Trilithic 860 DSPi Specs Provided by www.AAATesters.com

Multifunction Digital Analyzer

- Optional Embedded CableLabs® Certified DOCSIS 3.0 Modem
- DSP Technology Allows for Quick, Accurate Measurements
- Versatile Capabilities Range from Triple Play Signal Analysis for Installations to a Wide Range of Plant Maintenance Tests
- Adaptable Platform Grows to Meet the Needs of Technicians at Every Tier
- Easy-to-Read Display and Simple Interface
- Integrates with OSS and Workforce Management Systems for Improved Productivity



Change with the times without changing meters.

Fast, accurate measurements with a versatile meter you can update or upgrade anytime, usually with a simple firmware download.

Efficient, versatile, & comprehensive

Now with an optional CableLabs® certified DOCSIS 3.0 modem option, the 860 DSPi™ quickly and efficiently performs all of the critical transmission and signal quality tests needed to install, troubleshoot, and maintain analog, digital, HSD, and VoIP services.

The analyzer can be configured with features that make day-to-day maintenance more efficient and improve troubleshooting speed for plant technicians. Powerful options add high-resolution spectrum analysis, QAM and QPSK constellation displays, and a wide range of return path tests- all without impacting size or weight.

Fast boot-up and quick test mode transition improve technician productivity. And thanks to the efficiency of digital signal processing technology, the battery life of the 860 DSPi can be up to five times longer than that of other instruments. The 860 DSPi works with Guardian System II[™] reverse path monitoring equipment, and can be equipped with options to provide an extensive range of reverse path test capabilities. With the SpeedSweep[™] FS-1 option, the 860 DSPi receives forward sweep from the 8300 FST[™]; with the SR-1 option, it also generates a high resolution reverse sweep to be received by the 8310 RSA[™] and displayed on the 860's easy-to-read LCD display.

Adaptable for future needs

The 860 DSPi is the first portable instrument platform capable of evolving over time to meet emerging measurement and data communication requirements. It can be upgraded as new services are introduced, usually through Trilithic's free update website. The use of flexible, cutting-edge digital signal processing (DSP) technology means that applications that were not even available when the analyzer was originally purchased can be added later, often by simply downloading firmware. This ability to easily keep the 860 DSPi as up-to-date as currently shipped analyzers gives it a longer life cycle and significantly reduces the lifetime cost of ownership.

Fast boot-up for quick measurements

With the 860 DSPi ready to perform measurements within a few seconds after turn-on, technicians can perform tests quickly. The 860 also provides test data to the operator up to 10 times faster than other analyzers, so problem sources can be identified faster, shortening trouble calls.



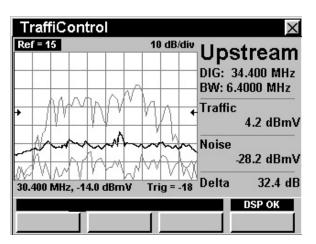
860 DSPi Multifunction Digital Analyzer

Complete Testing Capabilities

The 860 DSPi provides extremely versatile measurement capabilities, addressing the needs of technicians and engineers for everything from installation signal analysis to a wide range of plant maintenance tests.

Tra	Trace Route (IP = 10.1.31.19)											
Hos	st Name	YAHOO.COM										
	Host IP 216	.109.112.135										
1	10.1.1.1	10 msec : bem.trilithic.net										
2	207.250.51.129	<10 msec : 207-250-51-129.static.twtelecom										
3	66.192.244.20	10 msec : peer-02-so-0-0-0.chcg.twtelec										
4	216.115.97.21	20 msec : ge-2-0-9.p550.pat1.dce.yahoo.co										
5	216.115.108.3	20 msec : ge-0-0-0-p101.msr1.don.yahoo.co										
6	216.109.120.149	20 msec : ge3-1.bas1-m.don.yahoo.com										
7	216.109.112.135	20 msec : YAHOO.COM										
8												
Msg	:											
		Start Stop										

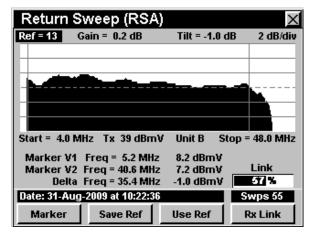
Track IP transmission paths with Trace Route™.



Find in-channel distortion or other interference without interrupting service with Error Vector Spectrum[™] or TraffiControl[™] modes.

Forward	Sweep : defa	ault.plan	\times
Ref = 30	Ref: 8.sref	Avg Low	10 dB/div
TP: Man	iual	TAP	: 0 dB
Marker A 6	99.000 MHz, -0.5 dl	3	Peak 0.7
Marker B 2	41.250 MHz, -0.2 dl	3	Valley -1.0
Delta -4	157.750 MHz,0.3 d	В	Delta 1.7
Msg:			Avg 0 / 0
SAVE REF	CHPLAN	USE REF	

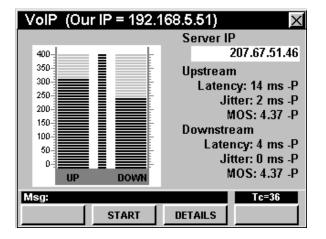
Measure system frequency response with SpeedSweep system compatibility.



The 860 DSPi, with an SR-1 Option, injects an agile sweep signal configured to "step around" active channels, sweeping in unoccupied spectrum areas to a frequency resolution of 100 kHz. The reverse sweep is received by the 8310 RSA[™] and the response information is relayed back to the 860 DSPi on via user configurable frequency agile forward telemetry signal.



Multifunction Digital Analyzer



Measure latency, jitter, packet loss, and other VoIP parameters in seconds. Analyze VoIP performance from end-to-end and from the subscriber to the CMTS. When testing end-to-end, the 860 DSPi displays separate test results for upstream and downstream paths and even calculates an MOS score for each.

Throughput (IP 10.1	.31.41)	\times
	Server IP	
100-	· · · · ·	10.1.31.15
90-	Upstream F	ile
80-	00_^	la_e9.dat
70- 60-	Downstream	m File
50-		860.DAT
40-	Upstream F	late
30-	•	MBits/Sec
20-	Downstrea	m Rate
UP DOWN		MBits/Sec
Msg:	P	ort 28657
Goto Upstream	Dnstream	Modem

BER : chplan.plan **≜**IFEC 256QAM CH 109 100000 705.000 MHz 10000 BER 1000 4.10E-05 рге 100 post 2.21E-05 10 ERRORS согг 29771 1 7275 uncor 0 err sec 30 200 180 160 140 120 100 80 60 40 20 0 Now sev sec 200 Sec 15 **Digital BER Mode** 7.193E+09 Plan Reset

Test throughput, packet loss, reverse transmit levels, MER, BER, and more.

Use the 860 DSPi's Average BER function to estimate BER up to 10 times faster than any alternative. Use the Impulse BER function to detect and count individual lost packets. BER data is displayed with values and a convenient graph that shows how pre and post BER changes over a user-settable interval. Enhanced digital video feature equips the analyzer to perform impulse BER measurements on deep interleave digital video channels and enhances constellation graphs if the 860 DSPi includes Option QA-2.



Designed for Convenience and Durability

- Fast boot up, fast operation
- Simple, direct keyboard functions
- Large, widely spaced buttons are usable with gloves
- Single keystroke measurement functions or soft keys for simple navigation
- Auto-test up to 16 functions, with limit comparison and pass/fail results
- Long battery life (operate your 860 DSPi for 4 to 6 hours on a single charge, even with the display backlight turned on, without intrusive battery-saving methods)
- High resolution 5.7" backlit transflective LCD display
- Strong, shock-resistant construction, with integral rubber boot; padded bag included
- Lightweight, with convenient carrying straps

Standard Measurements

- Signal levels: one channel to full span, analog and digital; total power
- Full channel scan
- "Mini-scans" of up to 10 selected channels (video and digital carriers)
- Forward tilt
- Carrier-to-noise and Hum
- Reverse spectrum scan to -40 dBmV
- Numerical values of forward BER/MER
- Digital power
- Lost packet rate
- DOCSIS modem upstream transmit level
- DOCSIS speed, throughput
 - PC substitution
 - VoIP jitter, latency upstream, and downstream
 - Lost/discarded packets upstream, and downstream
 - Calculated MOS score, upstream, and downstream
 - Trace route
 - Internet browser
 - 64 QAM source for upstream testing

OPTIONS

The 860 DSPi options are available on an *a la carte* basis, but the prerequisite option is the Power Pack[™], which must be purchased in order for the instrument to be fitted with other DSPi options.

D3 Option - DOCSIS 3.0

Built-in CableLabs®
certified DOCSIS 3.0
modem enabling a full
compliment of DOCSIS
3.0 tests that can be
performed up to 304
Mbps

Provides information for
all up and downstream
signals in bonded sets

14-Nov-2011	Batt	7.67V	25 C	CO	м	17:09:35			
Downstrear	n								
Frequen	oy	Rx L	evel	SNR	preBER	postBER			
777.00 MHz (2	56 Q.A	M) -3.06	dBmv	40.36 dB	0.00 E+00	0.00E+00			
783.00 MHz (2	56 Q.A	M) -4.11	dBmv	39.85 dB	0.00 E+00	0.00E+00			
789.00 MHz (2	56 Q.A	M) -3.88	dBmv	39.85 dB	0.00 E+00	0.00E+00			
795.00 MHz (2	56 Q.A	M) -3.88	dBmv	39.39 dB	0.00 E+00	0.00E+00			
801.00 MHz (2			dBmv	39.39 dB	0.00 E+00	0.00E+00			
807.00 MHz (2			dBmv	38.60 dB	0.00 E+00	0.00E+00			
813.00 MHz (2	56 Q.A	M) -6.88	dBmv	39.39 dB	0.00 E+00	0.00E+00			
819.00 MHz (2	56 Q.A	M) -6.79	dBmv	38.60 dB	0.00 E+00	0.00E+00			
Press UP for Upstream Data									
FW: US3A_60	3.1.1	.28-NA-02	2-1110	12	DOC	SIS 3.0			
Goto		P Info	l co	nfig File	1 Cha	nge ID			

UP-LD (Upstream Linear Distortions) Option

- Determine if equalization is hiding potential problems
- Allows the 860 DSPi to see the pre-equalization of the upstream channel, along with in-channel frequency response and in-channel group delay

Upstream EQ Co	ef. Ana	lysis	
14-Nov-2011 Batt 7.67V	26 C	COM	17:11:35
Equalizer Taps	10	dB/Div	
0-4		US	Chan: 0
-10-		С	h ID: 1
-20		-	6.90 MHz
-30		-	5.00 dBmV
-40			120.00 KSPS ker
-50			' кег 3.21 dB
-60		-	37 uS
		Dis	ance
Marker Location: 1			85 ft
		1	78 m
Msg:			860 DSPi
Refresh Graph Ty	pe Us	e Ref	Options

PP-1 Power Pack

- Adds full 5 MHz to 1 GHz spectrum analyzer display (300 KHz RBW), FM deviation, depth of modulation, CSO/CTB, and forward (system carrierreferenced sweep) sweep balancing
- The Power Pack is a prerequisite for all other 860 DSPi options

Wi-Fi (802.11 b/g) Option

- Detects in-range wireless IEEE 802.11 b/g access points and lists SSIDs
- Displays up to 10 access points, with signal strength and security status
- Survey mode verifies accessibility throughout a customer's home

12-Fet	b-200	19 Batt 6.	.95V	23 C	CO	м	10:1	5:22
Pow	er	SSID			CH	MAC	Addr	ess
-48	dBm	*unknow	n		01-I	0015	E9C1:	952
-55	dBm	*unknow	n		11-I	0017	9A841	FFO
-70 -	dBm	*market:	ing		11-I	0013	10EA:	3AA.
-70	dBm	INSTEN	ONET		06-I	0013	707B	ZAO
-74	dBm	*unknow	n		01-I	0010	F008	04A)
-76	dBm	*AIRSHO?	T2011	344	11-A	0220	70F8	SBF
-85	dBm	*Apps			06-I	0004	ESD6	7183
		istics and					Vaitin	

FDR Frequency Domain Reflectometer[™] Option

- Measurement uses sweep analysis of a cable or drop to determine the distance to multiple opens, shorts, splitters, or faults
- Allows the 860 to identify multiple cable components in a passive home network

Frequ	Jenc	y Rei	flecto	mete	r		\times
Ref =	-6 dBR	Vo	p = 81.9	9%	Dista	ince	39.4 feet
		<u>A</u>		۴			
		L III –	1 1	R			
		111		1			
	25	50 50	75	100	125	150	175 2
	: 5.01				z Sto	p:65	5.0 MHz
Marker							
Marker	B: 99.	9 m,	-8.796	abrt			
Freque	ncy Re	flector	neter				_
		Get	1	Calc	: Vop		



860 USPI Multifunction Digital Analyzer

FS-1 Forward Sweep Option

- Enables a forward sweep display
- Compatible with the SpeedSweep System for forward sweep balancing and troubleshooting

Forward	Sweep : defa	ult.plan	\times
Ref = 30	Ref: 8.sref	Avg Low	10 dB/div
10110			
TP: Mar	nual	TAP	: 0 dB
Marker A 6	99.000 MHz, -0.5 dB		Peak 0.7
Marker B 2	41.250 MHz, -0.2 dB		Valley -1.0
Delta -	457.750 MHz, 0.3 dE	3	Delta 1.7
Msg:			Avg 0 / 0
SAVE REF	CH PLAN	USE REF	

SA-1 Spectrum Analysis

- Full-featured DSP alternative to analog analyzers
- Adds multiple resolution bandwidth settings from 10 kHz to 3 MHz
- Adds Zero Span mode

Advan	ced Sp	ectrum Ar	alyzer	×
Ref = 5	Avg 16	RBW 10 kHz	Lim= 6	0.00 10 dB/div
				TP 1.5
	4₹ –	<u>∧</u> ₩/		
81/	mm	<u></u>		₩
$\neg \psi$	1	~~~		
	22.000 MH			: 15.000 MHz
		MHz, 1.4 dB		Peak
		MHz, -54.5 d iz55.9 d		
		n Analyzer	_	DSP OK
Detecto		-	ming	Hold
Detecto	i ivia	пкег	uning	noiu

TC-1 TraffiControl Option

 Allows viewing of in-channel spectrum characteristics for upstream data channels
 Image: Control
 Image: Control

 Ref = 15
 10 dB/div
 Upstream

 DIG: 34.400 MHz
 BW: 6.4000 MHz

 Image: Control
 Image: Control

 Image: Control
 Image: Contro

 Image: Control</

QA-2 QAM Option

- Constellation and equalizer display capability
- Error Vector Spectrum mode – enables viewing in-channel spectrum characteristics

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H	1	•			-		1		-	÷	÷	•		7	÷	÷	LEVEL: 9.2 dBmV
H		•		•	•		Ľ				÷	-	ŀ.	2	-	-	MER: 41.3 dB
H	1		-	÷	-			1		÷	÷			-	÷	-	mera rito ab
H		10	ŀ	÷		-	ż	÷		-	÷	ż	6	-	÷	÷	Pre BER:<1.0E-09
H	,		Ľ.	÷		÷		Ŀ	-		÷		•		2	-	Post BER:<1.0E-09
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	Display Plan						n		I		Z	Zoom In Zoom Out					

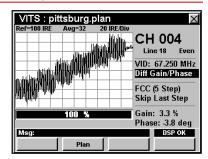
SR-1 Return Sweep Receiver

- Compatible with the 9581 SST and 8310 RSA
- Useful for return path balancing and troubleshooting

Return	Sweep	(RSA)		×
Ref = 13	Gain = 0.3	2 dB	Tilt = -1.0	dB 2 dB/div
H				
1. 1		-		
-				
Start = 4.0	MHz Tx 3	39 dBmV	Unit B S	top = 48.0 MHz
	/1 Freq = :		8.2 dBmV	
	/2 Freq = 4		7.2 dBmV	Link
Del	ta Freq=3	5.4 MHz	-1.0 dBmV	57 ×
Date: 31-A	ug-2009 at '	10:22:36		Swps 55
Marker	Save	Dof	Use Ref	RxLink

VITS Vertical Interval Test Signal[™] Option

Enables testing of baseband video parameters on active analog channels with active VITS



VP-1

- Adds RSVP^{2™} Installer's Return Tester functions to the 860
- Expands the 860 to allow testing of eight frequencies at once
- Compatible with 9581
 SST

RSVP : Return Installation Mode 🛛 📈				
Ref = 30 10 dB/div				
	1: P	ASS 21, C/ 40		
20				
	3: P	ASS 21, C/I 40		
	4:			
	5: P	ASS 21, C/I 40		
-20- -30- Чапараранараранаранаранаранаранара				
-40 ⁻¹				
6 12 18 24 30 36 42 48 54 60 8:				
Ingress Samples = 16 of 16 Link : 31 %				
RSVP : Return Installation Mode DSP OK				
Tx FREQS	Rx LINK	START		
	1 	10 dB/div 1: P 1: P 2: 3: P 5: P 4: 5: P 5: P 2: 2: 5: P 5: 2: 2: 5: P 5: 2: 2: 2: 5: P 5: 2: 2: 2: 2: 5: P 5: 2: 4: 30: 36: 42: 44: 54: 60 % 6: 5: S Samples = 16 of 16 Lin Installation Mode 1		

VSB Vestigial Sideband[™] Modulation Option

Feature enables analysis of off-air digital video transmissions, including levels, constellation, equalizer taps, and BER





860 DSPi Multifunction Digital Analyzer

RELATED PRODUCTS

Improved productivity with workforce management The 860 DSPi integrates with Trilithic's TDM[™] test data management server package to enable managers and others to configure and manage analyzer inventory, store measurement data, generate reports and create custom database queries.

The integrated system lets cable operators track tech performance, control the quality of installations and – via a connection to the company billing system – even develop and monitor productivity improvement metrics.

I-Stop™ Ingress Test Probe (P/N 2010838001)



The I-Stop probe contains a patented circuit that, when used with a reverse path monitoring system, confirms the location

of an ingress source down to the nearest tap. Eliminates the need to remove reverse pads, tap bodies, or diplexers for troubleshooting. Pressing the button on the side of the probe causes a 4 to 6 dB reduction in the ingress seen by the return monitoring system, confirming this leg of the distribution system contains the ingress source. The I-Stop probe has little or no visible effect on forward video signals.

TLB-60 Return Measurements Filter (P/N 2011066000)



The TLB-60 60 MHz low-pass filter is useful when searching for common path distortions or other low-level disturbances, eliminating

overload from forward channels present at the test port. The TLB-60 can extend the measurement range of a spectrum analyzer or field signal analyzer by as much as 20 dB.

8310 RSA (P/N 2011375000)



The 8310 RSA Return Sweep Analyzer receives a sweep initiated from a field test point by an 860 DSPi field analyzer and transmits the received sweep level information back to the analyzer

on a downstream telemetry signal.



860 DSP Analyzer: A Cost-Effective Alternative.

Part of the 860 family, the 860 DSP is for applications that do not require a modem-equipped meter. It performs physical measurements only. For technicians not required to maintain DOCSIS services, the 860 DSP is a cost-effective alternative.

I/O-15 Coaxial Precision Test Cable (P/N 2071527048)



The I/O-15 is a precision test cable suitable for field and head end test equipment. The small-diameter (0.16") allows the cable to be conveniently stored in a pocket or in

the instrument's bag. The I/O-15 exhibits a loss of only 0.7 dB at 1 GHz, and lab quality materials and machined female F-type connectors insure long service life. A lab-quality push-on adaptor is included with each cable.

CC-23 Utility Bag (P/N 2131221000)



The CC-23 is a protective carrying case large enough to conveniently hold a technician's instrument kit, including the 860 DSPi, a Searcher Plus-series leakage detector, test cables, probes, and more. Includes one I/0-15 precision test cable.

8300 FST (P/N 2011072001)



The 8300 FST Forward Sweep Transmitter generates a sweep that steps around system carriers to avoid interference, filling in vacant spectrum areas for a

complete view of the network frequency response.



860 DSPi Multifunction Digital Analyzer

SPECIFICATIONS

Frequency Range	5 MHz to 1 GHz		
Level Measurement			
Range	-40 to +50 dBmV		
Resolution	0.1 dB		
Accuracy	@ 25° C (77° F): ±0.75 dB		
	Over temp -18° to +50° C (0° to 122° F): ±2.0 dB (analog), ±2.5 dB (digital)		
· · · ·	, non-scrambled standard channels only)		
Minimum Input Level for	+10 dBmV		
Full Range			
Dynamic Range	50 dB		
Resolution	<0.5 dB		
Hum (In-service, non-scrambled standard channels only)			
Minimum Input Level	0 dBmV		
Range	0 to 5%		
Resolution	0.1%		
Accuracy	±0.5%		
Depth of Modulation (In-se	rvice, non-scrambled standard channels only)		
Range	50 to 100%		
Resolution	0.5%		
Audio Dimension	FM carriers		
Tilt			
Max Number of Carriers	10		
High/Low Delta	0.1 dB		
Resolution			
Scan	Video, audio, pilot, and digital carriers; includes total power measurement		
Spectrum Mode			
Display Spans	User-selectable in 10 kHz steps		
Display Scale	1, 2, 5, or 10 dB/division		
Display Range	8 vertical divisions		
Sweep Rate (78 Channels)	~500 ms		
Detection and Dwell	Selectable detector modes (Narrow or Wide) and dwell time		
	Selectable detector modes (Narrow or Wide) and dwell time		
Spurious Free Dynamic Range	60 dB @ 25° C (77° F) (+50 dBmV)		
Sensitivity	-40 dBmV (4 MHz to 1 GHz)		



Zero Span Mode

Video Bandwidth	Digital averaging		
Resolution Bandwidth	10, 30, 100, and 300 KHz; 1, 3 MHz		
Pulse Measurement Accuracy	Nominal level in <7ms, ±2 dB from nominal in 4 ms (300 kHz RBW)		
Sweep Times	50 μs to 20 sec in 1, 2, 5 settings		
Intermodulation Distortion	n (CSO/CTB)		
Range	≥60 dB		
Resolution	0.1 dB		
QAM Measurements			
Modulation Types	ITU J.83 annex A, B, C; QPSK, 16, 32, 64, 128, and 256 QAM (at symbol rates from 2 MSPS to 6.9 MSPS)		
Measurable Input (Lock)	64 QAM: -20 to +50 dBmV (typical)		
Range	256 QAM: -15 to +50 dBmV (typical)		
Frequency Tuning	5 MHz to 1 GHz		
BER; 64 and 256 on all Modulations	10 ⁻⁴ to 10 ⁻¹⁰		
MER	64 and 256 QAM, 6 MHz channel bandwidth: Range: 21 to 40 dB ±1dB Accuracy (typical): ±1.5 dB 64 and 256 QAM, 8 MHz channel bandwidth: Range: 21 to 35 dB Accuracy (typical): ±2.0 dB		
EVM	64 QAM, 6 or 8 MHz channel Range: 1.1 to 8.1% Accuracy: ±0.5% (1.1 to 2.0%) ±1.0% (2.1 to 4.2%) ±1.6% (4.3 to 8.1%)		
	256 QAM, 6 or 8 MHz channel Range: 1.1 to 5.3% Accuracy: ±0.5% (1.1 to 2.0%) ±0.8% (2.1 to 4.2%)		
QAM Level Measurement			
Signal Types	QPSK; QAM (16, 32, 64, 128, and 256)		
Range	-40 to +50 dBmV		
Accuracy @ 25° C	±1.25 dB		
QAM Source			
Frequecy Range	5 MHz to 42 MHz (65 MHz Euro/Dual mode models)		
Output Level Range	22 dBmV to 53 dBmV (User calibrated in 1 dB steps, Cal Adjustable by +/- 4dB steps, and dependent upon symbol rate)		
Modulation Types	QPSK; 16 QAM, and 64 QAM Upstream BER format		
Power Source			
Battery	Twin 7.2V 2700 mAHr NiMh packs		
Charging Time	4 hours		



860 DSPi

Multifunction Digital Analyzer

Operating Time,	6 hours in level mode	INCLUDES THE FOLLOWING:	
Continuous Use	4 hours in modem mode	5 MHz to 1 GHz analyzer (customer-	
Symbol Potos	160 kS/sec, 320 kS/sec, 640 kS/sec, 1.280 MS/	specified options)	
Symbol Rates	sec, 2.560 MS/sec, 5.120 MS/sec	Protective carrying case	
Physical		Shoulder strap	
Weight	5.85 lbs (2650 g)	Universal charger, 90 to 220 VAC, U.S	
Dimensions	10" in. x 8" in. x 3" in.	plug User's manual	
Operating Temperature Range	-18° to +50° C (0° to 122° F)	User's manual	
DOCSIS 3.0 Modem		OPTIONAL ACCESSORIES:	
Protocol Support	(Euro)DOCSIS 1.1 / 2.0 / 3.0 compliant (DOCSIS 4x4)	Protective display shields P/N 2230521001	
	SNMP V1, V2c, V3 IEEE 802.3, 802.3u	Utility bag (CC-23) P/N 2131221000	
Compliance Certificates	CE mark RoHS compliant CableLabs wave 61, 63, 66 (DOCSIS 4x4) CableLabs wave 80 (DOCSIS 8x4)	RELATED PRODUCTS: External battery charger P/N 2010986000	
Receiver Demodulation	Demodulation: 64 QAM, 256 QAM Data rate: Up to 304 Mbps with 8 downstream channel bonding (DOCSIS 8x4) Up to 200 Mbps with 4 downstream channel bonding (EuroDOCSIS 4x4) Channel bandwidth: 6 Mhz (DOCSIS, DOCSIS-J) 8 Mhz (EuroDOCSIS 4x4) 6/8 MHz (Dual mode 4x4) Maximum modem input signal level: 17 dBmV	Vehicle power adaptor (CL-5) P/N 2070704002 Precision test cable (I/O-15) P/N 2071527048 I-Stop probe P/N 2010838001 TLB-60 filter P/N 20110666000 WorkBench™ software	
Transmitter Modulation	Modulation: QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, and 128 QAM (SCDMA only) Data rate: Up to 108 Mbps with 4 upstream channels bonding Frequency (edge to edge): 5 to 42 MHz (DOCSIS) 5 to 65 MHz (EuroDOCSIS) 5 to 65 MHz (DOCSIS-J) Output level of CM can be controlled by CMTS though power ranging function	P/N 0930083000 ACTS™ software P/N 0930144000 TDM software P/N 2011092100 8300 FST Forward Sweep Transmitter P/N 2011072001 8310 RSA Return Sweep Analyzer	
85 MHz Source Board (optional)	Step: 1 dB Frequency range: 5 to 85 MHz Modulation types: CW, pulse, tag, sweep 42, sweep 65, sweep 85, single, repeat, loopback Frequency tuning: 10 kHz, 100 kHz, 1 MHz, 3 MHz, 5 MHz, 6 MHz Min output: 20 dBmV Max output: 55 dBmV Built-in pre-amp	P/N 2011375000	

