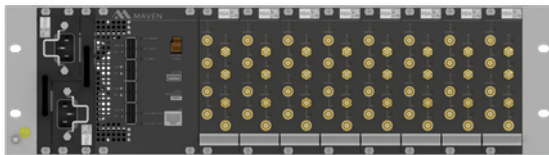


## System Features

- Fully digital end-to-end DAS system
- Fanless high power +43 dBm quad band remotes
- Highly efficient, reducing OPEX and emissions
- Quad band remotes weigh < 25 kg, one man lift
- Advanced MIMO support
- 5G NR Support
- Cascadable units
- Excellent PIM and noise performance
- Fully integrated 8 band 3U head end unit
- Prepared for C-RAN / ORAN open fronthaul
- System auto-commissioning
- Redundant system with automatic fail over



Maven DAS is a highly capable all-digital cellular DAS platform supporting multi-operator, multi-band installations for all European bands. The platform also supports 5G NR on all individual frequency bands.

The system consists of Stratus high power remotes, connected to Orion 19" head-end master rack units which convert BTS RF into digital CPRI feeding the remotes. The Maven DAS system supports C-RAN / O-RAN open fronthaul.

The system is highly optimised for efficiency. The high power Stratus remotes implement 4 RF bands at +43 dBm composite power each, with an efficiency of around 30% enabling fan less operation of all variants. The Orion head-end unit embeds the POI and all other head end functionalities in one single 3U unit. Each Orion head-end unit can be fitted with 8 separate RF modules giving up to 32 BTS connections.

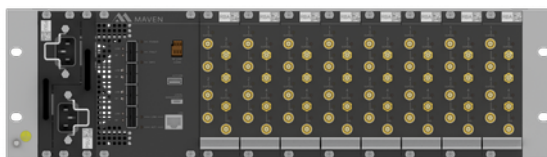
The digital fibre interface connects with 40 Gbps QSFP+ modules which each can carry up to 1200 MHz of RF

spectrum, enabling a link to carry all bands in advanced MIMO configurations as well having spare bandwidth for future spectrum allocations. The system supports various topologies for flexibility and redundancy such as star and ring topologies. The Stratus remotes can be cascaded flexibly. Both single mode and multi mode fibre can be used. Several remotes can be linked with local SFP+ connections for MIMO support or future upgrades.

Installation of the Maven DAS is quick thanks to few components, and also since the high power Stratus remotes are a one man lift. The system has auto-commissioning functionality which brings the system up and running quickly.

The secure web interface is intuitive and easy to use, making it useful for any level of technician. The equipment can be accessed from a laptop or a tablet. The standardised supervision interface can be connected to any standard NMS using SNMP v2c or v3. The Orion rack also provides a dry-contact relay output for alarm status.

## Orion specification



### General

---

Mains power	85 – 264 VAC, redundant, field replaceable -48 VDC, redundant, field replaceable
Power consumption	100 W max fully loaded
Management	Ethernet 10/100/1000 micro USB Standard USB accessory connector Summary alarm output (NC/NO)
Operating temperature	+5 to +45 °C
RF input	Up to 8 hot swappable band modules
System Gain	15 to 45dB in 0.1dB steps
Gain flatness	1dB pp

### Digital interface

---

CPRI ports	4 x QSFP+ connectors with option for SFP+ adapter
Spectrum bandwidth	Up to 1200 MHz RF spectrum per QSFP+ connector, either as a single WDM link or four 300MHz links
Single mode fibre	1310 nm band, up to 40 km distance
Multi mode fibre	850 nm band, up to 300 m distance

### RF module

---

Connections	2 or 4 RF interfaces, each with a duplex and simplex QMA connection.	
RF input range	0 to +30 dBm composite per RF module	
Frequencies	<u>Uplink (UL)</u>	<u>Downlink (DL)</u>
	703 – 733 MHz	758 – 788 MHz
	824 – 849 MHz	869 – 894 MHz
	832 – 862 MHz	791 – 821 MHz
	880 – 915 MHz	925 - 960 MHz
	1710 – 1785 MHz	1805 – 1880 MHz
	1920 – 1980 MHz	2110 – 2170 MHz
	2300 – 2400 MHz	
	2500 – 2570 MHz	2620 – 2690 MHz

### Mechanical

---

Dimensions (height, width, depth)	130 x 436 x 309 mm in standard 19" rack format
Weight	< 8 kg

## Stratus specification



### General

Mains power	85 – 264 VAC, -48 VDC optional
Power consumption	typically 360 W fully loaded
Management	Ethernet 10/100/1000, micro USB, Standard USB accessory connector
Operating temperature	-25 to +55 °C †
Ingress protection	IP65
Antenna port	4.3-10 or 7/16 optional, 1 combined antenna port as standard, max 4
Digital interface	3 x QSFP+ and 4 x SFP+
Number of bands	up to 4 bands in one enclosure

### RF parameters

Output power	+43 dBm per band @ 8 dB Peak-to-average ratio
Noise figure	3 dB typical at max gain
Return loss	> 14 dB
System impedance	50 Ω
Maximum input power	+17 dBm, non destructive *

Band	Uplink (UL)	Downlink (DL)	Operational bandwidth	Composite output power	Technologies
700	703 – 733 MHz	758 – 788 MHz	30 MHz	+ 43 dBm	LTE, 5G NR
850	824 – 849 MHz	869 – 894 MHz	25 MHz	+ 43 dBm	All
800	832 – 862 MHz	791 – 821 MHz	30 MHz	+ 43 dBm	LTE, 5G NR
900	880 – 915 MHz	925 - 960 MHz	35 MHz	+ 43 dBm	GSM(**), WCDMA, LTE, 5G NR
1800	1710 – 1785 MHz	1805 – 1880 MHz	75 MHz	+ 43 dBm	GSM(**), WCDMA, LTE, 5G NR
2100	1920 – 1980 MHz	2110 – 2170 MHz	60 MHz	+ 43 dBm	WCDMA, LTE, 5G NR
2300 TDD	2300 – 2400 MHz		100 MHz	+43 dBm	LTE, 5G NR
2600	2500 – 2570 MHz	2620 – 2690 MHz	70 MHz	+ 43 dBm	LTE, 5G NR

### Mechanical

Dimensions (height, width, depth)	670 x 383 x 270 mm
Weight	max 25 kg

### Standards & approvals

EMC & safety	EMC directive 2004/108/EC Low voltage directive 73/23/EEC RED directive 2014/53/EU
--------------	--

\* noise figure increases slowly and gradually after -37 dBm

\*\* maximum +37 dBm for GSM

† max 50 °C for quad band with full power in all bands

## Ordering information

### Orion head end unit

Item	Description	Part number
Orion Chassis	Orion head end 19" 3U main chassis	MRN00001
Power module VAC	110-230 VAC power supply Hot Swap	PSU00008
Power module VDC	-48 VDC power supply Hot Swap	PSU00009
800 band quad module	RF band module 791 – 821 MHz, quad port	RBM00006
900 band quad module	RF band module 925 - 960 MHz, quad port	RBM00007
1800 band quad module	RF band module 1805 – 1880 MHz, quad port	RBM00008
2100 band quad module	RF band module 2110 – 2170 MHz, quad port	RBM00009
2600 band quad module	RF band module 2620 – 2690 MHz, quad port	RBM00010
700 band quad module	RF band module 758 – 788 MHz, quad port	RBM00011
800 band dual module	RF band module 791 – 821 MHz, dual port	RBM00001
900 band dual module	RF band module 925 - 960 MHz, dual port	RBM00002
1800 band dual module	RF band module 1805 – 1880 MHz, dual port	RBM00003
2100 band dual module	RF band module 2110 – 2170 MHz, dual port	RBM00004
2600 band dual module	RF band module 2620 – 2690 MHz, dual port	RBM00005
700 band dual module	RF band module 758 – 788 MHz, dual port	RBM00012

### Stratus +43 dBm remote unit \*

Item	Description	Part number
Stratus 8/9/18/26 AC	Stratus QB 8/9/18/26 +43 dBm AC	RHN00001
Stratus 8/18/21/26 AC	Stratus QB 8/18/21/26 +43 dBm AC	RHN00002
Stratus 34 AC	Stratus 5G SB 34 +43dBm AC	RHN00005
Stratus 34/35 AC	Stratus 5G DB 34/35 +43dBm AC	RHN00006
Stratus 34/35/36 AC	Stratus 5G TB 34/35/36 +43dBm AC	RHN00007
Stratus 34/35/36/37 AC	Stratus 5G QB 34/35/36/37 +43dBm AC	RHN00008
Stratus 8/26 DC	Stratus DB 8/26 +43 dBm DC	RHN00012
Stratus 9/18/21/26 AC	Stratus QB 9/18/21/26 +43 dBm AC	RHN00017
Stratus 18/21/26 AC	Stratus TB 18/21/26 remote +43dBm AC	RHN00019
Stratus 21/26 AC	Stratus DB 21/26 remote +43 dBm AC	RHN00036
Stratus 8/9 AC	Stratus DB 8/9 remote +43dBm AC	RHN00022
Stratus 9/18 AC	Stratus DB 9/18 remote +43dBm AC	RHN00041
Stratus 8/8 AC -D	Stratus DB 8/8 dual antenna +43dBm AC	RHN00044
Stratus 18/18/26/26 AC	Stratus QB 18/18/26/26 +43 dBm AC	RHN00047
Stratus 8/9/18 AC	Stratus TB 8/9/18 +43dBm AC	RHN00048
Stratus 8/9/18/21 AC	Stratus QB 8/9/18/21 +43 dBm AC	RHN00050
Stratus 23TDD AC	Stratus SB 2300TDD +43 dBm AC	RHN00061
Cellular modem	Cellular (4G/3G/2,5G) integrated modem	MOD00001
GSM-R modem	GSM-R integrated modem	MOD00002

\*) Other frequency combinations available on request.

Note: All parameters are subject to change