

Installation and Operating Handbook

DBUH / DLAH Dual Hot Swappable Converters/ Line Amplifiers

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**EN 55022 CLASS B
EN 50082-1
EN 60950**



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**IMPORTANT NOTE: THE INFORMATION AND SPECIFICATIONS CONTAINED IN THIS
DOCUMENT SUPERCEDE ALL PREVIOUSLY PUBLISHED INFORMATION CONCERNING
THIS PRODUCT**

PEAK COMMUNICATIONS Ltd maintains a continuing programme of product improvement
and therefore reserves the right to change specifications without notice

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INTRODUCTION

The equipment's covered by this manual are high grade units which can be applied to many situations where good stability and phase noise etc are required.

The specification for the particular model purchased can be found at the end of this manual.

EMC AND SAFETY

EMC

The equipment has been designed to comply with the following standards;

Emissions : EN 55022 Class B; Limits and methods of measurement of radio interference characteristics of Information Technology Equipment.

Immunity : EN 50082 Part 1; Generic immunity standard, part 1: Domestic, commercial and light industrial environment.

The equipment must be operated with its lid on at all times. If it is necessary to remove the lid for routine servicing or fault finding then it is essential that the lid is fitted back correctly before normal operation.

For the Alarm and Remote Control data interfaces all 'D' type connectors must have grounding fingers on the plug shell to guarantee continuous shielding. The back-shells must comply to the requirements of VDE 0871 and FCC 20708, providing at least 40 dB of attenuation from 30 MHz to 1 GHz.

Connecting cables must be of the shielded type

Operation of the equipment in a non standard manner will invalidate compliancy to these standards.

Safety

To ensure safety of the operator the equipment has been designed to comply with the following safety standard;

EN 60950 Safety of information technology equipment, including electrical business machines.

Before operation the user must ensure that the installation complies with the information given.

The equipment is designed to operate in a static 19 inch rack system conforming to IEC 297-2. Operation of the equipment in transportable vehicles equipped with the means of providing a stable environment is permissible. Operation of the equipment on board vehicles, ships or aircraft without means of environmental conditioning will invalidate the safety compliancy; please contact the factory for further advice. Operation of the equipment in an environment other than that stated in the specifications will also invalidate the safety compliancy. The equipment must not be operated above 2000 metre altitude, extremes of temperature; excessive dust, moisture or vibration; flammable gases; corrosive or explosive atmospheres.

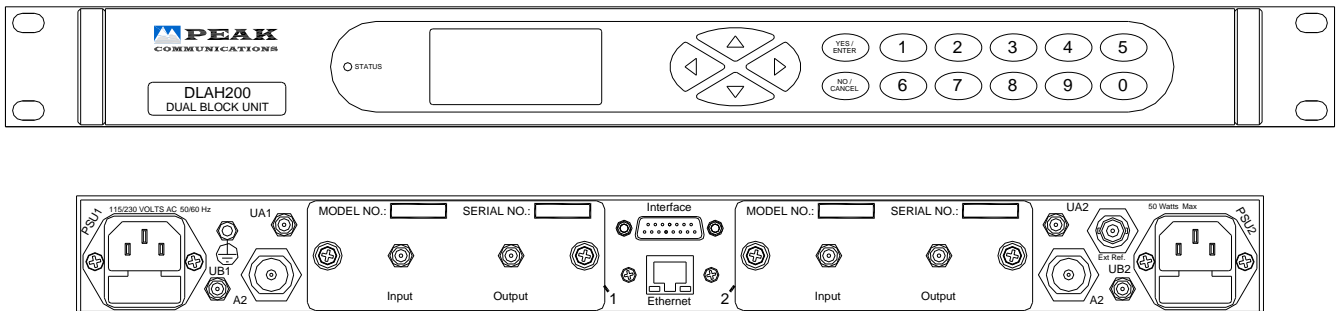
INSTALLATION

The equipment is classified in EN 60950 as a pluggable equipment class A for connection to the mains supply, as such it is provided with a mains inlet cord suitable for use in the country of operation. In normal circumstances this will be of an adequate length for installation in the rack. If the mains cord proves to be too short then any replacement must have a similar type fuse (if fitted) and be manufactured to similar specification: check for HAR, BASEC or HOXXX-X ratings on the cable. The connector ends should be marked with one of the following : BS1636A (UK free plug 13 amp); BSI, VDE, NF-USE, UL, CSA, OVE, CEBEC, NEMKO, DEMKO, SETI, IMQ, SEV and KEMA-KEUR for the IEC 6 amp free socket. Schuko and North American free plugs must have similar markings.

The installation of the equipment and the connection to the mains supply must be made in compliance to local or national wiring regulations for a category II impulse over voltage installation. The positioning of the equipment must be such that the mains supply socket outlet for the equipment should be near the equipment and easily accessible or that there should be another suitable means of disconnection from the mains supply.

The equipment is designed to operate from a TN type power supply system as specified in EN 60950. This is a system that has separate earth, line and neutral conductors. The equipment is not designed to operate with an IT power system which has no direct connection to earth.

UNIT DESCRIPTION



Front Panel Description

Keyboard

The keyboard is of the membrane type and is an integral part of the front panel assembly. The front panel overlay and is completely sealed against penetration of liquids but caution should be taken especially with solvents which may damage the front screen.

There are 16 keys in total - number keys in the range 0 to 9, YES/ENTER and NO/CANCEL and a 4 way arrow block of keys

LCD display

The backlit display is a graphic display and characters are scaled to incorporate as much information as possible on the screen. It provides detailed information about the status and configuration of the unit, and when appropriate, prompts the user to enter data via the keypad.

LED Indicator

Only one tricolour LED is present, marked STATUS. This shows GREEN when the unit is OK, RED when an internal fault is present and AMBER when in STANDBY (Redundancy operation)

An Internal alarm is caused by Power failure, Amplifier failure or Unit out of lock.

REAR PANEL DESCRIPTION

EXT. Ref	External Reference input.
Interface	Alarms connection.
Ethernet	Ethernet connection if option is fitted.

Other rear panel connections maybe applicable to the specific unit purchased please check the specification affixed to the end of this manual.

REAR PANEL PINOUTS

INTERFACE Alarms monitoring and control of the units.

Module 2 Amplifier N/O	1	9	Module 1 Amplifier N/O
Module 2 Amp Common	2	10	Module 1 Amp Common
Module 2 LO N/C	3	11	Module 1 LO N/C
Module 2 LO Common	4	12	Module 1 LO Common
Module 2 power N/C	5	13	Module 1 Power N/C
Module 2 Power Common	6	14	Module 1 Power Common
Module 2 Online	7	15	Module 1 Online
Ground	8		

REMOTE (If Ethernet option is not fitted) Alarms monitoring and control of the units.

RS485 Rx +	1	9	RS485 Rx -
RS485 Tx +	2	10	RS485 Tx -
Not used	3	11	Not used
Not used	4	12	Not used
Not used	5	13	Not used
Not used	6	14	GROUND
RS232 Rx In	7	15	RS232 Tx Out
Not used	8		

Ethernet (If option fitted)

RJ45 8P8C female connector

OPERATION

On switching on the unit the STATUS indicator on the front of the unit should turn GREEN if all is OK.

Please refer to the manual for the inserted modules for their capabilities.

Menu Structure

On Power up the unit will start in HOME mode displaying the following options.

Generally YES will select/enable an item and NO will step back one step with no changes.

The unit's HOME screen has 5 main menu options as shown in Figure 1 below:

```
HOME
1: Operating Display
2: Status
3: Configure
4: Log
5: Service
```

Figure 1

Operating display

This menu shows a graphical representation of the RF path and attenuation values, the screen is different if the unit is fitted with the redundancy option.

```
Module 1 [ ] dB .....
Module 2 [ ] dB .....
```

Figure 2

Status

This menu shows an immediate summary of all settings and alarm conditions, more details may be available by pressing the down arrow, left and right arrows cycle through the attached trays.

```
----- Unit -----
DLAH200 [9]
Software Version: 1.01
Serial No.: 00000
Summary Alarm: OK
----- Remote Control -----
Local Ethernet mode
Address: 32
```

Figure 3

Configure

This menu allows the user to configure different parts of the unit, the menu choice change depending on the unit, its options, and whether the unit is in remote or local mode. When in local mode all the menu items are available to the user to change, when in remote mode only the REMOTE CONTROL menu option is available.

Figure 3, below, shows a basic configure menu, however as stated above the menu choices change depending on the unit, the installed trays and their options.

```
CONFIGURE
1: Modules
2: Remote Control
```

Figure 4

The possible list of tray options that have their own configure menu items and associated configuration screens including:

```
MODULE CONFIGURATION
1: Module 1
2: Module 2
```

Figure 5

Attenuation

Allows the attenuation of the RF path of the selected tray to be changed, the step size and range are tray/option specific.

```
MODULE [1] ATTENUATION
0.0 dB - 30.0 dB
Variable Mode use ↑/↓
00.0 dB
```

Figure 6

Remote control

Selects a sub-menu with further menus. If the Ethernet module is not installed then the following menu will be shown:

```
RS232 (LOCAL Mode)
Address: N/A
Baudrate: 19200
1: Set REMOTE mode
2: Setup RS485
3: Setup RS232
```

Figure 7

- 1 *Set REMOTE mode* - Sets the unit to allow control from a remote source. Pressing 1 again returns the unit to local mode.
- 2 *SETUP RS485* - Allows the selection of RS485 UNIT ADDRESS and BAUD RATE.
- 3 *SETUP RS232* - Allows selection of BAUD RATE for RS232 communication.

If the Ethernet module is fitted then the menus change slightly to:

```

REMOTE CONTROL
RS232 (LOCAL Mode)
Address:N/A Baudrate:19200

1: Set REMOTE mode
2: Set Communications

```

Figure 8

- 1 *Set REMOTE mode* - Sets the unit to allow control from a remote source. Pressing 1 again returns the unit to local mode.
- 2 *Setup Communications* - Allows the selection of RS485, RS232 or Ethernet communication. RS232, RS485 menus work in the same way as shown above.

```

COMMUNICATIONS
1: Serial RS232
2: Serial RS485
3: Ethernet

```

Figure 9

3 *Ethernet* – This brings up a further menu as shown below in figures 11 and 12, these are accessed by using the up/down buttons

```

ETHERNET OPTIONS 1/2
1: DHCP [Enabled]
2: IPv4 Address
3: Subnet Mask
4: Gateway
5: TCP Port
6: TCP Socket Timeout
7: SNMP [Disabled]

```

Figure 10

```

ETHERNET OPTIONS 2/2
1: Set Options
2: Address

```

Figure 11

The menu choices (1-4) shown in figure 11 allow the user to change the relevant Ethernet settings of the unit.

- 5 *TCP Port* – Sets the TCP port number used that allows serial comms messages to be sent, via Ethernet, to the unit.
- 6 *TCP Socket Timeout* – Sets the timeout value, after which time if no communication is received on the open TCP socket it is closed.
- 7 *SNMP* – Allows the SNMP protocol to be turned Disabled/Enabled.

1 *SNMP Trap Address* – Sets the IP address of the device that will receive any SNMP trap error messages from the unit.

Set Options in figure 12 is used to set the Ethernet data all at once on the device, this must be used when trying to change the Ethernet settings.

Log

This provides an event log of any 'errors' or 'events' that have occurred.

```
LOG
Number of items: 14
1: View
2: Clear
```

Figure 12

- 1 *View* - Displays the stored logs.
- 2 *Clear* - Allows the user to clear the log.

Service

This menu has 3 submenus as shown below in figure 13.

```
SERVICE
1: Time And Date
2: Module 1 Type
3: Module 2 Type
```

Figure 13

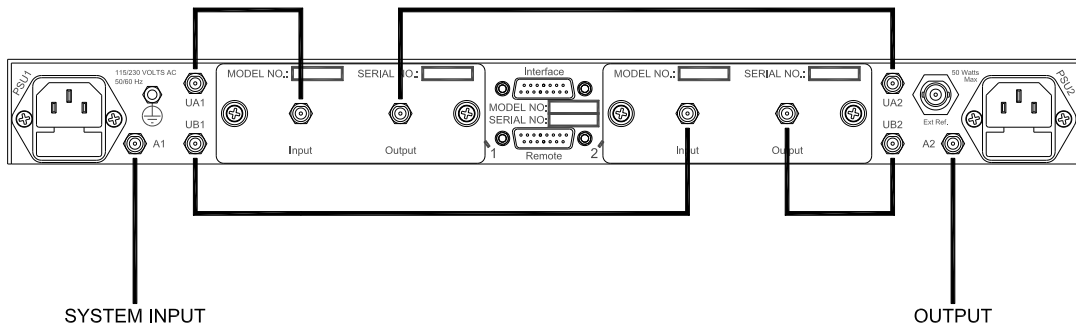
- 1 *Time And Date* - Allows setting of current time and date
- 2 *Module 1 Type* - Allows selection of installed module type
- 3 *Module 2 Type* - Allows selection of installed module type

REDUNDANCY

The redundancy option allows the user to select which tray is online, either A or B. Alternatively, Auto mode can be selected, allowing the automatic switching in/out of faulty trays.

Where the DBUH/ DLAH is purchased as a redundant system with two identical MBUH/ MBDH/ MLAH modules, the rear panel cabling configuration is shown below.

The customer is required to supply the system input and output cables. Peak Communications will supply the interconnecting cables unless instructed otherwise.



REMOTE CONTROL

Serial Communications RS232 / 485

The unit transmits and receives data serially in an asynchronous format using the standard ASCII character set. The serial data consists of message frames composed of the following message characters: STX, BYTE COUNT, UNIT ADDRESS, INSTRUCTION, BODY, CHECKSUM, ETX. All characters are compulsory except for the message body. The presence of a message body is determined by the message type (INSTRUCTION). The total number of message characters in a message frame may range from a minimum of 6 to a maximum of 255.

The remote control follows the following protocol: (in byte form)

[STX] start of message character #02.

[B] char defining how many characters are in the message including the STX & ETX parts.

[A] **Address of unit.** Address ranges from ASCII character 001 to 255. If in RS232 Mode this address can be anything in the 001 to 255 range.

[I] **Instruction number.** See List below

[MESSAGE]

Numerous characters from length 0 upwards.

[CHKSUM]

The checksum is used to verify the accuracy of the message frame. The checksum is defined as the summation of all the bytes in the message, **beginning** with the 3rd byte (DEVICE ADDRESS) and extending through the body of the message, **ending** with the last byte before the checksum. The total of the bytes is then ANDed with 255 so that the checksum is truncated to a single byte.

[ETX] End of transmission character #03

All message to and from the unit follow the above protocol with a character format of 8 data bits, one stop bit, no parity, baud rate 19200, 9600, 4800, 2400, 1200 or 300. Note; that all numeric values are shown as decimal.

INSTRUCTION NUMBER LIST (IN DECIMAL)

<i>To unit</i>	<i>From unit</i>	<i>Description</i>
20		Requests Status Allows different status request types: Module Status Request Power Supply Status Request
	21	Responds Status Allows different status response types: Module Status Response Power Supply Status Response
22		Reconfiguration Request Single Channel Status Response
24		Set Remote/Local Mode request
40		Asks for the main Unit settings
	41	Replies with the Unit Settings
42		Asks for the internal redundancy status
	43	Replies with the internal redundancy status
44		Reconfiguration request for the internal redundancy.

Instruction 20 (Module Status Request)

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	20	1	Message instruction
5	'M'	1	Module
6	'01'	2	Module number
8	?	1	Checksum
9	03	1	ETX

Instruction 20 (Power Supply Status Request)

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	20	1	Message instruction
5	'P'	1	Power supply
6	'01'	2	Power supply number
8	?	1	Checksum
9	03	1	ETX

Instruction 21 (Module Status Request Reply)

Due to the ability of the DBUH/DLAH to accept differing module types into it, the module status request reply may vary between these different module types.

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	21	1	Message instruction
5	'M'	1	Module
6	'01'	2	Module number
8	'-'	1	Module State: Module Missing 'X' Module Warmup 'W' Module Present '-'
9	'MLAH175'	20	Module name/type
29	'+123'	4	Attenuation asked for in 0.1 dB steps, '+123' = 12.3dB
33	'0'	1	External Reference 'X' = Not present 'L' = Locked 'U' = Unlocked
34	'....'	4	NOT USED
38	'0'	1	Summary Alarm '0' = OK '1' = FAULT
39	'0'	1	External Reference Fault '0' = OK '1' = FAULT
40	'0'	1	PLO Fault '0' = OK '1' = FAULT
41	'0'	1	Amplifier Fault '0' = OK '1' = FAULT
42	'0'	1	Attenuator Fault '0' = OK '1' = FAULT
43	'....'	4	NOT USED
47	('23/12/02 12:34:56')	17	OK Since time/date string, if there is a fault then the string is blank.
64	?	1	Checksum
66	03	1	ETX

If the channel is missing then the value of the rest of the bytes in the message is undetermined.

Instruction 21 (Power Supply Status Request Reply)

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	21	1	Message instruction
5	'P'	1	Power supply
6	'01'	2	Power supply number '01' = PSU 1 '02' = PSU 2
8	'-'	1	Power Supply Present 'X' = Missing '-' = Present
9	'.'	1	NOT USED
10	'....'	4	NOT USED
14	'0'	1	Summary Alarm '0' = OK '1' = FAULT
15	'0'	1	Power Supply Missing '0' = OK '1' = FAULT
16	'..'	2	NOT USED
18	('23/12/02 12:34:56')	17	OK Since time/date string, if there is a fault then the string is blank.
35	?	1	Checksum
36	03	1	ETX

Instruction 22 (Module Reconfiguration Requests)

The unit MUST be in remote mode to allow reconfiguration of parameters via the remote control. Setting the unit in Remote mode can be done either by the front panel or remotely using the instruction 24.

Due to the ability of the DBUH/DLAH to accept differing module types into it, the module status request reply may vary between these different channel types.

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	22	1	Message instruction
5	'M'	1	Module
6	'01'	2	Module number
8	'+123'	4	Attenuation in 0.1 dB steps '+123' = 12.3dB
12	?	1	Checksum
13	03	1	ETX

Instruction 24 (Set Remote/Local Mode)

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	20	1	Message instruction
5	'R'	1	'R' = Remote Mode 'L' = Local Mode
6	?	1	Checksum
7	03	1	ETX

Instruction 40 (Unit Status Request)

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	40	1	Message instruction
5	?	1	Checksum
6	03	1	ETX

Instruction 41 (Unit Status Request Reply)

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	41	1	Message instruction
5	'DLAH200'	27	Type of unit this is: DLAH200 etc
32	'12345'	5	Serial Number
37	'0112.34'	7	Software Version Number
44	'0'	1	Summary Alarm OK/FAULT '0' = OK '1' = FAULT
45	'0'	1	+5V voltage out of range fault '0' = OK '1' = FAULT
46	'0'	1	-15V voltage out of range fault '0' = OK '1' = FAULT
47	'0'	1	Temperature out of range fault '0' = OK '1' = FAULT
48	'0'	1	Internal Communications Fault '0' = OK '1' = FAULT
49	'0'	1	Coax Switch Fault '0' = OK '1' = FAULT
50	'0'	1	Ethernet Module Fault '0' = OK '1' = FAULT
51	'.....'	5	NOT USED
56	'23/12/02 12:34:56'	17	OK Since time/date string, if there is a fault with this down/up part of the converter then the string is blank.
73	'0'	1	Remote mode '0' = Local '1' = Remote
74	?	1	Checksum
75	03	1	ETX

Instruction 42 (Internal Redundancy Status Request):

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	42	1	Message instruction
5	?	1	Checksum
7	03	1	ETX

Instruction 43 (Internal Redundancy Status Request Reply):

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	43	1	Message instruction
5	('M')	1	Redundancy Mode 'M' = Manual 'A' = Auto
6	('1')	1	Unit Online '1' = Module 1 Online '2' = Module 2 Online '?' = Unknown due to Coax Switch error
7	('1')	1	Copy Settings across from one module to another when switching '0' = No '1' = Yes
8	('1')	1	Wanted Module Online, i.e. which module was asked to be forced online '1' or '2'
9	?	1	Checksum
10	03	1	ETX

Instruction 44 (Module Reconfiguration Requests)

The unit MUST be in remote mode to allow reconfiguration of parameters via the remote control. Setting the unit in Remote mode can be done either by the front panel or remotely using the instruction 24.

<i>Message Byte No.</i>	<i>Set Value / (example)</i>	<i>Length (bytes)</i>	<i>Description</i>
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	44	1	Message instruction
5	('M')	1	Redundancy Mode 'M' = Manual 'A' = Auto
6	('1')	1	Copy Settings across from one module to another when switching '0' = No '1' = Yes
7	('1')	1	Module To be Forced Online '1' or '2'
8	?	1	Checksum
9	03	1	ETX

If the user is requiring the redundancy mode to be Automatic then the 'Module to be forced online' parameter in the message above is ignored.

Ethernet

The Ethernet option for the equipment adds the ability to control the unit by Ethernet as well as by the existing standard RS232 or RS485, this is achieved via a separate module within the unit.

The unit can be controlled through the Ethernet port using three different approaches.

TCP Port

The unit can be controlled using the serial remote control messages as described earlier sent through the TCP port set in the Ethernet menu option.

Web Page

The unit can be controlled via the in build web server's web pages. There are two pages, Status and Configure. Hopefully both of which are self explanatory. Figures 17 & 18 show screen shots of web pages.

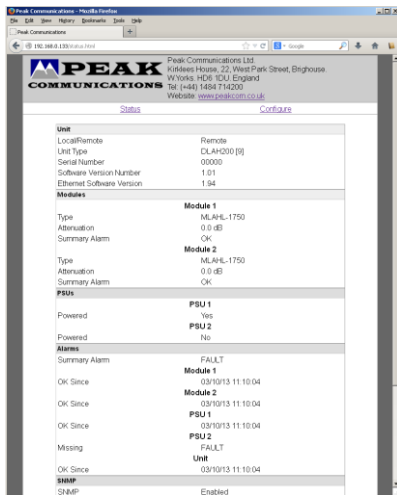


Figure 17

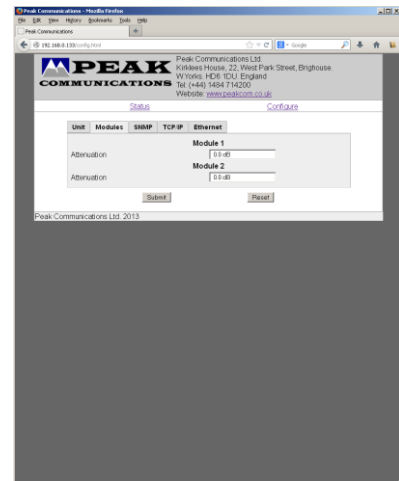


Figure 18

SNMP

The DBUH/DLAH series units fitted with Ethernet, have a built-in SNMP (Simple Network Management Protocol) agent software.

It supports SNMP Trap, RFC1155, 1157, 1212, 1213, 1901 & 1906, as well as the Peak MIBS.

The Peak SNMPv2 MIB files are available from Peak Communications Ltd website, below is a quick overview of them.

The Peak Enterprises node is essentially split into three main areas:

Converters – Off this node there is a nsConverters branch, in here there is a peakDXXHConverterModule, this includes tables for the modules and PSUs.

Unit – This node allows the unit's status to be checked as well as the Ethernet settings.

PeakFaultsModule – This node contains the unit summary alarm as well as a table showing all the faults currently on the unit.