CT1 Counter

1-Wire® Counter/Timer Module

http://www.EmbeddedDataSystems.com

FEATURES

- 32-bit counter/32-bit timer.
- Counts and times switch closure inputs.
- TMEX file-record formatted data.
- Unique Network addresses.
- Triple buffered time/count in 32-bit format.
- Self-exciting switch closure input.
- Digital Output Data.
- CRC16 Error Checking.
- Flexible power requirements.
- Uses 1-Wire Communication Protocol.
- Supported By EDS HA5, HA7 and HA7NET.
- As many as 100 devices on the network.
- Up to 1000+ Feet from Host.
- ESD protection on 1-Wire and count inputs.
- Sealed, stackable ABS enclosure.

Network:	Power in--------Orange
	Ground----------Blue/white
	1-Wire----------Blue
Input:	Signal----------Orange
	Ground----------Orange/White

DESCRIPTION

The CT1 Counter is designed to count and maintain switch closure pulses from dry contact devices such as relays and magnetic reed switches. A 32-bit time stamp is maintained with the last three transitions to the active (closed) state. The CT1 Counter provides the necessary switch excitation voltage so that no external power source is required. A 4ft cable provides electrical connection to the 1-Wire network. The output is digital, all data conversions are done internally. Therefore, distance to the sensor is unimportant for data integrity and it may be placed up to 1000+ feet from the host. In addition, all I/O and data communications with the sensor are CRC16 error checked for accuracy. The data is stored in RAM memory as a TMEX data packed. The most recent three counts and times are stored, most recent first, in memory. The user can determine rate, total time and total count at any time with a single read of the TMEX file format compatible RAM page 2.

The CT1 Counter has a built-in multidrop controller (DS2423), which provides a unique 64 bit registration number (8-bit family code + 48 bit serial number + 8 bit CRC) assuring error-free selection and absolute identity; no two parts are alike. Unique addressing allows I/O function to be identified absolutely, no more dip switch address confusion. All unique counter identification and calibration data is stored in on-board ROM memory for easy installation and setup.

The CT1 Counter is compatible with the EDS HA5, HA7, HA7NET and the Maxim DS9097U and Tini 1-Wire interface products. The data is stored as a 28 byte packed in TMEX file record format. This record contains the most recent three sets of 32-bit time and 32-bit count. The data record is CRC-16 error checked for accuracy. See the example below:

The CT1 Counter data record contains the three most recent time/count values. This consists of 3 8-byte fields starting with the most recent time/count value each in 32-bit format. The data is stored in the RAM memory of a DS2423 in page 2, memory location 0040 Hex. The record is organized as a TMEX file record with byte count, data, continuation pointer and CRC-16 for a total of 28 bytes. This format can be easily read with the HA5 file memory read command. The example below illustrates the how this is done and how to interpret the data response.

HA5 Command	Response
"aF1D<cr>"	"970000000124DB1D<CR>"
"aL,0102<cr>"	"00001E4E0000000900001E0D0000000800001E0600000007"

The read file record command removes the byte count, continuation pointer and CRC-16 and performs a CRC-16 error check automatically. The received record is explained below:

The HA5 received record: 00001E4E0000000900001E0D0000000800001E0600000007
Consists of three sub fields of the most recent time/count values in 32-bit format. The fields consist of 8 bytes (16 ASCII Hex characters) each starting with the 4-byte time and ending with the 4-byte count.

First Field: **00001E4E00000009**00001EOD0000000800001E0600000007

This first 4-byte sub-field (00001E4E) is the time in 5 millisecond units that has expired between the most recent count and the power up of the CT-1. The on-board clock will rollover every 248.5 days. The second sub-field (00000009) is the most recent count. These values are in hexadecimal format MSB first.

This value represents 38.79 seconds and a count of 9.

First Second: 00001E4E00000009**00001E0D00000008**00001E0600000007

This second field is the time and count of the count value that occurred before the most recent; first count.
The time is 38.46 seconds and the count is 8. The user can use this difference time and difference count to determine the rate of the input pulses at the most recent count.

The third sub-field is the count and time of the input that occurred before the second event. As new events occur the sub-fields are moved from left to right such that the most recent is always first. The user may take data at any time but there must be at least 100 milliseconds between reads of the RAM record.

PARAMETER	MIN	TYP	MAX	UNITS
Power Input Voltage	8	12	16	Volts
Power Supply Current	5	8	10	MilliAmp
Switch excitation voltage	4.8	5.0	5.5	Volts
Switch denounce time	-	10	-	MilliSec.
Operating Temperature Range	-40	-	85	ºC
Count pulse width.	10	-	-	MilliSec.
Count rate.	0	-	50	Hz.
Timer Resolution		5		MilliSec.
Timer Rollover Period		248.5		Days
Read Period	100		-	Millisec.