Havoc 256x256 L-band Matrix

Ultra compact

ETL's new ultra compact Havoc matrix provides routing for up to 256 input and output feeds in a 16U chassis. The matrix can be expanded from 16x16 up to 256x256 in blocks of 16.

Power saving

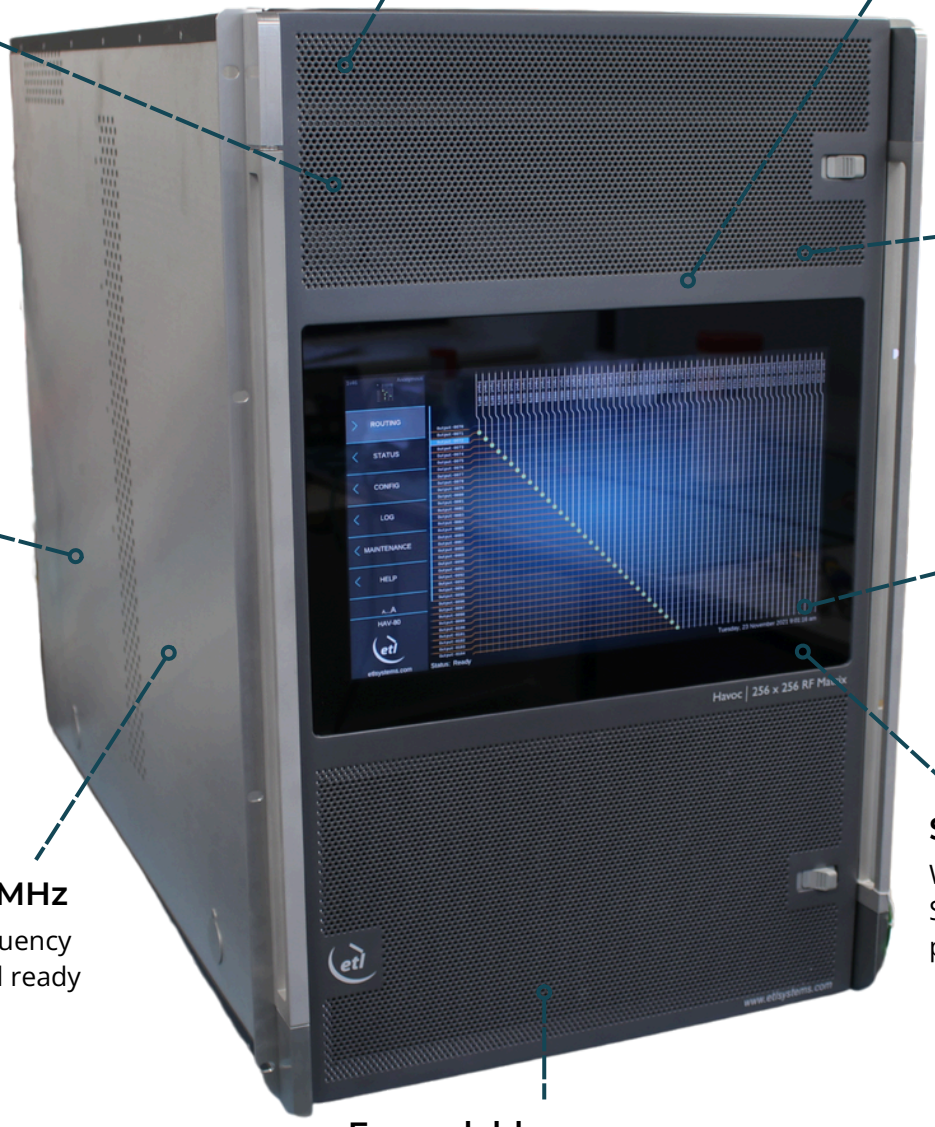
Only active signal routes are powered. This provides a greatly reduced power consumption compared to traditional matrices.

Minimal downtime

All active components can be hot-swapped without the need to re-boot the matrix. This includes power supplies, CPU modules, RF modules & fan trays.

Temperature monitoring

With intelligent fan speed control



Resilience

From quad redundant power supplies & dual redundant CPU modules

Compact

16U chassis providing 256 inputs x 256 outputs

Minimal training

Capacitive touchscreen controls, intuitive HMI and an improved web browser interface

Secure comms

With HTTPS, SNMPv3 and IPSEC protocols

850 - 2450 MHz

Operating frequency range, Ka-band ready

Expandable

Order in smaller sizes and expand in blocks of 16. Multi-chassis expansion available up to a maximum of 1024x1024

RF Parameters		
Routing		Distributive
Frequency Range		850 to 2450MHz
Capacity		256 inputs and 256 outputs, configurable in banks of 16 inputs/outputs
Power Consumption		<5W
Input & Output Ports		50 Ω SMA, all ports DC blocked
Gain (dB) Typ., mean across band		0±2
Gain Flatness (dB)	Full band	±2.0
	Any 36MHz	±0.5
Input Return Loss (db)	Typ.	18
	Min.	14
Output Return Loss (dB)	Typ.	20
	Min.	18
Gain Tracking		4 dB (Difference in mean gain between any two outputs when the same input is routed to both)
Gain Stability over Time		±0.2 dB / 24 hours
Gain Stability vs Temp		0.1dB / °C
Isolation (dB) Min. between any 2 ports	Input-Input	80 dB
	Output-Output	80dB
	Input-Output	55 dB
Noise Figure (dB)		Typ. 20 dB
1dB GCP (dBm) Output power, Min.	850 - 2150MHz	-3
	>2150MHz	-5
OIP3 (dBm) Output power, Typ.	850 - 2150MHz	+15
	>2150MHz	+10
OIP2 (dBm), Output power, Typ.		+33 (Second order intercept point)
Group Delay (Peak-Peak across specified bandwidth)	Full band	<1.0 ns
	Any 36MHz	±0.25 ns
SFDR		>110 dBm/Hz2/3
Non RF Parameters		
All Active Cards		Hot swappable
PSU Modules		Quad redundant hot swappable
CPUs		Hot swap dual CPU
Power Requirement		85-264Vac 47-63Hz Fused 4A
Power Consumption		600W (idle state) 1.8kW (fully routed) Only routed paths are powered.
MTBF		150,000 hours (17.1 years) TBC, fully populated 256x256 chassis
MTBF (RF Cards)		180,000 hours (20.5 years) TBC, each active RF card
MTTR		20 minutes. Assumes recommended spares are available.

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Control, Monitoring & Alarms	
Remote Control & Monitoring	Ethernet – RJ45 connector, 10/100/1000BaseTx, ETL Protocol over TCP, SNMP, Web Interface, Grass Valley NVision NV9000
HMI	Capacitive touch screen
Secure Communications	HTTPS SNMPv3
ETL Protocol over TCP	Supports up to 32 concurrent connections
Web Browser	Full remote control via web browser for 5 connections
Alarms	Comprehensive alarm status on communication protocols and front panel
Switching Time	Approx. 50ms (Measured from receipt of command on serial port to establishment of RF signal)
Amplifier Status	All RF amplifiers monitored. Local and Remote reporting.
Temperature Monitoring	All cards and modules individually monitored. Alarm when pre-set limits are exceeded.
Fan Speed Monitoring	All fans fitted with tachos. Alarm on over or under speed.
PSU Loading	Monitor unit power consumption. Report locally and remotely.
Physical & Environmental	
Dimensions	16U high x 850mm deep x 19” wide
Weight/Colour	184kg, RAL9023 – Pearl Dark Grey
Temperature	Operating: 0 to 45˚C / Storage: -20˚C to +75˚C
Location	Indoor use only
Humidity	20 to 90% non-condensing
Altitude	2,000 feet AMSL (Operational) 8,000 feet AMSL (Storage) *Above Mean Sea Level*
Absolute Maximum Ratings	
Max. DC Voltage on RF Ports	48Vdc, all ports are DC blocked
Input RF Power	+27dBm, any RF port

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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