

AC8800 INTELLIGENT FIBRE OPTIC PLATFORM



The AC8800 is a dual active output node. It is based on fixed platform but flexible modular solution. It supports two optical receivers with redundancy for downstream signal path on the motherboard. The upstream signal path can also be fully redundant with double transmitter modules. When more segmentation is needed, both optical transmitters can be fed with separate individual return signals. The amplifier stages are based on high performance hybrids, which makes the usable output level range especially wide.

AC8800 has a USB connector for local configuration with a PC or PDA. It is also equipped with a plug-in module slot for AC6990 transponder module. The transponder unit measures the levels of forward and return path signals and enables the automatic forward and return path alignment function. Node's dual power supplies are monitored by the transponder and increase the reliability of the node. Fully user configurable automatic level control (ALC) keeps output level constant, while forward path spectrum analyser and return path ingress analyser features aid in network monitoring and troubleshooting.

Features

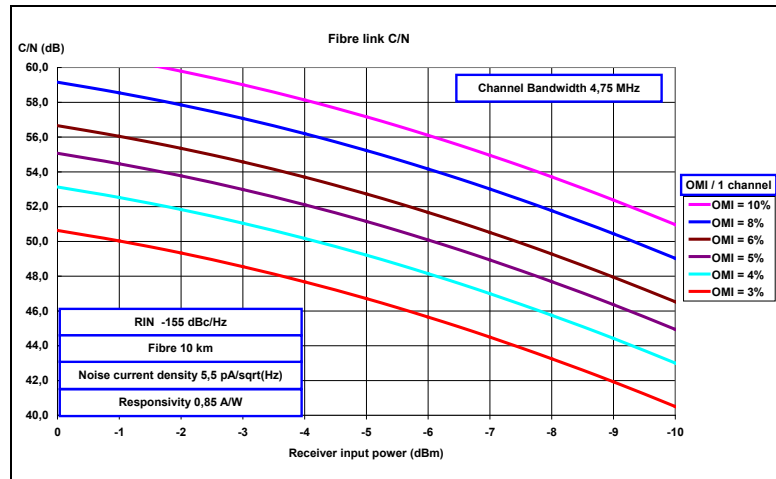
- Automatic alignment of both forward and return path
- 1 GHz forward path
- Integrated splice organizing option
- Wide range of upstream laser technologies available
- Efficient surge and ESD protection
- Redundant power supply
- Amplifier stages use GaAs technology
- Electrical level and slope controls
- Electrical control of return path signal combining
- Downstream and upstream spectrum analyser function as an option
- Return path pilot generator as an option

Technical specifications

Parameter	Specification
Downstream signal path	
Light wavelength	1290...1610 nm
Optical input power range	-7...0 dBm
Frequency range	47 / 54 / 70 / 85 / 108...1006 MHz
Return loss	18 dB 1)
Gain limited output level	2 x 113 dB μ V 2)
1 st interstage gain control	0...-16 dB 3)
2 nd interstage gain control	0...-13 dB 4)
Slope control	0...14 dB 5)
Flatness	\pm 0.5 dB 6)
Group delay	2 ns
Test point	-20 dB 7)
Noise current density	5.5 pA/ \sqrt Hz 8)
CTB 42 channels	113.5 dB μ V 9)
CSO 42 channels	115.0 dB μ V 9)
XMOD 42 channels	110.0 dB μ V 9)
CTB 110 / 77 channels	69.0 / 77.0 dBc 10)
CSO 110 / 77 channels	72.0 / 76.0 dBc 10)
XMOD 110 / 77 channels	63.0 / 70.0 dBc 10)
Upstream signal path	
Frequency range	5...30 / 42 / 50 / 65 / 85 MHz
Return loss	18 dB
Ingress switching	0 / -6 / < -45 dB
Input level	62.0 dB μ V 11)
CINR	> 52 dBc 12)
OMI adjustment	0...-20 dB
OMI test point	-10 dB 13)
Transponder connection	-32 dB 14)
General	
Power consumption	43 W 15)
Current need	see note 16)
Supply voltage	27...65 VAC, \pm 35...90 VDC
Maximum current feed through	12.0 A / port
Hum modulation	70 dB 17)
Optical connectors	SC/APC, FC/APC, E-2000
Output connectors	PG11
Test point connectors	F female
Dimensions	245 x 255 x 145 mm h x w x d
Weight	5.0 kg
Operating temperature	-40...+55 °C
Class of enclosure	IP 54
EMC	EN50083-2
ESD	4 kV 18)
Surge	6 kV 19)

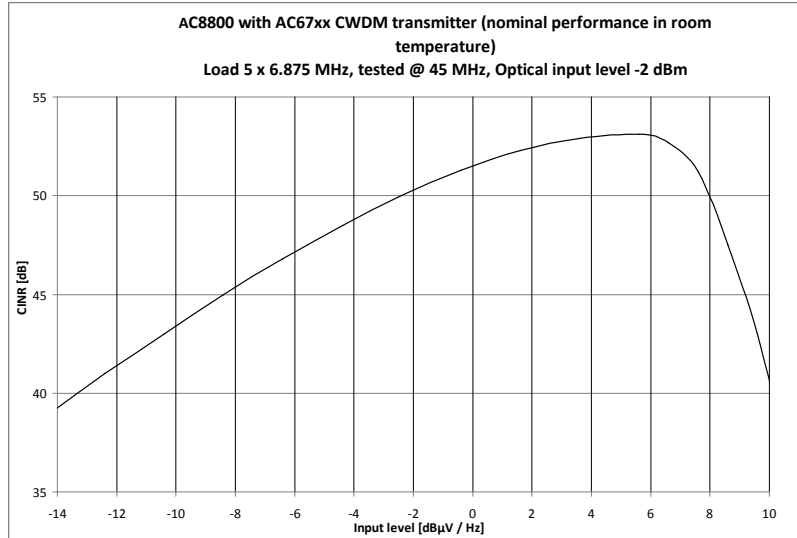
Notes

- 1) The limiting curve is defined at 40 MHz -1.5 dB / octave. Return loss is always better than 13 dB.
- 2) This is the gain limited output level when OMI is 4.0 %. The level is available with the optical input power of -7 dBm (AC6610). The used wavelength is 1310 nm.
- 3) Step size is 1 dB.
- 4) Step size is 0.2 dB. This adjustment is used in ALC operation.
- 5) Step size 0.5 dB. Defined between 47...1006 MHz.
- 6) Typical value in room temperature. Guaranteed value is ± 0.75 dB.
- 7) TP has a tolerance of ± 0.75 dB between 47...862 MHz and ± 1.0 dB between 862...1006 MHz.
- 8) This is a typical value at 862 MHz and the value can be used for C/N calculations. Typical C/N curves can be seen in the picture.

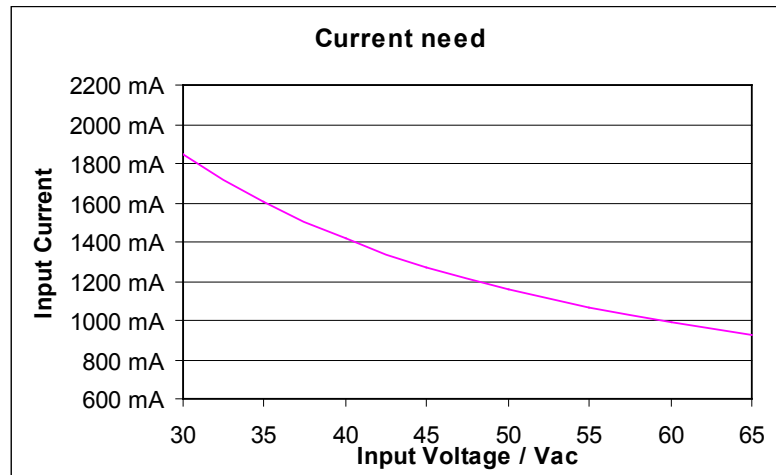


- 9) EN50083-3. Node output was 8 dB cable equivalent sloped and optical level was -7 dBm. All results are typical values in room temperature. XMOD is measured at the lowest channel. The highest recommended output level for the node is 113.0 dBμV with 41 channels.
- 10) Measured with 77 and 110 NTSC channels. The output was 12 dB linearly sloped and the used levels were at 55 / 550 / 750 / 862 MHz 35.0 / 42.5 / 45.5 / 47.0 dBmV. All results are typical values in room temperature, which can be used in system calculations. XMOD is measured at 55.25 MHz. The highest recommended output level for the node is 51 dBmV with 110 channels and 53 dBmV with 77 channels.
- 11) Nominal input level for 4.0 % OMI. Defined at the output connector of the node.

12)



- 13) -10 dB is valid if ingress switch and US input attenuator are having 0 dB values in use. The nominal value at this TP is 52 dBuV when OMI is set to 4 %. Tested at 20 MHz.
- 14) This is the level difference between return path input and transponder transmit pin when return path attenuation is 0 dB. This value increases linearly with increasing return path attenuation.
- 15) Power consumption is given with transponder and with 2 pcs of optical TX and RX.
- 16)



- 17) 70 dB hum value is valid at any frequency from 10 to 1006 MHz, when the remote current is less than 8.0 A/ port. Hum modulation is 65 dB, if 12.0 A is fed. 16.0 A is the maximum current, which can be locally injected into both ports together.
- 18) EN61000-4-2, contact discharge to enclosure and RF-ports.
- 19) EN61000-4-5, 1.2 / 50 μs pulse to RF-ports.

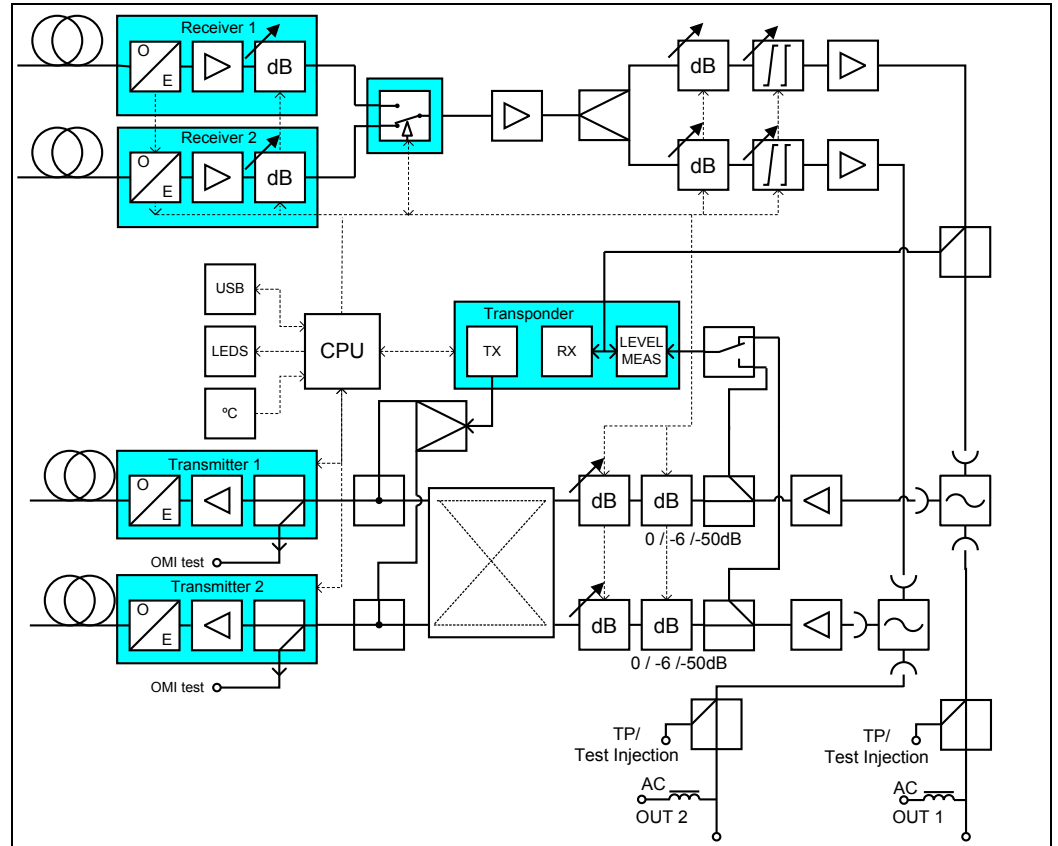
Monitoring functions

- Status LED for alarm indication
- Return path ingress switches on / attenuated / off control
- 65 VAC voltage measurement with alarms
- Local +12 V and +24 V voltage measurements with alarms
- Internal temperature measurement with alarms
- Full electrical control of all forward and return path alignments
- OMI based forward path automatic alignment
- OMI based return path automatic alignment
- Uptime, total uptime and reset counters for power outage statistics
- User notes can be stored into amplifier memory
- Fully user configurable alarm limits, severities, enabling and delays
- Alarm log stored into non-volatile memory for easy troubleshooting
- Node configuration and accessory information stored in amplifier memory
- Fast local software update via USB also without power supply
- Optical receiver input power measurement with alarms
- Optical transmitter laser bias current monitoring with alarms
- Automatic or manual optical receiver selection
- Optical transmitter pilot generator enabling and frequency control
- Return path signal combining / separation control with automatic backup

Additional features available with AC6990 transponder:

- Remote access to all AC8800 settings and monitored parameters
- ALSC and modem LEDs for alarm indication
- CATVisor and HMS compatible remote connection for monitoring and control
- Interstage gain control by ALC mode with saturation alarm
- ALC pilot frequencies, types, back-offs and decision levels are user programmable
- Automatic reserve pilot switching
- User configurable all pilots lost behaviour
- Pilot based forward path automatic alignment
- Full forward and return path automatic alignment with single button
- Lid status monitoring with alarm
- Service terminal connection monitoring with alarm
- Node configuration change monitoring with alarm
- Spectrum analyser for forward path level measurement with alarm
- Ingress analyser for return path level measurement with alarms
- Automatic ingress switch activation and deactivation based on detected ingress with alarms and user configurable delays
- Modem receive and transmit signal level monitoring with alarms
- Remote software update to multiple units simultaneously
- Return path 4 pilot generator with user programmable frequencies and levels

Block diagram



Ordering information

AC8800 configuration map

		1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12
		1 2 3	1 2 3	1 3	1 3	1 2	1 3	1 3	1 2	1 2	1	1 2 3	1
AC8800													
1-1 Platform type	A Standard 1GHz												
1-2 Power supply	A Single PSU, 65 VAC (1 x AC6310) B Double PSUs, 65 VAC (2 x AC6310)												
1-3 Fiber organizing	A Standard fibre organiser B Splice and fibre organiser in the lid												
2-1 Fibre feed-through adapter	E 58 Adapter (KDC316) G 1-4 fibres (KDD900) X None												
2-2 Output 2 connection	A PG11 B 58" C IEC D 3.512 E F												
2-3 Output 1 connection (first from right)	A PG11 B 58" C IEC D 3.512 E F												
3-1 Optical receiver RX1	10 RX1 input level -7...0 dBm (AC6610) XX None												
3-3 Optical connector for receiver RX1	A SC/APC, 9 deg. B FC/APC, 8 deg. C E-2000 D SC/APC, 8 deg. E SC/APC, 8 deg. AMP X None												
4-1 Optical receiver RX2	10 RX2 input level -7...0 dBm (AC6610) XX None												
4-3 Optical connector for receiver RX2	A SC/APC, 9 deg. B FC/APC, 8 deg. C E-2000 D SC/APC, 8 deg. E SC/APC, 8 deg. AMP X None												
5-1 Input signal routing	A Switching plug (AC6470)												
5-2 Diplexer filter	A 3047 MHz (2 x CXF030) B 4354 MHz (2 x CXF042) C 5070 MHz (2 x CXF050) D 6585 MHz (2 x CXF065) E Forward path jumper (2 x CXF000) F 5970 MHz (2 x CXF055) G 6585 MHz (2 x CXF065 18) H 85108 MHz (2 x CXF065) X None												
6-1 Return path transmitter TX1	40 +1 dBm FP 1310 nm (AC6740) 45 DFB 1310 nm (AC6745) 47 CWDM 1470 nm (AC6747) 49 CWDM 1490 nm (AC6749) 51 CWDM 1510 nm (AC6751) 53 CWDM 1530 nm (AC6753) 55 CWDM 1550 nm (AC6755) 57 CWDM 1570 nm (AC6757) 59 CWDM 1590 nm (AC6759) 61 CWDM 1610 nm (AC6761) XX None												
6-3 Optical connector for transmitter TX1	A SC/APC, 9 deg. B FC/APC, 8 deg. C E-2000 D SC/APC, 8 deg. E SC/APC, 8 deg. AMP X None												
7-1 Return path transmitter TX2	40 +1 dBm FP 1310 nm (AC6740) 45 DFB 1310 nm (AC6745) 47 CWDM 1470 nm (AC6747) 49 CWDM 1490 nm (AC6749) 51 CWDM 1510 nm (AC6751) 53 CWDM 1530 nm (AC6753) 55 CWDM 1550 nm (AC6755) 57 CWDM 1570 nm (AC6757) 59 CWDM 1590 nm (AC6759) 61 CWDM 1610 nm (AC6761) XX None												
7-3 Optical connector for transmitter TX2	A SC/APC, 9 deg. B FC/APC, 8 deg. C E-2000 D SC/APC, 8 deg. E SC/APC, 8 deg. AMP X None												
8-1 Optical filter 1	0 FWDM filter, 1310/1550 nm (AC6570) 2 FWDM filter, 1310 nm/CWDM (AC6572) X None												
8-2 Optical connectors (3 pcs) for filter 1	A SC/APC, 9 deg. B FC/APC, 8 deg. C E-2000 D SC/APC, 8 deg. E SC/APC, 8 deg. AMP X None												
9-1 Optical filter 2	0 FWDM filter, 1310/1550 nm (AC6570) 2 FWDM filter, 1310 nm/CWDM (AC6572) 9 Optical combiner / splitter X None												
9-2 Optical connectors (3 pcs) for filter 2	A SC/APC, 9 deg. B FC/APC, 8 deg. C E-2000 D SC/APC, 8 deg. E SC/APC, 8 deg. AMP X None												
10-1 Transponder module	A Transponder and ALSC module (AC6990) X None												
11-1 Application software	A CATVisor compatible B HMS compatible, NA												
11-2 Settings	X Factory default A Customer specified												
11-3 Product keys (software features)	X None A Plug'n'play/forward path alignment B Spectrum and ingress analyser functionality C A + B + Return path pilot generator												
12-1 Installation manual	X None A Manual												