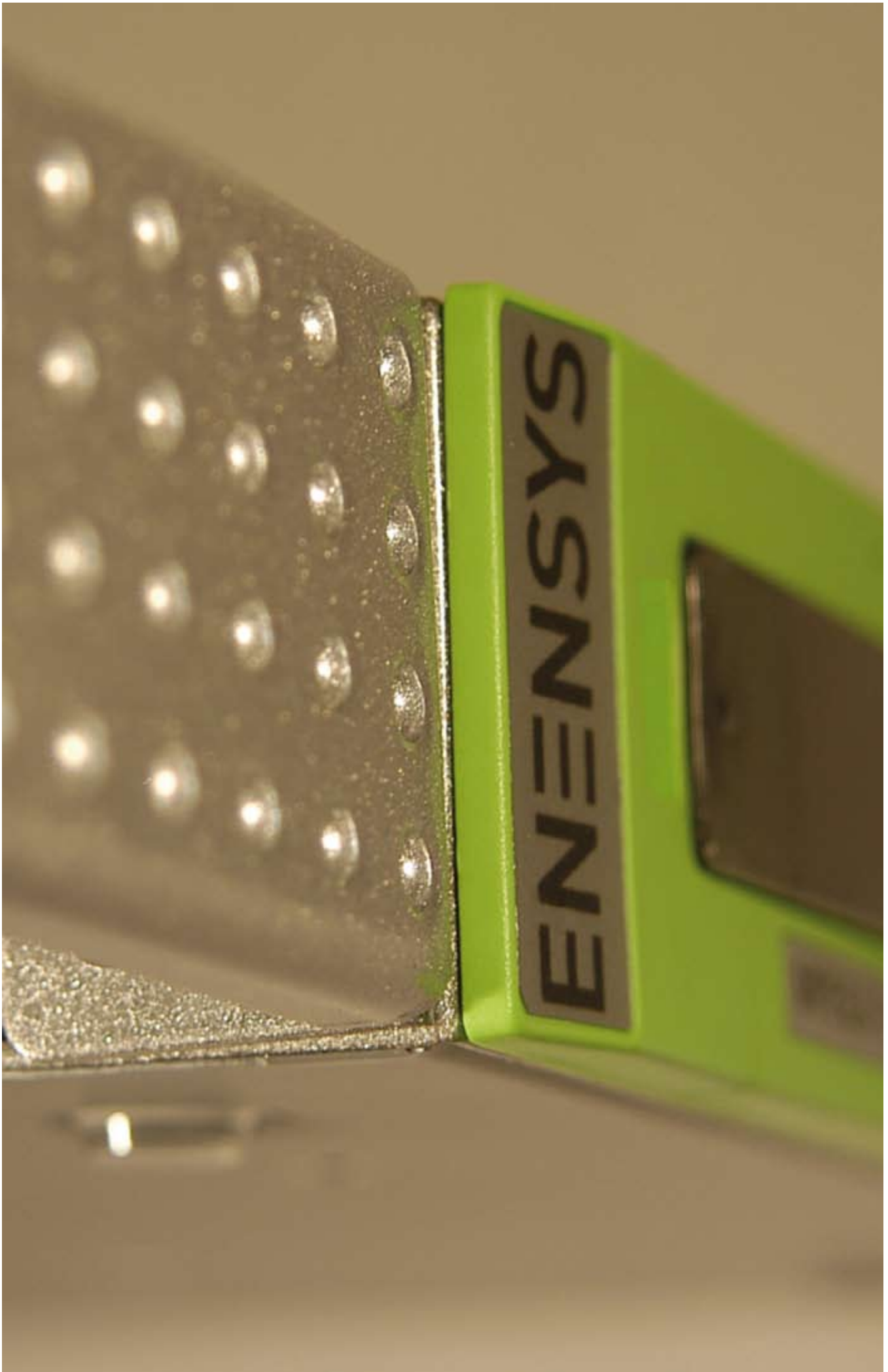


Elements to Systems

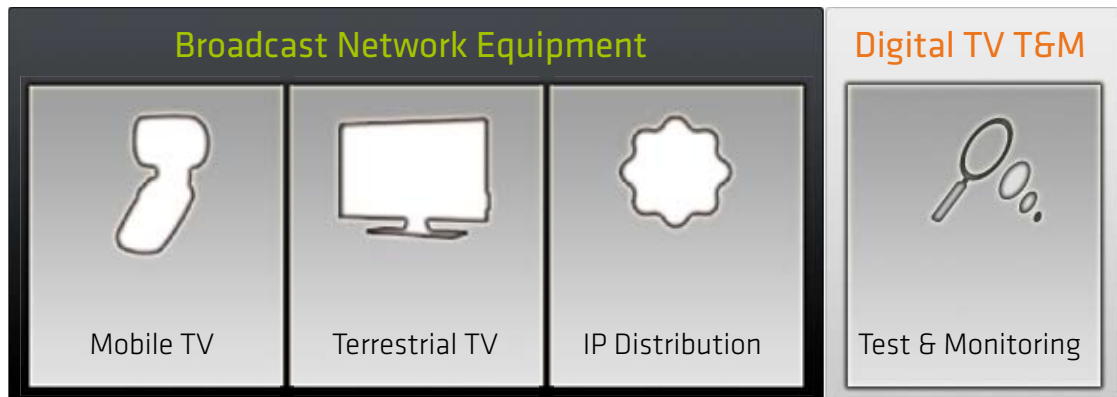
Digital TV Test & Monitoring



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# Introduction

ENENSYS Technologies designs and manufactures innovative professional equipment for Broadcast Network and Digital TV Test & Monitoring core markets.



ENENSYS Technologies, headquartered in Rennes, France, is a fast growing company: established in 2004, ENENSYS today counts over 65 employees and is publicly listed on NYSE Euronext Stock Exchange (FR0010286252 - MLENS).

The Team is composed of highly experienced Engineers, gathering a broad technology base such as hardware design, RF, Signal Processing and software. ENENSYS corporate culture is rooted on strong human values such as anticipation, creativity, empathy and reactivity to be ahead of your needs and achieve Customer care excellence.

High grade service is fostered worldwide by a network of trustworthy Partners and Distributors, sharing same time zone and language as our Customers.

ENENSYS has over 200 Customers located in more than 50 countries including:

- Broadcast Operators,
- Network Operators,
- Telcos,
- TV Channels,
- System Integrators,
- Chipset Vendors,
- Professional Equipment Manufacturers,
- Set Top Boxes Manufacturers.



*ENENSYS HQ, France*

## Independent Supplier

ENENSYS is proud to be an independent company, focused on servicing its Customers. This independence transpires at 3 levels:

- Financial level: ENENSYS is financially independent. Profitable since day 1, ENENSYS is a public company listed on NYSE Euronext Stock Exchange.
- Standard and technology level: ENENSYS is standard agnostic and offers solutions for Mobile TV, Digital Terrestrial TV, IP Distribution, and Test & Monitoring over several technologies.
- Industrial level: ENENSYS is not industrially bound to any player and is opened to integrate in its subsystem any piece of equipment you might recommend.

# Elements to Systems

Whether you are a Global System Integrator looking for the missing link to complete your Digital TV solution, or an Operator looking for a reactive partner to set up a new broadcast network, ENENSYS is your perfect choice.

ENENSYS takes you from your first mobile TV project all the way to your national roll-out, with a step-by-step approach:

## STEP 1 - Discover Technology

Discover technology by setting up a compact transmission chain in your lab and train yourself to this new technology.

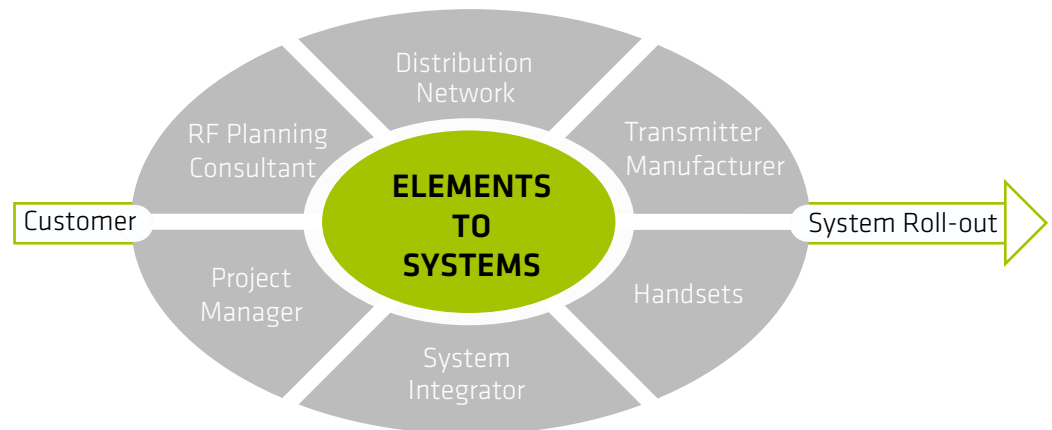
## STEP 2 - Pilot

Deliver a complete pilot platform on a turnkey basis to test services on a city.

## STEP 3 - Roll-Out

Achieve the roll-out of your system hand-in-hand with your preferred Global System Integrator or preferred Transmitter Manufacturer.

Scalability of ENENSYS products enable incremental reuse of units to move from one step to the next one.



ENENSYS design eases equipment integration in Network Management Systems, based on a mutualized SNMP implementation of all ENENSYS products. Once one ENENSYS product has been integrated in your NMS, integration of any other ENENSYS reference is straightforward.

# Customer Services

Every single product delivered by ENENSYS Technologies takes immediate benefits from ENENSYS exclusive Customer Services, including a 12-month warranty as well as granted login to ENENSYS Privileged Area (<http://privileged.enensys.com>): free access to the latest firmware and software downloads, maintenance or evolutionary releases, new technical documents, publications or manuals, etc.

For best service, ENENSYS has set up these following technical contacts and support:

- Global Technical support: +33 (0)1 70 61 70 25 or [support@enensys.com](mailto:support@enensys.com)
- US toll free line: (+1) 949 226-8056
- Shanghai (Chinese technical Engineers) : (+86-021) 62 25 3573

Several support and maintenance packages are available at any time with different levels of servicing that will match Customers' expectations (Standard / Extended / Premium), with suitable conditions (warranty extensions, on-site servicing, training, spare kits, prioritized support or repair...).

# Variety of Standards

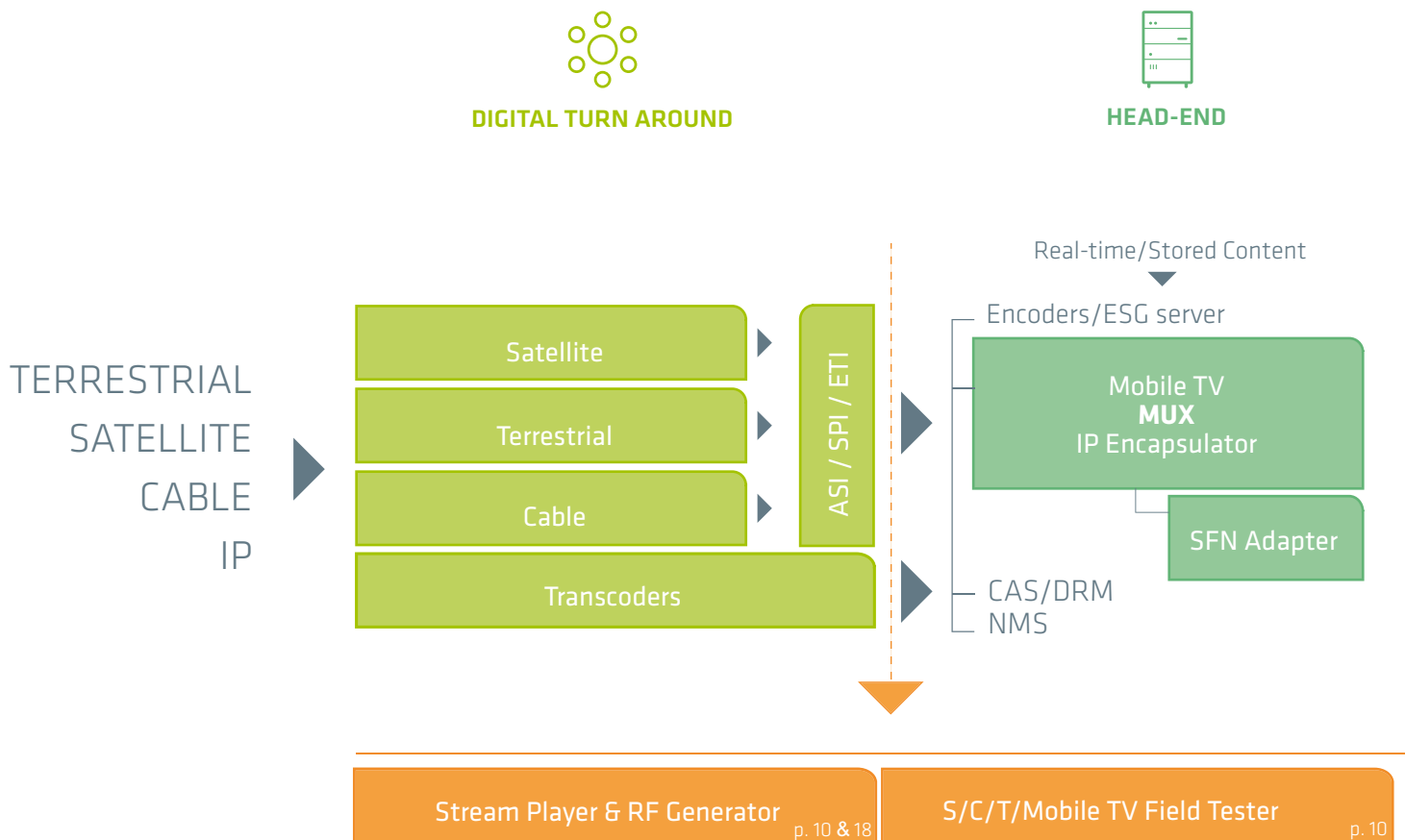
ENENSYS products are not focusing on a given technology but enable our Customers and System Integrators to follow emergence of new broadcast standards without having to re-develop their application or management systems from scratch, and cover the following fields:

- Mobile TV broadcast (DVB-H, T-DMB, MediaFLO)
- Digital Terrestrial TV broadcast (DVB-T, 8-VSB, DTMB)
- Video over IP transport (Pro MPEG Forum CoP3)
- Test & Monitoring (DVB-H, DVB-T, DTMB, QAM...)

ENENSYS products are broadcast grade and thus implement the most widely used standards in the broadcast industry for administration, remote control and redundancy (HTTP, SNMP...).

The aforementioned standards are covered and implemented in ENENSYS portfolio all along its 5 product lines as depicted below.

# Product Lines



# Mobile TV Trainings

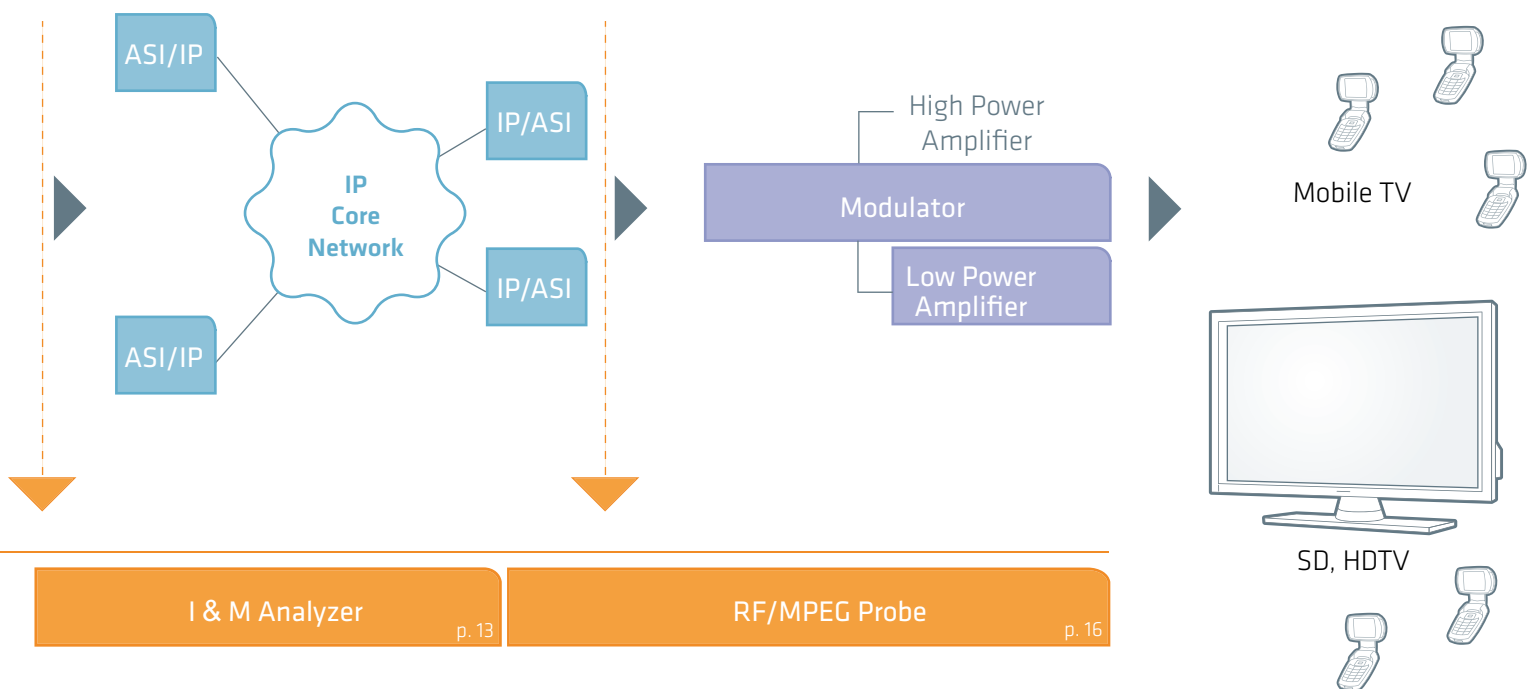
ENENSYS trainings encompass a past, instant and future view on the Digital TV markets, shedding light on both technology and business. Through a set of use cases adapted to customer questioning, ENENSYS offers Digital TV and MobileTV trainings that cover the following areas:

- Mobile TV market, technologies and standards overview, constraints and challenges
- Digital TV transmission (physical layer, transmission, SFN)
- MobileTV architectures (Head-End design, SFN, redundancy, distribution, regionalization)
- Dedicated DVB-H training
  - . DVB-H specific feature and architecture (time-slicing, MPE-FEC, ESG)
  - . DVB-H test & monitoring (Quality of service, Quality of Experience)

Get deeper into business cases around DVB-H deployment scenarios (video formats, handsets, capex/opex).

## IP DISTRIBUTION

## TRANSMISSION



## TEST & MONITORING





**STREAM GENERATION  
CAPTURE  
ANALYSIS**

# DiviSeries: The Digital TV Swissknife

DiviSeries products are must-have devices for testing and validating MPEG2-TS streams. All products are shipped with their companion software for controlling their operation and providing real-time advanced analysis. Applications also come with a command line package ideally suited for automated testing purposes.

Being available for both baseband and RF signals, they are the ideal companion for head-end monitoring or lab & field applications.

DiviPitch is a stream player featuring a signal output, as opposed to DiviCatch which is a stream receiver featuring a signal input and recording and analysis capabilities. DiviDual is a two-in-one product combining DiviPitch and DiviCatch capabilities and featuring both signal input and output.

## FULL RANGE FEATURES

### COMPACT, EASY-TO-USE AND PORTABLE

All DiviSeries are USB self-powered, meaning they do not require any external power supply:  
The pocket size devices can take their power from any USB2.0 port.

Their compact size and robustness make it the ideal companion for field applications when combined with a laptop.



## KEY FEATURES

### STREAM PLAYING

- DVB-ASI, DVB-SPI or ETI interfaces
- Intuitive Graphical User Interface
- Stream feed to broadcast equipment (eg, modulator, remux, etc)
- Playlist: Play one stream after the other
- Loop or segment play mode



### RECORDING

- Record the entire multiplex to a TS file
- Schedule capture time
- Set a maximum size for the captured file
- Endless loop capability for 24/7 monitoring



### MPEG2-TS ANALYSIS

- Real-time bitrate graph
- PSI/SI table parsing for DVB
- PSIP table parsing for ATSC
- MIP packets analysis for SFN networks



# The widest range of FIELD TESTERS on the market

## And even more to come...



### INTERFACES AVAILABLE

	DVB-ASI	ETI	DVB-SPI		RF
			LVDS	LVTTL	
DiviPitch	✓	✓	✓	✓	-
DiviCatch	✓	-	✓	-	✓
DiviDual	✓	✓	✓	✓	-

#### ETR290\* VALIDATION

- DVB's ETSI TR 101 290 guidelines implemented
- MPEG2-TS layer validation
- Priorities 1, 2 and 3 implemented
- PCR accuracy graph
- Configurable thresholds and settings
- Logging of alarms raised

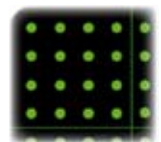


#### PROGRAM DECODING

- Decode all unencrypted programs in real-time
- Simultaneous DVB-H de-encapsulation on all PIDs
- DVB-H IP datagram decoding

#### RF ANALYSIS

- Real-time analysis of key RF parameters
- Constellation graphical display
- MER and EVM for evaluating modulation quality
- Signal level, Signal-to-Noise Ratio and BER for evaluating transmission quality



#### DVB-H ANALYSIS

- All time-sliced PIDs analyzed in real-time
- Information on burst structure
- Delta-T / Jitter information for IP encapsulator optimization
- Calculation of MFER and FER for evaluating quality of restitution
- ESG decoding and analysis



\* What is ETR290?

These guidelines are intended to provide an exhaustive overview of elements that matter for the transmission of an MPEG2-TS stream. All parameters tested in ETR290 are split over three priorities. First-level priority lists a basic set of parameters which are considered necessary to ensure that the TS can be decoded. Second-level priority lists additional parameters which are recommended for continuous monitoring. And third-level priority lists further optional parameters covering varied interests.

## Digital TV Stream Player

### APPLICATIONS

- BROADCAST CHAIN TESTING
- R&D STREAMS, TEST STREAMS PLAYBACK
- PORTABLE DEMONSTRATION SETUP

### KEY BENEFITS

- Easy stream feed to any broadcast equipment
- Available with MPEG2 TS output interface (ASI, SPI)
- Compliant with FLO bitstreams
- Available with ETI output interface (for T-DMB “TV on Mobile” application): ETI NI (G703), ETI NA5592 and ETI NA5376 (G704)
- Command line package for automated testing

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

	DiviPitch	DiviPitch ETI	
Interfaces	DVB-ASI Output	1	
	DVB-SPI (LVDS) Output	Opt.	
	DVB-SPI (LVTTTL) Output	Opt.	
	ETI (NI, NA) Output	-	1
	USB2.0 Port	√	√
Stream Player Capabilities	Off-line stream analysis	√	√
	Loop / Segment play modes	√	√
	Raw data playback mode	√	-
	Streams play-list handling	√	√
	Bit Rate Autodetection with PCRs	√	-
	Null Packets Removal	√	-
Ordering Codes	DVB-ASI Stream Player	DiviPitch	-
	ASI+LVDS Stream Player	DiviPitch LVDS	-
	ASI+LVTTTL Stream Player	DiviPitch TTL	-
	ETI Stream Player	-	DiviPitch ETI



# DiviCatch

## MPEG2 Stream Analyzer/Recorder

### APPLICATIONS

- LIVE BROADCAST CHAIN TEST & MONITORING
- R&D STREAMS OR SIGNAL ANALYSIS

### KEY BENEFITS

- Record live baseband signals
- Analyze MPEG2 TS tables in real-time
- Validate the conformity of MPEG2 TS layer
- Watch received programs (incl. HD)
- MPEG2 TS over IP streaming (multicast or unicast)

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

	DiviCatch	
Interfaces	DVB-ASI Input	1
	USB2.0 Port	√
Capture and Analysis	Real-time Analysis + ETR290	√
	Services, PIDs, PSI/SI Tables Display	√
	MPEG2/MPEG4 services decoding and display	√
	Standard and scheduled recording	√
	Multi-files endless circular recording	√
	Raw mode capture	√
	TS over IP analysis and streaming	√
Ordering Codes	DVB-ASI Capture Device	DiviCatch



## DVB-T & DVB-H Live RF Analyzer

### APPLICATIONS

- BROADCAST TEST AND MEASUREMENT
- RF RECEPTION QUALITY MEASUREMENT
- INSTALLATION & MAINTENANCE
- COVERAGE AND DRIVE TESTS

### KEY BENEFITS

- Receive live DVB-T and DVB-H signals
- Validate the quality of reception / transmission
- Watch received programs (incl. HD)
- Analyze and validate MPEG2 TS layer in real-time
- Evaluate Quality of Restitution (MFER and FER ratios)
- Analyze DVB-H layer and ESG in real-time
- Output coverage maps with GPS capability (opt.)

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		DiviCatch RF-T	DiviCatch RF-T/H
Interfaces	DVB-T RF Input	1	-
	DVB-T & DVB-H RF Input	-	1
	DVB-ASI Input	1	1
	RF Loophthrough	1	1
	USB2.0 Port	1	√
RF Front End	Constellation Display	√	√
	Signal Quality, MER, SNR, BER... Processing	√	√
	Frequency range	45-864 MHz	45-864 MHz
Capture and Analysis	Real-time Analysis + ETR290	√	√
	Services, PIDs, PSI/SI Tables Display	√	√
	MPEG2/MPEG4 services decoding and display	√	√
	ESG Parsing (DVB - CBMS) and services zapping	-	√
	DVB-H real-time analysis	-	√
	Standard and scheduled recording	√	√
	TS over IP analysis and streaming	√	√
	GPS feature	Opt.	Opt.
Ordering Codes	ASI + DVB-T + DVB-H RF Capture Device	DiviCatch RF-T	DiviCatch RF-T/H
	Above with GPS feature <b>OPTION</b>	DiviCatch <b>GPS</b>	DiviCatch <b>GPS</b>



# DiviCatch RF DTMB

## DTMB Live RF Analyzer

### APPLICATIONS

- BROADCAST CHINESE DTTV T&M
- RF RECEPTION QUALITY MEASUREMENT
- INSTALLATION & MAINTENANCE
- COVERAGE TESTS

### KEY BENEFITS

- Receive live DTMB signals
- Validate the quality of reception / transmission
- Watch received programs (incl. HD)
- Analyze and validate MPEG2 TS layer in real-time
- Output coverage maps with GPS capability (opt.)

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		DiviCatch RF-DTMB
Interfaces	DTMB RF Input (GB20600-2006)	1 UHF + 1 VHF
	DVB-ASI input	1
	USB2.0 Port	1
RF Front End	Signal Quality, BER processing, etc	√
	Frequency range	174-245 MHz 470-862 MHz
Capture and Analysis	Real-time Analysis + ETR290	√
	Services, PIDs, PSI/SI tables display	√
	MPEG2/MPEG4 services decoding and display	√
	Standard and scheduled recording	√
	TS over IP analysis and streaming	√
	GPS feature	Opt.
Ordering Codes	ASI + DTMB RF capture Device	DiviCatch RF-DTMB
	Above with GPS feature <b>OPTION</b>	DiviCatch RF-DTMB <b>-GPS</b>



## Cable RF Receiver with Stream Analyzer/Recorder

### APPLICATIONS

- DIGITAL CABLE TROUBLESHOOTING
- BROADCAST TEST & MONITORING
- RF RECEPTION QUALITY MEASUREMENT
- INSTALLATION & MAINTENANCE

### KEY BENEFITS

- Receive live Digital Cable signals
- Validate the quality of reception / transmission
- Watch the programs received (incl. HD)
- Analyze and validate MPEG2 TS layer in real-time
- Fit for worldwide Digital Cable broadcast schemes (ITU-J83)
- All modulation schemes supported (from QPSK to 256 QAM)

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		DiviCatch RF-C
Interfaces	ITU-J83 Digital Cable RF Input	1
	DVB-ASI Input	1
	RF Loophthrough	1
	USB2.0 Port	✓
Cable Front End	ITU-J83 Annex A, B, C	✓
	Constellation Display	✓
	Signal Quality, MER, SNR, BER... Processing	✓
Capture and	Real-time Analysis + ETR290	✓
Analysis	Services, PIDs, PSI/SI Tables Display	✓
	MPEG2/MPEG4 services decoding and display	✓
	Standard and scheduled recording	✓
	TS over IP streaming	✓
Ordering Code	DVB-ASI + Cable RF Capture Device	DiviCatch RF-C



# DiviDual

## Digital TV Stream Player/Analyzer/Recorder

### APPLICATIONS

- BROADCAST TEST & MONITORING
- PORTABLE DEMONSTRATION SETUP
- RGD STREAMS OR SIGNAL ANALYSIS

### KEY BENEFITS

- All-in-one DiviPitch + DiviCatch functionalities, available with either MPEG2-TS ASI/SPI or ETI input and output

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		DiviDual	DiviDual ETI
Interfaces	DVB-ASI Input	1	-
	DVB-SPI (LVDS) Input / Output	Opt.	-
	DVB-SPI (LVTTTL) Input / Output	Opt.	-
	DVB-ASI Output	1	-
	ETI input (NI, NA)	-	1
	ETI output (NI, NA)	-	1
Capture and Analysis	USB2.0 Port	✓	✓
	Real-time Analysis + ETR290	✓	-
	Services, PIDs, PSI/SI Tables Display	✓	-
	MPEG2/MPEG4 services decoding and display	✓	-
	Standard and scheduled recording	✓	✓
	Raw mode capture	✓	-
Stream Playing	TS over IP analysis and streaming	✓	-
	Off-line Stream analysis	✓	✓
	Loop / Segment play modes	✓	✓
	Raw data playback mode	✓	-
	Streams Play-list handling	✓	✓
	Bit Rate Autodetection with PCRs	✓	-
Ordering Codes	Null Packets Removal	✓	-
	DVB-ASI Play and Capture Device	DiviDual	-
	ASI+LVDS Play and Capture Device	DiviDual LVDS	-
	ASI+LVTTTL Play and Capture Device	DiviDual TTL	-
	ETI Play and Capture Device	-	DiviDual ETI



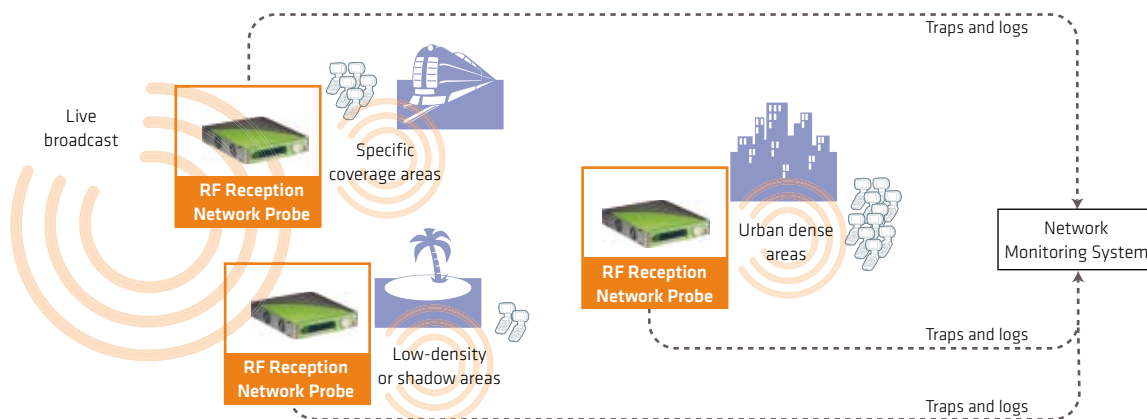


**MONITORING**

# Broadcast Monitoring Probes

CastXplorers are full-SNMP monitoring devices returning and logging real-time RF measures and key MPEG2-TS parameters. Including a web based remote control, these probes are intended to be placed at critical locations in the network like head-ends, urban dense areas or the edge of shadow areas. With a minimum footprint and being fully-FPGA based, they offer high resistance to temperatures and are the ideal monitoring tool for installation in high-constraint environments like outdoor cabinets or base stations.

The product periodically logs all RF measurements and ETR290 counters. It is also capable of sending traps based on threshold values for all key parameters. Combined with a centralized network monitoring system, CastXplorer turns into a real-time diagnosis system for your cable or terrestrial network.



## DIAGNOSIS OVERVIEW

- Real-time logging of key RF and MPEG2-TS parameters
- Traps based on threshold values
- Fully remote configurable (web based)
- Easy integration with Network Monitoring Systems through SNMP

## HIGH CONSTRAINT ENVIRONMENTS

- Compact footprint
- High resistance to temperatures
- Ideally fit for outdoor cabinets

# CastXplorer

## RF Network Probes

### APPLICATIONS

- DVB-H / DVB-T NETWORK MONITORING
- DIGITAL CABLE NETWORK MONITORING
- MONITORING OF CRITICAL AND KEY AREAS
- MULTI-CHANNEL MONITORING

### KEY BENEFITS

- Real-time monitoring and long-term performance management
- Frequency polling achieving cost-efficiency: one single device for multiple channels
- Fully configurable channel management
- Key RF and MPEG2-TS parameters monitored
- Full SNMP for easy integration with NMS
- Full FPGA: Small footprint and high resistance to temperatures

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		Cable	DVB-T	DVB-H
Interfaces	ITU-J83 Digital Cable RF Input (A, B & C)	1	-	-
	DVB-T RF Input	-	1	-
	DVB-T & DVB-H RF Input	-	-	1
	DVB-ASI output	2	2	2
	RF Loophthrough	1	1	1
	Ethernet control	1	2	2
Monitoring	Automated logging of RF parameters	√	√	√
	Key RF parameters (MER, SNR, etc.)	√	√	√
	Key ETR290 parameters	√	√	√
	MFER and FER ratios	-	-	√
	SFN synchronization validation	-	√	√
	SNMP traps with configurable thresholds	√	√	√
	Control	Web-based management	√	√
Full SNMP v2 support		√	√	√
Ordering Code	RF Network Probe	CastXplorer-C av.Q2.08 av.Q2.08		





# MODULATION

# Modulators

Specializing in modulation for terrestrial broadcast, modulator product line encompasses standards and technologies used worldwide for Mobile TV broadcast (DVB-H, MediaFLO, DMMB, T-DMB) and Digital Terrestrial Tv broadcast (DVB-T, DTMB).

ENENSYS offers a wide range of modulation agnostic modulators designed for lab use. Modulators can be smoothly integrated in any kind of environment (R&D, test labs, QA, production, manufacturing, etc...) thanks to a rich set of connectivity (inputs, outputs, communication interfaces and alarms) and can be controlled using IP protocol (TCP/IP or HTTP). Here is a focus on some key features implemented on the latest generation of ENENSYS modulators.



## KEY FEATURES

### RICH INPUT CONNECTIVITY

- Redundant inputs
- PCR restamping capability
- Bit rate adaptation

### HIGH GRADE OUTPUT STAGE

- Main + Monitoring RF outputs (100-858 MHz)
- Main IF output (5-75 MHz)

### EXTERNAL SYNCHRONIZATION

- Outputs for external 10MHz synchronization,

### ALARM MONITORING

- Log files
- Inputs real time monitoring
- Dry relay alarm contact closure

### REMOTE MANAGEMENT

- Dual Ethernet 10/100bT control interfaces
- Graphical User Interface built on HTTP

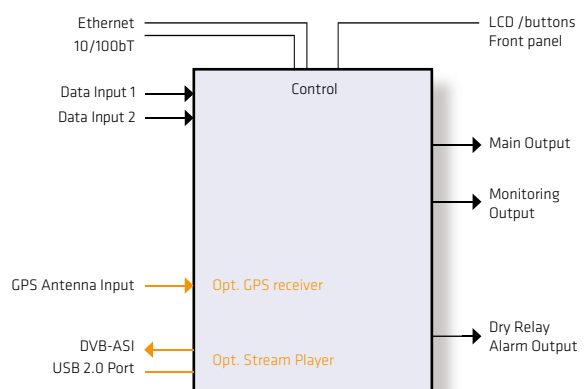
### Half 19" wide unit, 1RU RACKABLE

- Most compact product on the market
- Robust mechanics
- Regulated active cooling

### BUILT-IN STREAM PLAYER

- USB 2.0 input option with playout SW
- Supported interfaces: ETI, ASI, FLO
- Bit rate adaptation, stream loop play
- Play List handling

## BLOCK DIAGRAM



## DVB-T / DVB-H MFN Modulator

### APPLICATIONS

- DVB-T OR DVB-H RESEARCH AND DEVELOPMENT
- MANUFACTURING AND TESTING
- DEMONSTRATIONS AND ROADSHOWS

### KEY BENEFITS

- Outstanding MER and stability
- Remote Control using IP and ergonomic User Interface
- Transmission settings can be saved and retrieved as XML profiles
- Command Line package for Automated Testing

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		NN6-1160
Interfaces	DVB-ASI Inputs	1
	RF output (+ monitoring)	1 (+1)
	USB2.0 Input with Stream Player Software	Opt.
	10/100bT Ethernet	1
Modulation	DVB-T standard compliant	√
	DVB-H modulation option	Opt.
	MFN modulation broadcast	√
	Attenuation Steps	1 dB
	Output Frequency fine tuning step	1 Hz
Control & Monitoring	Command Line package for Automated Testing	√
	Ethernet Remote Control	√
	Dry Relay Alarm Output	√
Ordering codes	DVB-T Terrestrial Modulator, RF (173-858 MHz) Out	NN6-1160RF
	DVB-H <b>OPTION</b>	<b>NN6-DVB-H</b>
	USB2ASI input <b>OPTION</b>	<b>NN6-USB2ASI</b>



## RFModeler

## DVB-H Multipath Fading Simulator

### APPLICATIONS

- SFN NETWORK SIMULATION
- PROPAGATION IMPAIRMENTS CONTROL
- DVB-H RESEARCH AND DEVELOPMENT
- RECEIVERS VALIDATION / MANUFACTURING

### KEY BENEFITS

- DVB-T and DVB-H broadcast-class Terrestrial Modulation (VHF-UHF)
- Multiple fading echo generation with Doppler simulation profile (Mobile TV)
- Output C/N ratio full mastering with noise injection
- Simulates (rural or urban propagation profiles)
- Emulates MFN or SFN DTTV network and fading impairments
- Command line package for Automated Testing

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		RFModeler
Interfaces	DVB-ASI Inputs	2HP + 2LP
	RF output (+ monitoring)	1 (+1)
	10 MHz and 1PPS External Reference Inputs	1+1
	USB2.0 Input with Stream Player Software	1
	10/100bT Ethernet	1
Modulation	MFN + SFN Modulation Capability	√
	Hierarchical Mode Support	√
	Attenuation Steps	0.1 dB
	Output Frequency Increment	1 Hz
	Multi-Path Echo Fading Simulation	√
	Noise Generator with output C/N Full Control	√
	Broadcast Parameters load/save as Profiles	√
	Command Line package for Automated Testing	√
Control	Ethernet Remote Control	√
	Dry Relay Alarm Output	√
Ordering codes	DVB-T+DVB-H Terrestrial Modulator, RF (173-858 MHz) Out	RFModeler



## DTMB Modulator

### APPLICATIONS

- CHINESE DTTV (GB20600-2006)
- MFN BROADCAST
- R&D LABS, MANUFACTURING AND TESTING

### KEY BENEFITS

- Low Phase noise and stability
- Solution management through ergonomic Http Graphical User Interface
- RF and IF output in one box

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		NN6-DTMB
Interfaces	ASI Inputs (+ redundancy)	1 (+1)
	10 MHz clock output	1
	RF output (+ monitoring) (173-858 MHz)	1 (+1)
	IF output (5-75 MHz)	1
	Fast Ethernet IP port for control	1
DTMB modulation	DTMB standard compliant	✓
	MFN capable	✓
	Mono or Multi carrier	✓
	Output level from +2dB to -60dB	✓
Control & Monitoring	HTTP remote control	✓
	Front Panel for management (LCD + buttons)	✓
	Dry relay alarm output	✓
	Central carriers cancellation	✓
	Null symbol inserter	✓
	Single tone mode	✓
	PRBS generation	✓
	USB input	✓
	Ordering codes	DTMB modulator, RF-IF outputs



# NN6-FLO

## MediaFLO Modulator

### APPLICATIONS

- « FORWARD LINK ONLY »
- MEDIAFLO TRANSMISSION
- RESEARCH

### KEY BENEFITS

- Outstanding RF performances
- Compact, robust and standalone
- Full HTTP and ergonomic graphical user interface
- Full SNMP support for facilitated integration in broadcast networks

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		NN6-FLO
Interfaces	ASI inputs (automatic seamless switch)	1+1
	External 10 MHz input (from GPS receiver)	1
	External 1 PPS input (from GPS receiver)	1
	10 MHz output	1
	RF output (+ monitoring)	1 (+1)
FLO Modulation	FLO Open air interface modulation	✓
	FLO Transmitter minimum performance compliant	✓
	SFN network operation support	✓
	Channel bandwidth: 5, 6, 7 and 8 MHz support	✓
	Transmission modes 0-11 support	✓
	Wide (national) / Local (regional) broadcast	✓
	Statistics on FLO input stream	✓
Control & Monitoring	Built-in HTTP server	✓
	Front panel control (graphic LCD + buttons)	✓
	Dry relay alarm output	✓
Ordering Codes	MediaFLO Exciter, RF output (30 - 860 MHz)	NN6-FLO



## T-DMB / DAB Modulator

### APPLICATIONS

- T-DMB OR DAB TRANSMISSION
- T-DMB R&D, MANUFACTURING AND TESTING

### KEY BENEFITS

- DAB IP and EPM (Enhanced Packet Mode) DAB compatible
- SFN Synchronization capable
- Excellent MER and stability
- Modulation Settings can be saved as XML Profile

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		NN6-TDMB
Interfaces	ETI Inputs (seamless switchable)	2
	RF output (+ monitoring)	1 (+1)
	10 MHz and 1PPS External Reference Inputs	1+1
	USB2.0 Port	Opt.
	10/100bT Ethernet	1
T-DMB / DAB	NI or NA Framing Modes supported (G703, G704)	✓
Modulation	T-DMB and DAB Broadcast Compliant	✓
	MFN and SFN Modulation Capable	✓
	Timestamp Extraction for SFN Synchronization	✓
	DAB Modes I, II, III and IV Capability	✓
	Insertion of TII (Time Identification Information)	✓
Control & Monitoring	Dry Relay Alarm Output	✓
	Ethernet Remote Control (Graphical User Interface)	✓
Ordering Codes	T-DMB Modulator, VHF output	NN6-TDMB RF
	T-DMB Modulator, RF output in L-Band (1.4 - 1.7 Ghz)	NN6-TDMB RFL
	USB2.0 input with ETI Player <b>OPTION</b>	<b>NN6-USB2ETI</b>



Modulators

## RFBooster

### Low Power Broadcast Amplifier

#### APPLICATIONS

- DIGITAL TV BROADCAST
- ELABORATED DIGITAL MODULATED SIGNAL AMPLIFICATION
- LOCALIZED INDOOR OR UNDERGROUND AREA TRANSMISSION
- CORPORATE OR R&D LABS BROADCAST
- MANUFACTURING SITE TRANSMISSION COVERING

#### KEY BENEFITS

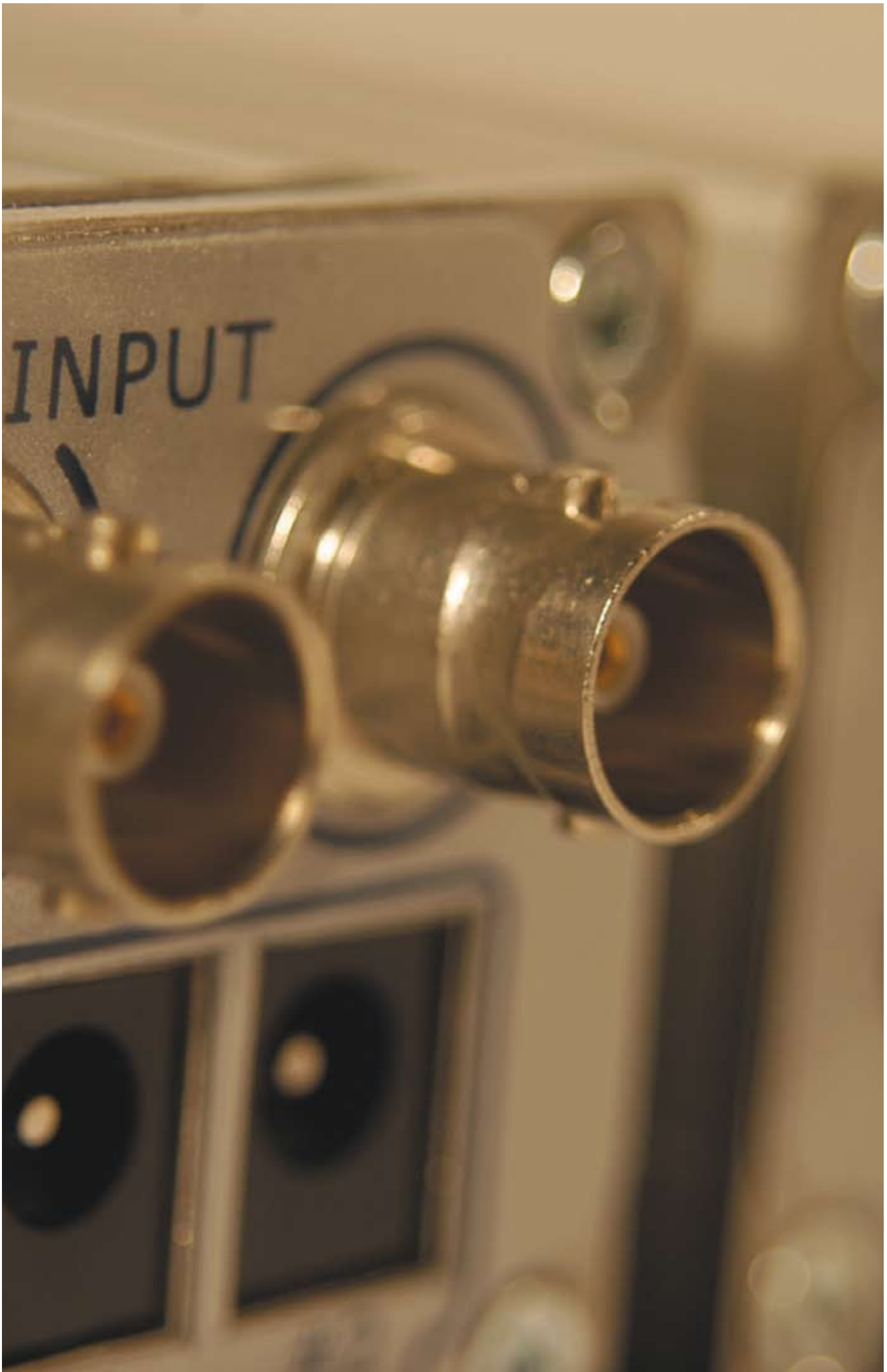
- VHF/UHF, 30 dB flat gain in the band
- Wide operating band: 100 MHz to 1 GHz
- Class A design, linear amplification
- Designed for digital modulations such as OFDM, VSB, QAM...
- Perfect fit with DVB-H, DVB-T, DTMB, T-DMB, DAB... transmissions
- Ultra-low distortion
- Passive cooling mode

### TECHNICAL CHARACTERISTICS AND ORDERING CODES

		RFBooster
Interfaces	RF input (VHF/UHF)	1
	RF Output (VHF/UHF)	1
	DC Input	1
Amplification	Amplification gain	30 dB
	Operating band	100 MHz-1 Ghz
	Max Output power level	30 dBm
	Max Input power level	0 dBm
Ordering Codes	1W RF Amplifier	RFBooster 1W



RF Amplifiers





# NETWORK INTERFACES

# MPEG2-TS Interfaces

Working in a more and more globalized digital TV environment, electrical interfaces keep multiplying. Even if DVB-ASI is becoming a de facto standard for baseband applications, many pieces of equipment still feature SMPTE310 or DVB-SPI interfaces.

MatchX devices offer full interoperability of your existing units of broadcast equipment. Especially fit for ATSC SFN networks (A/110), the new MatchX 1113 SFN also features an external GPS clock input (10 MHz) to ensure full synchronization of all equipment in the chain.



## MatchX

### DVB-ATSC MPEG2 Interfaces

#### APPLICATIONS

- CONNECT ASI EQUIPMENT TO ATSC TRANSMITTERS
- CONNECT OLD MODULATORS (LVDS, ETC) TO NEW ENCODERS (ASI)
- CONNECT ASI EQUIPMENT TO CHIPSETS OR BOARDS AT TTL OR LVDS LEVELS

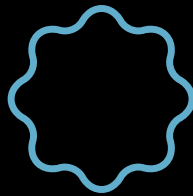
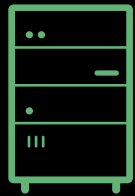
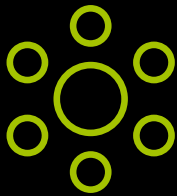
#### KEY BENEFITS

- MPEG2 TS interfacing line for ATSC, DVB applications
- Electrical format interfacing
- TS format adapting
- PCR restamping
- Compliant with ATSC SFN broadcast (A/110)
- Redundant Power Capabilities
- Small footprint: 4 units in 1RU 19" rackmount host

#### TECHNICAL CHARACTERISTICS AND ORDERING CODES

	ASI->SPI	ASI->SMPTE	SPI->ASI	SMPTE->ASI	LVDS<->TTL
DVB-ASI	1x In	1x In	2x Out	2x Out	-
SMPTE 310M	-	2x Out	-	1x In	-
DVB-SPI (LVDS)	1x Out	-	1x In	-	1x In/Out
DVB-SPI (TTL)	1x Out	-	1x In	-	1x Out/In
Dry Relay Alarm Out	√	√	√	√	√
Input Loophrough	√	√	-	√	-
Mirrored Outputs	-	√	√	√	-
Dual Power Inputs	√	√	√	√	√
External GPS 10 MHz clock input	-	Opt.	-	-	-
Ordering Codes					
ASI to LVDS/TTL	NN6-1130	-	-	-	-
ASI to SMPTE 310	-	NN6-1113	-	-	-
LVDS/TTL to ASI	-	-	NN6-3011	-	-
SMPTE 310 to ASI	-	-	-	NN6-1311	-
LVDS to/from TTL	-	-	-	-	NN6-4142
External GPS 10 MHz clock input <b>OPTION</b>	-	NN6-1113 <b>SFN</b>	-	-	-
Power supply <b>OPTION</b>	NN6-PSU				
RackMount Host <b>OPTION</b>	NN6-RCKM				





# TRANSMISSION KITS

## Simply Unpack and Broadcast

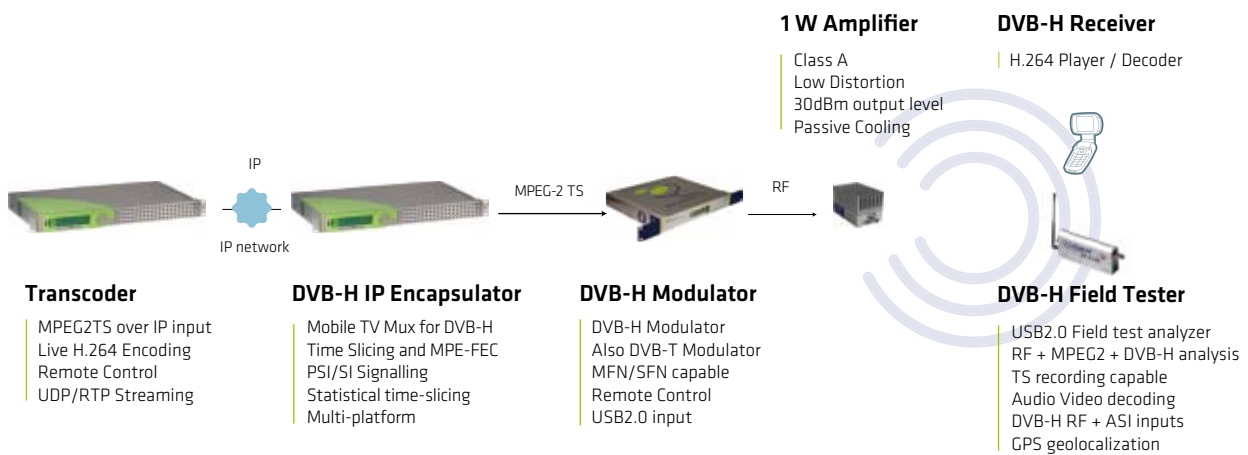
### APPLICATIONS

- DVB-H EXPERIMENTATION
- RESEARCH AND DEVELOPMENT
- MANUFACTURING TEST FOR DVB-H EQUIPMENT
- ROADSHOWS, DEMONSTRATIONS, TRAININGS

### DELIVERABLES

- Mobile TV H.264 Transcoder
- DVB-H IP Encapsulator
- DVB-H Modulator
- 1W Ultra Low Distortion Amplifier
- DVB-T/H Analyzer with RF Input
- DVB-H Receiver (featuring H.264 decoder)
- Training on DVB-H Broadcast by DVB-H experts

Ordering Code: DVB-H LAB KIT



# T-DMB Kit

## Full T-DMB suite at once

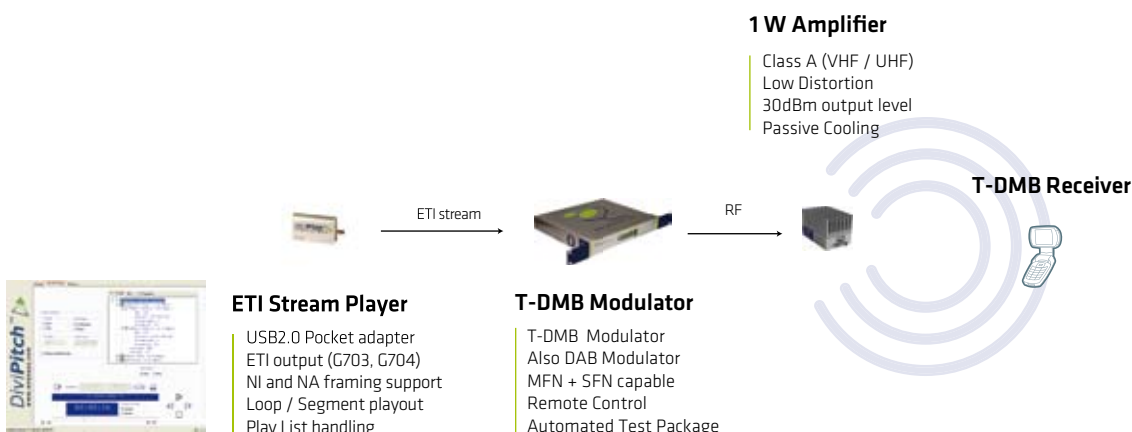
### APPLICATIONS

- DVB-H EXPERIMENTATION
- RESEARCH AND DEVELOPMENT
- MANUFACTURING TEST FOR DAB/T-DMB EQUIPMENT
- ROADSHOWS, DEMONSTRATIONS, TRAININGS

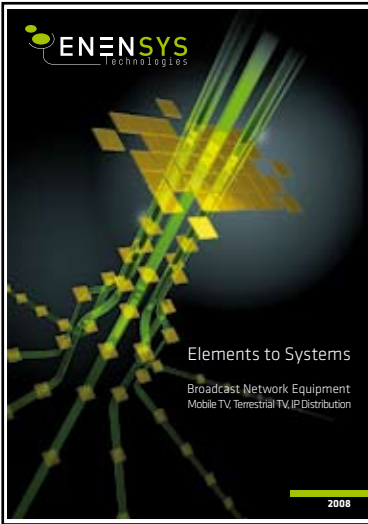
### DELIVERABLES

- USB2.0 ETI Stream player
- T-DMB SFN + MFN Modulator
- 1W Ultra Low Distortion Amplifier
- T-DMB Receiver
- Training by Mobile TV Broadcast Experts

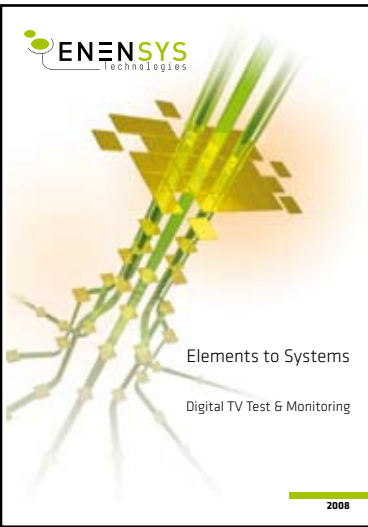
Ordering Code: T-DMB KIT







**BROADCAST  
NETWORK  
EQUIPMENT  
Catalogue**



**DIGITAL TV  
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&  
MONITORING  
Catalogue**

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