

### Model 3030 - Band 1 - Specifications

<b>Band 1 Input</b>	<b>Band 1 - 1 Megaohm (models below 40 GHz)</b>	
<b>Frequency Range:</b>	10 Hz to 120 MHz	
<b>Sensitivity:</b>	25 mVrms	
<b>Dynamic Range:</b>	25 mV to 1 Vrms	
<b>Coupling:</b>	AC	
<b>Impedance:</b>	1 Megohm/25 pF	
<b>Damage Level:</b>	250 VAC+DC to 400 Hz, decreasing to 5 V at 1 MHz; 5 V from 1 MHz to 120 MHz	
<b>Connectors:</b>	BNC female	



**Note:** Counter models below 40 GHz have a single Band 1 frequency range of 10 Hz to 120 MHz. Counter models at 40 GHz and above have a dual Band 1 frequency range.

### Model 3030 - Band 2 - Specifications

<b>Frequency Range:</b>	120 MHz to 3 GHz
<b>Sensitivity:</b>	-45 dBm
<b>Dynamic Range:</b>	Minimum sensitivity to +10 dBm.
<b>Overload Indicator:</b>	On at +10 dBm nom. to 3 GHz.
<b>Coupling:</b>	AC
<b>Impedance:</b>	50 ohms nominal
<b>Damage Level:</b>	+25 dBm
<b>Connectors:</b>	N female
<b>Auto Amplitude Disc.:</b>	10 dB separation between 2 signals within 30 MHz, 20 dB otherwise 10 dB separation between 2 signals within 30 MHz
<b>Integ. Kickback Noise:</b>	-40 dBm typical
<b>AM Tolerance:</b>	Any modulation index, provided the minimum signal is not less than the sensitivity spec.
<b>FM Tolerance:</b>	20 MHz P-P to 3 GHz
<b>VSWR (typical):</b>	2:1 typical to 26.5 GHz, 3:1 typical 40 to 60 GHz
<b>Signal Acquisition Time:</b>	Less than 60 milliseconds

### Oscillator Options Available (all internal):

	Standard TCXO (see note 1)	Option 112 OCXO (for Battery Option counters only)	Option 120 OCXO	Option 125 Internal Rubidium Frequency Standard (see Note 2)
<b>Aging/second:</b>	$5 \times 10^{-9}$ root Allan var.	$5 \times 10^{-10}$ root Allan var.	$5 \times 10^{-12}$ root Allan var.	$1.4 \times 10^{-11}$ root Allan var.
<b>Aging/day:</b>	N/A	$3 \times 10^{-9}$ (after 30 days)	$4 \times 10^{-10}$	$2 \times 10^{-11}$ (after 60 min.)
<b>Aging/year:</b>	$7.6 \times 10^{-7}$	$5 \times 10^{-7}$	$5 \times 10^{-8}$	$2 \times 10^{-9}$
<b>Warm-up (time): @ 25°C</b>	N/A	$1 \times 10^{-8}$ in 30 min.	$5 \times 10^{-8}$ in 30 min.	$5 \times 10^{-10}$ in 4 min.
<b>Retrace: @ 25°C</b>	$5 \times 10^{-7}$ after 24 hrs. ON, 24 hrs. OFF, 3 hrs. ON,	$2 \times 10^{-8}$ after 72 hrs. ON, 24 hrs. OFF, 12 hrs. ON	$5 \times 10^{-9}$ after 72 hrs. ON, 24 hrs. OFF, 2 hrs. ON	$5 \times 10^{-11}$ after 72 hrs. ON, 24 hrs. OFF, 1 hr. ON

<b>Temperature:</b> (0°C to 50°C)	1 x 10 <sup>-6</sup>	2 x 10 <sup>-8</sup>	2 x 10 <sup>-8</sup> (-30°C to 70°C)	3 x 10 <sup>-11</sup>
<b>MAINS change:</b> (+/-10%)	4 x 10 <sup>-7</sup>	5 x 10 <sup>-9</sup>	2 x 10 <sup>-9</sup>	N/A
<b>Recommended Calibration:</b>	1 year	1 year	1 year	1 year

**Note 1:** The standard TCXO oscillator is installed in the basic unit unless an optional oscillator is selected.  
**Note 2:** Election of Rubidium oscillator, option 125, extends the counter chassis depth from 13.1 in. (333 mm) to 14.5 in. (368 mm). Rubidium oscillator, option 125, is not available with Battery Option 150 counters. Warranty on Rubidium oscillator is for one year, Instrument is Warrantied for a period of FIVE years.

## General Specifications

### General:

**Accuracy:** +/-1 count, +/-time base accuracy.

**Gate Time:** 1 sec., 0.1 sec., 0.01 sec., & 1.0 ms.

**Frequency Resolution:** 1 MHz, 100 kHz, 10 kHz, 1 kHz, 100 Hz, 10 Hz, 1 Hz, 0.1 Hz, & 0.01 Hz. (Note: 0.01 Hz resolution is frequency dependent)

**Display Time:** 0.3 sec., 3.0 sec., Infinite, & Min.

**Self-Test:** All digit segments, all LED's, 10 MHz clock, & GPIB address.

**Display:** 11 digits/0.5" high LED, Overload, decimal point, & sign.

**Display Legend:** Hz, kHz, MHz, GHz, & dBm.

**Status Indicators:** BAND 1 (or BAND 1/1 Megohms, BAND 1/50 ohms), BAND 2, EXT REF, DISPLAY TIME, REMOTE, GATE, DeltaF, OVERLOAD (band 2 only), POWER METER (band 2 only), & STANDBY.

**Delta F:** Difference between stored and measured frequency.

**GPIB (IEEE 488 Std-1978):** [\(download PDF of 3030-3260 GPIB Commands\)](#) [\(Download PDF of 3400A/3460A/3600 GPIB Commands\)](#)

**Programmable Functions/Controls:** BAND 1 (or BAND 1/1 Megohm, BAND 1/50 ohms), BAND 2, RESET, TEST, DeltaF, DeltaF REFERENCE, DISPLAY TIME, POWER METER, STANDBY, & RESOLUTION.

### Power Meter (Band 2 only):

**Frequency Range:** 120 MHz (or 200 MHz) to end of band (model specific).

**Power Range:** -35 dBm (or counter sensitivity), whichever is greater, to +10 dBm max.

**Damage Level:** +25 dBm (+20 dBm/model 3600).

**Accuracy:** +/-1 dBm to 26.5 GHz (typical); +/-2 dBm 26.5 to 40 GHz (typical); +/- 2.5 dBm 40–46 GHz; +/-3 dBm at 60 GHz (typical).

**Resolution:** 0.1 dBm.

**Measurement Time:** Frequency measuring time +15 ms .

**Display:** Simultaneously displays Frequency (with 0.1 MHz resolution) and Power.

### Internal/External Reference Oscillator:

**10 MHz REF OSC OUT:** 10 MHz, 1 Vrms into 50 ohms.

**EXT REF OSC IN:** 1, 2, 5 or 10 MHz/>0.2 Vrms/1 kilohm.

**Connectors (IN/OUT):** BNC female (rear panel).

### Reliability:

**MTBF:** Greater than 32,000 hours (MIL-HDBK-217E).

**MTTR<sub>ACM</sub>:** 30.92 minutes (MIL-HDBK-472).

### Environmental:

*Designed to meet MIL-PRF-28800F Type III, Class 3, Style E and EN 61010-1, Specifically:*

**Operating Temperature:** 0°C to 50°C.

**Storage Temperature:** -40°C to 71°C.

**Relative Humidity:** 95%, +/- 5%, 10°C to 30°C; 75%, +/- 5%, to 40°C; 45%, +/- 5%, above 40°C.

**Altitude:** 4600 meters (15,092 feet)

**Vibration (random):** 5–500 Hz.

**Burn In:** Failure-free burn in of no less than 100 hours at 40°C.

**Pollution Degree:** 1 (no pollution)(EN 61010-1/3.7).

**Transient Overvoltage:** Installation Category II (EN 61010-1/J).

**Cooling:** XL Counters do not contain nor require a cooling fan.

**Montreal Protocol:** Nil Return.

**Standards Compliance: (CE Certified)**

**EC (European Union):**

EMC Emissions: Certified to EN 55022:1994 Class B.

EMC Immunity: Certified to EN 50082-1:1992.

Safety (LVD): Complies with EN 61010-1.

**VDE (Germany):**

EMC Emissions: Certified to VDE 0871/6.78 Class B.

**ISO 9001:** XL Microwave's Quality System for design and manufacture is registered and certified by TÜV Essen to the Quality Assurance Standards of ISO 9001.

**Mechanical:**

**Power (DC):** 11–28 VDC; 20 VA (Std. CW); 18–28 VDC (Opt. 125).

**Power (AC MAINS):** 90/132 VAC or 180/265 VAC, 45 Hz to 440 Hz; 25 VA.

**AC MAINS Fuse:** (115 VAC) 1/2 A/250 V SLO-BLO (3AG)(1/4" x 1-1/4"). (230 VAC) 1/4 A T/250 V (IEC 127-III-T Time-lag)(5 x 20 mm).

**Weight (Net):** 3.6 kg (8 lbs.) / Battery Option 5 kg. (11 lbs.).

**Weight (Shipping):** 5.5 kg (12 lbs.) / Battery Option 6.8 kg. (15 lbs.).

**Dimensions (HxWxD):** 89 mm x 213 mm x 333 mm (3.5 in. x 8.375 in. x 13.1 in.).

**Accessories Furnished:**

One (1) Operating/Maintenance Manual.

One (1) AC power cord (EN 60 320 and CEE color coding), 6 ft. (2 meters), UL listed type SVT, 3 conductor, Vinyl with NEMA, type 5-15p plug and IEC 320-3:1987/EN 60 320 end termination.

**Limited Warranty:**

XL Microwave Frequency Counters are warranted during a period of **FIVE years** from date of shipment to original purchaser to be free from defects in material and workmanship. The Warranty does not apply to Batteries, Back-Packs/Cases, and/or Accessories. The Warranty applies to all 3000 series Frequency Counters and options when options are installed at original purchase. All other products, options and accessories have a One-year Warranty including option 125 (Rubidium Oscillator).

**Other Options:**

**150: Battery Option.** AC MAINS and Internal Battery Powered CW counter. This option includes a Weather-Resistant Instrument Back-Pack and a 12 VDC/2.3 Ah Rechargeable sealed Lead/Acid Battery (approx. 3-hour operating time per full charge). The battery will recharge whenever the counter is connected to AC Mains. Note: In addition to the standard TCXO oscillator, OCXO oscillators (Options 112 & 120) are also available with the Battery Option. Battery and Instrument Back-Pack are excluded from instrument's warranty.

**152: Dual Battery Operation.** 2nd Battery, with cable, for dual battery operation to extend operating time\*\* (requires Option 150).

**160: OCXO Oven Always ON.** Provides constant power to OCXO oven circuitry with battery operation (shortens battery operating time\*\*)(requires Option 150 & 112 or 120 OCXO).

**170: Rack Ears.** 3.5 in. x 19 in. (88.9 mm x 482.6 mm)(H x W) EIA RS-310.

*All options are installed by the factory on original instrument order.*

*All XL Microwave Counters carry a limited five-year Warranty.*

*Warranties do not apply to batteries, carrying bags, cases, or accessories.*

*\*\*Operating times with Options 152 & 160, consult Factory.*

**Services:**

Factory calibration of XL counters, includes Calibration Certification with test data per ISO 9001.

**Accessories:**

**302:** Case: Hard Shell.

**326:** Case: Watertight, for severe environmental conditions.

**336:** Back-Pack: Weather-Resistant Instrument Back-Pack.

**320:** Battery: Spare, 12 V/2.3 Ah Rechargeable.

**305:** Manual: Spare Operating and Maintenance Manual.

- 315:** Adapter: V (m) to K (f) (model 3600 only).
- 316:** Adapter: V (f) to WR15 (model 3600 only).
- 317:** Adapter: V (f) to WR19 (model 3600 only).
- \*318:** Cable: Coax, 0.5 meter V (m) to V (m) (for use to 60 GHz, model 3600 only).
- \*319:** Cable: Coax, 0.5 meter V (m) to V (m) (for use to 60 GHz, model 3600 only).

**\*Note:** The Band 2 female 'V' sparkplug connector on the model 3600 millimeter wave counter is *not compatible with a 'SMA' type connector!* Attempting to directly connect a 'SMA' terminated cable to the 'V' connector will deform the 'V' connector's center conductor and render the connector unusable.

Model 3030 – Option	US List Price
3030-112 / Oven-Controlled Oscillator (5 x 10 <sup>-7</sup> per year) (OK with Opt.150)	\$700
3030-120 / Oven-Controlled Oscillator (5 x 10 <sup>-8</sup> per year) OK with Opt. 150 but reduced operating time)	\$1,000
3030-125 / Rubidium Standard Oscillator (2 x 10 <sup>-9</sup> per year) (Not with Opt. 150) (1-yr Limited Warranty)	\$5,000
3030-150 / Battery Operation: Internal, Rechargeable (includes Soft Shoulder Bag)(for CW Counters only)	\$600
3030-170 / Rack Ears (CW Counters and Model 500 only)	\$75