

GENUS Test Loop Translators

ETL Systems TLT modules offer loop-back testing capability within the 1U GENUS modular chassis.

GENUS is multi-configurable, so it can combine multiple RF and test functions into one habitat. TLT options include L, C, X, Ku, K and Ka-Band.

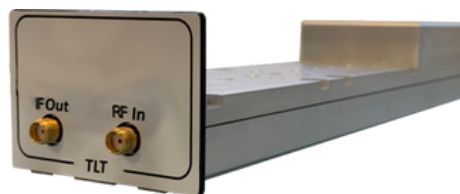
TLT Module



Ka-Band TLT Module

Hot Swap & replaceable

RF TLT modules



C-Band to L-Band TLT Module

Chassis Options

Local control & monitoring

via HMI high resolution touchscreen

Resilience

from dual redundant hot-swap power supplies & field replaceable CPU & HMI

Compact indoor & outdoor

chassis options, which can be part populated

Secure protocols

with SNMPv3 and HTTPS

Flexible Module Configurations

choose from a mixture of TLT modules with different operating frequencies.

Remote control & monitoring

via RJ45 Ethernet port with SNMP & web browser interface

Field replaceable Internal 10MHz reference source

and external reference inject port with auto detection



Indoor Chassis



Outdoor Unit

Chassis Specification	
Dimensions/Weight/Colour	1U high x 550mm deep x 19" wide / <10kg / RAL9003 - white (semi-matte)
Capacity	17 module slots. Note: Actual modules may require >1 slot. Refer to required module spec table.
Temperature	Operating: 0°C to +45°C Storage: -20°C to +75°C
Location/Humidity/Altitude	Indoor use only / 20 to 90% non-condensing / 2,000m AMSL (Operational) 8,000m AMSL (Storage) Above Mean Sea Level
Control & Monitoring	Local: HMI, capacitive touch screen Remote: Ethernet via RJ45, 10BaseT/100 BaseTx. ETL TCP/IP, SNMPv2/3, HTTPS & built-in web server. HMI and CPU field replaceable.
MTTR	20 minutes (15 minutes to retrieve spare part and 5 mins to replace). Applies to LRUs only and assumed in-house stock.
AC Input/Consumption	85-264Vac 50/60Hz / 275W max. consumption at steady state
PSU Redundancy	Dual redundant and alarmed. Diode OR. Hot swappable.
Input & Output Ports	Dependant upon module fitted

TLT Modules - GENERAL SPECIFICATIONS					
Model Number		TLT-U-L1L1-1001-S5S5	TLT-D-C2C1-1002-S5S5	TLT-D-K3K1-1003-S5S5	TLT-D-C3L1-1005-S5S5
Frequency Band		L-Band	C-band	Ku-band	C- to L-band
Operating Frequency Range	Input	2025 - 2125 MHz	5.725—6.725GHz	12.75GHz—14.5GHz	5.725—6.725GHz
	Output	2200 - 2300 MHz	3.4—4.4GHz	10.7GHz—12.75GHz	0.95—1.95GHz
LO Step Size		N/A	1KHz (At LO centre)		
External Reference		Input Freq. 10 MHz Auto detection (External reference optional)			
External Reference Level		+3dBm ±3dB			
LO Frequency Control		N/A	± 250MHz	± 750 MHz	3925—5625MHz
Internal Reference Stability		±0.05ppm over 0 to 50°C	±0.05ppm over 0 to 50°C	±0.05ppm over 0 to 50°C	± 5 x 10-8 over 0 to 50°C
Maximum Input Power Level		0dBm (Operational)	0dBm (Operational)	0dBm (Operational)	-10dBm (operational)
Absolute max Input Power		+ 10 dBm (No damage)	+ 20 dBm (No damage)	+15dBm (No damage)	+20dBm (No damage)
Conversion Gain		-20 ± 2.0 dB	0 ± 3.0 dB	0 ± 3.0dB	-20 ± 3.0dB
RF Connector		SMA Female	SMA Female	SMA Female	SMA Female
Impedance		50 ohms			
Attenuation Control Range		0 to 30dB	0 to 60dB		
Attenuation Control Steps		0.25dB ±0.20 Over full operating band			
Number of modules per		4 Max (3 slots wide)	1 Max (8 slots wide)	1 Max (8 slots wide)	3 Max (4 slots wide)
Input Return Loss		18 dB typ. 12 dB min	14dB typ. 12dB min.	14dB typ. 10dB min.	14dB typ. 12dB min.
Output Return Loss		18 dB typ. 15 dB min	14dB typ. 12dB min.	14dB typ. 10dB min.	16dB typ. 12dB min
Fixed LO Phase Noise	100 Hz	-80 dBc / Hz (typical)	-70 dBc / Hz (typical)	-70 dBc / Hz (typical)	-75 dBc / Hz (typical)
	1KHz	-95 dBc / Hz (typical)	-80 dBc / Hz (typical)	-80 dBc / Hz (typical)	-80 dBc / Hz (typical)
	10KHz	-100 dBc / Hz (typical)	-80 dBc / Hz (typical)	-80 dBc / Hz (typical)	-85 dBc / Hz (typical)
	100KHz	-105 dBc / Hz (typical)	-85 dBc / Hz (typical)	-85 dBc / Hz (typical)	-95 dBc / Hz (typical)
	1MHz	-115 dBc / Hz (typical)	-105 dBc / Hz (typical)	-105 dBc / Hz (typical)	-110 dBc / Hz (typical)

TLT Modules - GENERAL SPECIFICATIONS				
Model Number		TLT-D-KXXK1-1006-K5S5	TLT-D-C2C1-1002-S5S5	TLT-D-K3K1-1003-S5S5
Frequency Band		K-Band	X-Band	Ka-band
Operating Frequency Range	Input	17.3 GHz—18.3 GHz	7.9—8.4 GHz	12.75GHz—14.5GHz
	Output	10.7 GHz—12.75 GHz	7.25—7.75 GHz	17.3—21.2GHz
LO Step Size		1KHz (At LO centre)		
External Reference		Input Freq. 10 MHz Auto detection (External reference optional)		
External Reference Level		+3dBm $\pm$ 3dB		
LO Frequency Control		1250 MHz	N/A	$\pm$ 1.75GHz
Internal Reference Stability		$\pm$ 0.05ppm over 0 to 50°C	$\pm$ 0.05ppm over 0 to 50°C	$\pm$ 5 x 10-8 over 0 to 50°C
Maximum Input Power Level		0dBm (Operational)	0dBm (Operational)	0dBm (Operational)
Absolute max Input Power		+15 dBm (No damage)	+15 dBm (No damage)	+20dBm (No damage)
Conversion Gain		0 $\pm$ 3.0 dB	0 $\pm$ 3.0 dB	0 $\pm$ 3.0dB
RF Connector		2.92mm/SMA	SMA	2.92mm
Impedance		50 ohms		
Attenuation Control Range		0 to 60dB		
Attenuation Control Steps		0.25dB $\pm$ 0.20 Over full operating band		
Number of modules per		1 Max (8 slots wide)	1 Max (8 slots wide)	1 Max (8 slots wide)
Input Return Loss		14dB typ. 10dB min.	14dB typ. 10dB min.	14dB typ. 10dB min.
Output Return Loss		14dB typ. 10dB min.	14dB typ. 10dB min.	14dB typ. 10dB min.
Fixed LO Phase Noise	100 Hz	-70 dBc / Hz (typical)	-70 dBc / Hz (typical)	-70 dBc / Hz (typical)
	1KHz	-80 dBc / Hz (typical)	-80 dBc / Hz (typical)	-75 dBc / Hz (typical)
	10KHz	-80 dBc / Hz (typical)	-80 dBc / Hz (typical)	-80 dBc / Hz (typical)
	100KHz	-85 dBc / Hz (typical)	-85 dBc / Hz (typical)	-85 dBc / Hz (typical)
	1MHz	-100 dBc / Hz (typical)	-100 dBc / Hz (typical)	-100 dBc / Hz (typical)

Note 1: The specification is subject to regular reviews and will be updated from time to time as part of our continuing product development and improved spec accuracy.

Note 2: Operation beyond the quoted limits stated above may cause instantaneous and permanent damage.