

## Line Extender III Type 4 750 MHz with 40/52 MHz Split



22876

**NOTE:** The output tilt referenced in this document is defined as a LINEAR output tilt (as opposed to a CABLE output tilt). The distortion and noise figure specifications are applicable across the full operational temperature range (as opposed to being referenced to 68°F).

When calculating end of line performance, the specifications used for all of the amplifiers in a given cascade must be of similar format, due to the fact that all amplifiers in a cascade must operate with a similar output tilt (either all LINEAR output tilt or all CABLE output tilt).

### DESCRIPTION

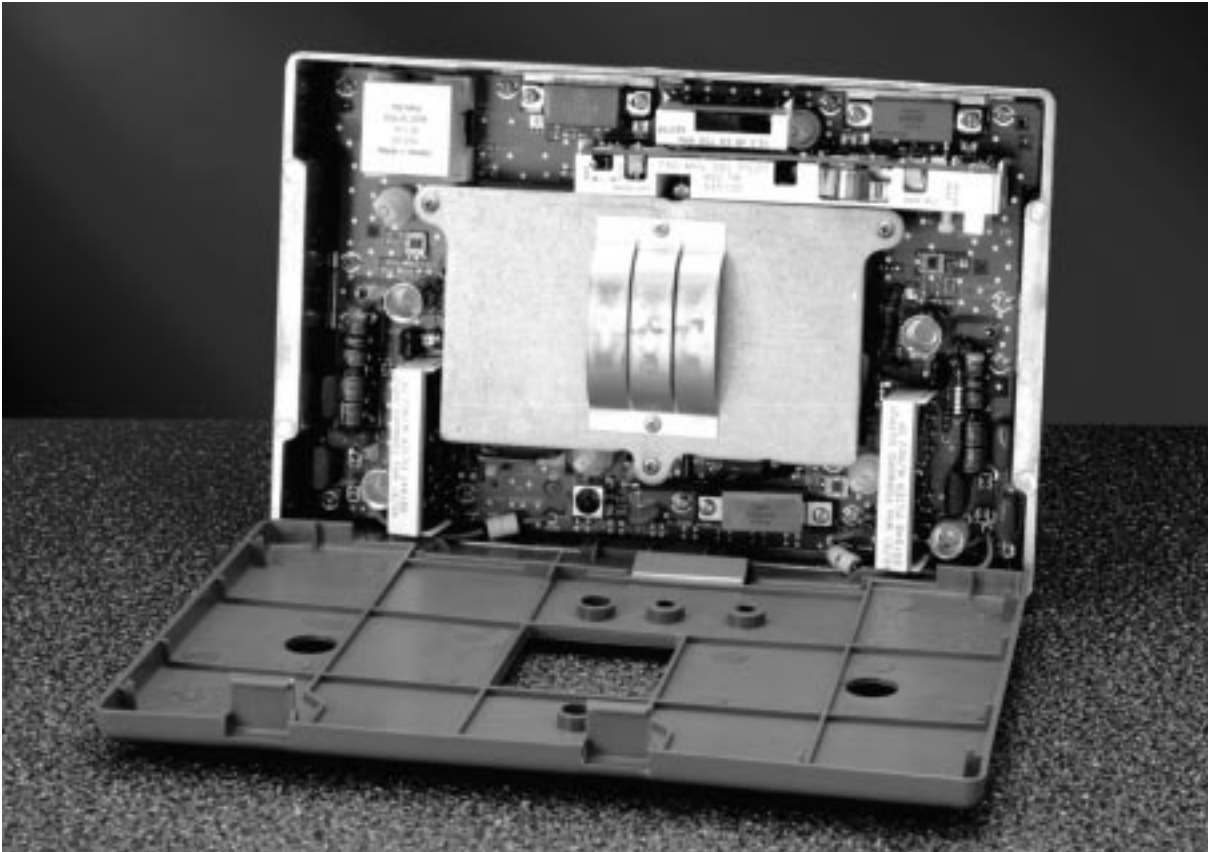
The Type 4 RF amplifier module offers a high performance design solution for the latest HFC networks.

This amplifier module comes pre-configured with interstage equalizer, diplexers, reverse amplifier, and AGC module, in order to achieve optimum station performance. Additionally, maximum flexibility in reverse signal path alignment is achieved via reverse test point and plug-in pad for the reverse input.

The Type 4 amplifier module provides one (trunk level) output.

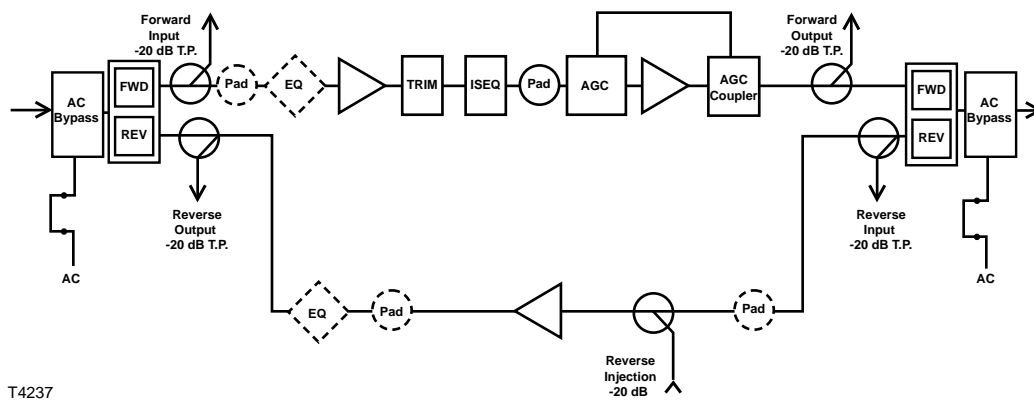
### FEATURES

- 60 and 90 V AC powering capability
- 15 ampere current capacity (steady state) and 25 ampere surge survivability
- Integrated reverse amplifier, with optimized diplex filter group delay for forward and reverse paths
- Reverse input test point and input pad allowing optimum reverse path alignment
- Improved station frequency response
- Unitized design (amplifier and power supply in a single module) enabling simplified and faster maintenance
- High efficiency, transformerless power supply lowering system operating cost
- RF testpoints using directional couplers for optimum accuracy
- Surge Resistant™ Circuitry ensuring hybrid protection without fuses or other nuisance failure causing devices



22883

### LINE EXTENDER III-TYPE 4 – 5-40/52-750 MHz



T4237

## LINE EXTENDER III TYPE 4 – 5-40/52-750 MHz

### General Station Performance Data

	Units	Forward	Reverse
Pass Band	MHz	52-750	5-40
Amplifier Type	---	PHD	PP
Operational Temperature Range	degrees	-40 to +140 F	-40 to +140 F
Frequency Response	dB	±0.5	±0.5
Auto Slope & Gain Range	dB	±4	N/A
Return Loss	dB	16	16
Operational AC Through Current	Amps	15	N/A
Max AC Through Current (2 hrs)	Amps	25	N/A
Hum Modulation @ 10 A (over specified frequency range)	dB	70 (55-750 MHz)	58 (5-15 MHz) 65 (16-40 MHz)
Hum Modulation @ 15 A (over specified frequency range)	dB	62 (55-150 MHz) 60 (151-600 MHz) 58 (601-750 MHz)	50 (5-15 MHz) 59 (16-40 MHz)
Test Points (±0.5 dB)	dB	-20	-20
Reference Output Level—High Freq.	dBmV	38.5 @ 750 MHz 35 @ 550 MHz	35 @ 40 MHz <sup>8</sup>
Reference Output Level—Low Freq.	dBmV	26 @ 54 MHz	35 @ 5 MHz <sup>8</sup>
Reference Output Tilt <sup>1</sup>	dB	+12.5	0
Interstage Level Control (type)		AGC w/ manual temp backoff	N/A
Interstage Equalizer (value - type)	dB	16.5 - fixed	N/A
Current Draw @ 24 V DC (Typ.)	Amps	0.73	0.13
Operational Gain (minimum) <sup>3,9</sup>	dB	29.	19.5
Internal Tilt <sup>2</sup> (±0.5 dB)	dB	+12.5	0
Noise Figure <sup>3,7</sup> @ 54 MHz	dB	9.5	---
Noise Figure <sup>3,7</sup> @ 750 MHz	dB	9.5	---
Reverse Noise Figure <sup>7,9</sup>	dB	---	6

### Forward and Reverse Performance with Specified Channel Loading

	Units	Forward	Reverse
CW Channel Loading	NTSC	79 w/ digital <sup>4</sup>	6
Composite Triple Beat <sup>5,7</sup>	dB	83	92
Cross Modulation <sup>6,7</sup>	dB	80	80
Composite Second Order <sup>5,7</sup> (high side)	dB	73	82

### Delay Characteristics

Forward (Chrominance to Luminance Delay)		Reverse (Group Delay in 1.5 MHz BW)	
Freq. (MHz)	Delay (ns)	Freq. (MHz)	Delay (ns)
55.25 - 58.83	24	38.5 - 40.0	25
61.25 - 64.83	12	33.5 - 35.0	8
67.25 - 70.83	6	10.0 - 11.5	6
77.25 - 80.83	3	5.0 - 6.5	55

#### NOTES:

- (1) Reference output tilt is specified as "LINEAR" tilt (as opposed to traditional "cable" tilt).
- (2) Down tilt, the effect of cable, is represented by a (-). Up tilt, the effect of equalization, is represented by a (+).
- (3) Forward gain and noise figure measured with 0 dB input EQ and 1 dB input pad.
- (4) "Digital" refers to 550-750 MHz loading with 33 QAM carriers at -6 dB levels relative to analog video carrier levels.
- (5) CTB and CSO measured using CW carriers, with spectrum analyzer as the measurement device.
- (6) X-Mod (@ 15.75 kHz) specified using 100% synchronous modulation and frequency selective measurement device.
- (7) Distortions and Noise Figures are typical and specified over the operational temperature range.
- (8) Reverse output reference level with a 0 dB reverse output equalizer and factory selected reverse output pad.
- (9) Reverse gain and noise figure is for station with 0 dB reverse input pad, 0 dB reverse output EQ and factory selected reverse output pad.

Unless otherwise noted, the above specifications reflect typical station performance at stated reference levels in the recommended operating configuration, including the input equalizer and reverse filters where applicable. Unless otherwise noted, specifications are based on measurements made in accordance with NCTA Practices for Measurements on Cable Television Systems using standard frequency assignments and are referenced to 68°F (20°C).

# Line Extender III-Type 4 — 5-40/52-750 MHz

## Station Powering Data

Line Extender III Type 4		I DC	AC Voltage											
		(Amps)	90	85	80	75	70	65	60	55	50	45	40	35
AC Current (A)		0.86	0.42	0.46	0.46	0.48	0.50	0.52	0.54	0.57	0.60	0.64	0.68	0.76
Power (W)			24.7	24.4	24.3	24.4	24.2	24.3	24.4	24.3	24.8	24.8	24.4	24.6

Data is based on stations configured for 2-way operation.

## ORDERING INFORMATION

### Amplifier Module - 1 required

- # 565741 - Type 4 amplifier module with AGC. AGC has 445.25 MHz pilot frequency and manual temperature backoff control.

**Note:** Amplifier module also comes configured with reverse amplifier, 16.5 dB interstage EQ, interstage pad, reverse output pad, 0 dB reverse output EQ, 40/51 duplex filters, and integrated power supply. Power supply has 30 V AC undervoltage lockout.

### Housing - 1 required (all have 15 amp capacity)

- # 545443 Uncoated 2-port housing
- # 545444 Coated 2-port housing

### Required Accessories

- Plug-in Pads (attenuators):
  - 1 required for forward (1 input)
  - 2 required for reverse (1 input, 1 output)
  - 1 required for AGC only if amplifier output level at pilot frequency is NOT 33 dBmV (AGC comes configured with a 5 dB pad, which is appropriate for 33 dBmV output level at pilot frequency).

Available in 0.5 dB steps from 0 to 20 dB. Order Model PP-\* (\* denotes pad value, specify value).
- Plug-in Forward Input Equalizer, 1 required. Available in 1.5 dB steps from 0 to 28.5 dB at 750 MHz. Order Model EQ750-\* (\* denotes equalizer value; specify value).
- Plug-in Reverse Output Equalizer, 1 required. Available in 1.0 dB steps from 1.0 to 12.0 dB at 40 MHz. Order Model EQ40S -\* (\* denotes equalizer value; specify value).

### Optional Accessories

- #467351 230 V AC Crowbar Surge Protector
- Plug-in Cable Simulator. Simulates cable losses, creating tilt opposite that of Equalizers. Use in place of Forward Input Equalizer as needed to maintain proper output tilt in short spaced locations. Available in 1.5 dB steps from 1.5 dB to 12.0 dB cable loss at 750 MHz.  
Order Model CS 750-\* (\* denotes CS value; specify value).

### Related Equipment

- #501111 Long Reach Test Point Adapter
- #276982 Reverse Injection Probe
- #548771 Pad Insertion/Removal Tool

## MECHANICAL SPECIFICATIONS

### Housing Dimensions

11.5 in. L x 9.5 in. H x 4.0 in. D  
292.1 mm L x 241.3 mm H x 101.6 mm D

### Weight

Housing 6 lbs, 6 oz; 2.9 kg  
Module 2 lbs, 13 oz; 1.3 kg

Specifications and product availability are subject to change without notice.

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Scientific-Atlanta, Inc. <http://www.sciatl.com>  
 United States: 4261 Communications Drive, P.O. Box 6850, Norcross, GA 30091-6850; Tel: 800-433-6222; Fax: 770-903-4617  
 Canada: 7725 Lougheed Highway, Burnaby, BC V5A 4V8; Tel: 604-420-5322; Fax: 604-420-5941  
 United Kingdom: Home Park Estate, Kings Langley, Herts WD4 8LZ, England; Tel: 44-923-266-133; Fax: 44-192-327-0448  
 Australia: Unit 2, 2 Aquatic Drive, P.O. Box 292, Frenchs Forest, NSW 2086, Australia; Tel: 61-2-9452-3388; Fax: 61-2-9451-4432  
 Singapore: 1 Claymore Drive, #08-11 Orchard Towers, Singapore 229594; Tel: 65-733-4314; Fax: 65-733-2706  
 Hong Kong: Suite 56 & 57, 5/F New Henry House, 10 Ice House Street, Central, Hong Kong; Tel: 852-2522-5059; Fax: 852-2522-5624