UZ 2500 Universal Counter

digimess® expert

Order no.: H.UC 15-00

The UZ 2500 universal counter is yet another addition to GRUNDIG electronics range of innovative service measuring intstruments. Like the others in the range, UZ 2500 is based on a sophisticated microprocessor-controlled operating concept and operation takes place over an LCD.

All the settings are carried out using only a few keys. This operating concept is in line with GRUNDIG electronics objective of allowing the user to work with the instrument after just a few minutes without having to refer to written documentation.

UZ 2500 is the big brother of UZ 2400, which has already been favourably received on the market. It features two counting channels for the range 10 Hz - 100 MHz and one for the range 50 MHz - 2.4 GHz.

Outstanding features of the instrument include a high input sensitivity of ≥ 25 mV and a time base accuracy of 10^{-8} over 24 hours.

In addition to frequency measurement and counting, periods and various frequency response ratios can be determined and pulse widths measured.

All the functions of the instrument can also be controlled over the combined RS-232 C/IEEE 488.2 interface with the exception of the trigger level settings for channels A and B.

Instrument settings can be saved and loaded as required.

UZ 2500 is suitable for a wide range of applications in the fields of research, production, training and service on the basis of its performance data and its unbeatable price/performance ratio.

Technical data

Characteristics of channels A and B

Frequency range	10 Hz to 100 MHz
Basic sensitivity	V_{rms} = 25 mV (sinusoidal signal) V_{pp} = 75 mV with pulses of a minimal width ≥ 10 ns
Input coupling	AC
Input impedance	1 MΩ (< 40 pF)
Input divider	1:1 or 10:1
Dynamic range with divider 10:1	75 mV ≤ V_{pp} ≤ 5 V 750 mV ≤ V_{pp} ≤ 50 V
Maximum input voltage	50 V (DC + AC_{peak}) with divider 10 :1, 8 V (V_{rms}) with divider 1:1, f > 100 kHz
Triggering edge	rising or falling
Trigger level setting Voltage divider 1:1 Voltage divider 10:1	Adjustable via potentiometer −1.5 V to +1.5 V −15 V to +15 V

Characteristics of channel C

Frequency range	50 MHz to 2400 MHz
Division ratio	100:1
Sensitivity where: f = 50 - 100 MHz f = 100 MHz - 2 GHz f = 2 - 2.4 GHz	 V_{rms} = 50 mV V_{rms} = 25 mV V_{rms} = 50 mV
Input impedance	50 Ω
Input coupling	AC
Maximum input voltage	V_{rms} = 2.5 V (sinusoidal signal) ± 40 V DC voltage content

Measuring functions

Self-diagnostics check (CHECK)

Measuring range	10 MHz (frequency standard)
Gate times	t_{gate} = 10 µs, 100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s
Accuracy	± 1 LSD[1]
Display of results	MHz with decimal point

Frequency measurement over channel A or B (FREQ A, FREQ B)

Measuring range	10 Hz to 100 MHz
Gate times	t_{gate} = 10 µs, 100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s
Frequency resolution	f = 1/t_{gate} (maximum of 9 digits)
Accuracy	± 1 LSD[1] ± time base error
Display of results	Hz, kHz, MHz with decimal point

Frequency measurement over channel C (FRC)

Measuring range	50 MHz to 2.4 GHz
Gate times	t_{gate} = 10 µs, 100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s
Frequency resolution	f = 100/t_{gate} (maximum of 9 digits)
Accuracy	± 1 LSD[1] ± time base error
Display of results	MHz, GHz with decimal point

Measurement of frequency response ratios over channels A and B (RAT A/B)

Inputs	Channels A and B (V_{rms} ≥ 100 mV for channel B)
Measuring range	10^{-7} to 10^{7}
Gate time n	10^{2} to 10^{8} times the period of the input signal of channel B
Frequency resolution	1/n
Accuracy	± 1 LSD[1] ± trigger error of channel B
Display of results	without unit of measurement, with decimal point

Mesurement of frequency response ratios over channels A and C (RAT A/C)

Inputs	Channels C and B (V_{rms} ≥ 100 mV for channel B)
Measuring range	0.5 - 2.4 × 10^{8}
Gate time n	10^{2} to 10^{8} times the period of the input signal of channel B
Frequency resolution	100/n
Accuracy	± 1 LSD[1] ± trigger error of channel C
Display of results	without unit of measurement, with decimal point

Period measurement over channel A or B (PER A, PER B)

Measuring range	1 µs to 100 ms
Sensitivity	V_{rms} = 100 mV
Unit of measurement (resolution)	100 ns
Accuracy	± 1 LSD[1] ± trigger error ± time base error
Display of results	µs, ms with decimal point

Measurement of time interval over channels A and B (TIME AB)

Measuring range	1 µs to 100 s
Signal rise	> 6 V/s
Unit of measurement (resolution)	100 ns
Accuracy	± 1 LSD[1] ± trigger error ± time base error
Display of results	µs, ms, s with decimal point

Pulse count over channel A or B (TOT A, TOT B)

Measuring range	1 to 10^{9} events
Sensitivity	V_{rms} = 100 mV (in the case of external trigger)
Signal rise	> 6 V/s
Accuracy of the external control Counting error Measuring interval error	 ± 1 LSD[1] ± trigger error
Display of results	

Time base

Warm-up time	15 min
Nominal frequency of quartz crystal	10 MHz
Frequency setting accuracy	± 5 × 10^{-9}
Frequency deviation after 24 hours	≤ ± 10^{-8}
Influence of temperature	< ± 5 × 10^{-9}/°C

Display

The instrument features an illuminated alphanumeric LCD display with two lines and 16 digits each. The first line displays the measured value, the unit of measurement and the decimal point. The second line displays the current measuring function and parameters such as the length of the measuring interval, the multiplication coefficient etc. During parameter input, the first line on the display contains the name of the function group and the second line the names of the function keys "F1" to "F4".

Interfaces

Full remote control of the instrument is possible over the standard interfaces RS-232 C and IEEE 488.2 with the exception of the trigger level settings for channels A and B.

Interface function settings:

a) RS 232:
Baud rates 1200 baud, 2400 baud, 4800 baud, 9600 baud, RTS/CTS protocol and no protocol

b) IEEE 488.2:
Adress, Talk only on/off

Environmental conditions

Nominal temperature	+23 °C ±2 °C
Operating temperature	+5 °C ... +40 °C
Relative humidity	20 to 80%
Atmospheric pressure	86 to 106 kPa
Interference suppression	Vfg. 1046/1984, VDE 0871 Category B

Power supply

Operating voltage	Sinusoidal AC voltage (distortion factor < 5%) 115/230 V (+10%/−15%), switchable internally, 47 to 63 Hz
Power consumption	40 VA
Fuses	T 200 L/250 V (230 V~) T 400 L/250 V (115 V~)
Protection class	I to EN 61010, corresponds to DIN VDE 0411 Part 1 1993

Dimensions and weights

Dimensions (W × H × D)	290 mm × 120 mm × 260 mm
Dimensions of packaging (W × H × D)	335 mm × 125 mm × 385 mm
Weight of the universal counter	approx. 3.8 kg
Weight inc. packaging and accessories	approx. 6.0 kg

Accessories supplied with the package

- Mains cable
- 2 × BNC-BNC cables
- Operating instructions
- Spare fuses

Note:
The gate time settings have no effect on the period measurement and pulse count functions. The measurement repetition rate during automatic operation is approx. 250 ms.

1) LSD (least significant digit): The smallest possible value displayed, corresponds to the resolution of the measuring range in question.