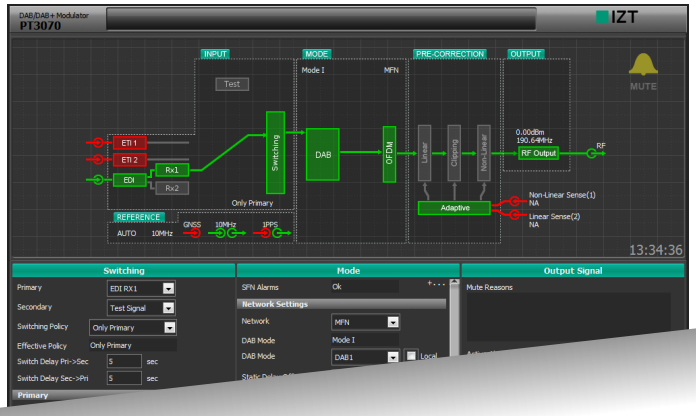
Compact Broadcast Modulator
IZT T1000

Product Information



- Fully reconfigurable, software-defined modulator platform for DAB and DAB+
- IZT DAB Content Server can be integrated
- Playback of ETI/EDI files for factory testing
- Seamless switching between any combination of inputs
- User-friendly intuitive Graphical User Interface
- Integrated GNSS receiver for synchronization

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Overview

The IZT T1000 is a compact and price-efficient modulator platform. It supports real-time modulation and multiplexing for the broadcast standards DAB and DAB+.

The IZT T1000 allows stand-alone operation and can be configured and controlled via a user-friendly web interface.

The IZT T1000 is based on a fully reconfigurable universal hardware platform. The modulation is software-defined, allowing the platform to be upgraded to other broadcast standards.

Due to the powerful integrated PC platform it is possible to run the DAB Contentserver in the compact T1000 which allows a very compact test signal source.

Key Features

POWERFUL FUNCTIONALITY

The IZT T1000 covers the VHF and UHF band supporting the standards DAB and DAB+. It comes with an intuitive web interface which can be used with any web browser. In addition, the device can be controlled and monitored via SNmP or SCPI.

Four Ethernet gigabit interfaces can be configured for control and data transport while two of them can be used for Transport Stream over IP (TSoIP) or DAB EDI inputs. The modulator supports seamless switching between any of the inputs.

FIGURE 1: IZT T1000 BROADCAST MODULATOR

MODULATION STANDARDS

DAB/ DAB+ Equipped for DAB/DAB+, the IZT T1000 provides two ETI and two EDI inputs via the Ethernet gigabit interfaces. Seamless switching between any combination of the inputs is fully supported in SFN mode.

The modulator provides advanced monitoring of the EDI/ETI inputs and supports SFN with absolute timestamps over EDI.

USER INTERFACE

The user can configure and monitor the IZT T1000 via an interactive and user-friendly web interface, providing access to modulation parameters, signal flow and system setup. The user interface includes a signal path diagram and makes it possible to see live measurements of the modulator such as MER and upper/lower

shoulder values. SNMP set/get/trap support enables remote control and monitoring of the modulator centrally in an installation.

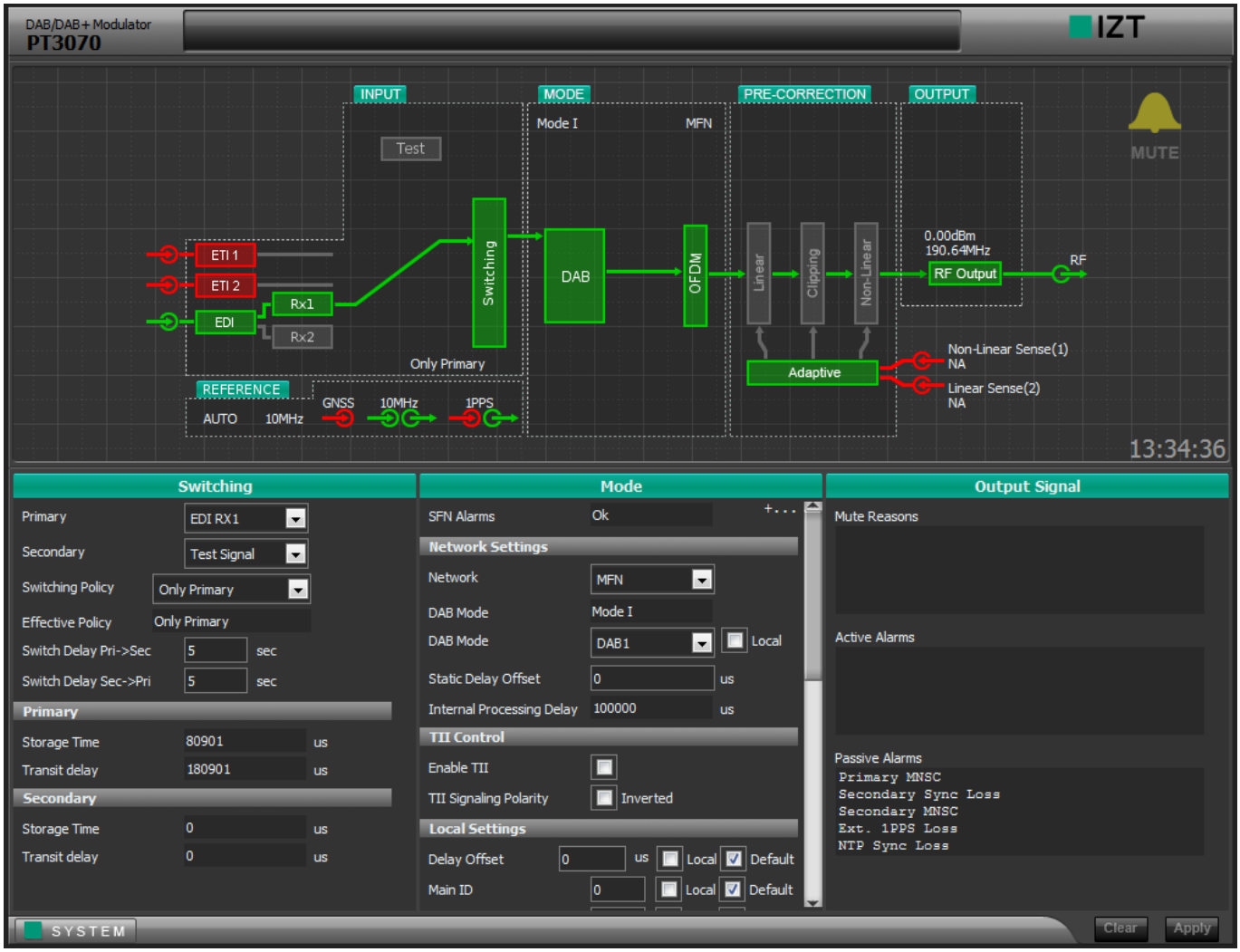

FIGURE 2: WEB GUI FOR CONVENIENT CONFIGURATION AND MONITORING OF THE IZT T1000

Your Benefits

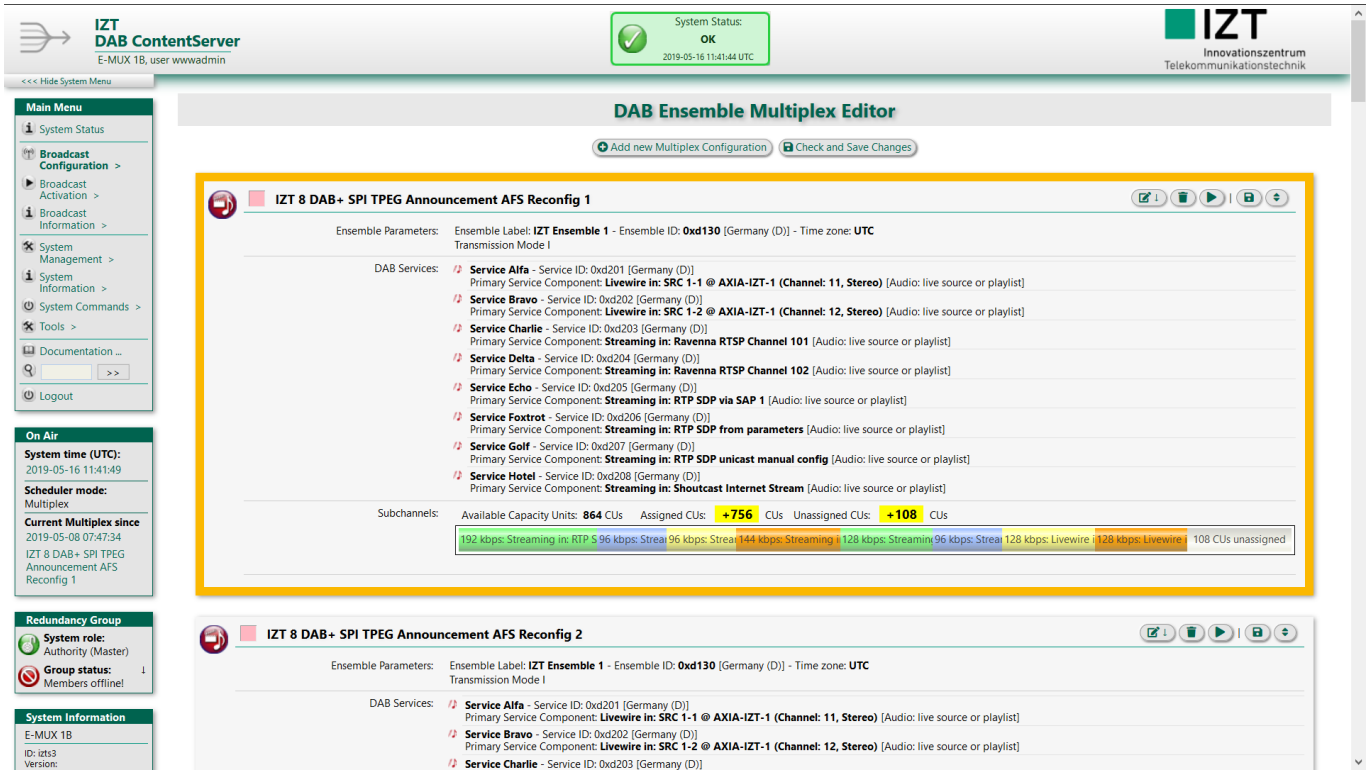

FIGURE 3: MULTIPLEX CONFIGURATION VIA THE WEB INTERFACE

COMPACT AND PRICE EFFICIENT

The IZT T1000 is a compact and price-efficient modulator platform. With dimensions of 443 mm x 44 mm (1U) x 344 mm the IZT T1000 is easy to handle and also it has a great price-performance ratio for modulate broadcast signals or feed existing power amplifiers.

EASILY EXTENDABLE SOFTWARE

The IZT T1000 Broadcast Modulator is based on a fully reconfigurable universal hardware platform. The modulation is software-defined, allowing the platform to be upgraded to other broadcast standards. All input, modulation and RF parameters can be controlled via LAN using either the web interface or SCPI commands.

Applications

LABORATORY USE

The IZT T1000 can be used to modulate broadcast signals, for example to test receivers during development or in production testing. It is a good choice for standalone operation in fixed or smaller test setups. All input, modulation and RF parameters can be controlled via LAN using either the web interface or SCPI commands.

For DAB/DAB+, the IZT T1000 complements the DAB ContentServer Developer Edition, modulating the real-time EDI/ETI output of the multiplexer. Furthermore, the IZT T1000 can be used to modulate a defined set of test signals to verify receivers, for example to confirm compliance to ETSI EN 300401 country specifications. Signals can be easily modulated from an integrated HDD or from an external USB devices.

BROADCASTING

The IZT T1000 can be used as an exciter to feed existing power amplifiers. It comes with high-performance digital adaptive pre-correction for maximum transmitter performance. In case of DAB/DAB+, the modulator can be combined with the DAB ContentServer to form a comprehensive broadcast solution, for example for local “small-scale” DAB/DAB+. It is also possible to install the DAB ContentServer in the IZT T1000.

FIGURE 4: THE REAR PANEL OF THE IZT T1000 – FOUR ETHERNET PORTS CAN BE CONFIGURED FLEXIBLY, TWO OF THEM FOR EDI OR TSOIP INPUT

Specifications

Technical Specifications		
RF output	Connector	SMA female, 50 Ω
	Centre frequency	Adjustable 30 MHz – 860 MHz Steps of 1 Hz
	Spectrum polarity	Inverted and non-inverted User selectable
	Level	Adjustable -10 to +10 dBm
	Stability	±0.5 dB
	Return loss	> 16 dB
Spectrum outside band (DAB)	Shoulders	< -45 dB
	Harmonics and spurious	< -55 dBc
	MER	> 42 dB
	±4.5 MHz (shoulders)	< -50 dB (typically -55 dB)
	Harmonics and spurious	< -55 dBc
	MER	> 45 dB (typically 50 dB)
Internal frequency reference	TCXO 2 ppm (default)	
	OCVCXO 0.25 ppm	(IZT T1000-OCX-025)
	OCVCXO 0.01 ppm	(IZT T1000-OCX-001)
Time reference (SFN timing)	Connector	BNC female, 50 Ω
	Frequency	1PPS
	Level	0 V – 5 V, selectable trigger point 1 V/1.6 V
	Trigger	Rising or falling edge, user selectable
	Impedance	50 Ω / > 1000 Ω, user selectable
External clock reference	Connector	BNC female, 50 Ω
(carrier frequency and SFN timing)	Frequency	10 MHz
	Level	100 mV – 3 V_{pp}
	Impedance	50 Ω / > 1000 Ω, user selectable
GNSS Receiver (T1000-GPS)	Connector	BNC female, 50 Ω
	Frequency	1.575 GHz (GPS) 1.602 – 1.603 GHz (GLONASS)
	Antenna net gain range	0 to +32 dB
	Antenna	Passive or active antenna (not included)
	Antenna DC supply	OFF, 3 VDC or 5 VDC (±0.5 V) User selectable
	Antenna DC current	Max. 50 mA
Ethernet ports (1 Gbit/sec)	No. of ethernet ports	4, 2 of them optimized for EDI or TSoIP
	Connector	Quadruple RJ45 mounted on the board

DAB		
ETI Inputs	No. of ETI inputs	2
	Standards	ETSI ETS 300 799 ETI-NI (G.703), ETI-NA (G.704), Jitter tolerance according to G.823
	Connector	SMA female, 75 Ω
	Return loss	> 20 dB (standardized as >18 dB)
EDI Streaming inputs	No. of EDI inputs	2 (out of 4 IP interfaces)
	Standards	ETSI TS 102 693 IP, RTP, UDP, IGMP (v2 & v3)
Redundancy		User-selectable switching policy between “Primary” and “Secondary” source
ETI monitoring outputs	No. of ETI outputs	1
	Connector	SMA Female, 25 Ω
	Return loss	>12 dB

DVB-T2		
Inputs	No. of ASI inputs	2
	Connector	BNC female, 75 Ω
	Return loss	> 13 dB
Streaming inputs	No. of TSoIP inputs	2 (out of 4 IP interfaces)
Redundancy		User-selectable switching policy between “Primary” and “Secondary” source

Modulation Standards ISDB-T/Tb ATSC 1.0 and ATSC 3.0 on request

General Data		
Dimensions (WxHxD)		443 mm x 44 mm (1U) x 344 mm
Weight		5.4 kg
Power supply, nominal values	Input voltage range	85 V – 264 V (AC)
	AC supply frequency	47 Hz – 63 Hz
	Max. input current	1.3 A

PC-Specifications	
Operating System	Debian Linux 9 64 bit
Storage	Internal SSD 128 GB
CPU	Intel 7th generation i3-61004
RAM	4 GB
Interfaces	2 x Display Port
	2 x USB 3.0

Ordering Guide

Option	Description
IZT T1000-CHS	Modulator Chassis including control PC and power supply
IZT T1000-DAB	Modulator Board for DAB/DAB+ incl. EDI input streaming
IZT T1000-GPS	GPS and GLONASS module
IZT T1000-ETI	Physical ETI input
IZT T1000-OCX-025	Internal Oscillator: 0.25 ppm (instead of TCXO 2 ppm)
IZT T1000-OCX001	Internal Oscillator: 0.01 ppm (Instead of TCXC 2 ppm)
IZT T1000-110	Player Application for DAB ETI/EDI
IZT T1000-120	Player Application for DVB-TS
IZT DABCS-060	DAB Contentserver Developer Edition
IZT DABCS-201	DAB Audio Encoder
IZT DABCS-202	DAB+ Audio Encoder
IZT DABCS-203	DMB Audio Encoder
IZT WE2	Warranty Extension to 2 years
IZT WE3	Warranty Extension to 3 years

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Product Information

About IZT The Innovationszentrum fuer Telekommunikationstechnik GmbH IZT specializes in the most advanced digital signal processing and field programmable gate array (FPGA) designs in combination with high frequency and microwave technology.

The product portfolio includes equipment for signal generation, receivers for signal monitoring and recording, transmitters for digital broadcast, digital radio systems, and channel simulators. IZT offers powerful platforms and customized solutions for high signal bandwidth and real-time signal processing applications. The product and project business is managed from the principal office located in Erlangen/Germany. IZT distributes its products worldwide together with its international strategic partners. The IZT quality management system is ISO 9001:2015 certified.

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