

# Model Three™

## Signal Level Meter

- 5 MHz to 1 GHz Frequency Range
- Full Scan, Single Channel, and Spectrum Modes
- Data Logging
- Digital Signal Measurements Power, MER, Pre- and Post-FEC BER for Deep Interleave
- Constellation Display (Optional)



### Overview

The Model Three™ signal level meter is the ideal for CATV installations - featuring a wide range of tests for analog and digital channel measurements. This rugged instrument can be customized, streamlining tests making your installations and troubleshooting more efficient.

With the press of a single key, the meter performs a complete test of all channels in the selected user channel plan, to specified limits that can be set to automatically perform level, spectrum, tilt (favorite), HUM, MER, BER, and limit tests at programmed intervals, unattended.

Carrier amplitudes are displayed individually, grouped with up to 12 "favorites", or a full-span. This meter also features a single-channel spectrum mode which displays interfering beats in addition to the carrier amplitudes. The meter also tests QAM channels, performs HUM, provides data logging, includes a voltmeter, and much more.

### Learned Channel Plans

The Model Three conveniently stores up to four user-defined channel plans customizing the meter for contractors that work in several systems with different channel lineups. Plans can be automatically learned (from eight base plans) at a cable drop, or downloaded from PC files using the optional ToolBox™ software. The operator can select favorite channels in each user plan to be included in a tilt/favorite channel plan.

### Digital Channel Measurement

The Model Three can measure the channel power of QPSK and QAM channels when testing or troubleshooting your digital transmission system. This function also measures MER, pre- and post-BER for deep interleave of QAM channels.

The Constellation Display (optional) allows the operator to quickly analyze 64 and 256 QAM downstream channels verifying quality or identifying impairments. This feature is field-upgradeable and can be added at the operator's convenience.

### Wide Channel Scans

The Model Three can display up to 126 channels in a single view or a total of 170 channels can be displayed in two overlapping views. The settings for the active measurement mode can be accessed at the press of a single key, without going through nested menus. This allows the operator to quickly make changes in the settings and return to measurement mode saving valuable time.

### Level Measurement

As an aid to troubleshooting, the operator can choose LIVE, MAX, or Δ P-P (variation) signal level displays.

### Spectrum Measurement

In Spectrum Mode the full spectrum or frequency spans from 2.5 MHz to 62.5 MHz can be displayed. The Δ MARKER function is included in spectrum and single-channel spectrum modes. MAX HOLD captures transient events. The Model Three also has an Average Display function for spectrum.

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### Hum

The Hum measurement function is used to troubleshoot interference that may result from a defective power supply or faulty or overloaded power inserters. This mode includes 60 Hz and 120 Hz (or 50 Hz and 100 Hz) and low pass (1 to 1000 Hz) measurements.

### Voltmeter

The Model Three is equipped with a built-in voltmeter function that can be used for troubleshooting power supplies or power drops. The measurement is displayed as a bar graph with a numerical readout and can accommodate AC or DC voltages up to 100 Volts.

### User-Defined Tests

A significant time and cost savings feature of the Model Three is the capability to group tests into automatic programs and executed with a single keystroke. Several programs can be stored in the meter and recalled as needed. These may include level, tilt, spectrum, QAM, HUM and limit tests. Limit test data may be automatically scored against specified limits and assembled into reports.

### Automated Proof of Performance

At the press of a key, the Model Three performs all FCC Part 76 level-related tests including: visual carrier levels,  $\Delta$  V/A,  $\Delta$  Max/Min visual carrier levels and  $\Delta$  Adjacent visual carrier levels. Measurements can be executed immediately or programmed to occur at timed intervals, unattended, as an FCC 24-hour variation test. The test results can then be compared against FCC limits, or limits set by the user.

### Flexible Data Storage

The operator can select and save the test data of the level, tilt, spectrum, scan, QAM, HUM, limit, and auto test measurements and recall them as needed. Scan, spectrum, and limit files can be viewed graphically. Any combination of up to 30 level, tilt, spectrum, or scans, or up to 22 limit test measurement files may be saved on the Model Three. These data records may be uploaded to a PC through the optional ToolBox software for reports, analysis, and printing.

### Extended Battery Life, Fast Charging

The Model Three's battery provides five hours or more of continuous use between charges. One hour of fast charging from AC or vehicle power provides nearly three hours of extended operation.

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#### INCLUDES THE FOLLOWING:

- 5 MHz to 1 GHz signal level meter
- Protective rubber bumper
- Carrying case
- Shoulder strap
- AC battery charger
- User's manual

#### OPTIONAL ACCESSORIES:

- CL-6 vehicle power adapter  
**P/N 2071483000**
- ToolBox software (includes I/O-11 PC data cable)  
**P/N 0930089000**
- I/O-15 precision RF coaxial test cable  
**P/N 2071527048**
- I/O-11 PC data cable  
**P/N 2071351000**
- CC-17 protective sleeve  
**P/N 2130856000**
- CC-18 holster with belt loop  
**P/N 2130854000**

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The Model Three signal level meter supports a variety of functions, including:

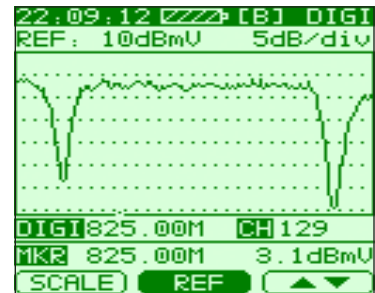
- Level measurement
- Tilt/favorite group display
- Single-channel display
- Scan display
- Spectrum display
- Digital channel measurements
- Data logging
- Limit test
- Auto test
- Voltmeter function
- Hum measurement
- Saves measurement files for viewing or uploading to optional ToolBox software



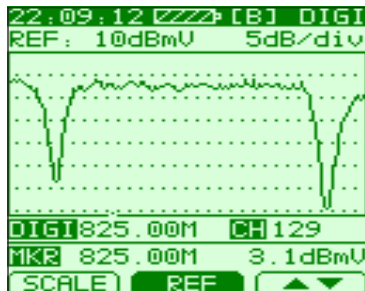
File list



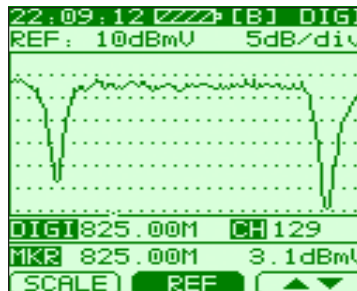
Auto test menu



Level screen for digital channel



QAM measurement screen



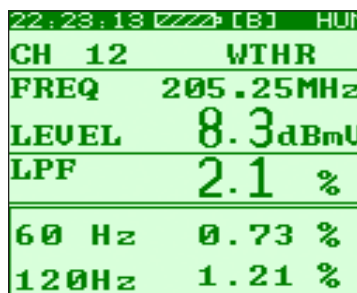
QAM spectrum screen



QAM constellation screen



QAM constellation (magnification)



Hum measurement screen

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### SPECIFICATIONS

<b>Frequency</b>	<b>Range:</b> 5 MHz to 1 GHz <b>Accuracy:</b> ±50 ppm (20° C ± 5°) (68° F ± 9°) <b>Resolution:</b> 10 kHz
<b>Channel Type</b>	<b>Analog TV:</b> TV <b>Digital TV:</b> 16/32/64/128/256 QAM, QPSK, COFDM <b>FM channel:</b> Single frequency
<b>Level Measurement</b>	<b>Range:</b> 5 MHz to 65 MHz (-42 dBmV to 60 dBmV) 65 MHz to 1GHz (-35 to +60 dBmV) <b>Accuracy:</b> >35 dBµV or -25 dBmV <b>Resolution:</b> 0.1 dB <b>Input impedance:</b> 75 Ω (unbalanced, BNC or F-type connector)
<b>Channel Scan</b>	<b>Number of channels:</b> 170 (max) <b>Scanning speed:</b> 5 channels per second <b>Scale:</b> 1, 2, 5, 10 dB/div <b>Zoom:</b> 1x, 2x, 3x, 4x, 5x; five levels of magnification or full channel plan scan
<b>Frequency Spectrum</b>	<b>Bandwidth:</b> 2.5 MHz, 6.25 MHz, 12.5 MHz, 25 MHz, 62.5 MHz, and full span <b>Scale:</b> 1, 2, 5, 10 dB/div
<b>Digital Channel</b>	<b>Demodulation type:</b> ITU-T J.83 Annex A/B/C standard <b>Support:</b> 16/32/64/128/256 QAM, QPSK, COFDM <b>Symbol rate:</b> 1 to 7 MS/sec <b>Bandwidth:</b> Enactment <b>MER:</b> To 36 dB (or greater) <b>Accuracy:</b> ±2.0 dB <b>BER:</b> 1E <sup>-3</sup> to 1E <sup>-9</sup> before and after R-S decoding <b>Power measurement type:</b> QAM, QPSK, COFDM
<b>Digital Channel Power (Average)</b>	<b>Level range:</b> -30 to +55 dBmV <b>Accuracy:</b> ±2.0 dB <b>Resolution:</b> 0.1 dB
<b>Constellation (Optional)</b>	<b>Display size:</b> 64 and 256 QAM Constellation with zoom capability
<b>Tilt Measurement</b>	<b>Number of channels:</b> 4 to 12 <b>Resolution:</b> 0.1 dB

<b>Limit Test Parameters</b>	Any of the following may be enabled: <b>Min video:</b> 40 to 120 dBµV (-20 to +60 dBmV) <b>Max video:</b> 40 to 120 dBµV (-20 to +60 dBmV) <b>Max Δ video:</b> 2 to 30 dB <b>Min Δ V/A:</b> 0 to 15 dB <b>Max Δ V/A:</b> 5 to 30 dB <b>Max Δ ADJ:</b> 0 to 20 dB <b>24-hour video dev.:</b> 0 to 20 dB
<b>Auto Test</b>	<b>Number of programs:</b> 7 (max) <b>Tests:</b> Level, tilt, spectrum, QAM, hum, limit, and 24-hour video deviation (any or all tests may be used in an auto test program) <b>Time intervals:</b> 1 to 23 hours <b>Test times:</b> 1 to 10 times
<b>Trunk Voltage Measurement</b>	<b>Input range:</b> 0 to 100 VAC or VDC <b>Accuracy:</b> ±2.0 V <b>Resolution:</b> 0.1 V
<b>Power</b>	11.1 V / 1.6 AH Li-Ion battery <b>Charger:</b> 100 to 240 VAC, 50/60 Hz, 1.8 A, 7 VDC (max) Provides 5 hours of continuous operation. <b>Charge time:</b> Less than 3 hours
<b>Display</b>	128 x 128 backlit LCD
<b>Communication Port</b>	RS-232C
<b>Storage</b>	32 Kb of memory Up to 30 complete scan files (170 channels max) or 22 complete limit test files (170 channels max); less if other files (level, tilt, QAM, hum, spectrum) are saved
<b>Weight</b>	1.76 lbs (800 g)
<b>Dimensions (H x W x D)</b>	8.52" x 3.74" x 1.93" (218mm x 95mm x 49mm) (dimensions do not include belt clip)

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