



ACION 1042 Optical Node

4 Output Optical Node 1002 MHz

The ACION 1042 is a compact economically priced 4 outputs node that is ideal for use in HFC, fiber deep, MDU or business class services architectures. The node can be configured with either a FP, DFB or CWDM DFB reverse path transmitter.

Features

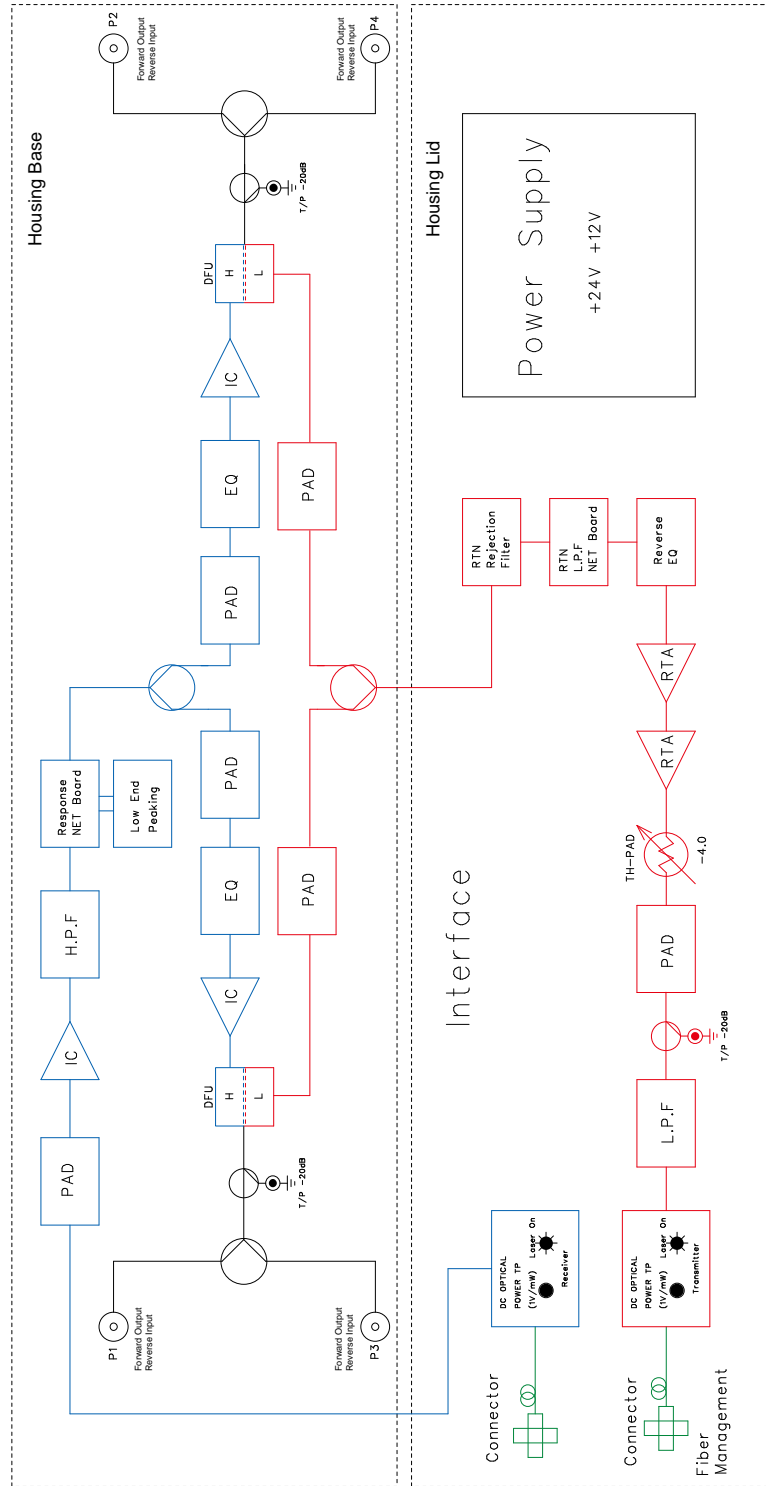
- ◆ 4 outputs
- ◆ Modular RF / optics section
- ◆ Plug-in pads and equalizers
- ◆ -20 dB directional coupler test points
- ◆ FP, DFB and CWDM transmitters available
- ◆ 40 to 90 VAC (cable)
- ◆ 90 to 240 VAC (mains)
- ◆ 15 Amp power passing capacity (40 to 90 VAC only)

Benefits

- ◆ Compact size
- ◆ Up to 46.0 dBmV out at 1002 MHz on each output port
- ◆ Ideal for HFC and passive architectures, or MDU and business class applications
- ◆ Pad adjustable linear equalizers standard
- ◆ 85/105 MHz frequency option that doubles the reverse bandwidth

Block Diagram

ACION 1042 1002 MHz Four Outputs Optical Nodes Block Diagram



Station Parameters

ACI		ACION 1042 Optical Node 1002 MHz Four Outputs			
STATION PARAMETERS:					
	CONDITIONS	UNITS	SPECIFICATION	NOTES	
Housing passband		MHz	5 to 1002		
Input current capacity	Any port, worst case	Amperes	10	Cable power only (40-90 VAC)	
Frequency range		MHz	50 - 1002		
Hum modulation	Time domain @ 0 AMPS	dBc	- 70	Cable power only (40-90 VAC)	
Hum modulation	Time domain @ 12 AMPS	dBc	- 70	Cable power only (40-90 VAC)	
Hum modulation	Time domain @ 15 AMPS	dBc	- 65	Cable power only (40-90 VAC)	
Test Points					
Test point type	Directional coupler	N/A	DC		
Test point level(s)		dB	- 20		
Test point accuracy	Forward TP	dB	± 0.75		
Test point accuracy	Reverse TP	dB	± 0.75		
RF Station					
Station passband		MHz	54 to 1002		
Return loss	Worst case	dB	- 16		
Station flatness - feeder out		dB	± 1.0		
Gain: 4 outputs	@ 1002 MHz Minimum	dB	40.0		
Output stability		dB	1.5		
Gain control type			Plug-in pads		
Gain control range		dB	15		
Gain control steps	Pad value steps	dB	0.5		
Slope control type	Linear equalizers	dB	Plug-in EQ's		
Slope control range		dB	- 9.0 to + 18.0	JXP Platform	
Slope control steps	Equalizer value steps	dB	1.0		
Operational Specifications with a 0 dBm optical input for 4 port					
Operational level	@ 1002 MHz	dBmV	46.0		
Operational slope	@ 54 / 550 / 750 / 870 / 1002 MHz	dB	28.8 / 37.8 / 41.4 / 43.6 / 46.0		
Optical input range	Typical	dBmV	- 3 to + 2		
Station Output Levels					
Distribution out	@ 54 / 550 / 750 / 870 / 1002 MHz	dBmV	28.8 / 37.8 / 41.4 / 43.6 / 46.0		
Station Noise Figure - values for RF portion of node only. Complete values dependent upon link.					
Noise figure (NF)	@ 54 MHz	dB	4.1		
Noise figure (NF)	@ 550 MHz	dB	5.1		
Noise figure (NF)	@ 1002 MHz	dB	6.2		
Station Distortions - values for RF Portion of node only. Complete values dependent on optical link.					
550 MHz analog channel loading, 79 channels +450 MHz digital channel loading 256 QAM at -6 dBc relative to its associated visual carrier					
			Worst Case	Typical	
Composite Triple Beat (CTB)		dBc	- 65	- 67	
Composite Second Order (CSO -)	(Vc +0.75 & -1.25 MHz)	dBc	- 60	- 62	
Composite Second Order (CSO +)	(Vc +1.25 MHz only)	dBc	- 60	- 62	
Station Group Delay					
Group delay	Channel 2 (Std)	nSec / 3.58 MHz	25		
Group delay	Channel 3	nSec / 3.58 MHz	16		
Group delay	Channel 4	nSec / 3.58 MHz	10		
Group delay	Channel 5 & >	nSec / 3.58 MHz	3		

Reverse Spectrum

ACI		ACION 1042 Optical Node 1002 MHz Four Outputs			
REVERSE SPECTRUM:					
Reverse - General		CONDITIONS	UNITS	SPECIFICATION	NOTES
Station passband			MHz	5 to 42	
Output stability			dB	1.0	
Station flatness	Peak-to-valley		dB	± 0.75	
Return loss	Worst case		dB	- 16	
Reverse - Station Gain					
Gain			dB	18 +1 / -0	
Gain control type			N / A	Plug-in pads	
Gain control range			dB	12	
Gain control steps	Pad value steps		dB	0.5	
Reverse - Station Output Levels					
@ Input to transmitter	Typical		dBmV	35	With 17 dBmV at housing port
Reverse - Noise Figure					
Station noise figure			dB	10.5	
Reverse - Bit Error Rate					
Bit error rate	QPSK (1.5 Mbps)		BER	≤ 10 ⁻⁶	
Reverse - NPR					
Noise-to-Power Ratio (NPR)	Noise loading		dB	Typical >35 / 18	@ 10.0 dB optical loss (6.0 dB fiber +4.0 dB flat loss) @ -46.0 dBmV/Hz
Reverse - Station Group Delay					
Group delay	5.5 MHz		nSec / 1.5 MHz	36	
Group delay	10.0 MHz		nSec / 1.5 MHz	16	
Group delay	33.5 MHz		nSec / 1.5 MHz	7	
Group delay	38.5 MHz		nSec / 1.5 MHz	10	
Power Requirements: For cable powered 40-90 VAC					
Station configuration	1RX + 1TX over temperature range of -40 to +140 °F (-40 to +60 °C)				
Power requirements	Worst case		W	38.9	
AC Voltage					
Input ranges			VAC	40 - 90	
Current Draw (Cable powered 40-90 VAC)					
@ 40 VAC	Maximum		A	1.09	
@ 50 VAC	Maximum		A	0.92	
@ 60 VAC	Maximum		A	0.81	
@ 70 VAC	Maximum		A	0.74	
@ 80 VAC	Maximum		A	0.68	
@ 90 VAC	Maximum		A	0.62	
Environmental					
Operating temperature			°F (°C)	- 40 to + 140 (- 40 to + 60)	
Physical					
Dimensions (H X W X D)			in. (cm)	5.8 X 9.25 X 5.94 (14.73 X 23.50 X 15.10)	
Weight			lbs (kg)	8.7 (3.95)	

Transmitter Specifications

ACI Communications, Inc.			ACION 1002 Optical Node 1002 MHz DFB CWDM Transmitter Specifications									
GENERAL	CONDITIONS	UNITS	TRANSMITTER SPECIFICATIONS									NOTES
TRANSMITTER MODEL NUMBER			090646-01XXX	090646-02XXX	090646-03XXX	090646-04XXX	090646-05XXX	090646-06XXX	090646-07XXX	090646-08XXX	WHERE XXX= CONNECTOR TYPE	
Optical wave length		nm	1471	1491	1511	1531	1551	1571	1591	1611	±1.5 nm @ 25° C	
Optical power range	Minimum	mW	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Laser type		N/A	Uncooled DFB (CWDM)									
Optical connector		N/A	SC/APC, SC/UPC, FC/APC, FC/UPC									
Operating bandwidth		MHz	5-200									
Optical power test point		V/mW	1.0 / 1.0									
Laser ON/OFF status indicator		-dBmV	3									Relative to initial optical power at 25 °C
RF impedance		Ohms	75									
Peak-to-valley frequency response		dB	1.0									Over operating bandwidth
Operational temperature range		°F (°C)	-40 to +140 (-40 to +60)									
DISTORTIONS												
Input level		dBmV	40.0									
Level repeatability		±dB	1.0									Maximum receiver RF level variation between transmitters
Return loss	Worst Case	-dB	10.0									
Single tone CNR		dB	50.0									CNR in 4 MHz bandwidth 9 dBmV @ input to station, using A8KQRR receiver
CTB	Worst Case	-dBc	64.0									Test uses 4T channels (T9-T13), using A8KQRR receiver
CSO	Worst Case	-dBc	62.0									Test uses 4T channels (T9-T13), using A8KQRR receiver

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 Information contained in this document is subject to change without notice.
 Revision Date: 11/24/14

Part Number Matrix

ACION 1042 Configuration Sheet

Customer: _____

Created By: _____ Order Date: _____

ORDERING MATRIX

April 16, 2018

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PART NUMBER	1	N	Q													

- | | |
|---|--|
| <p>3 <input checked="" type="checkbox"/> BASIC CONFIGURATION
Q = 4 RF Output Ports</p> <p>4 <input type="checkbox"/> RECEIVERS
0 = No Receiver
1 = Single Receiver</p> <p>5 <input type="checkbox"/> TRANSMITTERS
0 = No Transmitters
1 = Single Transmitter</p> <p>6 <input type="checkbox"/> DIPLEX FREQUENCY SPLIT
4 = 42/53
5 = 55/70
6 = 65/85
7 = 40/50
8 = 85/105</p> <p>7 <input type="checkbox"/> OPTICAL CONNECTOR TYPE
1 = SC/APC (Standard)
2 = SC/UPC
3 = FC/APC
4 = FC/UPC</p> <p>8 <input type="checkbox"/> TRANSMITTER TYPE FP & DFB
0 = None
D = Uncooled 1310 nm 1.0 mW FP
Y = Uncooled 1310 nm 1.0 mW FP W/ISOLATOR
H = Uncooled 1310 nm 2.0 mW FP W/ISOLATOR
B = Uncooled 1310 nm 3.0 mW DFB
R = Uncooled 1310 nm 2.0 mW DFB
J = Uncooled 1310 nm 1.0 mW DFB
C = Uncooled 1550 nm 2.0 mW DFB
E = Uncooled 1550 nm 2.0 mW DFB with WDM
F = Uncooled 1550 nm 3.0 mW DFB with WDM</p> <p>TRANSMITTER TYPE CWDM
A = Uncooled 1471 nm DFB CWDM (2.0 mW)
G = Uncooled 1491 nm DFB CWDM (2.0 mW)
V = Uncooled 1511 nm DFB CWDM (2.0 mW)
L = Uncooled 1531 nm DFB CWDM (2.0 mW)
W = Uncooled 1551 nm DFB CWDM (2.0 mW)
M = Uncooled 1571 nm DFB CWDM (2.0 mW)
N = Uncooled 1591 nm DFB CWDM (2.0 mW)
T = Uncooled 1611 nm DFB CWDM (2.0 mW)
U = Uncooled 1551 nm DFB CWDM (2.0 mW) with WDM 1310/1550 nm</p> | <p>9 <input type="checkbox"/> STATION SLOPE
0 = 0 dB @ 1002 MHz
1 = 17.2 dB @ 1002 MHz
2 = 15.0 dB @ 1002 MHz</p> <p>10 <input type="checkbox"/> POWER SUPPLY INPUT TYPE (See Note 1)
C = 40 to 90 VAC (Cable powering)
M = 90 to 240 VAC (Mains Power UL)</p> <p>11 <input type="checkbox"/> POWER SUPPLY MAINS
0 = None
1 = North America
2 = International/Europe
3 = Japan
4 = Australia
5 = Argentina
X = Custom (Contact Product Management)</p> <p>12 <input type="checkbox"/> STATUS MONITORING
N = None (Standard)</p> <p>13 <input type="checkbox"/> HOUSING TYPE
0 = No Housing or Power supply
N = Normal (Standard)
C = Chromate Finish</p> <p>14 <input type="checkbox"/> SURGE PROTECTION (See Note 2)
G = Built-in Gas Tube
A = Built-in Sidactor
N = None</p> <p>15 <input type="checkbox"/> Output Level
H = 46.0 dBmV Output Level / 4 Output Ports</p> <p>16 <input type="checkbox"/> CUSTOM
Blank = Not custom
X = Determined by Product Management</p> |
|---|--|

NOTES:

- The "M" version of the AC powered unit has an external UL listed 90-240 VAC to 24 VDC external transformer.
- The optional surge protecting Sidactor or gas tube is only offered on the 40-90 VAC cable powered node.



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Rev D 4-17-2018 Printed in U.S.A.
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