Introduction

A new standard of performance and functionality in a compact preset counter. The V454503 Batch Preset Counter offers a pre-settable counter with full calibration for a variety of applications. The V454503 Counter may also be used as an 8-digit single preset counter.

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.

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

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
**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 **PuLL** parameter to **no** and, for Add/Subtract operation, set **InPu** parameter to A-B.

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

**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 (Preset 1 output) or 16, 17 & 18 (Preset 2 output) (see below) as required. Do not route load wiring near count input or transistor output signals.

Open Collector Output
Connect Terminals 12 (Preset 1 open collector) and 4 (COM) or 15 (Preset 2 Open Collector) and 13 (COM) to solid state devices as below (upper circuit). To drive DC relay coils, connect Terminal 1 or 15 and V+ (Terminal 1) as below (lower circuit). Suppress switching transients with a suppression diode, connected as shown.

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 ratchet 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**

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

**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.

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1. Upper Display
2. Lower Display
3. Preset Output Displays (ON when active)
4. Program
5. Preset Annunciator
6. Reset Key
7. Enter
8. Next Key
9. Down Key
10. Batch

**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.

**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).

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

**NORMAL OPERATION**

<table>
<thead>
<tr>
<th>LED(s) ON</th>
<th>Upper Display</th>
<th>Lower Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>PST</td>
<td>Preset value (bottom 4 digits)</td>
<td>Preset value (top 4 digits)</td>
</tr>
<tr>
<td>BCH &amp; PST</td>
<td>Count value (bottom 4 digits)</td>
<td>Count value (top 4 digits)</td>
</tr>
<tr>
<td>BCH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* "View Only" display - not editable.

**8-DIGIT SINGLE PRESET COUNTER (UP_8) OPERATION**

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.

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**NOTE**

Use Down key to step through Count/Preset display, Count/Batch Preset display and Count/Batch Count display (Count/Preset display will be shown on power-up).

**TO ABORT AN EDIT**

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

**TO RESET THE BATCH COUNT**

To reset the Batch Count (to zero or to the Batch Preset value, according to the Count Direction parameter setting in Configuration Mode):
1. Select the Batch Count display in the lower display.
2. Press the Next key and the RST key simultaneously.

NOTE: This is the only way to reset the Batch Count. It cannot be reset via the rear terminals. The RST key is operative for this function even when disabled in Configuration Mode.

**SETTING THE PRESET VALUE IN EIGHT-DIGIT SINGLE RESET COUNTER (UP_8) MODE**

To set a Preset value of abcdefgh:
1. Select the Count value/Preset value display (PST ON, BCH OFF) and enter efgh in the lower display in the normal manner.
2. Select the Preset value/Preset value display (PST ON, BCH ON) and enter abcd in the lower display in the normal manner.

**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.
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
- **Pre-scaler**: Pre-scales counter operation (multiply from 0.001 to 9.999) Value = Count units displayed Count pulses input
- **Preset Output Time**: Sets momentary ON time for Preset output (0.01 - 99.99s; 0.00 for latched operation)
- **Batch Preset Output Time**: Sets momentary ON time for Batch Preset output (0.01 - 99.99s; 0.00 for latched operation)
- **Decimal Point**: Defines decimal point position

### Operator Mode:
- **Preset**: Shows Preset value
- **Batch Preset**: Shows Batch Preset value
- **Batch Count**: Shows Batch Count value

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

### NOTE
Possible Decimal Point Position settings are:

### NOTES
1. To adjust Pre-scaler, Out Time or either Preset or Batch 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).
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 the desired setting is shown, press the ENT key. The Configuration Mode parameters, in order of appearance, are:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Description (Upper Display)</th>
<th>Available Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter Speed</td>
<td>SPEE</td>
<td>20Hz 200Hz FULL</td>
</tr>
<tr>
<td>Input Operation</td>
<td>InPu</td>
<td>A-B Quad 8-B</td>
</tr>
<tr>
<td>Panel Reset Key</td>
<td>PRES</td>
<td>Enable Disable</td>
</tr>
<tr>
<td>Auto Reset</td>
<td>P-RS</td>
<td>Enable Disable</td>
</tr>
<tr>
<td>Input Pull-Ups</td>
<td>PULL</td>
<td>Yes No</td>
</tr>
<tr>
<td>Count Direction</td>
<td>CdIr</td>
<td>Up-counting Down-countin</td>
</tr>
<tr>
<td>Lock Strategy</td>
<td>Loc</td>
<td>None Preset Partial Program Preset &amp; Program Lock</td>
</tr>
</tbody>
</table>

**NOTE**
When Input Operation is set to UP_8, counter counts up from zero only (top 4 decades in Batch Preset, bottom 4 decades in Preset).

**LOCK STRATEGY:**
None = No security; all parameters available through regular methods of access  
Preset Lock = Preset/Batch Preset 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.
**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
(8, uni-directional in UP_8 mode)
Presets: 2 (4 decades each) - Preset/Batch Preset
1 (8 decades) in UP_8 mode
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.
Selective 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: \(3.0\text{V (source)}\)
\(3.0\text{V or open (sink)}\)
Low: \(\pm0.2\text{V (source)}\)
\(\pm0.2\text{V (sink)}\)
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 - \(3.0\text{V or open}\)
Low - \(\pm2.0\text{V}\)
Input Impedance: \(4.7\text{k\Omega to +V}\)
Input Response: 25 ms
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 1 energised when:
Count = Preset 1 (Up mode)
Count = 0 (Down mode)
Output 1 released when:
Hold time elapses or reset occurs
Output 2 energised when:
Batch Count = Batch Preset
Output 2 released when:
Hold time elapses or reset occurs

**SOLID STATE (OPEN COLLECTOR)**

Terminal Nos.: 12 (Preset) and 15 (Batch Preset)
Type: Open collector, current sink to COM. 30V DC max. 100mA max.

**RELAY**

Terminals: Preset: 9 (N/C), 10 (C), 11 (N/O)
Batch Preset: 16 (N/C), 17 (C), 18 (N/O)
Type: Form C (SPDT)
Rating: 5A resistive @ 110V AC
3A resistive @ 240V AC

**Mechanical**

Cut-Out: 45mm x 45mm (¼-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)
The order codes for the Veeder-Root 454503 Batch Preset Counter are shown below:

- Batch Preset Counter (USA) V45450-3
- Batch Preset Counter (UK/Europe) V45450E3
- Batch Preset Counter (USA) - Low Voltage AC/DC supply V45450-32
- Batch Preset Counter (UK/Europe) - Low Voltage AC/DC supply V45450E32

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.