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CR1200R Digital Signal Analyzer

with Return Path Testing



- QAM Digital and Return Path Testing in One Instrument
- 64 and 256 QAM Constellation, MER and BER Measurements
- Automatic Constellation Diagnosis
- Fast Full Functioned Spectrum Display
- Zero Span Display for Viewing Return Cable Modem Signals and Transient Ingress
- Rugged Water Resistant Case
- Full Functioned Analog Signal Level Meter
- Fully Compatible with DOCSIS Cable Modems

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Digital QAM and Return Path Testing

The CR1200R is a low cost CATV maintenance and troubleshooting tool that supports in-service measurements of 64 and 256 QAM-modulated video and cable modem digital signals, return path ingress and TDMA signals as well as traditional analog signals. Automated testing allows easy proof of performance testing on both analog and digital signals. The CR1200R is rugged, water resistant, portable and can be used without additional subscriber equipment.

Unlike analog video signals, digital video signals can appear to operate normally, even when they are very close to failing. Simply checking to see if there is a picture and sound does not tell the technician how close to failing the channel really is. By using the CR1200R's constellation display, modulation error ratio functions and bit error rate tester, the technician can quickly determine the integrity of the installation to ensure that the digital performance is well within limits. This will help to ensure long term subscriber reliability.

In addition to QAM testing the CR1200R is a full functioned return path test instrument. A fast full functioned spectrum analyzer display allows testing and trouble shooting of return path ingress. Zero span mode allows the user to measure return path TDMA signals such as the 16QAM or QPSK signals used by cable modems and telephony. Fast transient ingress as narrow as 10 s can be viewed on the zero span mode and can even be viewed on live TDMA signals.

Pre and Post FEC Bit Error Rate (BER) The CR1200R provides both Pre-FEC and Post-FEC Bit Error Rate (BER) testing, allowing the technician to determine if forward error correction is being used heavily to correct for errors in the path. The display will indicate the errored-seconds prior to the correction and after the correction. If the FEC codes can correct the errors, the POST-FEC will indicate zero. If the errors are so severe that the POST-FEC cannot correct them, then a severely errored second is displayed, showing that an impairment could be passed through the set top box to the subscriber s television set.

Constellation Display with Automatic Diagnosis A constellation display provides a graphic representation of the QAM modulated signal. Ideally each of the 64 or 256 symbols should display a clean dot, indicating a perfect QAM signal. The size and shape of the build up of these dots indicates the amount and type of impairment and tells the technician if they are a result of noise, interference, phase noise or gain problems. Constellation displays can also indicate the presence of in-band spurs or hum and laser clipping. Since all of these impairments can cause bit errors, this display is a valuable tool for identifying and troubleshooting these problems. With the CR1200R s exclusive Automatic Diagnosis (patent pending) function even users not trained in constellation displays will know what type of distortion is impairing their digital signal. The type of signal impairment is displayed on screen automatically, eliminating troubleshooting guess work.

Modulation Error Ratio (MER) The Modulation Error Ratio display on the CR1200R is analogous to the Signal-to-Noise measurement made in analog systems. MER is a measure of the ratio of the error power to the average power in an ideal QAM signal. Poor MER is an early indicator of channel impairment. MER measurements are useful for early detection of non-transient (noise) impairments. Examples of non-transient impairments include: system noise, CSO, CTB, ingress and modulator problems.

All in one instrument

Fast, Full Functioned Spectrum Analyzer Display The CR1200R s full functioned spectrum analyzer display equipped with the return band frequency option allows for viewing of return path ingress and forward path signals. The spectrum analyzer has variable spans up to 50 MHz allowing the user to view individual channels or the entire return path. Fast update and a max hold function ensures that even transient ingress will be displayed. Peak and average detection and variable video filtering allow the user to customize the display to match the type of testing being performed.

Fast Zero Span Spectrum Analyzer Display Transient signals as fast as 10 s such as cable modem return path signals or ingress can be displayed on the CR1200R's Zero Span Spectrum Analyzer mode. Markers allow for level measurement of individual cable modem packets as well as noise level between the packets. Delta markers allow for measurement of desired to undesired on live signals. Variable triggering and variable time per division allows the user to customize the display to view the type of signals and ingress desired. 300 KHz and 2 MHz resolution bandwidths allow the user to match the CR1200R's bandwidth to either narrow or wideband modem signals.

Automated Digital Testing The CR1200R's Auto Test mode automatically tests all of your digital channels and compares them to preprogrammed limits. MER, BER and power level are automatically tested on all digital channel at the touch of a button. The user simply selects the appropriate location, either headend, node, end of line, subscriber drop or user defined and the Auto Test mode will test all of the digital channels and tell you which channel passes or fails according to the location selected. All limits are fully user definable. Also indicated in the Auto Test is the type of impairment found by the Automatic Constellation Diagnosis.

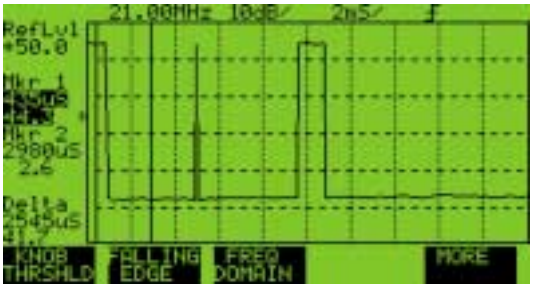
Data Logging The Data Logging function allows the user to test over a longer period of time to determine the presence of any intermittent problems. The CR1200R stores events that cause either the errored or severely errored second timer to mark the time. If an errored or severely errored second is reported, the time and signal-to-noise measurements for that second are stored in the log for later review.

Signal Level Meter The Signal Level Meter Mode measures both analog and digital carrier levels, eliminating the need to carry a second instrument to test analog channels. In analog mode, both the video and audio carrier levels are indicated as well as the delta audio video. On digital channels the average power over the user selectable bandwidth is automatically measured and displayed without the need for correction factors. Once the user has programmed the channel table to identify the digital channels the CR1200R will automatically measure and display the correct analog or digital measurement depending on the channel selected.

Free Windows Software The CR1200R Remote Windows Software allows screens captured and stored in the CR1200R to be uploaded to the computer for archiving, viewing and storage on your hard drive. Stored displays are saved in BMP format and can be pasted into other programs such as Microsoft Word for inclusion in other documents.

The CR1200R Digital Signal Analyzer

Intuitive and Easy to Use.



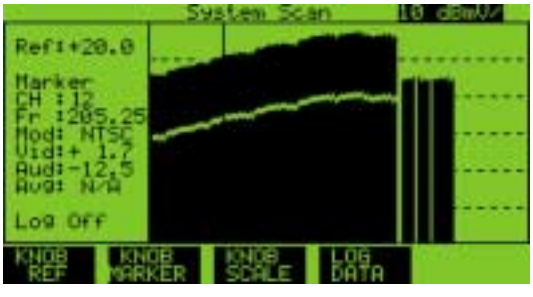
Fast Zero Span Mode for accurate measurement of Return Path TDMA Signals.



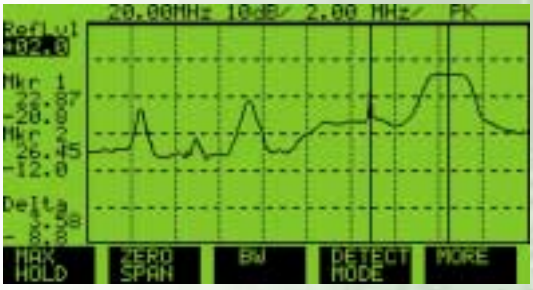
64 and 256 QAM Measurements with Hukk's exclusive Automatic Constellation Diagnosis.



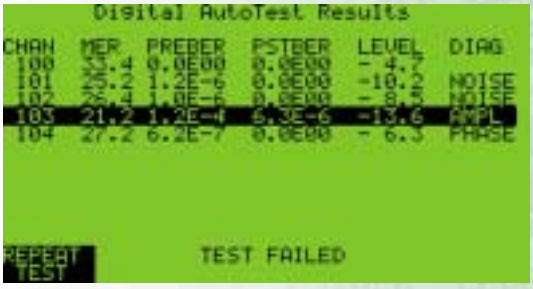
Accurate Digital Power reading over any bandwidth without correction factors.



Full functioned Analog and Digital Signal Level Meter eliminates the need for a second instrument.



Fast, full function 5-860 MHz Spectrum Mode for tracking down ingress.



Auto Test automatically checks all of your Digital Channels and diagnoses any problems.



Ordering Information:

CR1200R Digital Signal Analyzer with 44 - 860 MHz frequency range, includes 120V battery charger, 12V vehicle adapter, operations manual and training CD. Return path measurements require Return Path Frequency extension option.

Options:

Return path frequency extension for 5 - 860 MHz tuning range.
Free Windows Remote software, must be downloaded from http://www.hukk.com

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