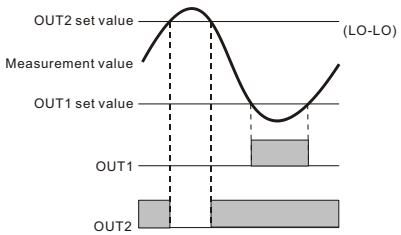
CTT Series - Digital Counter / Timer / Tachometer

Tachometer Mode

Tachometer Performance Specifications	
Output Modes	2Lo1Lo, 2Lo1Hi, 2Hi1Lo, and 2Hi1Hi (See tachometer output mode charts below).
Number of Digits	6 digits on each line
Input Frequency	1Hz, 30Hz, 200Hz, 1kHz, 5kHz, 10kHz
Display	Present values: red LED, character height: 8mm; Set value: green LED, character height: 6mm
External Reset	Minimum reset input signal width 1ms or 20ms (selectable)
Output Duration (Flicker)	10-9990ms variable every 10ms

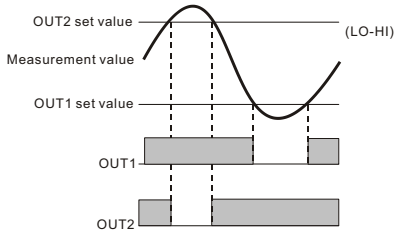
Tachometer Output Mode Charts

2Lo1Lo



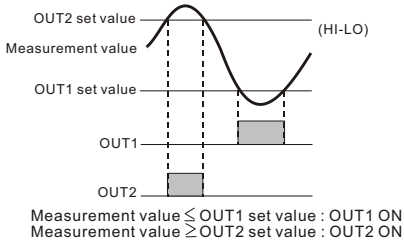
Measurement value ≤ OUT1 set value : OUT1 ON
Measurement value ≤ OUT2 set value : OUT2 ON

2Lo1Hi



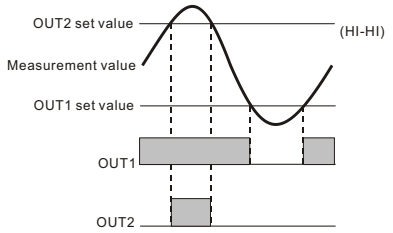
Measurement value ≥ OUT1 set value : OUT1 ON
Measurement value ≤ OUT2 set value : OUT2 ON

2Hi1Lo



Measurement value ≤ OUT1 set value : OUT1 ON
Measurement value ≥ OUT2 set value : OUT2 ON

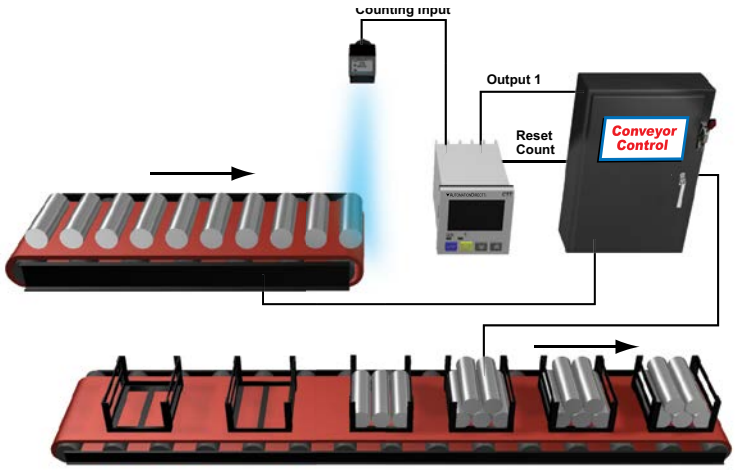
2Hi1Hi

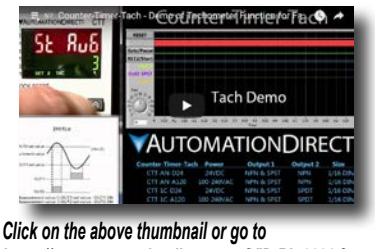


Measurement value ≥ OUT1 set value : OUT1 ON
Measurement value ≥ OUT2 set value : OUT2 ON

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.





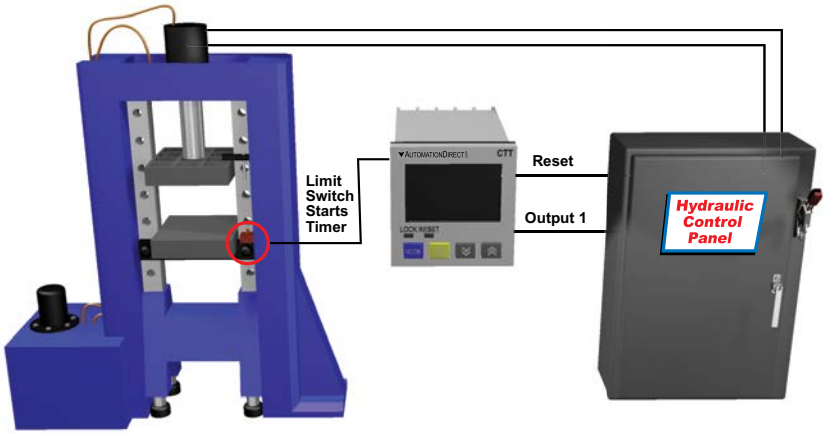
Click on the above thumbnail or go to https://www.automationdirect.com/VID-RL-0006 for a short Tachometer demo video.

Click on the above thumbnail or go to https://www.automationdirect.com/VID-RL-0005 for a Tachometer Set-up video.

CTT Series - Digital Counter / Timer / Tachometer

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 60/38PSCALE = 1.579

With the PSCALE set to 1.579 for every 38 input cycles the CTT will display a value of 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

E311366

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/Timer/ Tachometer Functions

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

Timer + Counter

Timer Functions (Up or Down)	Counter Input Modes	Counter Output Modes
Signal On Delay 1	Up	Select from eight (8) different output modes (F, N, C, R, K, P, Q, A)
Signal On Delay 2	Down	
Signal Off Delay		
Signal On		
Power On Delay		
Power On Delay Hold		
Repeat Cycle		
Repeat Cycle Hold		

Timer Functions (Up or Down)

Signal On Delay 1	Repeat Cycle
Signal On Delay 2	Repeat Cycle Hold
Signal Off Delay	Repeat Cycle 2
Signal On	Signal Cumulate
Power On Delay	Signal Twin On-Start
Power On Delay Hold	Signal Twin Off-Start

Tachometer Output Modes

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

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

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?t=link&-cat1=60

CTT Series - Digital Counter / Timer / Tachometer

Digital Counter / Timer / Tachometer			
Part Number	***Description***	***Wt (lb)***	***Price***
CTT-AN-D24	Counter / Timer / Tachometer, Output 1 NPN & SPST relay, Output 2 NPN, 24 VDC powered, panel mounting clip is included*	0.4	$94.00
CTT-AN-A120	Counter / Timer / Tachometer, Output 1 NPN & SPST relay, Output 2 NPN, 100-264 VAC powered, panel mounting clip is included*	0.4	$94.00
CTT-1C-D24	Counter / Timer / Tachometer, Output 1 NPN & SPST relay, Output 2 SPDT relay, 24 VDC powered, panel mounting clip is included*	0.4	$94.00
CTT-1C-A120	Counter / Timer / Tachometer, Output 1 NPN & SPST relay, Output 2 SPDT relay, 100-264 VAC powered, panel mounting clip is included*	0.4	$94.00

*** Spare panel clips part number PANEL-16**

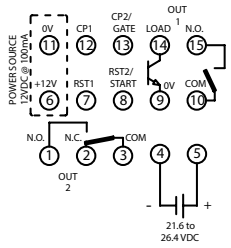
Digital Counter / Timer / Tachometer General Specifications			
Input Power Requirements		100 to 240 VAC 50/60 Hz	24 VDC
Operation Voltage Range		85 to 264 VAC	21.6 to 26.4 VDC
Power Consumption		Less than 10VA	
Power Source		12VDC +10%, 100mA	
Display		Double-line, 6-digit LCD display (SV = 8mm, PV = 6mm)	
Input Signal		NPN ON impedance 1K ohm max. ON residual voltage: 2V max. PNP 4.5 to 30VDC, low level: 0 to 2VDC	
		Counting Speed Setting (Count per second)	Minimum Input Signal Width (Milliseconds)
		1cps	20ms
		30cps	16.7 ms
		1K cps	0.5 ms
		5K cps	0.1 ms
		10K cps	0.05 ms
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	***CTT-1C-xxx***	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/s^2 3 edges, 6 surfaces and 1 corner	
Ambient Temperature		+32 to +122°F (0 to +50°C)	
Storage Temperature		-4 to +149°F (-20 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	***Conforming Wiring***	0.25-1.65mm² (24 to 16 AWG)	
	Permitted Torque	0.5 N·m (0.369 ft·lb)	
Agency Approvals *		UL508 listed (E311366), cULus, CE marked	

*** To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.**

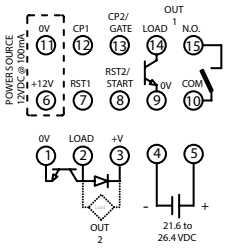
CTT Series - Digital Counter / Timer / Tachometer

Wiring Diagrams

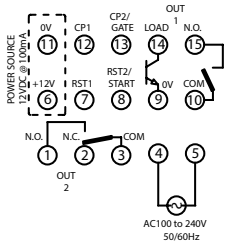
CTT-1C-D24



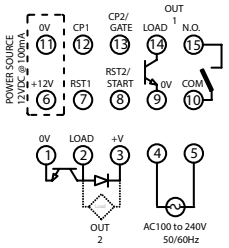
CTT-AN-D24



CTT-1C-A120

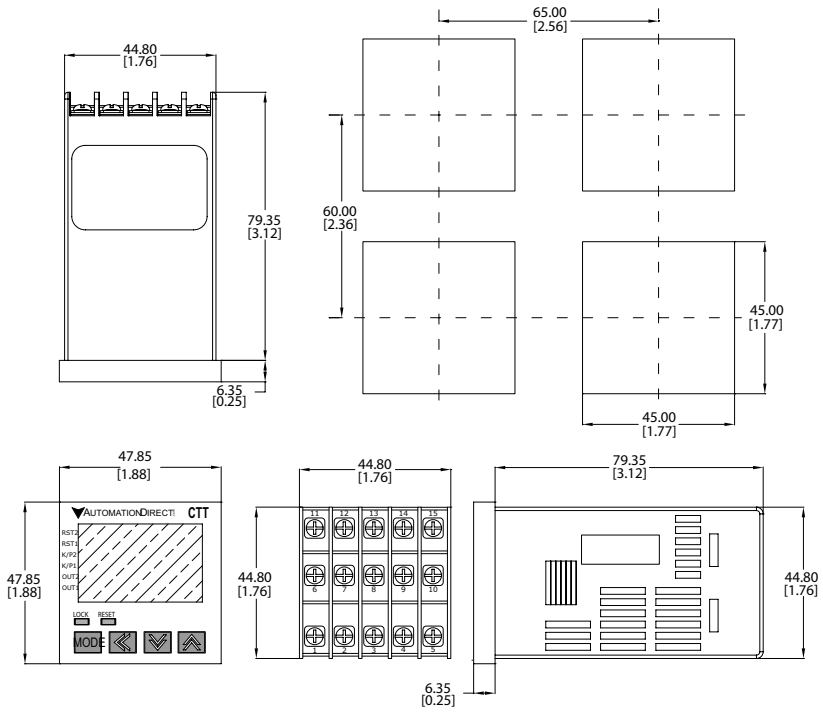


CTT-AN-A120



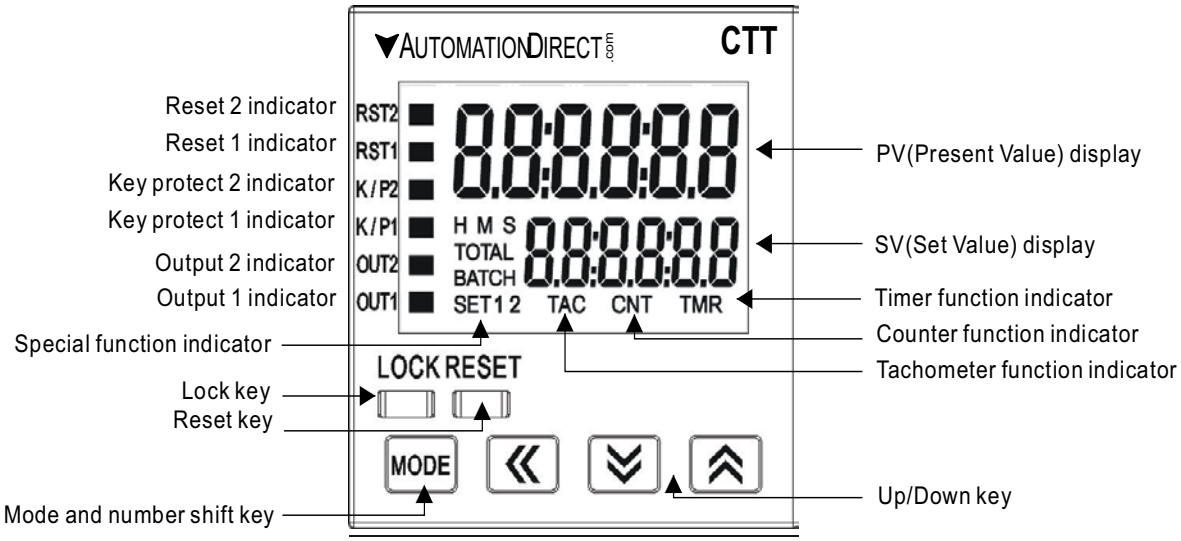
Dimensions

mm [inches]



CTT Series - Digital Counter / Timer / Tachometer

Display, Indicators & Keys



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