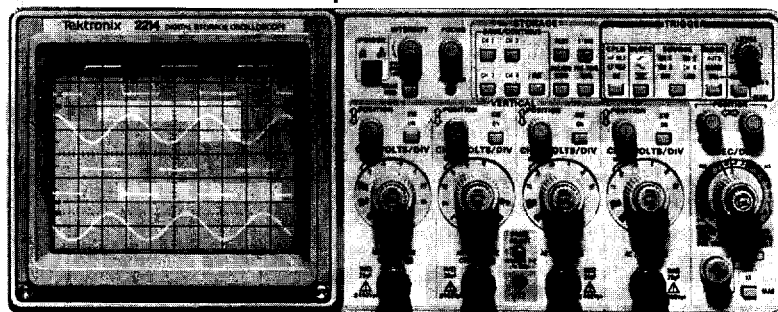


# 2214 20 MHz, 16 MS/s DIGITAL PLUS ANALOG OSCILLOSCOPE

## Four Channel DSO with 16 K Record Length for Physical Signal Investigation.

- 20 MHz Analog Bandwidth
- 16 MS/s Per Channel Concurrent Sampling
- 8-Bit Vertical Resolution
- 16 K Per Channel Records
- 500  $\mu$ V/div Sensitivity
- Hardcopy Out Interface with Chart Record (RS-232-C)



The 2214 has unique capabilities for Electromechanical, Biophysical and Process Control applications where data acquisition and multi-channel monitoring is needed.

## ORDERING INFORMATION

2214 20 MHz Oscilloscope **\$3,995**

Includes:  
Two 10X Probes (P6103),  
Operators Manual (070-7781-00),  
9-pin to 25-pin RS-232  
Interface Cable (012-1197-00),  
GRABBER 2 software,  
3 Year Warranty, Power Cord.

### INSTRUMENT OPTIONS

Opt. 3R - Rackmount Kit **+\$250**  
Opt. 07 - 12 VDC internal inverter **+\$445**  
Opt. 30 - Opt. 07 + 1104A battery **+\$895**

### ACCESSORY OPTIONS

Opt. 1C - C-9 Camera **+\$610**  
Opt. 1K - K212 Instrument Cart **+\$385**  
Opt. 3P - HC100 Plotter (120V) **+\$950**  
Opt. 3H - HC200 Printer (110V) **+\$420**  
(RS-232-C) w/ Chart Roll Adapter  
Opt. 1T - Transit Carrying Case **+\$345**  
Opt. 02 - Pouch and Front Cover **+\$60**  
Opt. 22 - 2 P6103 10X Probes **+\$80**  
Opt. 23 - 2 P6119 1/10X Probes **+\$130**

### INTERNATIONAL POWER PLUG OPTIONS

Opt. A1 - A5 - See page 108. **NC**

### WARRANTY-PLUS SERVICE PLANS

Opt. M2 - +2 yrs service **+\$245**  
Opt. M6 - +4 calibrations **+\$280**

### RECOMMENDED ACCESSORIES

Service Manual - 070-7783-00 **\$95**  
RS-232 Cable - 012-1298-00 **\$35**  
Rackmount Kit - 016-0819-03 **\$250**  
Battery Pack for Opt. 07 - 1104A **\$450**  
(See page 108 for more accessories.)

## NEW 2214 OSCILLOSCOPE

The new 2214 Four Channel Digital/Analog Oscilloscope is the ideal tool for research, service and maintenance people who need to troubleshoot or monitor Physical Systems. With its advanced design, the 2214 can acquire 16 K records on each of four fully attenuated channels and concurrently sample at a rate of 16 MS/s per channel. This allows users to capture long bursts of information and view it with fine resolution. With unique features like a continuously variable timebase, bi-slope triggering, chart record output and dual differential measurements the 2214 meets a wide variety of needs.

**Accuracy** - X1:  $\pm 3\%$ ; X10:  $\pm 4\%$ ; X50:  $\pm 5\%$  (+15°C to +35°C). X1:  $\pm 4\%$ ; X10:  $\pm 5\%$ ; X50:  $\pm 8\%$  (0°C to 40°C).

**Horizontal Operating Modes** - X1, X10, X50, ROLL, X-Y (NON-STORE, CH 1 & 2 only), Continuously Variable Mode in STORE & NON-STORE (to 1 ms/div in STORE).

## TRIGGER SYSTEM

**Trigger Sensitivity** - Internal: 0.4 div at 5 MHz, 1.5 div at 20 MHz. External: 50 mV at 5 MHz, 250 mV at 20 MHz.

**Trigger Operating Modes** - Peak-Peak AUTO, NORM, SGL SWP.

**Trigger Source** - CH 1, CH 2, CH 3, CH 4, LINE, EXT.

**Trigger Coupling** - Dc, HF REJ (attenuates above 30 kHz), LF REJ (attenuates below 30 kHz).

## X-Y OPERATION

**Mode** - X1 mag. and NONSTORE, CH 1 & 2 only.

**Deflection Factors** - Same as vertical system.

**Bandwidth** - X-Axis: 2 MHz. Y-Axis: same as vertical.

**Phase Difference** -  $\pm 3^\circ$  from dc to 50 kHz.

## ADVANCED FUNCTIONS

**Trigger Level Output** - Selects the amplitude point on the trigger signal that produces triggering. A side panel BNC provides the interface for the trigger level so it can be input to an external meter or a scope channel.

**External Clock Input** - Dc to 8 MHz. ROLL Mode: dc to 16 kHz.

**Hardcopy Interface (RS-232-C)** - Prints or Plots all 16K records (X1 MAG only), ROLL mode output for continuous printout of data like a CHART RECORDER (from 10 s/div to 2500 s/div). Baud rate: 300, 1200, 4800, 9600. Plotter/Printer Devices: HPGL, Epson FX-Series, Laserjet (100 dpi), Thinkjet. (9-pin DTE (male)).

**Communication Software (Grabber 2)** - Comes with the instrument and transfers waveform data from the 2214 to an IBM PC/XT/AT (or compatible) via RS-232. Can be used to convert files for use by other software.

## CRT SYSTEM

**Display** - 8 cm x 10 cm, 12.6 kV nominal voltage.

**Controls** - INTENSITY, TRACE ROTATION, BEAM FIND, FOCUS.

## POWER REQUIREMENTS

**Line Voltage Range** - Low: 95 VAC to 128 VAC. High: 185 VAC to 250 VAC.

**Line Frequency** - 48 Hz to 440 Hz.

**Maximum Power Consumption** - 85 W (95 VA).

**Opt. 07** - Inverter Input Voltage: 11.8 VDC to 30 VDC.

**1104A Battery Pack** - Couples to rear of scope. For use with opt. 07; Output: 12 V, 8 amps; Input: 95 VAC to 128 VAC or 185 VAC to 250 VAC (48 Hz to 440 Hz); Operating time: 2 Hrs; Charge time: Approx. 16 Hrs (longer when scope is operating); Weight: 14 lbs/6.5 kg.

## PHYSICAL CHARACTERISTICS

**Dimensions** - Width (with handles): 15.0 in; Height: 5.4 in; Depth (without cover): 17.2 in; Weight: 17.4 lbs.

**Safety** - UL 1244 listed, CSA certification.

**Warranty** - 3 years (1 year 1104A).

## CHARACTERISTICS

### DIGITAL STORAGE SYSTEM

**Sample Rate** - 16 MS/s per channel. (Quad Digitizers)

**Resolution** - Vertical: 8 bits (25 levels per division).

Horizontal: 14 bits (1600 points per division, on screen).

**Record Length** - 16 K per channel.

**Pre/Post Trigger** - 0% or 50% position selectable.

**Acquisition Mode** - Sample, Roll.

**Save/Continue Memory** - Freeze waveform record on any or all channels (16 K/CH). Non-Volatile. Front-panel settings non-volatile at power down.

### VERTICAL SYSTEM (4 Identical Channels)

**Bandwidth (-3 dB) and Rise Time** - 20 MHz and 17.5 ns (0°C to +40°C).

**Deflection Factor and Accuracy** - 5 mV/div to 5 V/div,  $\pm 3\%$ . 500  $\mu$ V/div to .5 V/div,  $\pm 3\%$ , limited to 1 MHz with X10 vertical mag.

**Vertical Operating Modes** - CH 1, CH 2, CH 3, CH 4, CH 1 INVERT, CH 3 INVERT, ADD CH 1 + CH 2, ADD CH 3 + CH 4 (dual differential), X10 vertical mag.

**CMRR** - At least 50:1 at 100 kHz.

**Input R and C** - 1 M $\Omega$ , 25 pF.

**Max Input Voltage** - 400 V (dc + peak ac), 800 V p-p.

**Channel Isolation** - 100:1 at 5 MHz.

### HORIZONTAL SYSTEM

**Sweep Speeds** - In NON-STORE: 0.5 s/div to 0.1  $\mu$ s/div, extended to 10 ns/div with X10 ALT MAG. In STORE, 0.5 s/div to 0.1 ms/div, extended to 2  $\mu$ s/div with X50 ALT MAG and 50 s/div with X100 ROLL MODE.