# CTT Series - Digital Counter / Timer / Tachometer

## Counter Mode

### Counter Performance Specifications

<table>
<thead>
<tr>
<th>Counter Functions</th>
<th>1-Stage Counting, 2-Stage Counting, Batch Counting, Total Counting, Dual Counting (See descriptions below)</th>
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</thead>
<tbody>
<tr>
<td>Input Modes</td>
<td>Counting Up, Counting Down, Counting Up / Command Counting Down, Counting Up / Counting Down, Quadrature, Addition, Subtraction (see descriptions below)</td>
</tr>
<tr>
<td>Timer Precision</td>
<td>Power On start max 0.01% 0.05 sec, Signal start max 0.01% 0.03 sec</td>
</tr>
<tr>
<td>External Reset</td>
<td>Minimum reset input signal width 1ms or 20ms (selectable)</td>
</tr>
<tr>
<td>Output Duration (flicker)</td>
<td>10-9990ms variable every 10ms</td>
</tr>
<tr>
<td>Number of Digits</td>
<td>6 digits on each line</td>
</tr>
<tr>
<td>Display</td>
<td>Current values: red LED, character height 8mm; Preset value: green LED character height 6mm</td>
</tr>
</tbody>
</table>

### Counter Functions

#### 1-Stage Counting

A single count setting value SV is available in 1-Stage Counting. Both Outputs 1 and 2 operate concurrently and will turn ON momentarily or will be maintained ON depending on the Output Mode selected.

#### 2-Stage Counting

In 2-Stage Counting, count setting value SV1 controls Output 1 and count setting value SV2 controls Output 2. Outputs will turn ON momentarily or will be maintained ON depending on the output mode selected.

#### Batch Counting

In Batch Counting, count setting value SV controls Output 2 which will turn ON momentarily or will be maintained ON depending on the output mode selected. Count setting value BATCH SV controls Output 1 which will be maintained ON.

#### Total Counting

A single count setting value SV is available in Total Counting.

#### Dual Counting

A single count setting value SV is available in Dual Counting. Both Outputs 1 and 2 operate concurrently and will turn ON momentarily or will be maintained ON depending on the Output Mode selected.

### Counter Input Modes

#### Counting Up

With the input signal OFF at input CP2, each leading edge of the input signal at CP1 will increment the count present value PV by 1. Turning ON the input signal at CP2 will prohibit the input signal at CP1 from incrementing the PV.

#### Counting Down

With the input signal ON at input CP1, each trailing edge of the input signal at CP2 will increment the count present value PV by 1. Turning OFF the input signal at CP1 will prohibit the input signal at CP2 from incrementing the PV.
**Counting Down**

With the input signal OFF at input CP2, each leading edge of the input signal at CP1 will decrement the count present value PV by 1. Turning ON the input signal at CP2 will prohibit the input signal at CP1 from decrementing the PV.

With the input signal ON at input CP1, each trailing edge of the input signal at CP2 will decrement the count present value PV by 1. Turning OFF the input signal at CP1 will prohibit the input signal at CP2 from decrementing the PV.

**Counting Up / Command Counting Down**

With the input signal OFF at input CP2, each leading edge of the input signal at CP1 will increment the count present value PV by 1.

With the input signal ON at input CP2, each leading edge of the input signal at CP1 will decrement the count present value PV by 1.

**Counting Up / Counting Down**

Each leading edge of the input signal at CP1 will increment the count present value PV by 1.

Each leading edge of the input signal at CP2 will decrement the count present value PV by 1.

**Quadrature**

When the quadrature input signal at CP1 leads the input signal at CP2, the trailing edge of CP2 will increment the count present value PV by 1.

When the quadrature input signal at CP2 leads the input signal at CP1, the leading edge of CP2 will decrement the count present value PV by 1.
## CTT Series - Digital Counter / Timer / Tachometer

### 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.

### Counter Functions

<table>
<thead>
<tr>
<th>Counter Input Modes</th>
<th>Counter Output Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Stage</td>
<td>Up</td>
</tr>
<tr>
<td>2-Stage</td>
<td>Down</td>
</tr>
<tr>
<td>Batch</td>
<td>Up / Command Down</td>
</tr>
<tr>
<td>Total</td>
<td>Up/ Down</td>
</tr>
<tr>
<td>Dual</td>
<td>Quadrature</td>
</tr>
<tr>
<td></td>
<td>Addition</td>
</tr>
<tr>
<td></td>
<td>Subtraction</td>
</tr>
</tbody>
</table>

Select from eleven (11) different output modes (F, N, C, R, K, P, Q, A, S, T, D)

### 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

Select from eight (8) different output modes (F, N, C, R, K, P, Q, A)

### Counter/Timer/Tachometer Functions

#### Counter/Timer/Tachometer Input Modes

<table>
<thead>
<tr>
<th>Input Mode</th>
<th>Output Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal On Delay 1</td>
<td>Repeat Cycle</td>
</tr>
<tr>
<td>Signal On Delay 2</td>
<td>Repeat Cycle Hold</td>
</tr>
<tr>
<td>Signal Off Delay</td>
<td>Repeat Cycle 2</td>
</tr>
<tr>
<td>Signal On</td>
<td>Signal Cumulate</td>
</tr>
<tr>
<td>Power On Delay</td>
<td>Signal Twin On-Start</td>
</tr>
<tr>
<td>Power On Delay Hold</td>
<td>Signal Twin Off-Start</td>
</tr>
</tbody>
</table>

### Tachometer Output Modes

Select from four (4) different output modes

- 2Lo/1Lo
- 2Lo/1Hi
- 2Hi/1Lo
- 2Hi/1Hi

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?i=link&cat1=60

Click on the above thumbnail or go to [https://www.automationdirect.com/VID-RL-0001](https://www.automationdirect.com/VID-RL-0001) for a short introductory video for the CTT units.

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

For latest prices, please check AutomationDirect.com
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>Wi (lb)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTT-AN-D24</td>
<td>Counter / Timer / Tachometer, Output 1 NPN &amp; SPST 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-AN-A120</td>
<td>Counter / Timer / Tachometer, Output 1 NPN &amp; SPST relay, 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>
</tbody>
</table>

* Spare panel clips part number PANEL-16

### 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 10VA

**Power Source**
- 12VDC ±10%, 100mA

**Display**
- Double-line, 6-digit LCD display (SV = 8mm, PV = 6mm)

**Input Signal**
- NPN ON impedance 1K ohm max.
- ON residual voltage: 2V max.
- PNP 4.5 to 30VDC, low level: 0 to 2VDC

**Output 1**
- Relay SPST max. 250VAC, 5A (resistive load), 4A (inductive load); Transistor: NPN open collector. When 100mA @ 30VDC, residual voltage = 1.5VDC max.

**Output 2**
- Relay SPDT max. 250VAC/30VDC, 5A (resistive load), 4A (inductive load)
- CTT-AN-xxx Transistor: NPN open collector. When 100mA @ 30VDC residual voltage = 1.5VDC max.

**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**
- 2000VAC 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, 300m/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**
- 2000m 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**

<table>
<thead>
<tr>
<th>Conforming Wiring</th>
<th>Permitted Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25-1.65mm² (24 to 16 AWG)</td>
<td>0.5 N·m (0.369 ft·lb)</td>
</tr>
</tbody>
</table>

**Agency Approvals**
- UL508 listed (E311366), cULus, CE marked

### Wiring

**CTT-1C-D24**

**CTT-AN-D24**

**CTT-1C-A120**

**CTT-AN-A120**
CTT Series - Digital Counter / Timer / Tachometer

Display, Indicators & Keys

CTT Series Dimensions

mm [inches]

<table>
<thead>
<tr>
<th>LCD Display and Indicators</th>
<th>Mode and number shift key</th>
<th>Lock key</th>
<th>Reset key</th>
<th>Special function indicator</th>
<th>Output 2 indicator</th>
<th>Output 1 indicator</th>
<th>Key protect 1 indicator</th>
<th>Key protect 2 indicator</th>
<th>Key protect 0 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>
<tbody>
<tr>
<td>RST 1/2</td>
<td>Light on when reset signal is detected</td>
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<td>K/P 1/2</td>
<td>Light on when key-protected mode is enabled</td>
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<tr>
<td>OUT 1/2</td>
<td>Light on when output is executing</td>
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<tr>
<td>HMS</td>
<td>Hour, minute, second, unit of timer, displayed in Timer function</td>
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</tr>
<tr>
<td>TOTAL</td>
<td>“Total Counting Mode” in Counter function</td>
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