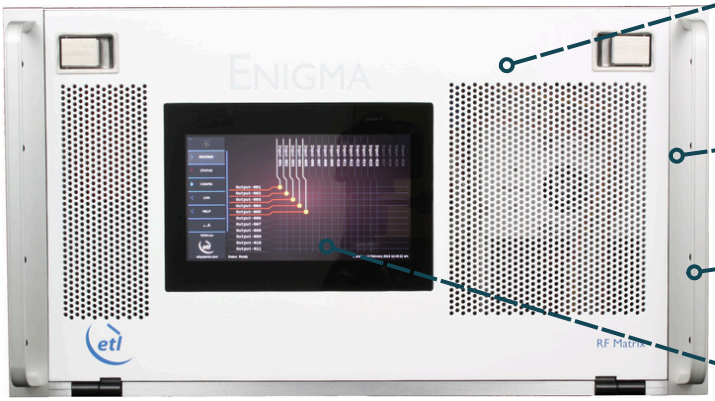
# 32 x 32 Enigma 50-2450 MHz Combining Switch Matrix / Router

4th generation Enigma matrix with enhanced RF performance including variable gain –5 dB to +5 dB settable per output.

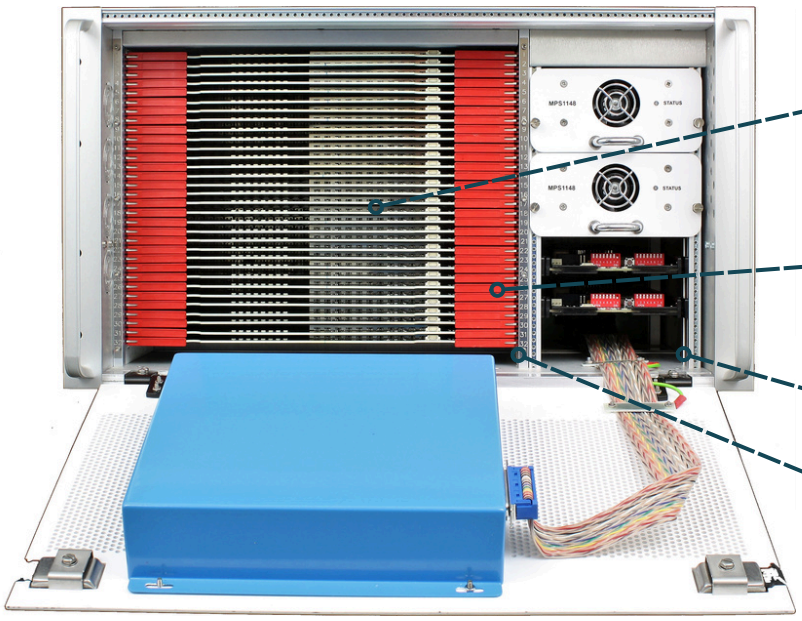


**50 - 2450 MHz**
operating frequency range

**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

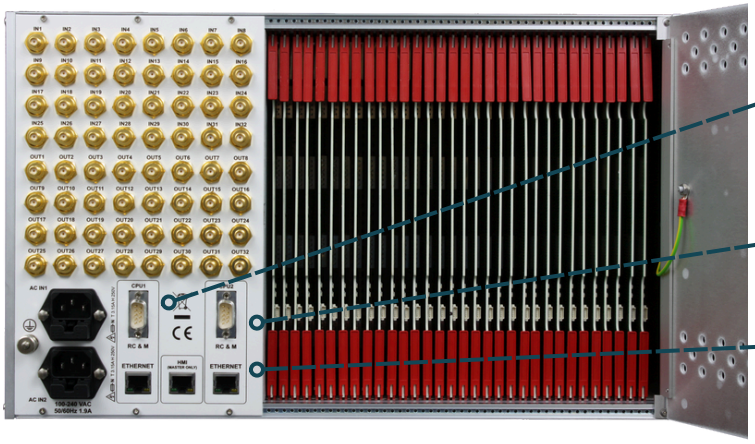


**Expansion**
in single increments or with additional matrix modules for larger systems

**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 | 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<br>Minimum 14 dBm | | | |
| | >2150MHz | Typical 18 dBm<br>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 | 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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