

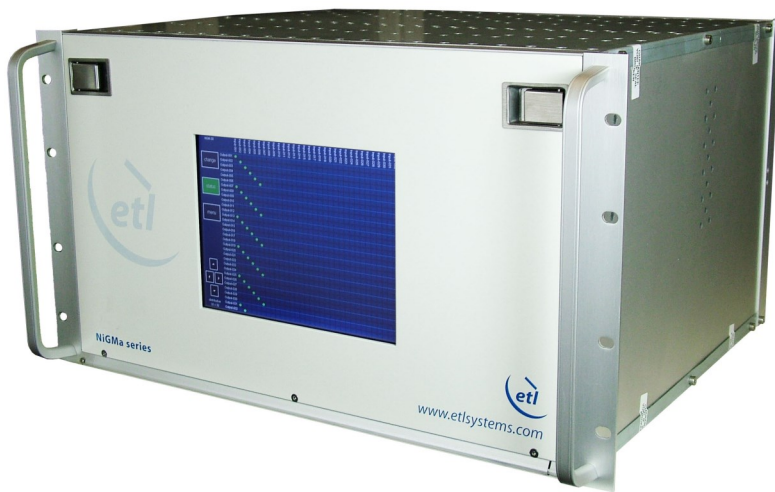


Model Number: NGM-30-xxxx

High Linearity & Variable Gain

Enigma L-band Switch Matrix / Router

32 x 32 L-band signal routing evolves to new heights



Front View of Model NGM-30 showing touch screen VGA

ETL's popular high performance Enigma L-band **distributive (fan-out)** matrix evolves to set new benchmarks for RF performance and leading edge technologies.

The next generation of Enigma matrix focuses on **improved resilience and performance** the impact of failure is minimised throughout the unit. The NGM-30 matrix joins the existing Enigma range by providing **high linearity** and **variable gain**.

As ETL customers use matrices in mission-critical applications, we understand the importance of redundancy and hot swap. Input and output cards, power supplies, CPU controller cards, fans and the new VGA human interface can all be **hot swapped**.

New Matrix design means there is one card associated with each input and each output – so failure of a card only affects one channel. For broadcasters, satellite operators and the defence sector, this provides exceptional resilience. The refined design offers rugged dual redundant power supplies with simple front access, enhanced CPU change-out, hot-swap fans and new card connectors. **Web Browser Interface** is standard on an NGM-30.

Improved RF performance of the Enigma which provides superior Isolation, frequency response or flatness, and 1 dB GCP levels – helping our customers ensure that their overall RF chain signal performance is optimised.

Self Diagnostics with continuous monitoring (and reporting) of amplifier status, PSU status (including temperature), fan speed and internal communications is included as standard. Any problems are rapidly identified and hot swap means they can be addressed in minutes.





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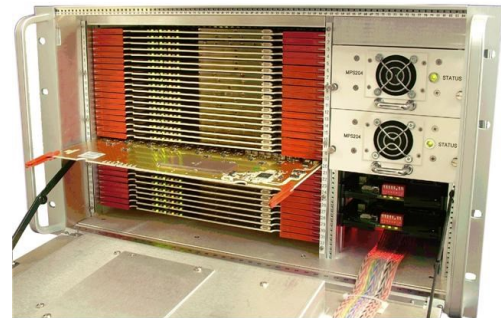
RF Engineering
and Custom Build

32x32 Enigma L-band high linearity & variable gain Switch
Matrix / Router

NEW FEATURES:

A number of new features have been introduced to the Enigma matrix, including those described below:

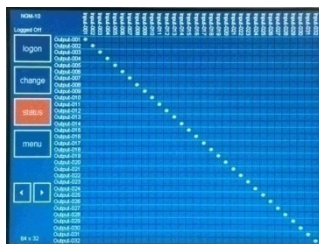
Fast Matrix Card Changeout from front and rear



On board log records all routing changes for each user



Touchscreen VGA control with security log on for up to 10 users



Aliases (10 character) on front screen to identify signal sources



FLEXIBILITY

The Enigma Matrix can be adapted and grown to a number of different sizes

Master Matrix offers routing control from touch screen or remotely

All modules offer hot-swap CPUs and PSUs for peace of mind



Front View

Hot-Swap Input & Output Matrix Cards on all modules offer easy expansion

Active Splitter & combiners offer patch panel & gain options



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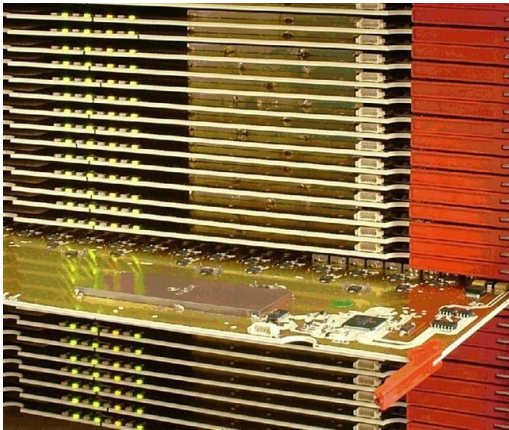
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Resilience

Resilience is designed-in

The Enigma matrix has been designed with resilience in mind. The impact of component failure is minimised and all active components can be hot swapped. Problems are rapidly identified and can be easily sorted out.

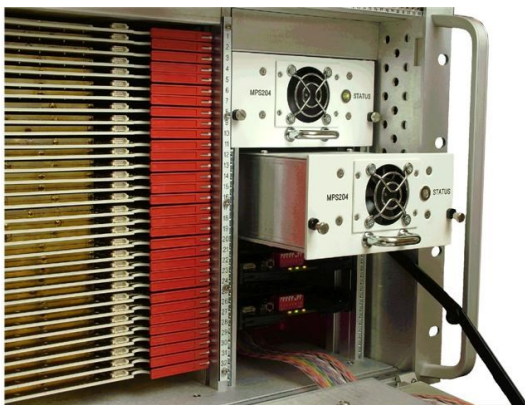
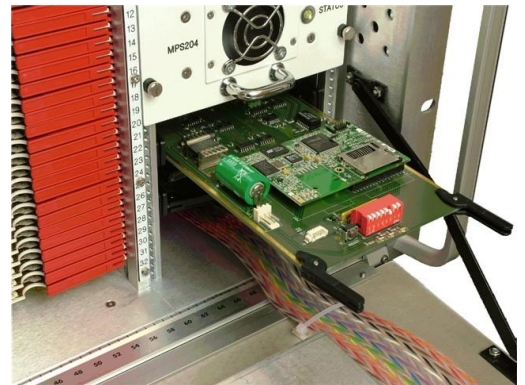


Minimal impact from card failure

One card per input and one card per output mean that the impact of card failure is minimised. Cards can be hot-swapped, and hot expansion can take place in single increments.

Minimal impact from CPU failure

The matrix contains dual redundant CPU's which both operate in parallel. If one CPU fails the other automatically becomes the master. CPU's can be hot-swapped.



Minimal impact from PSU failure

Dual redundant PSU's can be hot-swapped.

Rapid diagnosis of problems

The matrix continuously monitors the conditions of amplifiers, CPUs and PSUs. Any faults are immediately reported through the front panel and remotely. Alarms report the specific faults down to component level.





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32x32 Enigma L-band high linearity & variable gain Matrix Router

RF Engineering and Custom Build

Technical specifications and operating parameters

RF Parameters					
Capacity		32 inputs x 32 outputs			
Routing		Distributive, non blocking	Any input can be connected to any number of outputs		
Frequency Range		850-2150MHz (L-band)			
RF Connectors		50Ω BNC	75Ω BNC	75Ω F-type	50Ω SMA
Flatness	Full Band	±1.5 dB	±1.75 dB	±2.0 dB	±1.25 dB
	Any 36MHz	±0.4 dB	±0.5 dB	±0.5 dB	±0.4 dB
Input Return Loss	Typical	15 dB	12 dB	12 dB	15 dB
	Minimum	12 dB	10 dB	10 dB	12 dB
Output Return Loss	Typical	15 dB	12 dB	12 dB	15 dB
	Minimum	12 dB	10 dB	10 dB	12 dB
Gain	Maximum	5 ± 1 dB		nominal, mean across band	
	Minimum	-5 ± 1 dB			
	Gain Control Steps	0.5 ± 0.1 dB			
1dB Compression	At max gain	12 dBm typical			
	At unity gain	12 dBm typical			
	At min gain	8 dBm typical			
Noise Figure	At max gain	24 dB typical			
	At unity gain	25 dB typical			
	At min gain	28 dB typical			
OIP3 Output 3rd order intercept point	At max gain	22 dBm typical			
	At unity gain	22 dBm typical			
	At min gain	18 dBm typical			
Isolation Minimum between any 2 ports	I/P-O/P	60 dB			
	I/P-I/P	70 dB			
	O/P-O/P	70 dB			
Group Delay		<1ns		Across operational bandwidth	
MTBF (hours)	Chassis	170,740		Chassis excludes HMI and RF cards	
	Switch Card	270,297			
	Combiner Card	317,227			

Power		
AC Power	85-264Vac 50/60Hz	Fused 2A
PSU	Dual redundant	Diode OR
Hot-swap PSU	Yes	
Input RF Power	+20dBm	Absolute maximum
AC Consumption	100W	Max. consumption at steady state

Environmental	
Operating temperature	0 to 45°C
Location	Indoor use only
Storage temperature	-20°C to +75°C
Humidity	20-90% non-condensing

Physical	
Dimensions	6U high x 450mm deep x 19" wide
Weight	35 kg Fully Populated
Colour	White 00-E-55 semi-gloss

System Control	
Local Control	Touch screen & VGA Display
Remote Connection	Via RS232/RS485 and RJ45 Ethernet
SNMP Traps	For alarms & monitoring
Comms/Power Failure	Retains settings
Remote Control Software	Available
Web Browser Interface	Standard

Key Features	
Input Splitter Cards	One Card per input
Output Switch Cards	One Card per output
Matrix Cards	Single, Hot-swap
CPU	Dual redundant, Hot-swap
PSU	Dual redundant, Hot-swap
Self Diagnostics	Continuous Monitoring

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