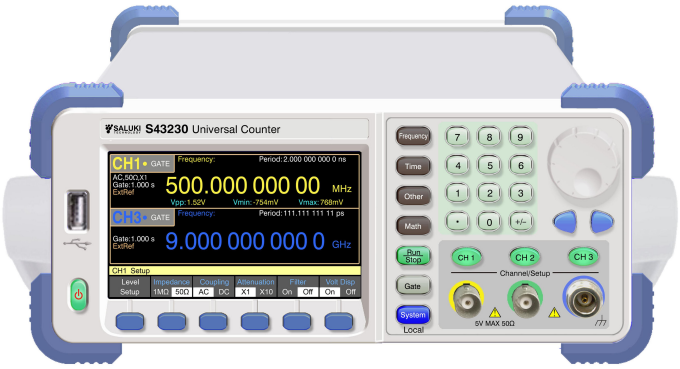
S43230 Series Universal Counter

Datasheet



Saluki Technology Inc.

The document applies to the universal counter of the following models:

- S43230 universal counter (channel A,B: DC-500MHz)
- S43230-01 universal counter (channel A,B: DC-500MHz, channel C: 100MHz-1.5GHz)
- S43230-02 universal counter (channel A,B: DC-500MHz, channel C: 100MHz-2.5GHz)
- S43230-03 universal counter (channel A,B: DC-500MHz, channel C: 100MHz-3GHz)
- S43230-04 universal counter (channel A,B: DC-500MHz, channel C: 100MHz-6GHz)
- S43230-05 universal counter (channel A,B: DC-500MHz, channel C: 100MHz-9GHz)
- S43230-06 universal counter (channel A,B: DC-500MHz, channel C: 100MHz-15GHz)

Standard Package of the S43230 series universal counter:

No.	Item	Qty.
1	Universal Counter	1
2	Test Cable (BNC male)	2
3	RS232 Cable	1
4	Power Cord	1
5	Fuse Tube BGXP-1-18-1A	2

Options of the S43230 series universal counter:

Model No.	Item
S43230-07	High-stability and Constant- temperature Crystal Oscillator 5×10^{-9}/day
S43230-08	High-stability and Constant- temperature Crystal Oscillator 3×10^{-9}/day
S43230-09	IEEE488 General Interface
S43230-10	Centronics standard printer interface
S43230-11	Test Cable (Type N)

Preface

Thank you for choosing S43230 series universal counter produced by Saluki Technology Inc.

We devote ourselves to meeting your demands, providing you high-quality measuring instrument and the best after-sales service. We persist with “superior quality and considerate service”, and are committed to offering satisfactory products and service for our clients.

Document No.

S43230-02-01

Version

Rev01 2022.05

Saluki Technology

Document Authorization

Product Quality Assurance

The warranty period of the product is three years from the date of delivery. The instrument manufacturer will repair or replace damaged parts according to the actual situation within the warranty period.

Product Quality Certificate

The product meets the indicator requirements of the document at the time of delivery. Calibration and measurement are completed by the measuring organization with qualifications specified by the state, and relevant data are provided for reference.

Quality/Settings Management

Research, development, manufacturing and testing of the product comply with the requirements of the quality and environmental management system.

Contacts

Service Tel:	886. 909 602 109
Website:	www.salukitec.com
Email:	sales@salukitec.com
Address:	No. 367 Fuxing N Road, Taipei 105, Taiwan (R.O.C.)

Content

1. Overview

The S43230 series universal counter is a high-precision frequency and time measuring instrument developed by our company. Its frequency measurement resolution reaches 11 bits/second, and the single-shot time measurement resolution reaches 50ps. It is controlled by a high-performance single-chip microcomputer inside the machine. The whole machine adopts reciprocal counting technology, fitting algorithm technology and digital interpolation technology to achieve high-precision measurement of the instrument. It has measurement functions such as frequency, period, count, time interval, pulse width, duty cycle, rising edge, falling edge, frequency ratio, phase, etc. and powerful mathematical operations and statistics (maximum value, minimum value, average value, standard deviation, Allan variance) functions. The machine has reliable performance, complete functions, high measurement accuracy, wide frequency and time measurement range, high sensitivity, large dynamic range, high cost performance and easy use. It is particularly suitable for time measurement in aerospace and other fields and time and frequency measurement in scientific research and measurement fields such as crystal oscillators and components.

2. Main Characteristics

- Using TDC method, the frequency measurement resolution can reach 11 bits per second, and the time measurement resolution is 50ps.
- Simultaneously measure the frequency, period, duty cycle, pulse width or count of the signals of two channels.
- Perform interval-free measurement on one signal.
- Using high-performance single-chip microcomputer, large-scale integrated circuit and FPGA devices, the instrument has high reliability.
- Channel 3 frequency measurement can reach up to 1 5 GHz.
- Measure single time interval and single pulse width.
- Limit check function and mathematical operation function.
- Scale, histogram and trend chart graphic display function.
- Multiple average, maximum value, minimum value, standard deviation, Allan variance and 5 calibration functions
- Statistical operation function.
- Counting measurement has fixed gate counting function and manual operation counting function.
- The counter can store 10 measurement states.
- Standard RS232 universal serial interface, USB DEVICE interface and LAN interface. Standard USB Host interface, which can write measurement data directly to USB disk.
- Optional Centronics standard printer interface.
- IEEE488 (GPIB) general programmable interface is optional.
- 4.3-inch color TFT LCD display, user-friendly and intuitive interface, supports Chinese and English interfaces.
- Dimensions: 260mm×290mm×105mm (W×D×H)
- Weight: 2.2kg

3. Technical Specifications

3. 1. Input Characteristics

Channel A and B:

Frequency range	0.14mHz to 500MHz（DC coupling below 1kHz）
Dynamic range	50mVrms to1.5Vrms sine wave (0.14mHz to 400MHz) 100mVrms to 1.5Vrms pulse wave (400MHz to 500MHz)
Input impedance	1MΩ‖45pF or 50Ω
Coupling mode	AC or DC
Trigger mode	Rising edge or falling edge
Input attenuation	×1 or ×10
Low-pass filter	Cutoff frequency about 100kHz
Trigger level	-5V to +5V any setting
Crosstalk interference	Not less than 500mVrms

Channel A and B can adapt to the input signal with modulation degree ≤30%, and the enveloping valley value shall satisfy the input sensitivity.

In order to prevent high-frequency components in the low frequency signal measured, the low-pass filter shall be opened for during low frequency measurement below 100kHz. When low frequency measurement below 100Hz is conducted, the trigger level shall be set manually.

Channel C:

Model	S43230-01/02/03
Frequency range	S43230-01: 100MHz-1.5GHz, S43230-02: 100MHz-2.5GHz, S43230-03: 100MHz-3GHz
Dynamic range	30mVrms - 1.5Vrms sine wave
Input impedance	50Ω
Coupling mode	AC

Model	S43230-04
Frequency range	150MHz-6GHz
Power range and sensitivity	150MHz-500MHz: -17dBm to +13dBm, 500MHz-6GHz: -25dBm to +13dBm
Damage level	+20dBm
Input impedance	50Ω
Coupling mode	AC

Model	S43230-05/06
Frequency range	S43230-05: 500MHz-9GHz ; S43230-06:500MHz-15GHz
Power range and sensitivity	500MHz-2GHz: -25dBm to +7dBm, 2GHz-6GHz: -25dBm to +13dBm 6GHz-15GHz: -20dBm to +13dBm
Damage level	+25dBm
Input impedance	50Ω
Coupling mode	AC
Standing wave ratio	< 2.5:1

External trigger input:

Signal input range	TTL level
Pulse width	> 50ns

Note: *The input signal shall not exceed the damage level of the channel. Otherwise, the input signal will be damaged, leading to instrument damage!*

3. 2. Time Base

Internal crystal oscillator	Nominal frequency	10MHz
	Daily aging rate	1×10^{-8}/ day, 0.01ppm (Standard) 1×10^{-9}/day, 5ppb (Option)
Time-based input	Frequency	5MHz or 10MHz
	Amplitude	≥ 1Vp-p
Time-based output	Frequency	10MHz
	Amplitude	≥ 1Vp-p

3. 3. Measurement Indicator

Frequency measurement:

Valid bits	11 bits/second
Gate time	1μs to 1000s, external gate optional
Measurement error	

Periodic measurement:

Measuring range	2ns to 7000s
Display least significant bit	50ps
Trigger signal	Internal automatic trigger or external trigger
System error	±50ps
Measurement error	±System error±Decoding error±Time base error

Time interval measurement:

Measurement range	50ps to 7000s
Display least significant digit LSD	50ps
Trigger signal	Internal automatic trigger or external trigger
Measurement error	±LSD±decoding error±time base error×time interval
System error	±50ps

Frequency ratio measurement:

Valid bits	11 bits/second

Pulse width measurement:

Measurement range	≥500ps, period＜100s
Display least significant digit LSD	50ps
Trigger signal	Internal automatic trigger or external trigger
Measurement error	±LSD±decoding error±time base error×time interval
System error	±50ps

Rising edge / falling edge measurement:

Measurement range	2ns to 1000s
Input channel	Channel 1
Display least significant bit	50ps
Trigger signal	Internal automatic trigger or external trigger
System error	±50ps
Measurement error	±(time base error × time interval + trigger error + system error)

Phase measurement:

Input signal frequency range	1Hz -100MHz
Input signal amplitude	≥2Vp-p
Measurement range	-180º to 180º/0º to 360º
Display least significant digit LSD	0.1º
Measurement error	±3° ± Error caused by signal noise

Duty ratio measurement:

Measurement range	1 to 99% (pulse width ≥20ns, period <100s)
Display least significant digit LSD	0.1%
Trigger signal	Internal automatic trigger or external trigger

Counting measurement:

Measurement range	0 - 1×10^{19}
Resolution	±1 counting
Gate time	AUTO, 1us~1000s, external gate optional

3. 4. Other Characteristics

Remote control interface	Standard: USB (Device, Host supports USB read and write), RS232, LAN Optional: Print port, GPIB
Power Supply	AC 198~242V，47Hz~53Hz
Dimension	260mm W × 105mm H × 290mm D
Weight	About 2.5kg

- End of Document -