

Watchdog Timer Modules

P8D-WDT Series
DIGITAL

New Product

I/O Compatibility
8-Pin Octal

Applications

- ▶ Industrial Control Systems
- ▶ Programmable Logic Controllers (PLC)
- ▶ Distributed Control Systems (DCS)
- ▶ Precision Timer Applications
- ▶ Permissive Start & Shutdown
- ▶ Automation & Machine Design
- ▶ Robotics
- ▶ Upgrade P8-Series Watchdog Timers



5 to 28 VDC Operation

Description

The **P8D-WDT** Watchdog Timer Module is a system component which provides advanced control system supervision to prevent 'loss of control'. Supervisory functions include a precision digital *Watchdog Timer* function. System integrity is ensured by monitoring for 'loss-of-power' and 'loss of control' which can be used to ALARM or SHUTDOWN a control system or process. (Please refer to P8-ISM types for models with power supply voltage supervision.)

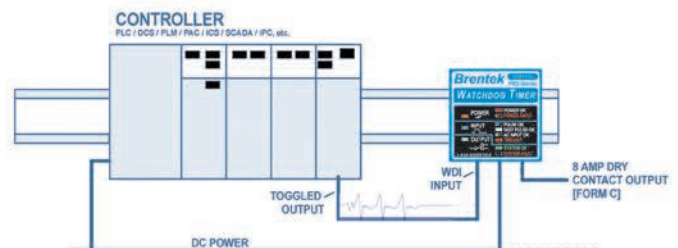
P8D-WDT types offer a host of *standard* features including a wide operating range from 5 to 28VDC, an opto-isolated reset/trigger WDI input (accepts 3-30V DC pulses), fail-safe FORM C Relay Output 8 Amp rated (de-energizes for all fault conditions, including 'loss-of-power'), indicators for **Input**, **Output** and **Power** with *smart status indication* (for all conditions) and precision *digital* timing technology (<2% accuracy STD). Low-profile 8-pin octal packaging, encapsulated circuitry and industrial operating-temperature make this series well suited to robust industrial applications. (See *Standard Features*)

The base model **P8D-WDT** offers a standard two second time-out and a FORM C DRY Output contact. *Optional* configurations include Adjustable time-out ranges, 'FAULT' Lock-out function and Power-up Trigger, Several Trigger options and extended time-out periods. (**Photo above shows optional #DIN8 8-pin octal socket*).

Standard Features

- ▶ Fully Encapsulated Circuitry
- ▶ 5-28V DC Operating Voltage
- ▶ Standard 8 Pin Octal Plug-in
- ▶ -40°C to +85°C Operating Temperature
- ▶ "Double-Redundant" Watchdog Design
- ▶ Precision Timing Accuracy (<2% STD)
- ▶ FORM C (8 Amp rated) Output Contacts
- ▶ 3-30V Sourcing/Sinking Trigger Input
- ▶ Smart Fast/Slow Pulse Detection
- ▶ Power-up Reset/Clear
- ▶ Enhanced Inductive Load Feature
- ▶ Edge-triggered Input
- ▶ INPUT, OUTPUT & POWER Indicators
- ▶ Relay Fail-safe (de-energizes on FAULT)
- ▶ Non-standard Configurations Available*
- ▶ PLC Compatible
- ▶ Standard 2 Second Time-out (fixed)
- ▶ 2500VAC Input optical isolation

Typical Application



Note(s):

Absolute Maximum Ratings (Note 1, 3)

Supply Voltage (Pins 2 & 7) +/-30VDC
 DC RESET (WDI) voltage (Pins 5 & 6).. +/-50VDC
 AC Reset (WDI) voltage (Pins 6 & 8)..... 200Vrms (-AC option)
 Contact Voltage (Pins 1,3 & 4) 200VDC/400VAC (Note 2)
 Contact Switching/Inrush Current 10 A at 250 VAC, 30 VDC
 Operating Temperature -40 to +85°C

1. Exceeding values above those listed may cause permanent device damage. Operation at these ratings for extended periods may affect reliability.
2. If DC switching voltage is greater than 30VDC, switching current must be derated. Please consult factory.
3. Depending on options chosen, other maximum values may apply. See maximum values in specifications for specific options.

Operating Parameters

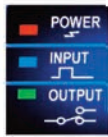
SYMBOL	PARAMETER	LIMITS			UNIT	CONDITION
		MIN	TYP	MAX		
V+	Supply Voltage	4.5		28	VDC	Pins 2(+) & 7(-)
I _{SUPPLY}	Supply Current		50	60	mA	Output Relay Energized
T _A	Operating Temperature	-40		+85	°C	Ambient Temperature
V _{IL}	Input Logic Low voltage	0		0.8	V	Input Pins 5(+) & 6(-)
V _{IH}	Input Logic High voltage	2.0		30	V	Input Pins 5(+) & 6(-)
R _{IN}	Input Resistance		10		KOHMS	Pins 5 & 6
F _{IN}	Maximum WDI Input rate		1	1.5	KHz	@50% duty. Note 1
V _{ISO}	Input Isolation Voltage		2500		Vrms	1 minute, RH <60%

Contact Specifications

SYMBOL	PARAMETER	LIMITS			UNIT	CONDITION
		MIN	TYP	MAX		
V _{SW}	Switching Voltage AC DC			250 30	VAC VDC	@Rated Load
I _{SW}	Switching Current	0.1		8	Amps	Resistive Load
P _{SW}	Switching Power			2500 240	VA W	1/2 HP @240VAC, 1/3 HP @120VAC
Life	Expected Cycle Life @Rated Load		3x10 ⁷ 1X10 ⁵		Cycles	Mechanical Electrical
R	Contact Resistance	0.1			Ohms	Initial Resistance
V _{ISO}	Isolation Voltage		5000 1000		Vrms	Coil to Contact Between open contacts
T _{DEL}	Pick-up Time (delay)		7		mS	Contact bounce
T _{LAT}	Drop-out Time (latency)		3		mS	Contact bounce

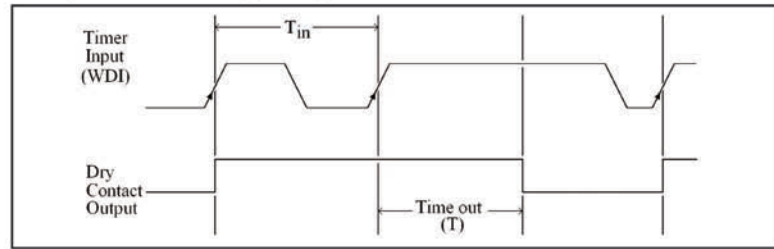
Contact Material: Silver tin oxide.

Operation



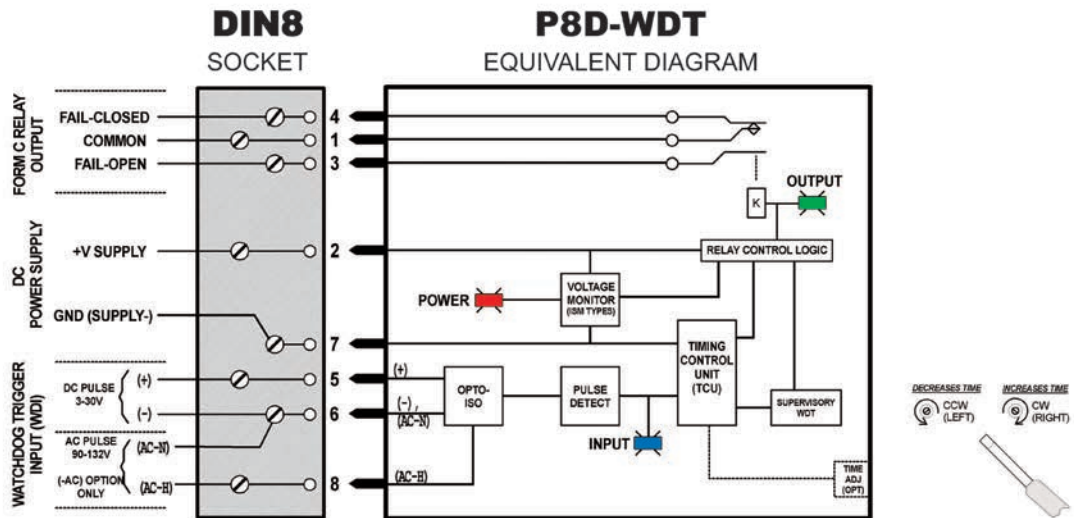
When power is first applied to pins 2(+) and 7(-), the timer is cleared, the output relay (pins 1, 3 & 4) remains de-energized and WDI input pulses pins 5(+) & 6(-) are initially ignored for the first 200 milliseconds 'TPUC'. Upon power-up, the POWER indicator is ON (RED) and the INPUT indicator is ON (RED) indicating the timer has not been triggered/reset. After the power-up clear period, the first ON-EDGE transition of the WDI input triggers and resets the internal Watchdog Timer, energizes the output relay with the OUTPUT indicator ON (GREEN) indicating 'SYSTEM OK' and begins timing. Subsequent input pulses reset the timer with each ON-EDGE transition, preventing time-out and are indicated by the INPUT indicator. Slow pulses are indicated in 'real time' ON (BLUE)-OFF, etc.; FAST PULSE is indicated by the INPUT indicator as (SOLID WHITE) ON while detecting multiple pulses within a 20mS period. Time-out occurs from the last ON-EDGE transition of the input pulse (WDI). Upon time-out, the output relay de-energizes, turns OFF the OUTPUT indicator and turns the INPUT indicator ON (RED) to indicate a time-out 'T' has occurred. 'Loss of Power' also de-energizes the output relay. The timer will retrigger with the next ON-EDGE input pulse, providing real-time system recovery, unless configured otherwise with optional -LO lock-out feature. (See options and special configurations for 'configuration-specific' operations and functions.)

Simplified Timing Diagram



Please refer to *Detailed Timing Specification* for all timing parameters.

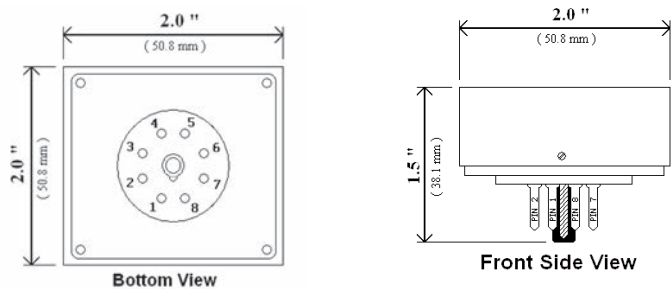
Connection Diagram



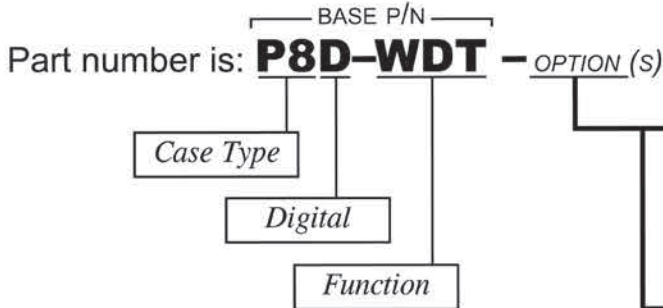
DC Input may be configured for sourcing (PNP) or sinking (NPN) logic. AC input is 60Hz.

Dimensions

- Note(s) :
- Overall height in #DIN8 Socket is 1.9" (max)
 - Shown with optional timing adjustment.



Part Numbering



Base p/n **P8D-WDT** is 2 second timeout, 5-28VDC operation with opto-isolated WDI input.

- Input WDI Trigger Option**
[Blank] - Triggers with ON-edge of WDI input pulse
- DT - Dual Edge Trigger. Triggers on ON and OFF edges of WDI input pulse
- Input Pulse Trigger Option**
[Blank] - Accepts DC pulse; 3 to 30Vpk
- AC - Accepts AC Pulse; 90 to 132V, 60Hz
- Factory Calibration Option**
[Blank] - Timer tolerance is +/-2%
- FC - Timer calibrated to +/-1%

- Fixed Time-out Options**
[Blank] - 2 Seconds (fixed)
-Txx.xx - Specify timing value 'xx.xx' in the range of 50 milliseconds to 60 seconds '-T50MS to -T60'
-Mxx, Sxx - Specify extended timing value in the range of 1 minute to 1440 minutes. '-M1, S0 to M1440, S59'

- Adjustable Time-out Option**
[Blank] - 2 Seconds (fixed)
-Ax.xx - x.xx - Specify any adjustable range with minimum and maximum values in the range of 50 milliseconds to 60 Seconds. (The smallest adjustment span is 100 milliseconds.)

- Power-up Trigger Option**
[Blank] - Power-up Clear
-PT - Power-up Trigger. Triggers on power-up

- Time-out Handling Option**
[Blank] - Free mode, retriggerable after time-out
-LO - Not retriggerable after time-out until power is cycled OFF for 2 seconds.

- P8-Series Compatibility Option**
[Blank] - Compatible with P8-Series with -ISO, -ISO5
- P8 - Compatible with non-isolated **P8-WDT24/PLC** types (Pins 6 & 7 internally connected)

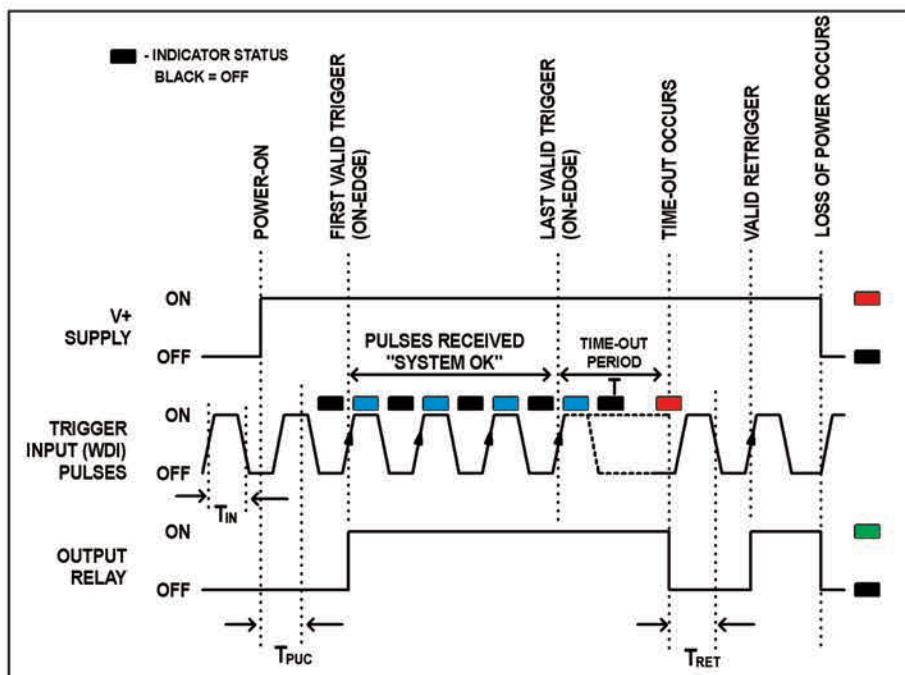
Part numbering examples:

- P8D-WDT-A1-5-LO** [Adjustable time-out 1 to 5 seconds, fault 'lock-out' mode.]
- P8D-WDT-T30-AC** [Fixed 30 Second time-out, 120VAC trigger input.]
- P8D-WDT-P8** [Upgrade model for P8-WDT24/PLC; Fixed 2 Second time-out.]
- P8D-WDT-T100MS-PT** [Fixed 100 millisecond time-out; Power-up Triggered.]

Note(s):

1. Specify any fixed time-out -T period in the range of 50 milliseconds to 60 Seconds (-T50MS to -T60).
[Example: For a fixed time-out of 15 Seconds, suffix would be: -T15]
2. Specify any fixed time-out period as combined 'Minutes + Seconds'. Valid ranges for -M are 1 Minute to 1440 Minutes (-M1 to -M1440). Valid range for S are 0 Seconds to 59 Seconds (-S0 to -S59).
[Example: For an extended fixed time-out of 5 minutes and 45 Seconds, suffix would be: -M5,S45]
3. Specify any adjustable time-out range (-TMIN-TMAX). Desired timing values must be in the order of increasing time and within the valid timing range of 50 milliseconds to 60 Seconds. Minimum span: 100mS, Resolution: 1% increments.
[Example1: For a range of 50 mS to 12 Seconds, suffix would be: -A50MS-12]
[Example2: For a range of 50 mS to 500 mS, suffix would be: -A50MS-500MS]
[Example3: For a range of 1 Second to 60 Seconds, suffix would be: -A1-60]
4. Please note: units with 'Dual-Trigger' (-DT) option will trigger on at power-up when no input pulse is present. When combing this option with the fault 'lock-out' option (-LO), pulses must be detected within the time-out period at initial power-up to prevent a fault 'lock-out' condition from occurring.

Detailed Timing Specification



SYMBOL	PARAMETER	LIMITS			UNIT	CONDITION
		MIN	TYP	MAX		
T	Time-out period	1.96	2.0	2.04	Seconds	Notes 1, 2, 3
T_{IN}	Trigger Input pulse-width	500 μ S		T		Pins 5 & 6, Note 5
T_{PUC}	Power-up clear delay		200	300	mS	Note 4
T_{RET}	Retrigger delay (lockout)		50		mS	Note 4

Note(s):

- Standard time-out period is 2 Seconds. Nominal time "T" corresponds accordingly for units with optional time-out values, including -Txx.x, -Mxxx, -Axx-xx, etc..
- Standard Tolerance is +/-2%, optional -FC factory calibration to +/- 1%.
- Standard units time-out from last valid ON-EDGE transition of input Trigger (pins 5 & 6).
Units with -DT dual triggered option time-out from last change-of-state of Trigger input.
- Trigger Input pulses ignored during this period. The Power-up clear delay feature assures that the timer is initialized when powered on. The Retrigger delay lockout prevents inductive or RFI/EMI coincident with time-out from inadvertently triggering the timer.
- This value applies to both 'ON' and 'OFF' time pulse widths of standard units. 'FAST PULSE' indication occurs when multiple pulses are received within a 15mS period. For units with AC input trigger option -AC, T_{IN} (min) is 25mS.

Options Index

Optional Configurations

Options allow a designer to specify parameters specific to a control system or application. Configurations include timing, triggering mode and type of WDI signal, mode of power-up, fault handling, timing accuracy and retrofit compatibility. Configuration options make the P8D-Series very flexible and simple to install and use.

Refer to the *Options Compatibility Chart* for which options can be combined together.

Refer to the *Options Index* for the applicable section for each specific option.

- 1** ▶ Fixed Time-out (specified) (-T)
- 2** ▶ Extended Fixed Time-out (Minutes) (-M), (-M+S)
- 3** ▶ Adjustable Time-out 25 TURN (-Axx.xx to xx.xx)
- 4** ▶ Power-up Triggered (-PT)
- 5** ▶ Dual-edge Input Trigger/Reset (-DT)
- 6** ▶ 120VAC/60Hz Trigger Input (-AC)
- 7** ▶ Lock-out 'First Fault' Annunciated (-LO)
- 8** ▶ Factory Calibration <1% Timing Accuracy (-FC)
- 9** ▶ Non-isolated P8-Series compatible (P8)
- 10** ▶ OEM USER Configurable (-OEM); (consult factory)

Options Compatibility Chart

OPTION(S)	FIXED TIMOUT (T)	1 MINUTES (M, S)	ADJUSTABLE (A)	POWER-UP TRIGGER (PT)	DUAL-EDGE TRIG (DT)	AC INPUT (AC)	LOCK-OUT (LO)	1% CALIBRATION (FC)	NON-ISOLATED (P8)
FIXED TIMOUT (T)				■	■	■	■	■	■
1 MINUTES (M, S)				■	■	■	■	■	■
ADJUSTABLE (A)				■	■	■	■	■	■
POWER-UP TRIGGER (PT)	■	■	■		■	■	■	■	■
DUAL-EDGE TRIG (DT)	■	■	■	■			2	■	■
AC INPUT (AC)	■	■	■	■			■	■	■
LOCK-OUT (LO)	■	■	■	■	2	■		■	■
1% CALIBRATION (FC)	■	■	■	■	■	■	■		■
NON-ISOLATED (P8)	■	■	■	■	■	■	■	■	

Note(s):

1 Minutes (M) values may be combined with Seconds (s) to provide a time-out; the sum of minutes and seconds.

2 The Dual Edge Trigger option combines a power-up trigger feature. If this option is used with the Latch option, the input trigger signal must be present at power-up. Otherwise, the timer will time-out from power-up and latch in the shutdown mode requiring an external reset to be applied with the input signal present.

BLANK BOXES indicate options which cannot be combined.

1 ▶ Fixed Time-out (specified) (-T)

P8D-WDT types without any timing options specified, provide a standard 2 second Fixed Time-out. If a time-out period is desired other than the standard two (2) seconds, specify the time-out desired when ordering. A fixed time-out value may be any value from 50 milliseconds to 60 Seconds.

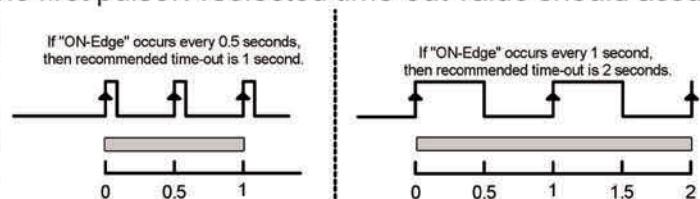
For a time-out of less than 1 second, the value must be specified in milliseconds (i.e. for a 250 millisecond timeout, specify “-T250MS”). For values of 1 second to 60 seconds, the value is specified in seconds (i.e. -T2.75 for 2.75 seconds OR -T30 for 30 seconds).

Timing Precision

Precision Timing values may also be specified to millisecond resolution. Timing values are the value of the internal precision digital timer with +/-2% standard accuracy or +/-1% optional accuracy. Note that for short time-out periods, the pick-up and drop-out times of the output relay need to be considered. A seven (7) millisecond pick-up latency of the output should be expected including contact bounce when the Watchdog is first triggered. Upon time-out, a three (3) millisecond drop-out latency of the output should be expected including contact bounce.

Selecting a Time-out

Standard P8D-Series modules are ‘Single-Edge’ or ‘ON-Edge’ triggered starting the timer and energizing the output relay upon receiving the first pulse. A selected time-out value should assure that at least two ON-Edges triggers occur within the time-out period. For example, if a pulse is received every 500 milliseconds, the recommended time-out value would be at least greater than two times, or 1 second. Careful consideration must be used when



using a “toggle” function to trigger the WDI input. An example would be, where a ‘toggle’ function is performed every 500mS - meaning the state changes OFF for 500mS, then ON for 500mS... In this case, only one “ON-EDGE” occurs every full second making the recommended time-out 2 seconds so that at least two triggering “ON-Edges” occurs within the time-out period.

Enhanced Inductive Load Feature

It is highly recommended that all inductive loads in any control system be suppressed with sufficient spike suppression to eliminate RFI/EMI from “inductive kick” when a coil de-energizes. The P8D-Series employs a proprietary *Enhanced Inductive Load Feature* which prevents false re-triggers from RFI/EMI spikes which can occur at time-out from the de-energizing of coincident inductive loads. Please refer to (T_{RET}) in the Detailed Timing Specification section.

2 ▶ Extended Fixed Time-out (Minutes) (-M), (-M+S)

The P8D-Series Watchdog Timers offer precision time-out periods from 1 minute to 24 hours (24 hours is the same as 1440 minutes). Time-out is the time from the last input trigger received until timer times-out. Configurations with specific times of minutes + seconds may be specified.

Whole Minutes Timing

If a time-out period is desired at an exact minute interval, then only the -M designator needs to be used in the part number. (i.e. - specify **-M10** for exactly 10 minutes, or for exactly 2 hours, specify M as calculated for minutes: 60 minutes/HR x 2 HRS = 120 minutes or -M120).

Precise Extended Timing

If a precise minute/second time-out is desired, both -M and -S designators are used in the part number. Any time-out can be achieved over the full 24 hour range within the timer accuracy. (Standard timer accuracy is +/-2%, with -FC option, accuracy is +/-1%.)

Basic Example:

For a time-out of 90 seconds, the time-out is denoted as 1 minute(s) and 30 seconds, or **-M1,S30**) derived from 60 seconds = 1 minute and an additional 30 seconds to total 90 seconds.

Advanced Example:

For a time-out of 6 hours, 22 minutes and 5 seconds. the M and S values are derived as follows:

60 minutes/HR x 6 Hours = 360 minutes

-M is 360 for 6 hours + 22 additional minutes, thus the total value for -M is 382.

-S are simply the additional 5 seconds required which are 5 in this example.

The time-out designation for this example is **-M382,S5** equal to

6 hours, 22 minutes and 5 seconds.

3 ▶ Adjustable Time-out 25 TURN (-Axx.xx to xx.xx)

The P8D-Series allows the range of time-out period adjustment to be specified. By defining the minimum and maximum time-out values, **a 25 turn adjustment is provided for field timing adjustment in 1% increments (or 100 step resolution)**. (Note: There are no stops in the timing adjustment screw - it will rotate continuously over the specified timing range.)

Any timing value ranges from 50 milliseconds to 60 seconds may be specified, with the minimum range span of 100mS. The time-out value increases with clockwise adjustment.

Specifying Adjustable Time-out Periods

Example(s):

1. For an adjustable range of 50 milliseconds to 2 seconds, specify **-A50MS-2** in the part number.
2. For 100 milliseconds to 500 milliseconds, specify **-A100MS-500MS**.
3. For an adjustable range of 2 to 10 seconds, specify **-A2-10**.
4. For an adjustment range of 1 to 60 Seconds, specify **-A1-60**.

Estimating Time-out by Adjustment Turns

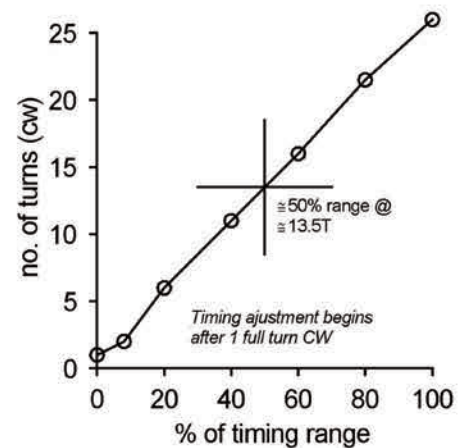
When determining time-outs, it is first recommended to begin at the minimum end of the adjustable timing range using a small screw driver and rotating the 25T adjustment screw 25+ times counter-clockwise (CCW or to the left). The timing range is at the maximum time when the 25T adjustment is rotated 25+ times clockwise (CW or to the right). (Note: There are no stops in the timing adjustment screw - it will rotate continuously.)

When calculating a time-out, add the minimum time (T_{min}) to the increased time derived from the graph to the right.

$$T = T_{\text{MIN}} + (\% \text{Range} \div 100\% \times (T_{\text{MAX}} - T_{\text{MIN}}))$$

where,

(T) is Timeout,
 (T_{MIN}) is the minimum time-out,
 (T_{MAX}) is the maximum time-out
 %Range is the estimated factor value determined by no. of turns from the adjustment graph.



Estimating Adjustment Turns by Time-out

To determine approximately how many turns to adjust the timing screw for the desired time-out value, the below formula can be applied:

$$\# \text{Turns} = 25.6 \times \left(\frac{T - T_{\text{MIN}}}{T_{\text{MAX}} - T_{\text{MIN}}} \right) + 0.67$$

where,

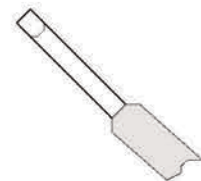
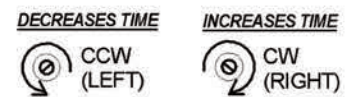
#Turns is the number of complete clockwise turns after starting at the minimum time determined by rotating timing adjustment 25+ Turns CCW prior to adjusting CW.

(T) is Desired Timeout Period,
 (T_{MIN}) is the minimum time-out,
 (T_{MAX}) is the maximum time-out,
 25.6 is the scale factor,
 and .67 is the portion of the adjustment screw having no effect on timing.

Example:

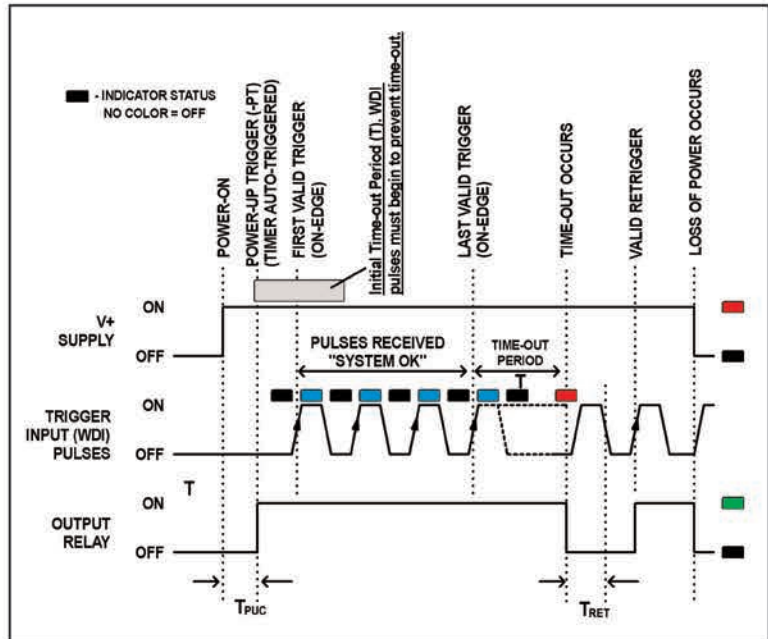
For an adjustable time-out period of 5 to 15 seconds (-A5-15), the number of turns can be estimated for any time-out within the range using the above formula:

If a time-out of 12 seconds is desired, #Turns is $(25.6 \times ((12 - 5) \div (15 - 5))) + 0.67$, where #Turns of full turns is 22.33T.
 If a time-out of 6 seconds is desired, #Turns is $(25.6 \times ((6 - 5) \div (15 - 5))) + 0.67$, where #Turns of full turns is 2.23T.



4 ▶ Power-up Triggered (-PT)

The Power-up Trigger function (-PT) is useful for applications which may require time to boot-up a control system intended to continue triggering the Watchdog Timer. After the initial power-up delay (T_{PUC}), the Power-up Trigger function (-PT) automatically triggers the timer when power is applied to pins 2 & 7, which energizes the output relay for the initial time-out period (T). If no pulses are subsequently received during the initial time-out period, the timer will time-out and de-energize the output as a system time-out fault. Other uses include precision power-on/delay-off timer applications.



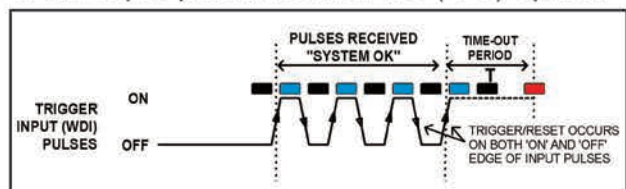
Application Note:

Special Considerations when employing (-PT) & (-LO) Options together

If the (-PT) option is combined with the Lock-out (-LO) option, trigger pulses need to be received after power-up and during the initial time-out period to prevent a 'time-out / lock-out' from occurring. If time-out / lock-out' does occurs, a RESET must be initiated to clear the 'lock-out' state by interrupting power to pin 2 for two (2) seconds. A RESET will allow the power-up trigger sequence to clear and again accept input trigger pulses.

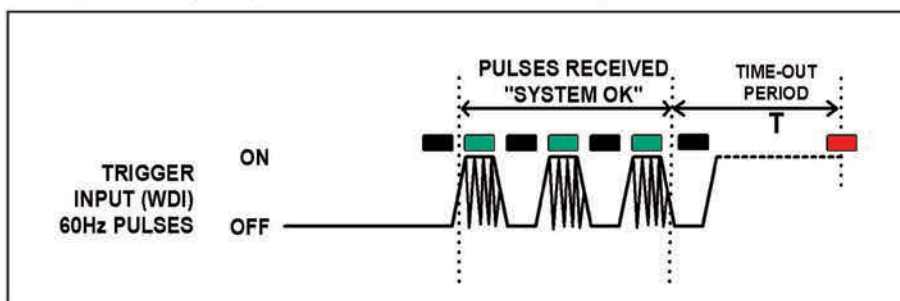
5 ▶ Dual-edge Input Trigger/Reset (-DT)

The standard Watchdog Timer input is 'single-edge' triggered only resetting the Watchdog Timer when an "ON-EDGE" is received (pins 5+ & 6-). The Dual-Edge trigger (-DT) option triggers/resets the timer on leading (ON) and trailing (OFF) edges of the input pulse. As with the (-PT) option, this feature triggers the timer at power-up. The same special considerations apply when using this feature with the (-LO) lock-out option as mentioned in the previous option section.



6 ▶ 120VAC/60Hz Trigger Input (-AC)

The (-AC) input option features an advanced filter which recognizes 60Hz AC voltages to determine their presence and absence providing dependable ON/OFF AC signal detection. Without this feature, an AC voltage continuously applied ON to a standard DC pulse input, it appears as multiple pulses keeping the timer triggered. (Please consult factory for filtering and detection of lower frequencies, such as 50Hz.)



This option provides detection of standard AC line voltages operating within the 90-130VAC limits which can be switched ON and OFF by standard DRY CONTACT outputs, such as mechanical relays, switches, etc.) The input indicator is ON (GREEN) while the AC is present and OFF when it is absent.

Application Note:

The input is virtually “non-loading” to the AC signal source and therefore may not meet the minimum loading requirements of SSR’s. In such applications, the required load must be applied externally or used in applications with minimum load requirements already met.

Operating Parameters -AC Option (Pins 6 & 8)

SYMBOL	PARAMETER	LIMITS			UNIT	CONDITION
		MIN	TYP	MAX		
F_{IN}	AC Frequency	58	60	480	Hz	
AC_{ON}	Pulse ON-time	2		time-out	mS	
AC_{OFF}	Pulse OFF-time	20		time-out	mS	
R_{in}	Input Resistance	200	250		Kohm	
V_{off}	Input OFF level	0		5	Vrms	
V_{on}	Input ON level	90	115	150	Vrms	

Absolute Maximum RESET (WDI) voltage (Pins 6 & 8) 200Vrms

7 ▶ Lock-out 'First Fault' Annunciated (-LO)

This feature is very useful for systems with intermittent faults or in safety applications which cannot allow a system to recover without user intervention (permissive start, machinery, etc.)

The Lock-out 'First Fault' option is an advanced feature which permits the system to maintain a time-out fault in the latched state until cleared by interrupting power to pins 2(+) and or 7(-) for at two seconds. This option differs from the standard 'free mode' operation, which automatically recovers when the monitored input pulse resumes.

At power-up, the P8D-WDT module is cleared of all faults while it awaits for an input pulse. The triggering edge of the first pulse then triggers the timer which energizes the output and lights the SYSTEM OK indicator. After the OK status has been indicated, if a time-out occurs, the output contact will de-energize and will not re-energize maintaining an 'lock-out'. Only by interrupting the power to the module clears a fault and restores operation.

8 ▶ Factory Calibration <1% Timing Accuracy (-FC)

This feature is recommended for long time-outs (60 seconds) and other demanding applications where precision timing is needed. The timing engine of the P8D-WDT has an inherent timing accuracy of better than +/- 2% achieved by advanced digital technology and precise factory trimmed components. The Factory Calibration option provides additional testing and calibration traceable NIST standards yielding an accuracy of better than +/- 1%.

9 ▶ Non-isolated P8-Series compatible (P8)

This option allows for upgrading applications using a P8-series P8-WDT24/PLC Watchdog Timer Module (without -ISO options). By using this option, the WDI input is NO LONGER ISOLATED. An internal connection is made between pins 6 & 7. This modification can also be made in the field to make the P8D-Series and the P8-Series compatible. NOTE: P8-Series modules with an -ISO, -ISO5 or -ISO10 option should not use the -P8 option as they already incorporate an isolated input.

10 ▶ OEM Field Configurable (-OEM);

(REFER TO P/N PD8-ISM DATA SHEET FOR USER CONFIGURABLE MODEL)

OEM units may be configured and reconfigured using the hand-held **Configurator™**.

Configurable parameters include:

- (-T) Fixed Time-out; any fixed time-out value from 50mS to 60 seconds.
- (-A) Adjustable time-out range; and valid timing range values 50mS to 60 sec.
- (-PT) Power-up Trigger; active or inactive
- (-DT) Dual-Edge Trigger; active or inactive
- (-LO) Lock-out; active or inactive