

# Oscilloscope

## with Frequency Counter



The Economic Oscilloscope establishes a brand new benchmark for the Oscilloscopes within the Same category. New and innovative functions, including LCD Readout Display, Frequency Counter, and Auto Time-Base setting, are provided as standard features, with a 30 MHz bandwidth and valuable features, is priced at the basic Oscilloscope level. 1 mV/div High Vertical Sensitivity is able to capture small signal variations in the input source. Additional functions such as XY mode display, MAG function (Time based Magnified), and Z-axis Input extend the application range of 72-6802 to both education and industry fields.

The added values without being converted into extra cost make the 72-6802 the most beneficial choice among the entry-level analog oscilloscopes available in today's market.

### Features:

- 1 mV / div High Vertical Sensitivity
- Internal 5 Digits Real-Time Frequency Counter
- LCD Readout Display for Vertical/ Horizontal/Frequency Measurement
- Auto Time-Base
- Buzzer Alarm
- TV (TV - V, TV - H) Trigger Modes
- XY Mode
- Z-Axis Input and External Trigger Input

### Specifications:

#### Vertical Axis

Sensitivity	: 1 mV to 5 V / div, 12 steps in 1-2-5 sequence
Accuracy	: $\leq 3\%$ , (1 mV / div, 2 mV / div: 5%)
Vernier Vertical Sensitivity	: $\leq 1/2.5$ of panel-indicated value
Bandwidth	: DC to 30MHz (1 mV / div, 2 mV / div: DC to 7 MHz)
Rise Time	: Approximately 11.7 ns (1 mV / div, 2 mV / div: Approximately 50 ns)
Input Impedance	: Approximately 1 M $\Omega$ // Approximately 25 pF
Square Wave Characteristics	: Overshoot : 5% ( at 10 mV/div range)
Linearity	: $\leq \pm 0.1$ div of amplitude change
Vertical Modes	: CH1, CH2, DUAL (ALT/CHOP), ADD
Chopping Repetition Frequency	: Approximately 250 kHz
Input Coupling	: AC, DC, GND
Maximum Input Voltage	: CAT II 300 V (DC + AC peak)
Common Mode Rejection Ratio	: 50:1 or better at 50 kHz sinusoidal wave
Isolation Between Channels	: $>1000:1$ at 50 kHz, $>30:1$ at 30 MHz (at 5 mv / div Range)
CH1 Signal Output	: At least 20 mV / div at 50 $\Omega$ terminal, frequency at least 50 Hz to 5 MHz



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### Triggering

Triggering Source	: CH1, CH2, ALT, LINE, EXT
Coupling	: AC : 20 Hz to full bandwidth
Slope	: +/-
Sensitivity	: 20 Hz to 2 MHz : 0.5 div, TRIG-ALT : 2 div, EXT : 200mV 2 MHz to 30 MHz : 1.5 div, TRIG-ALT : 3 div, EXT : 800mV TV : Sync pulse more than 1 div (EXT: 1V)
Triggering Modes	: AUTO , NORM , TV-V , TV-H

### Ext Triggering Signal Input

Input Impedance	: Approximately 1 M $\Omega$ // approximately 25 pF
Maximum Input Voltage	: CAT II 300 V (DC + AC peak)

### Horizontal Axis

Sweep Time	: 0.2 $\mu$ S to 0.5 S / div, 20 steps in 1-2-5 sequence
Sweep Time Accuracy	: $\pm$ 3%
Vernier Sweep Time Control	: $\leq$ 1/2.5 of panel-indicated value
Sweep Magnification	: 10 times
x 10MAG Sweep Time Accuracy	: $\pm$ 5% (20 nSec to 50 nSec are uncalibrated)
Linearity	: $\pm$ 3%, x 10 MAG: $\pm$ 5% (20 ns and 50 ns are uncalibrated)

### X-Y Mode

Sensitivity	: Same as vertical axis
Bandwidth	: DC to at least 500 kHz
X-Y Phase Difference	: $\leq$ 3 $^\circ$ at DC to 50 kHz

### Z Axis

Sensitivity	: 5 Vp-p (Positive-going signal decreases intensity)
Bandwidth	: DC to 2 MHz
Input Resistance	: Approximately 47 k $\Omega$
Maximum Input Voltage	: CAT II 30 V (DC + peak)

### Calibration Voltage

Waveform	: Positive-going Square wave
Frequency	: Approximately 1 kHz
Duty Ratio	: Within 48:52
Output Voltage	: 2 Vp-p $\pm$ 2%
Output Impedance	: Approximately 1 k $\Omega$

### Frequency Counter

Display Digits	: Maximum 5 - digits decimal
Frequency Range	: 50 Hz to 30 MHz
Accuracy	: $\pm$ 0.05% : 50 Hz to 1 kHz, $\pm$ 0.02% : 1 kHz to 30 MHz
Measuring Sensitivity	: > 2div

### LCD

Display	: VOLT / div, TIME / div, X-Y Mode, Frequency
Backlight	: Orange

### CRT

Type	: 6 inches rectangular type, internal graticule
Phosphor & Acceleration Voltage	: P 31 & Approximately 2 kV
Effective Screen Size	: 8 x 10 div (1 div = 10 mm (0.39 inches))
Graticule	: Internal
Trace Rotation	: Provided



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### Power Source

Line Voltage : AC 115 V, 230 V  $\pm$  15 % selectable  
Frequency : 50 Hz / 60 Hz

### Storage Environment

Temperature : -10°C to 70°C  
Humidity : 70 % RH (Maximum)

### Accessories

Standard accessories : User manual x 1  
: Power Cord x 1  
: Probe x 2

### Dimension and Weight

: (W) 310 x (H) 150 x (D) 455 mm  
: Approximately 8.2 kg

### Part Number Table

Description	Part Number
OSCILLOSCOPE, 30 MHZ + FQ COUNT	72-6802

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# Quad-Output DC Power Supply **TENMA™**



## Features:

- Quad Independent DC Output
- Four LED Display with 3 digits, selectable for two sets output voltage and current display simultaneously
- Auto series, parallel and tracking operation
- Constant voltage and constant current operation
- Low ripple and noise
- Overload and reverse polarity protection
- Selectable for continuous / dynamic load
- Output enable / disable control
- Rotation speed of the fan is controlled by heatsink temperature

## Specifications:

Output	CH1, CH2	CH3	CH4
Voltage	: 0 to 30 V	3 to 6 V	8 to 15 V
Current	: 0 to 3 A	1 A Fixed	1 A Fixed
Tracking Series Voltage	: 0 to 60 V		
Tracking Parallel Current	: 0 to 6 A	-----	

### Constant Voltage Operation (CH1, CH2)

Line Regulation	: $\leq 0.01\% + 3 \text{ mV}$
Load Regulation	: $\leq 0.01\% + 3 \text{ mV}$ (rating current $\leq 3 \text{ A}$ ) $\leq 0.02\% + 5 \text{ mV}$ (rating current $\leq 10 \text{ A}$ )
Ripple and Noise	: $\leq 1 \text{ mVrms}$ 5 Hz to 1 MHz
Recovery Time	: $\leq 100 \mu\text{s}$ (50% load change, minimum load 0.5 A)

### Constant Current Operation (CH1, CH2)

Line Regulation	: $\leq 0.2\% + 3 \text{ mA}$
Load Regulation	: $\leq 0.2\% + 3 \text{ mA}$
Ripple and Noise	: $\leq 3 \text{ mArms}$

### Tracking Operation (CH1, CH2)

Tracking Error	: $\leq 0.5\% + 10 \text{ mV}$ of the master
Series Regulation	: $\leq 300 \text{ mV}$
Load Regulation	: $\leq 0.01\% + 3 \text{ mV}$
Ripple and Noise	: $\leq 2 \text{ mVrms}$ 5 Hz to 1 MHz

# Quad-Output DC Power Supply

## 3 V to 6 V Output (CH3)

Line Regulation :  $\leq 5$  mV  
Load Regulation :  $\leq 10$  mV  
Ripple and Noise :  $\leq 2$  mVrms, 5 Hz to 1 MHz  
Voltage Accuracy :  $\pm 5\%$  rdg  
Current Output : 1 A

## 8 V to 15 V Output (CH4)

Line Regulation :  $\leq 5$  mV  
Load Regulation :  $\leq 10$  mV  
Ripple and Noise :  $\leq 2$  mVrms, 5 Hz to 1 MHz  
Voltage Accuracy :  $\pm 5\%$  rdg  
Current Output : 1 A

## Meter

3 digits 0.5 inches LED display  
Accuracy :  $\pm(0.5\% \text{ rdg} + 2 \text{ digits})$

## Insulation

Chassis and Terminal :  $\geq \text{DC } 500 \text{ V} / 20 \text{ M}\Omega$   
Chassis and ac Cord :  $\geq \text{DC } 500 \text{ V} / 30 \text{ M}\Omega$

## Power Source

ac 100 V / 120 V / 220 V  $\pm 10\%$ , 230 V  $\pm 10\%$  to  $-6\%$ , 50 / 60 Hz

## Accessories

Instruction manual  
Power cord  
Four Test Leads

## Dimensions and Weight

255 (W)  $\times$  145 (H)  $\times$  265 (D) mm, approximately 11.5 kg

## Part Number Table

Description	Part Number
PSU, Bench, 4 Output	72-6905

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## Specifications

Basic Functions	Range	Best Accuracy
DC Voltage	200 mV / 2 V / 20 V / 200 V	$\pm (0.5\% + 1)$
	1,000 V	$\pm (0.8\% + 2)$
AC Voltage	200 mV	$\pm (1.2\% + 3)$
	2 V / 20 V / 200 V	$\pm (0.8\% + 3)$
	750 V	$\pm (1.2\% + 3)$
DC Current	20 $\mu$ A / 2 mA	$\pm (0.8\% + 1)$
	200 mA	$\pm (1.5\% + 1)$
	20 A	$\pm (2\% + 5)$
AC Current	20 $\mu$ A / 2 mA	$\pm (1\% + 3)$
	200 mA	$\pm (1.8\% + 3)$
	20 A	$\pm (3\% + 5)$

# Digital Multimeter



## Specifications

Basic Functions	Range	Best Accuracy
Resistance	200 $\Omega$	$\pm (0.8\% + 3)$
	2 K $\Omega$ / 20 K $\Omega$ / 200 K $\Omega$ / 2 M $\Omega$	$\pm (0.8\% + 1)$
	20 M $\Omega$	$\pm (1\% + 2)$
	200 M $\Omega$	$\pm (5\% (\text{reading} - 10) + 10)$
Capacitance	2 nF / 20 nF / 2 $\mu$ F	$\pm (4\% + 3)$
	100 $\mu$ F	$\pm (5\% + 4)$
<b>Special Functions</b>		
Diode		✓
Continuity Buzzer		✓
Data Hold		✓
Display Backlight		✓
Low Battery Display		✓
Input Impedance for DC Voltage Measurement	Around 10 M $\Omega$	✓
Max. Display	1999	✓
<b>General Characteristics</b>		
Power	9 V Battery (6F22)	
LCD Size	64 x 32 mm	
Product Colour	Red and Grey	
Product Size	165 x 81 x 41.5 mm	
Standard Accessories	Test Lead; Battery, English Manual; Alligator Clip Test Lead	
Optional Accessories	No	

## Part Number Table

Description	Part Number
Multimeter, Digital	72-7720

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www.cpc.co.uk  
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# Lead Set Test, Accessory



## Specifications:

Voltage Rating	: 1,000V
Kit Contents	: Probe, Lead & Clip
Cable Assembly Type	: Test
Cable Length	: 1m
Colour	: Red / Black
Connector Type A	: 2mm
Connector Type B	: 4mm
No. of Ways	: 1

## Part Number Table

Description	Part Number
Lead Set, Test, Accessory	76-081

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