

# **Installation and Operating handbook**

## **RCU100 1:1 Redundancy unit RCU200 1:2 Redundancy unit**

Covers RCU100-103 / RCU200-203

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



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Certificate Number 2400  
ISO 9001

**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

## INTRODUCTION

The RCU100 and RCU200 units are 1 FOR 1 and 1 FOR 2 redundancy control units which are fully compatible with the L500, IBU and IBD Up and Downconverter units from Peak Communications. By external cabling the units can be configured to control either Up or Down converter units.

The RCU100 and RCU200 Redundancy control 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 RCU100 and RCU200 redundancy control 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 RCU100 and RCU200 redundancy control 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.

## CUSTOMER CARE

Contact the Peak Communications support department for:

- ✚ Product operation, application support or training requests
- ✚ Information for returning or upgrading a product
- ✚ Comments or suggestions on any supplied literature

### Contact Information

Peak Communications Ltd  
Attention: Support Department  
Unit 1, The Woodvale Centre  
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E-mail [support@peakcom.co.uk](mailto:support@peakcom.co.uk)

You can also contact us via our website at [www.peakcom.co.uk](http://www.peakcom.co.uk)

To return a Peak Communications product for repair:

1. Contact the Peak Communications support department and request a Return Material Authorisation (RMA) number.
2. You will be required to provide to our support representative the model number, serial number and a detailed description of the problem.
3. To prevent any damage to the product during shipment we recommend that the unit is returned in its original packaging or if this is not available the packaging used must be of an equal standard.
4. Return the product back to Peak Communications and advise shipment details to support representative for tracking purposes. (Any shipping charges should be prepaid)

## UNIT DESCRIPTIONS

### Front panel

The RCU100 and RCU200 Redundancy control unit front panels are the same with 2 switches and 5 indicator lights

#### Switches

REMOTE/LOCAL	2 position switch which selects remote control from external computer system or internal control for selection and setting of the system In REMOTE position the other selection switch is disabled
A/AUTO/B	This 3 position switch selects which unit or units are to be on line. In positions A and B the selection is fixed and can only be over-riden by selecting REMOTE. In AUTO the ONLINE LEDS on the converters should be observed to determine the status of the system. <b>RCU100.</b> If position A is selected the unit designated A by the position of the INTERFACE connector at the rear of the units is selected and put on line. Similarly of position B is selected B will be put on line. In AUTO the alarms of the units are monitored and switching is automatic. The unit first selected is the one last selected with A or B. <b>RCU200.</b> If position A is selected the unit designated A by the position of the INTERFACE connector at the rear of the units is substituted for the STANDBY unit which is put on line. Similarly of position B is selected the STANDBY unit is substituted for unit B. If a non selected unit is in alarm any change-over will not take place. When REMOTE is selected the unit will still automatically switch (if AUTO had been selected when the unit was switched to REMOTE) even though the A/AUTO/B switch is disabled.

#### Front panel indicators

POWER	Lit GREEN when status of 5 Volt supply is OK
SUMMARY ALARM	Normally lit GREEN but will turn RED with any internal unit failure or external unit failure
REMOTE	Lit Green when in REMOTE mode
AUTO	Lit Yellow when in AUTO mode. Flashes once when unit A is selected. Flashes twice when unit B is selected .
PSU OK	PSU Failure - cuts power to internal coaxial switch to prevent unwanted 'grey' switching

#### Rear panel connections

The connections made at the rear of the chassis are made according to whether the unit is a RCU100 1:1 or an RCU200 1:2 system. With an RCU100 some of the connectors are not used and are blanked. The RCU connectors differ from previous models and all connectors are now SMA type instead of a mixture. The switch arrangements one side to another on the rear are identical and theoretically interchangeable A for A, B for B etc. Converters are switched on both inputs and outputs and switches are rated to 18GHz.. Refer to the scheme below relative to the product and use and drawings at the end of this manual.

It is possible to use these RCU units to control Peak Communications' front panel LCD style units, e.g. ILAH, IBUH, IBDH etc. However it should be noted that in these situations the unit being controlled will not indicate if it is online or offline as it has no such knowledge, it will just think it is online all the time. The actual unit that is online can be deduced from the RCU as normal.

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		

If the RCU100 1:1 or an RCU200 1:2 has been purchased with Ethernet, there will be a RJ45 connector on the rear of the unit.

### POWER CONNECTIONS

The unit contains a redundant linear power supply arrangement. The voltage input can be set on the input sockets to the voltage required (nominally 120 volts or 230 volts) by removing the voltage selector and re-positioning. The settings on each side should be the same to avoid generating damage by feeding the wrong voltage but it is possible to have them set differently. The unit is designed to work off one or both of 2 feeds and whichever one is present then it is automatically selected. The phases of the supplies can be phase unrelated but caution should be taken when both feeds are brought close together because a very high mains voltage can be generated.

### CONNECTOR DESIGNATIONS

The connectors on the rear of the RCU units are labelled such that the RCU can be used for both up and down converter configurations. These are the Inputs/Outputs compared with the labelling for both units. Converter units are designated Unit A and Unit B, which match the front panel legend and Unit S as the Standby in RCU200 configurations

**Configuration for RCU100 1:1 system**

A1	System Input
A2	System Output
B1	Not used
B2	Not used
S1	Not Used
S2	Not Used
UA1	To Converter Unit A Input
UA2	From Converter Unit A Output
UB1	To Converter Unit B Input
UB2	From Converter Unit B Output

**Note that the connection position of the multiway D type cable supplied selects which unit is A and B.**

Unit A	RED
Unit B	YELLOW
Controller	BLUE

**Configuration for RCU200 1:2 system**

A1	System Input 1
A2	System Output 1
B1	System Input 2
B2	System Output 2
S1	To Standby Converter Unit Input
S2	From Standby Converter Unit Output
UA1	To Converter Unit A Input
UA2	From Converter Unit A Output
UB1	To Converter Unit B Input
UB2	From Converter Unit B Output

**Note that the connection position of the multiway D type cable supplied selects which unit is A and B.**

Unit A	RED
Unit B	YELLOW
Controller	BLUE
Standby	GREEN

INTERFACE

Alarms monitoring and control of the Converter units.

**Note that the connection position of the multiway D type cable supplied selects which unit is A and B – see above**

RCU100

Unit A PSU alarm	1	9	Unit A LO alarm
Unit A selected	2	10	Unit A conv alarm
Unit B PSU alarm	3	11	Unit B LO alarm
Unit B selected	4	12	Unit B conv alarm
Not Connected	5	13	Not Connected
Not Connected	6	14	Not Connected
Not Connected	7	15	Not Connected
Ground	8		

RCU200

Unit A PSU alarm	1	9	Unit A LO alarm
Unit A selected	2	10	Unit A conv alarm
Unit B PSU alarm	3	11	Unit B LO alarm
Unit B selected	4	12	Unit B conv alarm
Standby PSU alarm	5	13	Standby LO alarm
Standby selected	6	14	Standby conv alarm
Not Connected	7	15	Not Connected
Ground	8		

**Internal configuration of Redundancy control unit**

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	Baud Rate select

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

5	6	7	8	Baud rate
0	0	0	1	300
0	0	1	0	2400
0	1	0	0	9600
1	0	0	0	19200



For Ethernet units, if the following switch position are used the the IP address is set to a static one:

1 1 1 0 Static IP

The static IP address settings chosen are: IP address: 192.168.0.2, subnet mask: 255.255.255.0

Once the IP address has changed the switch can be moved back to a known, normal, position.

Any other 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. For this ensure the unit is switched off and the 12 cover screws are removed.

The jumper on LK1 on the microprocessor board needs to be set to the correct position in order to change between RS232 and RS485 operation. The correct position is shown on the PCB.

**Reset**

BTN1 on the PCB is the push to RESET for the microprocessor

## REMOTE CONTROL INTERFACING

RCU100 / RCU200 Redundancy control system unit may be monitored and controlled remotely either via a RS485 multidrop bus or RS232. The connection is made via the 15 way D type on the rear of the RCU Redundancy control unit and configured as described earlier. If the Redundancy control unit has the Ethernet option fitted then the unit can also be controlled via its inbuilt web page, TCP and SNMP these are described in the next section.

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.**

The possible instructions are:

STATUS REQUEST character 32

STATUS REPLY character 33

CONFIGURE character 34

ETHERNET character 4

[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

Status Request message:

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

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	6	1	No of bytes in message
3	?	1	Address
4	32	1	Message instruction
5	?	1	Checksum
6	03	1	ETX

The unit would then reply with a STATUS REPLY message.

## Status Reply message

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

### RCU100 reply:

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	14	1	No of bytes in message
3	?	1	Address
4	33	1	Message instruction
5	'O'	1	Position of the UNIT SELECT switch 'A' or 'B' or 'O' ( 'O' = AUTO) ( 'A' = UNIT A) ( 'B' = UNIT B)
6	'R'	1	Position of the remote/local switch 'R' or 'L' ( 'R' = Remote) ( 'L' = Local )
7	'A'	1	Coax switch position 'A', 'B' or 'S', ( 'A' = UNIT A) ( 'B' = UNIT B) ( 'S' = Standby)
8	'1'	1	Summary alarm status '0' or '1' (0 = Alarm) (1 = OK)
9	'1'	1	Unit A online status '0' or '1' (0 = Offline) (1 = Online)
10	'1'	1	Unit A alarm status '0' or '1' (0 = Alarm) (1 = OK)
11	'0'	1	Unit B online status '0' or '1' (0 = Offline) (1 = Online)
12	'1'	1	Unit B alarm status '0' or '1' (0 = Alarm) (1 = OK)
13	?	1	Checksum
14	03	1	ETX

### RCU200 reply:

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	13	1	No of bytes in message
3	?	1	Address

4	33	1	Message instruction
5	'O'	1	Position of the UNIT SELECT switch 'A' or 'B' or 'O' ( 'O' = AUTO) ( 'A' = UNIT A) ( 'B' = UNIT B)
6	'R'	1	Position of the remote/local switch 'R' or 'L' ( 'R' = Remote) ( 'L' = Local )
7	'A'	1	Coax switch position 'A', 'B' or 'S', ( 'A' = UNIT A) ( 'B' = UNIT B) ( 'S' = Standby)
8	'1'	1	Summary alarm status '0' or '1' (0 = Alarm) (1 = OK)
9	'1'	1	Unit A alarm status '0' or '1' (0 = Alarm) (1 = OK)
10	'0'	1	Unit B alarm status '0' or '1' (0 = Alarm) (1 = OK)
11	'1'	1	Standby alarm status '0' or '1' (0 = Alarm) (1 = OK)
12	?	1	Checksum
13	03	1	ETX

### Configure Message

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.

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

### Ethernet Settings Status Message

This message is sent to the unit, when the host computer wishes to query the Ethernet settings, subject to the fitting of the Ethernet option.

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	7	1	No of bytes in message
3	?	1	Address
4	4	1	Message instruction
5	'1'	1	Ethernet Message sub instruction
6	?	1	Checksum
7	03	1	ETX

The unit then responds with the following message:

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	74	1	No of bytes in message
3	?	1	Address
4	5	1	Message instruction
5	'1'	1	Ethernet Message sub instruction
6	'0'	1	DHCP (0 = Disabled) (1 = Enabled)
7	' '	1	Separator character
8	"192.168.000.025"	15	Ipv4 address
23	' '	1	Separator character
24	"255.255.255.0"	15	Subnet mask
39	' '	1	Separator character
40	"192.168.000.010"	15	Gateway address
55	' '	1	Separator character
56	'0'	1	SNMP (0 = Disabled) (1 = Enabled)
57	' '	1	Separator character
58	"192.168.000.032"	15	SNMP trap address
73	?	1	Checksum
74	03	1	ETX

## Ethernet Configure Message

This message is sent to the unit, when the host computer wishes to change the Ethernet settings of the unit, subject to the fitting on the Ethernet option. The unit does not need to be in remote mode for this to be achieved.

The layout of the configure message follows that of the status reply shown above.

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	74	1	No of bytes in message
3	?	1	Address
4	6	1	Message instruction
5	'1'	1	Ethernet Message sub instruction
6	'0'	1	DHCP (0 = Disabled) (1 = Enabled)
7	' '	1	Separator character
8	"192.168.000.025"	15	Ipv4 address
23	' '	1	Separator character
24	"255.255.255.0"	15	Subnet mask
39	' '	1	Separator character
40	"192.168.000.010"	15	Gateway address
55	' '	1	Separator character
56	'0'	1	SNMP (0 = Disabled) (1 = Enabled)
57	' '	1	Separator character
58	"192.168.000.032"	15	SNMP trap address
73	?	1	Checksum
74	03	1	ETX

When changing IP address or DHCP the unit will have to restart, it may take a few seconds for you to be able to communicate with it again.

### TCP Port Status Message

This message is sent to the unit, when the host computer wishes to query the TCP port number, subject to the fitting of the Ethernet option.

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	7	1	No of bytes in message
3	?	1	Address
4	4	1	Message instruction
5	'2'	1	TCP port sub instruction
6	?	1	Checksum
7	03	1	ETX

The unit then responds with the following message:

Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	11	1	No of bytes in message
3	?	1	Address
4	5	1	Message instruction
5	'2'	1	TCP port sub instruction
6	"4000"	4	TCP Port number
10	?	1	Checksum
11	03	1	ETX

### TCP Port Status Message

This message is sent to the unit, when the host computer wishes to change the TCP port setting of the unit, subject to the fitting on the Ethernet option. The unit does not need to be in remote mode for this to be achieved.

The layout of the configure message follows that of the status reply shown above.

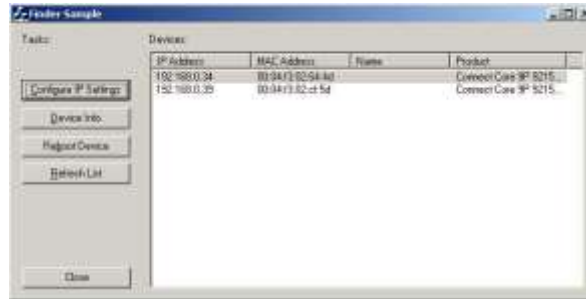
Message Byte No.	Set Value / (example)	Length (bytes)	Description
1	02	1	STX
2	11	1	No of bytes in message
3	?	1	Address
4	6	1	Message instruction
5	'2'	1	TCP port sub instruction
6	"4000"	4	TCP Port number
10	?	1	Checksum
11	03	1	ETX

## ETHERNET CONTROL

As mentioned previously, if the RCU100/200 Redundancy control system units have 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.

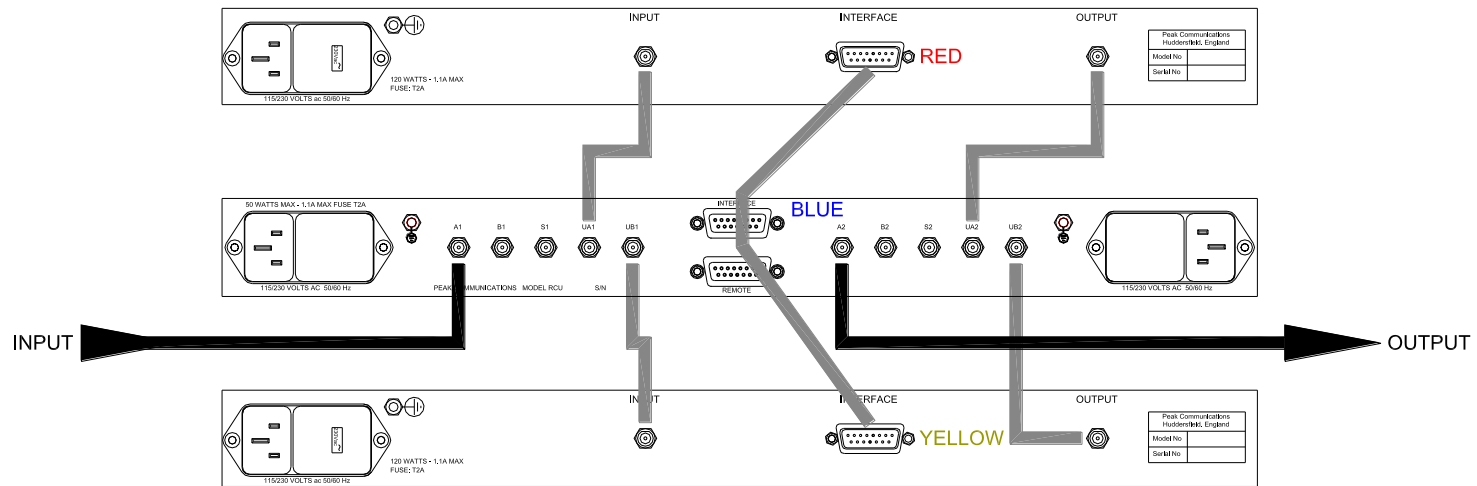


## TCP

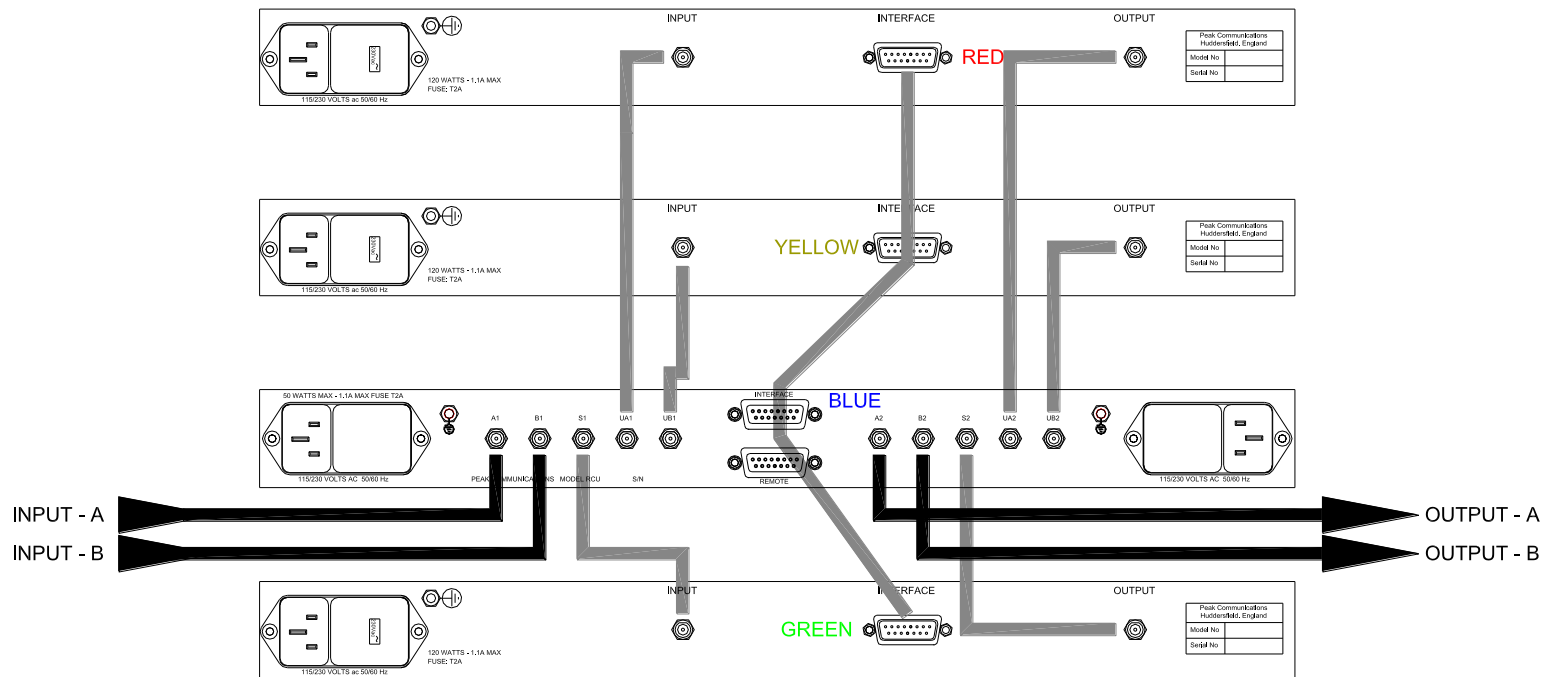
The units can be controlled via TCP, this involves sending the normal RS232/485 commands to the unit through a TCP port. The TCP port to be used is set by the user via one of the remote control interfaces.

## 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.



RCU100



RCU200