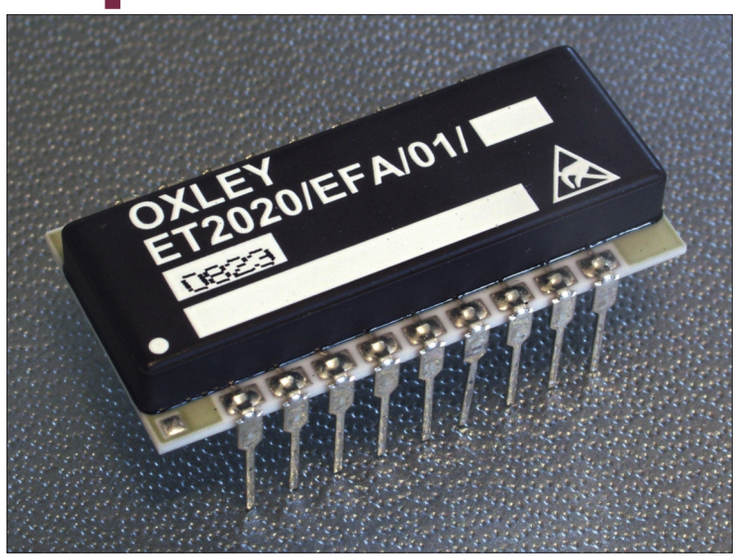
OXLEY

product information

Elapsed time indicator



ET2020/EFA/01/07

features

- EEPROM non-volatile memory
- 10 years data retention
- Low power, 5 mW typical
- Serial output
- Micro processor compatible
- Non-volatile text storage and recall
- Military specifications

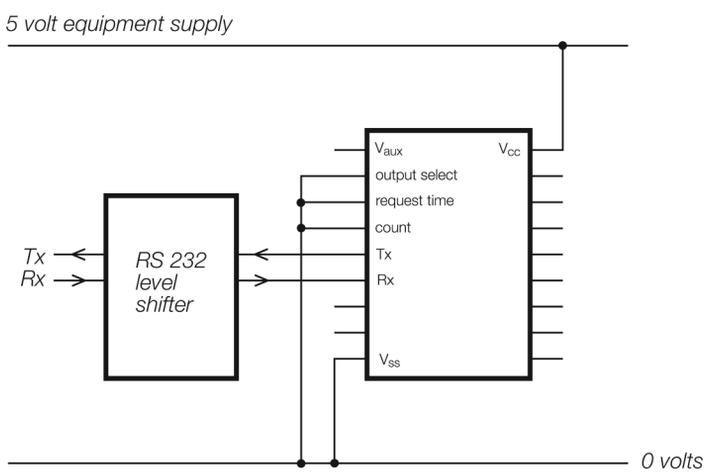
description

The 18 pin ceramic dual-in-line elapsed time indicator (ETI) is assembled using hybrid technology, ensuring suitability for applications where severe environmental conditions maybe encountered.

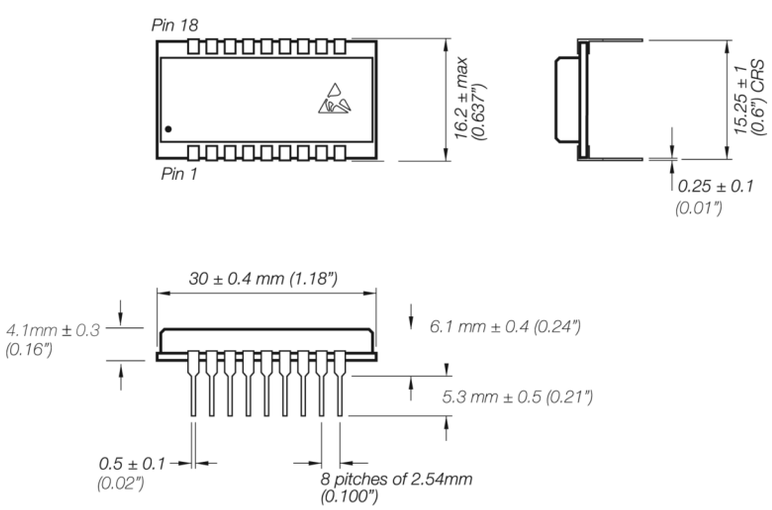
application diagrams

Typical serial connection diagram is shown on the right. The internal timer is activated whenever the 5V power supply is applied. No additional timing control circuitry is required.
The total elapsed time is accumulated in the internal non-volatile memory for interrogation through the serial interface.

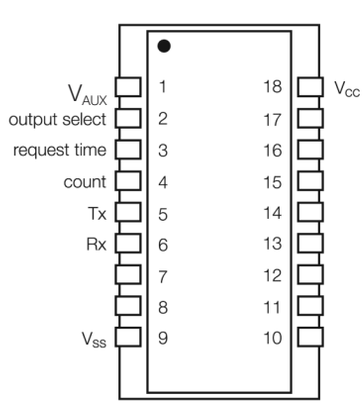
serial mode



dimensions



pin assignment



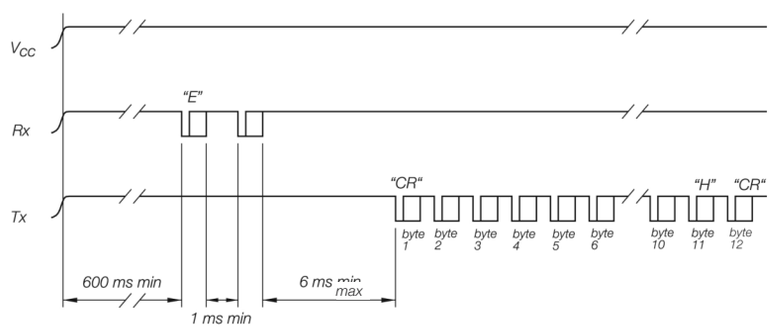
Pins 7-8 and 10-17 should be left unconnected for this device

characteristics

Operating temperature range	-55 to 125ºC
Storage temperature range	-55 to 125ºC
Supply voltage V_{CC}	4.5 to 5.5 Vdc
Supply voltage V_{AUX}	4.0 to 5.5 Vdc
Supply current	1mA typical, 2mA max
Timing resolution	0.01 hours
Timing accuracy	±0.1%
Capacity (serial mode)	10^5 hours/10^7 pulses
Pulse count frequency	30 Hz max
Pulse width	10ms min
V_{OH} output logic 1	V_{CC} -1 to V_{CC}
V_{OL} output logic 0	V_{SS} to 0.2 x V_{CC}
V_{IH} input logic 1	0.8 x V_{CC} to V_{CC}
V_{IL} input logic 0	V_{SS} to 0.2 x V_{CC}
I_Z high Z leakage current	± 10µA

interrogation

ETIs can be interrogated serially using the relevant serial commands.



byte	1	2	3	4	5	6	7	8	9	10	11	12
character	cr	0	0	0	0	0	.	0	0		H	cr
hex	0D	30	30	30	30	30	2E	30	30	20	48	0D

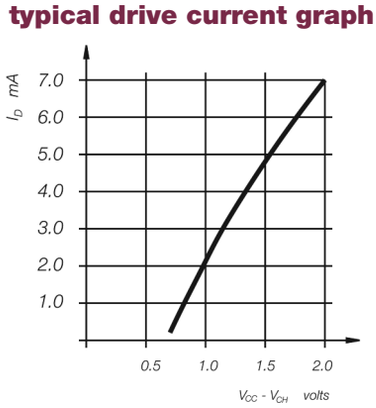
serial elapsed time

Bytes 1 and 12 are ASCII carriage return characters. Bytes 2 to 9 represent the elapsed time reading and are ASCII characters. Byte 2 is the most significant digit. Byte 7 is always "." and byte 11 "H" denoting units of hours. Elapsed time measurement is suspended for typically 300 ms during serial data output.

power supply

A single 5 volt power supply, V_{CC} is required for operation. A separate power supply input V_{AUX} is also provided for energisation from a second power source. A blocking diode is internally connected to prevent current from V_{AUX} powering parent equipment connected to V_{CC}. This provides cold read facilities during failure of parent equipment or when it is powered down.

typical drive current graph



serial data (output select = 0)

Serial data transfer uses two pins, R_X (receive data) and T_X (transmit data). Together with a signal common, these lines constitute a 3 wire serial communication interface utilising a standard non-return to zero (NRZ), data format. Direct interface can be made with integrated circuit UART devices.

The signals can also be level shifted to conform to RS232 requirements.

The R_X and T_X signals must meet the following requirements:

1. A High level indicates logic 1 (5V) and a low level indicates logic 0 (0V)
2. The R_X input must be a high state prior to reception of data
3. A start bit, (logic 0), is transmitted / received indicating the start of a message
4. Bytes of data are transmitted / received least significant bit first
5. A stop bit, (logic 1), in the 10th bit position indicates transmission / reception of a byte is complete
6. Baud rate: 9600b/s
   Data bits: 8
   Start bits: 1
   Stop bits: 1
   Parity: none

No serial data will be received whilst data is being transmitted.

To initiate transmission of serial elapsed time/pulse count data a unique two character ASCII command "ET" must be received at the R_X input. Following reception of a valid "ET" command the ETI will output the elapsed time message on the T_X output. If an invalid command is received an ASCII carriage return character, (0D hex), is transmitted.

No further serial data received for a period of 5ms.

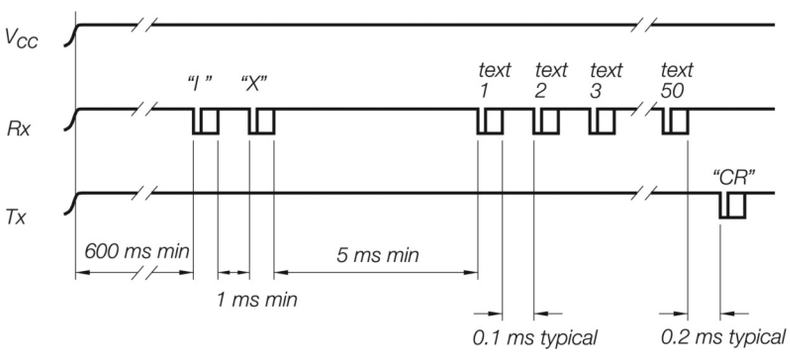
user programmable text

50 bytes of EEPROM are provided for user entry and storage of 50 characters of text information.
The text may record, for example maintenance and warranty status of parent equipment. Text may be rewritten as often as required and can be read and entered serially.

text entry

Text entry is initiated by detection of the ASCII "IX": command at the R_X input. Up to 50 ASCII text characters should then be input, terminated either by a carriage return or by entry of the 50th character.
Text entered will overwrite previously stored text.

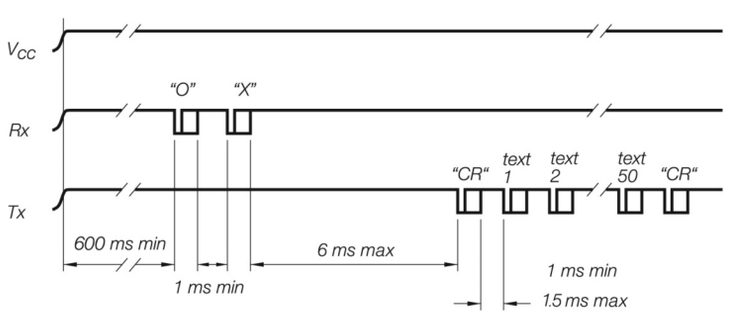
serial text input



serial text interrogation

Serial text interrogation is achieved by using the ASCII "OX" command.

serial text output



ordering information

Elapsed time indicator
ET2020/EFA/01/07
Non volatile pulse counter
PC2020/EFA/01/07

qualification

Originally approved to DEF-STAN 59-61 (Part 90/257)

Company Approvals:

BS EN 9100: 2003

ISO 9001:2000

Both on Certificate No. FM 01759

ISO 14001:2004 Certificate No: EMS 60559

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