

## Electronic Elapsed Time Indicator and Event Counter ET2010/-

This chapter contains product information for the Electronic Elapsed Time Indicator and Event Counter ET2010/-.

### Features

- Total electronic circuitry.
- Hours and/or events in a single package.
- EEPROM non-volatile memory.
- 10 years data retention.
- Printed circuit board mounting.
- Remote interrogation with hand-held reader.
- Nuclear survivability.

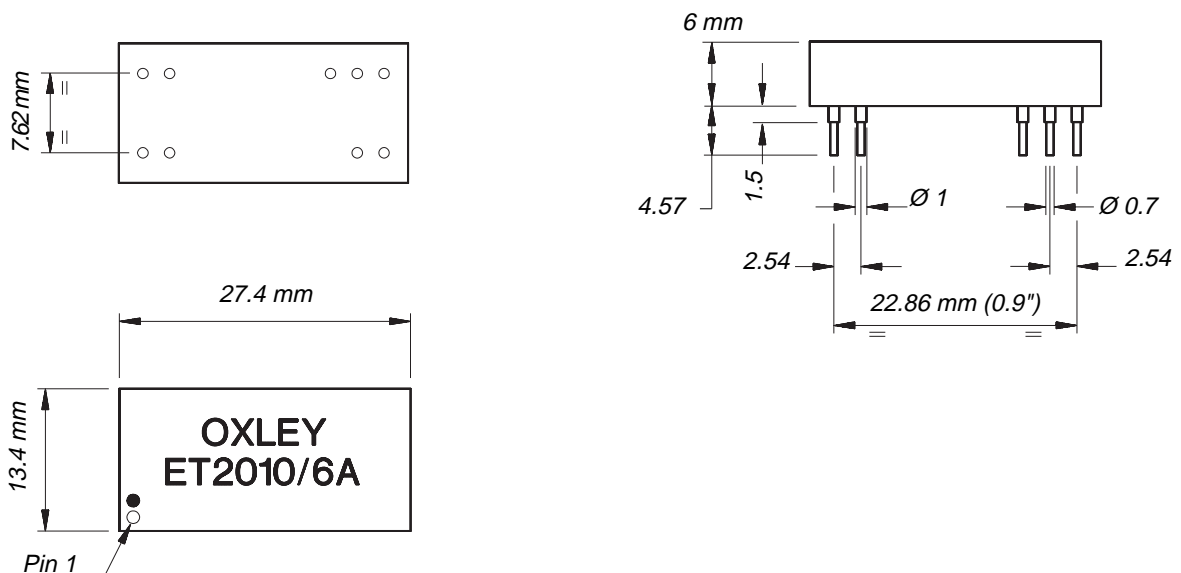


For ordering information see [page 16](#).

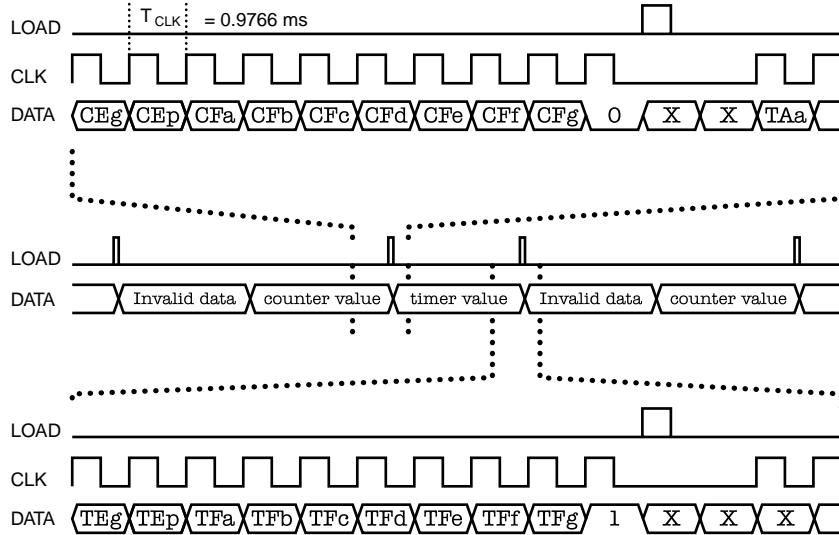
### Description

The Oxley Electronic Elapsed Time Indicator Type ET2010 is a PCB mounting device designed to record both elapsed time and events. It is encapsulated in a low profile, board mounting package and ideal for incorporation into equipment where individual Printed Circuit Board monitoring is required. The small package size is highly suitable for systems where space is at a premium.

The ET2010 is available in 8 different versions, offering varying combinations of resolution and capacity. It is equipped with a synchronous output data signal which may be simply interfaced to an LCD display; alternatively the Oxley [ET/HHR/3A hand-held reader](#) may be used. For details of LCD driver circuitry, please contact the [Technical Sales Department](#).



**Output Waveforms**



**Ratings**

Supply voltage	18 V d.c. to 33 V d.c. (DEF STAN 61-5 Part 6 compatible)
Supply current	600 $\mu\text{A}$ max at 5 V d.c., 15 mA at 30 V d.c.
Timing accuracy	$\pm 0.1\%$
Event signal	TTL compatible
Event pulse width	0.1 $\mu\text{s}$ to 8.0 ms
Event pulse frequency	50 Hz max
Data retention	10 year min at 25°C
Operating temperature	-55°C to +90°C
Storage temperature	-55°C to +100°C

**Note:** For 4.5 V d.c. to 10 V d.c. operation use the Vcc (+5 V) pin. For 18 V d.c. to 33 V d.c. operation use the +28 V pin. Supply voltages between 10 V d.c. and 18 V d.c. may be used providing an external resistor is also connected. For further information please contact the [Technical Sales Department](#).

## Pin Details

PIN	DETAILS
+28 V	Positive supply (18 V d.c. to 33 V d.c.). This pin is compatible with supplies as defined by DEF STAN 61-5 Part 6 (Pin 1).
CLK	Asynchronous clock pin for use with LCD display driver or Oxley <a href="#">ET/HHR/3A hand-held reader</a> (Pin 2).
EVEN T	TTL compatible input for use when TTL event counting EETI's are used. This pin is internally pulled down to 0 V using a 100 K $\Omega$ resistor and may be left unconnected when not required (Pin 8).
LCD	Asynchronous data pin for use with LCD display driver or Oxley <a href="#">ET/HHR/3A hand-held reader</a> (Pin 9).
0 V	Power supply common. Used in conjunction with either +28 V or Vcc (+5 V) (Pin 10).
Vcc (+5 V)	Positive supply (4.5 V d.c. to 10 V d.c.). Supplies exceeding this limit may be connected by inserting a series resistor (Pin 11).
LOAD	Asynchronous data load pin for connection to LCD display driver or Oxley <a href="#">ET/ HHR/3A</a> (Pin 12).
N.C	No connection (Pin 19).
Vaux	Positive supply connection for cold reads. Providing no supply is present at either +28 V or Vcc (+5 V) powering the device by this pin will inhibit all counting or timing functions. The voltage at this pin must be within the range 4.8 V d.c. to 6 V d.c. (Pin 20).

## Environmental Standards

TEST	SPECIFICATION	NEAREST EQUIVALENT MIL-STD-202 METHOD (except where stated)
Bump	IEC 68-2-29, 4000 Bumps, 40 g	No equivalent
Shock	DEF STAN 07-55 200 g, 3 ms, 1/2 Sine Wave, 18 shocks total	Method 213-2 Comp I, 00 g, 6 ms, sawtooth
Vibration	IEC 68-2-6, 10-2000 Hz 20 g	Method 20K Cond D, 10-200 Hz 20 g
Damp heat (steady state)	IEC 68-2-3, -55/90/21	Method 103 Cond B, 96 hours
Change of temp.	IEC 68-2-14, Ta = 55°C, Tb = 90°C, TI = 30 mins	Method 107 Cond A

## Nuclear Hardness

Maximum combined neutron & gamma ionising dose = 1550 cGy (Si)

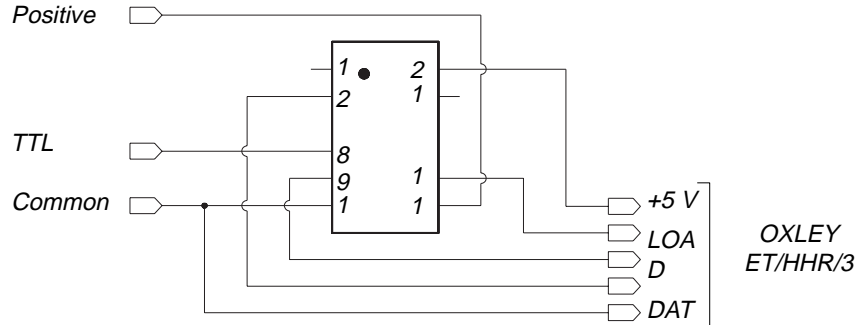
Maximum neutron fluence 10<sup>12</sup> n/cm/cm

## Hand-held Reader

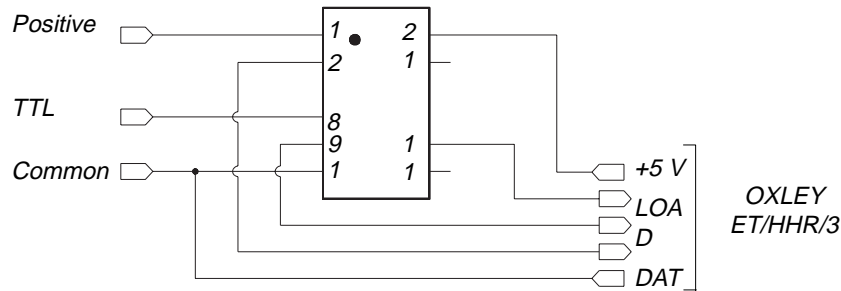
A hand-held reader ([ET/HHR/3A](#)) to display the recorded data, is available to interface with the ET2000 series EETIs. The reader is battery powered, capable of interrogating the device without incrementing the data stored within, and has no requirement for the host equipment to be energised. When active, the reader automatically recognises the type of EETI connected and correctly formats the information.

## Suggested Circuit Configurations

### ET 2010/ - 4.5 V to 10 V d.c. Operation



### ET 2010/ - 18 V to 33 V d.c. Operation



## Ordering Information

Type Number	Resolution (hours)	Capacity (hours)	Event Capacity
ET2010/1	1.0	999,999	-
ET2010/2	0.1	99,999.9	-
ET2010/5A	1.0	999,999	10 <sup>6</sup> TTL
ET2010/5B	1.0	999,999	10 <sup>6</sup> POWER UP
ET2010/6A	0.1	99,999.9	10 <sup>6</sup> TTL
ET2010/6B	0.1	99,999.9	10 <sup>6</sup> POWER UP
ET2010/7A	0.01	9,999.99	10 <sup>6</sup> TTL
ET2010/7B	0.01	9,999.99	10 <sup>6</sup> POWER UP

When ordering please specify type number and quantity.