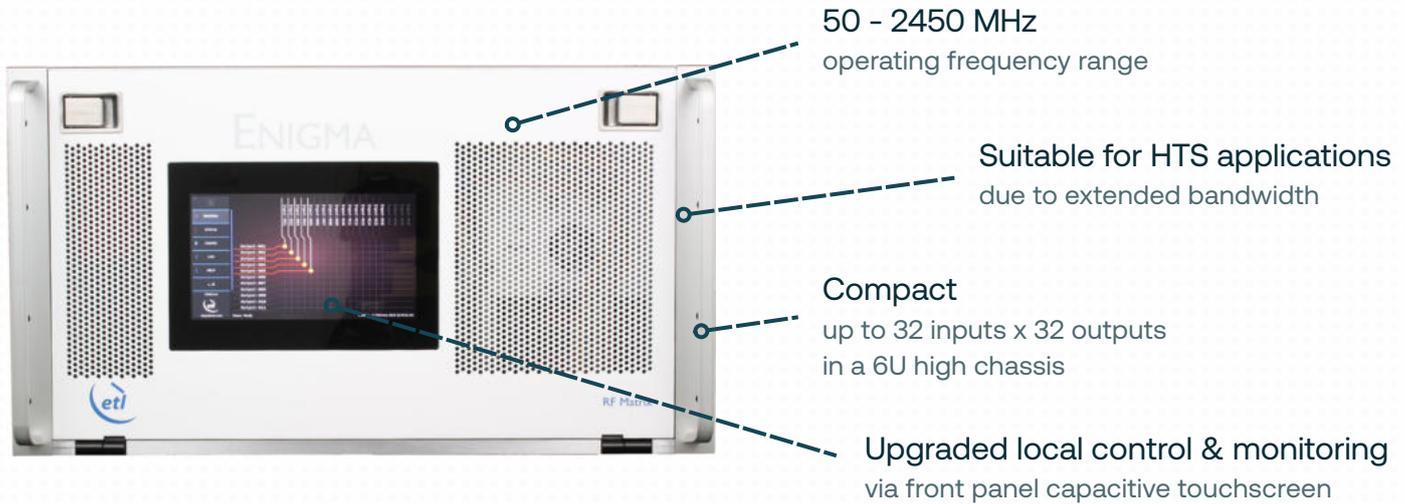# 32 x 32 Enigma 50-2450 MHz Combining Switch Matrix / Router

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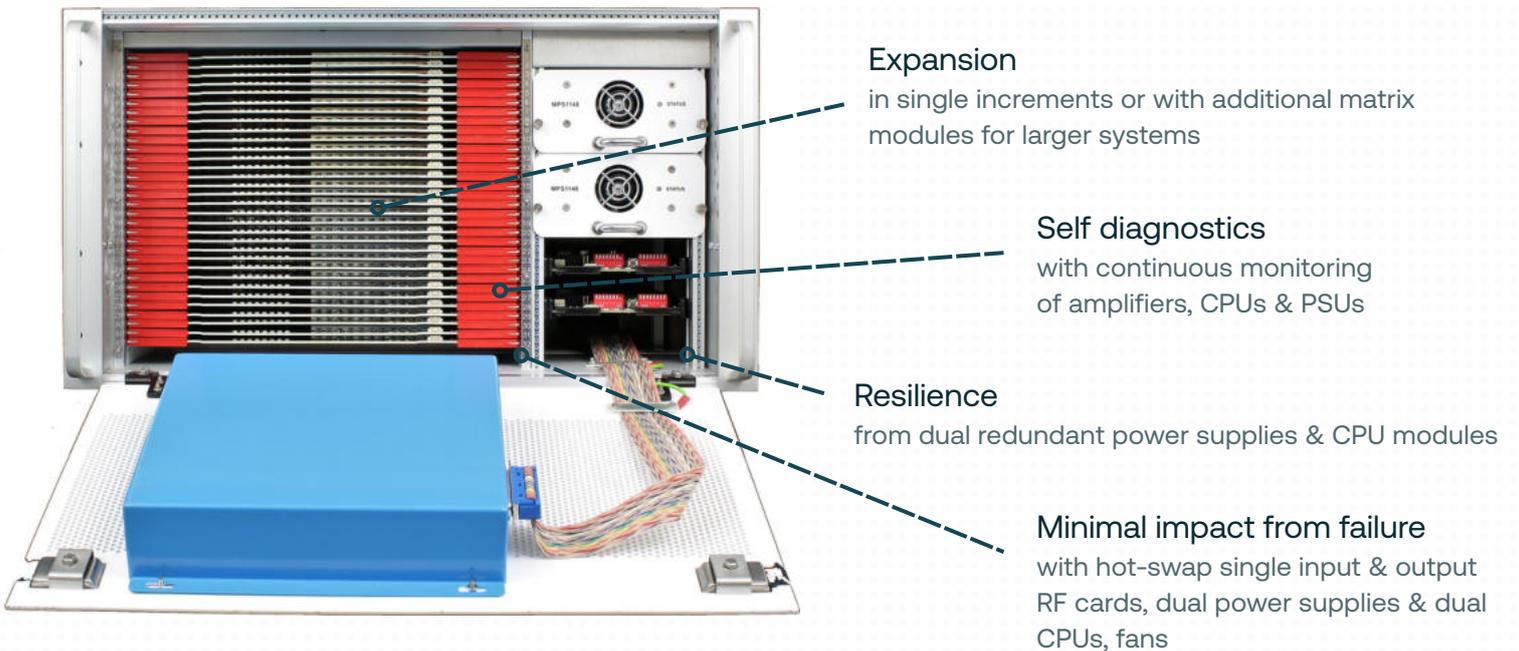

50 - 2450 MHz
operating frequency range

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

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
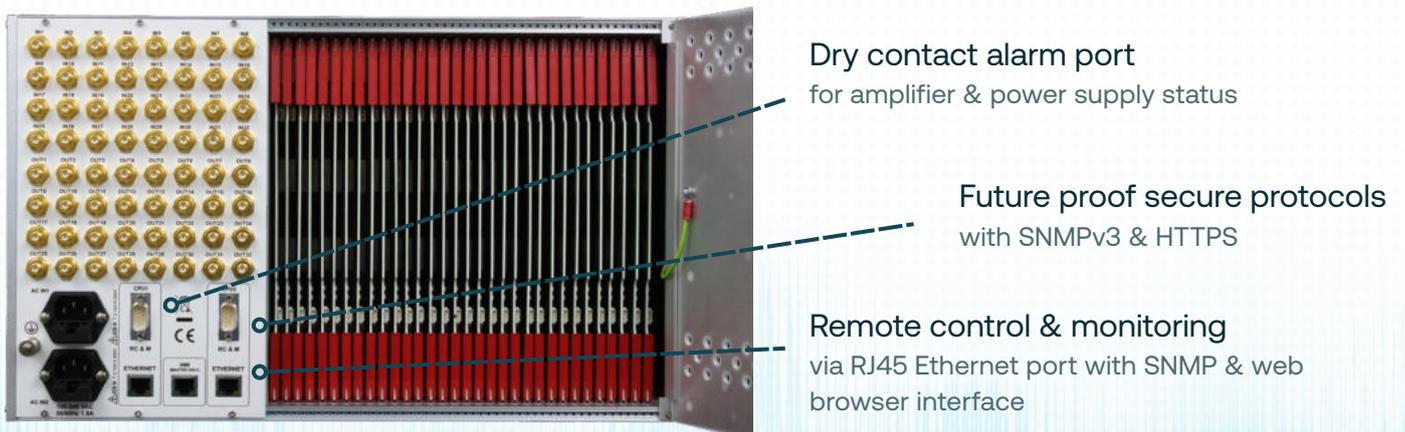
Dry contact alarm port
for amplifier & power supply status

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-in), non-blocking. Many inputs can be routed to each output.			
Frequency Range	50-2450 MHz			
Gain	0±1 dB Typical, mean across band			
Gain Control	0 to +10 in 0.25 dB steps			
RF Connectors	50Ω SMA	50Ω BNC	75Ω BNC	75Ω F-type
	All ports DC blocked			

Gain Flatness		50Ω SMA	50Ω BNC	75Ω BNC	75Ω F-type
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 (Min. between any 2 ports)		<2150 MHz	>2150 MHz	
	Input-Output	60 dB	50 dB	
	Input-Input	75 dB	75 dB	
	Output-Output	75 dB	75 dB	
Noise Figure	0 dB	24 dB		Typical, with one input routed to one output.
	+10 dB	16 dB		
1dB GCP (dBm)	<2150MHz	+5 dBm		1dB Gain Compression point, output power
	>2150MHz	+2 dBm		
OIP3	<2150MHz	Typical 18 dBm Minimum 14 dBm		
	>2150MHz	Typical 18 dBm Minimum 12 dBm		
OIP2	<2150MHz	50 dBm		
	>2150MHz	48 dBm		
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		
Spec. Version	1.0			

System Control		
Local Control	Via Front Panel capacitive touchscreen	
Remote Control & Monitoring	Ethernet port via RJ45 10BaseT/100 BaseTx. TCP/IP, SNMPv3, HTTPS & Web browser interface.	
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
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	
	Switch card	270,297	Chassis excludes HMI & RF cards
	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.