Chapter 1
Getting Started

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Overview of this Publication

Thank you for purchasing an AutomationDirect CTT Series Digital Counter / Timer / Tach. This manual shows you how to install, program and maintain the unit.

Who Should Read This Manual

This manual contains important information for those who will install, maintain, and/or operate the AutomationDirect CTT Series Digital Counter / Timer / Tach. It will provide the information you need to get and keep your system up and running.

Technical Support

On the Web: support.automationdirect.com

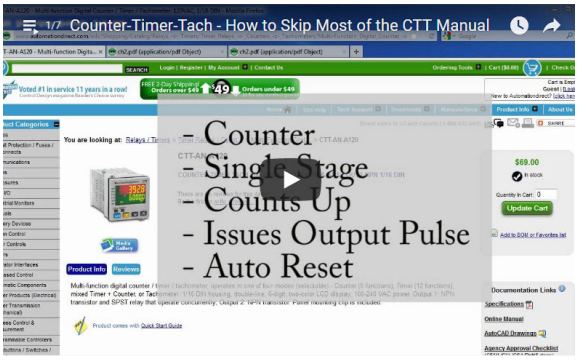
Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular situation, or, if for any reason you need additional technical assistance, please call technical support at 770-844-4200. We are available weekdays from 9:00 a.m. to 6:00 p.m. Eastern Time.

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal.

We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company. Visit us at www.automationdirect.com.

Special Symbols

When you see the "exclamation mark" icon in the left-hand margin, the paragraph to its immediate right will be a warning. This information could prevent injury, loss of property, or even death (in extreme cases).



Click on the above thumbnail or go to
https://www.automationdirect.com/VID-RL-0002
for a video on how to skip most of the CTT manual.

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

General Description

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, included panel mounting clip and gasket make panel mounting a snap. The CTT is available in 120-240VAC and 24VDC powered models.

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 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

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

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		

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

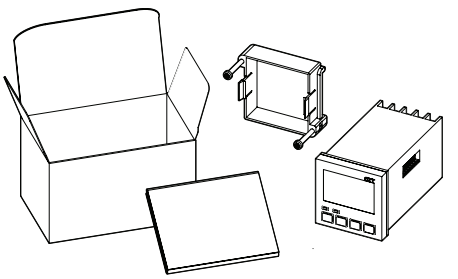
Features

-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 120-240VAC and 24VDC powered models
-UL508 listed, CE marked

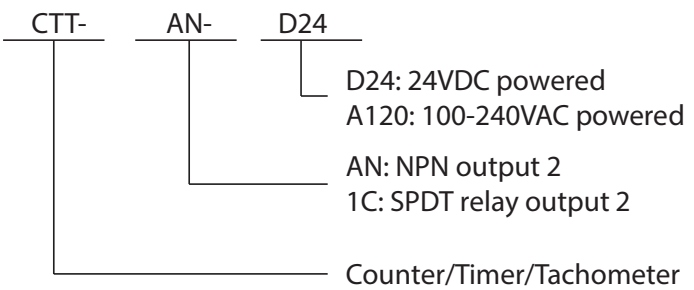
Unpacking

After receiving the CTT Counter/Timer/Tach, please check for the following:

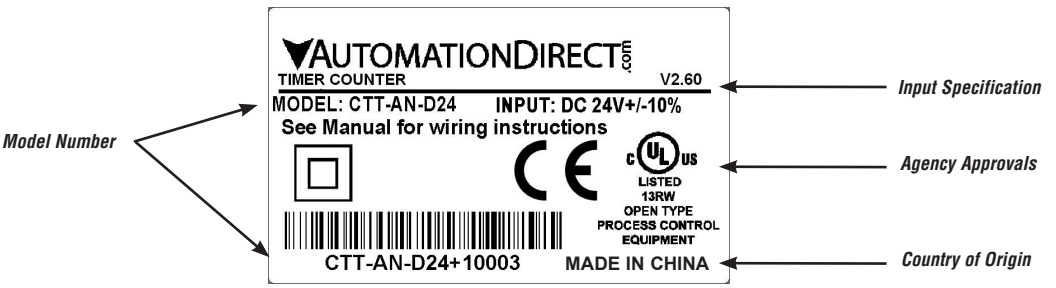
- Make sure that the package includes the CTT Counter/Timer/Tachometer, the mounting bracket and hardware, and the Quick Start Guide.
- Inspect the unit to insure it was not damaged during shipment.
- Make sure that the part number indicated on the label corresponds with the part number of your order.



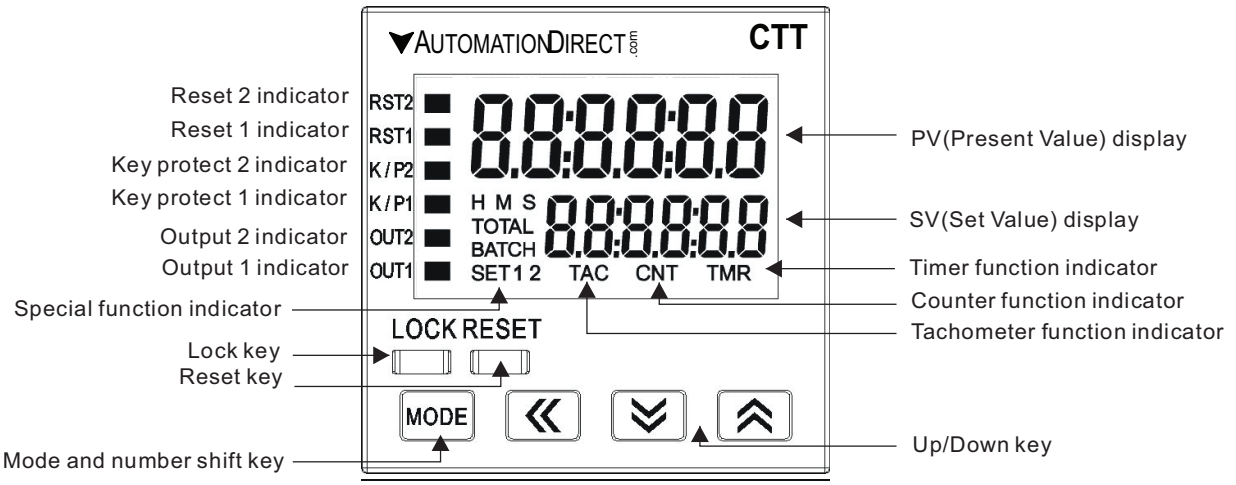
Model Number Explanation



Label Information



Display, Indicators and Keys

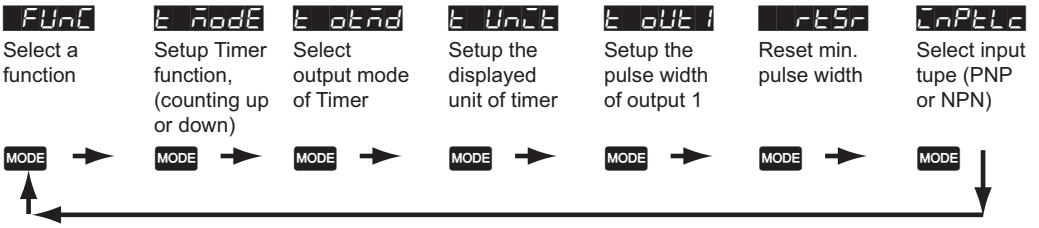


LCD Display and Indicators			
RST 1/2	Light on when reset signal is detected	***BATCH***	"Batch Counting Mode" in Counter
K/P 1/2	Light on when key-protected mode is enabled	***SET 1 2***	SV1, SV2 display
OUT 1/2	Light on when output is executing	***TAC***	Light on in Tachometer function
H M S	Hour, 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
Key Operation			
▼ ▲	Increase and decrease SV or change paramter settings		
◀	Left move 1 digit of the selected digit. The indicator of the selected digit will flash.		
MODE	Save the set parameters or switch among functions.		
LOCK	Prevent settings from being changed. Key-protected mode still works after the power is switched off. Press LOCK to enter key-protected mode. In non-key-protected status, press LOCK to enter Lock 1, press LOCK again to enter Lock 2. Press MODE and ◀ at the same time to disable key-protected mode. LoC 1 (Lock 1) disables the functions of all keys. LoC2 (Lock 2) allows users to change SV and functions of RESET remain. LOCK only functions in non-key-protected status.		
RESET	Clear and reset PV.		
Modes: Operation Mode and Configuration Mode			
Operation	When the power is on, the timer/counter/tachometer is in the operation mode. Press ▼ ▲ to change SV, or ◀ to select digit to change. The indicator of the selected digit will flash. After the change is made, press MODE to save the setting. If SV or paramters are not changed, press MODE once to switch between SET1 and SET2.		
Configuration	Press MODE in operation mode for more than 3 seconds to enter configuration mode. Press MODE once to switch among parameters. To return to operation mode, press MODE for more than 3 seconds.		

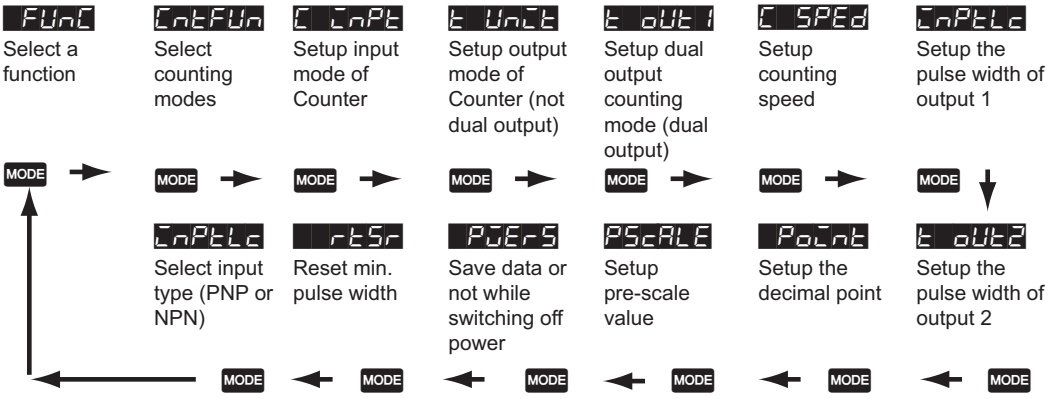
Menu Navigation and Parameters

Press mode in operation MODE for more than 3 seconds to enter configuration mode. Press MODE once to switch among parameters. To return to operation mode, press MODE for more than 3 seconds.

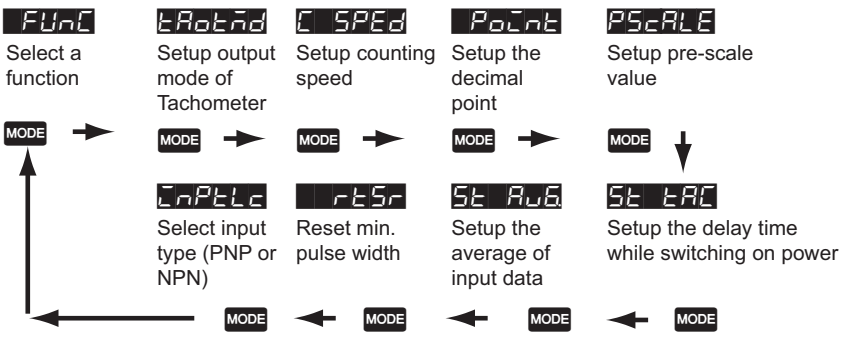
• Timer



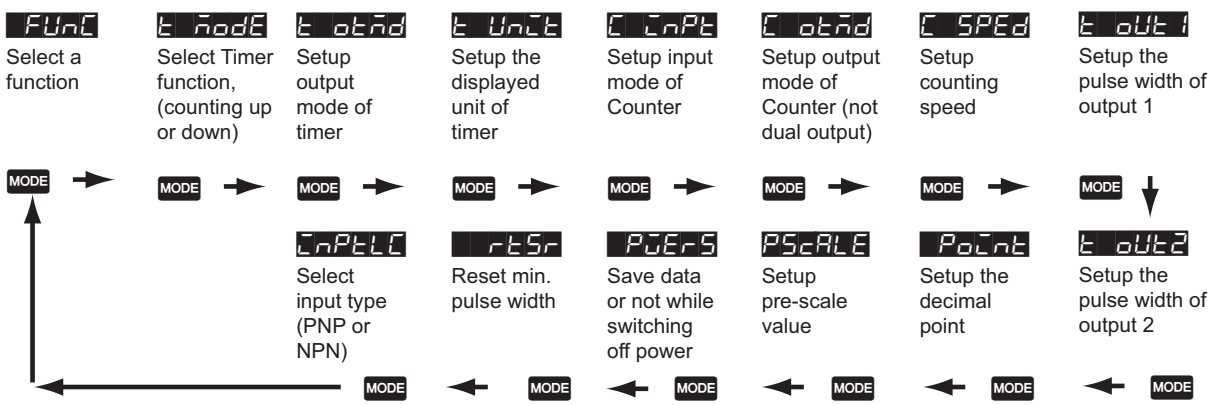
• Counter



• Tachometer



• Timer + Counter

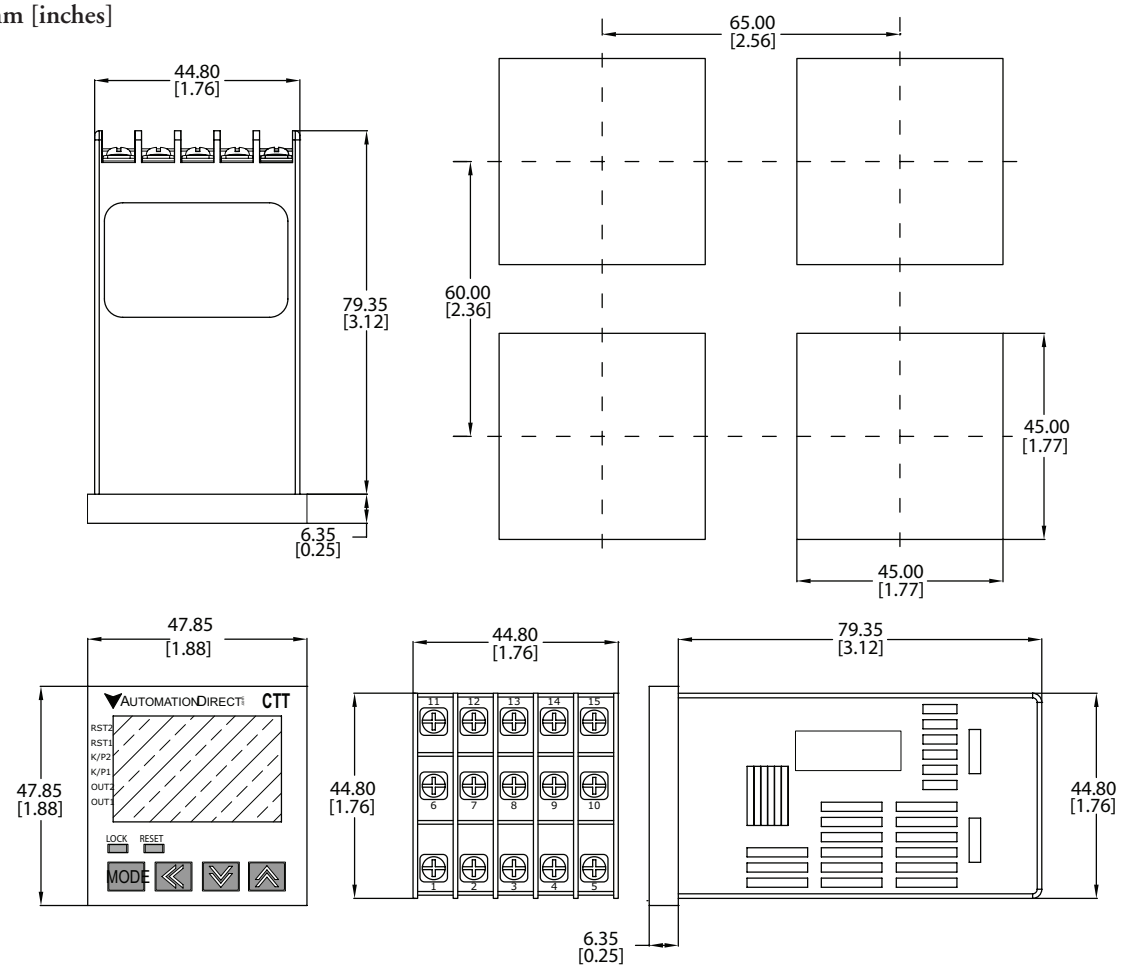


General Specifications

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	*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 50/60Hz for 1 minute	
Vibration Resistance		Without damage: 10 ~ 55Hz, amplitude = 0.75mm, 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	*Conforming Wiring*	0.25-1.65mm² (24 to 16 AWG)	
	Permitted Torque	0.5Nm (0.369 ft/lbs)	
Agency Approvals		UL508 listed (E311366), cULus, CE marked	

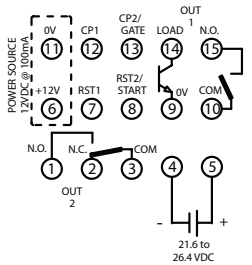
Drawings

mm [inches]

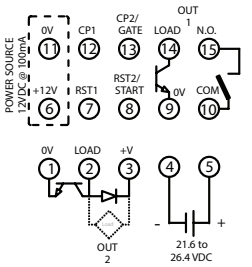


Terminal Layout

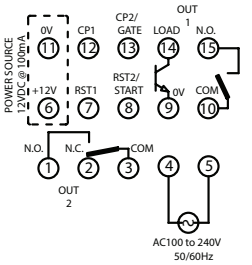
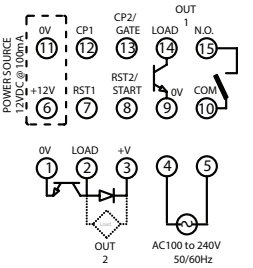
CTT-1C-D24



CTT-AN-D24



CTT-1C-A120



CTT-AN-A120