Packed with features and ready for the field, the 6040 is your best level meter value

Compare the 6040 Selective Level Meter to other instruments. You'll find a field durable, portable instrument with the accuracy and features usually found only on lab instruments that cost much more.

✔ THE LEVEL ACCURACY of ±0.2 dB at carrier frequencies provides the precision required to do end-to-end line-ups on high density, long haul microwave systems. Accurate measurements on the full range of customer test point configurations can be accommodated with the 6040 because this level meter automatically compensates for bridging and impedance errors.

✔ A PRECISION FREQUENCY COUNTER is built into the 6040 level meter giving you the testing capability of two instruments for the price of one. The 6040's frequency counter is derived from a high stability, temperature compensated, crystal oscillator module. It provides ≤0.4 PPM accuracy that is excellent for testing frequency drift on drop and insert channel oscillators and pilots. By not having to purchase a separate frequency counter, you'll save money, stretch your budget and have one less instrument to carry to the field.

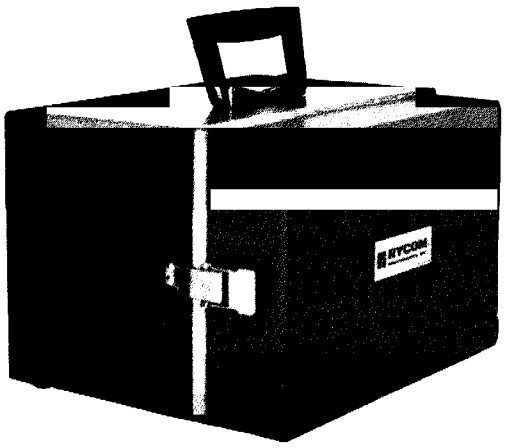
✔ AUTO LEVEL RANGING HELPS the technician make accurate measurements because it automatically selects the appropriate range for any signal level. The level range can also be manually selected.

✔ AFC TUNING automatically takes the tuning errors out of your measurements. The 6040's AFC is locked to the high stability oscillator so each measurement is tuned to exactly the same point on the filter providing REPEATABLE measurement accuracy. The AFC is also a great time-saver since no delicate, time consuming manual tuning is required. Just lock the AFC onto the signal in the wide filter, then switch to the narrow filter and read the exact digital level. For measurements not suited to AFC tuning such as noise and FSK signals, manual tuning and an analog tuning indicator are provided.

✔ OPERATION IN THE FIELD IS NO PROBLEM. The field portable 6040 weighs just 21 lbs. and is AC or rechargeable battery powered. It has a unique battery discharge protection feature that helps prevent running out of battery capacity before you have completed your tests. At a threshold battery voltage, LO BAT alert will flash in the LEVEL dBm display. After 25 minutes the 6040 shuts itself off to prevent permanent battery damage. By momentarily switching to POWER OFF the protection circuit can be reset to complete your remaining measurements.

✔ OPERATOR AIDS TO IMPROVE MEASUREMENT ACCURACY are built into the complete 6040 design. The built-in frequency counter, AFC tuning, Auto Ranging, Adjust Range indicators, and automatic bridging and impedance error correction are just a few of the key features built into the 6040 to help ensure your measurement accuracy.

With more than 30 years of experience in building test instruments, Rycom has developed the 6040 to last through years of tough field use. A cast aluminum front panel provides the basis for the 6040's mechanical stability. This gives it the structural integrity to withstand the rigors of shock and vibration. The durable construction minimizes both down time and expensive repairs. With the aluminum face plate cover in place, the 6040 is completely enclosed in a rigid metal case for transport. An optional foam lined carrying case is also available to provide additional protection against extreme shock and vibration.



TECHNICAL SPECIFICATION
6040 Selective Level Meter

FREQUENCY

Range: 300 Hz to 3.5 MHz

Impedance	Bandwidth (Hz) 50	100	3,100	or	C Msg. Equiv.
50Ω, 75Ω	300 Hz to 3.5 MHz	400 Hz to 3.5 MHz	12 kHz	to	3.5 MHz
124Ω, 135Ω, 150Ω	4 kHz to 2.0 MHz		12 kHz	to	2.0 MHz
600Ω	300 Hz to 100 kHz	400 Hz to 100 kHz	12 kHz	to	100 kHz

Instrument is usable over wider, but unspecified, frequency ranges.

Signal Counter Accuracy:
≤4 x 10^{-7} (≤0.4 PPM) or ±LSD whichever is greater after 3 minute warm-up initially.
≤1 x 10^{-6} (≤1.0 PPM) per year aging rate with reset capability

Temperature Stability:
≤±2 x 10^{-7} (≤0.2 PPM) from +20° C to +30° C
≤±2 x 10^{-6} (≤2.0 PPM) from -10° C to +55° C

Resolution:
Selectable: 10 Hz with fast update, signal count and center passband
1 Hz with 2 second update, signal count only

Display:
6 digit hi temp thermostatically controlled LCD in kHz units

Automatic Frequency Control (AFC):
AFC phase locked to internal precision reference oscillator.
Selectable ON/OFF.

LEVEL

Range: -99.9 dBm to 20.9 dBm, 0.1 dB resolution
dBm Reference Impedance: Selectable, 50Ω, 75Ω, 124Ω, 135Ω, 150Ω, 600Ω
Ranging: Automatic (AUTO RANGE) or manual in eleven 10 dB steps
Display: 3 digit hi temp thermostatically controlled LCD with sign

ACCURACY with Frequency

Impedance**	FREQUENCY RANGE (kHz) .3 to 12	12 to 3,250	3,250 to 3,500
75Ω Unbal Terminated	+0.0 dB -0.5 dB	±0.2 dB	+0.0 dB -0.5 dB
124Ω, 135Ω, 150Ω, 600Ω Unbal Terminated Typical			

Referred to -30 dBm, CAL RANGE, AFC (ON) at 23° C. For Bal. Terminated typically add ±0.1 dB to the above.

ACCURACY with Range

Impedance**	LEVEL RANGE (dBm) -99.9 to -90	-89.9 to 0	0 to +20.9
75Ω Unbal Terminated	±1.0 dB	±0.2 dB	±0.3 dB
124Ω, 135Ω, 150Ω Unbal Terminated Typical			
124Ω Bal Terminated	±1.0 dB	±0.3 dB	±0.4 dB
75Ω, 135Ω, 150Ω Bal Terminated Typical			
600Ω Bal Terminated* Typical	±1.2 dB	±0.5 dB	±0.6 dB

Referred to 250 kHz measured at RANGE Maximum levels, AFC (ON), at 23° C.
*600Ω measurement referred to 50 kHz.

ACCURACY with Temperature
With Recalibration: See "Level Calibration Reference", Level Stability.

Analog Peaking Indicator:
Type:
Vertically mounted edgewise meter indicates relative level
Range:
Switchable, typically 20dB without set point and 4 dB FSD with manual 0 dB set point adjustment
Resolution:
Nominally, 1 dB in 20 dB range and 0.2 dB in 4 dB range

Input Over-Range Indicator:
Red flashing LED indicator reports over-range signal inputs. Level display is simultaneously blanked

Input Under-Range Indicator:
Amber flashing LED indicator reports under-range signal inputs which may cause measurement errors

Maximum Input:
Unbalanced port:
DC coupled, +30 dBm bridging or terminated
Balanced ports:
AC coupled, +30 dBm bridging or terminated, ±200 V (DC and peak AC)

Note: Level measurement accuracy measured after a warm-up period of 30 minutes and after level calibration, unless otherwise noted.

**Note: With precision terminations, accuracy of bridging measurements, including 50 ohm, is typically the same as terminated measurements.

WARM-UP CHARACTERISTICS

(Ambient Temperature +23° C)
Recommended Warm-up Period: 3 minutes

Time Dependent Level Drift
(Initial calibration, no recalibration, input tuning maintained):
3 to 60 minutes ± 0.3 dB max.
3 minutes to 4 hours ± 0.5 dB max.

Time Dependent Tuning Drift
(Initial tuning, no retuning):

Without AFC:
3 to 60 minutes ± 150 Hz max.
3 minutes to 4 hours ± 200 Hz max.

With AFC:
3 to 60 minutes ± 2 Hz max.
3 minutes to 4 hours ± 4 Hz max.

LEVEL CALIBRATION REFERENCE

Calibration Level:
-30.0 dBm ±0.25 dB at 23° C

Level Stability:
Better than ±0.2 dB over operating temperature range (Typically ±0.006 dB/° C)

Frequency:
250 kHz ±30 Hz

TECHNICAL SPECIFICATION

Continued

SELECTIVITY

Wideband Filter:
3100 Hz nominal
Passband: 2 kHz at -0.5 dB points
3100 Hz ±10% at -3 dB points
9000 Hz at -70 dB points

Narrowband Filter:
50 Hz nominal
Passband: 20 Hz at -0.5 dB points
50 Hz ±10% at -3 dB points
250 Hz at -70 dB points

INPUT

Impedance (Balanced):
Terminated—75Ω, 124Ω, 135Ω, 150Ω, 600Ω
Bridging—50Ω, 75Ω, 124Ω, 135Ω, 150Ω, 600Ω,
Typically 5 kΩ shunted by 55 pF
Automatic level correction with impedance selected
Automatic compensation of bridging errors

Impedance (Unbalanced):
Terminated—75Ω, 124Ω, 135Ω, 150Ω, 600Ω
Bridging—50Ω, 75Ω, 124Ω, 135Ω, 150Ω, 600Ω,
Typically 5 kΩ shunted by 55 pF
Automatic level correction with impedance selected
Automatic compensation of bridging errors

Common Mode Rejection:
≥30 dB at 250 kHz
≥20 dB at 1.0 MHz

Return Loss (75Ω Unbalanced):
≥35 dB

Connectors:
Unbalanced:
BNC female nom. 75Ω
Balanced:
Banana jack nom. 600Ω

OTHER PARAMETERS

INTRINSIC DISTORTION

Noise Power Ratio (NPR)
(Equivalent 600 channel system, 75Ω Unbalanced):
≥55 dB for 40 dB increase in sensitivity measured in any band-stopped slot in band

2nd and 3rd Order Harmonics:
≥70 dB below fundamental, single tone 2.5 kHz to 3.5 MHz for 60 dB increase in sensitivity

I.F. and Image Rejection:
≥70 dB

INTERMEDIATE FREQUENCIES
5 MHz and 455 kHz

DEMODULATOR
AM, USB, LSB

OUTPUTS

Loudspeaker (Internal):
Output greater than 100 milliwatts, adjustable level

External Audio Output:
≥10 dBm into 600Ω load ≤5% THD, adjustable level

Harmonic distortion (1 kHz Tone):
≤5% for 100 milliwatt loudspeaker output

Recorder Output:
Linear dB scaled output, +4.0 VDC output at range ref. level 0.0 VDC at 20 dB below range ref. level
2 kΩ source impedance

POWER REQUIREMENTS

AC Supply:
115 VAC ±10%, 50-60 Hz for operation and/or battery charging

Battery Operation:
Internal rechargeable battery

Battery Capacity:
8 hrs approximate maximum operation, 6 hrs LO BAT protection cut-off typical
3 hour nominal operation below 5° C. A discharged battery will recharge overnight

Battery Discharge Protection:
25 minutes LO BAT advance warning on LCD display. Low voltage battery shut-off after time-out with manual reset

Auxillary Power (AUX+12V)
12.6 VDC minimum, 2.5 amp maximum to 0.080 in. front panel tip jack

Fuses:
Battery—Type AGA 2 amp
AC line—Type MDL 3/8 amp

MISCELLANEOUS

AC Supply Option:
230 VAC ±10% 50-60 Hz

Standard Filter Options:
Wideband:
"C" Message Noise Equivalent

Narrowband:
100 Hz nominal
Passband: 60 Hz at -0.5 dB points
100 Hz ±10% at -3 dB points
460 Hz at -70 dB points

TEMPERATURE RANGE

Operate:
-10° C to +55° C

Storage:
-40° C to +85° C

MECHANICAL

Dimensions:
8" x 12" x 9"
(203.2mm x 304.8mm x 228.6mm)

Weight:
21 lbs (9.5 kg)

Notes: Design modification or improvements may result in changes to specifications without notice.
"Typical", "Minimal", or "Approximate" values are informational, non-warranted specifications that may be helpful in using the instrument.

RYCOM instruments, inc.®
9351 EAST 59th ST./RAYTOWN, MO 64133
(816) 353-2100
TWX 910-771-2182 (RYCOMINSTR)

Printed USA