

mod. **HD TAB 9** STCO

THE PROFESSIONAL & ACCURATE TOUCH SCREEN ANALYZER

Automatic, Fast & Easy-to-Use

TFT 9"
16:10

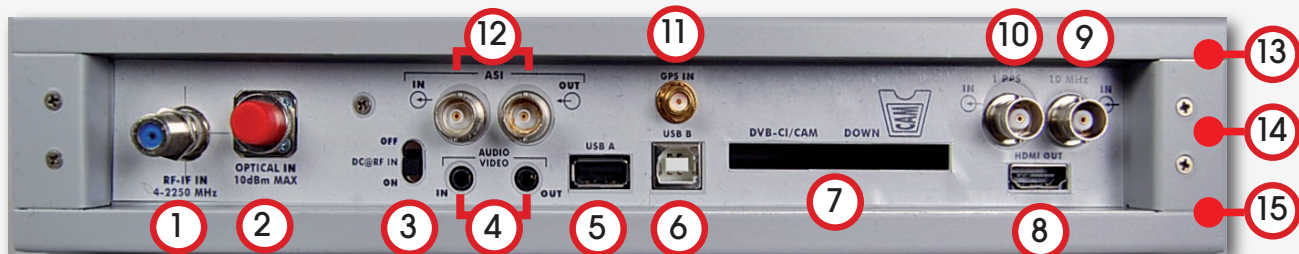


FULL TOUCH
Excludable

EXCLUSIVE DUAL
COMMANDS

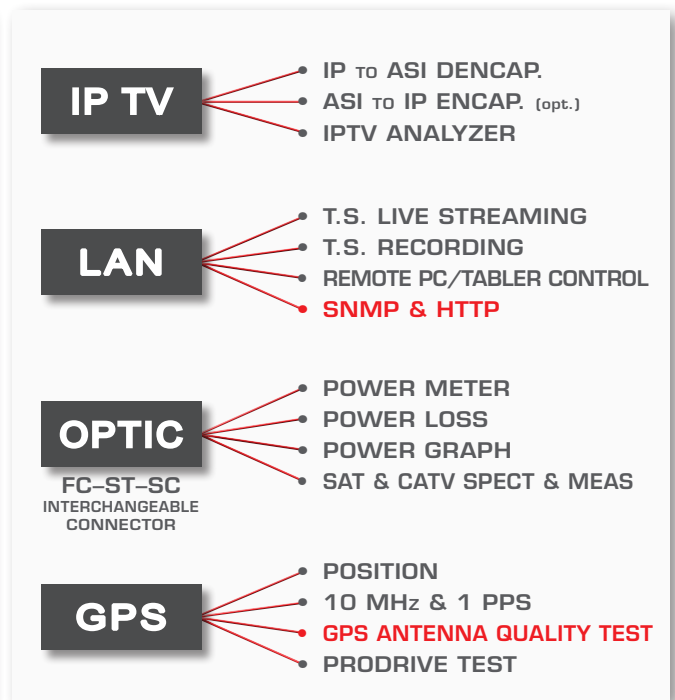
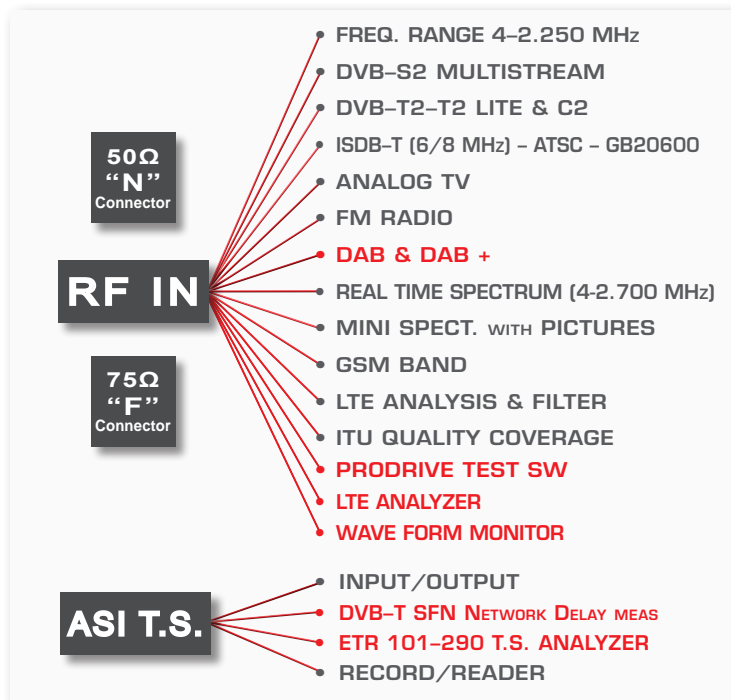
MECHANICAL
Keys & Encoder

UP SIDE CONNECTOR VIEW



- 1 = IF/RF IN connector type *F* 75 Ω or OPTIC IN: FC-ST-SC opt.
- 2 = IF/RF In connector type *N* 50 Ω or OPTIC IN: FC-ST-SC opt.
- 3 = Remote Power Supply switch - DC at RF IN ON/OFF
- 4 = Analog Audio & Video IN/OUT connector
- 5 = USB A connector for memory stick
- 6 = USB B connector for SW/test drive (opt.) upgrades
- 7 = Common Interface Slot for CAM module
- 8 = HDMI Output connector

- 9 = 10 MHz Input connector (opt.)
- 10 = 1PPS Input connector (opt.)
- 11 = GPS antenna Input with SMB connector (opt.)
- 12 = ASI Transport Stream IN/OUT
- 13 = TS over IP input (IP decapsulator opt.)
- 14 = LAN Ethernet RJ45 connector
- 15 = Power Supply input (12 V DC - 3A)



HD TAB 9 MAIN FUNCTIONS

SUPPLIED

- N,2 IF/RF INPUTS "N" 50Ω/"F" 75Ω (or N & opt. OPTIC, or F& opt. OPTIC)
- REAL TIME SPECTRUM with MAX HOLD
- DVB-T2 with Multi-PLP
- DVB-S2 MULTISTREAM with ISI Select
- WORLD WIDE ANALOG TV & RADIO STANDARDS
- DVB-S2 & C2 with AUTOMATIC SYMBOL RATE SELECTION
- ASI INPUT/OUTPUT
- FULL MPEG 2&4/SD & HD DECODER
- T.S. RECORDER/READER via LAN
- MER vs CARRIER Nor/Inverted
- ALL MEASUREMENTS: MER, PER, LDPC, BCH, αBER, βBER, EVM, NOISE MARGIN, Average POWER
- ECHOES/MICROECHOES/PREECHOES in REAL TIME
- COMMON INTERFACES for CAM
- CATV MEAS: INGRESS, LEAKAGE, BARSCAN & TILT
- LCN PROGRAM CODE
- AAC/HEAAC & AC3/DD+DOLBY SOUND
- FREE SW UPGRADES from the Rover WEBSITE
- SUN and RAIN PROOF

- ALUMINIUM BODY, BAG & CASE
- 6h /10A LI-ION POLIMER BATTERIES

OPTIONAL

- DVB-T2 LITE
- DAB+ MEASURES
- ETR 101-290 T.S. ANALYZER, built-in FPGA
- DVB-C2
- LTE AUTOTEST with REJECTION FILTER
- OPTIC INPUT for PWR & SPECT with INTERCHANGEABLE CONNNECTORS, ST/SC/FC
- IP to ASI/DE-ENCAPSULATOR
- IPTV QUALITY ANALYZER
- NETWORK DELAY MEASUREMENTS for the DVB/T SFN NETWORK
- GPS RECEIVER for POSITION & GPS ANTENNA QUALITY TEST
- SIGNAL COVERAGE QUALITY with GPS & "PRODRIVE TEST SW"
- SATEXPRT FUNCTION DISH POINTING
- MINI SPECTRUM ON DIGITAL TV PICTURE

MULTI-PURPOSE BAG

Make work easier by taking advantage of your HD TAB 9's multi-purpose bag



- 1** Work safely and without restrictions with both **hands free**.

Connect the shoulder strap to the two hooks at the corners of the bag (top left and bottom right), so you can **hang your meter around your neck**, leaving both hands free.

2



- 3** The **sun-light-shield flap** allows an even better visibility of the high brightness display.

Secure your meter by connecting it to the antenna mast or in your car with the help of a practical **ring belt with quick attachment**.

4



- 5** If you change the configuration of the shoulder strap, you can **carry** the meter easily vertically **by your side**.

You can also **carry** your instrument **using** its practical **handle**.

6



7

You can use the bag's convenient **stand flap** for operation on a counter.



HD TAB 9 TECHNICAL SPECIFICATIONS

SUPPORTED STANDARDS

SAT:	DVB-S DVB-S2 Single Stream DVB-S2 Multi-Stream (for Broadcast Multiple Network, Transmitters feeding)
TV:	Analog TV: PAL / SECAM / NTSC B-G-I-L-M-N DVB-T DVB-T2 Multi-PLP ATSC USA* GB20600 China* ISDB-T/Tb JAPAN & South America*
* option	
CATV:	DVB-C & Annex A
option	DVB-C & Annex B DVB-C2 EU*
RADIO:	FM DAB (PWR MEAS.)
OPTIC (option):	WL 1310 - 1490 (1625 for USA) - 1550
ASI:	ASI IN/OUT
LAN IPTV (option):	Encaps./De-encaps. IP to ASI/ASI to IP
RF input performances (5-2.250 MHz)	
2 selectable RF inputs:	1- 75 Ω "F" connector and 1 - 50 Ω "N" connector, or on request: 1- 50 Ω "N" connector and OPTIC INPUT, or 1-75Ω "F" connector and OPTIC INPUT with interchangeable connector ST/SC/FC, Input selectable in the meter's config menu
50Ω input matching (RL):	SAT >18 dB TV/CATV >20 dB
75Ω input matching (RL):	SAT >16 dB TV/CATV >18 dB
Audio decoding	
MPEG-1 Layer I / II (ISO-IEC 13818-3) Dolby Digital Plus Dolby AC-3 AAC & HE AAC	
Video decoding	
MPEG-2 MP@ML HDTV (ISO-IEC 13818-2) MPEG-4/AVC (ISO-IEC 14496-10) ITU-T H.264 ITU-T HEVC (2014 with Interchangeable MPEG decoder board)	

DIGITAL SATELLITE

Standard:	DVB-S (EN 300421) DVB-S2 Single Stream (DTH) DVB-S2 Multi stream (for Broadcast Multiple Network, Transmitter feeding)
RF input:	2 selectable inputs: 1- 75 Ω "F" connector and 1 - 50 Ω "N" connector, or on request: 1- 50 Ω "N" connector and OPTIC INPUT, or 1-75Ω "F" connector and OPTIC INPUT with interchangeable connector ST/SC/FC, Input selectable in the meter's config menu
Input level range:	30 to 130dBμV - Max input power without damage +30 dBm (30V without simultaneous generation of internal voltage to the RF input)
Frequency range:	930 MHz to 2250 MHz
Frequency resolution:	1MHz (with 100 KHz AFC Control)
Modulation:	QPSK, 8PSK, 16APSK, 32APSK
Roll Off:	Automatic selection in line with the selected standard
FEC:	1/2, 2/3, 3/4, 5/6, 7/8, (DVB-S) 1/2, 2/3, 3/4, 5/6, 8/9, 9/10, 2/5, 3/5 (DVB-S2) Automatic selection
Symbol Rate:	DVB-S: 1 to 45MS/s Full automatic selection DVB-S2: 2 to 45MS/s Full automatic selection
ISI Selection (DVB-S2 Multistream):	From 1 to 10
ISSY synchronization (DVB-S2 Multi-stream):	Automatic detection and reading
Pilot (DVB-S2):	On, off. Automatic detection & reading
FEC Frame (DVB-S2):	Normal, short. Automatic detection and reading
LNB Control:	V (13V) / H(18V) polarization 22kHz tone DiSEqC 1.0 and 2.0, SCR & MOTOR

Digital SAT Measurement performances

Synchronization indication:	Unlock, Power Too Low, Lock
RF power level accuracy:	1dB typ. (2dB max)
RF level unit:	dBμV, dBmV, dBm selectable
AFC - Capture range:	0 to 5MHz – step 100kHz
LNB frequency error measurement:	0 to 5MHz – step 100kHz
MER Range:	Up to 25dB
MER Accuracy:	0,5dB up to 18dB - 1dB from 19 to 25dB
BER before Viterbi (DVB-S):	1E-06 to 2E-02
BER after Viterbi (DVB-S):	1E-08 to 0
BCH (DVB-S2):	1E-06 to 1E-02
LDPC (DVB-T2):	1E-08 to 0
PER (DVB-S2):	1E-07 to 0
Constellation:	Constellation diagram with standard-specific grid and zoom

SAT Special Functions

SAT SCR:	This function lets you control and verify the SCR LNB installation by checking the correct signal reception at each one of the LNB's RF outputs via the spectrum analyzer or the SAT measurement interface.
DUAL FEED LNB:	This function enables the user to verify the installation of a Dual Feed LNB dish, that can be either 9°&13°, 13°&19° or 19°&23° or others; if the installation type is set to VARIABLE the user can perform the test on a couple of independent plans, at choice among those available in the meter.
DiSEqC MOTOR:	This function allows the user to control motorized dishes by moving the motor via DiSEqC commands. The control can be done using either the spectrum analyzer or the SAT measurement interface.
SAT FINDER:	This function allows the user to determine the correctness of the dish pointing by detecting three transponders among those composing the requested satellite.
BUZZER & NOISE MARGIN GRAPH:	This function could be activated on Satellite and Terrestrial canalizations. Its main AIM is to provide the user with a real time GRAPHIC diagram of the Noise Margin vs time. The measurement is also associated with a buzzer, synthesizing a tone the intensity of which is proportional to the signal quality.
SAT POINT:	The aim of this function is to automatically set all spectrum parameters to facilitate dish pointing operations; the MAX HOLD & LIVE function guarantees perfect pointing at the maximum signal strength direction.
SATEXPRT FUNCTION: (Option)	Advanced universal SAT pointer, the faster & accurate SAT FINDER (with electronic compass opt.)

DIGITAL TERRESTRIAL TV

Standard:	DVB-T/DVB-H (ETSI EN 300 744) DVB-T2 (ETSI EN 302 755)
RF input:	2 selectable inputs: 1- 75 Ω "F" connector and 1 - 50 Ω "N" connector, or on request: 1- 50 Ω "N" connector and OPTIC INPUT, or 1-75Ω "F" connector and OPTIC INPUT with interchangeable connector ST/SC/FC, Input selectable in the meter's config menu
Input level range:	29 to 130dBμV - Max input power without damage +30dBm (30V without simultaneous generation of internal voltage to the RF input)
Frequency range:	47MHz to 1000 MHz
Frequency resolution:	50kHz
OFDM Modulation:	QPSK, 16QAM, 64QAM (DVB-T) 256QAM (DVB-T2)
FFT mode:	2k, 8k (DVB-T) 1k, 2k, 4k, 8k, 16k, 32k (DVB-T2) Automatic selection
Guard Interval:	1/4, 1/8, 1/16, 1/32 (DVB-T) 1/4, 1/8, 1/16, 1/32, 1/128, 19/128, 19/256 (DVB-T2) Automatic selection
FEC:	1/2, 2/3, 3/4, 5/6, 7/8 (DVB-T) 1/2, 2/3, 3/4, 5/6, 7/8, 3/5, 4/5 (DVB-T2) Automatic selection
Channel Bandwidth:	5MHz, 6 MHz, 7 MHz, 8 MHz

Digital TV Measurement performances

Synchronization indication:	Unlock, Power Too Low, Lock
RF power level accuracy:	0,5dB typ. (1dB max)
RF level unit:	dBμV, dBmV, dBm Selectable
MER Range:	Up to 42dB

MER Accuracy:	0,5dB up to 38db, 0,7dB up to 40dB, 1,2dB up to 42 dB
BER before Viterbi (DVB-T):	1E-06 to 1E-02
BER after Viterbi (DVB-T):	1E-08 to 0
BCH (DVB-T2):	1E-06 to 1E-01
LDPC (DVB-T2):	1E-08 to 0
PER (DVB-T2):	1E-07 to 0
Constellation:	Constellation diagram with standard-specific grid and zoom
Echoes measurement:	-340 μ s to 340 μ s 4 selectable scales
MER vs Carrier:	MER measurement for DVB-T and DVB-T2 signals with selectable carrier range: 1 to 32k carriers, normal or reverse.

Digital TV Special Functions

ATTENUATION TEST:	This function lets you verify that all ends of the distribution system receive the same signal strength, to make sure that there are no losses or other distribution issues.
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DIGITAL CABLE CATV

Standard:	DVB-C (ETSI EN 300 429) DVB-C2 (ETSI EN 302 769) (opt.)
RF input:	2 selectable inputs: 1- 75 Ω "F" connector and 1 - 50 Ω "N" connector, or on request: 1- 50 Ω "N" connector and OPTIC INPUT, or 1-75 Ω "F" connector and OPTIC INPUT with interchangeable connector ST/SC/FC, Input selectable in the meter's config menu
Input level range:	35 to 130dB μ V - Max input power without damage +30dBm (30V without simultaneous generation of internal voltage to the RF input)
Frequency range:	4MHz to 1000 MHz
Frequency resolution:	50kHz
Modulation:	16QAM, 32QAM, 64QAM, 128QAM, 256QAM (DVB-C), 1024QAM (DVB-C2)
Symbol rate:	2 to 6.999MS/s - Automatic selection
FEC:	
Channel Bandwidth:	6 MHz, 7 MHz, 8 MHz

CATV Measurement performances

Synchronization indication:	Unlock, Power Too Low, Lock
RF power level accuracy:	0,5dB typ. (1dB max)
RF level unit:	dB μ V, dBmV, dBm selectable
MER Range:	Up to 40 dB
MER Accuracy:	0,5dB typ.
BER before Reed Solomon:	1E-09 to 1E-02
BER after Reed Solomon:	1E-09 to 0
Constellation:	Constellation diagram with standard-specific grid and zoom

Digital CATV Special Functions

LEAKAGE:	This function provides a technician with a tool to verify the presence of any signal leakage in a CATV distribution system.
INGRESS:	This function lets the user verify the interference of the CATV return path, with a frequency band ranging from 4 to 66 MHz

OPTICAL INPUT (option)

Input interface:	FC / ST / SC exchangeable connectors
Wavelengths range:	WL 1310 - 1490 (1625 for USA) - 1550
Optical input level range:	- 40 dBm to +10 dBm
Optical level resolution:	0,1dB
Optical level measurement accuracy:	0,5dB

ANALOG TV

Standard:	PAL / SECAM / NTSC B-G-I-L-M-N
RF input:	2 selectable inputs: 1- 75 Ω "F" connector and 1 - 50 Ω "N" connector, or on request: 1- 50 Ω "N" connector and OPTIC INPUT, or 1-75 Ω "F" connector and OPTIC INPUT with interchangeable connector ST/SC/FC, Input selectable in the meter's config menu
Input level range:	5 to 130 dB μ V - Max input power without damage +30 dBm (30V without simultaneous generation of internal voltage to the RF input)
Frequency range:	47 MHz to 1000 MHz
Frequency resolution:	50 kHz

Analog TV Measurement performances

Level indication:	Level to low
RF power level accuracy:	0,5dB typ. (1dB max)
RF level unit:	dB μ V, dBmV, dBm selectable

C/N measurement:	5dB to 55dB
A/V ratio:	4dB to 26dB
Audio carrier FM modulation:	4,5MHz, 5,5 MHz, 6,0 MHz, 6,5 MHz
Audio Carrier AM modulation	6,5 MHz "L" FRANCE Standard

LAN IP/ASI ENCAP./DENCAP. (option)

IP Interface	
LAN:	1 Gb/s Ethernet interface
IP protocol:	UNICAST/MULTICAST RTP/UDP WITH 2 dimensional FEC IGMP v2
FEC:	Pro MPEG CoP#/SMPTE 2022
IP measurement	
Streaming status:	Present, Not Present
Number of MPEG packet size:	1 - 7
TS packet size:	188, 204
FEC status:	No FEC, FEC1, FEC2
L:	$1 \leq L \leq 20$
D:	$4 \leq D \leq 20$
Input Ethernet port:	1, 2, both
TS Bitrate:	0 - 216 Mb/s
Number of missing packets successfully recovered:	0 - ∞
Number of missing packets:	0 - ∞
IP Stream Jitter:	0 - 1000 ms
IAT:	MIN, MAX, MED, Jitter
ASI mode	
ASI Mode:	MPEG-TS on ASI Compliant to EN 50083-9 packet length 188/204 bytes
ASI Status:	Lock 188, Lock 204, Unlock
ASI Bitrate:	0 - 216 Mb/s
Destination MAC Address:	MAC is the host receiver in unicast; in multicast it is the MAC multicast defined by the Destination IP address
Transport Stream Content:	MPEG2 and MPEG4 HD Service

GPS RECEIVER (option for Position & Installation Antenna Test)

RF Input:	SMA 50 Ω connector
DC at RF IN:	5V d.c. automatic, for active and passive Antennas (active antenna supplied)
RF level Sensitivity:	- 160 dBm
Frequency:	L1 (1575, 42 MHz)
Noise Figure:	1,5 dB typ.
Position accuracy:	2,0 m typ. 2,5 m
Hot Start Autonomus:	1 s
Timepulse Frequency:	10 MHz & ppS
Received SAT:	up to 12

SAT, TV & CATV SPECTRUM ANALYZER

Measurement parameters	
Frequency range:	4MHz to 2.250 MHz
RF level range:	5 to 130dB μ V
Resolution Bandwidth:	TV / CATV = 100kHz SAT = 4MHz / 1MHz selectable
SPAN:	TV / CATV: 2MHz, 5 MHz, 7 MHz, 10 MHz, 20 MHz, 50 MHz, 100 MHz, 200MHz, 500 MHz, Full VHF, Full UHF, 5/65 RP and FULL band 4 to 1000 MHz SAT: 50MHz, 100MHz, 200MHz, 500MHz, FULL band 930-2.250 MHz
Video Bandwidth:	Automatic selection Satellite: FAST mode = 10kHz SUPERFAST mode = 5kHz TV & CATV: FAST mode = 100kHz SUPERFAST mode = 50kHz
Frequency sweep:	Up to 80ms
dB/div scale selection:	1dB/div, 2dB/div, 5dB/div, 10dB/div
Spectrum Special functions	
Max-hold function:	to compare the real-time signal with the max-hold envelope.
Spectrum save & recall function:	to save and store spectrum measurements.

Markers:	Single marker: 1 mrk to perform punctual measurements on the signal envelope Delta marker: 2 mrk to perform frequency offset and differential power measurements between two points of the spectrum Marker BW: 3 mrk to measure precisely the channel frequency bandwidth and the corresponding bandwidth power
Help function:	To perform channel auto-discovery from the signal spectrum: the meter determines automatically modulation type and parameters (DVB-T/2, DVB-S/S2, DVB-C/C2, Symbol Rate, Centre frequency, etc).
Visualization modes:	Full Picture or Envelope MENU Selectable
Trace color schemes Customizable:	GREEN BLUE GREY BROWN config. Selection

TRANSPORT STREAM PERFORMANCE ANALYZER

TS interface		
Input / output:	75 Ω BNC connectors	
ASI mode:	MPEG-TS on ASI - compliant to EN 50083-9 Packet length 188 / 204 bytes	
Transport Stream content:	MPEG-2 and MPEG-4 HD Services	
TR 101 290 v1.2.1 ANALYSIS		
1st priority monitoring:	1.1 Sync loss 1.2 Sync byte 1.3.1 PAT Int 1.3.2 PAT PID 1.3.3 PAT scr 1.4.a Cont [Ord]	1.4.b Cont [Tri] 1.4.c Cont [Los] 1.5.1 PMT Int 1.5.2 PMT Scr 1.6 PID Err
2nd priority monitoring: * on a selected Service	2.1 Transport error 2.2 CRC error 2.3a PCR repetition error 2.3b PCR discontinuity error	2.4 PCR accuracy error * 2.5 PTS error 2.6a CAT [SCR] 2.6b CAT [Table]
3rd priority monitoring:	3.1 PID error 3.2 SI Rep 3.4 UNREF PIDS 3.5 SDT error	3.6 EIT error 3.7 RST error 3.8 TDT error
TS information monitoring		
SI tables decoding:	Visualization of service list, stream type	
PMT decoding:	Service PID composition; real time refresh on service selection	
Bitrate measurement:	TS total bitrate, Stuffing rate Service bitrate, ES bitrate 0 to 270Mb/s Resolution 1kb/s	
TS advanced monitoring (option)		
Network Delay measurement:	Transport Stream delay measurement based on MIP packets range: 0 to 999 ms**	
PCR accuracy:	PCR accuracy measurement and graphical representation* Measurement range: 0 to 1000 ns	
Jitter measurement:	Jitter accuracy measurement and graphical representation* *on a selected service (opt.) **external 10MHz/1PPS reference needed (opt.)	

PRODRIVE TEST

Fast Multiple CH Measurement, from 1 to 8 Analyzers in parallel.

Single CH or multiple CHs measurements acquisition for each Analyzer.

Supported mobile measurements: Field strength/power, Mux lock, MER, PER/BER, ECHOES, (depending on speed and standard).

Supported Stationary Measurements: Field strength/power, Mux lock, MER, PER/BER, ECHOES.

Supported Standards: DVB-T, DVB-T2, Analog TV, FM Radio, DAB, ISDB-T 6/8 MHz, ATSC, GB20600.

DATA STORAGE AND LOGGING

Logging capabilities

Automemory:	Automatic channels detection and recording based on a channel PLAN. The result is an AUTO plan stored in the meter to be used as reference during measurement campaign
Manumemory:	Function to create customized mixed channel plans SAT-TV-CATV-RADIO manually or with PC
Datalogger:	Automated measurement campaign based on an Automemory or Manumemory channel plan. The Datalogger contains all the RF parameters of the listed channels and can store up to 1300 channels
Data export:	USB-On-The-Go plug to connect an external USB device 10/100 Base-T LAN to download data on an external PC

GENERAL DATA

Integrated Controller

CPU:	ARM11 & Cortex ARM7
Operating System:	RO.VE.R. embedded OS
Storage:	External USB drive LAN connection for data download on external PC

Interfaces

Universal Serial Bus (USB):	1x USB-A, USB On-The-Go for USB memory stick 1x USB-B for PC connection
Local Area Network (LAN):	1x 10/100 Base-T Ethernet interface (management)
Asynchronous Serial Interface (ASI):	ASI input on 75Ω BNC connector ASI output on 75Ω BNC connector
External Reference:	10MHz input on 75Ω BNC connector* 1PPS input on 75Ω BNC connector* * Supplied with optional SFN Network Delay Measurement
Audio / Video:	Composite A/V input HDMI output
Common Interface:	PCMCIA slot for single/multi-service CAM modules
IF/RF input:	2 selectable inputs: 1- 75 Ω "F" connector and 1 - 50 Ω "N" connector, or on request: 1- 50 Ω "N" connector and OPTIC INPUT, or 1-75Ω "F" connector and OPTIC INPUT with interchangeable connector ST/SC/FC, Input selectable in the meter's config menu

Remote Operation

USB interface:	S.M.A.R.T. management Software for firmware upgrades and file Expert to create plans & download measurements, etc.
Ethernet: <i>* (option)</i>	Instrument remote measurement application via SNMP*

Local Operation (Dual command TOUCH and MECHANICAL)

Touch screen display:	Full touch instrument operation Touch screen excludable via conf. menu
Full Keyboard & High precision 24 steps encoder:	Direct access to meter's with 6 main direct keys: SAT, TV, CATV, Spectrum, Barscan, PLAN and CHs, Freq. Enter with mechanical encoder.

Very High Brightness TFT Display

Width:	10,2" - brightness 1200 candles per m2
Format:	16:10 full VGA 800x480 high brightness touch screen display
Resolution:	720p to 1080 p
Graphical User Interface:	Selectable color themes (green, blue, grey, brown)

Environmental conditions

Operating temperature range:	0° C to +50° C
Storage temperature range:	-25° C to 70° C
Humidity:	Up to 90% non condensing
AMSL:	Up to 3.000 m
Power Supply:	External power adapter - Input: 110 VAC to 240 VAC - 50 Hz to 60 Hz - Output: 12 VDC - max 3A Internal Battery - LI-ion Polymer 10A battery with up to 6 hours duration

LEADER

LEADER INSTRUMENTS CORPORATION

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