ETL Systems
New technologies in RF distribution

32 x 32 Enigma L-band Distributive Switch Matrix / Router

Typical applications:
- RF content acquisition for TVRO &IPTV headends
- Signal monitoring of satellite traffic
- Remote controlled unmanned satcom sites

4th generation Enigma matrix with enhanced RF performance including variable gain –5 dB to +5 dB settable per output.
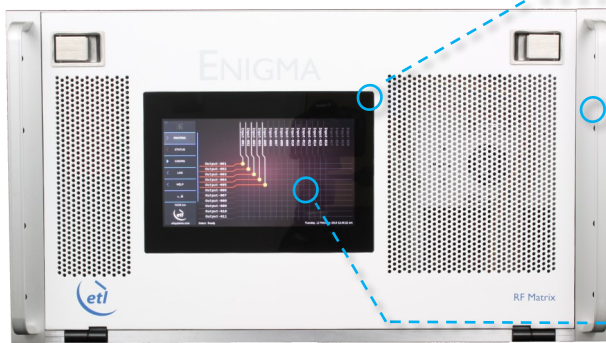
850 - 2150 MHz operating frequency range

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

Upgraded local control & monitoring via front panel capacitive touchscreen

Expansion in single increments or with additional matrix modules for larger systems

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

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
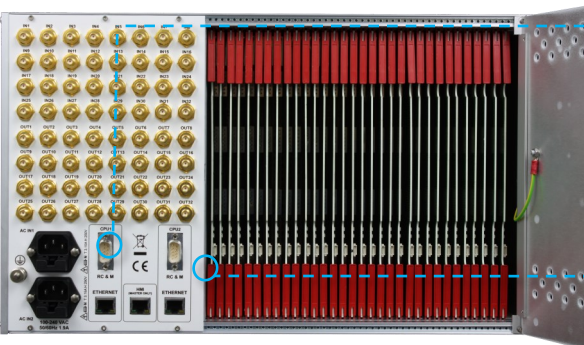
Future proof secure protocols with SNMPv3 & HTTPS

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

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	850-2150 MHz (L-band)				
Gain	0±1 dB Typical, mean across band				
Gain Control	-5 to +5 dB 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	Full band	±1.0 dB	±1.0 dB	±1.5 dB	±1.5 dB
	Any 36MHz	±0.25 dB	±0.25 dB	±0.50 dB	±0.50 dB
Input Return Loss	Typical	20 dB	20 dB	16 dB	16 dB
	Minimum	16 dB	16 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 (min between any 2 ports)	I/P - O/P	60 dB			
	I/P - I/P	75 dB			
	O/P - O/P	75 dB			
Group Delay		≤ 1 ns, across operational bandwidth			
Noise Figure	Typical	15 dB	Typical, 1 input routed to 1 output (@ unity gain)		
	Maximum	16 dB			
1dB GCP (dBm)		+8 dBm output power (@ unity gain)			
OIP3	Typical	22 dBm (@ unity gain)			
	Minimum	20 dBm (@ unity gain)			
OIP2	Typical	32 dBm (@ unity gain)			
	Minimum	30 dBm (@ unity gain)			
Switching Time		< 50ms from receipt of a command to implementation of path change			
Input RF Power		+ 20 dBm	Absolute maximum		

System Control

Local Control	Via Front Panel capacitive touchscreen	
Remote Control	Ethernet via RJ45, 10BaseT/100BaseTx, ETL TCP/IP Protocol SNMPv3, HTTPS & built in Web Server	
Alarms	Dry contact (D-type) & Ethernet (RJ45) for PSU & Amp. status	

Power

PSU Power		85-264Vac 50-60Hz	Fused 2A
AC Consumption		150W	Max. consumption at steady state
LNB Power		None	
PSU		Dual redundant & alarmed	Diode OR. Hot swappable
Hot-swap PSU		Yes	
CPU		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 mins, 15 mins to retrieve spare part and 5 mins 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.

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