

BABELFISH & INTERNAL PROTOCOL CONVERSION



Contents

Contents	1
1 Introduction	4
2 The Babelfish	5
3 SC12 configuration tool	6
3.1 Connection to Sirius	6
3.2 Connection to Halo	8
3.3 Connection to Babelfish	8
3.4 Direct connection	9
3.5 LAN connection	10
3.6 Beck chip configuration	11
3.7 Connection problems	13
3.7.1 Theory of operation	13
3.7.2 Fault examples	13
4 Router SNMP Agent	15
4.1 Loading SNMP Agent software	15
4.2 Trap destination IP address	16
4.3 Testing the system	18
4.4 Installing the Windows Trap Service	19
4.4.1 Windows NT	19
4.4.2 Windows 2000/XP	20
4.5 Setting the correct type of database	21
4.5.1 Halo	21
4.5.2 Sirius 4U and 7U	21



Babelfish & internal protocol conversion

4.5.3	Sirius 16U	21
4.6	SNMP terminology	22
5	Tandberg Sandar protocol	25
5.1	2432/2433 card configuration	25
5.2	Loading Tandberg Sandar software	26
5.3	Testing the connection	27
5.4	Setting the correct type of database	29
6	Soft Source Assign Panel	31
6.1	What is a Source Assign Panel?	31
6.2	The Soft SAP	32
6.3	The Aurora database	32
6.4	Automation and 'auto-assignment'	33
6.5	Installation and Configuration	33
6.5.1	Connecting the system	34
6.5.2	Configuring the Babelfish	34
6.5.3	Installing the SAP software	36
6.5.4	Configuring the Soft SAP	37
6.5.5	Editing the keypad	38
6.6	Operating the Soft SAP	40
6.6.1	Assigning sources	40
6.7	Editing the Aurora database	41
6.7.1	Adding a TX system to Aurora	41
6.7.2	Adding new sources	41
7	SW-P-02 over IP	44
7.1	System connections	44
7.2	Configuring the system	44
7.2.1	Loading the application	44
7.2.2	Configuring the .ini file	46
8	SW-P-02 control to IP	50

Babelfish & internal protocol conversion



8.1	System connections	51
8.2	Configuring the system	51
8.2.1	Loading the application	51
8.2.2	Configuring the .ini file	52



1 Introduction

This handbook describes Pro-Bel's solution to a number of interfacing requirements, particularly between routing systems and external equipment. All interfaces have in common a piece of configuration software, known as 'SC12Cofig.exe', and a single-chip PC known as the 'Beck chip'. The configuration software runs on a standard PC, and the Beck chip will be resident on a router control card, or in a stand-alone interface unit called a 'Babelfish'.

The interfaces described in this handbook are as follows:

- **Router SNMP Agent:** allows any Master Sirius or Halo router to be controlled and have it's status monitored using Pro-Bel's General Switcher protocol over SNMP using the router Ethernet port
- **Tandberg Sandar protocol:** allows any Master Sirius or Halo router to be controlled using the Sandar Prosan protocol over the serial interface
- **Soft Source Assign Panel Server:** this allows the sources on a Pro-Bel Master Control mixer to be assigned using a PC connected to an Aurora router control system via the Babelfish interface
- **SW-P-02 over IP:** allows a Beck Chip to be configured either in a Sirius/Halo router or a Babelfish to accept General Switcher commands over a TCP/IP network for making routes and receiving status messages, the Babelfish connects to any Pro-Bel router via it's serial port
- **SW-P-02 control to IP:** configures a Babelfish to be the controller interface to a TCP/IP network, such such serial General Switcher commands are converted to IP data, this provides the complement to the translator described above

A Section in this handbook is devoted to each interface, including full configuration details, and Section 3 describes the SC12Config.exe configuration software which is common to all interface types.

2 The Babelfish



Babelfish (with apologies to 'Hitchhikers Guide to the Galaxy') is the name given to Pro-Bel's stand-alone protocol translator product, which has the Pro-Bel part number 2324. The unit houses a PC-on-a-chip, known as the Beck Chip, and is fitted with two RS422 serial ports and one 10 Base-T Ethernet port. An external power supply unit is used, or two may be connected for redundant operation. The unit's flash memory may be loaded with one of a variety of translator programs using the SC12Config.exe software via the Ethernet port, as described in the appropriate Sections of this handbook.

3 SC12 configuration tool

This PC based configuration tool is required for all interfaces described in this handbook and is used to configure the Beck chip, whether it is on the Sirius/Halo control card or in the Babelfish. The IP configuration tool software is available on a CD ROM (automatically supplied with every router), or directly from Pro-Bel. The user requires a PC running the Windows NT, 2000 or XP operating system with a 10 Base-T Ethernet adapter configured for TCP/IP. The software can be run directly from the CD or installed onto the PC, to do this a new directory must be created on the PC's hard drive and the following components copied into it:

- 'SC12Config.exe' program file
- 'SC12_app.txt' help file
- 'Applications' sub-directory

The program can be executed directly from the SC12Config.exe file, by double-clicking on it, or from a shortcut created from this file.

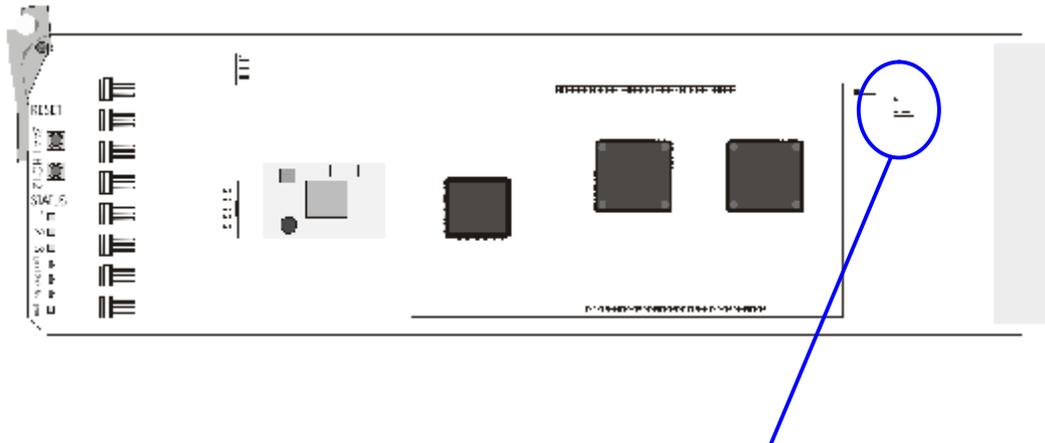
The PC must be connected to the router, or Babelfish, via it's RJ45 network connector, this can be done with a direct connection, or via a LAN. If the connection is direct, a 'crossover' network cable is required. The user must be aware that when using a direct connection it may be necessary to re-configure their PC for a fixed IP address, this is described in Section 3.4. If it is via a LAN, both the router or Babelfish and PC must be connected to a 10 Base-T Hub or switch within the same network segment.

3.1 Connection to Sirius

Any Master Sirius router is fitted with at least one 2432 control card, and two may be fitted with two for redundant operation. Two RJ45 connectors are supplied on the rear panel for configuration and control purposes, labelled A and B, which correspond to the two card positions. From the front of the 4U or 7U Sirius frame controller A is on the right, and B on the left. On a 16U Sirius, controller A is at the bottom, and B at the top.

The RJ45 Ethernet ports must be activated on the control cards by setting jumpers PL5 and 6 to 'NETWORK', this will also disable control port 2 on the same card:

Babelfish & internal protocol conversion



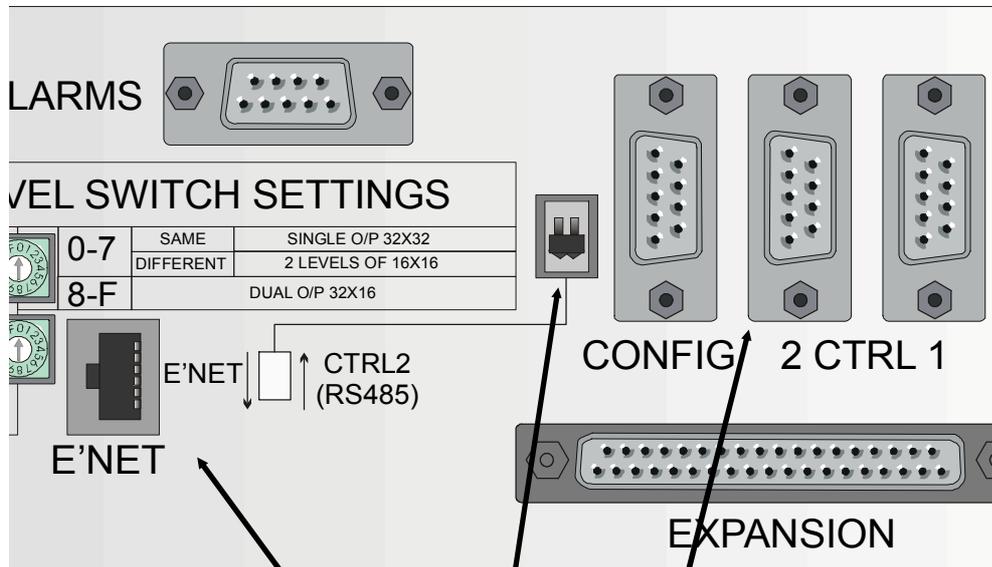
PL5 & PL6 should be set to 'NETWORK'

In addition, control port 2 must be configured for General Switcher protocol in the Sirius database. Failure to do this will not stop communication with the SC12Config tool, but will prevent any application from setting crosspoints. To achieve this, the user must check the following:

- If a fixed database is in use (SW7 on 2443 OFF), SW8 on 2443 must be OFF
- If a configured database is in use (SW7 on 2443 ON), port 2 must be set to General Switcher protocol in the editor

It must be noted that when two controllers are fitted, configuration must be carried out twice, once for each control card using the two Ethernet ports.

3.2 Connection to Halo



Ethernet port Selector switch Control port 2

The Master Halo router has one Ethernet port which must be enabled by selecting the slider switch on the rear panel to 'E'NET'. It must be noted that Control port 2 is disabled in this mode of operation. The Ethernet port is designed for direct connect using a standard CAT5 cable to a network Hub or switch. A 'crossover' cable is required for connection direct to a PC network card.

3.3 Connection to Babelfish

The Babelfish has one 10 Base-T RJ45 Ethernet connection which is designed for direct connect using a standard CAT5 cable to a network Hub or switch. A 'crossover' cable is required for connection direct to a PC network card.

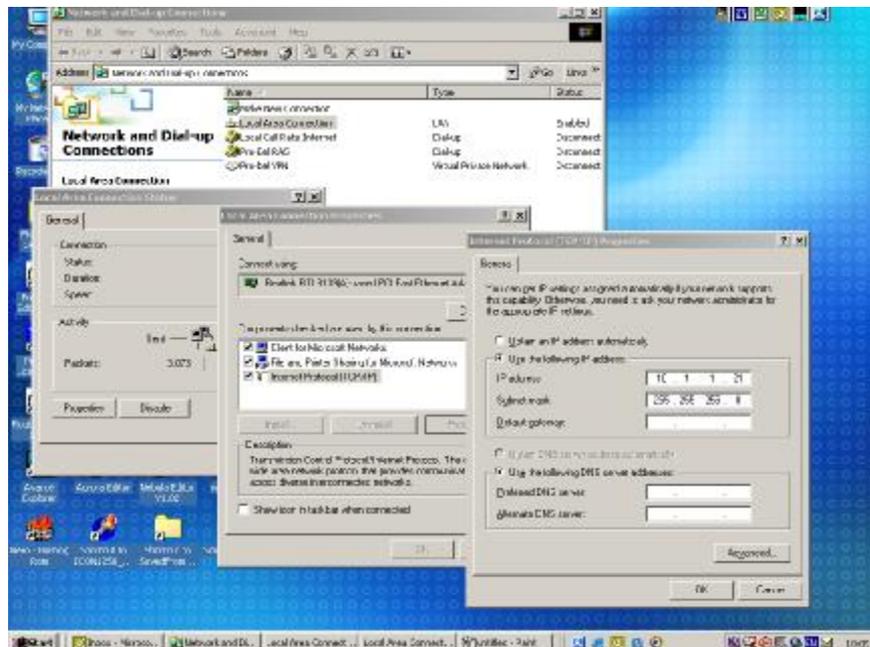
Babelfish & internal protocol conversion



3.4 Direct connection

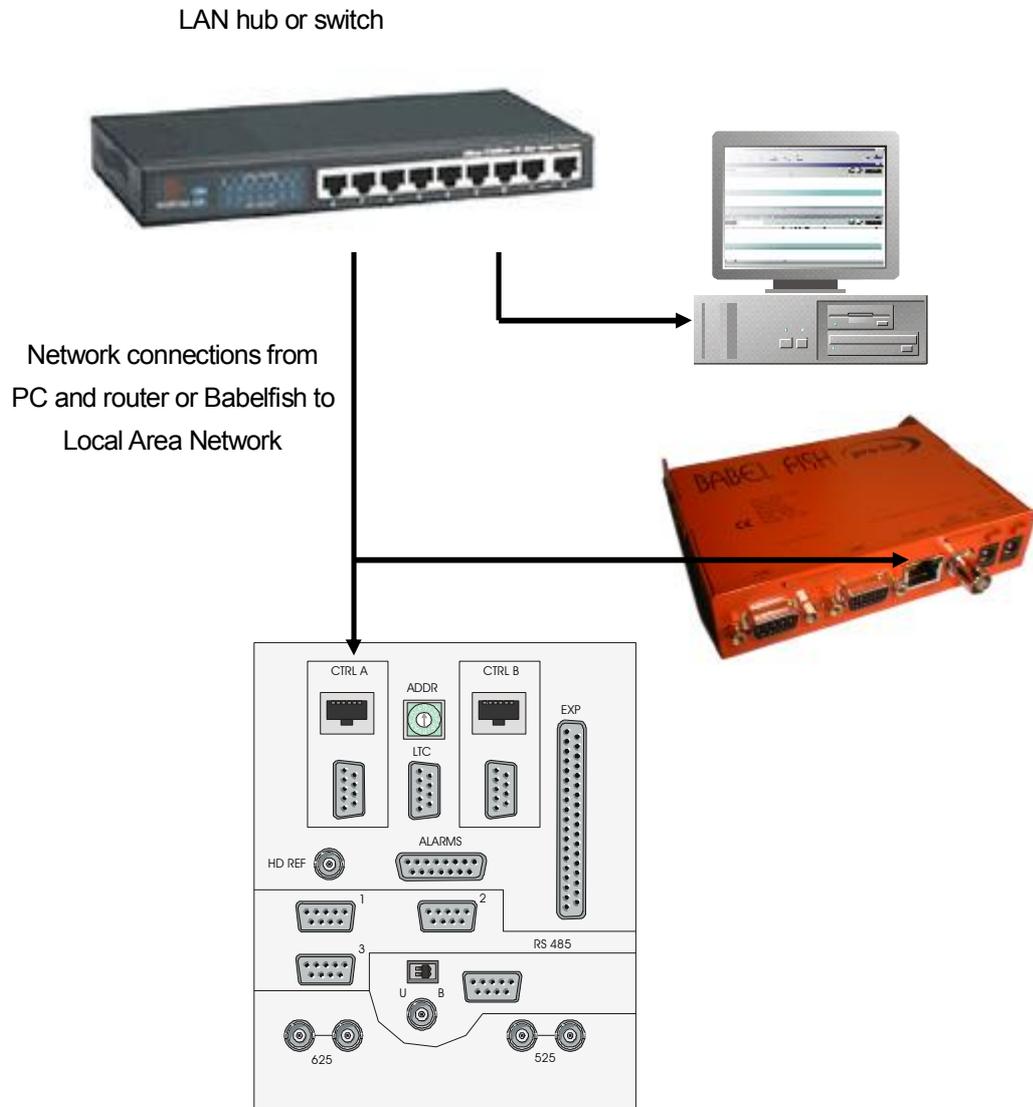
Connect the router or Babelfish RJ45 connector to the PC Network adapter using a CAT5 'crossover' cable. Check the network configuration of the PC, as follows:

Right click and select 'properties' on 'My Network Places'. Select 'Local Area Connection' and double click to open 'Local Area Connection Status'. Select 'Properties' then 'Internet Protocol TCP/IP' in the next window that appears. The next window shows you the current computer IP address settings. At this point PLEASE WRITE DOWN YOUR CURRENT SETTINGS. Now select 'use the following IP address' and set it to 10.1.1.21 (for example) with a subnet address of 255.255.255.0



You may need to restart your PC for this to take effect. Make sure that you are also disconnected from your normal LAN so that the system does not try to connect you with that address (it may cause conflict with another device if it has this same fixed IP address). Continue as detailed in Section 3.6.

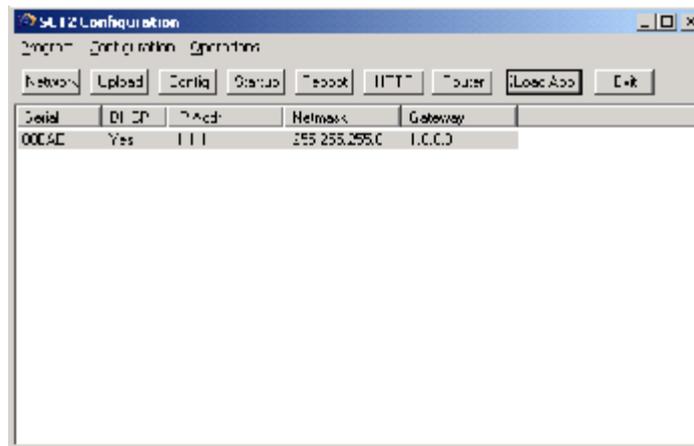
3.5 LAN connection



The PCs network configuration does not require changing in this mode of operation. Use standard CAT5 cables for all connections and test the connection as detailed in the next Section.

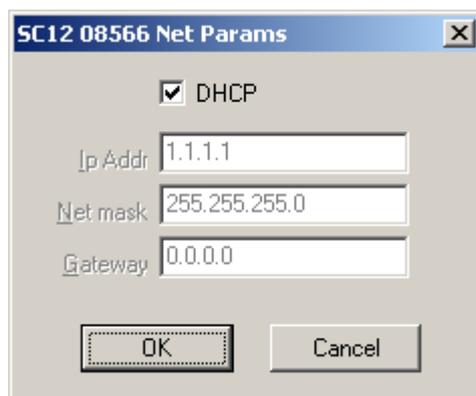
3.6 Beck chip configuration

The connection between the PC and the Beck chip can be tested by executing the SC12Config program, which will search for any Beck chips on the network and display the following:



If more than 1 Beck chip exists on the network the user must identify the one requiring configuration, if necessary by unplugging it's cable.

The Beck chip, by default, is configured to search for a DHCP Server, and acquire an IP address. The IP address of 1.1.1.1 means that no address has been assigned to the chip, although a previously configured IP address may be indicated here. The address is configured by highlighting the required device (there may be more than one), and clicking on 'Network', the following window will appear:



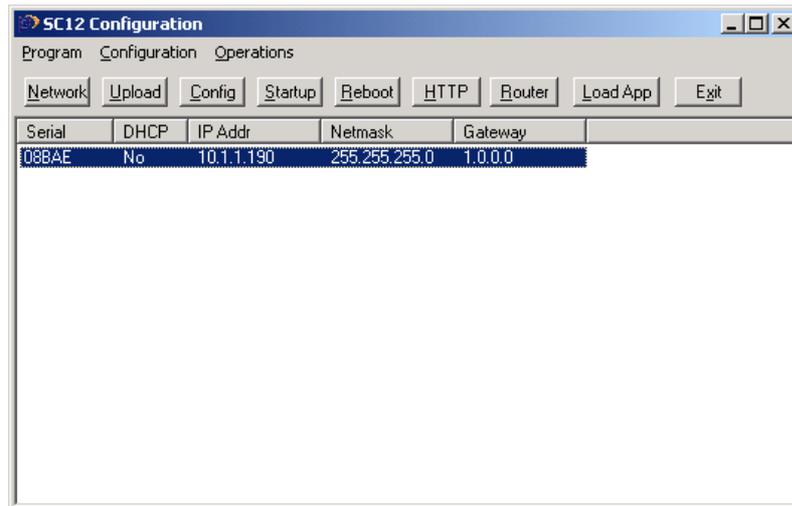
If a DHCP Server is present on the network, leave the box checked. If not, uncheck it and assign a unique IP Address. The user can check that an IP address is unused by 'Ping'ing from their PC, or alternatively by consulting their network administrator. Note that if communicating over a LAN, the IP address must be in the same subnet as the PC in order to continue. In brief, this means that if the Net mask for the PC is 255.255.255.0, then only the last number of the IP address is allowed to differ (e.g. 10.1.1.1 and 10.1.1.2 are in the same subnet). Note that the Net mask and Gateway settings for the Beck Chip are



Babelfish & internal protocol conversion

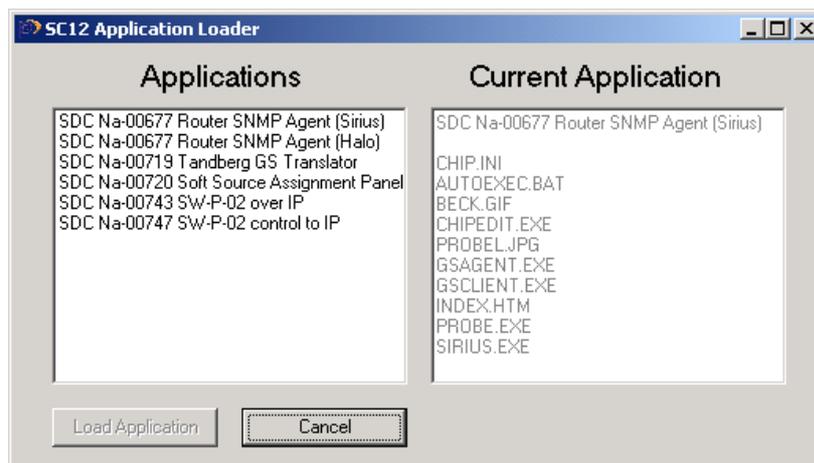
currently not used.

Click OK, this will force the Beck chip to fetch an address or take the assigned one. If successful, the following will appear after a few seconds:



If the details do not re-appear, try re-powering the Babelfish, or resetting the Sirius control card, and then re-starting the SC12Config.exe application.

To finally check the connection, highlight the required device and click on 'Load App', a screen similar to the following should appear:



This means that full communication has been established with the Beck Chip and the user can continue with configuration by referring to the appropriate Section in this handbook.

3.7 Connection problems

There are various conditions that will prevent communication between the PC and the Beck Chip, which are detailed in this Section.

3.7.1 Theory of operation

The SC12Config.exe application uses a UDP (User Datagram Protocol) broadcast message to call for any Beck Chips on the LAN to respond. All Beck Chips within the same subnet should respond, using both broadcast and unicast messages, but any IP Switches on the LAN may block responses from Beck Chips outside that subnet.

The user must note that any IP Routers on the network may block UDP broadcasts to other segments.

A subnet is defined as all devices with IP addresses bounded by the Subnet Mask. A Subnet Mask of 255.255.255.0 indicates that the first three numbers of each IP address must be identical to be in the same subnet. This is because 255 represents 8 binary '1's, and a 1 means that the source and destination IP address in binary notation must agree, this allows subnets of any size to be constructed, for example:

Subnet Mask: 11111111.11111111.10000000.00000000 (255.255.128.0)

IP addresses of all devices must match where a '1' occurs in the mask, therefore 10.1.128.1 and 10.1.129.1 are in the same subnet, but 10.1.127.1 is not. IP packets outside the subnet mask are routed to the 'default gateway' for passing to the next subnet, if available.

3.7.2 Fault examples

- SC12Config does not find the connected device. Assuming the Sirius/Babelfish is powered and correctly connected to the network, it is possible that it is configured with an IP address outside the PCs subnet. The user must connect directly to the Beck Chip using an Ethernet 'crossover' cable and attempt connecting using a fixed IP address. Once located, the Beck Chip IP address can be edited appropriately. See Section 3.3.
- The device is seen, but a 'socket' error is displayed when 'Load App' is clicked. This happens when a direct connection is being used, but the IP address of the PC and Beck Chip are not in the same subnet, the user must edit the PC IP address or subnet mask appropriately.



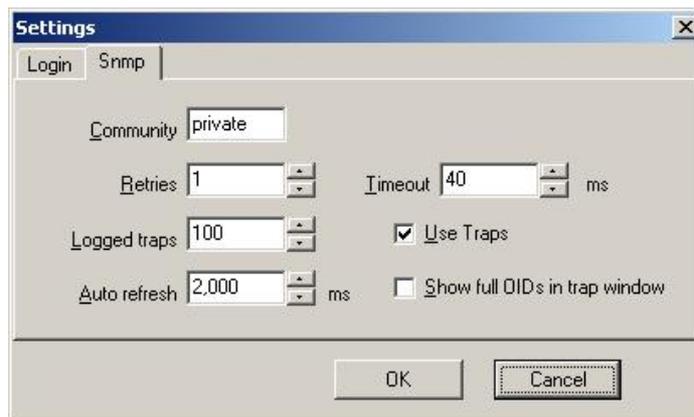
Babelfish & internal protocol conversion

- Applications cannot be loaded, or the Chip.ini file cannot be edited. These functions use the Telnet and FTP functions in the Beck Chip, and the user needs to check the configuration, as follows: Select Program\Options from the toolbar. The Windows should appear like this:



The image shows a 'Settings' dialog box with the 'Login' tab selected. It contains two sections: 'Telnet' and 'Ftp'. Each section has a 'Username' and 'Password' field. The 'Telnet' Username is 'tel' and the Password is '***'. The 'Ftp' Username is 'ftp' and the Password is '***'. There are 'OK' and 'Cancel' buttons at the bottom.

The passwords for 'tel' and 'ftp' are identical to the usernames



The image shows a 'Settings' dialog box with the 'Snmp' tab selected. It contains several configuration options: 'Community' (private), 'Retries' (1), 'Timeout' (40 ms), 'Logged traps' (100), 'Auto refresh' (2,000 ms), 'Use Traps' (checked), and 'Show full OIDs in trap window' (unchecked). There are 'OK' and 'Cancel' buttons at the bottom.

4 Router SNMP Agent

This translation software allows router control commands to be sent over the Simple Network Management Protocol application layer for transmission via Ethernet to a Sirius or Halo router. There are therefore 2 versions of this program, one each for the Sirius and Halo router control cards, which configure the router Ethernet port for router control over SNMP.

There are two stages to system configure for this mode of operation, enabling the Ethernet port on the router, and loading the software into the Beck Chip.

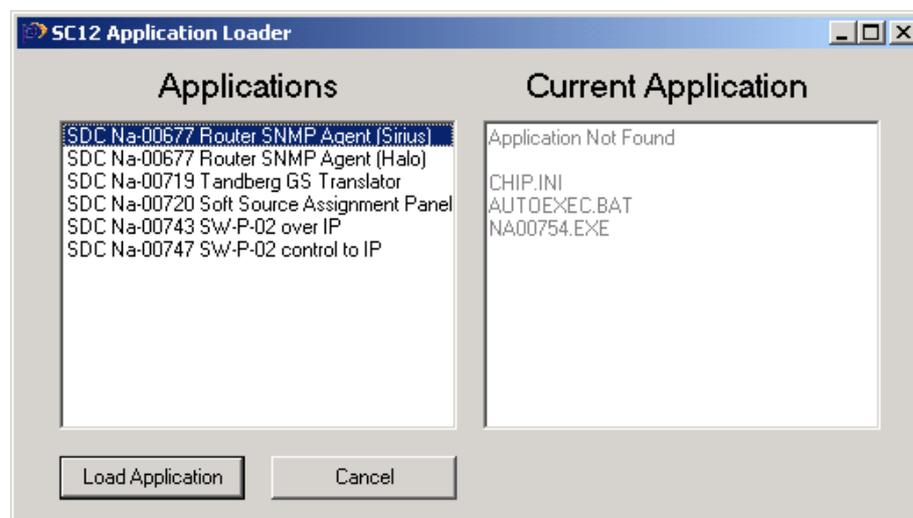
The Halo or Sirius Ethernet port must be enabled as detailed in Section 3.1 and 3.2 of this handbook.

The SC12Config.exe software must be installed on a PC and a connection established with the router, as described in Section 3 of this handbook.

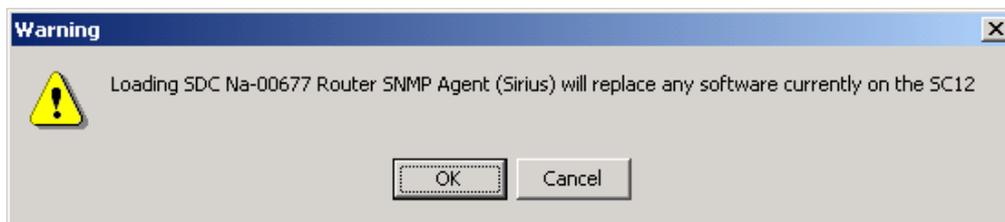
Now continue, as follows:

4.1 Loading SNMP Agent software

With the SC12Config software running, click on 'load app'. A screen will appear showing which software application is currently loaded with a list of alternative software applications that can be loaded instead.



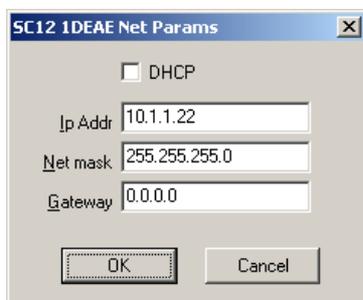
Highlight either the Sirius or Halo SNMP Agent application and click on 'load application'. There will be brief warning about overwriting the current software:



Click OK, and a confirmation will appear that this has been achieved:



The final step before rebooting the card (either by using the 'reboot' function or by unplugging and re-plugging the card) is to confirm the IP address configured for the Beck chip:



Click OK and then reboot the card. The card should then re-appear under the main SC12 screen. It is recommended to check that the correct software has been loaded by pressing 'load app' once more, before proceeding to the next stage.

4.2 Trap destination IP address

To test the SNMP agent, the user must configure their PC as a 'trap destination'. From the main window, click on HTTP:

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The image shows two screenshots of the SC12 Configuration web interface. The top screenshot shows the 'SC12 Configuration' window with a menu bar (Program, Configuration, Operations) and a toolbar (Network, Upload, Config, Startup, Reboot, HTTP, Router, Load App, Exit). Below the toolbar is a table with columns: Serial, DHCP, IP Addr, Netmask, Gateway.

Serial	DHCP	IP Addr	Netmask	Gateway
0C65B	No	10.1.1.49	255.255.255.0	0.0.0.0
088AE	No	10.1.1.201	255.255.255.0	1.0.0.0

The bottom screenshot shows the 'SNMP CONFIG' page with the following fields:

- Http Username: system
- Http Password: [masked]
- System name: Default Name
- Location: Default Location
- Read community: public
- Write community: private
- Trap Destinations: 10.1.1.166

Navigation buttons (Forward, Home, Close) are visible at the bottom of both screenshots.

Click on SNMP Configuration, the HTTP Username and Password are:

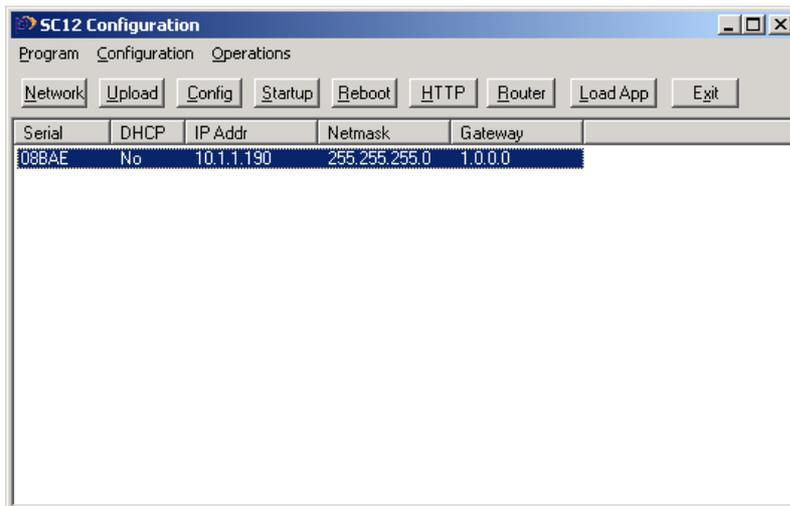
'System' and 'masterkey'

Enter the IP address of the PC you are using in the list, followed by 'update'.

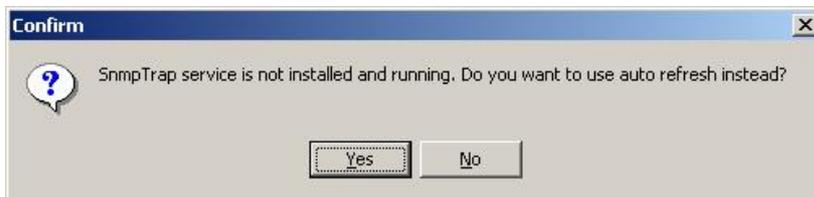
Close the window and Reboot the chip from the configuration window.

4.3 Testing the system

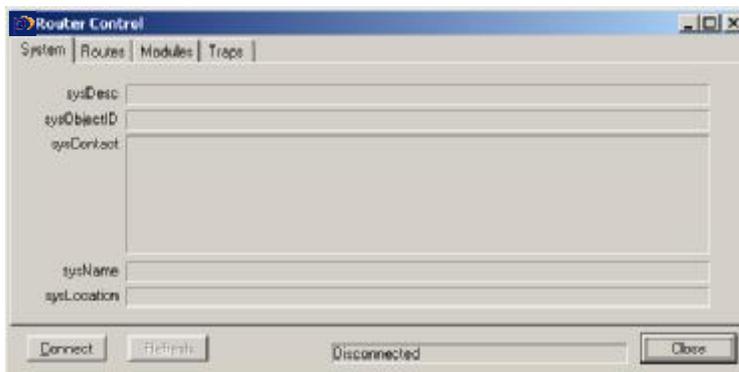
At this point, the system configuration can be tested by attempting to read the router status and by setting crosspoints. From the main window, click on 'Router':



If the following window appears, you need to install and start the SNMP Trap service on your PC for full functionality, see the next section

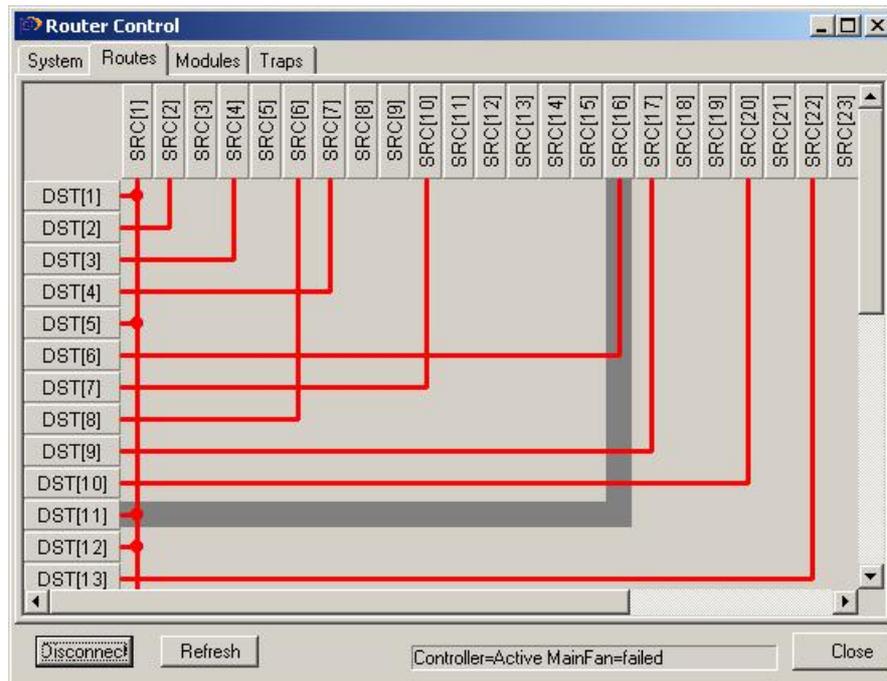


When the following window appears, click 'Connect':



If the connection is successful, the 'Routes' tab may be selected and the following will appear:

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This screen shows the route status, with a shadow representing the mouse cursor position, clicking will activate this route, which will indicate red. This action confirms that the router is being controlled over SNMP. The user may also check the module and PSU/fan status by selecting the 'modules' tab.

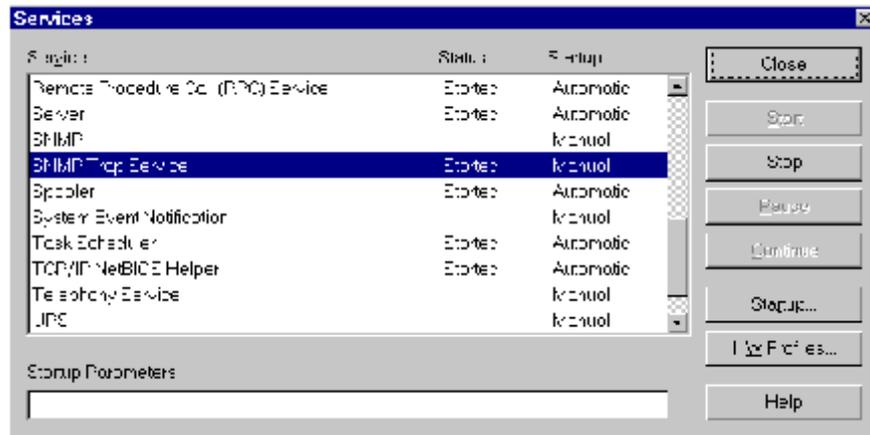
4.4 Installing the Windows Trap Service

4.4.1 Windows NT

To check to see if the SnmpTrap service is running under Windows NT, open the control panel then double click on the 'Services' icon. Look for 'snmptrap' in the list of services and check to see if it is running.



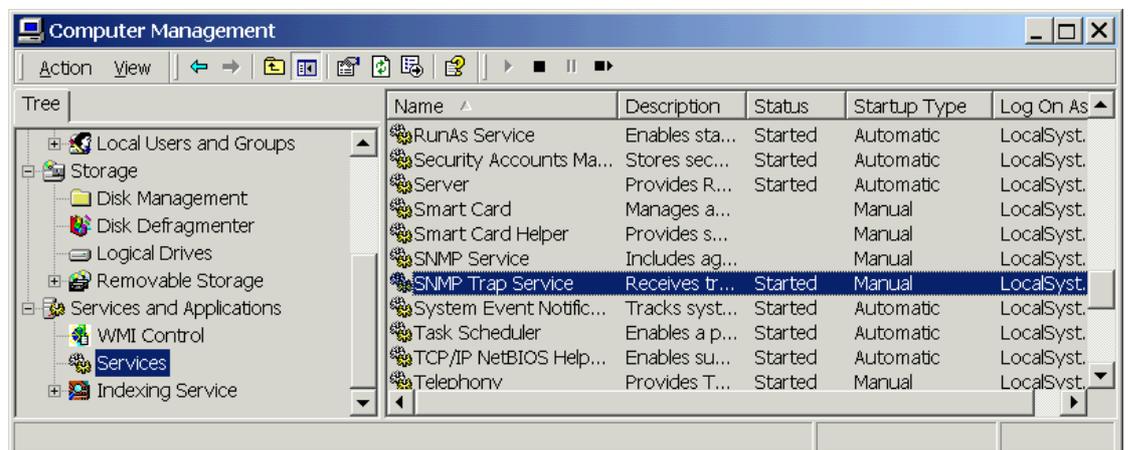
Double click on Services



And check that 'SNMP trap service' is started. To install the service, use the 'Network Setup' wizard: Right click on 'Network Neighbourhood', choose Properties. Select the 'Services' page, then click the 'Add' button. Select the 'SNMP service' from the list. You may need to provide your original Windows NT setup disk to complete the installation.

4.4.2 Windows 2000/XP

To see if the Snmp trap service is running, Right-click on 'My Computer' and choose 'Manage' to open the WMI console. Select 'Services and Applications', then 'Services' and see if the 'Snmp trap service' is listed on the right hand side of the window.



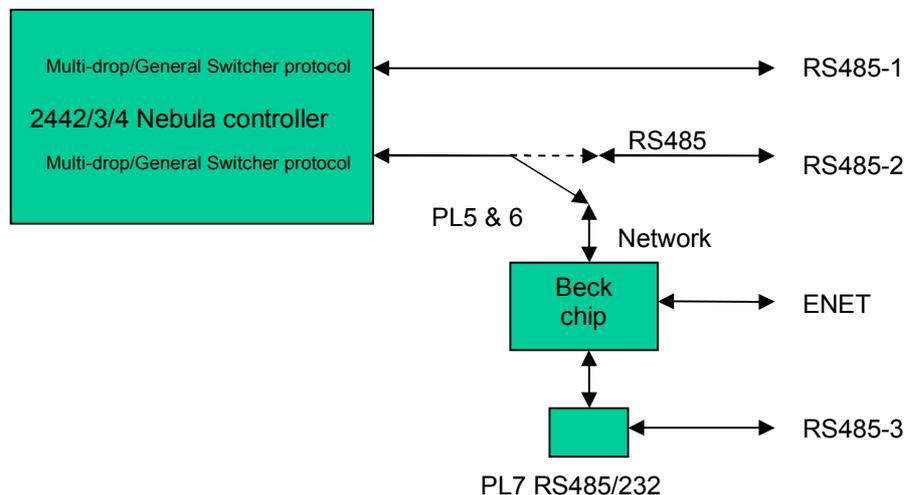
To install the SNMP service in Windows 2000/XP use the 'Add/Remove Windows Components' function of the 'Add/Remove programs' control panel applet. The SNMP service is listed under 'Management and Monitoring tools'.

The final step, once you have ensured that the Snmp Trap service is running, and that the IP address of your management station is listed in 'Trap Destinations' on the agent, is to enable the use of traps in the SNMP manager by checking the 'Use Traps' checkbox on the SNMP page of the Program Options dialog. (Program|Options).

4.5 Setting the correct type of database

A final consideration when using this mode of router control is the database configuration currently active on the Nebula router control card. Nebula is the name given to the control system included with a Master Sirius or Halo router. This may be important because crosspoints can only be set if they lie within the database parameters, and it also determines which external reference is used when crosspoints are being switched.

For Sirius routers it must be remembered that PL5 and 6 must be set to Network, and that RS485 port 2 must be configured for General Switcher protocol in the database. The external port labelled RS483-2 will be disabled in this mode, as shown in the following diagram:



4.5.1 Halo

The Halo router is always shipped with a 'pre-configured' database, defining 4 levels of 32x32 routing, auto-detection of the reference and with control port 1 configured for Multi-drop protocol and port 2 configured for General Switcher. The only consideration when controlling this router with General Switcher over SNMP is that the rear selector switch must be set to 'E'NET'.

4.5.2 Sirius 4U and 7U

Both these routers will function with a 'fixed' database selected on the 2443 control card (SW7 OFF) and the ports configured for General Switcher (SW8 OFF).

4.5.3 Sirius 16U

This router requires a configured database because of the size restriction of the resident



Babelfish & internal protocol conversion

fixed database. In recent releases of Nebula card (SP407-3) the 'fixed' database in resident EPROM is restricted to a maximum size of 128x128 for each of 4 levels. Consequently, using the resident fixed database restricts control to a maximum of 128 destinations. It is therefore necessary load a minimum pre-configured database of a single level 256x 256 (set up as a Sirius 256 and SDV format type), and configure the Nebula card so that this database is used (SW 7 ON). It is also necessary that Port 2 within the database is set to use SW-P02 General Switcher protocol.

Full details on the use of the Nebula editor are contained in the Nebula handbook.

4.6 SNMP terminology

SNMP is a complex subject and cannot be fully described within this manual. The following is a summary of terms that may be encountered:

Manager and Agent

The terms 'client' and 'server' tend not to be used when discussing SNMP. Instead, the terms 'Manager' and 'Agent' are used. The agent is the device being managed, normally some sort of network infrastructure such as a router or hub. The manager is the software that is using SNMP to communicate with agents. The reason that the terms 'client' and 'server' are not appropriate is that these terms imply a central server supplying services to a number of clients. With SNMP normally one manager is used to manage a number of agents, although it is perfectly possible for an agent to be connected to more than one manager at once.

MIB

SNMP is a 'variable-based' protocol. An agent provides an interface comprising a number of variables, these can be scalar variables (a single value, for example 'SysLocation' a string describing the physical location of the device) or tables, which are lists of structured records, like database tables. Each device will want to provide data that is structured in accordance with the type of the device. The structure of the information provided via SNMP for a particular device is called a "management information base2" or MIB. In the case of SNMP the MIB is stored in a file – wherein the structure of the information is described using a language called ASN.1.

MIB2

Although a specific type of device will have a MIB that is particular to its function there are some variables that are deemed to be common to all devices managed by SNMP. These variables are stored in the 'MIB2' branch of the overall MIB tree. All SNMP managed

Babelfish & internal protocol conversion



devices are supposed to support these variables.

OID

Variables within a MIB are identified with an OID, or 'OBJECT_IDENTIFIER'. This is a long sequence of numbers, separated by dots. These numbers are globally unique and are managed by the IANA on behalf of the IETF. In practice the IANA does not approve every OID, but assigns an OID to an organisation, which then becomes a 'branch' of the global namespace. Pro-bel's OID is 1.3.6.1.4.1.6419.1. The OID for the Sirius router is 1.3.6.1.4.1.6419.1.1.1.

PDU

PDU stands for 'Protocol Data Unit' and is a UDP packet conforming to SNMP format specifications sent between manager and agent. There are four basic PDU types: GET, GETNEXT, SET and TRAP. For example, to retrieve a variable from an agent, a manager sends a GET PDU then waits for a GET response from the agent. Similarly with GETNEXT (which retrieves the 'next' variable in the MIB from the one asked for) and SET.

TRAP

A manager initiates GET, GETNEXT and SET transactions, by sending an appropriate PDU. A TRAP, on the other hand, is sent unsolicited by the Agent. The manager does not have to respond to a TRAP. TRAPs are intended to allow an agent to inform a manager that something requires attention. It is then up to the manager to decide what action to take. A TRAP can include variable bindings, but it doesn't normally include a lot of data – normally it is sufficient to indicate to the manager what has changed, so the manager can then use a GET to retrieve the information.

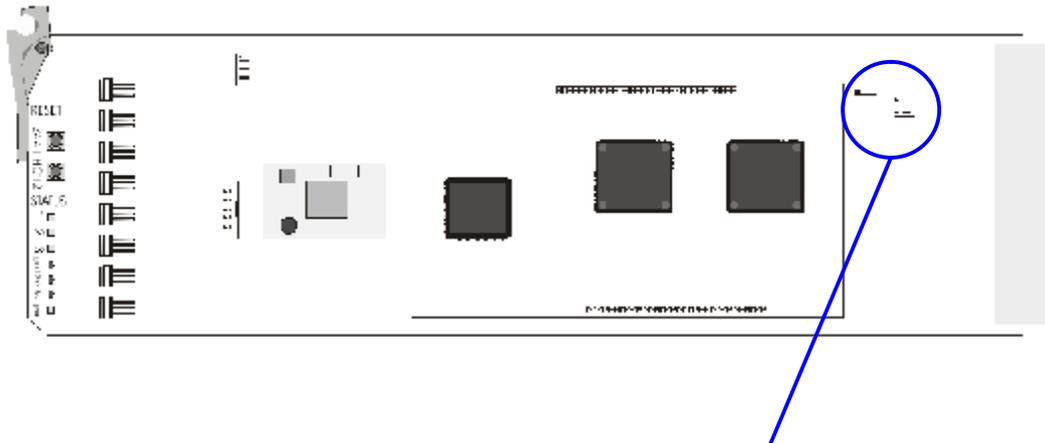


Babelfish & internal protocol conversion

5 Tandberg Sandar protocol

This Section describes the configuration of a Sirius Master router for use with a Tandberg control system using the Beck chip on-board the Sirius 2432 controller as a protocol translator. This set up uses Port 3 on the rear of the Sirius router, configured as RS232, for connection to the Tandberg system. While it is strictly not necessary to configure any Sirius 2433 interface card used in a Sirius Slave frame for this task, it is worth configuring this card ready for use in the event that the 2433 needs to be used as a main controller card by simply fitting the 2443 sub-board.

5.1 2432/2433 card configuration



PL5 & PL6 should be set to 'NETWORK'
PL7 should be set to RS232

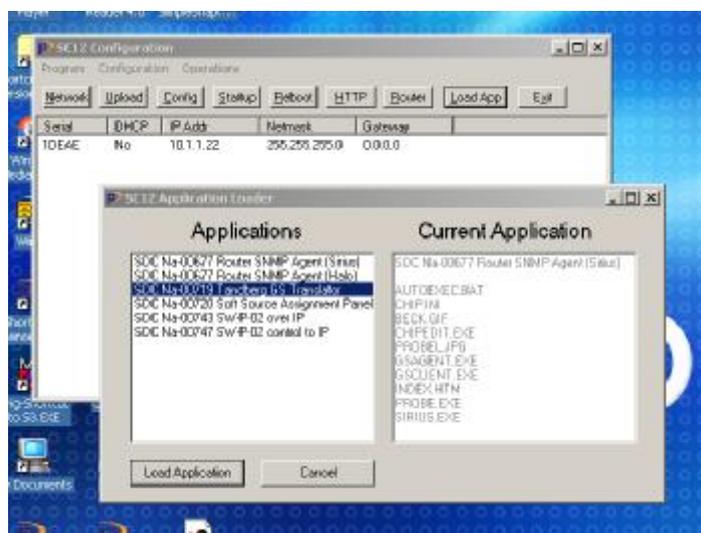
In order that Port 3 on the rear of the router can be used with a straight 9-pin RS232 link from the Tandberg controller, Port 2 (which is normally used for control) will need to be disabled. This is done by configuring **PL5, PL6 and PL7** as above.

5.2 Loading Tandberg Sandar software

The SC12Config.exe software must be installed on a PC and a connection established with the router, as described in Section 3 of this handbook.

Now continue, as follows:

With the SC12Config software running, click on 'load app'. A screen will appear showing which software application is currently loaded with a list of alternatives that can be loaded instead.



Highlight the required application (in this case the one marked 'Tandberg GS Translator') and click on 'load application'. There will be brief warning about overwriting the current software:



Click OK, and a confirmation will appear that this has been achieved:

Babelfish & internal protocol conversion



The final step before rebooting the card (either by using the 'reboot' function or by unplugging and re-plugging the card) is to confirm the IP address configured for the Beck chip:



Click OK and then reboot the card. The card should then re-appear under the main SC12 screen. It is recommended that the correct software has been loaded by pressing 'load app' once more, before proceeding to the next stage.

5.3 Testing the connection

With the card correctly configured (as above) it becomes possible to test the unit through Port 3 using supplied test software and a simple command. This will require the use of 9-pin RS232C port on the back of the computer and a straight 9-pin2pin ribbon cable to make connection between the computer and Port 3 on the back of the router. Please note : In the case of 2433 cards (without the 2443 sub-board fitted) which are used in Sirius Slave frames, it will be necessary to fit a Nebula 2443 short-pin controller card in order to test the configuration.

To perform the test, go to the root directory where the SC12 software is installed. If you are unsure as to where this is, just right click on the shortcut to the software (usually found on the desktop) and click properties. At the next screen click 'find target' and the computer will open up a screen showing the root directory for the software.

Open the directory called 'applications' and then the directory called 'SDC Na-00719

Babelfish & internal protocol conversion

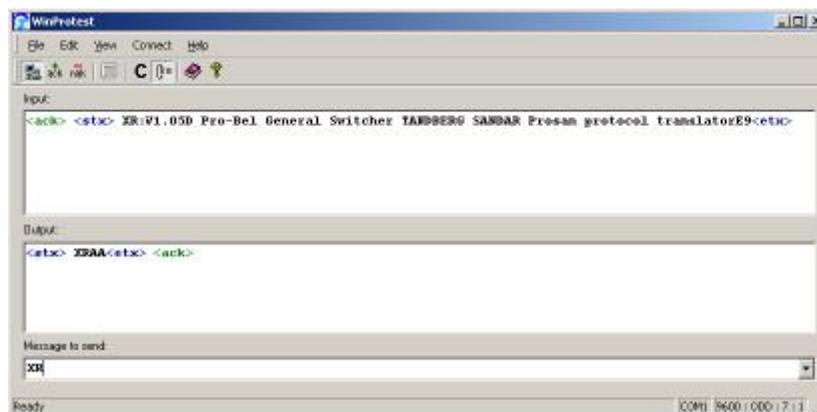
Tandberg GS Translator'. Now run the application called WinProTest.exe



Next, check the comms port and handshake has been set correctly, by clicking on 'properties' under the drop-down 'File' menu. The screen should show you the com port selected and that the handshake should be 9600baud, Odd parity, 7 bit, 1 stop-bit.

Next, click the 'connect' button on the top menu and select connection to the matrix controller.

Finally, with a flashing cursor in the 'message to send' field, type in capitals the command 'XR' and press return. The controller card network chip should respond by showing which software is currently loaded.



The above confirms that the controller is now ready for use with the Tandberg control system. Proceed to the final step.



5.4 Setting the correct type of database

The final task for all 2432 cards to complete the conversion process is to switch in the correct parameters for use with the 'fixed' database on the Nebula card **or** load in a configurable database (which is **mandatory** in the case of all Sirius 256 frames).

If the 2432 control card is to be used in a Sirius 128 or Sirius 64, then the resident 'fixed' database from the onboard EPROM can be used as a quick and easy alternative, providing the port setting is switched to '**gen switcher**' so **both RS485 ports use this protocol**, and that 'Auto Configure' is also used so that the card takes into account the actual size and resources available within the router it is to be used with. Make sure therefore that the Nebula SW3 bit 6 is ON, and that bit 7 and 8 are OFF. When it is confirmed that the router configuration is as expected, SW6 can be set OFF to store the configuration. You may also need to configure other items such as the reference input chosen using SW3-bit5, and whether the Nebula card is master or slave using SW3 bit . The 2432 card (and also the 2433) will also need to be configured for master or slave status, whether it is with or without a controller card, and the level type. See the Sirius manual for details.

However, for the **Sirius 256 frame** it is **necessary** to load a preconfigured database because of the size restriction of the resident fixed database. In recent releases of Nebula card (SP407-3) the 'fixed' database in resident EPROM is restricted to a maximum size of 128x128 for each of 4 levels. Consequently, using the resident fixed database restricts the Tandberg to control over a maximum of 128 destinations. You will therefore need to load a minimum pre-configured database of a single level 256x 256 (set up as a Sirius 256 and SDV format type), and configure the Nebula card so that this database is used (rather than the fixed database). Make sure therefore that SW3 bit 6 and 7 is on . Before downloading the database into the control card, it is important as an absolute necessity that Port 2 within the database is set to use SW-P02 General Switcher protocol. This item actually configures the port 2 connection into the Nebula card itself. This port is used in this 'Tandberg' setup by the network chip (rather than the 9-pin Port 2 connector to the back of the frame) to talk to the Nebula CPU as well as receive ACK messages from it to pass back to the Tandberg system. (this is set up by altering the positions of PL5, 6 and 7 on the 2432/2433 card, see the earlier section)

It is recommended that Port 1 is also set to Gen Switcher protocol rather than multi-drop so that it is possible to plug MATSTAT into the unit and test the switching capability independently of the Tandberg system. As a preconfigured database is in use here, the Nebula SW3 bit 5 is ignored so it is also important to check the reference to be used has



Babelfish & internal protocol conversion

also been set within the database.



6 Soft Source Assign Panel

6.1 What is a Source Assign Panel?

A Source Assign Panel (SAP) is used to program an Aurora router controller with the source allocations required by a Pro-Bel TX Master Control mixer. It is an essential piece of equipment in any Aurora router control system that includes a TX220, TX300, TX400 or TX500 series mixer. A Master Control mixer cannot preview, or put a source on air unless that source is assigned to one of its channels. A mixer may have any of its channels assigned to any video and audio source located on any router under control of the host Aurora system. On some mixers these may be assigned at the installation stage and never changed, however, on many systems operators may wish to change the channel allocations on a regular basis in order to suit operational requirements.

The TX220, TX320, TX420 and TX520 mixers all have 20 channels on their Preset (PST) and Programme (PGM) busses, and 24 channels on the two Auxiliary (AUX1 and AUX2) busses. Channels 1 to 20 have the same video and audio assignments available across all 4 busses, and channels 21 to 24 are available only to the Auxiliary busses. The TX310, TX410 and TX510 mixers have only 12 channels on the PST and PGM busses, and 16 on the single Auxiliary buss. If any of these mixers are connected to an Aurora controller, all the sources must be assigned using a Source Assign Panel.

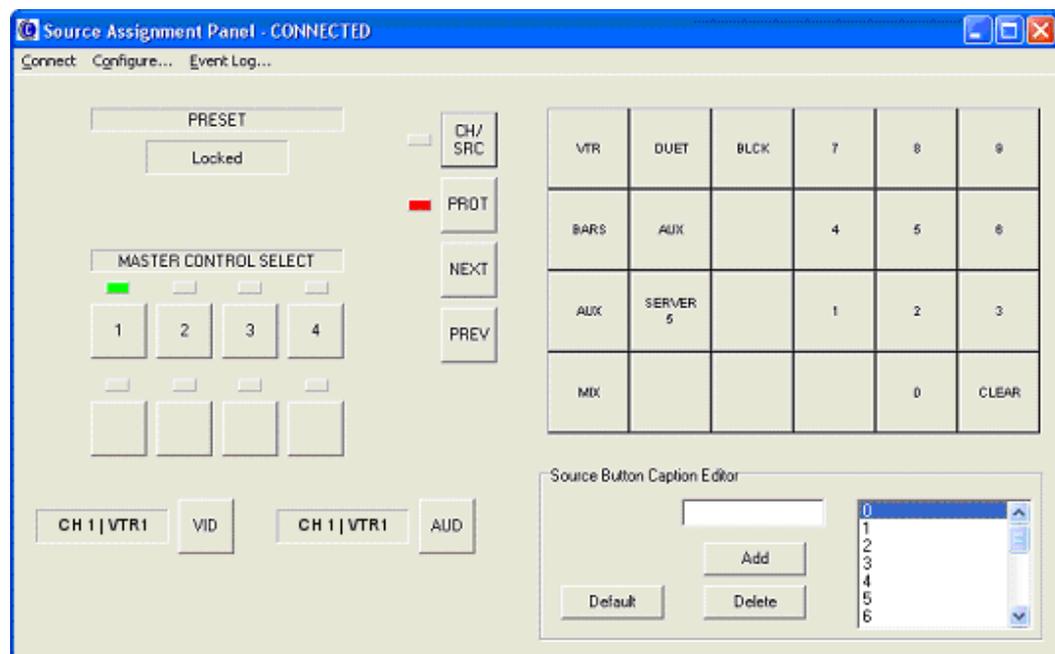
Once assigned, the data is held in non-volatile (battery-backed memory) in the Aurora controller, and in a dual-controller system both controllers hold it. Consequently, this essential data is retained during system resets, controller changeover and the downloading of databases.

A hardware version of the Source Assign Panel has always been available, which is actually a 6277-2 type routing panel, with a special version of firmware installed. However, with the proliferation of PC hardware, it has become desirable and convenient to provide a 'soft' version of the same panel.

The Soft SAP uses the Babelfish as a protocol translator to interface the LAN on which the PC is connected, to the Multi-drop device port on an Aurora router controller.

6.2 The Soft SAP

The TX Soft Source Assign Panel is a piece of PC software designed to perform the same task as its existing hardware equivalent. Either panel is essential in any Pro-Bel Aurora router control system that includes a TX series Master Control mixer. The Soft SAP runs on a Windows 9X, NT, 2000 or XP operating system, and the user interface (GUI) is a direct representation of the hardware panel it replaces. A user can therefore easily adapt to the soft SAP if they have previously used the hardware panel.



Full operating instructions are given in a later Section.

6.3 The Aurora database

A Source Assignment Panel, of either type, will not function if it does not exist in the Aurora database. Not only must it exist as a panel type, it must have all required Sources entered as key-sequences on the appropriate keypad. As a security measure, the Source Assignment Panel keypad cannot be programmed with 'Next' and 'Previous' buttons like a standard dial-up keypad, which means that only sources that have a specified key-sequence may be pre-selected and consequently assigned.

If the user is required to assign sources that have no current key-sequence, then they must edit both the Aurora database and the Soft SAP keypad. This function is only available to users who can access the on-line Aurora Editor, and is explained in Section 4 of this

Babelfish & internal protocol conversion



manual.

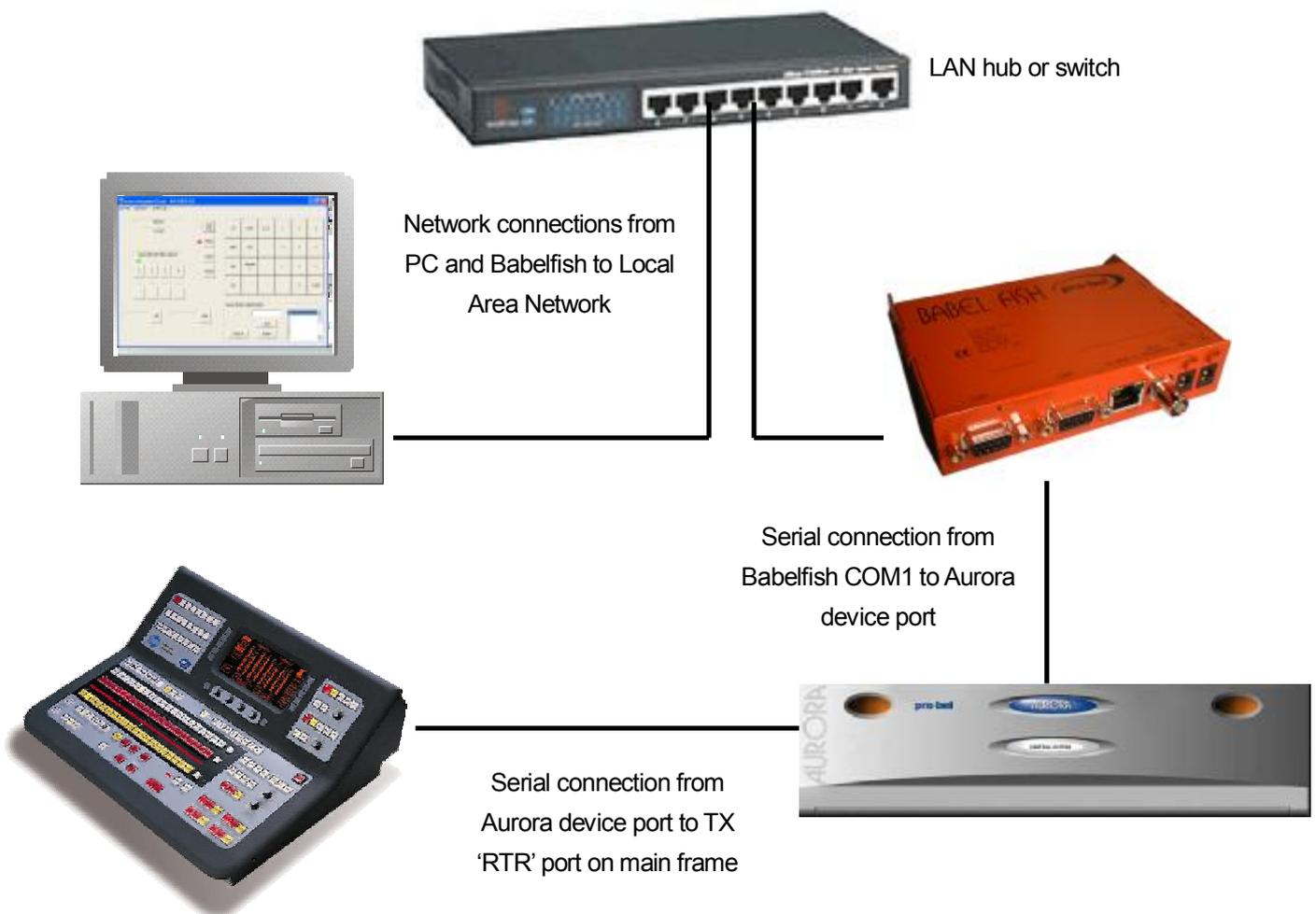
6.4 Automation and ‘auto-assignment’

If the users installation includes a Pro-Bel Automation system, or any third party automation that interfaces with the Pro-Bel TX Master Control mixer, a feature known as ‘auto-assignment’ will be active. This feature ensures that any source requested by the automation system will be automatically assigned to a master control channel, giving the operator full access to the source. Sources are auto-assigned to a spare channel, that is, one that is not being used by any of the mixer busses, starting at channel 20. If channel 20 is in use, the source is assigned to channel 19, and so on. At its limit, video and audio sources may have to be auto-assigned to channels 13 and 14, but only if both Auxiliary busses and the PGM bus have separate video and audio sources already assigned. Auto-assigned sources will override manually assigned sources, which may then require the user to re-assign sources using the Source Assign Panel, if operation requirements change.

6.5 Installation and Configuration

There are both hardware and software components to be installed and configured for this product. It is also essential that the host Aurora controller has a Source Assign Panel and Master Control panel configured in its database. If the Soft SAP is replacing an existing hardware SAP, this configuration will already exist. If, on the other hand, this is a new installation, Section 6.8 describes the process of configuring a SAP in the Aurora database.

6.5.1 Connecting the system



Both serial cables are connected pin-to-pin and terminated with a 9 pin D type plug on each end.

6.5.2 Configuring the Babelfish

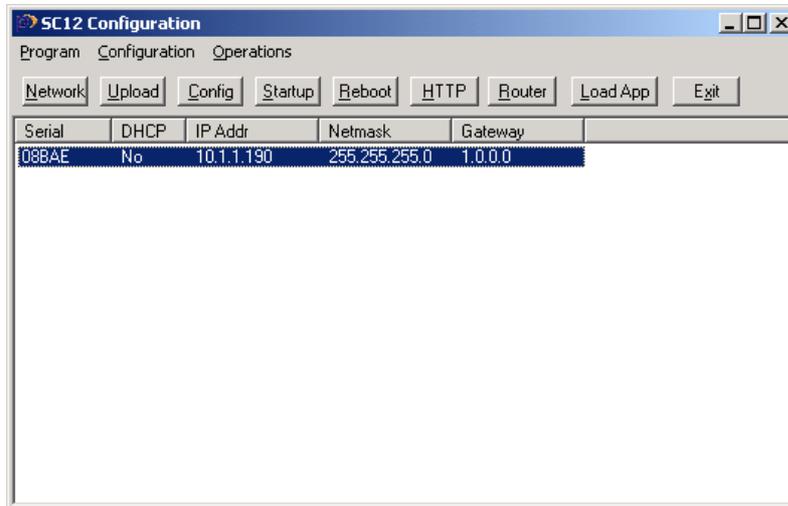
A connection must be established between a PC running the SC12Config.exe configuration software and the Babelfish. See Section 3 of this handbook. It is possible that this can be the same PC running the Soft SAP software, with the exception that SC12Config.exe will not run on the Windows 9X operating system.

With SC12Config.exe running, select the required Beck Chip (there may be more than one

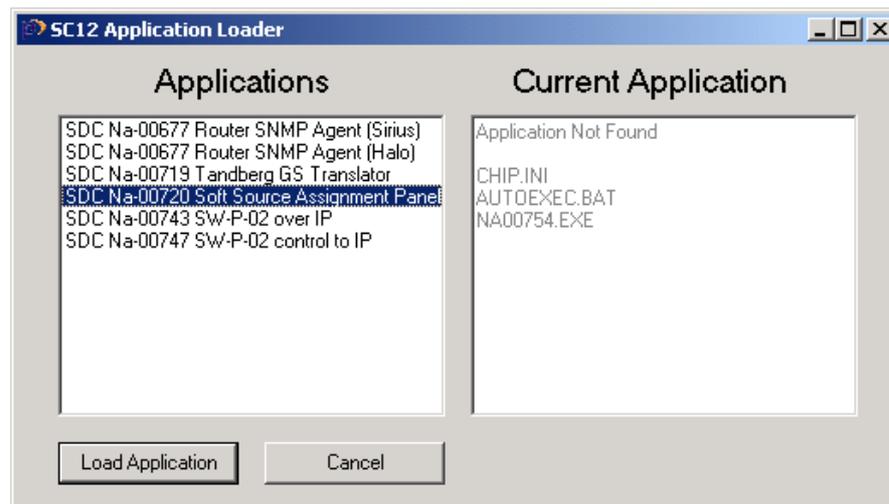
Babelfish & internal protocol conversion



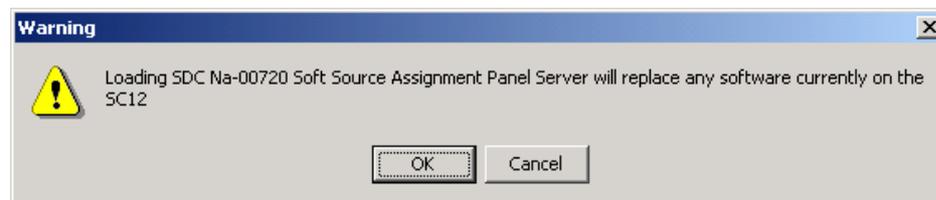
on the network), and click on 'Load App':



The following will appear:



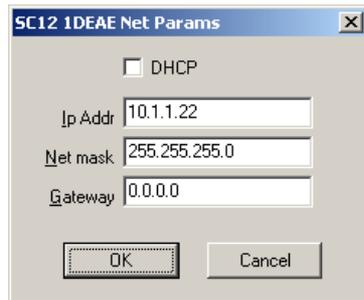
Highlight either the Soft Source Assignment Panel application and click on 'load application'. There will be brief warning about overwriting the current software:



Click OK, and a confirmation will appear that this has been achieved:



The IP address will then be confirmed, as follows:



Click OK and then re-power the Babelfish. The Beck Chip should then re-appear under the main SC12 screen. It is recommended that the correct software has been loaded by pressing 'load app' once more, before proceeding to the next stage.

6.5.3 Installing the SAP software

The TX Soft SAP software will be supplied on a CD ROM. The user must locate the 'Setup.exe' file in the root directory of the CD ROM using Windows Explorer, and double click on the file to execute it. When the software has finished installing, a shortcut will be available on the PC Desktop and also in the Pro-Bel Program group from the Start menu. Before the SAP software can be used, the SAP Server must be configured, as follows:

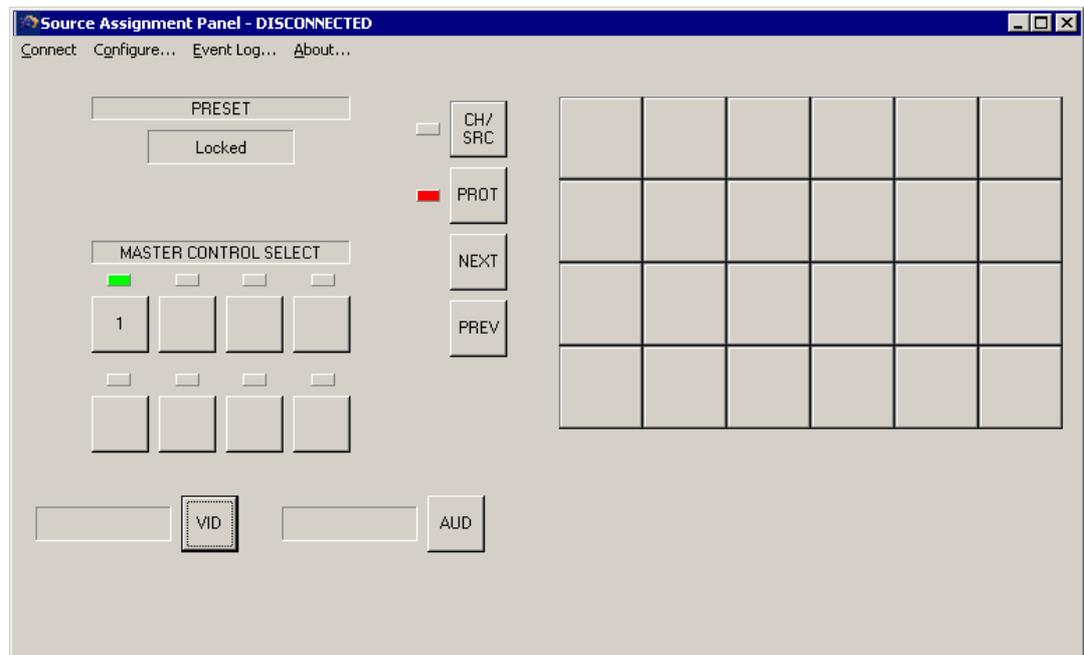
The TX Soft SAP requires a Pentium PC 233Mhz, or better, running the Microsoft Windows 9X, NT, 2000 or XP operating system. The PC must be fitted with a 10/100 Base T Ethernet network adaptor card, configured with TCP/IP. A Pro-Bel 'Babelfish' is also required, running the 'Soft Source Assignment Panel' software, see the next Section. Ideally, both the PC and Babelfish will be connected to the same Local Area Network, although the two may be directly connected together using their Ethernet ports and a crossover patch lead. COM port 1 of the Babelfish must connect to the Aurora multi-drop device port for which the Source Assign Panel is configured. **The Babelfish is the only device which may be connected to this port.**

Babelfish & internal protocol conversion

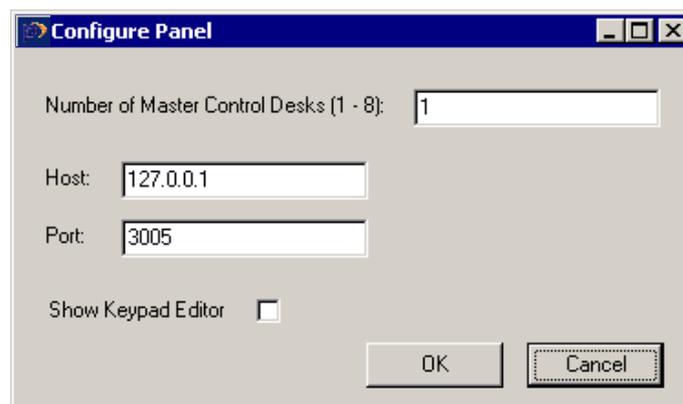


6.5.4 Configuring the Soft SAP

When the Babelfish SAP Server is running, the user can launch the Soft SAP application on the PC. This can be done from the desktop shortcut, or from the Pro-Bel program group from the Start menu. The following window will appear:



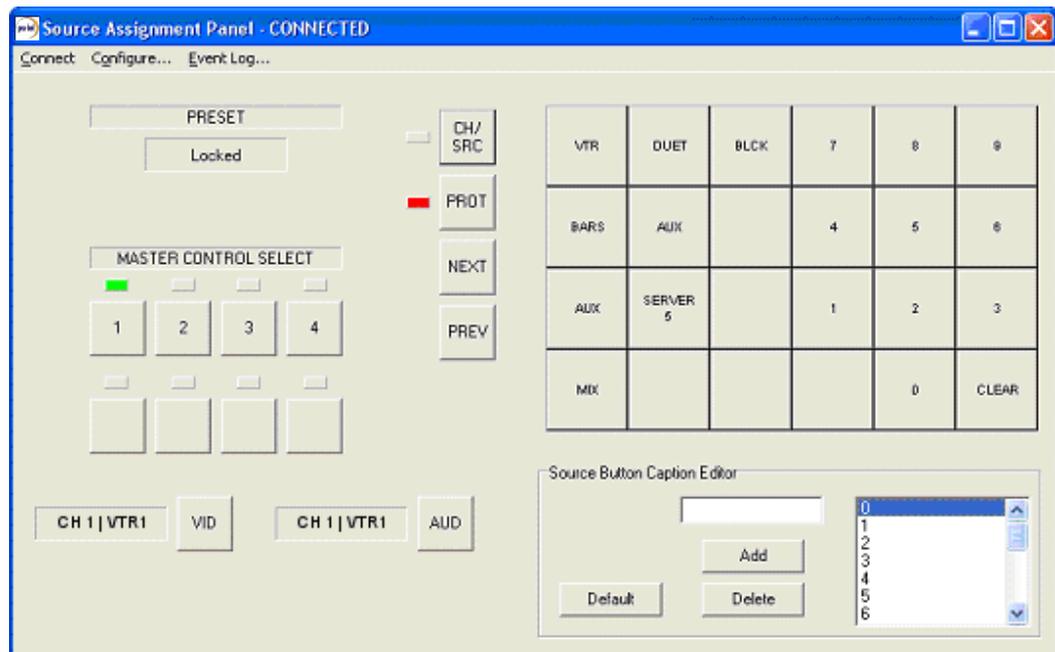
The user must now configure the application by clicking on 'Configure' from the tool bar. The following will appear:



The user must type in the IP address of the Babelfish SAP Server in the 'Host' window. The 'Number of Master Control Desks' relates to the number of Pro-Bel TX series Master Control mixers that are connected to the host Aurora system. If this is the first time the application has been used, check the 'Show Keypad Editor' box. Do not change the 'Port'

number. Click OK.

From the main application window, click on 'Connect' from the toolbar. The application will attempt to connect to the Aurora controller via the Babelfish. If this is successful, the window will appear as follows:



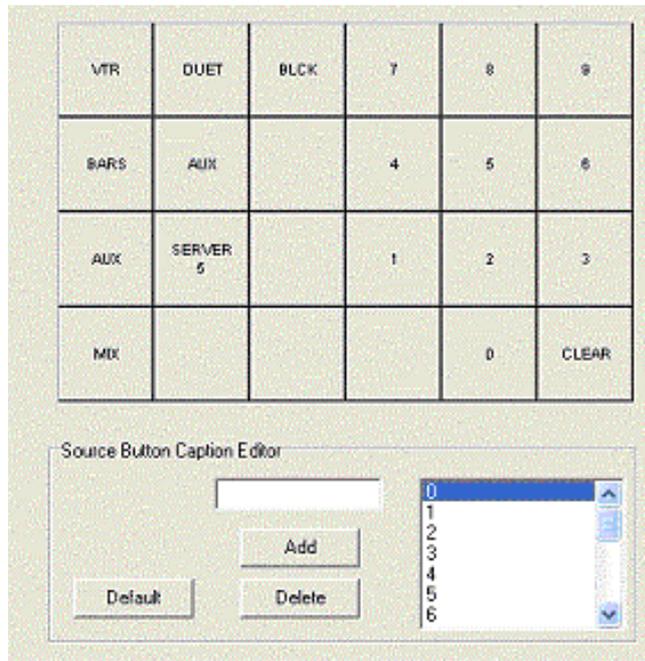
Although if this is the first time the application has been run, no keypad labels will exist.

6.5.5 Editing the keypad

The Soft SAP keypad will require editing when the application is first installed, or if new sources are added to the Aurora database and consequently need assigning to the TX System. The Soft SAP keypad must match the SAP keypad configured in the Aurora database, and therefore the user must have access to that database. Section 4 of this manual describes how the SAP is configured in the Aurora database.

Keypad button captions are created by 'dragging and dropping' the required names from the list displayed in the caption editor, shown here:

Babelfish & internal protocol conversion



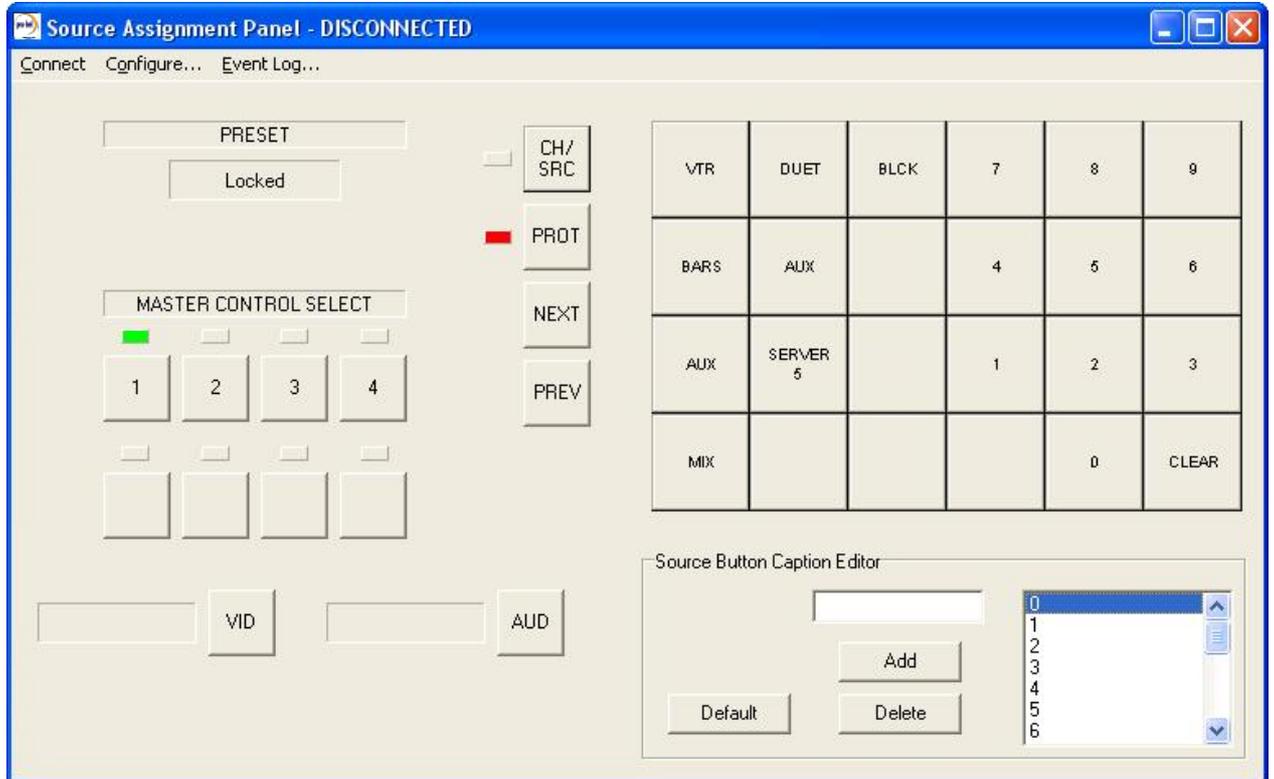
If the caption editor is not visible it is because the appropriate box has not been checked in the configuration setting, see Section 2.2.2 of this manual.

If the required caption does not exist in the list, it can be typed in the box, and the 'Add' button clicked, it will then appear in the list. Similarly, captions can be deleted from the list by highlighting them and clicking on 'Delete'.

If a caption is dropped onto a button where a caption already exists, the original caption will move to the bottom half of the button, and the new caption will occupy the top half.

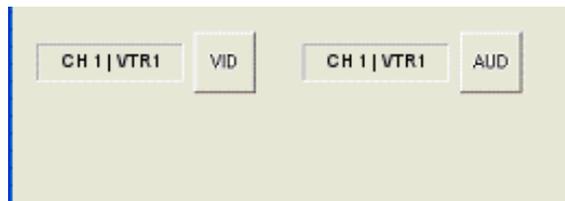
Clicking on 'Default' will clear all captions and assign a standard number keypad and 'Clear' button only, to which new captions may be added.

6.6 Operating the Soft SAP



To assign sources to the channels of a Master Control mixer, proceed as follows:

- Click on the PROT button to unlock the panel (red indicator off)
- If more than one Master Control mixer exists in the system, select the appropriate MASTER CONTROL SELECT button
- Check that the CH/SRC is in Channel mode (red indicator off)
- Click on the number keypad to call up a channel number
- the NEXT or PREVIOUS buttons may be used to select any other channel number
- The video and audio sources, if any, assigned to that channel will appear as follows:



- Click on the CH/SRC button to put it into Source mode (red indicator on)
- 'dial-in' the sequence for the required source on the keypad (e.g. VTR then 1)
- check that the required source appears in the PRESET display

Babelfish & internal protocol conversion



- click on the VID and AUD take buttons to assign the sources
- the NEXT or PREVIOUS buttons may be used to select the next channel number to be assigned

6.7 Editing the Aurora database

6.7.1 Adding a TX system to Aurora

If the users Aurora system does not include a TX Master Control mixer, it must be added using the Aurora Editor, as follows:

Each Master Control system requires the following components adding to the database:

- Destination Associations for the master control video and audio inputs:
 - 'PGM video' (video only association)
 - 'PST video' (video only association)
 - 'AUX1 video' (video only association)
 - 'AUX2 video' (video only association) not required for TX310, 410, 510
 - 'PGM audio' (audio only association)
 - 'PST audio' (audio only association)
 - 'AUX1 audio' (audio only association)
 - 'AUX2 audio' (audio only association) not required for TX310, 410, 510
- A keypad for a 'master control' type panel
- Key names and sequences on that keypad for all required sources
- Four control panels of type 'master control' configured as follows:
 - 'Assign video', configured for suite number 1
 - 'Assign audio', configured for suite number 2
 - 'TX video', configured for suite number 1, controlling the video only destination associations
 - 'TX audio', configured for suite number 2, controlling the audio only destination associations
- The 'Assign' panels are connected to an unused device port on positions 1 (video) and 2 (audio)
- The 'TX' panels are connected to an unused device port on positions 1 (video) and 2 (audio)
- **Note:** The 'Assign' device port is the port connected to the Babelfish and the 'TX' device port is the port connected to the TX control frame. **Neither of these ports can be used for any other purpose.**

6.7.2 Adding new sources

Sources can only be assigned to a TX series Master Control mixer if they can be 'dialed up' on the Source Assign Panel. If a 'key-sequence' does not exist for the required source, then it must be added to the source assign keypad in the Aurora database, and subsequently to the Soft SAP keypad.



Babelfish & internal protocol conversion

The procedure for adding sources to the Source Assign Keypad in the Aurora database editor is as follows:

Open up the keypad editor window:

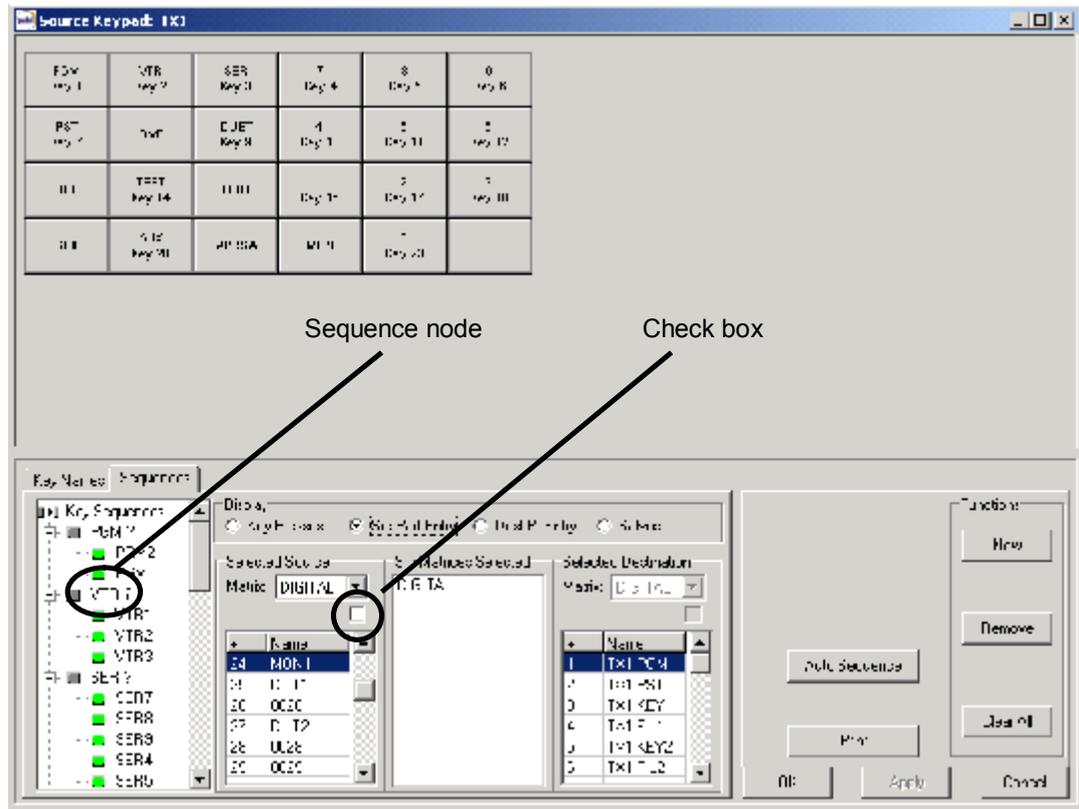
The screenshot shows a window titled "Source Keypad: TX1". The main area contains a keypad grid with the following labels:

PGM Key 1	VTR Key 2	SER Key 3	7 Key 4	8 Key 5	9 Key 6
PST Key 7	DVE	DUET Key 9	4 Key 10	5 Key 11	6 Key 12
OFF	TEST Key 14	HUD	1 Key 16	2 Key 17	3 Key 18
GFX	AUX Key 20	APR\$A	MON	0 Key 23	

Below the keypad is a configuration panel with two tabs: "Key Names" and "Sequences". The "Key Names" tab is active, showing a list of key names: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, AIR, APR, AUX, DSK, DUT, DVE, GFK. To the right of the list is a "New Name" text box. Further right is a "Functions" panel with buttons for "Add", "Remove", "Clear All", and "Print". At the bottom of the panel are "OK", "Apply", and "Cancel" buttons.

If a key label does not exist for the new source, 'drag and drop' it from the list, or if it is not in the list, type it in the 'New Name' box, click 'Add', and then drag it from the list. Select the 'Sequences' tab:

Babelfish & internal protocol conversion



Click on 'New' and then click on the keypad buttons in the exact sequence required. Select the appropriate source, on the appropriate matrix, from the source list, and finally click on the check box to complete the new sequence. If necessary, the 'Src Part Entry' name may be edited (by right-clicking on the sequence node).

If the key labels exactly match the source names, 'Auto Sequence' may be used, by first highlighting the required source(s), and clicking on 'Auto Sequence'.

The same key captions must now be added to the Soft SAP, see Section 2.2.3 of this guide.

7 SW-P-02 over IP

This application allows clients on a TCP/IP network to control any Pro-Bel router using SW-P-02 General Switcher protocol over IP. The Beck Chip provides the interfacing by acting as a Server to these clients. On Sirius and Halo routers the Beck Chip is resident on the router control card and interfacing is made through the router's Ethernet port, on older routers a Babelfish is required externally to the router in order to interface between the router serial port and Ethernet.

The application provides the following features:

- Up to 8 clients can connect to the server at any one time
- Clients may connect and disconnect at any time
- Up to 20 'connects' can be instructed in one message
- All clients receive 'connected' messages via a UPD multicast
- Router PSU and fan failure also reported to clients subscribed to the multicast group

7.1 System connections

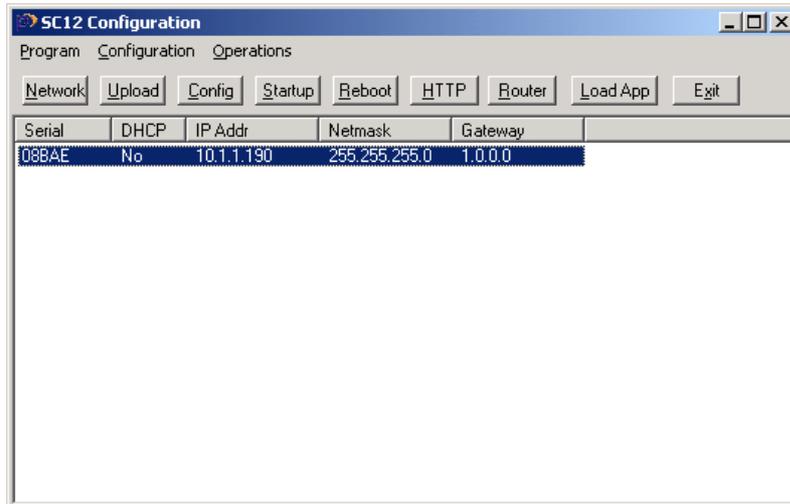
A PC running the SC12Config.exe software must be connected to the Sirius/Halo router, or to the Babelfish, as described in Section 3 of this handbook in order to configure the application. The Ethernet connection for passing the SW-P-02 over IP commands is made either directly to the Sirius/Halo Ethernet port, or to the Babelfish for other router types. When using the Babelfish, it's COM1 port is used to connect to the General Switcher control port of the router with a pin-to-pin 9 way cable.

7.2 Configuring the system

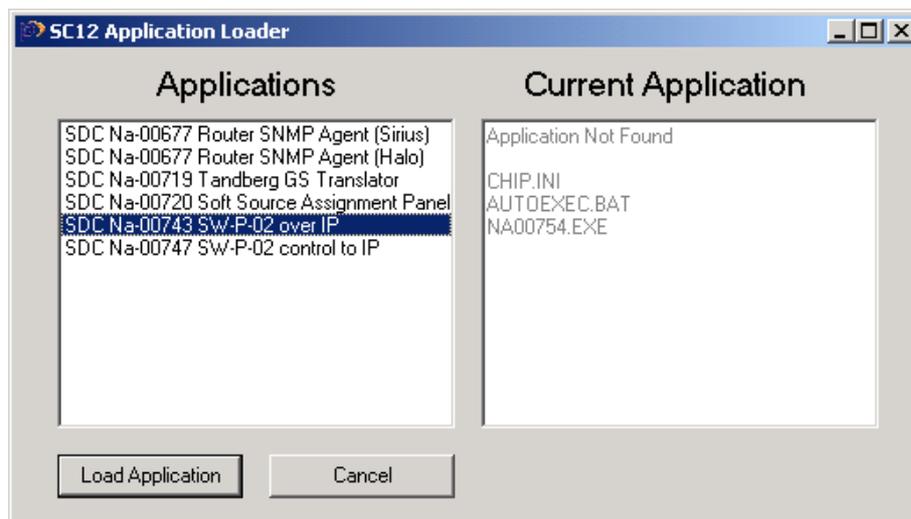
7.2.1 Loading the application

With SC12Config.exe running, select the required Beck Chip (there may be more than one on the network), and click on 'Load App':

Babelfish & internal protocol conversion



The following will appear:



Highlight 'SW-P-02 over IP' and click on 'load application'. There will be brief warning about overwriting the current software:



Click OK, and a confirmation will appear that this has been achieved:



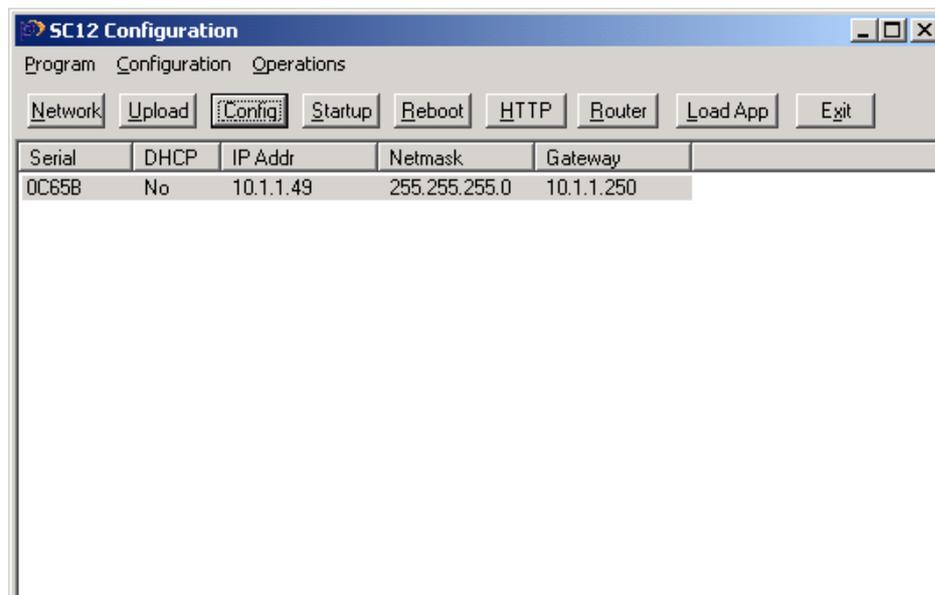
Click OK, the IP address of the Beck Chip will then be confirmed, as follows:



Click OK and then reboot the card, or re-power the Babelfish. The card should then re-appear under the main SC12 screen. It is recommended to check that the correct software has been loaded by pressing 'load app' once more, before proceeding to the next stage.

7.2.2 Configuring the .ini file

A number of application parameters can be edited in the 'CHIP.INI' file, if necessary, as follows:



Click on 'Config' to open the CHIP.INI file editor, any non-default parameters may be typed in and saved by clicking 'OK' when complete:

TCP_IP_PORT=2000

Babelfish & internal protocol conversion



This is the port used for the TCP/IP server connection. The default is 2000.

UDP_CONNECT_PORT=2001

This is the port used for UDP multicast message for 'connected's. The default is 2001.

UDP_STAT6_PORT=2002

This is the port used for UDP multicast messages for PSU and fan failure messages. The default is 2002.

CONNECT_MC_ADDR=224.1.1.1

Multi-cast address used for 'connected' s. The default is "224.1.1.1".

STAT6_MC_ADDR=224.1.1.2

Multi-cast address used for PSU and fan failure messages. The default is "224.1.1.2".

TCP_IP_LINK_TIME=60000

Time (in milli-seconds) that the link remains open after the last message is received. A value of 0 causes the link to remain open indefinitely. The default is 60000 (1 minute).

COMPORT=COM1 or COM2

This specifies the com port used for the connection to the router. The default used depends on whether the SC12 is located in a Babelfish or directly in the router. If the SC12 is in a Babelfish COM1 is the default, COM2 can be used by adding "COMPORT=COM2" to the INI file. If the SC12 is embedded in the router COM2 is the default since this is the port wired to the router control port. This would not normally be overridden, but it is possible by added "COMPORT=COM1" to the INI file.

BAUDRATE=38400

This is the baud rate used on the serial link to the router. The default is 38400.

POLLTIME=1000

This is the frequency the SC12 polls the router for status, it gives the time in milli-seconds between each poll. The default is every 1000 mill-seconds. Increasing this value reduces the load on the SC12 and the router by polling it less frequently, it however increases the time before an error is reported. It may be necessary to do this on a heavily loaded SC12 or router. Reducing this value reduces the time before an error is reported but increases the load on the SC12 and the router. The value should not be set lower then the TIMEOUT value.



Babelfish & internal protocol conversion

TIMEOUT=50

This is the timeout in milli-seconds for a response from the router. The default is 50 milli-seconds. This should be sufficient for most routers when single commands are sent in a TCP/IP packet. If multiple connect messages are sent in a single TCP/IP packet the timeout should be increased to 200 milli-seconds. Also if the router is heavily loaded this value may need to be increased. The number of TCP/IP connections to the SC12 should not effect the timeout, since this is the timeout on the serial port to the router. The clients connecting to the SC12 may need to adjust their timeout for the response on the network due to messages on multiple TCP/IP connections being serialised to the router.

PSUMASK=FF

This is used to mask local PSU faults. The default is FF (allow all faults). The Babelfish can report two PSU faults corresponding to bits 0 and 1. Setting bit 0 or 1 to 0 will mask the corresponding PSU fault. This can be used when the Babelfish only has one PSU.

e.g. Babelfish with 1 PSU: PSUMASK=F1

with 2 PSUs: PSUMASK=F3

When in a router up to four PSU faults can be reported, using bits 0 to 3. If the Beck Chip is fitted to a router that does not have four PSU's, it would be desirable to mask faults on those PSU's that are not fitted by setting the corresponding bits to 0.

e.g. Router with 2 PSUs: PSUMASK=F3

Bits 3 to 7 are not used in a Babelfish and bits 5 to 7 are not used in a router.

FANMASK=FF

This is used to mask local Fan faults in the same way as the PSUMASK masked PSU faults. The default is FF (allow all faults). There are no local fans in a Babelfish, consequently this is not used. In a router up to five local fan faults can be reported using bits 0 to 4. Setting the appropriate bits to 0 in this mask will mask those corresponding fan faults.

RETURN_STATUS_5=YES

This determines whether status request 1 messages return the status response 5 message, or whatever response is returned from the router. The default is YES. Setting this to NO means that status response 1 to 4 are returned depending on what router the SC12 is connected to (See SW-P-02 for which routers return which responses). This is intended

Babelfish & internal protocol conversion



for use with existing equipment that does not support the status response 5 message.

USE_IPADDR_SWITCH=1

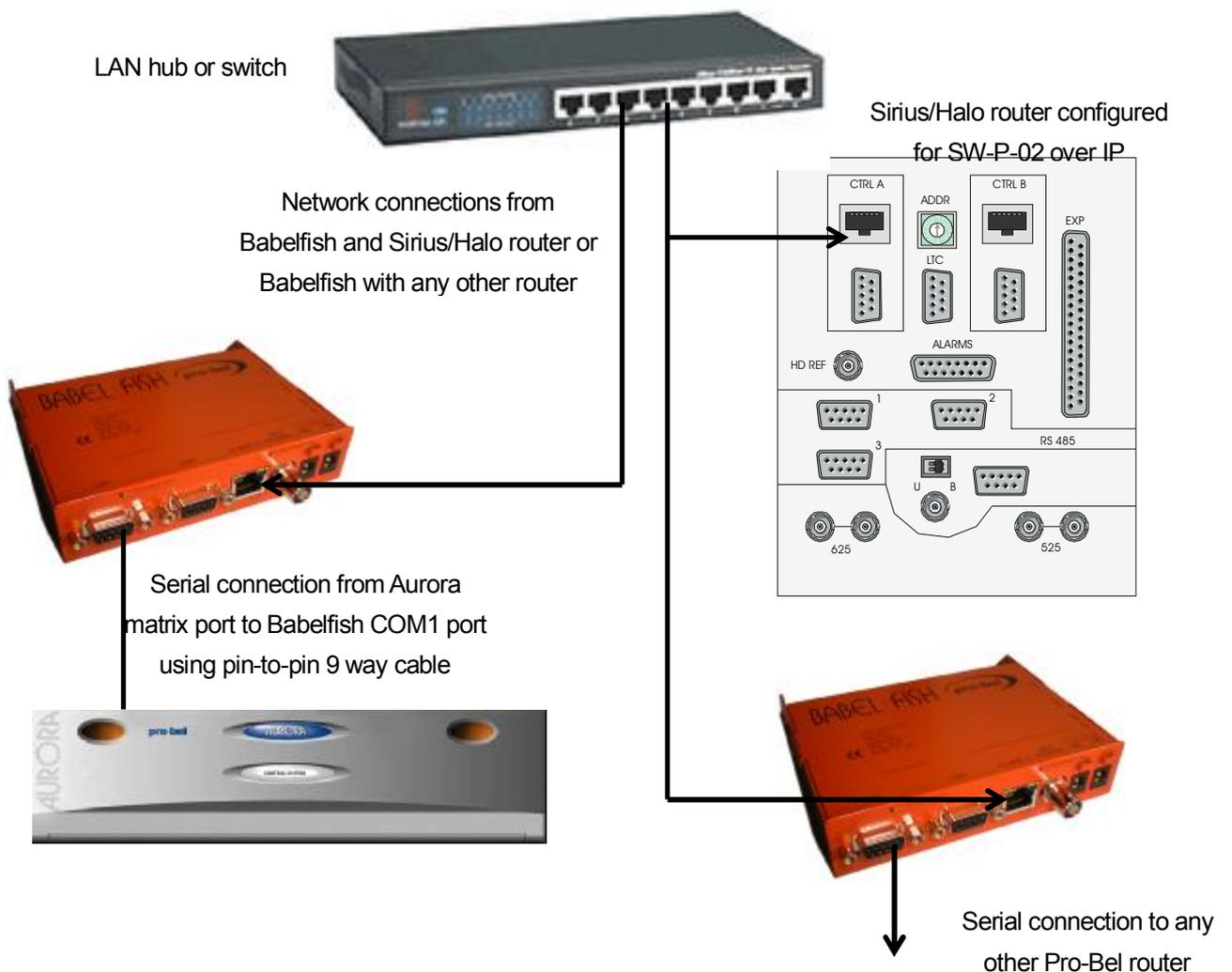
Adding the above line to the 'IP' section of the chip.ini file causes the IP address to be partially configured using the hex switch(es) on the back of a Sirius router. This function is only available when a 2434 card is fitted to a Sirius router and DHCP is not enabled.

A Sirius Gold has two 4 bit hex switches allowing 256 addresses to be selected. This is used to override the last byte of the configured IP address. e.g. if the hex switches were set to 81H (129) the resulting IP address would be aaa.bbb.ccc.129 where aaa, bbb and ccc are configured as normal. Note: When setting the IP address on a Sirius Gold frame the switches are reversed when viewed from the back of the frame. i.e. to set address 129 (81Hex) the left switch would have to be set to 1 and the right switch to 8.

Other Sirius routers have only a single hex switch allowing 16 addresses to be selected. This selection overrides bits 0 to 3 of the last byte of the configured IP address. e.g selecting 8 on the hex switch would result in an IP address with the last byte X8, where the X part is configured in the normal way.

8 SW-P-02 control to IP

This application provides the complement to the interface described in the previous Section. Using a Babelfish as an interface, SW-P-02 General Switcher commands via a serial RS422 connection are translated into SW-P-02 over IP on an Ethernet connection. This therefore provides the controlling end of the network connection, where the SW-P-02 on IP interface provides the router end:



In the above diagram, the Babelfish on the left is configured for 'SW-P-02 control to IP' and the one on the right for 'SW-P-02 over IP'.

Babelfish & internal protocol conversion



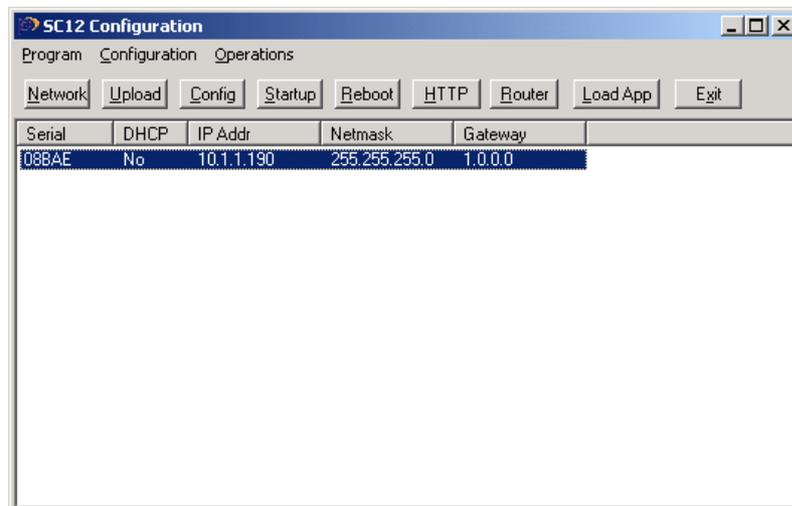
8.1 System connections

In addition to those connections shown in the previous diagram, a PC running the SC12Config.exe software must be connected to the Babelfish requiring configuration, either directly or via the LAN, as described in Section 3 of this handbook.

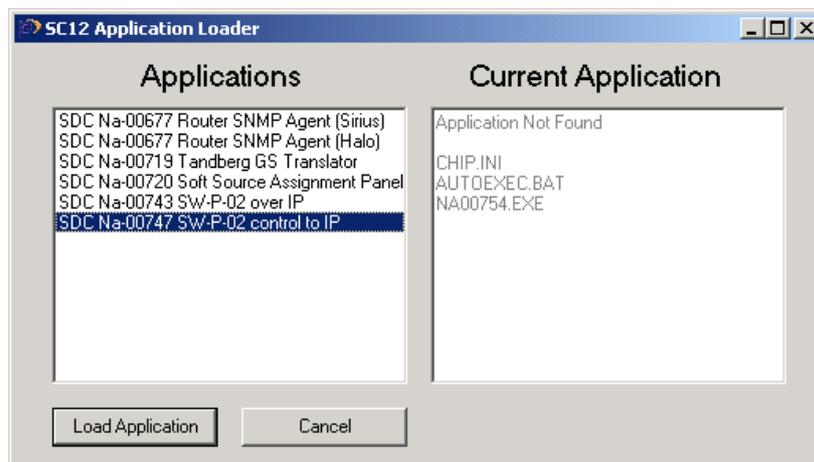
8.2 Configuring the system

8.2.1 Loading the application

With SC12Config.exe running, select the required Beck Chip (there may be more than one on the network), and click on 'Load App':



The following will appear:



Highlight 'SW-P-02 control to IP' and click on 'load application'. There will be brief warning

about overwriting the current software:



Click OK, and a confirmation will appear that this has been achieved:



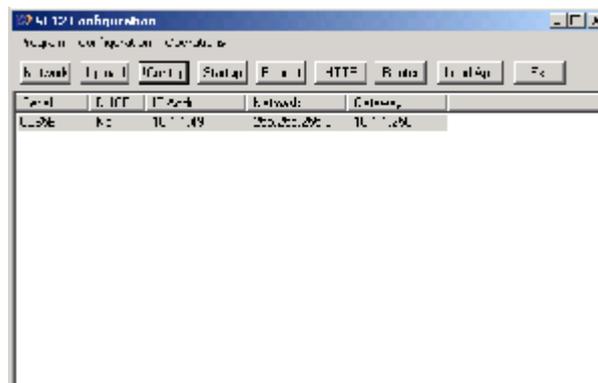
Click OK, the IP address of the Beck Chip will then be confirmed, as follows:



Click OK and then re-power the Babelfish. The card should then re-appear under the main SC12 screen. It is recommended to check that the correct software has been loaded by pressing 'load app' once more, before proceeding to the next stage.

8.2.2 Configuring the .ini file

A number of application parameters can be edited in the 'CHIP.INI' file, if necessary, as follows:



Babelfish & internal protocol conversion



Click on 'Config' to open the CHIP.INI file editor, any non-default parameters may be typed in and saved by clicking 'OK' when complete:

TCP_IP_PORT=2000

This is the port used for the TCP/IP server connection. The default is 2000.

UDP_CONNECT_PORT=2001

This is the port used for UDP multicast message for connecteds. The default is 2001.

UDP_STAT6_PORT=2002

This is the port used for UDP multicast messages for router PSU and Fan failure messages. The default is 2002.

TCP_IP_ADDR=127.0.0.1

This is the IP address of the TCP/IP server. The default is "127.0.0.1" (local loop back port).

CONNECT_MC_ADDR=224.1.1.1

Multi-cast address used for connecteds. The default is "224.1.1.1".

STAT6_MC_ADDR=224.1.1.2

Multi-cast address used for router PSU and Fan failure messages. The default is "224.1.1.2".

UDP_CONNECT_ENA=YES

This determines whether the Beck Chip registers for multicast connect messages. The default is YES. This results in a connected message being sent on the serial port whenever a connected is received on the multicast port. Setting this to NO prevents any unexpected connecteds being sent on the serial port.

UDP_STAT6_ENA=YES

This determines whether the Beck Chip registers for router PSU and Fan failure messages. The default is YES. This results in a status 6 message being sent on the serial port whenever one is received on the multicast port. Setting this to NO prevents these unexpected messages being sent on the serial port.

COMPORT=COM1 or COM2

This specifies the com port used for the connection to the control system. The default used depends on whether the SC12 is located in a Babelfish or directly in the router. If the Beck Chip is in a Babelfish COM1 is the default, COM2 can be used by adding



Babelfish & internal protocol conversion

“COMPORT=COM2” to the INI file. Although this software can be run on an Beck Chip in a router, it is unlikely it would be since it implements the control system end of the connection. However if it were COM2 is the default. This could be overridden by adding “COMPORT=COM1” to the INI file.

BAUDRATE=38400

This is the baud rate used on the serial link to the control system. The default is 38400.