

**PATHWORX™**  
**870MHz**  
**High Gain Line Extender Specification**

The requirements for the delivery of advanced services have made scalability and ease of maintenance critical in HFC architectures. ADC Amplifiers have been designed to provide a level of maintainability, as well as, a future migration path that is unequaled in the industry today. These amplifiers provide unparalleled reliability, scalability, and superior RF performance for the low cost delivery of video, data, and voice.

ADC's Pathworx™ Line Extender provides the flexibility to grow with the changing performance needs of today's HFC architectures. This Amplifier has been designed to provide superior distortion performance and greater bandwidth to meet the growing requirements of advanced networks.

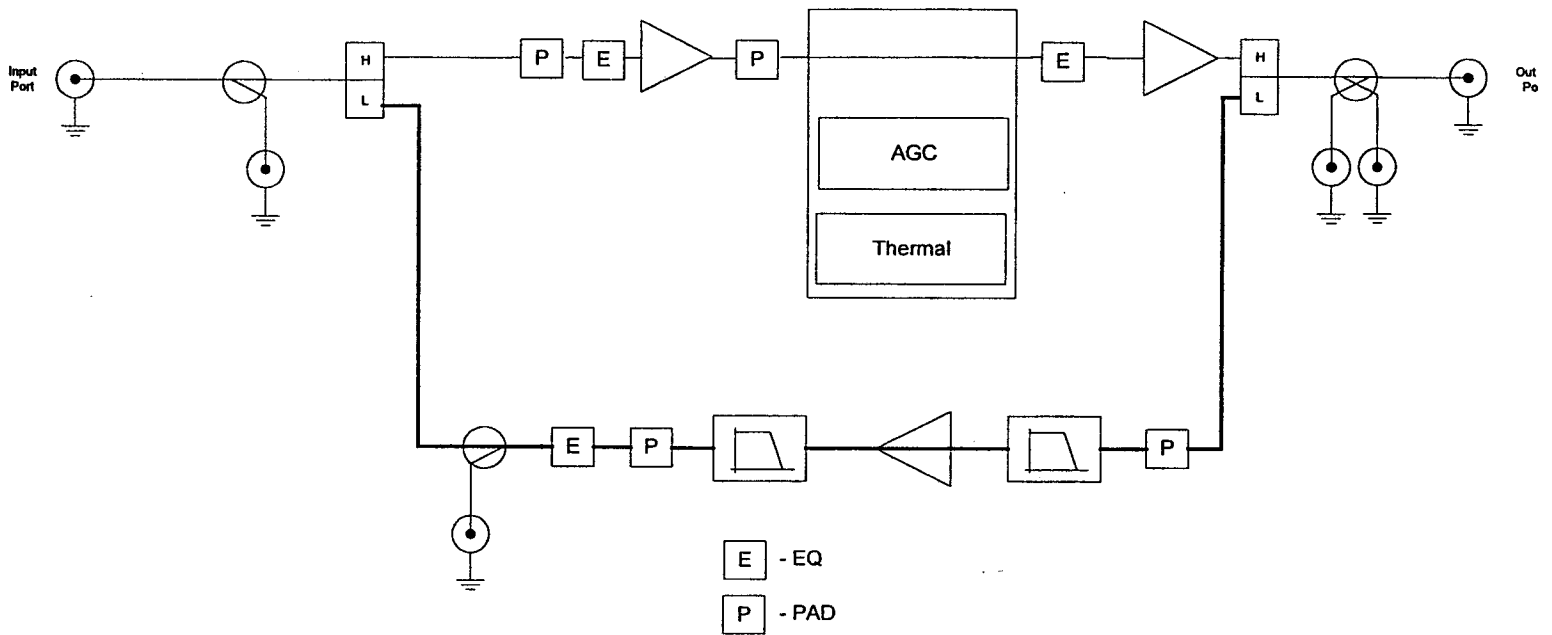
The Pathworx™ High Gain Line Extender is another in the family of ADC amplifiers designed with these requirements in mind. The High Gain Line Extender is ideal for supporting new build, rebuild, and upgrade scenarios. With its superior gain and distortions, the High Gain Line Extender can provide the signal reach needed to address multiple architectural requirements.

ADC's "From the Ground Up" approach to amplifier features and functionality translates into amplifiers with features and performance found nowhere in the industry today.

**Features**

- 870MHz forward bandwidth for increased bandwidth requirements
- High efficiency power supply capable of supporting 60 or 90 volt AC applications
- Available Reverse Amplifier with thermal compensation for steady reverse operation
- Optional low cost "Local Status Monitoring" module which provides amplifier status information (voltage and RF levels) up to 400 feet away without opening the amplifier housing
- Common fixed value accessories (pads and equalizers) for all Pathworx™ Network Amplifiers and Line Extenders
- 15 amp power passing
- Superior module control through a software interface
- Standard 2 port housing
  - High Grade 360 aluminum
  - Optional 90° access ports for pedestal applications
  - Optional 4 port housing for Future Upgrades
- Remote Status Monitoring and Control support
- Reversible module for upgrade flexibility
- Optional surge suppressor
- External test points for ease of maintenance

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**Station Performance**

**Forward**

Passband	52.5-870 MHz
Full Gain (min)	39dB
Frequency Response	± 0.5dB (max), ± 0.25 (typ)
Return Loss (max)	16dB
AC Current Carrying Capacity	15 Amps
Test Points	-20 dB ± 0.5 dB
Slope & Gain Control Range	± 4 dB
Hum Modulation (5-10 MHz)	60 dB @12Amps, 55dB @15 Amps
Hum Modulation (11-750 MHz)	70 dB @12Amps, 65dB @15 Amps
Hum Modulation (751-870 MHz)	60 dB @ 12Amps, 55dB @ 15 Amps

	Manual	Manual w/ 12.5dB I/S Tilt 52.5-750MHz	Thermal w/ 12.5dB I/S Tilt 52.5-750MHz	Auto w/ 12.5dB I/S Tilt 52.5-750MHz
Operational Gain dB 870 MHz	39	38	33	32
Station Tilt (±0.5dB) dB	0	12.5	12.5	12.5
Noise Figure @ 52MHz	7.0	7.7	9.0	9.0
Noise Figure @ 550MHz	7.9	7.9	8.1	8.1
Noise Figure @ 750MHz	8.5	8.6	8.6	8.6
Noise Figure @ 870MHz	9.2	9.2	9.3	9.3

**Reverse**

Passband	5-42 MHz
Full Gain (min, all ports)	18dB
Frequency Response (all ports)	± 0.5dB
Thermal Control Range	± 1.0dB
Return Loss (max, all ports)	16dB
Test Points	-20dB ± 0.5dB

# PATHWORX™

## 870MHz

### High Gain Line Extender Specification

#### Distortion Performance

##### **78 NTSC Channels w/ 198 MHz Digital**

Video Reference 78 Channels    12.5 dB total tilt 52.5 – 750 MHz

Output Levels

55.25 MHz      35.0 dBmV

547.25MHz      44.0 dBmV

Digital Reference 198 MHz Bandwidth (33 - 6 MHz Segments)

Output Levels -6dB from video carrier level

552 MHz      38.0 dBmV

750 MHz      41.5 dBmV

	Manual	Manual w/ 9dB I/S Tilt 52.5-552MHz	Thermal w/ 9dB I/S Tilt 52.5-552MHz	Auto w/ 9dB I/S Tilt 52.5-552MHz
CTB <sup>1</sup> -dBc	73.0	71.7	68.4	68.4
CSO <sup>1</sup> -dBc	81.0	78.4	74.7	74.7
XMOD <sup>1</sup> -dBc	69.0	67.2	62.9	62.9

##### **14 NTSC Channels w/ 222 MHz Digital**

Video Reference 94 Channels    14 dB total tilt 52.5 – 870 MHz

Output Levels

55.25 MHz      35.0 dBmV

643.25 MHz      46.0 dBmV

Digital Reference 222 MHz Bandwidth (37 - 6 MHz Segments)

Output Levels -6dB from video carrier level

648 MHz      40.0 dBmV

870 MHz      43.0 dBmV

	Manual	Manual w/ 11dB I/S Tilt 52.5-650MHz	Thermal w/ 11dB I/S Tilt 52.5-650MHz
CTB <sup>1</sup> -dBc	63.0	60.6	59.3
CSO <sup>1</sup> -dBc	70.9	68.8	67.7
XMOD <sup>1</sup> -dBc	62.2	60.2	58.4

<sup>1</sup>Typical. Maximum is not to exceed typical by more than 2dB.

<sup>2</sup>Typical. Maximum is not to exceed typical by more than 1 dB. Includes 1 dB loss for Reverse EQ.

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**Reverse – 6 NTSC Channels**

Reference Output Level (all ports) dBmV	35 dBmV Flat
Reference Tilt	0 dB
Operational Gain (all ports) dB	18
Station Tilt ( $\pm 0.5$ dB) dB	0
Noise Figure @ 5 MHz dB <sup>2</sup>	8
Noise Figure @ 42 MHz dB <sup>2</sup>	8
CTB -dBc <sup>1</sup>	90
CSO -dBc <sup>1</sup>	82
XMOD -dBc <sup>1</sup>	80

**Group Delay**

Forward		Reverse	
Freq (MHz)	ns @ 3.58 MHz above	Freq (MHz)	ns @ 1.5 MHz above
55.25	25 max	5	50 max
61.25	16 max	10	6 max
67.25	10 max	35	10 max
>77.25	3 max	40	30 max

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**Powering Requirements**

**AC Voltage**

Configuration		90	85	80	75	70	65	60	55	50	45	40
<b>Manual</b>	AC Current (A)	0.49	0.49	0.50	0.51	0.52	0.53	0.54	0.56	0.57	0.61	0.70
	Power (VA)	44.1	41.7	40.0	38.3	36.4	34.5	32.4	30.8	28.5	27.5	28.0
<b>Manual w/ Reverse</b>	AC Current (A)	0.51	0.52	0.53	0.53	0.54	0.55	0.58	0.60	0.62	0.69	0.83
	Power (VA)	45.9	44.2	42.4	39.8	37.8	35.8	34.8	33.0	31.0	31.1	33.2
<b>Thermal</b>	AC Current (A)	0.49	0.49	0.51	0.52	0.53	0.54	0.55	0.57	0.58	0.63	0.72
	Power (VA)	44.1	41.7	40.8	39.0	37.1	35.1	33.0	31.4	29.0	28.4	28.8
<b>Thermal w/ Reverse</b>	AC Current (A)	0.51	0.52	0.53	0.54	0.55	0.56	0.58	0.61	0.63	0.70	0.85
	Power (VA)	45.9	44.2	42.4	40.5	38.5	36.4	34.8	33.6	31.5	31.5	34.0
<b>Auto</b>	AC Current (A)	0.51	0.52	0.53	0.54	0.55	0.56	0.58	0.61	0.63	0.71	0.86
	Power (VA)	45.9	44.2	42.4	40.5	38.5	36.4	34.8	33.6	31.5	32.0	34.4
<b>Auto w/ Reverse</b>	AC Current (A)	0.53	0.54	0.55	0.56	0.57	0.60	0.62	0.64	0.69	0.80	0.97
	Power (VA)	47.7	45.9	44.0	42.0	39.9	39.0	37.2	35.2	34.5	36.0	38.8

**Dimensions**

Length – 12.9

Width – 11.20

Height – 5.70

Weight – Fully loaded station – 17.5lbs.

## High Gain Line Extender Ordering Information

### Housings (1 per Station):

<u>Model Number</u>	<u>Description</u>
HLE-1-U	2-Port Line Extender Housing, Uncoated
HLE-1-C	2-Port Line Extender Housing, Coated
HLE-2-U	2-Port Line Extender Housing with 90° Access Ports, Uncoated
HLE-2-C	2-Port Line Extender Housing with 90° Access Ports, Coated
HLE-3-U	4-Port Line Extender Housing with 90° Access Ports, Uncoated
HLE-3-C	4-Port Line Extender Housing with 90° Access Ports, Coated

### Amplifier Modules:

<u>Model Number</u>	<u>Description</u>
LE84-03	High Gain Line Extender, 870 MHz, 42/52.5 MHz Split

### Forward Accessories:

<u>Model Number</u>	<u>Description</u>	<u>Quantity</u>
IPAD-XX.X	Fixed Attenuators (XX.X is value eg. 3.5dB=IPAD-035, 0.5 dB steps from 0-20 dB and Termination available)	2
EQ50750-XXX	Fixed Equalizer, 750 MHz (XXX=value in dB Tilt, e.g 11 dB=EQ50750-110, 1 dB steps from 0-23dB)	1 <sup>1</sup>
EQ50870-XXX	Fixed Equalizer, 870 MHz (XXX=value in dB Tilt, e.g 13 dB=EQ50870-130, 1 dB steps from 0-22 dB)	1 <sup>2</sup>
CE50870-XXX	Cable Simulator (negative value equalizers) for 750 MHz and 870 MHz systems (XXX=value in dB Tilt to 870 MHz, e.g. -12 dB=CE50870-012, 1 dB steps from -12 to -1)	1 <sup>3</sup>

### Thermal/EQs

T750-125	750 MHz Thermal/EQ, 12.5 dB Tilt	1 <sup>4</sup>
T870-115	870 MHz Thermal/EQ, 11.5 dB Tilt	1 <sup>5</sup>
T870-140	870 MHz Thermal/EQ, 14.0 dB Tilt	1 <sup>6</sup>

### AGC Kits

AGC-445-LE-750	750 MHz AGC for Line Extender, Single Pilot, 445.25 MHz	1 <sup>7</sup>
AGC-445-NA-870	870 MHz AGC for Line Extender, Single Pilot,	

<sup>1</sup> 2 are required for Manual Operation

<sup>2</sup> 2 are required for Manual Operation

<sup>3</sup> Use either EQ or CE for Input Equalizer

<sup>4</sup> Thermal/EQ is not required for Manual or AGC Operation

<sup>5</sup> Thermal/EQ is not required for Manual or AGC Operation

<sup>6</sup> Thermal/EQ is not required for Manual or AGC Operation

<sup>7</sup> AGC is not required for Manual or Thermal Operation

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**Reverse Accessories:**

<b><u>Model Number</u></b>	<b><u>Description</u></b>	<b><u>Quantity</u></b>
LG42RA	42 MHz Low Gain Reverse Amplifier w/Thermal Compensation (18 dB Station Gain)	1
HG42RA	42 MHz High Gain Reverse Amplifier w/Thermal Compensation (24.5 dB Station Gain)	1
IPAD-XX.X	Fixed Attenuators (XX.X is value eg. 3.5dB=IPAD-035, 0.5 dB steps from 0-20 dB and Termination available)	2
EQ542-XX	Fixed Equalizer, 42 MHz (XXX is value in dB Tilt e.g 5 dB=EQ542-05, 1dB steps from 0 to 12dB)	1

**Optional Accessories:**

<b><u>Model Number</u></b>	<b><u>Description</u></b>
SC-01	Surge Suppressor
LSM-01	2.4 GHz Wireless Local Status Monitoring Kit

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<sup>8</sup> AGC is not required for Manual or Thermal Operation