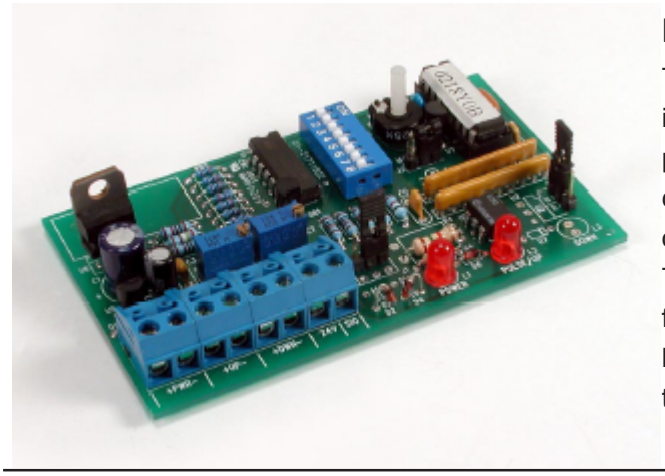
AX-MPTA

Multiple Pulsewidth to Analogue converter



Product Overview

The AX-MPTA converts a pulsewidth or phase cut input signal into a 0-10 volt analogue output. Various pulsewidths are selectable and if required the input can be isolated. The version 4 can convert a pulse output from a water meter to an analogue signal. The AX-MPTA is supplied in a DIN Rail carrier suitable for mounting on TS35 section DIN Rail and features high quality rising clamp terminals for ease of connection.

Features

- Selectable input pulsewidth or phase cut
- Fully isolated Input option
- AC or DC input
- 24V ac or dc powered
- Manual test option
- DIN rail mounting

Applications

- Pulse to analogue converter
- Interface to VFD
- Interface to actuator
- Phase cut to analogue converter
- Duty cycle to analogue control
- Digital to analogue conversion

Product Specifications

Power Supply:		21.6 to 26.4Vac or 24 to 35Vdc
Supply Current:		240mA max using Voltage output terminal
		125mA max if not using Voltage output terminal
Inputs:	Signal source	Relay contact closure, Transistor, or Triac (24Vac 50/60hz)
	Version 1	1/ 0.02 to 5 secs 2/ 01 to 10 secs 3/ 0.59 to 2.94 secs 4/ 0.1 to 25.5 secs
	Version 2	1/ 0 to 10 secs duty cycle pulse 2/ 0.023 to 6 secs
	Version 3	1/ 0-20V Staefa phase cut to analogue (trigger level 5% to 95% of phase cut waveform)
	Version 4	Flowmeter ppm to analogue (4 ranges see page 5 & 6)
Output: :	Voltage	8 ranges (0 - 10Vdc standard) at load impedance 400ohms at 10Vdc
	Current	2 ranges (4-20mA standard) 0 to 750 ohms max
Accuracy:		+/- 3% of span.for adjustment ranges 5% for preset
Power Supply Output:		24Vdc 48mA max
Resolution:		256 steps of resolution
Terminals:		Rising Clamp for 0.5-2.5mm^2 Cable
Ambient Temp:		0-50^{o}C
Dimensions:		95 x 58 x 30mm (max.)
Weight:		60gms
Country of Origin:		U.S.A.

Order Codes

AX-MPTA - PWM to Analogue converter (specify version 1,2,3,4)

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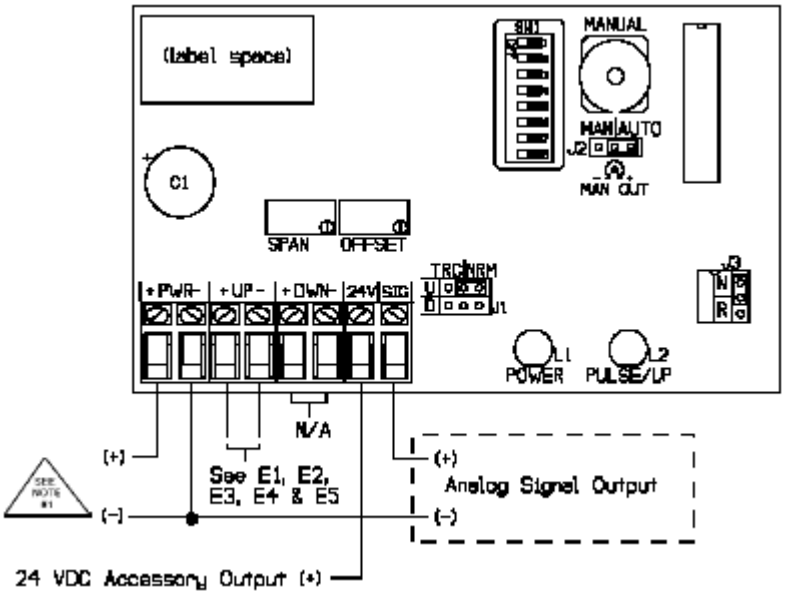
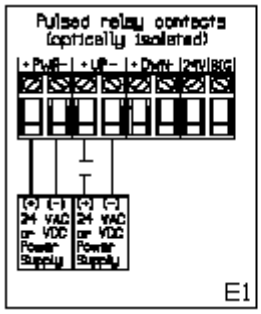
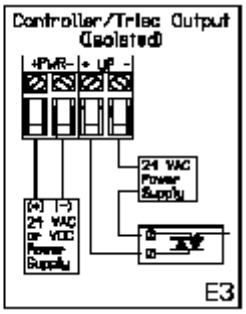
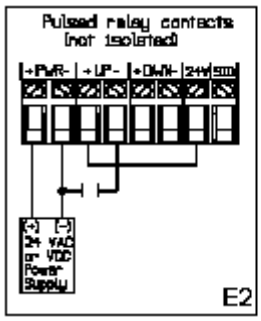
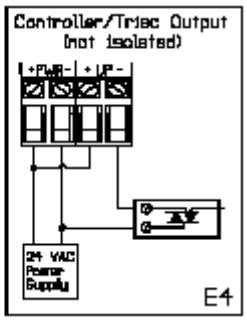
Connections

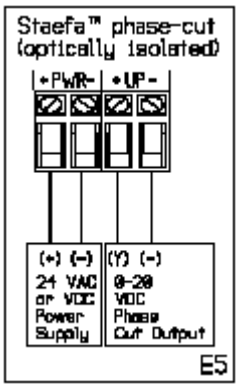












MAKE DIP SWITCH SETTINGS
WITH POWER OFF.

INPUT PULSE RANGE

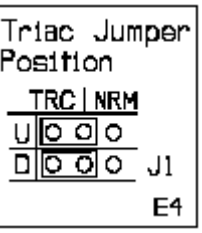
Version #1 - 0218Y08.Hex	
.1 to 10 sec.	1 & 2 OFF
.1 to 25.5 sec.	1 OFF, 2 ON
.02 to 5 sec.	1 ON, 2 OFF
.59 to 2.93 sec.	1 & 2 ON

Version #2 - 0303Y08.Hex	
0-10 sec. Duty Cycle Pulse	1 OFF, 2 ON
.023 to 6 sec.	1 & 2 OFF

Version #3 - 0146Y0C.Hex	
Staefa Phase-Cut	1 & 2 ON

Fig B

Triac Jumper Position



OUTPUT	
Current Out	7 ON, 8 OFF
Voltage Out	7 OFF, 8 ON
CAUTION - Don't set both switches in the ON position or the OFF position when powered, or the PTA may be damaged.	

Fig B

SPAN			
1 volt (no mA)	3, 4 & 5 ON	adjustable 1 to 9.5 volt and 4 to 20 mA	3 & 4 ON, 5 OFF
10 volt (no mA)	3 & 5 ON, 4 OFF	adjustable 10 to 16 volt (no mA)	3 ON, 4 & 5 OFF
4 volt or 16 mA	3 OFF, 4 & 5 ON	adjustable 4 to 14 volt (no mA)	3 & 5 OFF, 4 ON
13 volt (no mA)	3 & 4 OFF, 5 ON		

Fig. D

OFFSET	
offset of 1 volt or 4 mA	6 OFF
offset adjustable from 0 to 5 volts or 4 to 20 mA	6 ON

Fig C

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INSTALLATION

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION.

Ground yourself before touching board. Some components are static sensitive.

MOUNTING:

Circuit board may be mounted in any position. If circuit board slides out of snap track, a nonconductive "stop" may be required. Use only fingers to remove board from snap track. Slide out of snap track or push against side of snap track and lift that side of the circuit board to remove. Don't flex board. Use no tools.

POWER CONNECTIONS:

1) 24 VDC - with power off, connect 24 volt DC power supply to terminals PWR (+) and PWR (-) on the board.

2) 24 VAC - with power off, connect one transformer secondary leg to the PWR(-) on the board, along with signal output common (-). Connect the other transformer secondary leg to PWR (+). Check the wiring configuration of any other loads that may be connected to this transformer. Any field device connected to this transformer must use the same common. If you are not sure of other field device configurations, use separate transformers.

2) If the 24 volt AC (or DC) power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, Transorb, (a diode if DC), or other spike snubbing device across each of the shared coils. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.

3) It is highly suggested that the 24 VAC neutral of all transformers be earthed at the transformer. Analog input,digital input, and analog output circuits should not be earth grounded at two points. Any field device connected to this transformer must use the same common. If you are not sure of other field device configuration, use separate transformers.

4) You should measure the actual voltage output of the secondary. If the output is not fully loaded you may read a higher voltage than the circuit board can handle.

CALIBRATION AND CHECKOUT

SIGNAL INPUTS: See Figs. E1, E2, E3, E4 or E5 for wiring detail. The MPTA is jumper selectable (jumper J1) for NORM setting for pulse input at 5-26.4 VDC/VAC (see Fig. E2), relay or SSR, or TRIAC setting for triac (9-26.4 VAC/VDC) input (See Fig.E6).

Version #1 offers 4 jumper selectable pulse width modulated signal ranges.

Version #2 accepts: 1) The Solidyne PWM signal or

2) A continuous pulse signal command string, sampled in a 10 second window (No pulse within a 10 second window = minimum percent output, a ten second pulse or continuous pulse = 100% output).

Version #3 is the StaefaTM 0-20V Phase Cut output. Trigger level is detected only above 5% (approx.) and below 95% of phase cut waveform (nothing is detected in the lower 5% or upper 5% of maximum detection band).

DIP SWITCH SELECTION (WITH POWER OFF):

1) Select the input pulse range by setting the DIP switch as shown in Figure A.

2) Select current or voltage output using the two switches as shown in Figure B. **NEVER have both switches on or off** at the same time when powered, or chip failure may occur.

3) Select offset by setting the switch as shown in Fig. C. If you chose adjustable offset, adjust the "OFFSET" trim pot, when powered, to the desired offset or starting point (covered below).

4) Select the desired span and set the three switches as shown in Figure D. If you chose an adjustable span, you can adjust the "SPAN" trim pot, when powered, to the desired signal span (covered below). Turning "SPAN" potentiometer counterclockwise will increase span.

JUMPER SHUNT POSITIONS (WITH POWER OFF):

1) J1 See SIGNAL INPUTS above and chart on page 1.

2) J2 See MANUAL OVERRIDE below.

3) J3 jumper shunt selects a normal (N) or reverse acting (R) output.

After all selections have been made, activate the power source. The "POWER" LED should light. The "PULSE" LED will light when the PTA is receiving an input signal.

SETTING ADJUSTABLE "OFFSET" POTENTIOMETER:

If you desire to set your own minimum and maximum output (not use any of the preset selections) then set the Offset DIP switches (Figure C) for adjustable.

1. Place Man/Auto jumper in the Manual position. Power up the MPTA.
2. Turn Offset Potentiometer Counter-clockwise to Decrease or Clockwise to Increase.
3. Turn the override potentiometer counter-clockwise until it stops (it is a 3/4 turn pot).
4. **Adjust the OFFSET** trimmer potentiometer to the minimum output level desired, measured between terminals PWR (-) and SIG, as read on meter. Power down the PTA.

Examples:

If Span is set at 4 VDC and the Offset is set at 0 VDC, Minimum Output will be 0 VDC, Maximum Output will be 4 VDC If Span is set at 16 mA and the Offset is set at 4 mA, Minimum Output will be 4 mA, Maximum Output will be 20 mA

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SETTING ADJUSTABLE "SPAN" POTENTIOMETER:
The Span DIP switches (Figure D) should be set for the span desired.

1. Man/Auto jumper should be in the Manual position. Power up the MPTA (power-up required after any DIP switch change.
2. Turn the span potentiometer counterclockwise to increase, clockwise to decrease.
3. Turn the override potentiometer clockwise until it stops.
4. Adjust SPAN potentiometer until the desired maximum output signal signal is read on the meter between terminals PWR (-) and SIG.

The input signal will NOT cause "wrap around" or start over if the upper range limit is exceeded. Example: With the .02 to 5 second range selected, a pulse longer than 5 seconds will be ignored. The minimum output signal will be equal to the offset. The maximum output signal will be equal to the offset plus the span.

Whenever power is first applied or restored after power interruption, the MPTA automatically resets to the minimum output signal as defined by the DIP switch settings, or adjusted values.
MANUAL OVERRIDE - The manual override potentiometer overrides the output of the processor when J2 jumper shunt is in MANual position. **Always return jumper shunt J2 to AUTO when finished with adjustments.**

TROUBLESHOOTING AND TESTING
1. Apply 24 VAC/VDC to "PWR" terminal, confirm power LED is on and measure voltage to confirm proper voltage.
2. Check the DIP settings. "ON" is closest to the Man/Auto potentiometer. Reset power if DIP switch changes are made.
3. Testing the output. Connect power. Place MAN/AUTO jumper to Manual.

Voltage out: Confirm DIP setting to "Voltage Out". With meter only connected to the SIG and PWR (-), turn the manual potentiometer full left and then full right. The output should vary from 0 to 100 % of calibrated or set range.
If no change is seen, contact tech support.
If yes, connect load/device and meter to SIG and PWR (-) terminals. Turn override pot and measure voltage.
Do the readings match the no load test? If no, check load impedance mismatch or for a possible ground loop problem and/or call ACT tech support. If yes, voltage output is functioning properly.

Current out: Confirm DIP setting to "Current Out". With meter only connected to the SIG and PWR (-) and set to current out, turn the manual potentiometer full left and then full right. The output should vary from 0 to 100 % of calibrated or set range. If no, measure the voltage and turn the Manual override potentiometer clockwise.
Is voltage present? If no, contact tech support. A voltage between 15-39 VDC indicates the PTA is attempting to generate the desired mA. Load or meter may have an open, blown fuse or connected improperly. A 250 or 500 ohm resistor will also work to test the output. Connect the resistor to the SIG and PWR (-) terminal. With 250 ohms on the output. The voltage from one side of the resistor to the other will be 1 VDC @ 4 mA and 5 VDC @ 20 mA. Using the 500 Ohm will give 2 VDC @ 4 mA and 10 VDC @20 mA. Does the unit function as stated above?
If no, contact tech support.
If yes, current output is functioning properly.

4. **Testing the input**.

To manually test the input apply 24 VAC/VDC to the PWR terminal. Connect your meter to the SIG and PWR (-) Terminal. Set meter to match output ranges selected by DIP switch settings. Place MAN/AUTO jumper to AUTO. Connect a jumper wire from UP (+) to the PWR (+). Connect a jumper wire to the PWR (-) only. You are now ready to simulate a timed pulse signal. For testing purposes, select .1 to 10 seconds range. Be sure to reset power to allow the PTA to recognize new DIP switch settings. Take the free end of the jumper wire from PWR (-) and connect by holding wire to the UP (-) terminal. Count to 5 seconds (or the time = to 50% of timing `range)` and remove. Verify the pulse LED indication. Read output. Has the output changed? The output should be close to 50% of set output.
If no, change the TRC/NRM to the opposite setting and repeat test. Has the output changed? If no, contact tech support. If yes, unit is functioning properly.
Remove all temporary jumpers and wires before putting in service.

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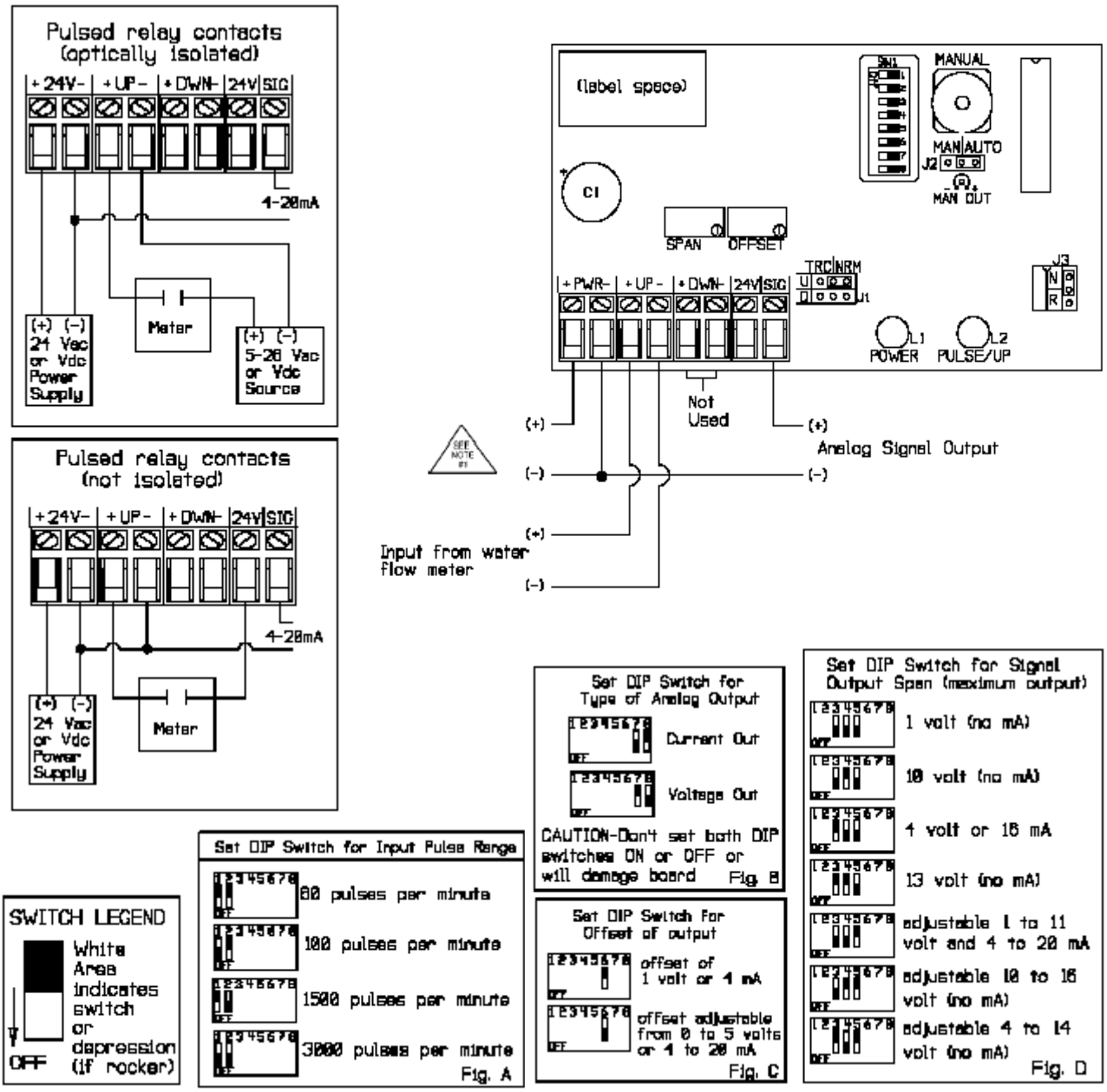
Water Flow Meter Pulse to Analog Current or Voltage Output - Version 4



SPECIFICATION- Version 4

Power Supply:	24 VAC or 24 VDC +/- 10%
Supply Current:	45 mA
Trigger Level:	Dry Contact to common or 5-24 volts
Accuracy:	+/-3%

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POWER CONNECTIONS:

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2) If the 24 volt AC (or DC) power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, Transorb, (a diode if DC), or other spike snubbing device across each of the shared coils. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.
3) The secondary voltage (power) should be isolated from earth ground, chassis ground, and neutral leg of the primary winding. Grounding should be to the system common only. If you do not follow these procedures improper operation can result.
4) You should measure the actual voltage output of the secondary. If the output is not fully loaded you may read a higher voltage than the circuit board can handle.

CALIBRATION AND CHECKOUT

DIP SWITCH SETTINGS (WITH POWER OFF):

DIP switch settings for pulse per minute ranges (Figure A on page 5).

Range	Switch 1	Switch 2
3000 Pulses Per Minute	On	On
1500 Pulses Per Minute	Off	On
100 Pulses Per Minute	On	Off
60 Pulses Per Minute	Off	Off

JUMPER SHUNT SETTINGS (WITH POWER OFF):

1) J1 Set for normal (jumper on center pin and pin under NRM) or triac input (jumper on center pin and pin under TRC)
2) J2 Set for AUTO. See instructions for MANUAL OVERRIDE below.
3) J3 jumper shunt selects a normal (N) or reverse acting (R) output (NOTE: The output will be direct acting if the jumper is totally removed from the board).

After all selections have been made, activate the power source. The "POWER" LED should light. The "PULSE" LED will light when the PTA is receiving an input signal.

MAKE POTENTIOMETER ADJUSTMENTS TO THE PTA WHILE POWERED.

1) Turn the OFFSET pot counter-clockwise (decrease) until the output is 0.
2) Make sure the DIP switches are set, and give the PTA a known pulse per minute input.
3) Turn the "SPAN" pot counter-clockwise (increase) to the desired value in volts or milliamps and measured between analog output terminals PWR (-) and SIG (+). The input signal will NOT cause "wrap around" or start over if the upper range limit is exceeded. The PTA automatically resets to the minimum output signal (or the maximum output if set reverse acting), as defined by adjusted values, when:
1) power is first applied,
2) power is restored after power interruption,
3) no pulse is received after 60 seconds,
4) a constant pulse is received for a period greater than 60 seconds.

NOTE: When signals are faster than the set ranges, the output will equal the maximum value (minimum if reverse acting jumper is set), and if the signals are slower than set range, the output will equal the minimum value (maximum if reverse acting jumper is set).

MANUAL OVERRIDE – Move J2 jumper shunt to MANUAL. Clockwise rotation of this single turn manual potentiometer increases the analog output signal. **Return jumper shunt J2 to AUTO when finished.**

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