



THURLBY THANDAR INSTRUMENTS

TF830



## 1.3GHz bench/portable universal frequency counter

- *5Hz to 1300MHz range, 0.0001mHz max. resolution*
- *Excellent sensitivity across the whole frequency range*
- *Frequency, period, pulse width, frequency ratio & event counter*
- *Reciprocal counting technique for higher accuracy and resolution, at least 7 digits of resolution per second of measurement time*
- *Very low power consumption, ac mains or battery operation*
- *Optional RS-232 interface for remote operation & read-back*

# TF830 - 1.3GHz LCD universal frequency counter

## Microcontroller based versatility

The TF830 universal counter incorporates an advanced microcontroller which significantly enhances its capabilities when compared with conventional frequency counters.

## A wide range of functions

In addition to frequency measurement the TF830 offers period measurement, frequency ratio, pulse width and event counting. Pulse width measurements can be made from rising to falling edge or vice versa.



## High resolution reciprocal counting

The TF830 uses the reciprocal frequency counting technique to achieve high resolution at all frequencies.

Reciprocal counting involves synchronized multiple period measurements followed by computation of the reciprocal value.



This results in high resolution measurements regardless of the signal frequency and eliminates the +/-1 input cycle errors of a conventional frequency counter.

The system yields at least 7 digits of resolution per second of measurement time and can measure low frequencies to a resolution of 0.001mHz.

## Low power operation gives true portability

To ensure maximum flexibility the TF830 can operate from disposable batteries, rechargeable batteries or AC line. Low power circuitry is combined with an LCD display to give up to 200 hours of operation from alkaline batteries.

## Remote control and read-back

The TF830 is available with the option of an addressable RS-232 interface. This can be used as a normal RS-232 interface or as part of a multi-instrument setup under the TTI ARC system.

All front panel functions can be remotely controlled and measurements can be read back to the controller.

### Functions

#### Frequency (Range A)

Frequency range: 5Hz to 25MHz  
Resolution: 0.001mHz to 100Hz (see Note 1)

#### Frequency (Range B)

Frequency range: 20MHz to 1.3GHz  
Resolution: 1Hz to 10kHz (see Note 1)

#### Period

Frequency range: 5Hz to 25MHz  
Resolution: 10<sup>-7</sup>ns to 1us (see Note 1)

#### Count

Counter range: 1 to 268435456 (2<sup>28</sup>), only the least significant 8 digits shown with overflow indication past 99999999 pulses  
Frequency range: 1Hz to at least 14MHz  
Minimum pulse width: 20ns

#### Ratio A/B

Frequency range: A - 5Hz to 25MHz; B - 20MHz to 1.3GHz  
Resolution: Displayed with 8 significant digits irrespective of actual input frequencies and measurement time

#### Pulse Width

Mode: Falling to rising edge or rising to falling edge  
Pulse width Range: 1μs to 26s  
Resolution: 100ns  
Measurement time: 0.1s and 1s ranges determine the inter-measurement time. 10s range will hold until reset

**Note 1:** The resolution depends upon the measurement time and input frequency. At least 7 digits are displayed per second of measurement time.

### Timebase

Oscillator: 10MHz Xtal  
Initial adjustment error: <±1ppm at 23°C  
Temp. coefficient: Typically less than ±0.3ppm/°C over 18°C to 28°C, less than ±10ppm over -20°C to 70°C  
Ageing rate: < ±5ppm/year

### Input Specifications

#### Input A

Input impedance: 1MΩ/25pF, AC coupling  
Frequency range: 5Hz to 25MHz  
Sensitivity: Sinewave 15mVrms 10Hz to 20MHz; pulse 40mV pk-pk 0Hz to 14MHz  
Trigger level: Continuously adjustable by front panel control  
Max. input voltage: 60Vdc; 30Vrms 50/60Hz reducing to 1Vrms above 1MHz  
Low pass filter: Switchable 50kHz low pass noise filter

#### Input B

Input impedance: 50 Ohm nominal, AC coupling  
Frequency range: 20MHz to 1.3GHz  
Sensitivity: 10mVrms - 20MHz to 700MHz, <50mVrms to 1.3GHz  
Max. Input voltage: 60Vdc; 30Vrms 50/60Hz; 1Vrms 20MHz to 1.3GHz

#### External Standard Socket

An external 10MHz frequency standard (5V/TTL level) can be applied.

### RS232 Interface

#### (TF830-RS232 ONLY)

All functions remote-controllable including trigger level and filter.

Complies fully with normal RS-232 standard.

Can also be used in addressable mode using the TTI ARC interface standard (addressable RS-232 Chain).

### General

AC Input: 220 to 240 volts ±10% or 110 to 120 volts ±10% 50/60Hz, Installation Category II.  
Battery type: 6 'C' size disposable or rechargeable cells (selectable).  
Battery life: 200 hrs typical from Alkaline Cells. Low battery indicator  
Electrical Safety: Complies with EN61010-1  
EMC: Complies with EN31326  
Environmental: Indoor use at altitudes to 2000m, Pollution Degree 2.  
Operating range: +5°C to +40°C, 20% to 80% RH  
Storage range: -20°C to +70°C  
Size: 260(W) x 235(D) x 88(H) excluding handle and feet  
Weight: 1.4kg (excluding batteries).

*Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice.*

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