Introduction

A new standard of performance and functionality in a compact preset counter. The V454501 Single Preset Counter offers a pre-settable counter with full calibration for a variety of applications.

The bright red LED display provides simultaneous count and preset indication. The use of annunciators and simple key sequences makes operator changes quick and easy. A variety of count sources are accommodated, including relay and pushbutton contacts, photocells and proximity switches and uni- or bi-directional incremental encoders. The open collector output can interface to light duty devices and the relay contacts offer heavy duty load switching.

Set-up and installation are simplified through
front panel entry of configuration parameters
and a unique no tools required panel mounting bracket.

The V454500 family of preset counters combines state-of-the-art circuitry and electronic assembly techniques with an ergonomic package design that results in the most cost-effective , high-performance counter value on the market.

Technical Manual
#701935-0001

VEEDER-ROOT

V454501 Single Preset Counter

Features

* Dual four-digit displays for Count and Preset values
* 10kHz count speed
* Add/Subtract or bi-directional count inputs
* Digital calibrator and programmable decimal point
* Accepts current sinking or sourcing devices
* Key reset, remote reset and auto reset modes
* Reset to zero or preset number
* Relay (SPDT) and open collector outputs
* Accessory sensor power supply
* Universal 90 - 264V AC power requirements
* NEMA 4/IP65 sealed front panel
* Designed to comply with EN50081 and EN50082 EMC specifications

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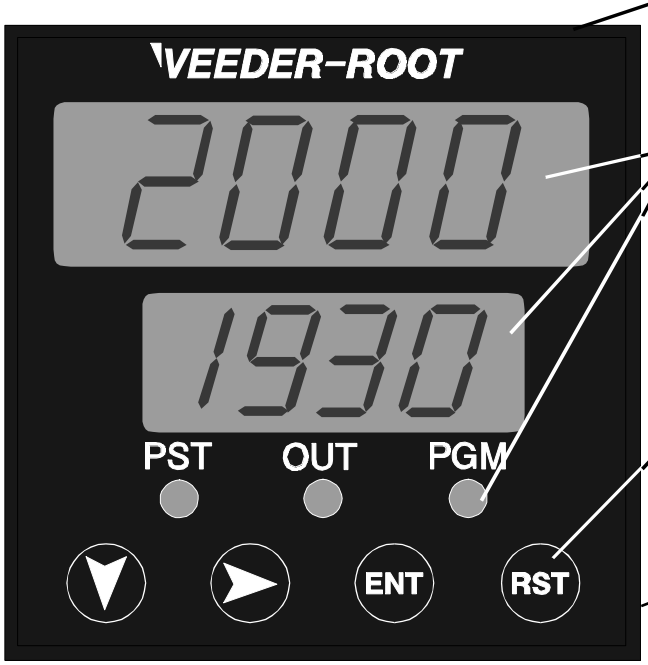
OVERVIEW

CONSTRUCTION



Compact Design

Uses only 48mm of panel space. 110mm behind-panel depth.

Dual Four-character Display

Simultaneous display of Count and Preset data. Red LED display. Annunciators show input, display and output status.

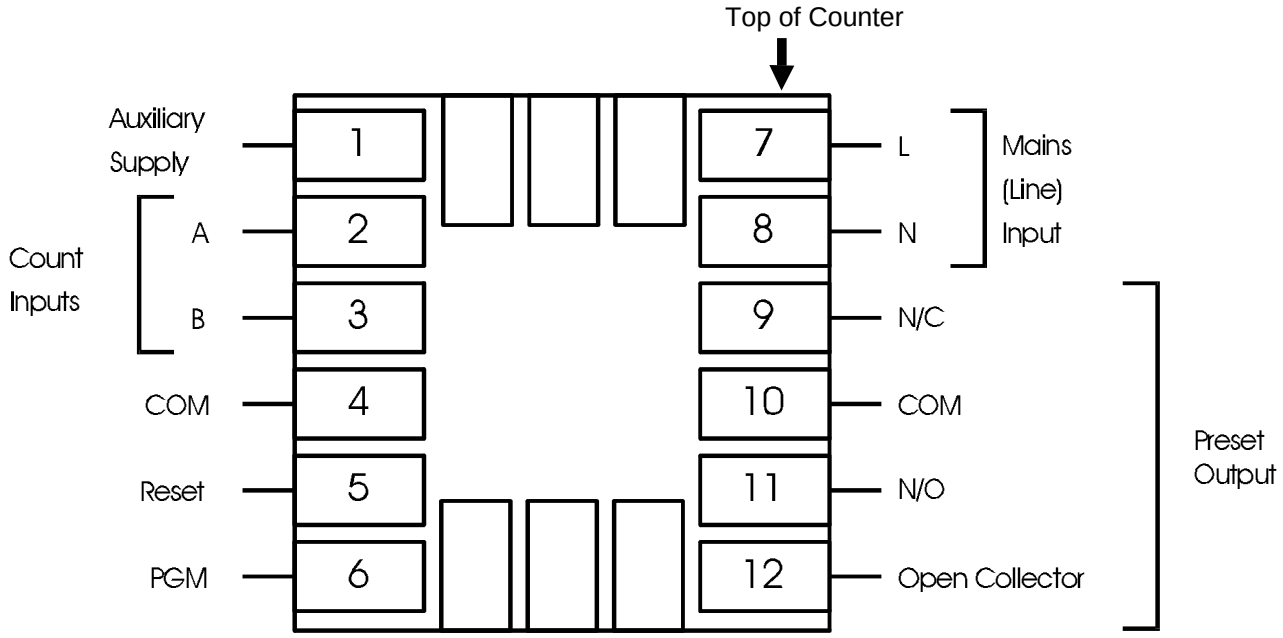
Ergonomic Keypad

Simple key sequences to view and edit Presets.
Front Panel Reset key can be disabled.

Front Panel Seal

NEMA 4/IP65-rated when installed with panel mount gasket supplied.

Rear Terminal Connections



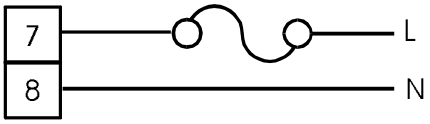
INSTALLATION

WIRING

IMPORTANT: In severe electrical noise environments, shielded cable is recommended for inputs and outputs. Connect the shield only to the building earth (ground).

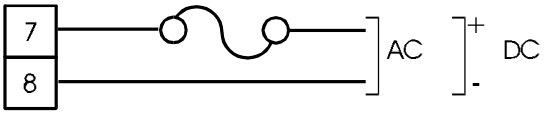
AC Power Input

Connect AC power to Terminal 7 (Line) via a 1A slow-blow fuse and to Terminal 8 (Neutral) - see below. AC power should be from a separate branch circuit which is noise-free and does not feed heavy loads.



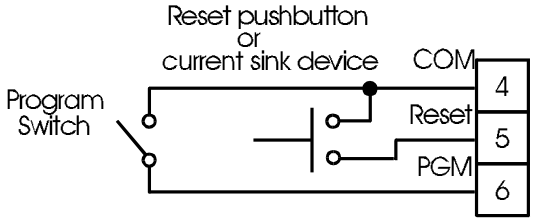
DC/Low Voltage AC Power Input

Connect DC/low voltage AC power to Terminal 7 (+) via a 0.5A slow-blow fuse and to Terminal 8 ( ) - see below. DC power should have low ripple and be noise-free.



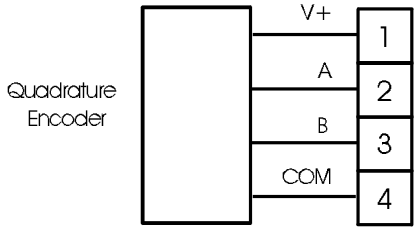
Reset and Program Inputs

Connect Reset pushbutton or current sink device to Reset (Terminal 5) and COM (Terminal 4). Connect Program switch or jumper to PGM (Terminal 6) and COM (Terminal 4).



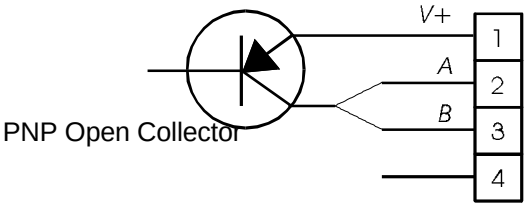
Bi-directional Quadrature Inputs

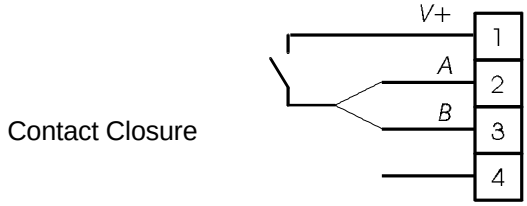
Connect Quadrature Encoder to V+ (Terminal 1), A input (Terminal 2), B input (Terminal 3) and COM (Terminal 4) as shown below. In Configuration Mode, set **InPu** parameter to **QuAd**. For NPN open collector devices with no pullup resistors, set **PuLL** parameter to **YES**.

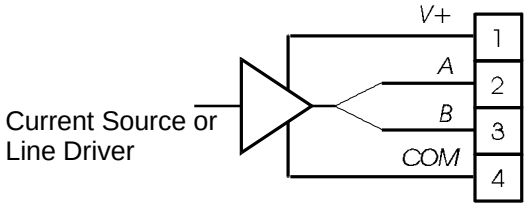


Current Sourcing (PNP) Count Inputs

Connect Add count input to Terminal 2 (A) and/or Subtract count input to Terminal 3 (B) - see below. In Configuration Mode, set **PuLL** parameter to **no** and, for Add/Subtract operation, set **InPu** parameter to **A-B**.

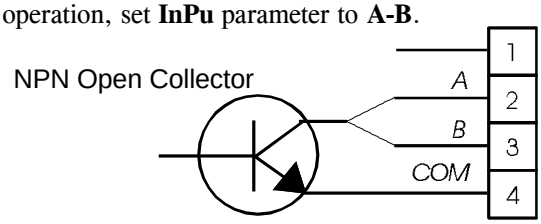


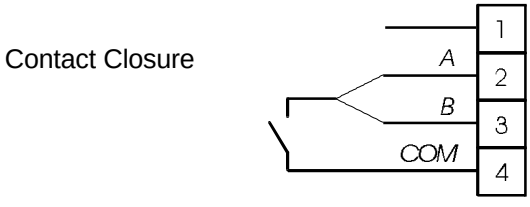


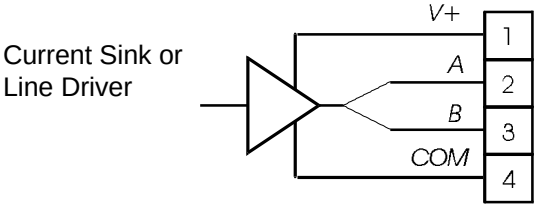


Current Sinking (NPN) Count Inputs

Connect Add count input to Terminal 2 (A) and/or Subtract count input to Terminal 3 (B) - see below. In Configuration Mode, set **PuLL** parameter to **YES** and, for Add/Subtract operation, set **InPu** parameter to **A-B**.



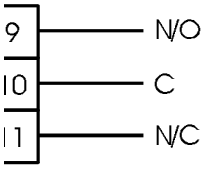




INSTALLATION

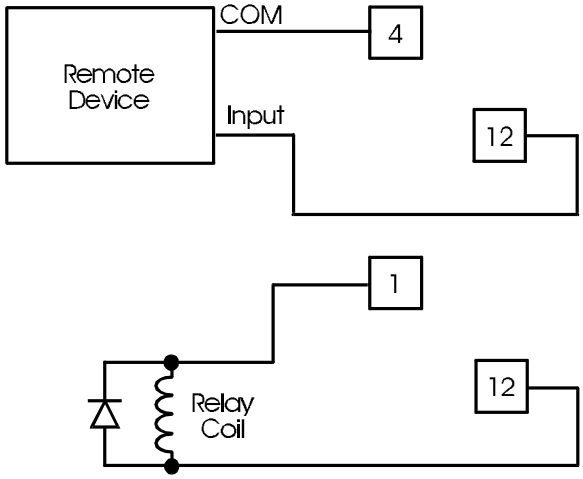
Relay Output

Connect AC or DC load circuits to Terminals 9, 10 & 11 (see below) as required. Do not route load wiring near count input or transistor output signals.

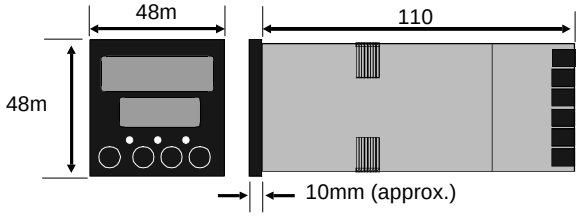


Open Collector Output

Connect Terminals 12 (open collector) and 4 (COM) to solid state devices as shown below (upper circuit). To drive DC relay coils, connect Terminal 12 and V+ (Terminal 1) as shown on below (low circuit). Suppress switching transients with a suppression diode, connected as shown.

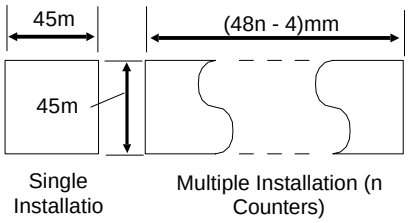


PANEL MOUNTING

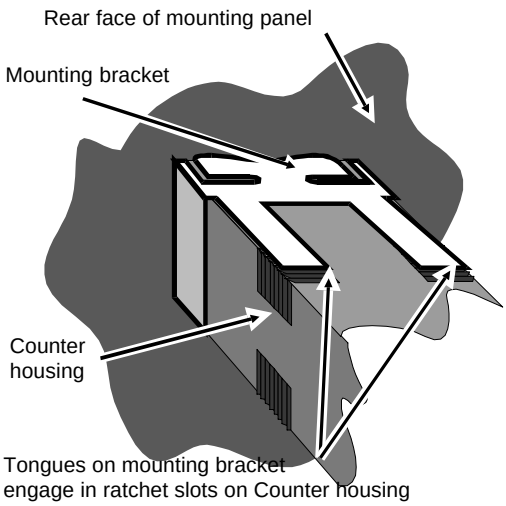


Panel Mounting

Make cut-out(s) according to the details in the diagram on the right. The maximum panel thickness is 6 mm.



Insert the rear of the Counter housing through the cut-out (from the front of the mounting panel) and hold the Counter lightly in position against the panel. Ensure that the panel gasket is not distorted and that the Controller is positioned squarely against the mounting panel. *Apply pressure to the front panel bezel only*. Slide the mounting bracket in place (see right) and push it forward until it is firmly in contact with the rear face of the mounting panel (tongues on the bracket should engage in matching rachet positions on the Counter housing and the mounting bracket springs should push firmly against the mounting panel rear face).

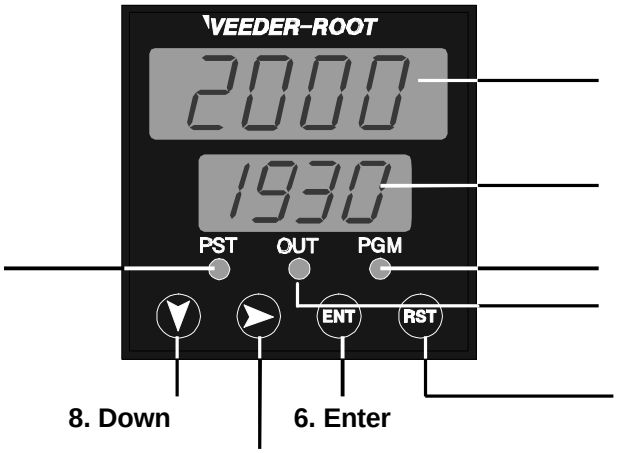


CAUTION

Do not remove the panel gasket from the Counter as this may result in inadequate clamping of the Counter in the mounting panel.

OPERATION

FRONT PANEL



1. Upper Display

2. Lower Display

3. Program

4. Preset Output Annunciator
(ON when active)

5. Reset Key

6. Enter

7. Next Key

8. Down

9. Preset Annunciator
(ON when Preset value is shown in the lower display)

Down key

Operator Mode: Used to change the currently-selected (flashing) digit. Depressing this key will decrement the value (wrap-around from 0 to 9). If the key is held continuously, the value will decrement at the rate of 2/sec.

Program Mode: Used to advance from one parameter to the next. Once a parameter value has been selected for editing (through use of the Next key), depressing this key will decrement the value (wrap-around from 0 to 9). If the key is held continuously, the value will decrement at the rate of 2/sec.

Configuration Mode: Used to advance from one parameter to the next.

Next key

Operator Mode: Used to select a parameter for editing (left-most digit will start to flash) and to move between the digits. Once the proper digit is selected (flashing) with the Next key, its value can be altered through use of the Down key.

Program Mode: Used to select a parameter for editing (left-most digit will start to flash) and to move between the digits. Once the proper digit is selected (flashing) with the Next key, its value can be altered through use of the Down key. For Decimal Point Position, this key scrolls through the available choices.

Configuration Mode: Used to select a parameter for editing and to scroll through available choices.

NOTE

To abort changes to a parameter value, press Down and Next together instead of **ENT**.

ENT key

Operator Mode/Program Mode: Confirms an edited value (display will cease flashing after the **ENT** key is depressed).

Configuration Mode: Confirms setting/value selection (display will cease flashing after the **ENT** key is depressed).

IMPORTANT

In Edit Mode, you must press the **ENT** key within 15 seconds of the last keypress, otherwise the new data will be lost and the old data will be restored.

RST key

Operator Mode/Program Mode: Resets count value to either zero or Preset value (based on the setting of the Count Direction parameter in Configuration Mode). Also releases latched outputs.

Configuration Mode: Exits Configuration Mode when held down for 2 seconds.

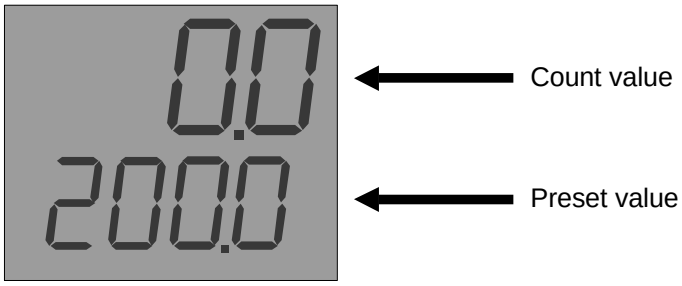
NOTE: The **RST** key will not be active unless enabled in Configuration Mode.

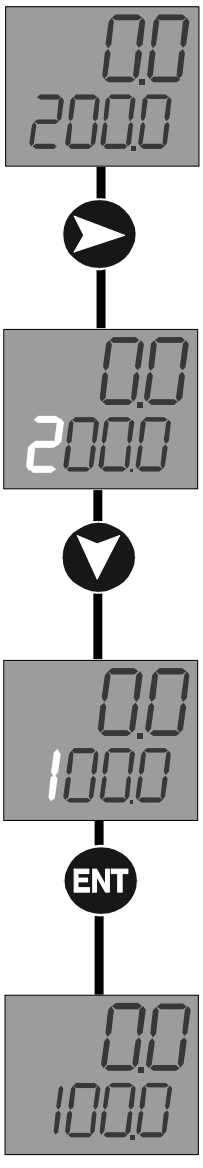
For information on Operator Mode, see Page 6.
For information on Program Mode, see Page 7.
For information on Configuration Mode, see Page 8.

PROGRAMMING

OPERATOR MODE

The Operator Mode is used for viewing the Count value and viewing/changing the Preset value.





NOTE

To abort an edit operation (before the new value is confirmed), press the Down and Next keys together.

WARNING!

Caution should be observed if it is necessary to change the preset value while the process is operating. Do not set values which are already exceeded by the count value without resetting the counter.

Press the Next key to enter Edit Mode. The most significant digit of the Preset Data display will then flash. Press the Next key repeatedly as required to select the desired digit.

Press the Down key to change the value of the selected digit (there is wrap-round from 0 to 9).

When all digits are as required, press the **ENT** key to confirm the changes; the display will stop flashing.

IMPORTANT

You must press the **ENT** key within 15 seconds of the last keypress when entering a new value, otherwise the new value will be discarded and the old value will be retained.

PROGRAM MODE

WARNING!

Changing Program Mode parameter values while the process is operating may be hazardous to the operator and/or the controlled equipment. Use extreme caution and stop the process before attempting to change Program Mode parameter values.

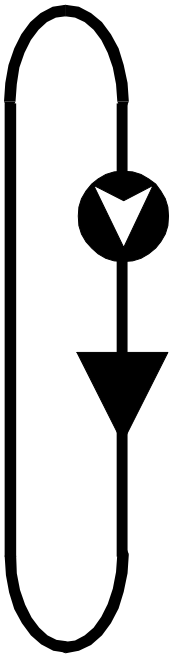
IMPORTANT

You must press the **ENT** key to implement new parameter values.

NOTE

Possible Decimal Point Position settings are:

To enter Program Mode, set the PGM input active (low) e.g. by tying it to COM. Whilst in Program Mode, the PGM indicator will be ON.



Function	Parameter Description (Upper Display)	Meaning
Pre-scaler		Pre-scales counter operation (multiply from 0.001 to 9.999) Value = Count units displayed / Count pulses input
Out Time		Sets momentary ON time for PRESET output (0.01 - 99.99s; 0.00 for latched operation)
Decimal Point		Defines decimal point position
Operator Mode: Preset	None	Shows Preset value

NOTES

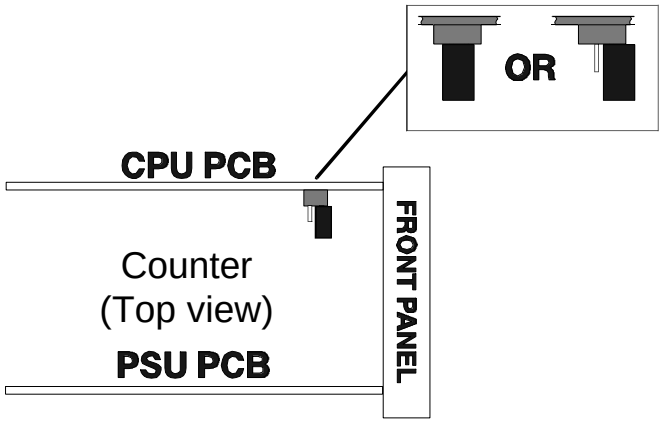
1. To adjust Pre-scaler, Out Time or Preset value (as selected), press Next key to enter Edit Mode (digits will flash), use Next key to select each digit to be adjusted, and adjust digit value using Down key. When adjustment is complete, press **ENT** key to exit Edit Mode (digits will become static).

2. To adjust decimal point position, select that parameter, press Next key to enter Edit Mode, then use Next key to position decimal point. Press **ENT** key when finished.

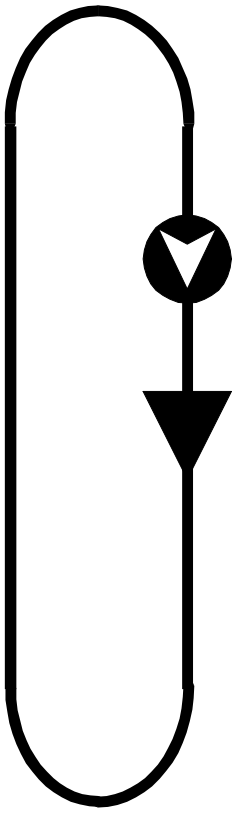
To exit Program Mode, set the PGM input inactive (High).

CONFIGURATION MODE

To enter Configuration Mode, power-down the Counter and remove it from its housing. Change the position of the link jumper on the CPU PCB (the actual position is irrelevant, as long as the position is changed). Replace the Counter in its housing and power-up. The PGM indicator will flash whilst the Counter is in Configuration Mode.



To edit a parameter, use the Down key to step through the parameters; when the desired parameter description is shown in the upper display, press the Next key to enter Edit Mode and to scroll through the available settings. When desired setting is shown, press the **ENT** key. The Configuration Mode parameters/settings, in order of appearance, are:



Parameter	Parameter Description (Upper Display)	Available Settings
Counter Speed	SPEE	20 (20Hz) · 200 (200Hz) · FULL (10kHz)
Input Operation	InPu	A-B (A-B (Add/Subtract)) · QuAd (Quadrature (bi-directional))
Panel Reset Key	P.rES	EnAb (Enable) · diSA (Disable)
Auto Reset	A.rES	EnAb (Enable) · diSA (Disable)
Input Pull-Ups	PULL	YES (Yes (current-sinking) · no (No (current-sourcing
Count Direction	Cdir	uP (Up-countin) · dn (Down-countin)
Lock Strategy	Loc	nonE (None) · PSt (Preset Lock) · PArt (Partial Program Lock) · both (Preset & Program Lock)

LOCK STRATEGY:

None = No security; all parameters available through regular methods of access
Preset Lock = Presets become Read Only
Partial Lock = Output ON times are Read Only
Both = Operator Mode parameters and Output ON times are Read Only.

To exit Configuration Mode, either momentarily remove power from the Counter or press and hold down the RST key for at least two seconds.

APPENDIX A

SPECIFICATIONS

Input Power

AC:	Terminals 7 (Line) and 8 (Neutral) 90 - 264V 50/60Hz (standard) 20 - 50V AC 50/60Hz (option)
DC:	Terminals 7 and 8; 22 - 65V (option)
Power consumption:	4W approx.

Output Power

DC:	Terminals 1 (+) and 4 (COM) 9 - 15V DC (unregulated) 0 - 100mA. ®0.5V ripple

Main Counter

Decades:	4, Bi-directional
Presets:	1 (4 decades)
Operation:	Add/Subtract (Input A counts up, Input B counts down) or bi-directional
(quadrature;	counts up when Signal A leads Signal B).
Direction:	Up (reset-to-zero) or Down (set-to-a-number)
Count Rate	
High:	10kHz max.
Medium:	200Hz max.
Low:	20Hz max.
Resets:	Manual or automatic. Selectable reset-to-zero or reset-to-Preset

Calibrator

Range:	0.001 to 9.999 Common to Inputs A and B.

Count Inputs

Signal A:	Terminal 2
Signal B:	Terminal 3
Input Voltage	
High:	⏐3.0V (source) ⏐3.0V or open (sink)
Low:	®2.0V or open (source) ®2.0V (sink)
Max.:	30V DC
Input Impedance	
Source:	10kΩ to COM
Sink:	4.7kΩ to +V
Input Response: (Source or sink)	0.05ms (high speed) 2.5ms (medium speed) 25.0ms (low speed)

Control Inputs

Remote Reset:	Terminal 5 (edge-sensitive)
Program Mode:	Terminal 6 (level-sensitive)
Input Voltage:	High - ⏐3.0V or open Low - ®2.0V
Input Impedance:	4.7kΩ to +V
Input Response:	25.0ms
Max.:	30V DC

Front Panel Keys

Type:	Mechanical switches under sealed membrane overlay.

Display

Type:	LED (red) 4 digit
Height:	Upper - 0.4" (10mm) Lower - 0.3" (7mm)

Security

Preset data can be protected (selectable in Configuration Mode). Program data is accessible only if the PGM input is active.

Output

Operation:	Output energised when: Count = Preset (Up mode) Count = 0 (Down mode) Output released when: Hold time elapses or reset occurs
SOLID STATE (OPEN COLLECTOR)	
Terminal No.:	12
Type:	Open collector, current sink to COM. 30V DC max. 100mA max.
RELAY	
Terminals:	9 (N/C), 10 (C) and 11 (N/O)
Type:	Form C (SPDT)
Rating:	5A resistive @ 110V AC 3A resistive @ 240V AC

Mechanical

Cut-Out:	45mm x 45mm (1/16-DIN)
Depth:	110mm
Weight:	0.2kg approx.

Environmental

Operating Temp.:	0 - 55°C (32 - 131°F)
Storage Temp.:	20 - 80°C (4 - 176°F)
Relative Humidity:	20 - 95% non-condensing
Front Panel Seal:	NEMA 4/IP65 when installed with panel gasket (supplied)

N O T E S

N O T E S

ORDER CODES

The order codes for the Veeder-Root 454501 Single Preset Counter are shown below:

Single Preset Counter (USA)	V45450-1
Single Preset Counter (UK/Europe)	V45450E1
Single Preset Counter (USA) - Low Voltage AC/DC supply	V45450-12
Single Preset Counter (UK/Europe) - Low Voltage AC/DC supply	V45450E12

WARRANTY

This instrument is warranted to be free from defects in workmanship and material for a period of three years from the date of despatch. In the unlikely event of a fault, call the appropriate number below for a Return Material Authorisation (RMA) number.

The obligation of the Company under this warranty is limited to the repair or replacement of this instrument. Should the cause of the fault be due to misuse or abuse of the instrument or the warranty period has expired, the customer shall be informed before any repair work is started.

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