

# **Installation and Operating handbook**

## **DLA200 Dual Line Amplifier Unit**

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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 DLA200 units are able to power 2 MLA Amplifier modules.

The DLA200 units are housed in 19 inch 1'U' high chassis, suitable for rack mounting. They are 400 mm deep and may be fitted with rack slides if required.

## EMC AND SAFETY

### EMC

The DLA200 units have 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 with 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

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

### SAFETY

To ensure safety of operator the DLA200 units have 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 mains inlet cords suitable for use in the country of operation. In normal circumstances they will be of an adequate length for installation in the rack. If a 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.

## SPECIFICATION

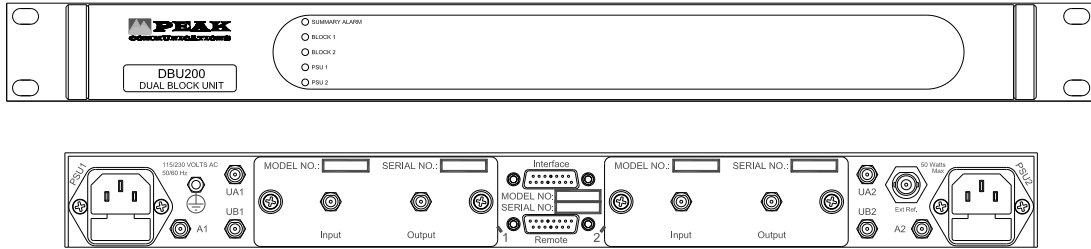
Given as a guide only. For an up-to-date specification giving performance, features and available options please see the current data-sheet).

DLA units are used to power the MLA series of amplifiers a brief overview of which is included below;

<b>Frequency</b>	MLA1450; 950-1450MHz MLA1750; 950-1750MHz MLA2150; 950-2150MHz Other module types are available, please see datasheet
<b>Connector</b>	50Ω, SMA (female), option 1a; N-Type, Option 1c; BNC
<b>Return Loss</b>	Input 16dB typical, Output 18dB typical
<b>Gain</b>	20dB minimum
<b>Gain flatness</b>	±0.25dB (bandwidths <500MHz) ±0.5dB (bandwidths <800MHz) ±1dB (bandwidths <1200MHz)
<b>Active Directivity</b>	22dB typical 20dB minimum
<b>RF Input power</b>	-10dBm max. (no load, no damage)
<b>TOIP</b>	+25dBm typical
<b>1dB Output GCP</b>	+13dBm typical
<b>Noise Figure</b>	7 to 9dB typ. (frequency dependent)

## UNIT DESCRIPTION

### FRONT & REAR PANEL VIEW



The DLA200 unit front panels have 5 indicator lights;

### FRONT PANEL INDICATIONS

SUMMARY ALARM	GREEN: both units & PSU's OK. RED: unit FAULT.
BLOCK 1	GREEN: Line amplifier OK and ONLINE. AMBER: Line amplifier OK and OFFLINE (STANDBY), only used with integral 1+1 switching option, or external 1+1 switch. RED: Line amplifier FAULT, see rear panel interface connector for condition.
BLOCK 2	GREEN: Line amplifier OK and ONLINE. AMBER: Line amplifier OK and OFFLINE (STANDBY), only used with integral 1+1 switching option, or external 1+1 switch. RED: Line amplifier FAULT, see rear panel interface connector for condition.
PSU 1	GREEN: PSU 1 & mains input OK. RED: PSU 1 or mains input FAULT.
PSU 2	GREEN: PSU 2 & mains input OK. RED: PSU 2 or mains input FAULT.

## REAR PANEL CONNECTIONS

### INTERFACE

Alarms, monitoring and control of the Converter units.

Unit 2 Amplifier N/O	1	9	Unit 1 Amplifier N/O
Unit 2 Amp Common	2	10	Unit 1 Amp Common
Unit 2 Not connected	3	11	Not connected
Unit 2 Not connected	4	12	Not connected
Unit 2 Power N/C	5	13	Unit 1 Power N/C
Unit 2 Power Common	6	14	Unit 1 Power Common
Unit 2 Online input (note 1)	7	15	Unit 1 Online input (note 1)
Ground	8		

Note 1; these are INPUTs to control the front panel module online/ standby LED's only for use with external 1+1 switch units. If the internal 1+1 switch option is fitted then these pins are not connected.

### REMOTE

15-way, D type RS232/485 serial interface. Configuration for baud rate and addresses are set inside the unit as described later.

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

When the DLA200 has the Ethernet option (option 9), the 15 way D type connector is replaced by a RJ45 Ethernet connector.

### POWER CONNECTIONS

The unit contains 2 redundant switch mode power supplies. The voltage input can be in the range of 100-240VAC. The unit is designed to work off both or one of the 2 feeds. In normal condition the Left hand MLA will be powered from the left hand mains input and the right hand MLA will be powered from the right hand mains inlet. Fault condition of only one mains input present will power both sides from the single mains input

### SLOT DESIGNATIONS

The Slots for the MLA units are designated Unit 1 and Unit 2, looking from the front of the unit the RHS slot is for unit 1 and the LHS slot is for unit 2. This is also indicated on the rear panel.

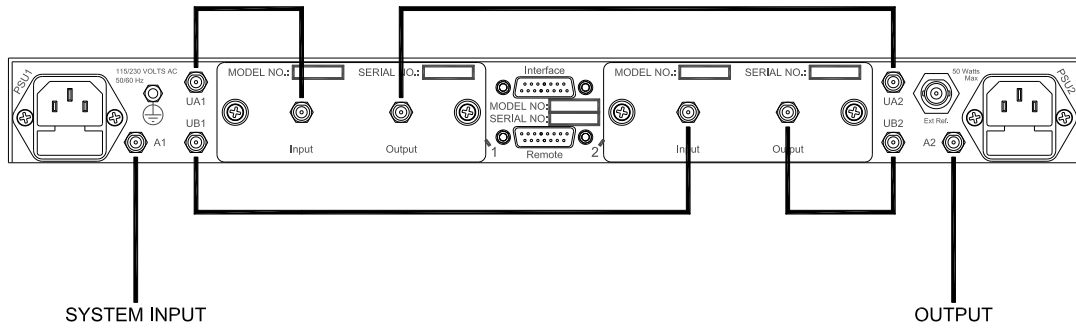
When the MLA unit is slotted into position the external mounting screws must be fully tightened.

The slots are “hot swappable” and are capable of insertion / removal whilst the unit is powered.

### REDUNDANCY WIRING

Where the DLA200 is purchased as a redundant system with two identical MLA 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 module interconnecting cables unless instructed otherwise.



## REMOTE CONTROL INTERFACE

### RS232/485 INTERFACE

The DLA200 dual block control system unit may be monitored and controlled remotely either via a RS232 or a RS485 multi-drop bus. The connection is made via the 15 way D type on the rear of the unit and configured as described earlier.

#### INTERNAL CONFIGURATION (RS232/485)

RS485 - 232 address/ baud rate configuration switches

No	Colour	Function
1	Brown	RS485 address select
2	Red	RS485 address select
3	Orange	RS485 address select
4	Yellow	RS485 address select
5	Green	Baud Rate select
6	Blue	Baud Rate select
7	Violet	Baud Rate select
8	Grey	Factory Setting

Baud rate selection with switches 5- 8 (0=off)

5	6	7	Baud rate
0	0	1	2400
0	1	0	9600
1	0	0	19200

Any Configuration of switches not shown here means the baud rate defaults to 9600.

RS485 unit address with switches 1 - 4 (0=off)

Note addresses have been started at 32 to avoid any possible conflict in reading data

4	3	2	1	Address
0	0	0	0	32
1	0	0	0	33
0	1	0	0	34
1	1	0	0	35
0	0	1	0	36
1	0	1	0	37
0	1	1	0	38
1	1	1	0	39
0	0	0	1	40
1	0	0	1	41
0	1	0	1	42
1	1	0	1	43
0	0	1	1	44
1	0	1	1	45
0	1	1	1	46
1	1	1	1	47

An internal connection change is required for changing from RS232 to RS485. Please ensure that the unit is switched off and the 12 cover screws are removed.

The jumper LK1 on the PCB needs to be set to the correct position in order to change between RS232 and RS485 operation. RS485 is towards the front of the unit, while RS232 is when the jumper is placed towards the rear of the unit.



When the Ethernet option is fitted to the unit the user cannot change between RS232 or RS485, or baud rate, however the address can still be changed. Changing the baud rate, which by default is 19200 on an Ethernet enabled, unit will stop the Ethernet working properly!

### MESSAGE FORMAT

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, DEVICE 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 32 to 47. (configurable via dip switches - see earlier)
- [I] **Instruction number.**  
See table below.

[MESSAGE]

numerous characters from length 0 upwards. If no message present enter a 0.

[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 300, 2400, 9600 or 19200. Note that all numeric values are shown as **decimal**.

#### Message Information

The message protocol for this unit has been made to emulate the RCU100 units therefore the bands are set as 'A' and 'B' not '1' and '2' as the metalwork/front panel says. Extra information has been added to show the PSU status information.

#### **Instruction Number List: (in decimal):**

To DLA200 unit	From DLA200 unit	Description
32		Status request
	33	Status reply
34		Configure unit
36		Extended block status request
	37	Extended block status reply

### Status Request message

In order to find out the STATUS of the unit a status request message must be sent.

#### 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	32	1	Message instruction
5	?	1	Checksum
6	03	1	ETX

Example for a Status Request to a unit that has been configured as address 32. The following characters should be sent.

2, 6, 32, 32, 64, 3

This is explained as follows - character 2 is start of message, Character 6 denotes the message has 6 characters in total, Character 32 is instruction 32 (status request) character 64 is the checksum (32 plus 32 added), Character 3 is end of message.

The unit would then reply with a STATUS REPLY message.

### Status Reply message

This message tells the host computer the status of the unit.

#### STATUS 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	33	1	Message instruction
5	'O'	1	Position of the UNIT SELECT switch 'O' = Auto 'A' = Unit 1 (A) 'B' = Unit 2 (B)
	'L'	1	Position of the remote/local switch 'R' = Remote 'L' = Local
	'A'	1	Coax switch position 'A' = Unit 1 (A) 'B' = Unit 2 (B) '?' = Unknown
	'1'	1	Summary Alarm Status '0' = Alarm '1' = OK
	'1'	1	Unit 1 (A): Online status '0' = Offline '1' = Online
	'1'	1	Unit 1 (A): Summary alarm status '0' = Alarm '1' = OK
	'1'	1	Unit 2 (B): Online status '0' = Offline '1' = Online
	'1'	1	Unit 2 (B): Summary alarm status '0' = Alarm '1' = OK
	'1'	1	PSU 1: Status

			'0' = Not OK '1' = OK
	'1'	1	PSU 2: Status '0' = Not OK '1' = OK
6	?	1	Checksum
7	03	1	ETX

Example of a DLA200 message body which is Auto, Local, switch to UNIT 1, summary alarm OK, UNIT 1 online, UNIT 1 unit alarm OK, UNIT 2 offline, UNIT 2 unit alarm OK with PSU 1 and 2 are OK is ALA1110111.

### Configure Unit

This message is sent to the unit, when the host computer wishes to change which unit or units are to be on line. When the message has been received by the unit a Status reply message will be sent back by the unit.

The command will only change the state of the unit IF the unit is in REMOTE mode. The actual position of the switch is overridden but the indicators on the front panel show the actual status.

#### CONFIGURE UNIT:

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	34	1	Message instruction
5	'O'	1	Position of the UNIT SELECT switch 'O' = Auto 'A' = Unit 1 (A) 'B' = Unit 2 (B)
6	?	1	Checksum
7	03	1	ETX

### Extended block status request

This message is sent to the unit, when the host computer wishes to receive more information on the status of the blocks. When the message has been received by the unit an extended block status reply message will be sent back by the unit.

#### EXTENDED BLOCK 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	36	1	Message instruction
5	?	1	Checksum
6	03	1	ETX

### Extended block status reply

This message tells the host computer the extended status of the blocks.

#### EXTENDED BLOCK STATUS REPLY:

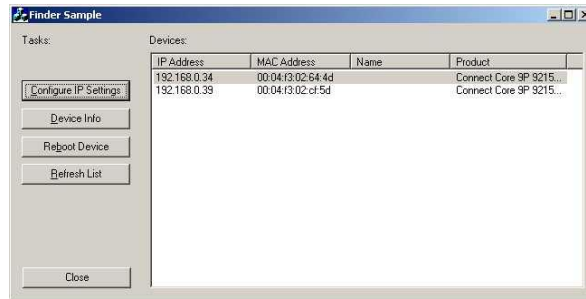
Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	?	1	No of bytes in message
3	?	1	Address
4	37	1	Message instruction
5	'1'	1	MBU/D 1 Present '0' = Not Present '1' = Present
6	'1'	1	MBU/D 1 Online '0' = Not Online '1' = Online
7	'0'	1	MBU/D 1 Summary Alarm '0' = Alarm '1' = OK
8	'0'	1	MBU/D 1 PLO Alarm '0' = Alarm '1' = OK
9	'1'	1	MBU/D 1 External Reference Present '0' = Not Present '1' = Present
10	'1'	1	MBU/D 2 Present '0' = Not Present '1' = Present
11	'1'	1	MBU/D 2 Online '0' = Not Online '1' = Online
12	'0'	1	MBU/D 2 Summary Alarm '0' = Alarm '1' = OK
13	'0'	1	MBU/D 2 PLO Alarm '0' = Alarm '1' = OK
14	'1'	1	MBU/D 2 External Reference Present '0' = Not Present '1' = Present
15	?	1	Checksum
16	03	1	ETX

## ETHERNET INTERFACE (Option 9)

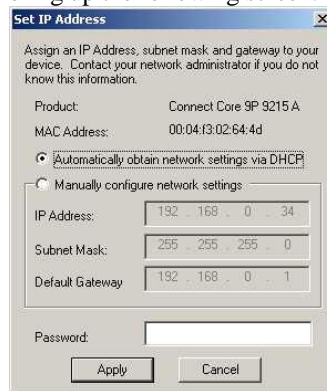
If the DLA200 unit has been fitted with the Ethernet option the unit can be controlled via its in built web page, TCP or SNMP.

Due to a lack of front panel on these units, it is not possible to display the IP address and other Ethernet settings to the user easily. In order to discover the IP address and other Ethernet settings, initially only, the Peak discovery windows programme needs to be run.

This software is available off the Peak website, when run it lists the units on the network, and allows the user to view and modify, if necessary, the Ethernet settings to suit the user's network.



The Configure IP settings button will bring up the following screen:

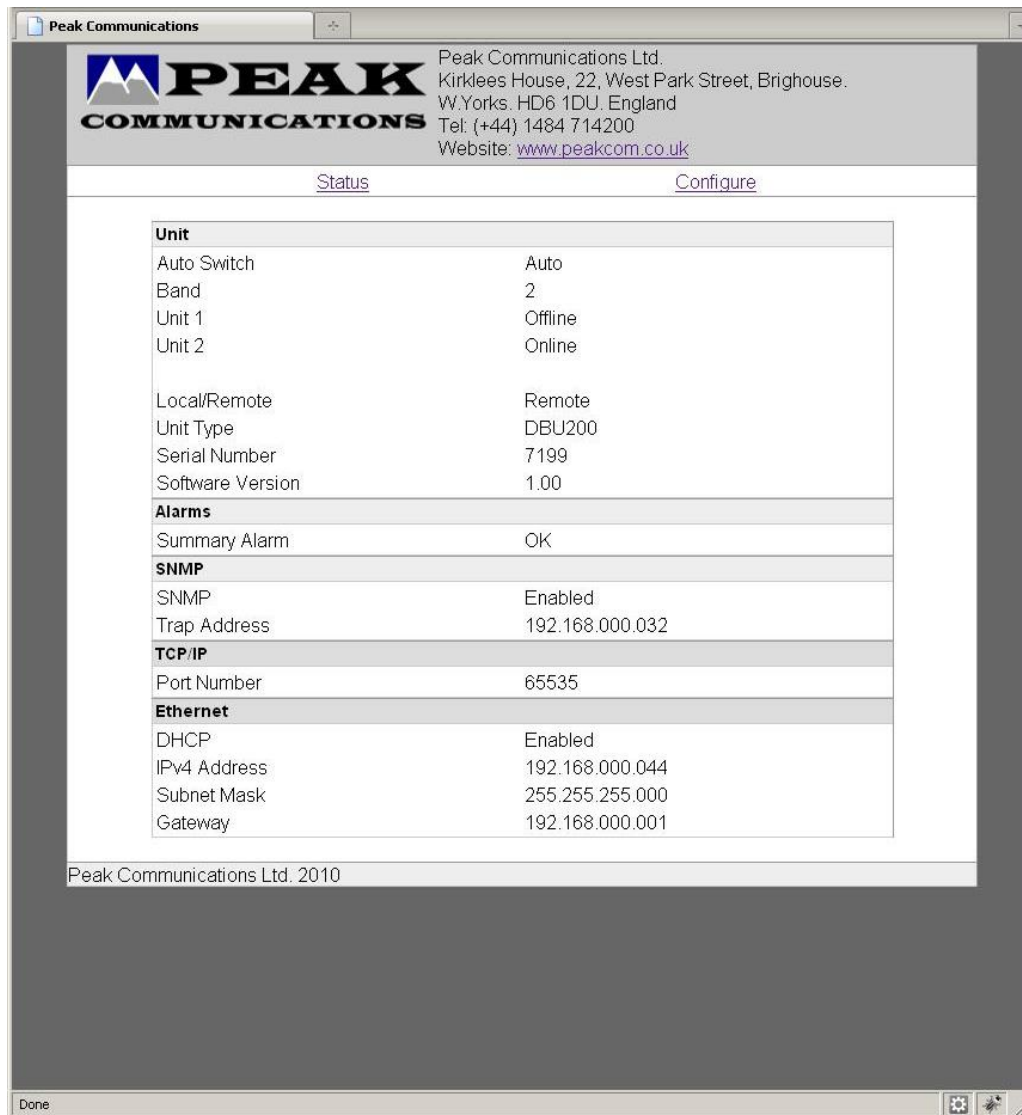


This allows the changing of the Ethernet settings, the initial password is "password", after the initial settings change, it will change to "PEAKpass123", and is case sensitive.

In order for the new settings to be used, the unit must be restarted by cycling the power.

## Webpage

The webpage is essentially split into two screens, Status and Configure, each one accessible via the links part way down the screen. The webpage is displayed by entering the unit's IP address into a normal web browser.



The screenshot shows a web browser window titled "Peak Communications". The page header includes the Peak Communications logo and contact information: "Peak Communications Ltd. Kirklees House, 22, West Park Street, Brighouse. W.Yorks. HD6 1DU. England Tel: (+44) 1484 714200 Website: [www.peakcom.co.uk](http://www.peakcom.co.uk)". Below the header are two navigation links: "Status" and "Configure". The main content area is a table with the following sections:

Unit	
Auto Switch	Auto
Band	2
Unit 1	Offline
Unit 2	Online
Local/Remote	Remote
Unit Type	DBU200
Serial Number	7199
Software Version	1.00
Alarms	
Summary Alarm	OK
SNMP	
SNMP	Enabled
Trap Address	192.168.000.032
TCP/IP	
Port Number	65535
Ethernet	
DHCP	Enabled
IPv4 Address	192.168.000.044
Subnet Mask	255.255.255.000
Gateway	192.168.000.001

At the bottom of the page, it says "Peak Communications Ltd. 2010". The browser status bar at the bottom shows "Done" and some navigation icons.

## TCP

The units can be controlled via TCP, this involves sending the normal RS232/485 commands to the unit through a TCP port. The TCP port to be used is set by the user via one of the remote control interfaces.

## SNMP

The units can be controlled via SNMP, the MIBS necessary for this are available from the Peak Communications website. Please refer to the Peak-Agents.MIB file, as this shows which of the MIBS available is used for the unit in question.