Description

The 83 Counter features a 7 segment, 2 lines by 6-digit backlit LCD display. The main display line is red and shows the count value or the batch/total value when preset 3 or output 3 is viewed in the secondary display. The smaller secondary display line is green and can be used to view the prescaler value, preset values, output count values or batch/total count values (batch model only).

The 83 Counter offers a choice of nine programmable counting modes for use in applications requiring bidirectional, anti-coincidence, and quadrature counting. The unit may be programmed to detect counts on both edges of the input signal resulting in a doubling of frequency. DIP switches are used for input configuration setup and to provide a program disable function.

Four front panel push buttons are used for ease of programming the operating modes and data values, to change the viewed display, and performing user programmable functions, e.g. reset, etc. The 83 Counter can be configured for one of two numeric date entry methods.

Digital - The digital entry allows for the selection and incrementing of digits individually.

Automatic Scrolling - This method allows for the progressive change of one through all digits positions by pressing and holding the **up** or **down** button.

Protection of data value and unit configuration - The program disable DIP switch, a user-programmable code value, and an external user input selected for program disable can be utilized to provide multilevel protection.

The standard with dual presets is available with solid-state and relay outputs. The batch counter has relay outputs for output 2 and the batch/total output 3, with output 1 available as solid-state. For all 83 Counters, the solid-state outputs are available in a choice of NPN current sinking or PNP current sourcing, open- collector transistor outputs. All relay output boards are field replaceable.

Prescaler output is available as a dual preset, with solid-state outputs. The prescaler output is useful for providing a lower frequency scaled pulse train to a PLC or another external totalizer. The prescaler output provides a programmable width for every count or every 10 counts registered on the display

RS485 communications - optional serial communication capability allows for interrogation and modification of the preset, count and prescaler values.

Construction - The unit is made of lightweight, high impact plastic with a textured front panel and a clear display window. The front panel meets NEMA4X/IP65 specifications when properly installed. Multiple units can be stacked horizontally or vertically. SMT, extensive testing, plus high immunity to noise interference make the 83 Counter extremely reliable in industrial environments.

Features

- Quadrature sensing
- Bidirectional counting, up/down control
- Count values to (999999)
- Prescaler output model (dual preset only)
- Field replaceable relay output boards
- Solid State and relay output models
- NEMA4X/IP65 sealed bezel
- Status indicators for outputs
- Security via programmable operator access privileges and protected values menu
- Programmable user inputs and front panel function key
- Horizontal or vertical stacking of multiple units
- 85 to 250VAC or 18 to 36VDC/24 VAC power units
- RS485 communications option
- Choice of numeric data entry modes

Options

- Output type
- Serial communications
- Voltage input
- Display color
- Number of presets

Display: 2 line by 6 digits LCD display**,** negative image transmissive with RED (top line) and GREEN (bottom line) backlighting. Positive image reflective display units are non-stock available.

Main: 0.3" (7.6mm) high digits

Secondary: 0.2" (5mm) high digits

Annunciators:

   Value: PRS, 1,2 and 3

   Output: 01, 02 and 03

POWER REQUIREMENTS:

AC Versions

   AC Power: 85 to 250 VAC, 50/60Hz, 9VA max.

   DC Power: 11 to 14 VDC @ 159 mA max.
   (Non PNP output models)

Note: Models with PNP current sourcing outputs must be powered from AC

DC Versions

   DC Power: 18 to 36 VDC: 5.5 W max.

   AC Power: 24 VAC +/- 10%: 50/60 Hz: 7VA max.

Note: The 10% tolerance range on AC input voltage must be strictly adhered to   DO NOT EXCEED 26.4 VAC

PEAK (START-UP CURRENT)

   AC or DC Power: 500mA peak start-up current for 10 msec. max.

DC OUT/ VSCR IN-terminal 10

For units that do not have PNP current sourcing outputs, this terminal provides a DC output for sensor power + 12 VDC (+/- 15%). The maximum sensor current is 100mA.

For units with PNP current sourcing outputs this terminal serves a dual purpose depending on the application PNP output voltage level and current requirements.

1.   The terminal may be used as a +12 VDC output for sensor power. In this case, the PNP output voltage level will be +12 VDC (+/-15%). A maximum of 100 mA is available for the combination of sensor and PNP output sourcing current.

2.   If a higher PNP output voltage level or additional output sourcing current is needed, an external DC supply may be connected between the *"DC OUT (V SRC IN)"* and *"COMM."* terminals. This supply will determine the PNP output voltage level, and must be in the same range of +13 to +30 VDC.
An external DC supply can also provide the additional output sourcing current required in applications where two or more PNP outputs are "ON" simultaneously. However, the maximum current range of 100mA per individual output must not be exceeded, regardless of external supply capacity.

3. Memory: Nonvolatile FRAM retains all program parameters and count values.

4. SENSOR POWER: + 12 VDC (+/- 15%) @ 100mA max.

5. COUNT INPUTS A & B: Accepts count pulses from a variety of sources, DIP switch selectable.

Current Sourcing: (active high): V_{in}max. = 3.9K ohm pull-down to 30 VDC.

Current Sinking: (active low):   7.8 K ohm pull-up to 12 VDC : I_{snk} = 1.8mA max.

Debounce : 50 Hz

Lo Bias: V_{IL} = 1.5 VDC max., V_{IH} = 3.75 VDC min.

Hi Bias: V_{IL} = 5.5 VDC max., V_{IH} = 7.5 VDC min.

6. MAX. COUNT RATE: Model dependent. All listed values are in Khz.
Note: Max. count rates for X2 & X4 modes are given for 50% duty cycle signals and quad signals with 90° phase shift.

Single Preset Model 8301

| Prescaler | C1-Usr | C2-usr | *Ad-sub | QUAD | | |
Value	C1-Ud	C2-Ud	Ad-Ad	X1	X2	X4
0.00001-0.99999	8.4	4.1	9.4	5.4	4.5	2.1
1.00000	12.0	5.9	12.4	6.5	6.0	3.0
1.00001-2	6.6	3.2	6.8	4.3	3.3	1.6
2.00001-3	5.3	2.6	5.6	3.7	2.6	1.3
3.00001-4	4.3	2.1	4.6	3	2.2	1.1
4.00001-5	3.6	1.8	3.8	2.7	1.8	0.9
5.00001-6	3.1	1.5	3.4	2.4	1.6	0.8
6.00001-7	2.8	1.4	3.2	2.1	1.4	0.7
7.00001-8	2.6	1.3	2.8	1.9	1.3	0.6
8.00001-9	2.3	1.1	2.4	1.8	1.1	0.5
9.00001-9.99999	2.1	1.0	2.3	1.7	1.1	0.5

Dual Preset Model 8302

| Prescaler | C1-Usr | C2-usr | *Ad-sub | QUAD | | |
Value	C1-Ud	C2-Ud	Ad-Ad	X1	X2	X4
0.00001-0.99999	8.3	4.1	8.6	4.5	4.1	2.1
1.00000	11.5	5.7	11.5	6.0	5.8	3.0
1.00001-2	6.5	3.2	6.6	4.0	3.2	1.6
2.00001-3	5.0	2.4	5.2	3.4	2.5	1.3
3.00001-4	4.1	2.0	4.4	2.8	2.0	1.0
4.00001-5	3.4	1.7	3.8	2.5	1.7	0.8
5.00001-6	2.9	1.4	3.2	2.2	1.4	0.7
6.00001-7	2.7	1.3	2.8	2.0	1.3	0.6
7.00001-8	2.2	1.1	2.4	1.8	1.2	0.6
8.00001-9	2.2	0.9	2.3	1.6	1.1	0.5
9.00001-9.99999	1.9	0.9	2.0	1.5	0.9	0.4

Batch Model 8303

With Counter 2 configured as a Batch Counter (*C2 A5n = bAtch*)

| Prescaler | C1-Usr | C2-usr | *Ad-sub | QUAD | | |
Value	C1-Ud	C2-Ud	Ad-Ad	X1	X2	X4
0.00001-0.99999	8.3	4.1	8.4	3.7	3.6	2.1
1.00000	11.4	5.5	11.8	4.3	4.2	3.0
1.00001-2	6.5	3.2	6.6	3.2	3.0	1.6
2.00001-3	5.0	2.5	5.4	2.8	2.5	1.3
3.00001-4	4.1	2.0	4.2	2.4	2.0	1.0
4.00001-5	3.4	1.7	3.8	2.1	1.7	0.8
5.00001-6	2.9	1.4	3.2	1.9	1.5	0.7
6.00001-7	2.7	1.3	2.8	1.7	1.3	0.6
7.00001-8	2.4	1.1	2.6	1.6	1.2	0.6
8.00001-9	2.2	1.1	2.4	1.5	1.1	0.5
9.00001-9.99999	1.9	0.9	2.2	1.4	1.0	0.4

Batch Model 8303

With Counter 2 configured as a Total Counter (*C2 A5n = totAL*)

| Prescaler | C1-Usr | C2-usr | *Ad-sub | QUAD | | |
Value	C1-Ud	C2-Ud	Ad-Ad	X1	X2	X4
0.00001-0.99999	6.5	3.3	6.6	3.5	3.3	1.6
1.00000	8.5	3.6	8.6	4.0	4.0	2.1

Prescaler Output Model 8304

| Prescaler | C1-Usr | C2-usr | *Ad-sub | QUAD | | |
Value	C1-Ud	C2-Ud	Ad-Ad	X1	X2	X4
0.00001-0.99999	6.2	N/A	N/A	N/A	N/A	N/A
1.00000	8.0	N/A	N/A	N/A	N/A	N/A

 * *Inputs A & B rates summed.*

7. **USER INPUTS:** Configurable as current sinking (active low), or current sourcing (active high) inputs via a single plug jumper.

    Current Sinking: (active low) : V_{IL}= 1.5 VDC max. 22 K ohm pull-ups to 5 VDC

    Current Sourcing: (active high): V_{IH} =3.5 min. V_{IN} max. = 30 VDC; 22K ohm pull-down.

    Response Time: 10 msec. max.

    Inhibit Response Time: 250 microsec max.

8. **OUTPUTS:** (Output type and quantity model dependent)
  Solid-State:

    NPN Open Collector: I_{SNK}= 100mA max. @ V_{OL} = 1.1 VDC max. ;V_{OH}= 30 VDC max.

    PNP Open Collector: I_{SRC} = 100mA max. (See note) ; V_{OH} = 12 VDC +/-15% (using internal supply); V_{OH} = 13 to 30 VDC (using external supply).

    Note: The internal supply of the 83 counter can provide a total of 100 mA for the combination of sensor current and PNP output sourcing current. The supply voltage is +12 VDC (+/-15 %), which will be the PNP output voltage level when using only the internal supply.

    If additional PNP output sourcing current or a higher output voltage level is desired, an external DC supply may be connected between the "DC Out/In" and "Comm" terminals. This supply will determine the PNP output voltage level, and must be in range of +13 to 30 VDC.

    An external supply can provide the additional output sourcing current required in applications where two or more outputs are "ON" simultaneously. However, the maximum rating of 100mA per individual output must not be exceeded, regardless of external supply capacity.

  Relay: Form A contact, rating = 5 A @ 250 VAC, 30 VDC (resistive load) , 1/10 HP @ 120 VAC (inductive load).

  Relay Life Expectancy: 100,000 cycles min. at max. load rating.

  Programmable Timed Output: User selectable output time resolutions.

    0.01 Second Resolution: 0.01 to 99.99 sec., +/-0.01% +20 msec max. (Prescalers less than 2)

    0.1 Second Resolution: 0.1 to 999.9 sec. +/- 0.01 + 100 msec max. (Prescalers less than 2)

9. **RS485 SERIAL COMMUNICATIONS (Optional):** Up to 32 units can be connected.

    Baud Rate: Programmable from 1200 to 9600 baud.

    Address: Programmable from 0 to 99.

    Data Format: 10 Bit Frame, 1 start bit , 7 or 8 data bits, 1 or no Parity bit, and 1 stop bit.

    Parity: Programmable for Odd (7 data bits), Even (7 data bits) or None (8 data bits).

10. **CERTIFICATIONS AND COMPLIANCES:**
  UL Recognized Component, File # E195514
  Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

  CE Compliant:
  ELECTROMAGNETIC COMPATIBILITY

  Immunity to EN 50082-2

electrostatic discharge	EN 61000-4-2
electromagnetic RF fields	EN 61000-4-3
fast transients	EN 61000-4-4
RF conducted interference	EN 61000-4-6
simulation of cordless phone	EN V502204

  Emissions to EN 50081-2

RF interference	EN 55011	enclosure class A

11. **ENVIRONMENTAL CONDITIONS:**
  Operating Temperature: +32°F to +122°F [0°C TO +50°C]
  Storage Temperature: -40°F to +158°F [-40°C to +70°C]
  Operating and Storage Humidity: 85% max. relative humidity (non-condensing) from +32°F to +122°F [0°C to +50°C]

Altitude : Up to 6500 Feet [1981 Meters]

12. **ELECTRICAL CONNECTIONS:** Wire clamping screw terminals.

13. **CONSTRUCTION:** Black plastic case with collar style panel latch. The panel latch can be installed for horizontal or vertical stacking. Black plastic textured bezel can be removed from the case without removing the case from the panel or disconnecting the wiring. Front panel meets NEMA4X/IP65 requirements for indoor use, when properly installed. Installation Category II, Pollution Degree 2.

14. **WEIGHT:** 6.0 oz [170g]

SINGLE PRESET MODELS
  The 8301 has a solid-state output that operates in parallel with a relay output. The solid-state output is available as an NPN or PNP open collector transistor.

DUAL PRESET MODELS
  The 8302 has two outputs that are activated from presets 1 and 2. These outputs can be relay or solid-state outputs. The solid-state outputs are available as NPN or PNP open-collector transistors. Units with solid-state outputs can be ordered with an optional prescaler output.

3 PRESET BATCH MODELS
  The 8303 has a secondary counter that can be used for batch counting, or to keep a total count. This second counter can be programmed to operate in one of eight operating modes. Output 1 and 2 are assigned to the primary process counter (C1). Output 3 is assigned to the secondary Batch/Total counter (C2). The three preset batch unit can be ordered with solid-state or relay outputs. Units with solid-state outputs have a User Input 2 terminal available. The relay model has a relay output for Output 2 and Output 3 (Batch/Total). Output 1 is available only as solid-state.

PRESCALER OUTPUT MODELS
  The 8304 is a dual preset counter with solid-state outputs. These models have an additional output configured as a prescaler output. Each time the least significant digit of the display increments, the Prescaler output provides a pulse. The width of this pulse is variable in that the output will turn off after a programmed number of count input pulses has occurred (1-9). The Prescaler output can also be programmed to activate when the 10's digit of the display increments, rather than the least significant digit.

  Note: Prescaler Output Models are limited to two programmable count modes and prescaler values of 1.00000 or less. See Count Input Modes for available modes.

FRONT PANEL KEYPAD

[F1 / RST] - Performs user Programmed Function.

[⏎]
- Cycles through secondary displays.
- Enters Programming Mode or Protected Value Menu when pushed and held for 2 seconds.
- Scrolls through programming displays.
- Enters Data Values.

[▲]
- Selects next available mode in programming mode.
- Increments digit in digit Entry mode.
- Increments value in Auto Scrolling entry mode.
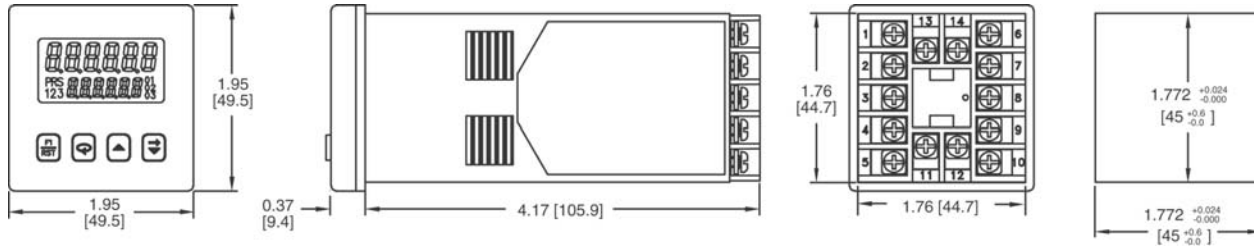
[➡/▼]
- Selects Digit to right when in Digit Entry mode.
- Decrements value in Auto Scrolling entry mode.

Models   Description

For Details on Models and Descriptions, see the Ordering Information section

Dimensions

MULTIPLE UNIT STACKING

The Model 83 is designed for close spacing of multiple units. Units can be stacked either horizontally or vertically. For vertical stacking, install the panel latch with screws to the sides of the unit. For horizontal stacking, the panel latch screws should be at the top and bottom of the unit. The minimum spacing from center line to center line of the units is 1.96" (49.8 mm). This spacing is the same for vertical or horizontal stacking.
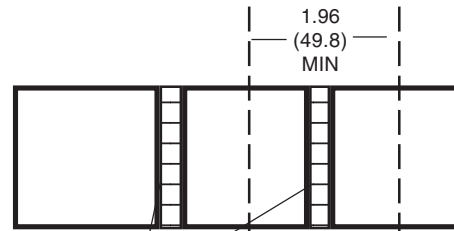
Note: When stacking units, provide adequate panel ventilation to ensure that the maximum operating temperature range is not exceeded.
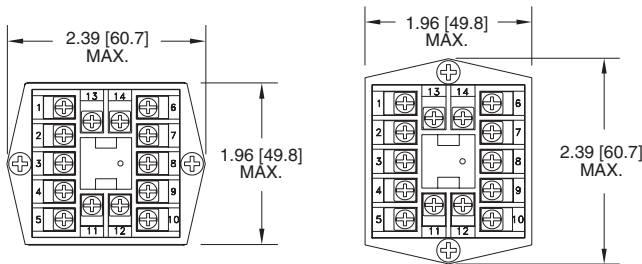
PANEL LATCH INSTALLED FOR VERTICAL UNIT STACKING

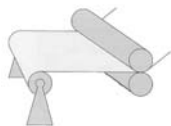PANEL LATCH INSTALLED FOR HORIZONTAL UNIT STACKING

PANEL CUTOUT SPACING FOR MULTIPLE UNIT STACKING. HORIZONTAL ARRANGEMENT SHOWN.

1.96 (49.8) MIN

IF NEMA 4 IS NOT REQUIRED, THIS PANEL MATERIAL MAY BE REMOVED.
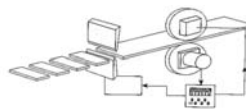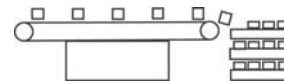
Applications

Convert-ing

Batching

Cut-to-length

Packag-ing

Ordering Information

MODEL NO.	DESCRIPTION	NPN O.C. OUTPUT(S)	*PNP O.C. OUTPUT(S)	RELAY OUTPUT(S)	RS485	PART NUMBERS FOR AVAILABLE SUPPLY VOLTAGES	
						18-36 VDC/24 VAC	85 TO 250 VAC
8301	1 Preset Counter Backlit LCD	Yes	No	Yes	No	**8301-0110**	**8301-1110**
8302	2 Preset Counter Backlit LCD	Yes	No	No	No	**8302-0100**	8302-1100
	2 Preset Counter Backlit LCD	Yes	No	No	Yes	**8302-0101**	**8302-1101**
	2 Preset Counter Backlit LCD	No	No	Yes	No	**8302-0010**	**8302-1010**
	2 Preset Counter Backlit LCD	No	No	Yes	Yes	**8302-0011**	**8302-1011**
8304	2 Preset Counter w/Prescaler Output Backlit LCD	Yes	No	No	No	**8304-0100**	**8304-1100**
	2 Preset Counter w/Prescaler Output Backlit LCD	Yes	No	No	Yes	**8304-0101**	**8304-1101**
8303	3 Preset Batch Counter Backlit LCD	Yes(01)	No	Yes	No	**8303-0110**	**8303-1110**
	3 Preset Batch Counter Backlit LCD	Yes(01)	No	Yes	Yes	**8303-0111**	**8303-1111**
	3 Preset Batch Counter Backlit LCD	Yes	No	No	No	**8303-0100**	**8303-1100**
	3 Preset Batch Counter Backlit LCD	Yes	No	No	Yes	**8303-0101**	**8303-1101**

Note: On batch Relay Models, Outputs 2 and 3 are relays, and Output 1 (01) is a solid-state output.

* PNP outputs are non-stock items
* Items in bold are normally in factory stock.

RELAY OUTPUT BOARDS

DESCRIPTION	NPN O.C.	* PNP O.C.	RELAY	PART NUMBER
Single Preset	Yes	No	Yes	1726-044S
Dual Preset	No	No	Yes	1726-045S
Batch	Yes	No	Yes	1726-046S