

# FREQUENCY COUNTER/TIMERS

Featuring the precision and intuitive operation you've come to expect from our oscilloscopes, Tektronix counter/timers are built with performance and convenience in mind. Featuring industry-leading resolution, built-in measurement and analysis modes.



	FCA3000	FCA3100	MCA3000
<b>Frequency Range</b>	400 MHz, 3 GHz, 20 GHz	400 MHz, 3 GHz, 20 GHz	27 GHz, 40 GHz
<b>Resolution</b>	<ul style="list-style-type: none"> <li>• 100 ps (time)</li> <li>• 12 digits/s (freq)</li> </ul>	<ul style="list-style-type: none"> <li>• 50 ps (time)</li> <li>• 12 digits/s (freq)</li> </ul>	<ul style="list-style-type: none"> <li>• 100 ps (time)</li> <li>• 12 digits/s (freq)</li> </ul>
<b>Data Transfer</b>	<ul style="list-style-type: none"> <li>• 250 k Samples/sec (internal)</li> <li>• 5 k Samples/sec (block)</li> </ul>	<ul style="list-style-type: none"> <li>• 250 k Samples/sec (internal)</li> <li>• 15 k Samples/sec (block)</li> </ul>	<ul style="list-style-type: none"> <li>• 250 k Samples/sec (internal)</li> <li>• 5 k Samples/sec (block)</li> </ul>
<b>Measurements</b>	13 Automated Measurements Frequency, Period, Ratio, Time Interval, Time Interval Error, Pulse Width, Rise/Fall Time, Phase Angle, Duty Cycle, Vmax, Vmin, Vp-p	14 Automated Measurements Frequency, Period, Ratio, Time Interval, Time Interval Error, Pulse Width, Rise/Fall Time, Phase Angle, Duty Cycle, Vmax, Vmin, Vp-p, Totalize	13 Automated Measurements Frequency, Period, Ratio, Time Interval, Time Interval Error, Pulse Width, Rise/Fall Time, Phase Angle, Duty Cycle, Vmax, Vmin, Vp-p + An Integrated Power Meter
<b>Analysis Modes</b>	TrendPlot™, Measurement Statistics, Allan Deviation, Histogram	TrendPlot™, Measurement Statistics, Allan Deviation, Histogram	TrendPlot™, Measurement Statistics, Allan Deviation, Histogram
<b>Connectivity</b>	Rear panel: USB device port, GPIB PC communications software: NI LabVIEW SignalExpress™ Tektronix Edition (LE Version)	Rear panel: USB device port, GPIB PC communications software: NI LabVIEW SignalExpress™ Tektronix Edition (LE Version)	Rear panel: USB device port, GPIB PC communications software: NI LabVIEW SignalExpress™ Tektronix Edition (LE Version)

## CHOOSING YOUR COUNTER/TIMER

To help you choose the right counter/timer for your needs, the most common selection criteria are listed below, along with helpful tips for determining your requirements.

### 1 Frequency Resolution

The frequency resolution is the smallest change the counter/timer can detect in closely spaced frequencies. The resolution is influenced by the time setting on the instrument, i.e., longer time settings (averaged) will display more digits. In general this feature is expressed as the number of digits per second shown on the instrument's display (e.g., 12 digits/s). More digits indicate a higher frequency resolution.

### 2 Time Resolution

For timing measurements this feature represents the smallest "time" change that the instrument can detect. Time resolution is sometimes described as "single shot" resolution and is generally measured in picoseconds, e.g., 50 ps. The lower the number, the better the time resolution feature.

### 3 Time Base Stability

The internal time base establishes the reference against which input signals are measured. The better the time base, the more accurate your measurements can be. Most counters employ a quartz crystal as the internal time base element, which comes in 3 basic types; Room Temperature (RTXO), Temperature Compensated (TCXO) and Oven Control (OCXO). TCXO and OCXO devices are more stable and when used as the internal time base, the instrument will consistently yield accurate and reliable results.

### 4 Analysis Capability

When choosing your counter/timer, you should review available analysis modes, such as trend plotting, measurement statistics, histograms and modulation domain analysis to ensure your needs are met.



### FCA3100/3000 Series

Looking to capture small frequency and time changes? Look no further than this Timer/Counter/Analyzer. Capture small changes in your signal with industry-leading frequency and time resolution. Quickly and accurately analyze signals with 13 automated measurements and comprehensive built-in analysis modes, including measurement statistics, histograms and trending. Get unparalleled ease of use with intuitive operation and USB connectivity. It's everything you need in a Timer/Counter/Analyzer. And more.

MODEL	FCA3000	FCA3003	FCA3020	FCA3100	FCA3103	FCA3120
Max. Frequency	400 MHz	3 GHz	20 GHz	400 MHz	3 GHz	20 GHz
Channels	2	2 – 400 MHz 1 – 3 GHz	2 – 400 MHz 1 – 20 GHz	2	2 – 400 MHz 1 – 3 GHz	2 – 400 MHz 1 – 20 GHz
Time Resolution	100 ps	100 ps	100 ps	50 ps	50 ps	50 ps
Frequency Resolution	12 digit/s	12 digit/s	12 digit/s	12 digit/s	12 digit/s	12 digit/s

- 12 digit/sec frequency resolution
- 50 ps (FCA3100) or 100 ps (FCA3000) single-shot time resolution
- 0.001° phase resolution
- 250 k readings/sec data transfer rate to internal memory
- 13 automated frequency, time, phase and voltage measurements
- See how your device is changing over time with built-in analysis modes – TrendPlot™, histograms and statistics.
- Easily connect to a PC with the USB and GPIB ports.



#### SHIPS WITH PRODUCT

- Trial Version of TimeView™ and NI LabVIEW SignalExpress™ TE (LE version) Software
- Calibration Certificate
- User Manual on CD
- Programmers Guide & Technical Specifications
- Power Cord
- 3-year Warranty

#### RECOMMENDED ACCESSORIES

- 174-4401-xx: USB Host to Device Cable, 3 Feet
- 012-0991-xx: GPIB Cable, Double Shielded
- 012-1256-xx: BNC Male to BNC Male, 9 Feet
- ACD4000: Soft Carrying Case
- HCTEK-4321: Hard Carrying Case
- RMU2U: Rackmount Shelf Kit for 2 Units
- TVA3000: TimeView™ Modulation Domain Analysis Software

#### INSTRUMENT OPTIONS

- MS: Medium Stability OCXO Timebase, 2x10<sup>-7</sup>
- HS: High Stability OCXO Timebase, 5x10<sup>-8</sup>
- RP: Rear-panel Connectors

#### RECOMMENDED SERVICE

- SILV200: 5-year Extended Warranty (FCA3000, FCA3003, FCA3100, FCA3103)
- SILV400: 5-year Extended Warranty (FCA3020, FCA3120)

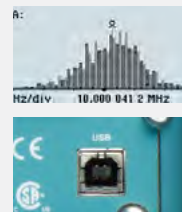
**LEARN MORE** ➤ Download the “Time and Frequency Measurements for Oscillator Manufacturers” Application Note.

### MCA3000 Series

Feature-rich. Fully loaded. No matter how you say it, this microwave timer/counter is packed with functionality. Measure up to 40 GHz signals. And, get two extra 300 MHz timer/counter ports for added versatility. Quickly and accurately analyze signals with 13 automated measurements and comprehensive analysis modes, including statistics, histograms and trending. Get unparalleled ease of use with intuitive operation and USB connectivity. Finally, fully loaded comes standard.

MODEL	MCA3027	MCA3040
Max. Frequency	27 GHz	40 GHz
Channels	2 – 300 MHz 1 – 27 GHz	2 – 300 MHz 1 – 40 GHz
Time Resolution	100 ps	100 ps
Frequency Resolution	12 digit/s	12 digit/s

- 12 digit/sec frequency resolution
- 100 ps single-shot time resolution
- 250 k readings/sec data transfer rate to internal memory
- 13 automated frequency, time, phase and voltage measurements
- Integrated power meter
- See how your device is changing over time with built-in analysis modes – TrendPlot™, histograms and statistics.
- Easily connect to a PC with the USB and GPIB ports.



#### SHIPS WITH PRODUCT

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- User Manual on CD
- Programmers Guide & Technical Specifications
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#### RECOMMENDED ACCESSORIES

- 174-4401-xx: USB Host to Device Cable, 3 Feet
- 012-0991-xx: GPIB Cable, Double Shielded
- 012-1256-xx: BNC Male to BNC Male, 9 Feet
- AC4000: Soft Carrying Case
- HCTEK-4321: Hard Carrying Case
- RMU2U: Rackmount Shelf Kit for 2 Units
- TVA3000: TimeView™ Modulation Domain Analysis Software

#### INSTRUMENT OPTIONS

- HS: High Stability OCXO Timebase, 5 X 10<sup>-8</sup>
- US: Ultra High Stability OCXO Timebase, 1.5 X 10<sup>-8</sup>

#### RECOMMENDED SERVICE

- SILV600: 5-year Extended Warranty

**LEARN MORE** ➤ Download the “Measurement Statistics, Histograms and TrendPlot™ Analysis Modes” Application Note.

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