Icon Electronics

D4-CNT1 / P49-CNT1
Counter / Frequency monitor
Operating instructions
and
Guarantee Certificate

www.icon-electronics.com

Description:
This device may be configured for counting or frequency monitoring functions. Using the "save" function, the state of the counter is saved to non-volatile memory during power failures, allowing the device to continue from where it left off before the power was removed. A 10V – 24V DC supply (± 30mA) is included for use with NPN proximity switches. The relay may be configured to either energize or de-energize when the pre-set number of pulses have been counted. Pulses can be acknowledged when the pulse pins are either shorted OR released. A pre-scaler of up to 200 is included. (the device reads the "pre scale" amount of pulses before updating the counter value). The post-scaler multiplies the pulses received by up to 200. Pulses may be displayed as lapsed (up-counting), remaining (down counting) or frequency (even if configured for counting). Using the reset timer the device can automatically be reset between 0.1 and 99.9 seconds after the pre-set number of pulses have been counted, eliminating the need to generate reset pulses manually. By using this timer function, the output pulse length can be varied from 0.1 to 99.9 sec. When monitoring frequency the hysteresis may be set from 1 to 50% of the set-point. A latch facility and 10 second start-up timer is also incorporated. See description of the different functions for further details.

Menu functionality:
All adjustments are made via the three front mounted buttons. Press the "MENU" button repeatedly until the desired setting is reached, press "SELECT" to display the current value of the selected setting, or sub menu (if applicable). The "+" and "-" buttons are used to change the value. "ENTER" will return the device to the menu. The "BACK" button will exit the menu.

Menu options:
- **Function ("Func") (default: Counter) Select the device's functionality.**
  - Counter ("Cntr")
    The relay changes state when the pre-set number of pulses is reached. It returns to the original state upon reset (manual or via reset timer), or after 0.5 seconds if the pulse facility is used.
  - Frequency monitor ("FrEq")
    The relay is energised until the pre-set maximum frequency is reached. It will re-energise once the frequency has dropped by the hysteresis amount. If the latch pins are shorted, it remains de-energised until the short is removed. (Even if the input frequency is removed)
- **Setpoint ("SEt") (default:1)**
  Program this value to the number of pulses to be counted or maximum frequency.
- **Hysteresis ("HySt") (Frequency mode only. default:1)**
  If the input frequency has exceeded the pre-set limit, and the relay has de-energised, it will remain in this state until the input frequency has dropped by this value.
- **Relay functionality ("o.Put") (counter mode only. Default: Continuous)**
  Once the pre-set count has been reached, the relay will:
  - Change state continuously ("Cont")
    The relay changes state until the counter is reset by the reset timer or by shorting the reset pins.
  - Be pulsed ("PULS")
    The relay changes state for 0.5 seconds. If the counter is reset by the reset timer or reset pins during this time, the relay changes back immediately.
- **Reverse relay ("rE r") (counter mode only. Default: Close)**
  This setting allows the relay functionality to be reversed. When set to default (close) the relay will close / energise once the pre-set number of pulses have been counted.
- **Pre scale ("Pr.SC") (available in all modes. default:1)**
  The device will read this amount of pulses before updating the counter by 1.
- **Post scale ("Po.SC") (counter mode only default:1)**
  The device multiplies the number of pulses received by this value.
- **Input pulse source ("i.Put") (available in all modes. default:Slow)**
  - Low Frequency ("SLO")
    This setting removes switch bounce and limits the input frequency to 30Hz
  - High Frequency ("FASt")
    Select this setting when using proximity switches. (max frequency: 9999Hz)
- **Input pulse type ("P.tyP") (available in all modes. Default: Close)**
  - Increment when contacts open ("OPEn")
  - Increment when contacts close ("CLOS")
    When using digital inputs, "CLOS" will cause the device to recognise a pulse when the input changes from a high (5V-12V) to a low (0V).
- **Reset delay ("rES.d") (counter mode only. Default: Disabled)**
  By setting this value the counter can be automatically reset 0.1 - 99.9 seconds after the preset number of pulses have been counted. It has the same effect as shorting the reset pins. (The delay is disabled when set to zero)
- **Save memory ("SAuE") (counter mode only. Default: Off)**
  When set to "on", the device restarts in the same state as it was before a power failure occurred. (i.e. the number of pulses counted are not reset during power failures)
- **Display format ("diSP") (Default: Lapsed pulses) (counter mode only)**
  - Lapsed time ("LA P")   Pulses counted
  - Remaining time ("rE P")   Remaining pulses before set-point is reached
  - Frequency ("FrEq")   Input frequency

- **Reset ("rESt)**
  Press "+" or "-" when "ConF" is displayed to reset all settings to default.

Please Note:
- The Decimal pointer is used to indicate values greater than 9999.

  Value: 10000-19999 ,   Display : **"9.9 9 9"**
  20000-29999   **"9.9.9 9"**
  30000-39999   **"9.9.9.9"**
  40000-49999   **"9.9.9.9."**

- The device is held in reset as long as the reset pins are shorted.
- As a power saving feature, the display dims if settings are not being made.
- Certain settings are reset to default when the device is re-configured. Before commissioning, re-check all settings to ensure they are correct.
- If the counter display is configured to lapsed pulses, pulses received after the set-point has been reached are displayed to a maximum of 9.9.9.9. (unless a reset occurs)
- The relay will not energise if the input voltage is below the operating voltage.
- When configured as a Frequency monitor, the start-up delay will force the relay to remain energised for the first 10 sec after power-up. Regardless of the freq.
- If the input mode is changed from "fast" to "slow", or "slow" to "fast", or the pre-scale value is changed, the device may not count the correct number of pre-scale pulses until it has either been reset, or counted enough pulses to update the main counter value.

Example:
Set the device to count 100 pulses generated by mechanical pulses when the contacts open. Reset the device 1 second after the 100th pulse is received. Set the display to indicate pulses remaining (count from 100 to 0).

Press "MENU" to display "Func". Press "SELECT". Use the "+" and "-" buttons to change the value to "Cntr". Press "ENTER" to return to the menu. "SEt" is displayed. Press "SELECT". Use "+" and "-" to change the value to "100". Press "ENTER". "o.Put" is displayed. Press "SELECT" and change the value to "Cont". Press "ENTER" 4 times until "i.Put" is displayed. Press "SELECT". Use "+" and "-" to change the value to "SLO". Press "ENTER". "P.tyP" is displayed. Press "SELECT" and change the value to "OPEn. Press "ENTER". "rES.d" is displayed. Press "SELECT" and change the value to 1.0. Press "ENTER" 2 times. "diSP" is displayed. Press "SELECT" and change the value to "rE P. Press "ENTER". Press "BACK".

Lock adjustment & full / reduced menu: (these settings are not changed via the menu)
When NOT in a menu or sub-menu, press and hold "+" and "-". After 3 seconds the display will show "----". If the keys are released at this point, the lock settings feature will be activated (settings may be viewed, but not changed). If the keys are held for an additional 2 seconds, the display will show "____". The full menu will be activated. To toggle the lock feature, or full / reduced menu, repeat the above procedure.

Specifications:

Count:	1 – 49999 pulses ("9.9.9.9." see notes)		
Pre-scale:	1-200 pulses		
Post-scale:	1-200		
Accuracy:	Counter:	100%	Freq.: $\pm$0.25%
Display Resolution:	Counter:	1 pulse	Freq.: 1 Hz
Input voltage:	$\pm$15% of rated voltage		
Led indication:	Relay status		
Reset time:	0.5 sec (power supply reset), 0.05 sec (reset pulse)		
Response time:	Counter:	<0.02s Freq:	<1.1s
Input frequency	"FASt":	9999 Hz "SLO":	30Hz
Pulse source type	mechanical switch or NPN proximity		

12 Month guarantee:
Our product is guaranteed for a 12 (twelve) month period from date of purchase. This guarantee is valid for defects arising from failure during specified conditions. This guarantee does not cover damage due to abuse, tampering or improper installation. Our company does not accept liability for any consequential damage or loss arising from product malfunction. Should this product prove to be defective, kindly return for inspection or repair. For further information contact your nearest distributor.

Relay specifications:
Contact rating: **10A 250 VAC 2500VA (Resistive)**
Mechanical life: **30 million operations**
Electrical life: **250 000 operations (at maximum load)**

Note: If the input voltage is below the minimum operating voltage, the relay may not energize.