Aviat
NETWORKS

Aprisa XE

POINT-TO-POINT DIGITAL MICROWAVE LINKS

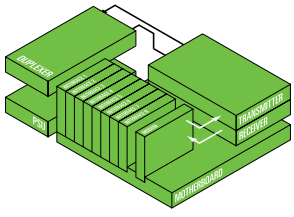
Licensed bands: 400, 900, 1400, 2000 MHz

DATASHEET [ISED / IC]

Aprisa XE: maximizing spectrum use and making challenging long distance links possible. Now aligned with ISED SRSP 302.0 channel sizes that maximizes the bandwidth and throughput that can be licensed.

- **Efficient future-proof single-box architecture**: the built-in multiplexer and cross-connect of the Aprisa XE eliminates external equipment with customer-configurable interface slots integrating IP, voice, and data traffic. Configuration, performance monitoring and diagnostics are easy with the Aviat embedded web-based element management system, SuperVisor.
- **High capacity**: class-leading spectral efficiency with up to 64 QAM modulation make the maximum use of the available spectrum and deliver industry leading capacity of up to 64.4 Mbit/s in a 14 MHz channel.
- **Long range**: a single Aprisa XE can bridge distances in excess of 240 km / 150 miles, overcoming environmental conditions and topographical obstacles, including over water paths.
- **Carrier-class performance**: Aprisa XE links are engineered to achieve 99.999% availability, benefiting from state of the art forward error correction and inherent low latencies, for unrivaled five nines quality of service.
- **Cost effective**: the Aprisa XE has a low total cost of ownership, providing a rapid return on investment by minimizing both initial capital including tower costs and operational expenses.
- **Redundancy options**: Monitored Hot Standby and Hitless Space Diversity are available for protection for mission-critical applications.
- **Reliable**: the Aprisa XE has an actual MTBF over 95 years. Deployed in over 150 countries, it can be relied upon to perform in the harshest and most remote environments.

Future-proof single-box architecture



In Brief

- Licensed 400 MHz, 900 MHz, 1.4 GHz, 2.0 GHz frequency bands
- Built-in cross-connect and multiplexer
- Up to 64.4 Mbit/s capacity
- 25 kHz, 50 kHz, 75 kHz, 100 kHz, 150 kHz, 200 kHz, 500 kHz, 1.25 MHz, 2.5 MHz, 3.5 MHz, 5.0 MHz, 7.5 MHz, 10.0 MHz, and 14.0 MHz channel sizes
- QPSK to 64 QAM modulation
- Path lengths of more than 240 km / 150 miles possible
- Industry-leading reliability
- Web server and SNMP management
- All voice, data and IP applications
- MHSB and HSD protection options

Specifications

RF	Band (MHz)	Tuning Range (MHz)	Synthesizer Step Size (kHz)
	400	394 – 460	5.0
	900	928 – 960	12.5
	1400	1350 – 1550	12.5
	2000	1900 – 2300	62.5
Modulation Types	Software configurable: QPSK / 16 / 32 / 64 QAM		
Frequency Stability	Short term ± 1 ppm (environmental effects and power supply variations) Long term ± 2 ppm (aging of crystal oscillators ≈ over 5 years)		
Antenna Connection	N-type female 50 ohm		

Transmitter Power Output	400 / 1400 MHz	900 MHz	2000 – 2500 MHz
QPSK	+21 to +35 dBm	+15 to +29 dBm	+20 to +34 dBm
16 QAM	+17 to +31 dBm	+15 to +29 dBm	+17 to +31 dBm
32 QAM	+16 to +30 dBm	+15 to +29 dBm	+16 to +30 dBm
64 QAM	+15 to +29 dBm	+15 to +29 dBm	+15 to +29 dBm

Receiver			
Maximum Input Level	–20 dBm		
Dynamic Range	58 to 87 dB at 10^{-6} BER		
C/I Radio	Co-Channel	QPSK	better than 16 dB
		16 QAM	better than 20 dB
		32 QAM	better than 23 dB
		64 QAM	better than 27 dB
	First adjacent channel		better than –5 dB
	Second adjacent channel		better than –30 dB

Duplexer (bandpass)	Passband MHz	TX / RX Split (MHz)	Frequency Bands (MHz)
B0	2.0	≥ 9.45	400 – 470
B1	0.5	≥ 5.0	400 – 470
B2	3.5	≥ 20	400 – 470
G2	1.0	≥ 9.0	928 – 960
H0	7.0	≥ 48.0	1350 – 1550
H1	7.0	≥ 23.5	1350 – 1550
I0	14.0	≥ 91	1900 – 2300
I1	7.0	≥ 50	1900 – 2300
I2	3.5	≥ 45	1900 – 2300

Power Supply	
Input Range	115 / 230 VAC, 50 / 60 Hz
	±24 VDC (20.5 – 30 VDC), ±48 VDC (40 – 60 VDC)
Power Consuption	53 – 180 W input power (dependent on interface cards fitted and transmitter output power level)

Interfaces	
Ethernet Ports	Integrated 4-port 10 / 100Base-T switch with port-based rate limiting, VLAN tagging and QoS Support Quad port Ethernet interface card supporting 10Base-T or 100Base-TX
E1 / T1	Quad 120 ohm G.703 / 4
Data	Quad V.24 asynchronous, synchronous and over sampling mode Single synchronous X.21 / V.35 / RS-449 / RS-530
Analogue	Dual 2-wire FXS / FXO (POTS); Quad 4-wire E&M

Auxiliary Interfaces	
Alarms	4 external alarm outputs, 2 external alarm inputs
Configuration	Embedded web server with SNMP
Management	Ethernet interface for SuperVisor and SNMP; V.24 / RS-232 CLI setup port
RSSI	Front panel test point

Environmental	
Operating	+14° F to +122° F (–10° C to +50° C)
Storage	–4° F to +158° F (–20° C to +70° C)
Humidity	Maximum 95 % non-condensing

Mechanical	
Rack Mount	19" 2U high (internal duplexer)
Weight	10 kg (23 lbs) typical

Protected Options	
MHSB	⩽ 4 dB splitter / cable loss, ⩽1 dB TX relay / cable loss (system gain reduced by a maximum of 5 dB)
HSD	⩽ 1 dB TX relay / cable loss, < 25 ms TX switching / hitless RX switching

Compliance	
Radio	RSS-GEN 400 MHz / 900 MHz RSS-119 **1.4 GHz SRSP-301.4** SRSP-301.4 does not specify the minimum antenna performance but ISED may set requirements on a case-by-case basis **2.0 GHz SRSP-302.0** 1. The Aprisa XE shall not be operated with a transmit power > +31 dBm 2. The Aprisa XE operating in a 10 MHz channel size, shall not use QPSK 3. If the channel size is ⩽ 1.25 MHz, ensure that the power at the antenna is ⩽ +30 dBm 4. SRSP-302.0 sets out the minimum antenna performance requirements, set by a combination of geographic congestion and capacity. Please contact Aviat Networks for further information.
EMI / EMC	ICES-003
Safety	EN/UL/IEC 62368-1, CB Certified, NRTL listed CSA 253147 applicable for AC, 48 VDC and 24 VDC product variants
Environmental	EN 300 019-2-3 Class 3.2

Product Range

	Channel Size													
	kHz							MHz						
	25	50	75	100	150	200	500	1.25	2.5	3.5	5.0	7.5	10.0	14.0
400	✔	✔	✔	✔	✔	✔	✔	✔	✔					
900				✔		✔								
1400										✔				
2000							✔	*	*		*	*	*	✔

* New channel sizes

System Performance

25 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	N/A	56 (0 TS + 56) kbit/s	72 (1 TS + 8) kbit/s	88 (1 TS + 24) kbit/s
Receiver Sensitivity[2]	N/A	–105 dBm	–102 dBm	–99 dBm
System Gain [2]	N/A	136 dB	132 dB	128 dB

50 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	72 (1 TS + 8) kbit/s	152 (2 TS + 24) kbit/s	192 (3 TS + 0) kbit/s	232 (3 TS + 40) kbit/s
Receiver Sensitivity[2]	–109 dBm	–103 dBm	–100 dBm	–97 dBm
System Gain [2]	143 dB	134 dB	130 dB	126 dB

75 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	128 (2 TS + 0) kbit/s	264 (4 TS + 8) kbit/s	312 (4 TS +56) kbit/s	400 (6 TS + 16) kbit/s
Receiver Sensitivity[2]	–107 dBm	–101 dBm	–98 dBm	–95 dBm
System Gain [2]	141 dB	132 dB	128 dB	124 dB

100 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	136 (2 TS + 8) kbit/s	280 (4 TS + 24) kbit/s	352 (5 TS + 32) kbit/s	424 (6 TS + 40) kbit/s
Receiver Sensitivity[2]	–106 dBm	–100 dBm	–97 dBm	–94 dBm
System Gain [2]	135 dB	129 dB	126 dB	123 dB

150 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	264 (4 TS + 8) kbit/s	536 (8 TS + 24) kbit/s	672 (10 TS + 32) kbit/s	808 (12 TS + 40) kbit/s
Receiver Sensitivity[2]	–104 dBm	–98 dBm	–95 dBm	–92 dBm
System Gain [2]	138 dB	129 dB	125 dB	121 dB

200 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	312 (4 TS + 56) kbit/s	632 (9 TS + 56) kbit/s	792 (12 TS + 24) kbit/s	952 (14 TS + 56) kbit/s
Receiver Sensitivity[2]	–102 dBm	–96 dBm	–93 dBm	–90 dBm
System Gain [2]	131 dB	125 dB	122 dB	119 dB

500 kHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	792 (12 TS + 24) kbit/s	1592 (1 T1 + 8) kbit/s	1992 (1 T1 + 408) kbit/s	2392 (1 T1 + 808) kbit/s
Receiver Sensitivity[2]	–102 dBm	–96 dBm	–93 dBm	–90 dBm
System Gain [2]	131 dB	125 dB	122 dB	119 dB

1.25 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	1816 (1 T1 + 232) kbit/s	3640 (2 T1 + 472) kbit/s	4552 (2 T1 + 1384) kbit/s	5464 (3 T1 + 712) kbit/s
Receiver Sensitivity[2]	–95 dBm	–89 dBm	–86 dBm	–83 dBm
System Gain [2]	129 dB	120 dB	116 dB	112 dB

2.5 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	3736 (2 T1 + 568) kbit/s	7480 (4 T1 + 1144) kbit/s	9352 (5 T1 + 1432) kbit/s	11224 (7 T1 + 136) kbit/s
Receiver Sensitivity[2]	–93 dBm	–87 dBm	–84 dBm	–81 dBm
System Gain [2]	127 dB	118 dB	114 dB	110 dB

3.5 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	5720 (3 T1 + 968) kbit/s	11448 (7 T1 + 360) kbit/s	14312 (9 T1 + 56) kbit/s	17176 (10 T1 + 1336) kbit/s
Receiver Sensitivity[2]	–90 dBm	–84 dBm	–81 dBm	–78 dBm
System Gain [2]	125 dB	115 dB	111 dB	107 dB

5.0 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	7736 (4 T1 + 1400) kbit/s	15480 (9 T1 + 1224) kbit/s	19352 (12 T1 + 344) kbit/s	23224 (14 T1 + 1048) kbit/s
Receiver Sensitivity[2]	–89 dBm	–83 dBm	–80 dBm	–77 dBm
System Gain [2]	123 dB	114 dB	110 dB	106 dB

7.5 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	12232 (7 T1 + 1144) kbit/s	24472 (15 T1 + 712) kbit/s	30572 (19 T1 + 496) kbit/s	36712 (23 T1 + 280) kbit/s
Receiver Sensitivity[2]	–87 dBm	–81 dBm	–78 dBm	–75 dBm
System Gain [2]	121 dB	112 dB	108 dB	104 dB

10.0 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1 + wayside)	15544 (9 T1 + 1288) kbit/s	31096 (19 T1 + 1000) kbit/s	38872 (24 T1 + 856) kbit/s	46648 (29 T1 + 712) kbit/s
Receiver Sensitivity[2]	–86 dBm	–80 dBm	–77 dBm	–74 dBm
System Gain [2]	120 dB	111 dB	107 dB	103 dB

14.0 MHz Channel	QPSK	16 QAM	32 QAM	64 QAM
Capacity[1] gross (T1+wayside)	23992 (15 T1 + 232) kbit/s	47992 (30 T1 + 472) kbit/s	59992 (32 T1 + 9304) kbit/s	64464 (32 T1+14776) kbit/s
Receiver Sensitivity[2]	–85 dBm	–78 dBm	–75 dBm	–72 dBm
System Gain [2]	119 dB	109 dB	105 dB	101 dB

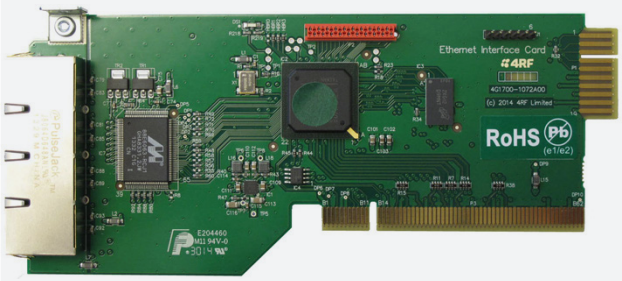
NOTES (SYSTEM PERFORMANCE TABLES)

[1] T1 capacities are specified as unframed. The management Ethernet capacity must be subtracted from the gross capacity (default 64 kbit/s).

[2] Performance specified at the antenna port for 10^{-6} BER. Figures for 10^{-3} BER are typically 1 dB better.

Interface Cards

QETH: Quad port Ethernet interface card supporting 10Base-T or 100Base-TX

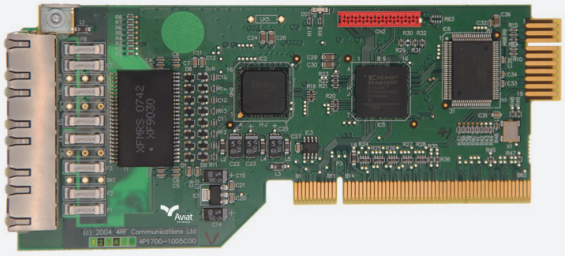


The QETH is a quad port Ethernet interface card supporting 10Base-T or 100Base-TX for transport of user Ethernet traffic. The QETH features are:

- Layer 2 Ethernet / VLAN Switch conforming to 802.1D/Q supporting standard LAN networks
- Traffic segregation with transparent VLAN and per port VLAN tagging for user and management traffic.
- QoS support for tight traffic control with per packet prioritization, scheduling and priority queuing. Priority can be either per port or per packet and scheduling can be either strict priority or weighted priority. Ingress rate limiting per port (up to 8 Mbit/s) can be used to protect against buffer flooding.

Shipping weights and dims 0.15 kg, 240mm x 108mm x 32mm

QJET: QJET Quad E1 / T1 framed / unframed interface card



The QJET is a quad port 2 Mbit/s E1 / T1 digital interface providing unframed (G.703) and framed (G.704) interfaces.

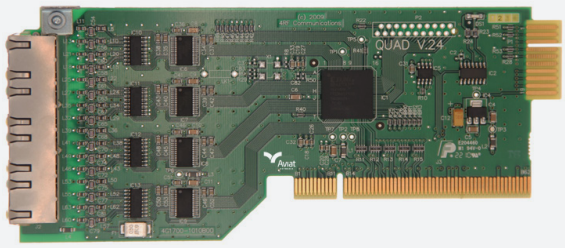
Unframed (G.703) E1 is typically used for transport of an entire E1 / T1 over the radio link.

Framed (G.704) E1 / T1 timeslots can be cross connected to:

1. Any other E1 / T1 timeslot on any other E1 / T1 interface providing transport, timeslot grooming and drop and insert functionality.
2. Analogue interface cards providing digital trunk interface connection to PBX and telephone exchanges.
3. QV24 interface cards providing synchronous over sampling circuits.

Shipping weights and dims 0.14 kg, 240mm x 108mm x 32mm

QV24: Quad V.24 serial interface card



The QV24 is a quad port serial interface card providing asynchronous and synchronous V.24 data transmission.

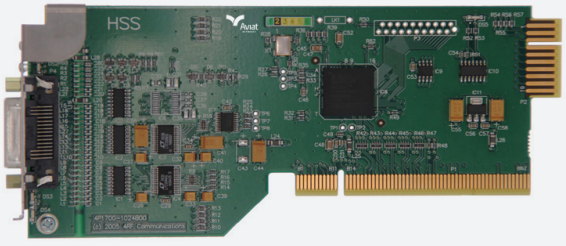
Asynchronous mode provides V.24 circuits at data rates of 300, 600, 1200, 2400, 4800, 7200, 9600, 12800, 14400, 19200, 23040, 28800, 38400, 57600 and 115200 bit/s.

In synchronous mode, interface data is synchronously mapped to radio capacity using proprietary subrate multiplexing providing data rates of 300, 600, 1200, 2400, 4800, 9600 and 19200 bit/s. QV24 interfaces are required at both ends of the circuit.

In over sampling mode, the interface data is sampled at a fixed 64 kHz. This timeslot can be cross connected to an E1 or T1. This over sampling mode can be operated up to 19200 bit/s.

Shipping weights and dims 0.14 kg, 240mm x 108mm x 32mm

HSS: Single synchronous serial interface card



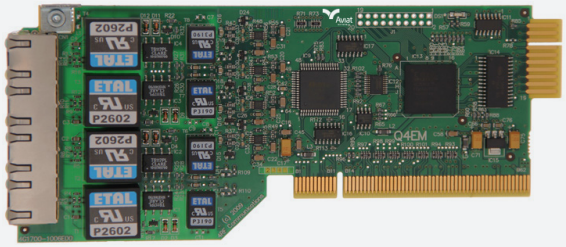
The HSS is a single port high speed serial interface card providing V.35, X.21, RS-449 and RS-530 synchronous data transmission as either a DTE or a DCE. It supports data rates of 8 to 2048 kbit/s in 8 kbit/s steps (dependent on rate selected). 8 kbit/s is used for control lines.

The interface card provides an LFH 60 connector and uses standard Cisco WAN port serial interface cables to provide the correct data interface connector.

The interface specification (X.21 / V.35 etc) is automatically changed by simply changing the type of interface cable connected to the HSS.

Shipping weights and dims 0.14 kg, 240mm x 108mm x 32mm

Q4EM: Quad 4 wire E&M interface card



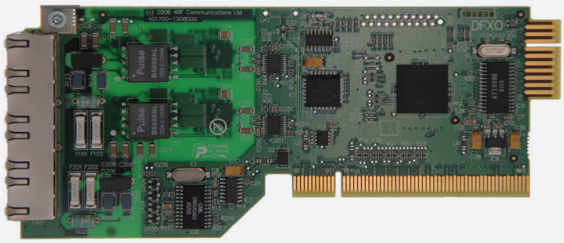
The Q4EM is a quad port analogue interface card providing a 4 wire analogue circuit and single E&M signalling.

The Q4EM digitizes analogue signals using either 64 kbit/s PCM (G.711-compliant) or 32, 24 or 16 kbit/s ADPCM compression (G.726-compliant), providing phone-quality voice transmission. Channel Associated Signalling (A bit) is used to signal between the interfaces.

The Q4EM E&M signalling leads are optically isolated, bi-directional lines which can be externally referenced to meet any of the EIA-464 connection types I, II,IV or V.

Shipping weights and dims 0.18 kg, 240mm x 108mm x 32mm

DFXO: Dual 2 wire loop signalling foreign exchange office (FXO) interface card



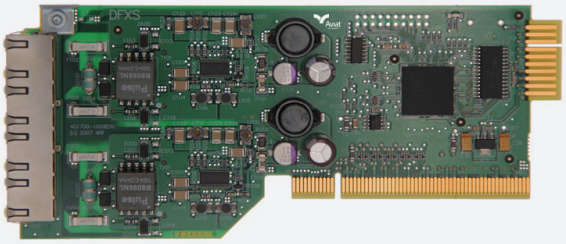
The function of FXO / FXS two wire loop interface circuits is to transparently extend the 2 wire interface from the exchange line card to the telephone / PBX, ideally without loss or distortion. These circuits are known as 'ring out, dial in' 2 wire loop interface circuits. The DFXO interface simulates the function of a telephone.

The DFXO digitizes analogue signals using either 64 kbit/s PCM (G.711-compliant) or 32, 24 or 16 kbit/s ADPCM compression (G.726-compliant), providing phone-quality voice transmission. Channel Associated Signalling (ABCD bits) is used to signal the remote DFXS.

Line and balance impedances are synthesized with high-performance DSP architecture.

Shipping weights and dims 0.14 kg, 240mm x 108mm x 32mm

DFXS: Dual 2 wire loop signalling foreign exchange subscriber (FXS) interface card



The function of FXO / FXS two wire loop interface circuits is to transparently extend the 2 wire interface from the exchange line card to the telephone / PBX, ideally without loss or distortion. These circuits are known as 'ring out, dial in' 2 wire loop interface circuits. The DFXS interface simulates the function of an exchange line card.

The DFXS digitizes analogue signals using either 64 kbit/s PCM (G.711-compliant) or 32, 24 or 16 kbit/s ADPCM compression (G.726-compliant), providing phone-quality voice transmission. Channel Associated Signalling (ABCD bits) is used to signal the remote DFXO.

Line and balance impedances are synthesized with high-performance DSP architecture.

Shipping weights and dims 0.16 kg, 240mm x 108mm x 32mm

Disclaimer

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