

eRTM Local Oscillator Generation eRTM-LOG1300

HIGHLIGHTS

LO and CLK generation from a common RF source

< 3 fs Additive Jitter [10 Hz-10MHz]

22 Diff. CLK Outputs, 9 LO Outputs, 9 REF Outputs

On-Board Active Temperature Control

MicroTCA.4 Compliant



The DRTM-LOG1300 is a multi-channel local oscillator generator and high frequency signal and clock fan-out module. The module provides the fan-out for 9 high frequency reference, 9 local oscillator and 9 calibration signals in the range from 400 MHz to 6 GHz. In addition, the module provides 22 configurable low jitter differential clock signals in the range up to 160 MHz for high-precision ADC sampling applications.

The local oscillator and the clock signals are generated from an external RF reference. The residual phase noise of the local oscillator at 1354 MHz is below 6 fs (rms) [10 Hz, 10 MHz]. The rejection of the upper and lower sidebands is higher than 80 dBc. Long-term instabilities of the RF signals are mitigated by on-board temperature regulation.

Each high frequency and clock signal can be switched on/off individually via RF backplane communication depending on the crate configuration. Board health-status can be monitored via front-panel RJ-45 connector (Ethernet based comm.) or over LVDS lines in the MTCA.4 system. In addition the module can operate as a stand-alone unit. If long term stability is critical, the DRTM-LOG1300 offers an optionally on-board temperature regulation via Peltier elements.

DESY offers the DRTM-LOG1300 for licensing to industry. DESY can modify this product to meet special customer requirements.

FEATURES

Extended Rear-Transition Module (eRTM).

Two double width, full-height, MicroTCA.4 compliant

Provides signal fan-out of 9 high frequency reference, 9 local oscillator and 9 calibration signals in the range from 400 MHz to 6GHz (variant optimized for 1.3 GHz).

Provides 22 low jitter differential clock signals up to 160 MSPS for ADC sampling.

Local oscillator residual phase noise < 6 fs (rms) [10 Hz, 1 MHz] at 1.354 GHz.

Each output clock and RF signal can be switched on/off individually for a specific crate configuration.

No program is needed for basic board functionality.

Easy internal frequency adaption.

RoHS compliant

Options:

- On-board temperature regulation
- External front panel signal fed

TECHNICAL SPECIFICATIONS

ARCHITECTURE

Physical	Dimensions	Double width, two full-height units Width: 148.5 mm [5.486 inch] Depth: 180.6 mm [7.110"]
Standards	MTCA.4	extended Rear-Transition-Module (eRTM)
	Module management	IPMI Version 2.0
Compatibility	Zone3 classification	Slot 15 eRTM (class in progress)
	Compatible products	MTCA.4 RF backplane

CONFIGURATION

Type	eRTM local oscillator	Local oscillator channels	9
		Reference channels	9
		Calibration signal channels	9
		RF signals frequency range	L, S and C-bands (400 MHz – 6 GHz)
		Clock signal channels	22
		Clocks frequency range	up to 160 MHz
Electrical properties		Short-term phase stability	< 6 fs (rms) [10 Hz, 1 MHz] at 1.354 GHz
		Spectral purity	< -80 dBc
		Power consumption	15 W

CONNECTIVITY

Inputs	Reference input	Front	1 input
		Connector type	SMA type, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Return loss	-9 dB
		Nominal input power level	+19 dBm
	Calibration input	Front / Rear panel	1 input
		Connector type	SMA type, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Return loss	-27 dB
		Nominal input power level	< +40 dBm
Outputs	Local oscillator outputs (LO)	RF backplane	9 outputs
		Type	RADIALL R694.252.107, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Output power level per ch.	+13 dBm (1.354 GHz)
	Reference outputs (REF)	RF backplane	9 outputs
		Type	RADIALL R694.252.107, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Output power level per ch.	+9 dBm (1.354 GHz)
	Calibration outputs (CAL)	RF backplane	9 outputs
		Type	RADIALL R694.252.107, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Output power level per ch.	Input power - 14 dB
	Clock outputs	RF backplane	22 outputs
		Type	ERNI ERmetZD-10x3P-FEM
		Impedance / Coupling	100 Ω differential / AC
		Output voltage	1.3 V _{pp} differential

TECHNICAL SPECIFICATIONS

CONNECTIVITY (CONTINUED)

Outputs	Additional reference out	Front	1 output
		Type	SMA type, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Output voltage	+20 dBm
	Clock monitor	Front	1 output
		Type	SMA type, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Output voltage	0.5 V
	Local oscillator monitor	Front	1 output
		Type	SMA type, single-ended, 50 Ω
		Impedance / Coupling	50 Ω / AC
		Output voltage	0 dBm

OTHER FEATURES

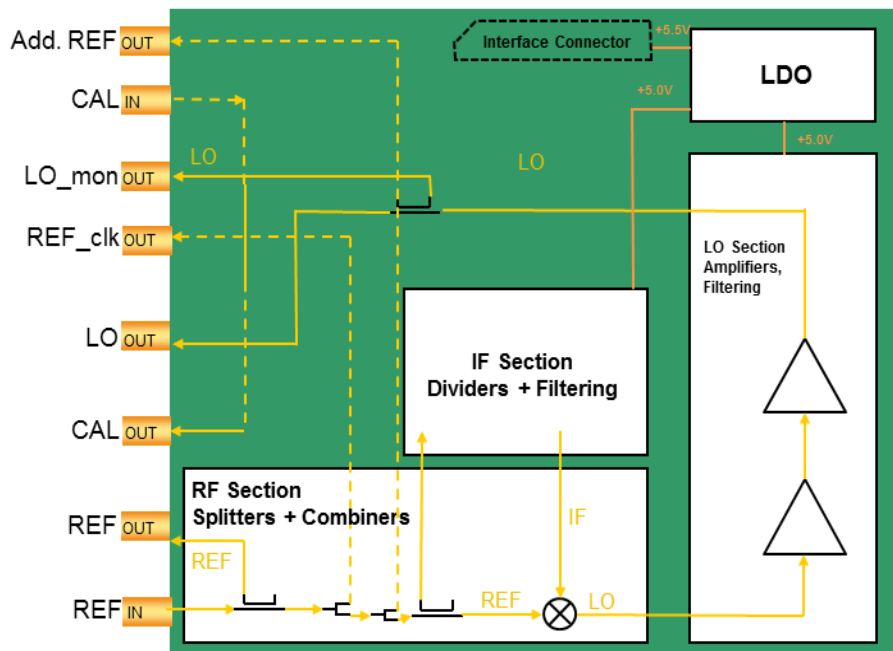
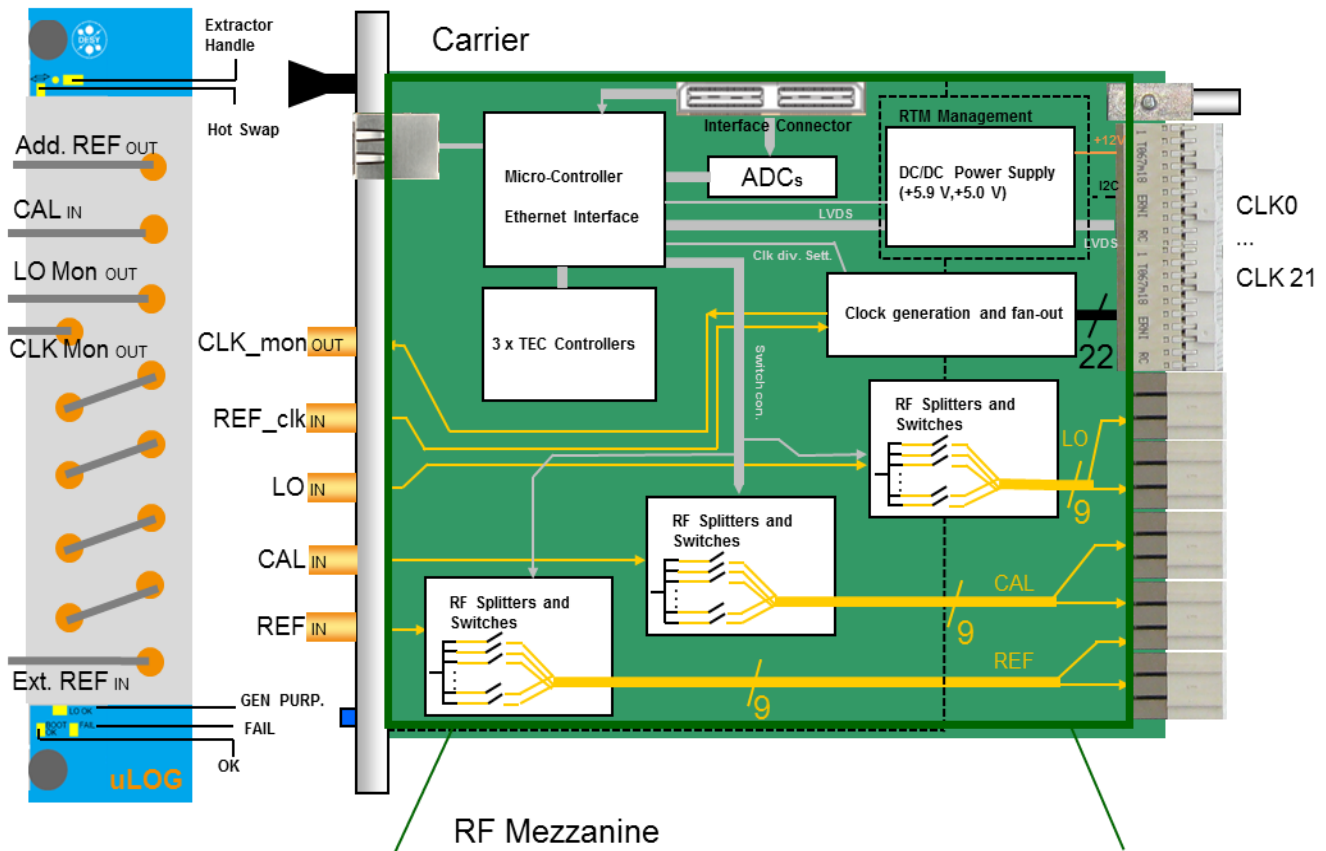
On board	RF-chain diagnostics	RF power measurements on LO, REF and CAL
	RF-chain diagnostics readout	via RF backplane and RTM MCH
	Individual enabling of signals	via RF backplane and RTM MCH
	Setting of CLK dividers	via RF backplane and RTM MCH
	Temperature regulation	via temperature controllers and Peltier elements
	Voltages readout	via RF backplane and RTM MCH
Interface	LEDs	IPMI management control
	Mechanical	Hot swap ejector handle
Environmental	Operating temperature	0 ... 50 °C (no temperature regulation)
	Storage temperature	-40 ... + 90 °C (no temperature regulation)
	Relative humidity	5 ... 90 %, non-condensing
	Weight	0.7 kg

OTHER

Compliance	RoHS
Licensing to industry	Yes / Deutsches Elektronen-Synchrotron - Notkestr. 85, 22607 Hamburg - Germany - Email: mtca-techlab@desy.de

eRTM Local Oscillator Generation eRTM-LOG1300

FUNCTIONAL BLOCK DIAGRAM AND FRONT PANEL



OPTIONS

DRTM-LOG - A - B - C -D

A Reference input frequency
xxxx = (400...6000) MHz

B Local oscillator output frequency
xxxx = (400...6000) MHz

C Clock output frequency
xxx = (0...160) MHz

Temperature regulation

D 0 ... no temperature regulation
1 ... with temperature regulation



DOWNLOAD
FULL
DATASHEET