HiGain HMS-317, HMS-318, and HMS-358

Deployment Guidelines

for HDSL, HDSL2, and HDSL4

Revision History of This Manual

To order copies of this manual, use document catalog number LTPH-RG-1232-01. (Copies of this publication can be downloaded from the ADC website at *www.adc.com.* To order a hard copy, please contact your sales representative.)

Issue	Release Date	Revisions Made
1	June 27, 2003	Initial release

USING THIS MANUAL

The following conventions are used in this manual:

- `Monospace type` indicates screen text.
- Keys you press are indicated by small icons such as Y or ENTER. Key combinations to be pressed simultaneously are indicated with a plus sign as follows: CTRL + ESC.
- Items you select are in **bold**.
- The following types of messages, identified by icons, may appear in text.

Notes provide information about special circumstances.

General cautions indicate the possibility of personal injury, product failure, or equipment damage if instructions are ignored or not completely followed.

An Electrostatic Discharge (ESD) caution indicates that a device or assembly is susceptible to damage from electrostatic discharge.

RELATED PUBLICATIONS

Listed below are related manuals and their publication numbers. Copies of this publication or related publications can be downloaded from the ADC website at *www.adc.com*. To order a hard copy, please contact your sales representative.

Document Catalog Number	Title
LTPH-UG-1166-01	HMS-317/318 L2/L2B and L3 Installation Guide
LTPH-AD-1204-01	HMS-317 and HMS-318 Management Shelves Addendum
LTPH-SM-1052-04	HMS-358 List 5 and List 6 Installation & Verification Guide
LTPH-UM-1142-02	HMU-319 List 7A and List 7 (v3.2) User Manual

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OVERVIEW

This Deployment Guidelines document for HDSL, HDSL2, and HDSL4 is designed for use by network engineers, planners, and designers who are creating a communications network for T1 delivery. The document contains dimension, heat dissipation, and current draw information to assist ADC® customers in provisioning, testing, alarm status, and system monitoring.

EQUIPMENT DIMENSIONS, POWER REQUIREMENTS, AND HEAT DISSIPATION

Table 1 describes product dimensions, typical current draw, and typical heat dissipation for all HiGain® units. Figure 1 on page 4 and Figure 2 on page 5 show 3190 mechanics *x*HDSL examples with an HMS-317 and HMS-358 chassis, respectively.

For information on maximum current draw for the HMS-317, HMS-318, and HMS-358 HiGain management shelves, refer to the appropriate user manuals (see "Related Publications" on page iii).

Table 1. *HiGain Equipment—Dimensions, Current Draw, and Heat Dissipation*

Product	Equipment Description	H x W x D (inches)	Typical Current Draw (mA) [a]	Typical Heat Dissipation (Watts)
Central Office Common Equipment				
HMS-317 List 2 [b]	HiGain Managed Shelf, 23-inch, 3192 mechanics	5.33 x 23 x 11.5	N/A	N/A
HMS-318 List 2 [b]	HiGain Managed Shelf, 19-inch, 3192 mechanics	5.33 x 19 x 11.5	N/A	N/A
HMS-358 List 5	Wideband 3190 chassis, split power	12.12 x 21.38 x 11.75	N/A	N/A
HMS-358 List 6	Wideband 3190 chassis, redundant power	12.12 x 21.38 x 11.75	N/A	N/A
HMU-319L7A32	HiGain Management Unit (10BASE-2)	4.8 x 1.06 x 10.5	104	5
HMU-319L9V32	HiGain Management Unit (10BASE-T)	0.98 x 7.72 x 9.81	104	5
HXU-360L1V11	HiGain DS3 Multiplexer Unit	0.98 x 7.72 x 9.81	250	12
HDSL Central Office Line Units with Remote				
HLU-231 List *xx*	HDSL Line Unit (220 mechanics)	5.9 x 1.4 x 10	182	4.5
HLU-319 List *xx*	HDSL Line Unit (3192 mechanics)	4.75 x 0.625 x 10	182	4.5
HLU-388 List *xx*	HDSL Line Unit (DDM+ mechanics)	3.5 x 0.72 x 10.25	182	4.5
HLU-432 List 1	HDSL Line Unit (200 mechanics)	5.9 x 1.4 x 10	182	4.5
HLU-432 List 2	HDSL Line Unit (200 mechanics with reversed DS1 and HDSL lines)	5.9 x 1.4 x 10	182	4.5

Continued

Table 1. *HiGain Equipment—Dimensions, Current Draw, and Heat Dissipation (Continued)*

Product	Equipment Description	H x W x D (inches)	Typical Current Draw (mA) [a]	Typical Heat Dissipation (Watts)
HDSL Remote Units				
HRU-402 List *xx*	HDSL Remote Unit (200 mechanics, line or local-powered)	5.5 x 0.7 x 5.6	N/A	N/A
HRU-419 List 3	HDSL Remote Unit (3192 mechanics, local-powered)	4.750 x 0.625 x 10	N/A	N/A
HRU-488 List 1	HDSL Remote Unit (DDM+ mechanics, local-powered)	3.50 x 0.72 x 10.25	N/A	N/A
HDSL Central Office Line Units with Repeaters and Remotes				
HLU/HDU/HRU	HDSL Line Unit with one repeater and remote	N/A	294	5.9
HLU/HDU/HDU/HRU	HDSL Line Unit with two repeaters and remote	N/A	410	7.1
HLU/HDU/HDU/HDU/HRU	HDSL Line Unit with three repeaters and remote	N/A	539	8.1
HDSL2 Central Office Line Units with Remote				
H2TU-C-202 List *xx*	HDSL2 Line Unit (200/400 mechanics)	5.6 x 0.7 x 5.6	259 (line) 186 (local)	6.4 (line) 6.1 (local)
H2TU-C-231 List *xx*	HDSL2 Line Unit (220 mechanics)	5.9 x 1.4 x 10	260 (line) 186 (local)	6.4 (line) 6.1 (local)
H2TU-C-319 List 2	HDSL2 Line Unit (3192 mechanics)	4.750 x 0.625 x 10	260 (line) 186 (local)	6.4 (line) 6.1 (local)
H2TU-C-319 List 7*x*	HDSL2 Line Unit (3192 mechanics)	4.750 x 0.625 x 10	168 (line) 127 (local)	4.3 (line) 4.1 (local)
H2TU-C-388 List 2	HDSL2 Line Unit (DDM+ mechanics)	3.62 x 0.69 x 10	260 (line) 186 (local)	6.4 (line) 6.1 (local)
H2TU-C-388 List 7*x*	HDSL2 Line Unit (DDM+ mechanics)	3.62 x 0.69 x 10	168 Line 127 (local)	4.3 Line 4.1 (local)
HDSL2 Remote Units				
H2TU-R-402 List *xx*	HDSL2 Remote Unit (200 mechanics, line or local-powered)	5.5 x 0.7 x 5.6	N/A	N/A
HDSL4 Central Office Line Units with Remote (12 kft with 26 AWG at 25°C and line powering at -185V)				
H4TU-C-231 List *xx*	HDSL4 Line Unit (220 mechanics)	5.9 x 1.4 x 10	170	4.74
H4TU-C-319 List *xx*	HDSL4 Line Unit (3192 mechanics)	4.750 x .625 x 10	170	4.74
H4TU-C-388 List *xx*	HDSL4 Line Unit (DDM+ mechanics)	3.62 x .69 x 10	170	4.74

Continued

Table 1. *HiGain Equipment—Dimensions, Current Draw, and Heat Dissipation (Continued)*

Product	Equipment Description	H x W x D (inches)	Typical Current Draw (mA) [a]	Typical Heat Dissipation (Watts)
HDSL4 Remote Units				
H4TU-R-402 List *xx*	HDSL4 Remote Unit (200 mechanics)	5.5 x 0.7 x 5.6	N/A	N/A
HDSL4 Central Office Line Units with Repeaters and Remotes				
H4TU-C/H4D/H4TU-R	HDSL4 Line Unit with one repeater and remote	N/A	261	5.95
H4TU-C/H4D/H4D/H4TU-R	HDSL4 Line Unit with two repeaters and remote	N/A	463	6.64

(a) HDSL products—Current draw is at -42.5 Vdc.; HDSL2 and HDSL4 products—Current draw is at -48 Vdc.
(b) Limitations of 10 amperes per side.

Example:

All HLU-319s
10 chassis at 22.5W = 225W
(22.5W = 5 units x 4.5W each)

All HMU-319s
10 chassis at 5W = 50W

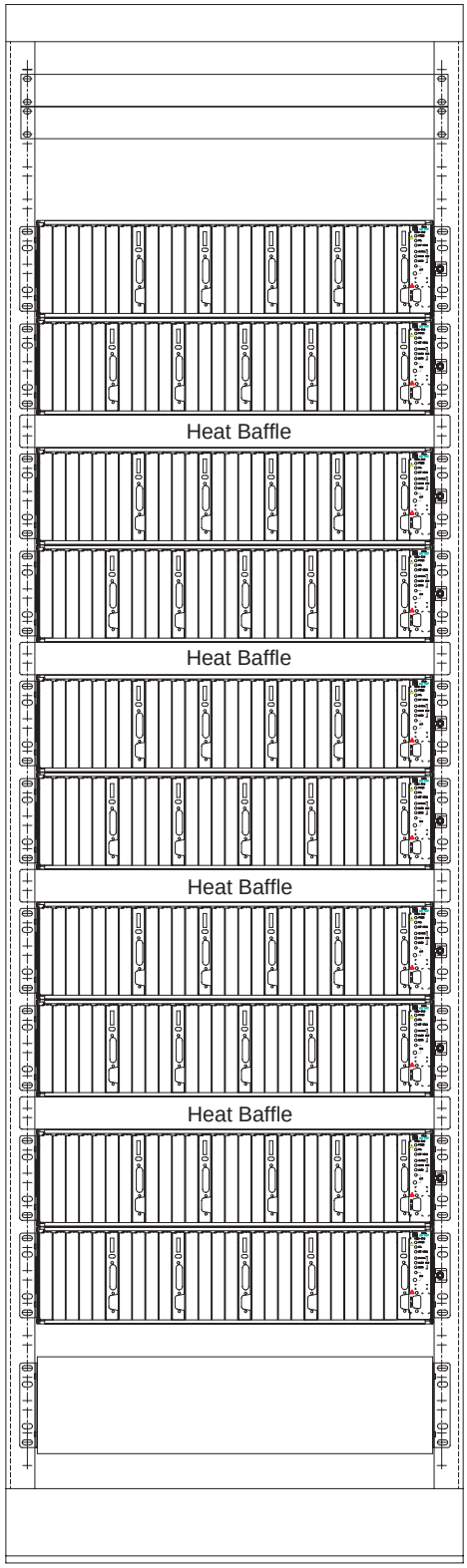

Figure 1. *xHDSL with HMS-317 Chassis*

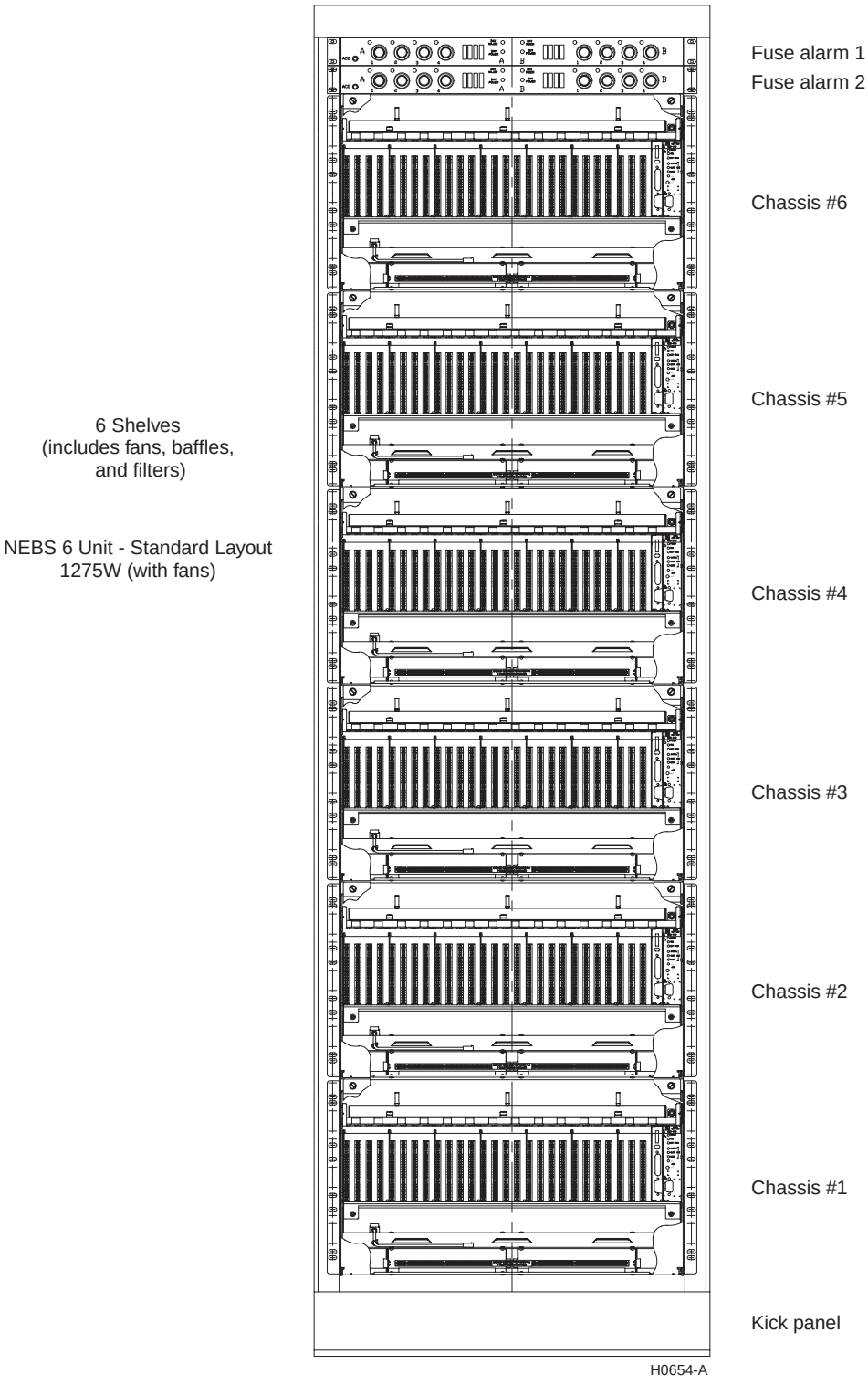

Figure 2. *xHDSL with HMS-358 Chassis*

CURRENT DRAW SHELF CONFIGURATIONS

Table 2 through Table 4 are examples of typical shelf configurations with a current draw of each module at -42.5 Vdc. Refer to Table 5 for information on recommended fuse size.

Table 2. *Shelf Configuration #1 with a Current Draw at -42.5 Vdc*

Product Configuration	Number of Modules	Typical Current Draw (Amps)	Total Current Draw (Amps) [(a)]
HMU-319L9V32	1	0.104	0.104
HXU-360L1V11	1	0.25	0.25
Total:			**0.0354**

(a) Total Current Draw = Number of modules multiplied by the applicable current draw.

Table 3. *Shelf Configuration #2 with a Current Draw at -42.5 Vdc*

Product Configuration	Number of Modules	Typical Current Draw (Amps)	Total Current Draw (Amps) [(a)]
HMU-319L7V32	1	0.104	0.104
HLU	6	0.182	1.092
HLU/HDU/HRU	6	0.294	1.764
HLU/HDU/HDU/HDU/HRU	6	0.539	3.234
Total:			**6.194**

(a) Total Current Draw = Number of modules multiplied by the applicable current draw.

Table 4. *Shelf Configuration #3 with a Current Draw at -42.5 Vdc*

Product Configuration	Number of Modules	Typical Current Draw (Amps)	Total Current Draw (Amps) [(a)]
HXU-360L1V11	1	0.25	0.25
HLU/HDU/HRU	6	0.294	1.764
H2TU-C-*xxx*-L7*x*	6	0.168	1.008
H4TU-C-*xxx*-L*x*	6	0.17	1.02
Total:			**4.042**

(a) Total Current Draw = Number of modules multiplied by the applicable current draw.

Table 5 summarizes the recommended fuse size based on wire gauge and current draw at -42.5 Vdc or -48 Vdc.

Table 5. *Recommended Fuse Size Chart*

Current Draw at -42.5 or -48 Vdc	Recommended Wire Gauge	Recommended Fuse Size
2.6 to 5.8 Amps	12 AWG	10 Amps
5.8 to 8 Amps	12 AWG	15 Amps
8 to 15 Amps	10 AWG	20 Amps

CURRENT DRAW WORKSHEET

For single shelf deployment, use the following worksheet to calculate the total current draw.

Current Draw Worksheet

Product Description	Current Draw in Amps (line)	* Quantity (number of units)	Total Current Draw (Amps) [(a)]
HMU-319L7A32	104		
HMU-319L9V32	104		
HXU-360L1V11	250		
HLU-231 List *xx* with remote	182		
HLU-319 List *xx* with remote	182		
HLU-388 List *xx* with remote	182		
HLU-432 List 1 with remote	182		
HLU-432 List 2 with remote	182		
HLU/HDU/HRU	294		
HLU/HDU/HDU/HRU	410		
HLU/HDU/HDU/HDU/HRU	539		
H2TU-C-202 List *xx* with remote	259		
H2TU-C-231 List *xx* with remote	260		
H2TU-C-319 List 2 with remote	260		
H2TU-C-319 List 7*x* with remote	168		
H2TU-C-388 List 2 with remote	260		
H2TU-C-388 List 7*x* with remote	168		
H4TU-C-231 List *xx* with remote	170		
H4TU-C-319 List *xx* with remote	170		
H4TU-C-388 List *xx* with remote	170		
H4TU-C/H4D/H4TU-R	261		
H4TU-C/H4D/H4D/H4TU-R	463		
Total:			

(a) Total Current Draw (Amps) = Current draw multiplied by the quantity; for example. if the current draw is 104 and the number of units equals 3, then the Total Current Draw is 312 Amperes.

HEAT DISSIPATION SHELF CONFIGURATIONS

Table 6 on this page through Table 8 on page 8 are examples of heat dissipation for typical shelf configurations.

Table 6. *Shelf Configuration #1—Heat Dissipation*

Product Configuration	Number of Modules	Heat Dissipation (Watts)	Total (Watts) [a]
HMU-319L9V32	1	5	5
HXU-360L1V11	1	12	12
Total:			**17**

(a) Total Watts = number of modules multiplied by heat dissipation.

Table 7. *Shelf Configuration #2—Heat Dissipation [a]*

Product Configuration	Number of Modules	Heat Dissipation (Watts)	Total (Watts)
HMU-319L7V32	1	5	5
HLU	6	4.5	27
HLU/HDU/HRU	6	7.1	42.6
HLU/HDU/HDU/HDU/HRU	6	8.1	48.6
Total:			**123.2**

(a) Total Watts = number of modules multiplied by heat dissipation.

Table 8. *Shelf Configuration #3—Heat Dissipation [a]*

Product Configuration	Number of Modules	Heat Dissipation (Watts)	Total (Watts)
HXU-360L1V11	1	12	12
HLU/HDU/HRU	6	7.1	42.6
H2TU-C-*xxx*-L7*x*	6	4.3	25.8
H4TU-C-*xxx*-L*x*	6	4.74	28.44
Total:			**108.84**

(a) Total Watts = number of modules multiplied by heat dissipation.

HEAT DISSIPATION WORKSHEET

For single shelf deployment, use the following worksheet to calculate total heat dissipation.

Heat Dissipation Worksheet

Product	Heat Dissipation in Watts (line)	* Quantity (number of units)	Total Heat Dissipation (Watts) [(a)]
HMU-319L7A32	5		
HMU-319L9V32	5		
HXU-360L1V11	12		
HLU-231 List *xx* with remote	4.5		
HLU-319 List *xx* with remote	4.5		
HLU-388 List *xx* with remote	4.5		
HLU-432 List 1 with remote	4.5		
HLU-432 List 2 with remote	4.5		
HLU/HDU/HRU	5.9		
HLU/HDU/HDU/HRU	7.1		
HLU/HDU/HDU/HDU/HRU	8.1		
H2TU-C-202 List *xx* with remote	6.4		
H2TU-C-231 List *xx* with remote	6.4		
H2TU-C-319 List 2 with remote	6.4		
H2TU-C-319 List 7*x* with remote	4.3		
H2TU-C-388 List 2 with remote	6.4		
H2TU-C-388 List 7*x* with remote	4.3		
H4TU-C-231 List *xx* with remote	4.74		
H4TU-C-319 List *xx* with remote	4.74		
H4TU-C-388 List *xx* with remote	4.74		
H4TU-C/H4D/H4TU-R	5.95		
H4TU-C/H4D/H4D/H4TU-R	6.64		
Total:			

(a) Total (Watts) = Heat dissipation multiplied by the number of units; for example, if the heat dissipation is 5 and the number of units equals 3, then the Total Heat Dissipation is 15 Watts.

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