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

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

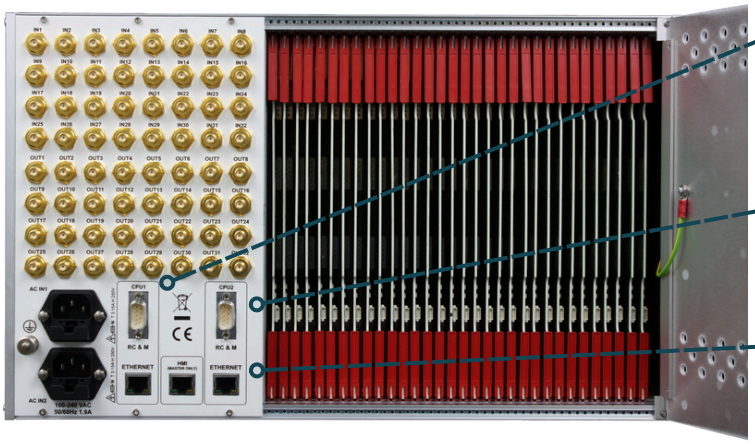
Upgraded local control & monitoring
via front panel capacitive touchscreen

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

Self diagnostics
with continuous monitoring of amplifiers, CPUs & PSUs

Resilience
from dual redundant power supplies & CPU modules

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



Dry contact alarm port
for amplifier & power supply status

Future proof secure protocols
with SNMPv3 & HTTPS

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

RF Parameters					
Capacity		32 inputs x 32 outputs, fully populated			
Routing		Combining (fan-out), non-blocking. Many inputs can be routed to each output.			
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	18 dB	18 dB	16 dB	16 dB
	Minimum	14 dB	14 dB	10 dB	10 dB
Output Return Loss	Typical	20 dB	20 dB	16 dB	16 dB
	Minimum	16 dB	16 dB	10 dB	10 dB
Isolation (Min. between any 2 ports)	Input-Output	60 dB			
	Input-Input	75 dB			
	Output-Output	75 dB			
Group Delay		≤ 1 ns, across operational bandwidth			
Noise Figure	Minimum Gain	24 dB Max.		With one input routed to one output.	
	Unity Gain	18 dB Max.			
	Maximum Gain	14 dB Max.			
1dB GCP	Minimum Gain	+5 dBm Min.		1dB Gain Compression point, output power	
	Unity Gain	+10 dBm Min.			
	Maximum Gain	+10 dBm Min.			
OIP3	Minimum Gain	+15 dBm Min			
	Unity Gain	20 dBm Min			
	Maximum Gain	20 dBm Min			
OIP2	Minimum Gain	+25 dBm Min.			
	Unity Gain	+30 dBm Min.			
	Maximum Gain	+30 dBm Min.			
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 & Monitoring		Ethernet via RJ45, 10BaseT/100BaseTx, ETL TCP/IP Protocol SNMPv3, HTTPS & built in Web Server	
Alarms		Ethernet (RJ45) & Dry contact (D-type) 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 affects only one input port
Output cards		Hot swap	Failure affects 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.

ETL SYSTEMS LTD
Coldwell Radio Station, Madley,
Hereford, England HR2 9NE

EMAIL
info@etlsystems.com

TELEPHONE
+44 (0)1981 259020