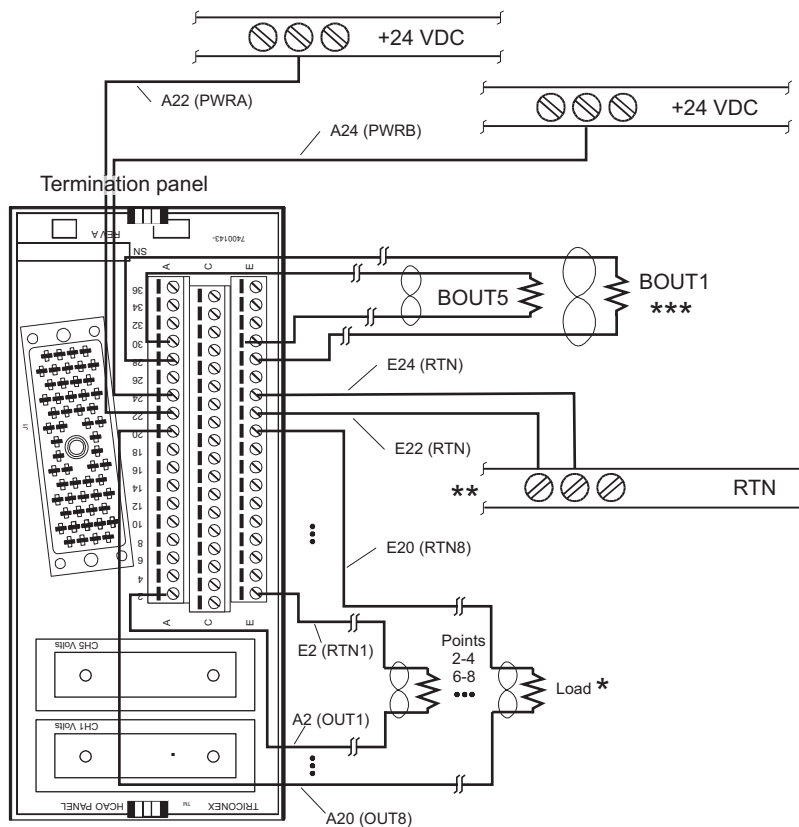
This table describes analog output modules compatible with 9863-710.

**Table 140 Modules Compatible with 9863-710**

Module Part Number	Points per Module	Module Description
3806E	8	6 4–20 mA outputs, 2 20–320 mA outputs, commoned-return, DC-coupled, TMR

## Field Wiring Diagrams

This figure illustrates how to connect 9863-710 and 4–20 mA outputs to the field. See [Figure 189 High-Current Circuits \(page 235\)](#) for how to connect to the 20–360 mA outputs.

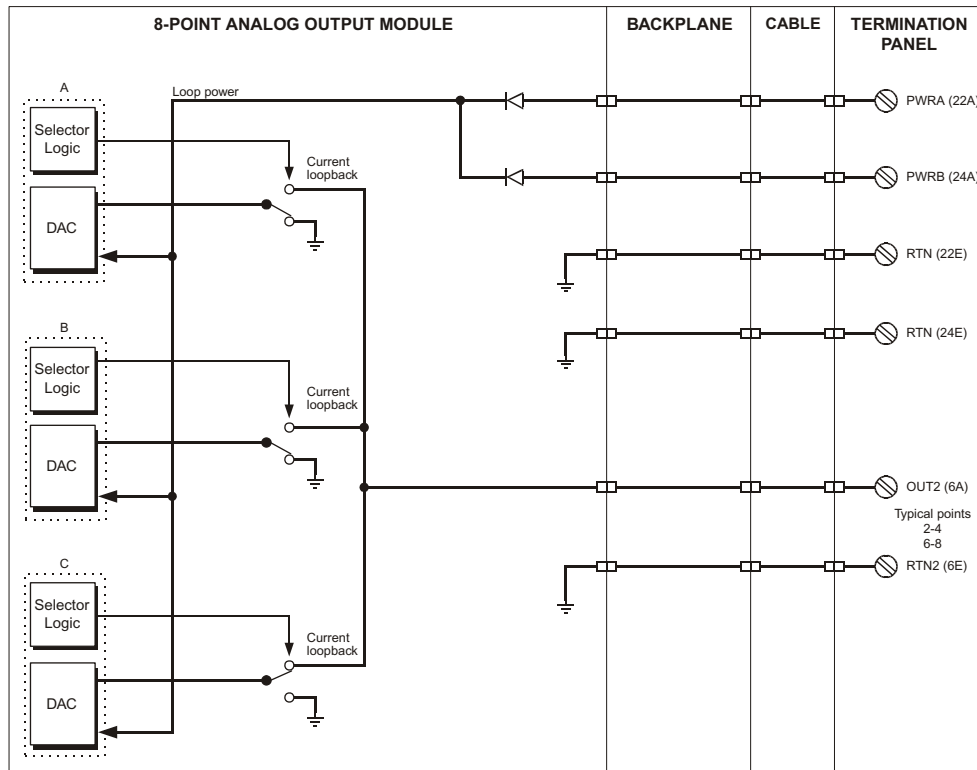


- \* A shorting jumper must be connected to each unused point.
- \*\* One RTN connection is required. More than one is okay.
- \*\*\* Typically connected to current analog input point to monitor 20–320 mA output voltages.

**Figure 186** Field Wiring for 9863-710 with a 3806E AO Module

## Simplified Schematics

This is a simplified schematic of a typical 3806E analog output module with a 9863-710 panel (1 of 8 module points shown).



**Figure 187** Simplified Schematic of 3806E AO Module with a 9863-710 Panel

## Pin-Outs

This table describes pin-outs for the 9863-710.

**Table 141 9863-710 Pin-Outs**

Label	Pin No.	Signal	Description
A2	AA	OUT1A	Channel 1A out
E2	LL	RTN1A	Channel 1A return
A4	AA	OUT1B	Channel 1B out
E4	LL	RTN1B	Channel 1B return
A6	z	OUT2	Channel 2 out
E6	EE	RTN2	Channel 2 return
A8	p	OUT3	Channel 3 out
E8	v	RTN3	Channel 3 return
A10	h	OUT4	Channel 4 out
E10	l	RTN4	Channel 4 return
A12	e	OUT5A	Channel 5A out
E12	b	RTN5A	Channel 5A return
A14	e	OUT5B	Channel 5B out
E14	b	RTN5B	Channel 5B return
A16	W	OUT6	Channel 6 out
E16	S	RTN6	Channel 6 return
A18	L	OUT7	Channel 7 out
E18	F	RTN7	Channel 7 return
A20	M	OUT8	Channel 8 out
E20	B	RTN8	Channel 8 return
A22	t	PWRA	Power A +
E22	x	RTN	Power A -
A24	j	PWRB	Power B +
E24	m	RTN	Power B -
A28		VT1+	Channel 1 V-to-I Out
E28		VT1-	Channel 1 V-to-I Return
A30		VT5+	Channel 5 V-to-I Out
E30		VT5-	Channel 5 V-to-I Return
A34	T	CGND	Chassis Ground
C34	H	CGND	Chassis Ground

**Table 141 9863-710 Pin-Outs** (continued)

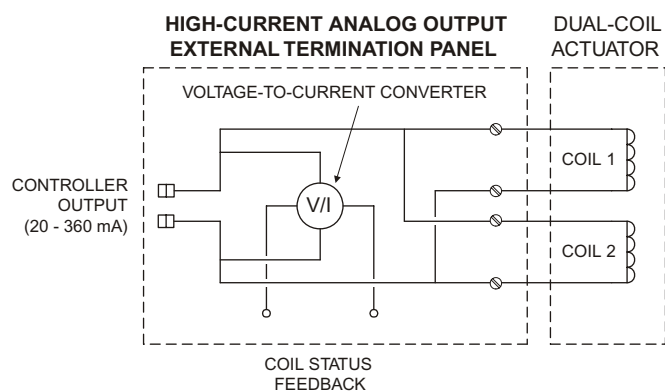
Label	Pin No.	Signal	Description
E34	w	CGND	Chassis Ground
A36	FF	CGND	Chassis Ground

**Note** CGND is the controller chassis ground (functional earth). Pins r, s, X and Y on the panel connector are not used.

## Dual-Coil Actuator

A single high-current analog output supplies the signal for both coils of the dual coil actuator. The current is divided according to the impedance of the two coils.

The power produced by the actuator coils is a function of the number of coils and the current through them. If only one coil is used, the current must double to maintain the same power.



**Figure 188** High-Current AO Termination Panel Assembly

Because the controller output is a constant current, failure of one coil diverts all the current through the remaining coil, thus maintaining the correct actuator output. For example: If the controller output is 160 mA and the coil impedance is equal, the controller output is split evenly, supplying 80 mA to each coil. If one coil fails, all of the controller output current goes to the remaining good coil, effectively doubling the force that the failed coil produced before the failure.

The voltage-to-current converter across the controller output responds to changes in the output voltage that would result from the loss of a coil. The volt/amp characteristics of the good coils are programmed into the controller. A significant deviation in the volt/amp characteristics causes an alarm to be issued.

This is a simplified schematic of the high-current circuits.

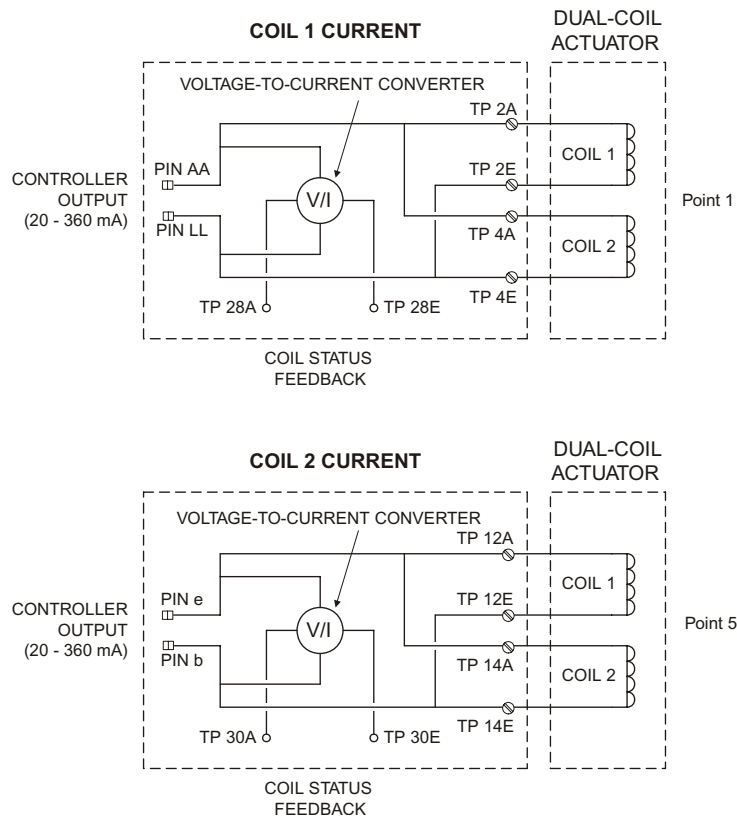


Figure 189 High-Current Circuits

### Voltage-to-Current Converter

This is a simplified schematic of a voltage-to-current converter.

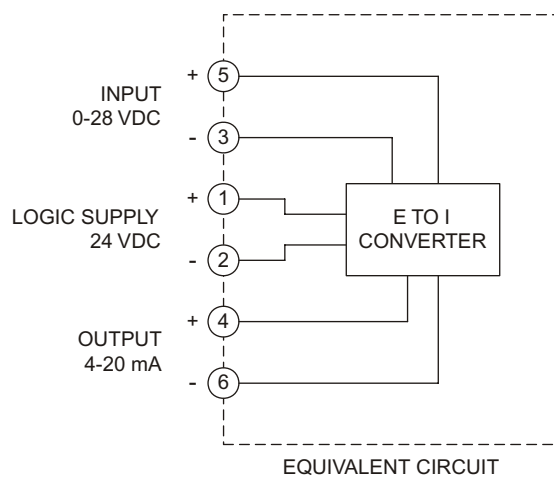


Figure 190 Simplified Schematic of a Voltage-to-Current Converter

This table describes specifications for the voltage-to-current converter.

**Table 142 Voltage-to-Current Converter Specifications**

Feature	Specification
Voltage	24 VDC, nominal (20–28 VDC maximum range)
Current	20 mA quiescent, with $V_{\text{supply}} = 24 \text{ V}$ , $V_{\text{in}} = 0$ , $R_L = 0$ , $I_s = 4 \text{ mA}$
Input impedance	1 MW Differential Mode 850 k $\Omega$ Common Mode
Input voltage range for 4–20 mA out	0–20 V
Maximum input voltage, either terminal with respect to power supply common	$\pm 100 \text{ V}$ continuous $\pm 200 \text{ V}$ pulsed, 0.5 second, 2% duty cycle
Differential mode frequency response	–6 dB/octave from 1 kHz to 8 kHz –12 dB/octave above 8 kHz
Common mode frequency response	–12 dB/octave above 8 kHz
Output range	4–20 mA for 0–20 V input
Maximum load resistance	750 $\Omega$ with $V_{\text{supply}} = 24 \text{ V}$
Offset and linearity	$\pm 0.1 \text{ mA}$ maximum over entire range
Power supply sensitivity	Output varies less than $\pm 0.1 \text{ mA}$ over entire range, into 500 $\Omega$ load, for $20 \text{ V} < V_{\text{supply}} < 28 \text{ V}$

## 9853-610 (current output, basic, 8 pts.)

Termination panel 9853–610 is compatible with 4–20mA output modules and HART analog output interface modules. Each panel has:

- 8 current output terminals (OUT)
- 8 current return terminals (RTN)
- Terminals for connecting redundant 24 VDC power supplies

### Specifications

This table describes specifications for 9853–610.

**Table 143 Specifications for Term Panel 9853-610**

Feature	Description
Panel type	Current output, basic
Points	8



## Compatible Modules

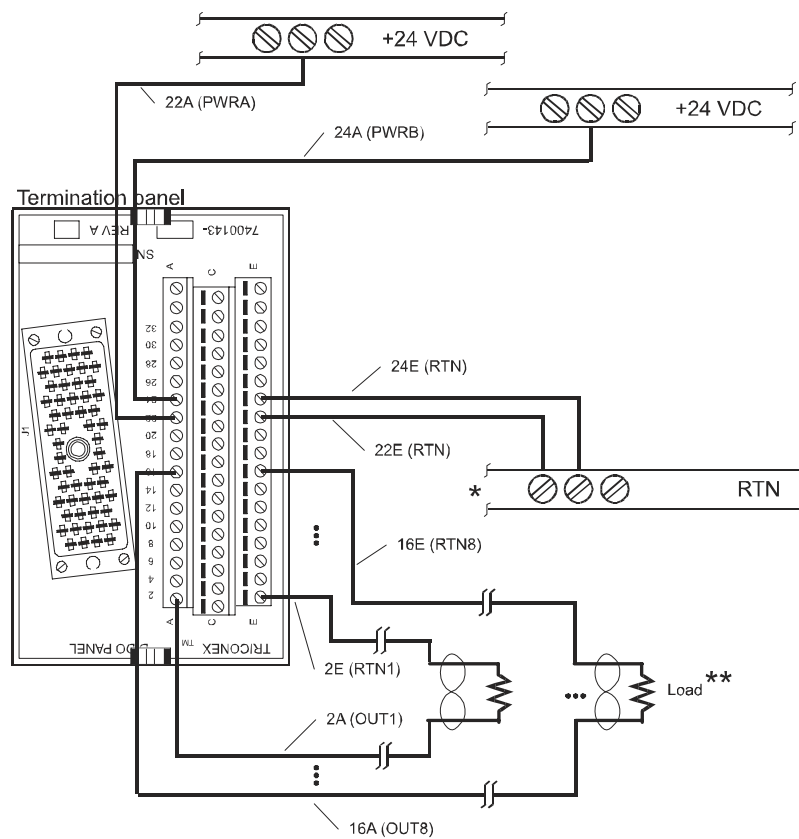
This table describes analog output modules compatible with 9853-610.

**Table 144 Modules Compatible with 9853-610**

Module Part Number	Points per Module	Module Description
2870H	8	HART analog output interface module
3805E/H	8	4-20 mA, commoned-return, DC-coupled, TMR

## Field Wiring Diagrams

This figure illustrates how to connect an 8-point analog output module or HART analog output interface module and a 9853-610 to the field (1 of 8 module points shown).



\* One RTN connection is required. More than one is okay.

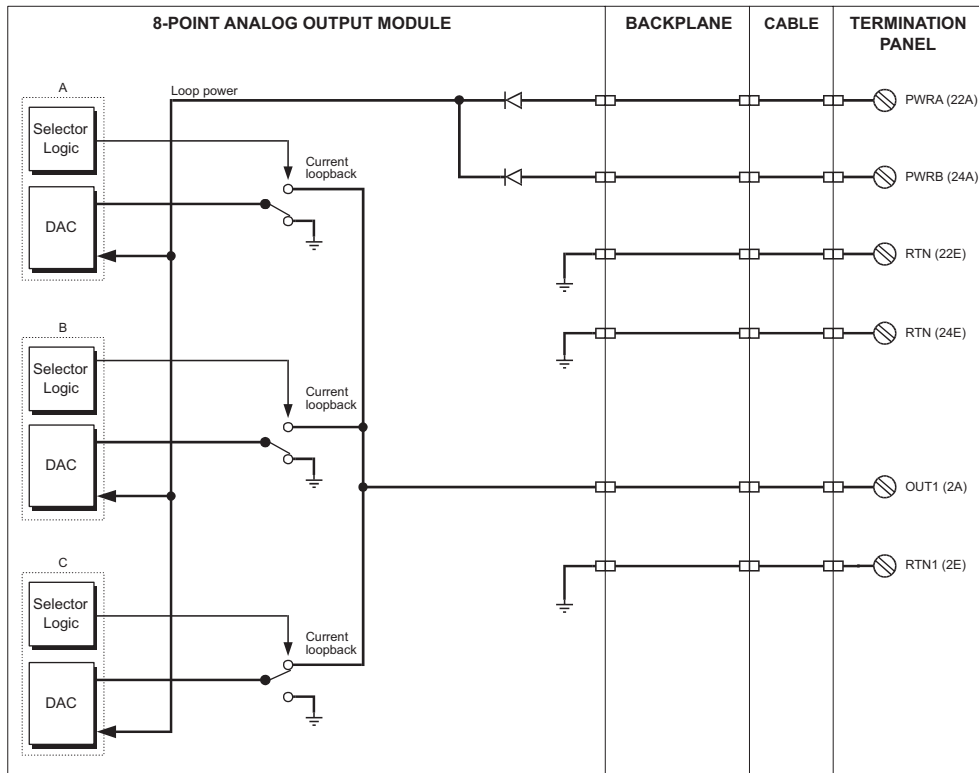
\*\* A shorting jumper must be connected to each unused point.

**Figure 191** Field Wiring for 9853-610 with a 3805E or 3805H AO Module or 2870H HART AO Interface Module

**Note** For additional instructions on installing HART Interface Modules, see the *Planning and Installation Guide for Tricon v9-v10 Systems*.

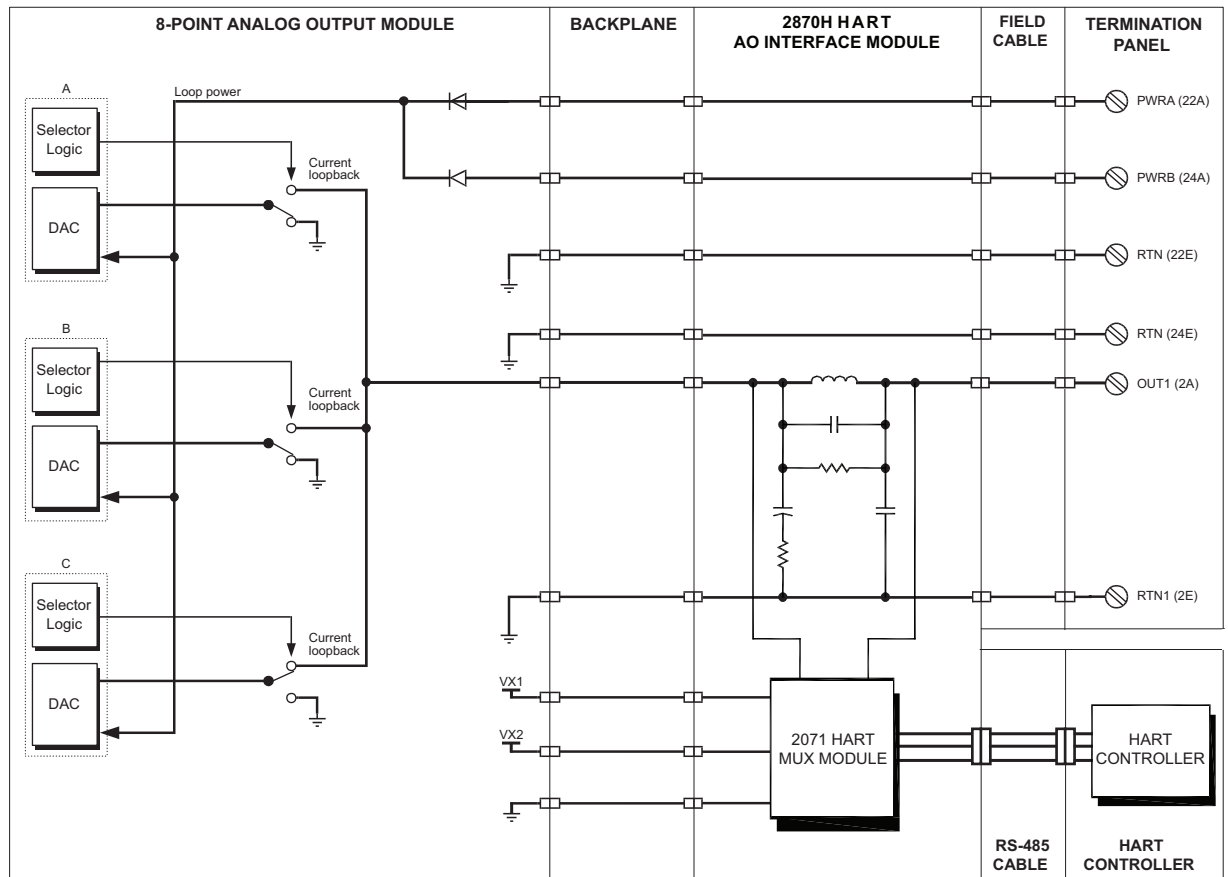
## Simplified Schematics

This is a simplified schematic of a typical 8-point commoned-return analog output module with a basic current output panel (1 of 8 module points shown).



**Figure 192** Simplified Schematic of a 3805E or 3805H AO Module with a 9853-610 Panel

This is a simplified schematic of a Model 2870H HART Analog Output Interface Module with a basic current output panel (1 of 8 module points shown).



**Figure 193** Simplified Schematic of a 2870H HART AO Interface Module with a 3805E or 3805H AO Module and a 9853-610 Panel