CTT Series - Digital Counter / Timer / Tachometer

Tachometer Mode

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<td><strong>Input Frequency</strong></td>
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<tr>
<td><strong>Display</strong></td>
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<tr>
<td><strong>External Reset</strong></td>
</tr>
<tr>
<td><strong>Output Duration (Flicker)</strong></td>
</tr>
</tbody>
</table>

Tachometer Output Mode Charts

Counter Example:

Using the counter feature of the CTT to count the total number of pieces in a box to signal a conveyor to advance to the next station.

Click on the above thumbnail or go to [https://www.automationdirect.com/VID-RL-0006](https://www.automationdirect.com/VID-RL-0006) for a short Tachometer demo video.

Click on the above thumbnail or go to [https://www.automationdirect.com/VID-RL-0005](https://www.automationdirect.com/VID-RL-0005) for a Tachometer Set-up video.
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Timer Example:
A basic Timer used to control the clamp time of a compression model press. When the operator signals, the mold is loaded with material. When a start button is pressed, the hydraulic cylinder closes the press to make a limit switch which starts the CTT timing. Upon completion of the timer cycle, Output 1 is turned on and the press is opened by the hydraulic cylinder.

Tachometer Example:
Using PScale to convert pulses into engineering units
The PScale feature of the CTT is very useful in converting the pulsed signal from an encoder or sensor into a usable unit of measurement.
For example, if connecting a proximity switch to the CTT to monitor the speed of a motor using a sensing gear, there is a simple calculation to convert the pulses from the sensor to Motor RPMs.
Using the following formula, you can calculate a PScale value to change a pulse signal into RPMs. First, obtain the pulses per revolution (ppr) or number of teeth on the sensing gear.

For example, in the illustration below, there are 38 teeth on the gear or 38 ppr. If the gear is coupled directly to the motor, this is all that is required to perform the calculation.
PScale = 60/ppr or 60/38
PScale = 1.579
With the PScale set to 1.579 for every 38 input cycles the CTT will display a value of 1.
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Features

- Can operate as a digital counter, timer, combination timer + counter or tachometer
- Accepts voltage and non-voltage inputs from a wide variety of NPN, PNP, or dry contact sensors
- Selectable counting speeds from 1 to 10,000 cycles per second
- Multiple transistor and relay outputs can operate as momentary or maintained
- Double-line, 6-digit, 2-color LCD display
- Easy configuration with externally accessible DIP switches or the lockable keypad
- Display decimal point selection
- Available in 100-240VAC and 24VDC powered models
- UL508 listed (E311366), cULus, CE marked

A lot of functionality in one powerful little unit!

The CTT series is an extremely versatile multi-function device that is easily configured for operation as a digital counter, timer, combination timer + counter, or tachometer. Both voltage and non-voltage inputs are accepted from a wide variety of sensor types with NPN, PNP, or dry contact outputs. The first output on the CTT is a single-pole, single-throw relay and NPN transistor that operate concurrently. The second CTT output can be ordered as either a single-pole, double throw relay or NPN transistor. Parameters are easily set using the externally accessible DIP switches or the lockable keypad. The double-line, 6-digit, two-color LCD display shows the counter, timer, or tachometer present values, setting values and menu parameters during set-up. Additional individual indicators are provided for inputs, outputs and functions. The standard 1/16 DIN size, with included panel mounting clip and gasket, make panel mounting a snap. The CTT is available in 100-240VAC and 24VDC powered models.

Visit www.automationdirect.com to download the free comprehensive CTT Series manual.

### Counter Functions

<table>
<thead>
<tr>
<th>Counter Functions</th>
<th>Counter Input Modes</th>
<th>Counter Output Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Stage</td>
<td>Up</td>
<td>Select from eleven (11) different output modes (F, N, C, R, K, P, Q, A, S, T, D)</td>
</tr>
<tr>
<td>2-Stage</td>
<td>Down</td>
<td></td>
</tr>
<tr>
<td>Batch</td>
<td>Up / Command Down</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Up / Down</td>
<td></td>
</tr>
<tr>
<td>Dual</td>
<td>Quadrature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Addition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subtraction</td>
<td></td>
</tr>
</tbody>
</table>

### Timer Functions (Up or Down)

- Signal On Delay 1
- Signal On Delay 2
- Signal Off Delay
- Signal On
- Power On Delay
- Power On Delay Hold
- Repeat Cycle
- Repeat Cycle Hold

<table>
<thead>
<tr>
<th>Signal Functions (Up or Down)</th>
<th>Counter Input Modes</th>
<th>Counter Output Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal On Delay 1</td>
<td>Up</td>
<td>Repeat Cycle</td>
</tr>
<tr>
<td>Signal On Delay 2</td>
<td>Down</td>
<td></td>
</tr>
<tr>
<td>Signal Off Delay</td>
<td></td>
<td>Repeat Cycle Hold</td>
</tr>
<tr>
<td>Signal On</td>
<td></td>
<td>Repeat Cycle 2</td>
</tr>
<tr>
<td>Power On</td>
<td></td>
<td>Signal Cumulate</td>
</tr>
<tr>
<td>Power On Delay</td>
<td></td>
<td>Signal Twin On-Start</td>
</tr>
<tr>
<td>Power On Delay Hold</td>
<td></td>
<td>Signal Twin OR-Start</td>
</tr>
<tr>
<td>Repeat Cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeat Cycle Hold</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Tachometer Output Modes

- Select from four (4) different output modes
  - 2Lo/1Lo
  - 2Lo/1Hi
  - 2Hi/1Lo
  - 2Hi/1Hi

Visit www.automationdirect.com to download the free comprehensive CTT Series manual.

For latest prices, please check AutomationDirect.com

For a full set of Demo and Set Up videos for the CTT units please scan the QR code or follow the link below. https://www.automationdirect.com/videos/home?ref=link&cat1=60
## CTT Series - Digital Counter / Timer / Tachometer

### Digital Counter / Timer / Tachometer

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Pcs/Pkg</th>
<th>Wt (lb)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTT-AN-D24</td>
<td>Counter / Timer / Tachometer, Output 1 NPN &amp; SPST relay, Output 2 NPN, 24 VDC powered, panel mounting clip is included*</td>
<td>1</td>
<td>0.4</td>
<td>$79.00</td>
</tr>
<tr>
<td>CTT-AN-A120</td>
<td>Counter / Timer / Tachometer, Output 1 NPN &amp; SPST relay, Output 2 NPN, 100-264 VAC powered, panel mounting clip is included*</td>
<td>1</td>
<td>0.4</td>
<td>$79.00</td>
</tr>
<tr>
<td>CTT-1C-D24</td>
<td>Counter / Timer / Tachometer, Output 1 NPN &amp; SPST relay, Output 2 SPDT relay, 24 VDC powered, panel mounting clip is included*</td>
<td>1</td>
<td>0.4</td>
<td>$79.00</td>
</tr>
<tr>
<td>CTT-1C-A120</td>
<td>Counter / Timer / Tachometer, Output 1 NPN &amp; SPST relay, Output 2 SPDT relay, 100-264 VAC powered, panel mounting clip is included*</td>
<td>1</td>
<td>0.4</td>
<td>$79.00</td>
</tr>
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</table>

* Spare panel clips part number PANEL-16

### CTT Series - Digital Counter / Timer / Tachometer General Specifications

- **Input Power Requirements**: 100 to 240 VAC 50/60 Hz, 24 VDC
- **Operation Voltage Range**: 85 to 264 VAC, 21.6 to 26.4 VDC
- **Power Consumption**: Less than 10 VA
- **Power Source**: 12 VDC ±10%, 100 mA
- **Display**: Double-line, 6-digit LCD display (SV = 8 mm, PV = 6 mm)
- **Input Signal**: NPN ON impedance 1 kΩ max., ON residual voltage 2 V max.
  - PNP 4.5 to 30 VDC, low level: 0 to 2 VDC
- **Output 1**: CTT-1C-xxx
  - Relay: SPST max. 250 VAC, 5 A (resistive load), 4 A (inductive load)
  - Transistor: NPN open collector
  - When 100 mA @ 30 VDC, residual voltage = 1.5 VDC max
- **Output 2**: CTT-AN-xxx
  - Relay: SPDT max. 250 VAC/30 VDC, 5 A (resistive load), 4 A (inductive load)
  - Transistor: NPN open collector
- **Life Expectancy**:
  - Mechanical: 10,000,000 operations (frequency 18,000 operations/hr)
  - Electrical: 100,000 operations (frequency 900 operations/hr)
- **Output Duration (where used)**: 0.00 (latching) / 0.01 to 99.99 seconds
- **Output Switching Time**: 2 milliseconds max
- **Dielectric Strength**: 2000 VAC 50/60 Hz for 1 minute
- **Vibration Resistance**: Without damage: 10 ~ 55 Hz, amplitude = 0.75 mm, 3 axes for 2 hours
- **Shock Resistance**: Without damage: drop 4 times, 300 m/s², 3 edges, 6 surfaces and 1 corner
- **Ambient Temperature**: +32°F to +122°F (0°C to +50°C)
- **Storage Temperature**: -4°F to +149°F (-20°C to +65°C)
- **Altitude**: 2000 m or less
- **IP Rating**: IP 66 (with proper enclosure installation)
- **Case Materials**: Case = ABS Plastic, Lens = Polycarbonate
- **Ambient Humidity**: 35% to 85% RH (non-condensing)
- **Memory Backup upon Power Failure**: EEPROM writing up to 100,000 times; Memory duration: 10 years
- **Terminals**: Conforming Wiring 0.25-1.65 mm² (24 to 16 AWG)
  - Permitted Torque: 0.5 N·m (0.369 ft·lb)
- **Agency Approvals**: UL508 listed (E311366), cULus, CE marked

### Wiring

- **CTT-1C-D24**
- **CTT-AN-D24**
- **CTT-1C-A120**
- **CTT-AN-A120**

For latest prices, please check AutomationDirect.com
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Display, Indicators & Keys

<table>
<thead>
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<th>Mode and number shift key</th>
<th>Lock key</th>
<th>Reset key</th>
<th>Special function indicator</th>
<th>Key protect 1 indicator</th>
<th>Key protect 2 indicator</th>
<th>Output 1 indicator</th>
<th>Output 2 indicator</th>
<th>Reset 1 indicator</th>
<th>Reset 2 indicator</th>
<th>PV(Present Value) display</th>
<th>SV(Set Value) display</th>
<th>Timer function indicator</th>
<th>Counter function indicator</th>
<th>Tachometer function indicator</th>
<th>Up/Down key</th>
</tr>
</thead>
</table>

LCD Display and Indicators

| RST 1/2 | Light on when reset signal is detected | BATCH | "Batch Counting Mode" in Counter | K/P 1/2 | Light on when key-protected mode is enabled | SET 1 2 | SV1, SV2 display | OUT 1/2 | Light on when output is executing | TAC | Light on in Tachometer function | H M S | Hour, minute, second, unit of timer, displayed in Timer function | CNT | Light on in Counter function | TOTAL | "Total Counting Mode" in Counter function | TMR | Light on in Timer function |

CTT Series Dimensions

mm [inches]