



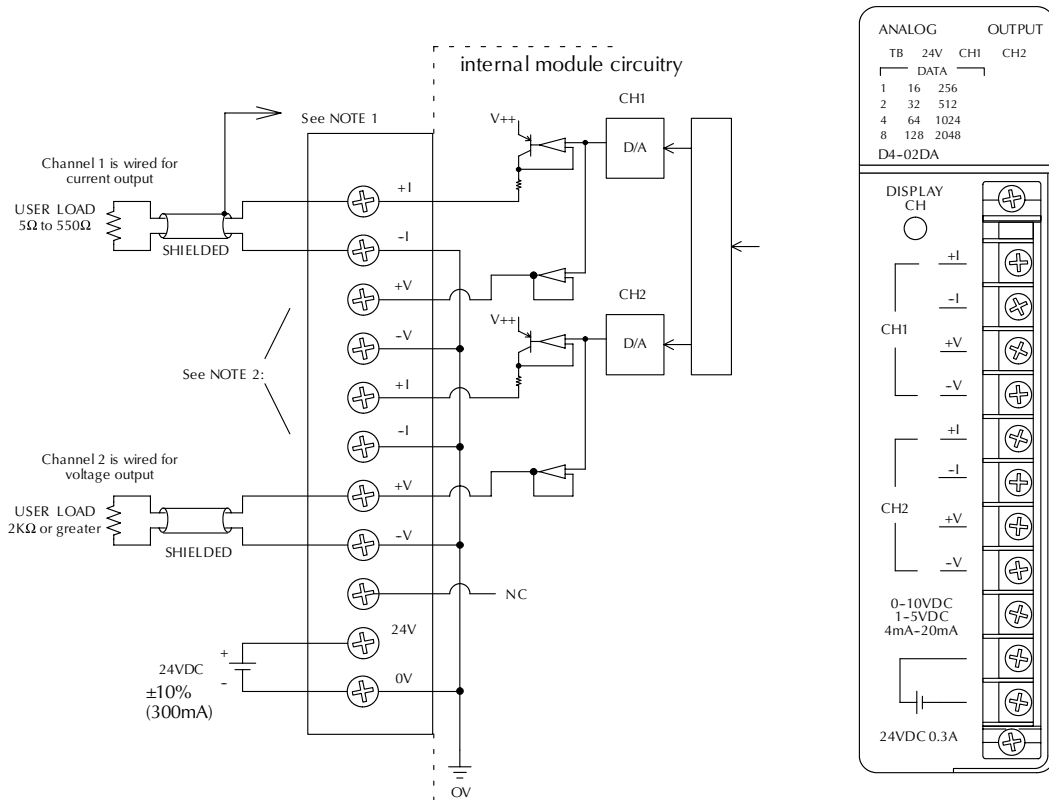
# ANALOG OUTPUT MODULES

D4-02DA 2-Channel Analog Output \$259.00	
<b>Number of Channels</b>	2 (independent)
<b>Output Ranges</b>	0-10V, 1-5V, 4-20 mA
<b>Channels Individually Configurable</b>	Range determined by field wiring connections used
<b>Resolution</b>	12 bit (1 to 4096)
<b>Output Type</b>	Single ended
<b>Output Impedance</b>	0.5 maximum, voltage output
<b>Output Current</b>	5 mA maximum, voltage output
<b>Load Impedance</b>	550ohm maximum, 5.0 minimum, current output 2Kohm minimum, voltage output
<b>Linearity</b>	± 0.1% maximum
<b>Accuracy vs Temperature</b>	± 70 ppm/°C maximum
<b>Maximum Inaccuracy</b>	± 0.2% maximum at 25°C
<b>Conversion Method</b>	Integration
<b>Conversion Time</b>	Start of scan, 30µS + one scan

<b>PLC Update Rate</b>	1 or 2 channels per scan
<b>Digital Output Points Required</b>	32 (Y) Output points (12 binary data bits times 2, eight unused bits.)
<b>Base Power Required 5V</b>	250mA
<b>External Power Supply</b>	24VDC, ± 10%, 300 mA, class2
<b>Operating Temperature</b>	32° to 140°F (0 to 60°C)
<b>Storage Temperature</b>	-4 to 158°F (-20 to 70° C)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Insulation Resistance</b>	10M, 500 VDC
<b>Noise Immunity</b>	NEMA ICS3-304

NOTE 1: Shields should be connected to the 0V of the module or to the 0V of the power supply  
NOTE 2: Unused voltage & current outputs should remain open (no connections)

1 - 8 0 0 - 6 3 3 - 0 4 0 5



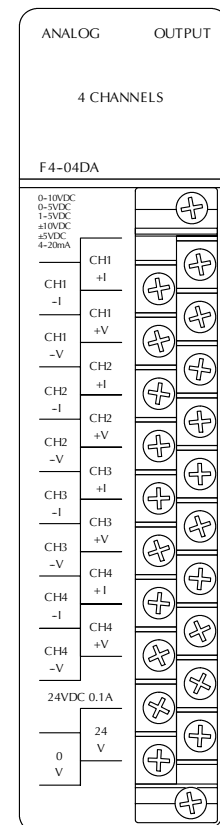
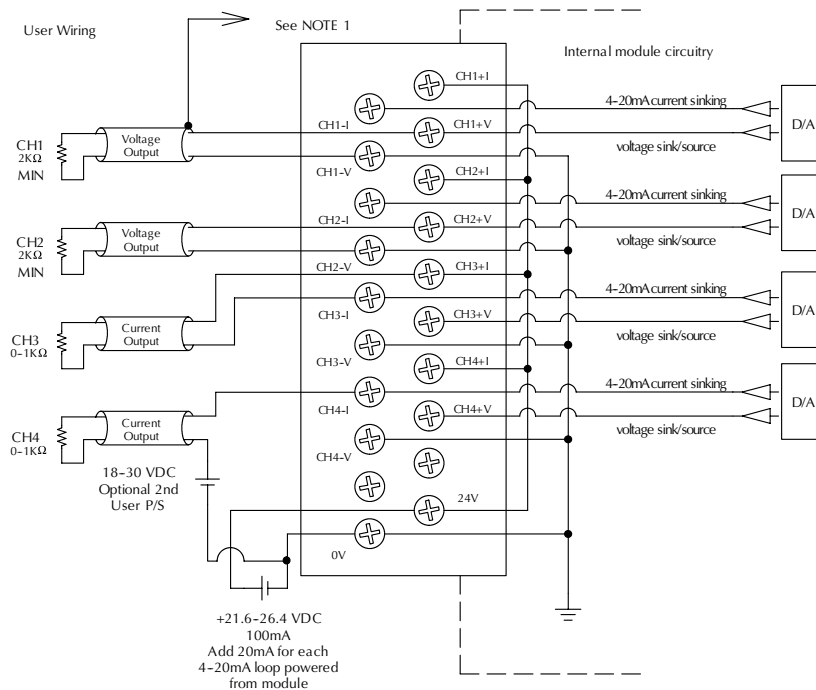
# ANALOG OUTPUT MODULES

F4-04DA 4-Channel Analog Output \$489.00	
<b>Number of Channels</b>	4
<b>Output Ranges</b>	0-5V, 0-10V, 4-20 mA
<b>Channels Individually Configurable</b>	Yes*
<b>Resolution</b>	12 bit (1 to 4,096)
<b>Conversion Method</b>	Successive approximation
<b>Output Type</b>	Single ended, 1 common
<b>Output Impedance</b>	0.2 typical, voltage output
<b>Load Impedance</b>	2Kohm minimum, voltage output 0ohm minimum, current output
<b>Maximum Load/Power Supply</b>	680/18V, 1Kohm/24V, 1.5K/36V, current output
<b>Voltage Output Current</b>	5mA sink or source
<b>Short-circuit Current</b>	15mA typical, voltage output
<b>Linearity Error</b>	± 0.1 count (± 0.25%) maximum
<b>Gain Calibration Error</b>	± 8 counts max., voltage output -8 to +11 counts max., current output
<b>Offset Calibration Error</b>	± 2 counts max., voltage output -5 to +9 counts max., current output

<b>Conversion Time</b>	5µs max., settling time 0.3 ms max., digital out to analog out
<b>Digital Output Points Required</b>	16 (Y) output points (12 bits binary data and 4 channel select bits)
<b>Base Power Required 5V</b>	120 mA
<b>External Power Supply</b>	+24VDC (± 10%), 100 mA, class 2 (add 20 mA for each current loop used)
<b>Accuracy vs. Temperature</b>	± 50 ppm/°C maximum offset ±25 ppm/°C maximum full scale
<b>Operating Temperature</b>	32° to 140°F (0 to 60°C)
<b>Storage Temperature</b>	-4 to 158°F (-20 to 70° C)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Insulation Resistance</b>	10M, 500VDC
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 4,096).  
NOTE 1: Shields should be grounded at the signal source  
NOTE 2: Unused channels should be connected to 0V or have current jumpers installed

Note: The F4-04DA is not recommended for new applications. It is recommended that the F4-04DA-1 or F4-04DA-2 module be used.





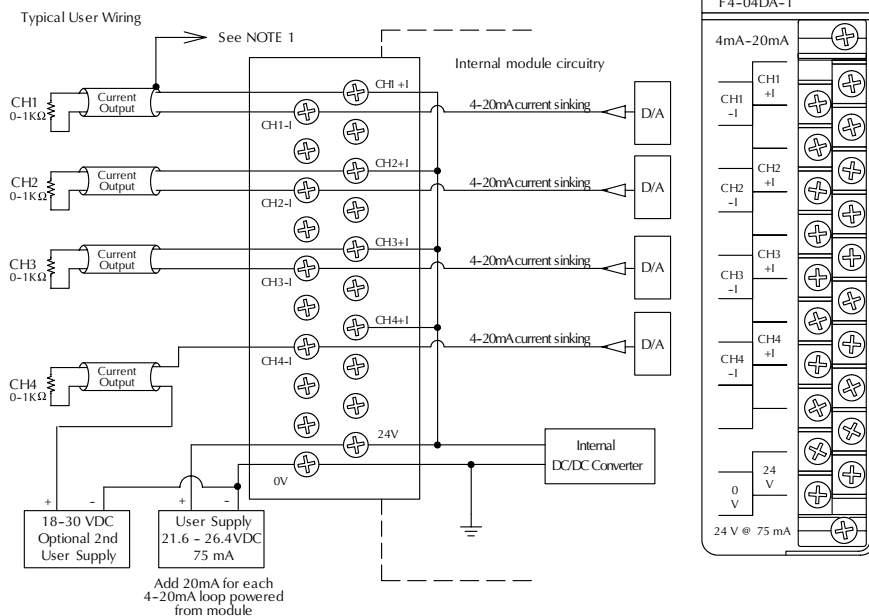
# ANALOG OUTPUT MODULES

F4-04DA-1 4-Channel Analog Current Output \$270.00	
<b>Number of Channels</b>	4, single-ended (one common)
<b>Output Range</b>	4-20 mA current
<b>Resolution</b>	12 bit (1 to 4095)
<b>Output Type</b>	Outputs sink 4-20mA from external supply
<b>External Load Resistance</b>	0 minimum
<b>Maximum Loop Supply</b>	30VDC
<b>Peak Output Voltage</b>	40VDC (clamped, transient suppressor)
<b>Maximum Load/Power Supply</b>	620/18V, 910ohm/24V, 1200/30V
<b>Linearity Error (best fit)</b>	± 1count (±0.025%) maximum
<b>Gain Calibration Error</b>	± 5 counts maximum
<b>Offset Calibration Error</b>	± 3 counts maximum
<b>Maximum Inaccuracy</b>	±0.1% @ 77° F (25° C) ±0.3% @ 32 to 140° F (0 to 60° C)
<b>Conversion Time</b>	100µs max., settling time 2.0 ms max., digital out to analog out

<b>Digital Output Points Required</b>	16 (Y) output points (12 bits binary data, 4 active channel bits)
<b>Base Power Required 5V</b>	70 mA
<b>External Power Supply</b>	21.6-26.4 VDC, 75 mA, class 2 (add 20 mA for each current loop used)
<b>Accuracy vs. Temperature</b>	± 57 ppm/°C full scale calibration range (including maximum offset change, 2 counts)
<b>Operating Temperature</b>	32° to 140°F (0 to 60°C)
<b>Storage Temperature</b>	-4 to 158°F (-20 to 70° C)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 4,096).  
NOTE 1: Shields should be connected to the 0V of the User Power Supply at the module terminal block.  
NOTE 2: Unused current outputs should remain open (no connections)

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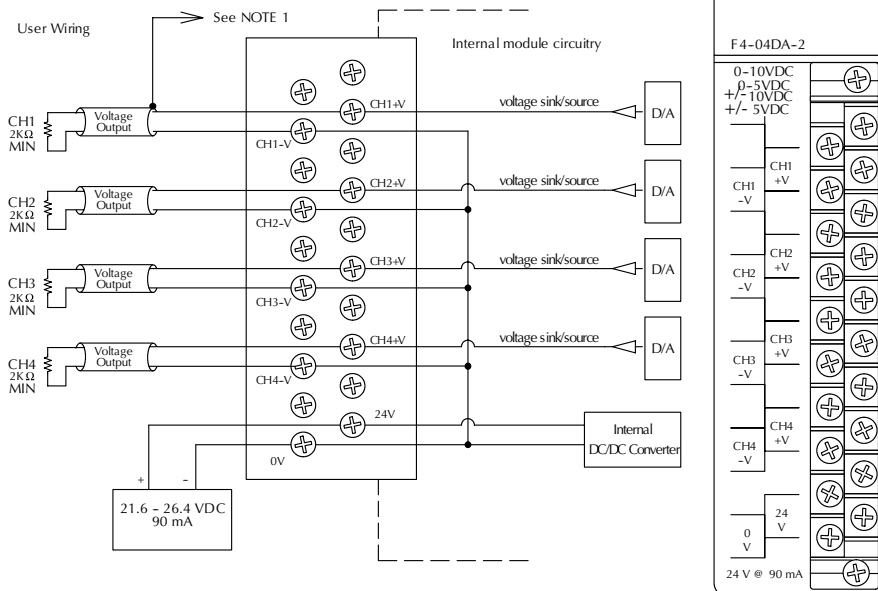


# ANALOG OUTPUT MODULES

F4-04DA-2 4-Channel Analog Voltage Output \$315.00	
<b>Number of Channels</b>	4, single ended (one common)
<b>Output Ranges</b>	0-5V, 0-10V, $\pm 5V$ , $\pm 10V$
<b>Channels Individually Configurable</b>	Yes
<b>Resolution</b>	12 bit (1 to 4,095)
<b>Load Impedance</b>	2K minimum
<b>Load Capacitance</b>	0.01 $\mu$ F maximum
<b>Voltage Output Current</b>	5.0mA sink or source
<b>Short-circuit Current</b>	15 mA typical
<b>Linearity Error (End to End) and Relative Accuracy</b>	$\pm 1$ count ( $\pm 0.025\%$ ) maximum
<b>Offset Calibration Error</b>	$\pm 3$ counts maximum, unipolar $\pm 4$ counts maximum, bipolar
<b>Full Scale Calibration Error</b>	$\pm 8$ counts maximum (offset error included)
<b>Maximum Inaccuracy</b>	$\pm 0.2\%$ @ 77° F (25° C) $\pm 0.4\%$ @ 32 to 140° F (0 to 60° C)

<b>Conversion Time</b>	5 $\mu$ s maximum, settling time 2.0 ms maximum, digital out to analog out
<b>Digital Output Points Required</b>	16 (Y) output points (12 bits binary data, 4 active channel bits or 2 active channel bits and 1 sign bit for bipolar)
<b>Base Power Required 5V</b>	90 mA
<b>External Power Supply</b>	21.6-26.4 VDC, 90 mA, class 2 (outputs fully loaded)
<b>Accuracy vs. Temperature</b>	$\pm 57$ ppm/ $^{\circ}$ C full scale calibration change (including maximum offset change, 2 counts)
<b>Operating Temperature</b>	32° to 140°F (0 to 60°C)
<b>Storage Temperature</b>	-4 to 158°F (-20 to 70° C)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 4096).  
NOTE 1: Shields should be connected to the 0V of the module or the 0V of the P/S  
NOTE 2: Unused voltage outputs should remain open (no connections)





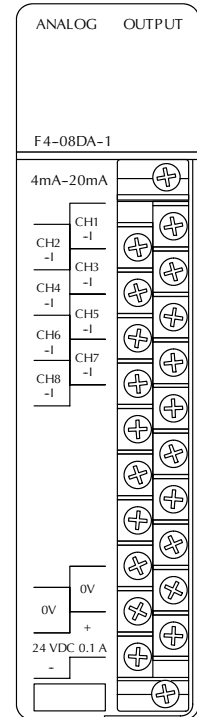
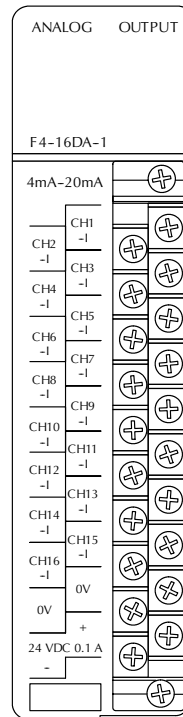
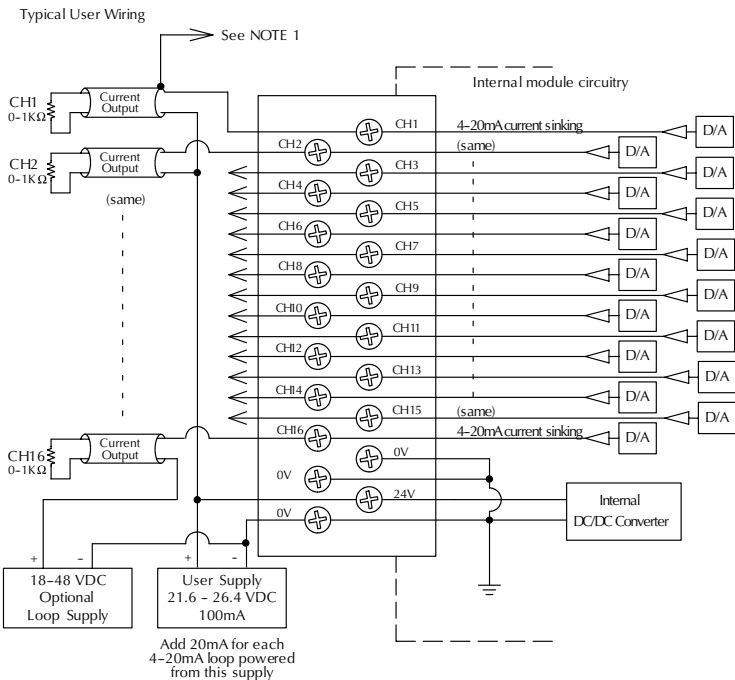
# ANALOG OUTPUT MODULES

<b>F4-08DA-1 8-Channel Analog Current Output \$455.00</b> <b>F4-16DA-1 16-Channel Analog Current Output \$580.00</b>	
<b>Number of Channels</b> F4-08DA-1 F4-16DA-1	8, single ended (one common) 16, single ended (one common)
<b>Output Ranges</b>	4-20mA current
<b>Resolution</b>	12 bit (1 to 4095)
<b>Output Type</b>	Outputs sink 4-20 mA from external supply
<b>Peak Output Voltage</b>	40VDC (no transient voltage suppression)
<b>External Load Resistance</b>	0-480 @ 18V, 220-740 @ 24V, 1550-1760 @48 V
<b>Maximum Loop Supply</b>	48VDC (with load resistance in proper range)
<b>Crosstalk</b>	-70dB, ± 1 count maximum
<b>Linearity Error (End-to-End) &amp; Relative accuracy</b>	± 1 count maximum
<b>Full Scale Calibration Error (offset error incl.)</b>	±8 counts max. (20.0 mA at 25° C)
<b>Offset Calibration Error</b>	± 3 counts max. (4.0 mA at 25° C)
<b>Maximum Inaccuracy</b>	±0.2% @ 77° F (25° C) ±0.4% @ 32 to 140° F (0 to 60° C)

<b>Conversion Time</b>	400µs maximum, for full scale change 2.25 to 4.5 ms for digital out to analog out
<b>Digital Output Points Required</b>	<b>F4-16DA-1</b> 16 (Y) output points (12 bits binary data, 3 bits channel select, 1bit output enable) <b>F4-08DA-1</b> 32 (Y) output points 2 sets each (12 bits binary data, 3 bits channel select, 1bit output enable)
<b>Base Power Required 5V</b>	90 mA
<b>External Power Supply</b>	21.6-26.4 VDC, 100 mA, class 2 (add 20 mA for each current loop used)
<b>Accuracy vs. Temperature</b>	± 57 ppm/°C full scale calibration range (including maximum offset change, 2 counts)
<b>Operating Temperature</b>	32° to 140°F (0 to 60°C)
<b>Storage Temperature</b>	-4 to 158°F (-20 to 70° C)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 4,096).  
 NOTE 1: Shields should be connected to the 0V of the User Power Supply at the module terminal block.  
 NOTE 2: Unused current outputs should remain open (no connections)

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# ANALOG OUTPUT MODULES

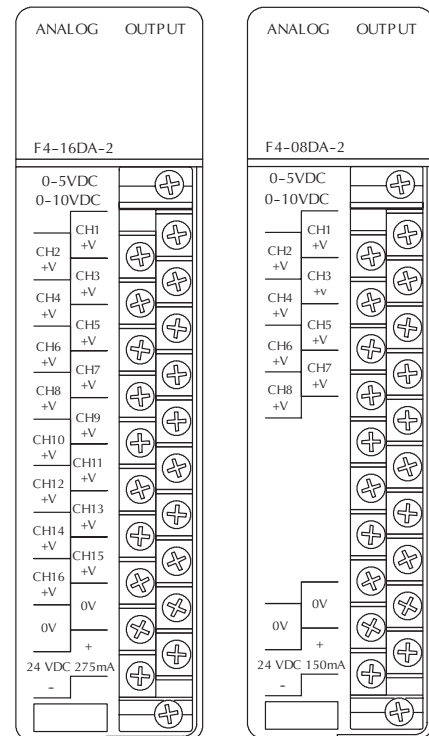
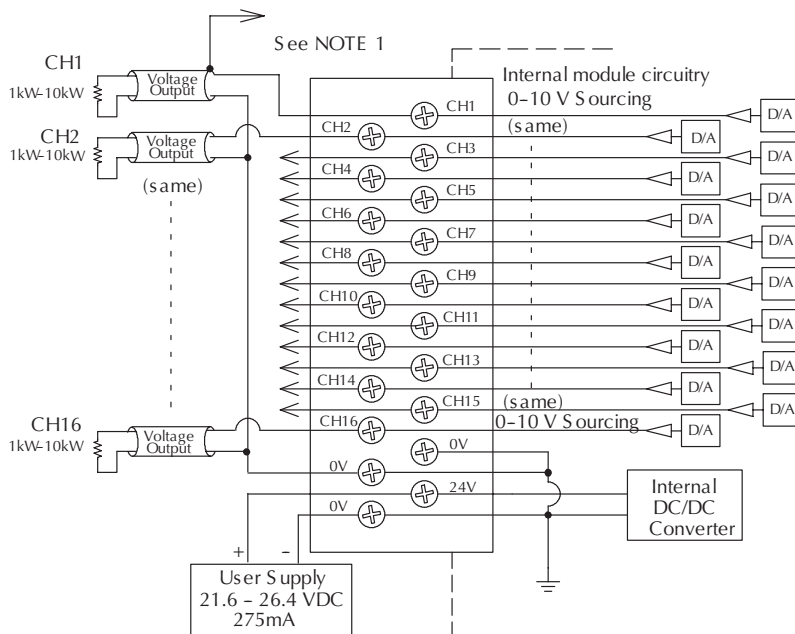
**F4-08DA-2 8-Channel Analog Voltage Output \$475.00**  
**F4-16DA-2 16-Channel Analog Voltage Output \$609.00**

<b>Number of Channels</b> F4-08DA-2 F4-16DA-2	8, single ended (one common) 16, single ended (one common)
<b>Output Range</b>	0-5VDC, 0-10VDC
<b>Resolution</b>	12 bit (1 to 4095)
<b>Output Type</b>	Voltage Sourcing 10mA max.
<b>External Load Resistance</b>	1K max./10K min. (example: 10volts@ 1K = 10mA load)
<b>Crosstalk</b>	-70dB, ± 1 count maximum
<b>Linearity Error (End-to-End) and Relative Accuracy</b>	± 1count maximum (10VDC at 25°C)
<b>Full Scale Calibration Error (Offset Error Included)</b>	± 6 counts max. (10VDC at 25°C)
<b>Offset Calibration Error</b>	± 3 counts max. (0VDC at 25°C)
<b>Maximum Inaccuracy</b>	±0.2% @ 77°F (25°C) ±0.4% @ 32 to 140°F (0 to 60°C)

<b>Conversion Time</b>	400µs maximum, for full scale change 4.5 to 9 ms for digital out to analog out
<b>Digital Output Points Required</b>	<b>F4-08DA-2</b> 16 (Y) output points 12 bits binary data, 3 bits channel select, 1 bit output enable) <b>F4-16DA-2</b> 32 (Y) output points (two sets each of 12 bits binary data, 3 bits channel select, 1 bit output enable)
<b>Power Budget Require</b>	80mA @ 5VDC (base power)
<b>External Power Supply</b>	21.6-26.4VDC, 150mA, class 2
<b>Accuracy vs. Temperature</b>	± 57 ppm/°C full scale calibration range (including maximum offset change, 2 counts)
<b>Operating Temperature</b>	32° to 140°F (0 to 60°C)
<b>Storage Temperature</b>	-4 to 158°F (-20 to 70°C)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 4,095).  
 NOTE 1: Shields should be connected to the 0V of the User Power Supply at the module terminal block.

Typical User Wiring





# ANALOG OUTPUT MODULES

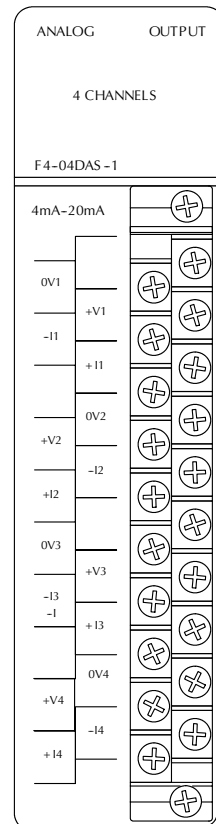
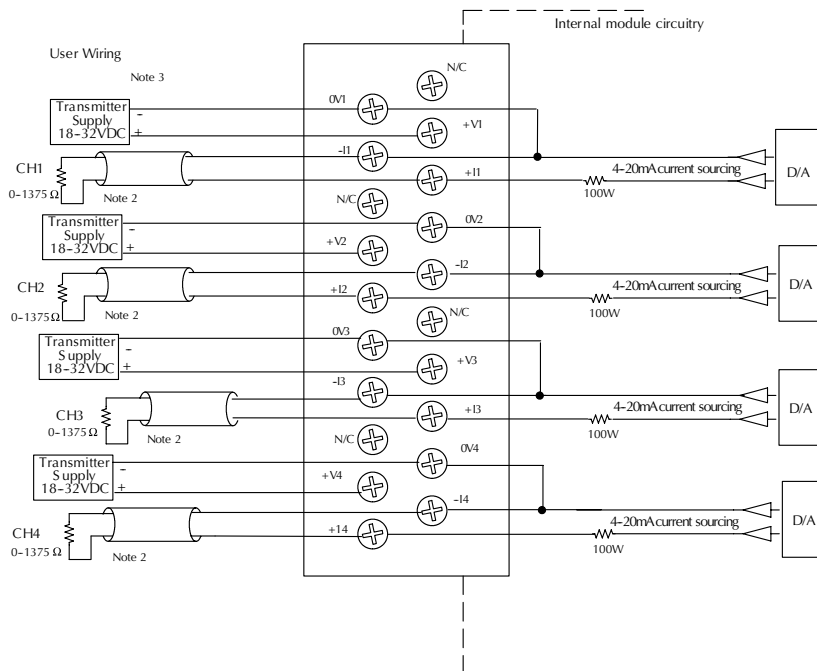
## F4-04DAS-1 4-Ch. 4-20mA Isolated Analog Out \$425.00

<b>Number of Channels</b>	4, isolated current sourcing
<b>Output Range</b>	4-20mA current
<b>Resolution</b>	16 bit (1 to 65536)
<b>Output Type</b>	Outputs source 4-20 mA from external supply
<b>Isolation Voltage</b>	±750V continuous, channel to channel, channel to logic
<b>Loop Supply</b>	12-32VDC
<b>Output Loop Compliance</b>	V <sub>in</sub> - 2.5V
<b>Load Impedance</b>	0-1375 (@ 32V)
<b>Maximum Load/Power Supply</b>	375/12V, 975/24V, 1375/32V
<b>PLC Update Rate</b>	1 channel per scan min., 4 per scan max.
<b>Digital Output Points Required</b>	32 (Y) output points 16 binary data, 2 channel identification, 1bit output enable)
<b>Power Budget Requirement</b>	60mA @ 5VDC (supplied by base)
<b>External Power Supply</b>	50mA per channel

<b>Linearity Error (End-to-End)</b>	± 10 count maximum (0.015% of full scale)
<b>Conversion Settling Time</b>	3ms to 0.1% of full scale
<b>Gain Calibration Error</b>	± 32 counts (± 0.05%)
<b>Offset Calibration Error</b>	± 13 counts (± 0.02%)
<b>Output Drift</b>	50ppm/°C
<b>Maximum Inaccuracy</b>	±0.07% @ 77° F (25° C) ±0.18% @ 32 to 140° F (0 to 60° C)
<b>Operating Temperature</b>	0 to 60°C (32° to 140°F)
<b>Storage Temperature</b>	-20 to 70° C (-4 to 158°F)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 65536).  
 NOTE 1: Shields should be connected to the 0V.  
 NOTE 2: Load must be within compliance voltage.  
 NOTE 3: For non-isolated outputs, connect all 0V's together (0V1...0V4) and connect all +V's together (+V1...+V4).

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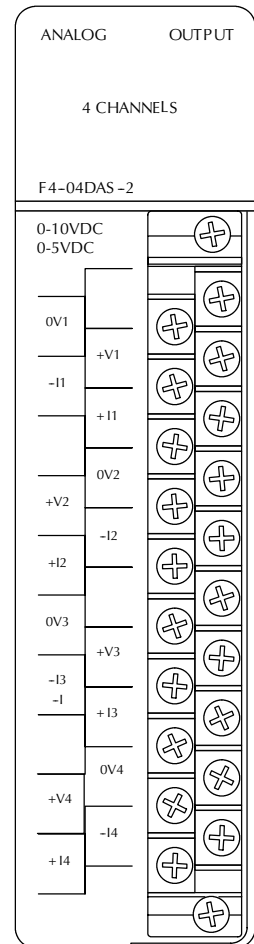
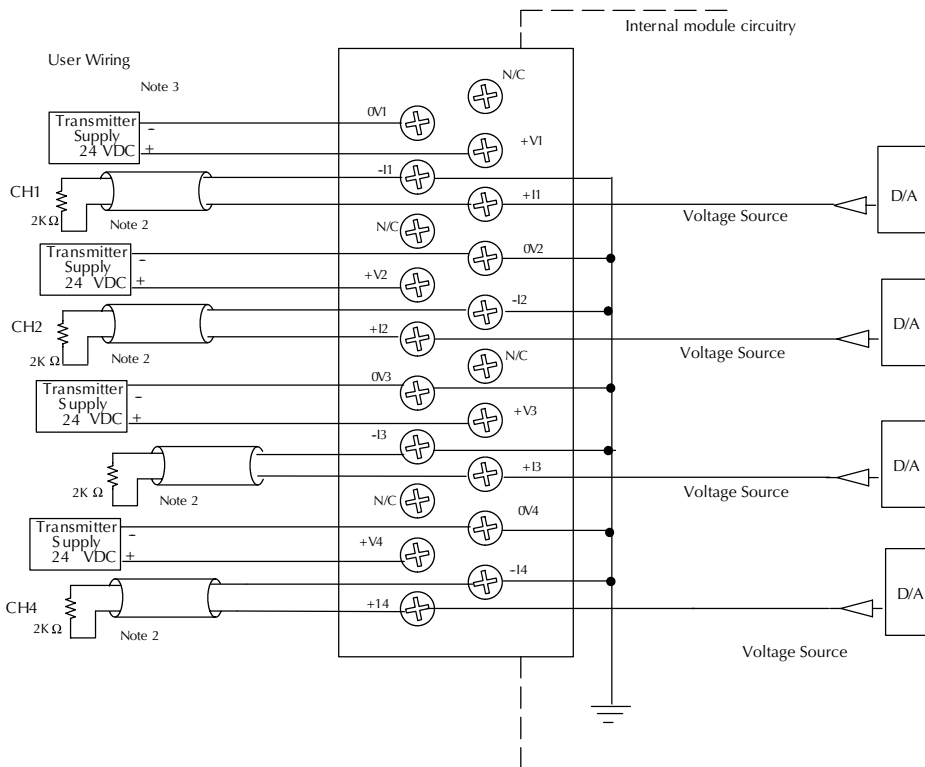


# ANALOG OUTPUT MODULES

F4-04DAS-2 4-Channel 0-5V/10V Isolated Analog Output \$299.00	
<b>Number of Channels</b>	4, isolated
<b>Output Range</b>	0-5VDC, 0-10VDC
<b>Resolution</b>	16 bit (1 to 65536)
<b>Isolation Voltage</b>	±750V continuous, channel to channel, channel to logic
<b>Load Impedance</b>	2k min
<b>PLC Update Rate</b>	1 channel per scan min., 4 per scan max.
<b>Digital Output Points Required</b>	16 data bits, 2 channel ID, 1 output enable 32 (Y) output points
<b>Power Budget Requirement</b>	60mA @ 5VDC (supplied by base)
<b>External Power Supply</b>	60mA per channel, 21.6VDC-26.4VDC

<b>Linearity Error (End-to-End)</b>	± 10 count maximum (0.015% of full scale)
<b>Conversion Settling Time</b>	3ms to 0.1% of full scale
<b>Gain Calibration Error</b>	± 32 counts (± 0.05%)
<b>Offset Calibration Error</b>	± 13 counts (± 0.02%)
<b>Maximum Inaccuracy</b>	±0.07% @ 77° F (25° C) ±0.18% @ 32 to 140° F (0 to 60° C)
<b>Operating Temperature</b>	0 to 60°C (32° to 140°F)
<b>Storage Temperature</b>	-20 to 70° C (-4 to 158°F)
<b>Relative Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	MIL STD 810C 514.2
<b>Shock</b>	MIL STD 810C 516.2
<b>Noise Immunity</b>	NEMA ICS3-304

One count in the specification table is equal to one least significant bit of the analog data value (1 in 65536).  
 NOTE 1: Shields should be connected to the 0V.  
 NOTE 2: Load must be within compliance voltage.



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