**Description**

The TSD Series is designed for more demanding commercial and industrial applications where small size, and accurate performance is required. The factory calibration for fixed time delays is within 1% of the target time delay. The repeat accuracy, under stable conditions, is 0.5% of the time delay. The TSD Series is rated to operate over an extended temperature range. Time delays of 0.1 seconds to 1000 minutes are available. The output is rated 1 A steady and 10 A inrush. The modules are totally solid state and encapsulated to protect the electronic circuitry. This product is suitable for many applications, including dispensing, welding, and exposure timing.

**Operation**

Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will not energize if the initiate switch is closed when input voltage is applied.

**Reset:** Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

**Function**

![Single Shot Diagram]

V = Voltage  
L = Load  
TD = Time Delay  
S1 = Initiate Switch  
R = Reset

**Connection**

![Connection Diagram]

R<sub>T</sub> is used when external adjustment is ordered.  
Dashed lines are internal connections.

L = Timed Load  
UTL = Optional Untimed Load  
S1 = Initiate Switch

**Ordering Table**

<table>
<thead>
<tr>
<th>TSDS Series</th>
<th>X</th>
<th>Input</th>
<th>X</th>
<th>Adjustment</th>
<th>X</th>
<th>Time Delay</th>
<th>X</th>
<th>Switching Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- 12 V DC</td>
<td></td>
<td>- Fixed</td>
<td></td>
<td>0.1 ... 10 s</td>
<td></td>
<td>P - Positive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 24 V AC</td>
<td></td>
<td>- External</td>
<td></td>
<td>1 ... 100 s</td>
<td></td>
<td>N - Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 24 V DC</td>
<td></td>
<td>- Adjust</td>
<td></td>
<td>2 ... 1000 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 120 V AC</td>
<td></td>
<td>- Onboard</td>
<td></td>
<td>3 ... 10 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 230 V AC</td>
<td></td>
<td>- Adjust</td>
<td></td>
<td>4 ... 100 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 100 V DC</td>
<td></td>
<td>-</td>
<td></td>
<td>5 ... 1000 m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example P/N: **TSDS421** Fixed - **TSDS310.1SP**

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**Accessories**

- **External adjust potentiometer**  
P/Ns:  
P1004-95  (fig A)  
P1004-95-X (fig B)
- **Mounting bracket**  
P/N: P1023-6
- **Female quick connect**  
P/N: P1015-64 (AWG 14/16)
- **Quick connect to screw adaptor**  
P/N: P1015-18
- **Versa-knob**  
P/N: P0700-7
- **DIN rail adaptor**  
P/N: P1023-20
- **DIN rail P/Ns:**  
  C103PM (Al)  
  017322005 (Steel)

See accessory pages for specifications.
# Single Shot (Pulse Former)  
**TSDS Digi-Timer**  
**Timing Module**

## Technical Data

| Time Delay |  
|------------|---|
| **Range** |  
| **Repeat Accuracy** | +/-0.5% or 20 ms, whichever is greater  
| **Tolerance (Factory Calibration)** | +/-1%  
| **Reset Time** | 150 ms  
| **Initiate Time** | 20 ms  
| **Time Delay vs. Temperature & Voltage** | +/-2%  

| Input |  
|-------|---|
| **Voltage** |  
| **Tolerance** | +/-15%  
| **Power Consumption** | AC <= 2 VA; DC <= 1 W  
| **Line Frequency** |  
| **DC Ripple** |  

| Output |  
|-------|---|
| **Type** | Solid state  
| **Form** | Normally Open, closed during timing  
| **Maximum Load Current** |  
| **Voltage Drop** | AC = 2.5 V at 1 A; DC = 1 V at 1 A  
| **Off State Leakage Current** | AC = 5 mA at 230 V AC; DC = 1 mA  
| **DC Operation** | Positive or negative switching  

| Protection |  
|-----------|---|
| **Circuitry** | Encapsulated  
| **Dielectric Breakdown** | >= 2000 V RMS terminals to mounting surface  
| **Insulation Resistance** | >= 100 MΩ  
| **Polarity** | DC units are reverse polarity protected  

| Mechanical |  
|-----------|---|
| **Mounting** | Surface mount with one #10 (M5 x 0.8) screw  
| **Package** | 2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)  
| **Termination** |  

| Environmental |  
|---------------|---|
| **Operating/Storage Temperature** | -40°C ... +75°C / -40°C ... +85°C  
| **Humidity** | 95% relative, non-condensing  
| **Weight** | 2.4 oz (68 g)  

## External Resistance vs Time Delay

**In Secs. or Mins.**

| Time Delay Ranges | In 0.1 s ... 1000 m in 6 adjustable ranges or fixed  

### Fixed and External Adjust

#### Mechanical View

**Onboard Adjust**

This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the R₁ terminals; as the resistance increases the time delay increases.
When selecting an external R₁, add the tolerances of the timer and the R₁ for the full time range adjustment.
**Examples:** 1 to 5 s adjustable time delay, select time delay range 1 and a 50 k ohm R₁. For 1 to 100 s use a 100 k ohm R₁.