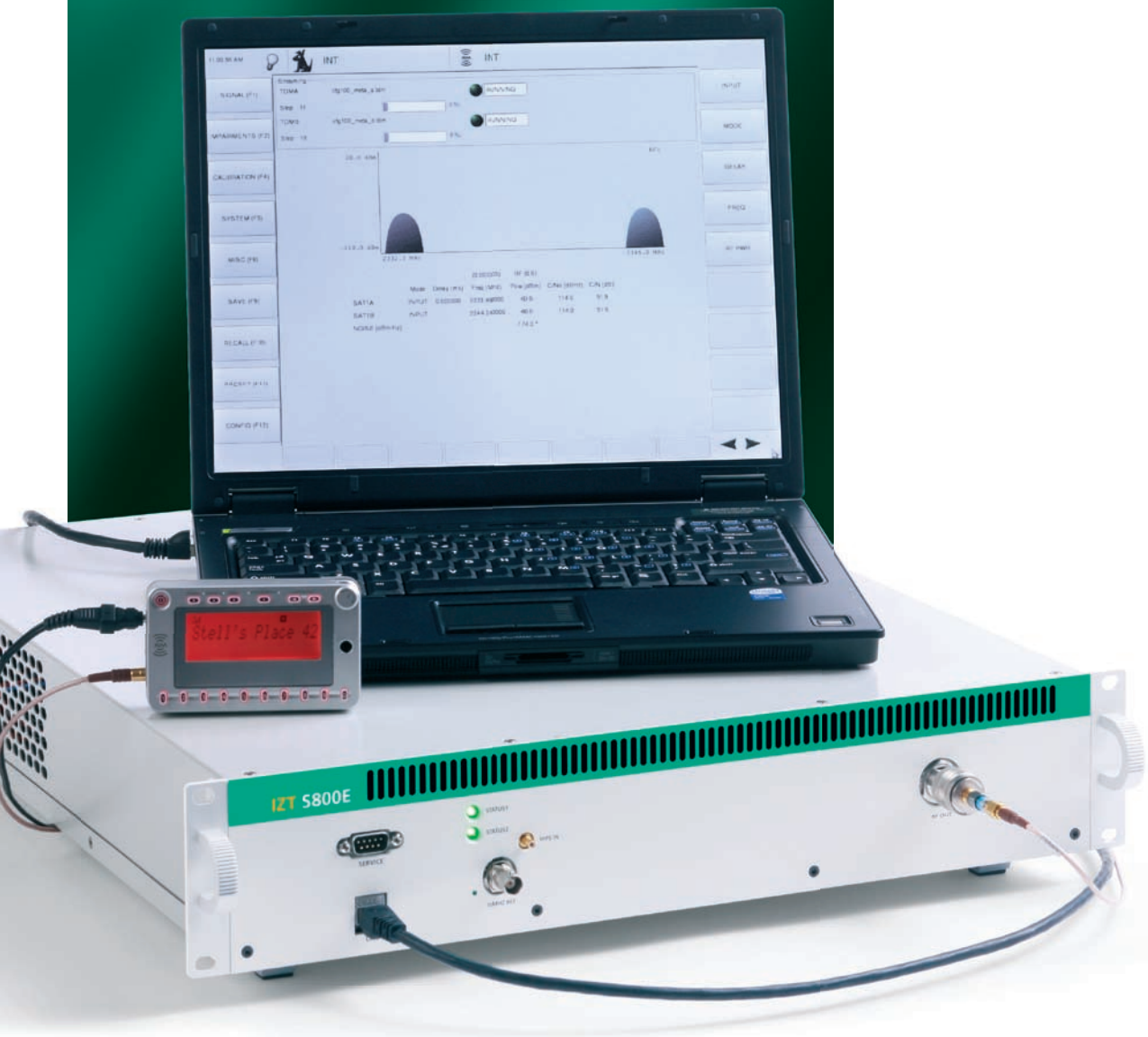
IZT S800E

Signal Source for XM and Sirius

Innovationszentrum Telekommunikations-technik GmbH



IZT S800E

The IZT S800E is a cost efficient test signal source for the two SDARS Systems, Sirius and XM Satellite Radio.

Its functionality is specifically tailored to the needs of manufacturers of headunits, radio manufacturers integrating pre-tested OEM tuner modules and application software development.

The S800E offers the following features:

- generates XM Radio or Sirius Radio signals
- supports Sirius legacy and Overlay waveforms
- real-time signal generation with hours of continuous content
- satellite and terrestrial signal
- RF output in S-band
- Additive White Gaussian Noise can be added
- Graphical User Interface very similar to IZT S2000
- save and recall of settings
- Programming Option for test scenarios
- Remote control via SCPI-like commands are a subset of the ones used for the IZT S2000

The S800E consists of a notebook allowing the user to generate and configure the signal and the actual hardware performing the real-time modulation of the signal.

Parameters

The S800E allows the configuration of the following settings:

- Source file to change the content of the transmission
- Delay of the carriers (only when stopped) to simulate different reception locations
- Frequency offset of ±45 kHz applied to all carriers to simulate the aging of the receiver
- RF output power level from -110.0 to -15.0 dBm in steps of 1.0 dB to change the reception strength

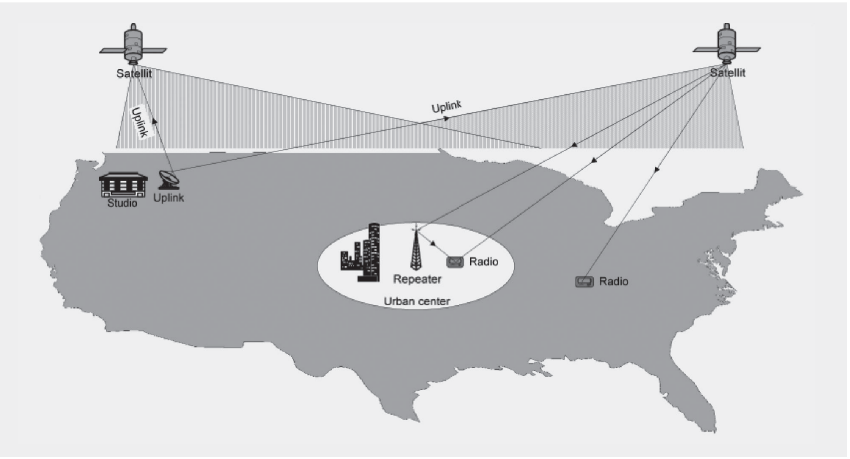


figure 1:
SDARS Systems Sirius Satellite Radio and XM Satellite Radio

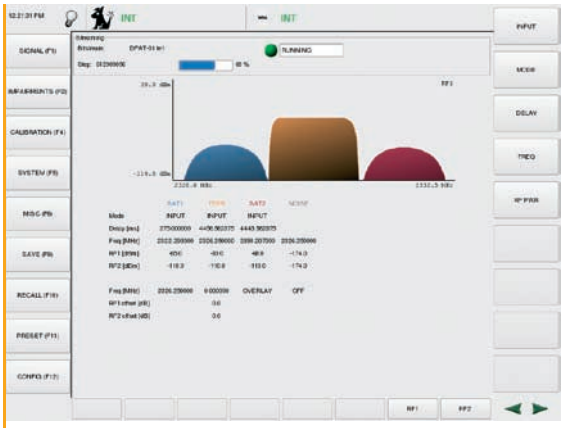


figure 2:
Graphical user interface, Sirius signal

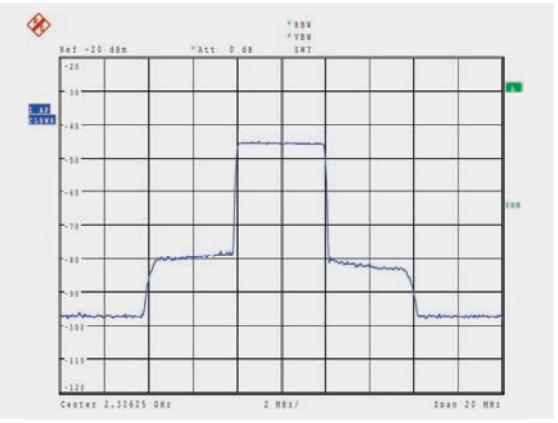


figure 3:
Spectrum of the Sirius signal

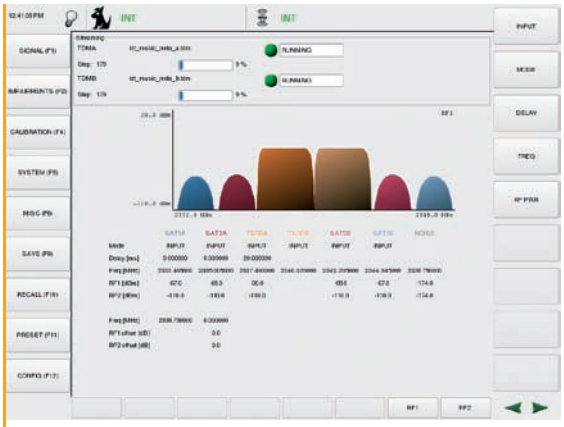


figure 4:
Graphical user interface, XM signal

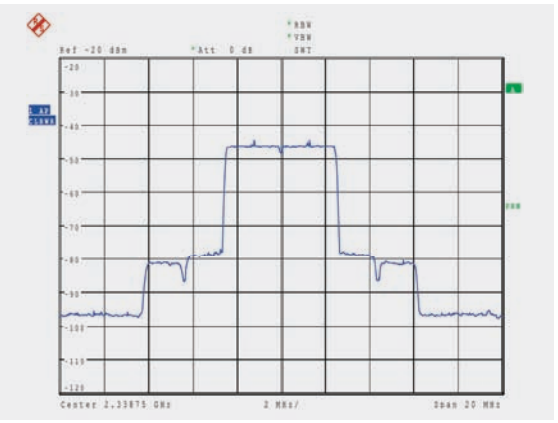


figure 5:
Spectrum of the XM signal

AWGN

The S800E can add noise to the signal in order to verify the BER performance of the receiver. The noise can be configured as noise density or be locked to one carrier as C/N or C/No. In the latter case, the software automatically adjusts the noise density when the power level of the carrier is changed.

RF outputs

The signal is put out at S-Band with an accuracy of 1.5dB. The clock stability (TCXO) of the generated signal is 1ppm. Configured with an optional 2nd RF output the system can be used for Sirius manufacturing line testing.

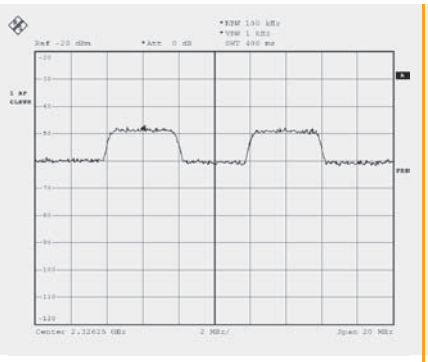


figure 6:
AWGN added to the Sirius signal

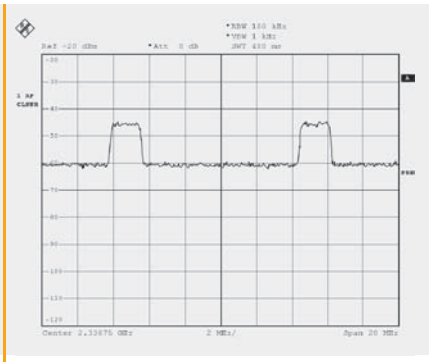


figure 7:
AWGN added to the XM signal

Option IZT S800E-001: Sirius Unit		
Signal	2xQPSK	2322.293MHz / 2330.207 MHz
	COFDM	2326.250MHz
	frequency	nominal frequencies ±45kHz, stepsize 1 Hz
	delay	SAT1: 228 to 322 ms, TERR: fixed SAT2: 4397 to 4490 ms
	stability	$1x10^{-6}$ (TCXO)
Impairments	AWGN	assignable in C/N, C/No and No
S-band output	output power	-110.0 to -15.0 dBm, stepsize 1.0 dB
	level uncertainty	absolute < ±1.5 dB
	auto-calibration	user initiated auto-calibration
	QPSK/COFDM	maximum output power difference between QPSK and COFDM: 45 dB
	QPSK/QPSK	max. difference between QPSK signals: 35 dB
Front panel connectors	RF output	one N-type output, impedance 50 ohms
	10 MHz input	accepts an external reference (timebase) input; BNC, impedance 50 ohms, 100 mVPP - 5 VPP
	LAN	connection to notebook
	service	IZT internal service port
Rear panel connectors	power connector	power connection and ON/OFF switch
Notebook connectors	remote programming	via RS232 or GP-IB (option)

Option IZT S800E-002: XM Unit		
Signal	4xQPSK	2333.465 MHz / 2335.305 MHz / 2342.205 MHz / 2344.045 MHz / 2342.205 MHz / 2344.045 MHz
	2xMCM	2337.490 MHz / 2340.020 MHz
	frequency	Nominal frequencies ±45 kHz, stepsize 1 Hz
	delay	SAT1,2: ±6 ms TERR: 10 to 30 ms processing delay
	stability	$1x10^{-6}$ (TCXO)
Impairments	AWGN	assignable in C/N, C/No and No
S-band output	output power	-110.0 to -15.0 dBm, stepsize 1.0 dB
	level uncertainty	absolute < ±1.5 dB
	auto-calibration	user initiated auto-calibration
	QPSK/MCM	maximum output power difference between QPSK and MCM: 35 dB
	QPSK/QPSK	maximum difference between QPSK signals: 35 dB
Front panel connectors	RF output	one N-type output, impedance 50 ohms
	10 MHz input	accepts an external reference (timebase) input; BNC, impedance 50 ohms, 100 mVPP - 5 VPP
	LAN	connection to notebook
	service	IZT internal service port
Rear panel connectors	power connector	power connection and ON/OFF switch
Notebook connectors	remote programming	via RS232 or GP-IB (option)

Comparison	IZT S800E	IZT S2000
Hours signal generation	•	•
Satellite signal	•	•
Terrestrial signal	•	•
Delay	nom. delays [1] ms	0 to 7000 [1] ms
Frequency range	offset ±45kHz	full range [0.1] Hz
Frequency accuracy	$1x10^{-6}$	$5x10^{-8}$
Power level range	-110.0 to -15.0 [1.0] dBm	-110.0 to +20.0 [0.1] dBm
Power level accuracy	±1.5 dB	±0.5 dB
Arbitrary Waveform Generator	–	•
Nonlinearity simulation	–	•
Terrestrial filter simulation	–	•
Channel simulator	–	•
Power level profiles	–	•
Frequency/delay profiles	–	•
Remote access	RS232, GP-IB (option)	RS232, LAN, GP-IB (option)
SCPI-like remote commands	•	•
Save/Recall/Preset	•	•
Labview driver option	•	•
Sirius overlay option	•	•

[•] Option [–] not available

Ordering Guide	
IZT S800E SIRIUS	Sirius signal generator
IZT S800E SIRIUS - RF2	Additional 2nd RF output
IZT S800E SIRIUS - SAT	Sirius satellite signals
IZT S800E SIRIUS - TERR	Sirius terrestrial signal
IZT S800E SIRIUS - OVLY	Sirius overlay waveform

IZT S800E XM	XM signal generator
IZT S800E XM - RF2	Additional 2nd RF output
IZT S800E XM - SAT	XM satellite signals
IZT S800E XM - TERR	XM terrestrial signal
IZT S800E - GPIB	GP-IB port
IZT S800E - LABVIEW	Driver for Labview

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