# ETL Systems
New technologies in RF distribution

32 x 32 Enigma 50-2450 MHz Distributive Switch Matrix / Router

4th generation Enigma matrix with enhanced RF performance including variable gain 0 dB to +10dB settable per output.

Typical applications:
- RF content acquisition for TVRO &IPTV headends
- Signal monitoring of satellite traffic
- Remote controlled unmanned satcom sites
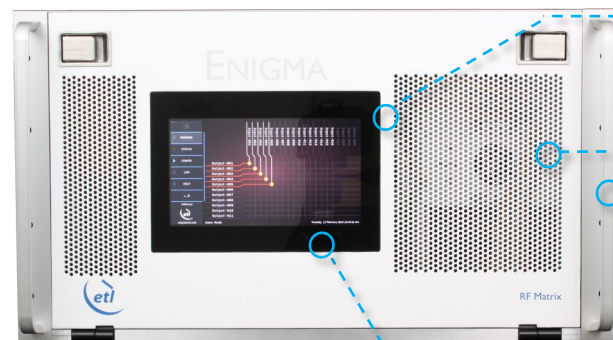
50 - 2450 MHz operating frequency range

Suitable for HTS applications due to extended bandwidth

Compact up to 32 inputs x 32 outputs in a 6U high chassis

Upgraded local control & monitoring via front panel capacitive touchscreen

Self diagnostics with continuous monitoring of amplifiers, CPU's & PSU's

Expansion in single increments or with additional matrix modules for larger systems
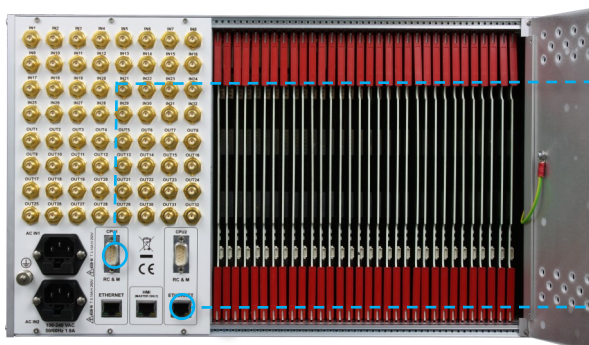
Resilience from dual redundant power supplies & CPU modules

Minimal impact from failure with hot-swap single input & output RF cards, dual power supplies & dual CPU's, fans

Dry contact alarm port & serial communications for amplifier & power supply status

Future proof secure protocols with SNMPv3 & HTTPS

Remote control & monitoring via RJ45 Ethernet port with SNMP & web browser interface

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Technical specifications and operating parameters

RF Parameters

Capacity	32 inputs x 32 outputs, fully populated			
Routing	Distributive, non-blocking	Any input can be connected to any number of outputs		
Frequency Range	50-2450 MHz			
Gain	0±1 dB Typical, mean across band			
Gain Control	0 to +10 in 0.25 dB steps	Settable at each output		
RF Connectors	50Ω SMA	50Ω BNC	75Ω BNC	75Ω F-type
	All ports DC blocked			

Gain Flatness	50-2150 MHz	±1.25 dB	±1.25 dB	±1.5 dB	±1.5 dB
	Any 36 MHz	±0.25 dB	±0.25 dB	±0.5 dB	±0.5 dB
	50-2450 MHz	±2.5 dB	±2.5 dB	±3.0 dB	±3.0 dB
	Any 36 MHz	±0.5 dB	±0.5 dB	±0.75 dB	±0.75 dB
Input Return Loss	Typical	18 dB	18 dB	16 dB	16 dB
	Minimum	12 dB	12 dB	10 dB	10 dB
Output Return Loss	Typical	18 dB	18 dB	16 dB	16 dB
	Minimum	14 dB	14 dB	10 dB	10 dB

Isolation (Minimum between any 2 ports)		<2150 MHz	>2150 MHz
	I/P - O/P	60 dB	50 dB
	I/P - I/P	70 dB	60 dB
	O/P - O/P	75 dB	75 dB
Noise Figure Typical, 1 input routed to 1 output	0 dB	22 dB	24 dB
	+10 dB	20 dB	22 dB
1dB GCP Typical, Gain Compression Point, output power	0 dB	+3 dBm	+0 dBm
	+10 dB	13 dBm	10 dBm
OIP3	0 dB	Typical 18 dBm Minimum 12 dBm	Typical 18 dBm Minimum 10 dBm
	+10 dB	Typical 25 dBm Minimum 20 dBm	Typical 25 dBm Minimum 20 dBm
OIP2	Typical 32 dBm Minimum 30 dBm (@ 0dB gain)		
Group Delay	±1.5 ns across operational bandwidth		
Switching Time	< 50ms from receipt of a command to implementation of path change		
Input RF Power	+ 20 dBm	Absolute maximum	
Tech Spec Version	1.4		

System Control

Local Control	Via Front Panel HMI capacitive touchscreen
Remote Control & Monitoring	Serial (RS232 or RS422/485) and Ethernet port via RJ45 10Base T/100 BaseTx. TCP/IP, SNMP v3, HTTPS & Web browser interface.
Alarms	Dry contact (D-type) & Ethernet (RJ45) for PSU & Amp. status

Power

PSU Power	85-264Vac 50-60Hz	Fused 2A
AC Consumption	150W	Maximum consumption at steady state
PSU	Dual redundant & alarmed	Diode OR. Hot swappable
Hot-swap PSU	Yes	
CPU Redundancy	Dual redundant	Hot swappable
Input Cards	Hot swap	Failure effects only one input port.
Output Cards	Hot swap	Failure effects only one output port.
MTTR	20 minutes. 15 minutes to retrieve spare part and 5 minutes to replace.	Applies to LRUs only and assumed in house stock.
MTBF	Chassis	271,444	Chassis excludes HMI & RF cards
	Switch card	270,297	
	Divider card	317,227	

Environmental

Operating temperature	0 to 45˚C
Gain Stability versus Temperature	0.05dB/°C
Storage temperature	-20˚C to +75˚C
Location	Indoor use only
Humidity	20 to 90% non-condensing
Altitude (operational)	10,000 feet AMSL (Above Mean Sea Level)
Altitude (storage)	30,000 feet AMSL (Above Mean Sea Level)

Physical

Dimensions	6U high x 450mm deep x 19" wide
Weight	35 kg, fully populated
Colour	RAL9003—White (Semi-Matte)

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.

RoHS COMPLIANT   Pb Pb-Free   nqa ISO 9001 QUALITY MANAGEMENT   UKAS MANAGEMENT SYSTEMS 015