ALB190 Series
Low Power C-band BUC

Installation and Operation Manual

IM02960240 Rev. A

Agilis

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Chapter 1 Product Overview

Agilis, a global leader in the design, development and manufacturing of quality satellite products for various applications, introduces the ALB190 Series Low Power Compact C-BUC.

The ALB190 Series Low Power Compact C-BUC is easy to install and redundancy ready. The Agilis C-Band BUC also offers a wide range of distinctive advantages and enhanced features for satellite communication systems in remote or challenging geographic regions. Its innovative and robust design makes it very reliable under harsh environment conditions.

This user manual provides detailed information to system integrators and end users on how to set-up, operate and maintain the Low Power Compact C-BUC.

1.1 About the BUC

The ALB190 Series Low Power C-band Block Up Converter (C-BUC) is a high performance, cost-effective RF transmitter designed for satellite communication with high speed transmission capability suitable for both telephony and high speed data communication.

The C-band BUC can be operated with different modulation formats such as BPSK, QPSK and FM. Due to stringent performance specifications, it is suitable for the following applications:

- Single Carrier Per Channel (SCPC)
- Multi-Carrier Per Channel (MCPC)
- Demand Assigned Multiple Access (DAMA)
- Time Division Multiple Access (TDMA)

1.2 BUC Functions

The main function of the C-Band Block Up Converter (C-BUC) is to up convert L-band transmit signal to the C-Band transmit frequency range and amplifies it by an integrated SSPA.

The C-BUC is a single stage up conversion from L-band to C-band frequencies. The spectrum is non- inverted with phase noise surpassing Intelsat, Insat, Measat 3, ST- 1/Palapa-C and Full C standards.

The BUC includes the following function modules:

- **Monitor and control**

  The M&C module is the central processing hub of the C-BUC. It is developed on an embedded microcontroller to perform the required monitoring and control functions. The unit can be connected to a remote PC via serial communication using RS485 through Ethernet (SNMP and Web). Using the M&C module, you can:

  - Control the BUC (attenuation, RF output)
  - LO unlocked alarm
  - Monitor RF (RF output power and temperature) and electrical readings
  - Check alarm status

- **Power supply**

  The C-BUC is powered via an external 220V AC power source (range 90~264VAC). An internal AC-DC converter converts the AC power received into the DC voltages required by the various modules within the BUC. The internal AC-DC converter receives AC power and converts it to DC voltages which are then supplied to the various internal modules.

1.2.1 BUC Functional Block Diagram

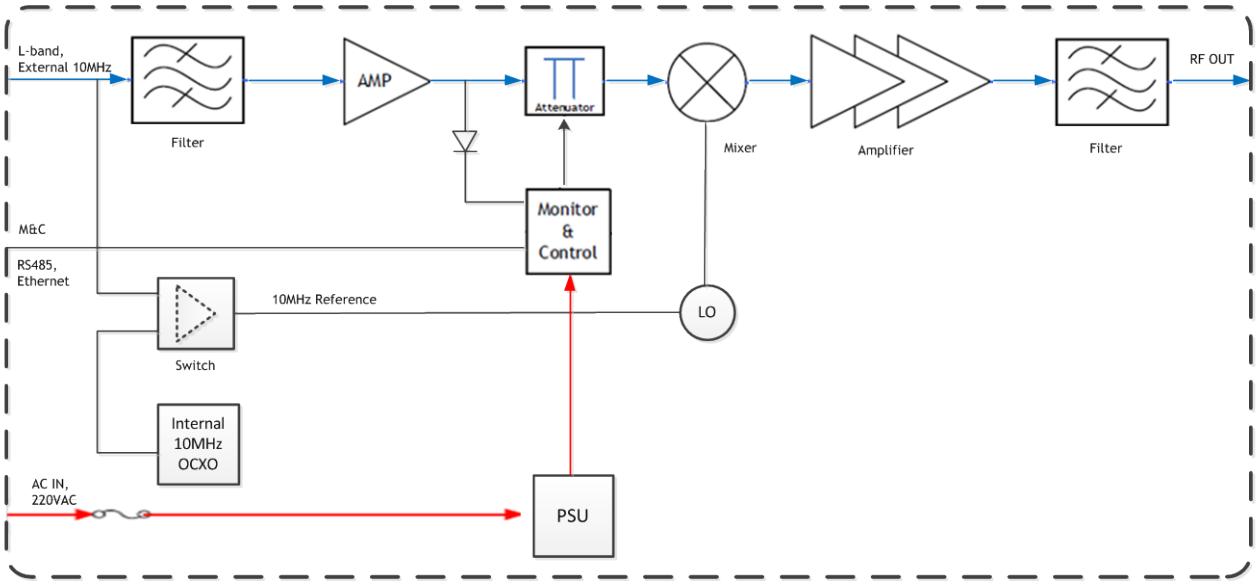


Figure 1.1 BUC Functional Block Diagram

1.2.2 Frequency Band Options

Table 1-1 BUC Transmit Frequency Bands for Low Power C-BUC

C-band Frequency	Input Transmit (MHz)	Output Transmit (GHz)	Local Oscillator (MHz)
Intelsat	950 to 1525	5850 to 6425	4900
ST-1 / Palapa C	1150 to 1450	6425 to 6725	5275
Insat	1100 to 1400	6725 to 7025	5625
Full C	950 to 1825	5850 to 6725	4900
Extended Full C	975 to 1200	5725 to 6725	4750
Extended Full C	950 to 1725	5725 to 6725	5000
Measat C	950 to 1750	5925 to 6725	4975

1.3 BUC Interfaces

The following section describes the physical interface of the BUC device.

1.3.1 BUC Front View

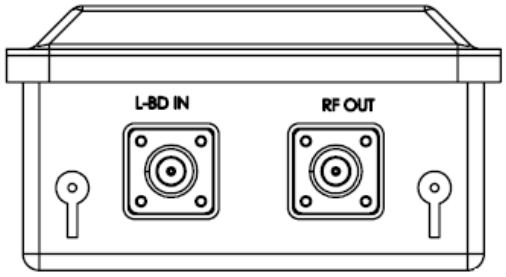


Figure 1.2 1mW C-BUC Front View

Table 1-2 Interfaces present on the side of the 1mW BUC unit

Port Reference	Connector Type	Signal Details
L-BD IN	50Ω N-type Female connector; SMA connector (optional)	L-band input signal, 10MHz external frequency
RF OUT	50Ω N-type Female connector; SMA connector (optional)	C-Band RF output signal
Status LED	LED	Status Indicator

1.3.2 BUC Side View

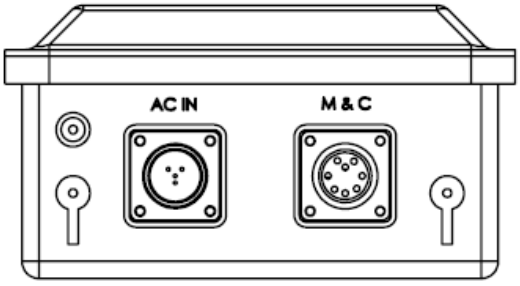


Figure 1.3 Side View of the 1mW C-BUC

Table 1-3 Interfaces present on the front of the BUC unit

Port Reference	Connector Type	Signal Details
M&C	KPT02E12-8S 8-pin square flange female connector	Monitor and Control interface • Alarm if 0.8V @ Pin D; No alarm if 4.5~5.5V @Pin D • M&C alarm for internal 10MHz reference

Port Reference	Connector Type	Signal Details
AC IN	KPT02E12-3P 3-pin Male Connector	AC input power supply

Table 1-4 Pin-out Configuration for M&C

	Pin #	Function
Serial	Pin B	Ground
	Pin E	RS485+
	Pin F	RS485-
Ethernet	Pin A	Tx+
	Pin C	Tx-
	Pin G	Rx+
	Pin H	Rx-
	Pin D	Status Link 5V

Table 1-5 Pin-put Configuration for AC IN

Pin	Function
A	Ground
B	Live
C	Neutral

1.4 Product Models

This manual is suitable for the following Low Power C-BUC models:

Table 1-6 Product Series Models

Model Type	Model # (F-Type)
ALB190 Low Power C-band BUC, Outdoor	ALB190xxx-xx
1mW Standard C-BUC, Outdoor	ALB190AC7-0E

Chapter 2 System Configuration

This chapter explains, in detail, the system in which the BUC is deployed in and its various components.

2.1 Types of System Configurations

The BUC unit can be deployed in outdoor environments in a Standalone system configuration which is explained in details below.

2.1.1 Stand-Alone System Configurations

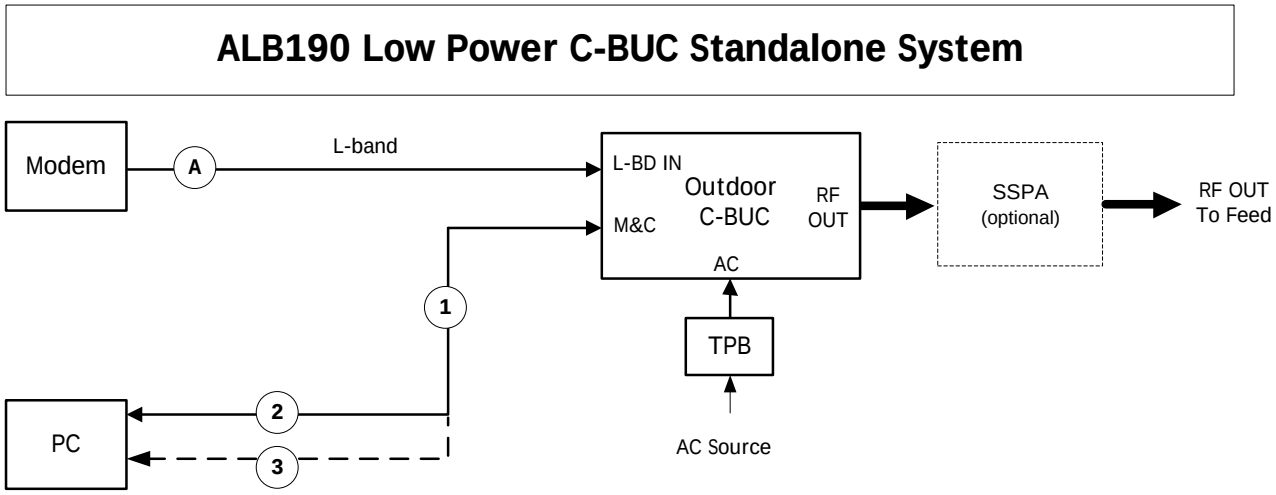


Figure 2.1 ALB190 1mW C-BUC Standalone System setup

The table below lists the accessories and components that can be obtained from Agilis to setup the system.

Table 2-1 List of accessories and components for standalone system

Item No.	Agilis Part No.	Description	Length (m)	Quantity
1	2502041169	C/A M&C VSAT (Eth, RS485)	2	1
2	2502041166	C/A VSAT Eth-DB9 to RJ45 Converter	2	1
3	6103480008	Converter RS485 to USB	1.5	1

Item No.	Agilis Part No.	Description	Length (m)	Quantity
4	1001520980	Transient Protect Box with power cable	-	1
A	-	RF Cables	To be arranged by customer	
-	ALB190xxxx	C-BUC	-	1
-	AAA11xxxx	C-band SSPA	-	1
-	2503160038	BUC Mounting Accessories	-	1

🕮 **Note:** Depending on your purchase order, your BUC package may not include certain optional cables and components. Please contact Agilis if you wish to purchase any of the accessories listed in the table.

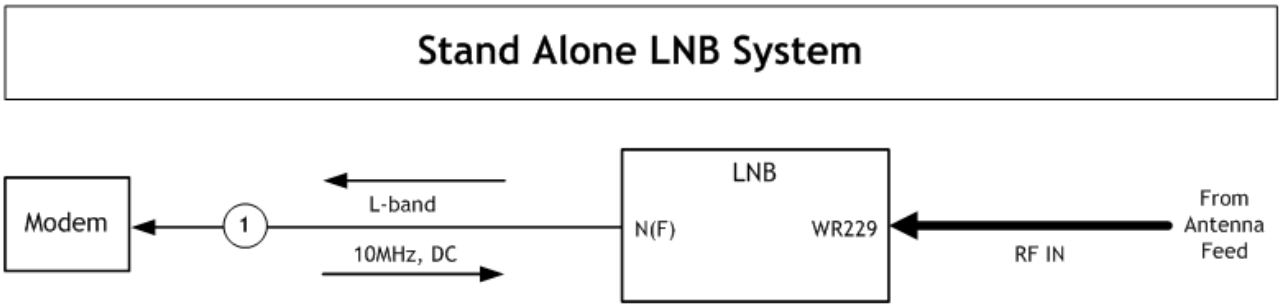


Figure 2.2 Standalone LNB configuration setup

The table below lists the accessories and components required to setup the Stand Alone LNB system. This setup diagram and table can also be found at the back of this manual for your convenience.

Table 2-2 List of accessories and components for standalone LNB system

Item No.	Agilis Part No.	Description	Length (m)	Quantity
1	-	Provided customer by the customer	-	-
-	ACA11XXXXX	C-Band LNB	-	2

🕮 **Note:** The table above is a typical accessories list for the BUC Stand Alone LNB System. Depending on your purchase order, your BUC package may not include certain optional cables. Please contact Agilis if you wish to purchase any of the above accessories.

2.2 System Components

2.2.1 Transient Protection Box

Transient protection prevents spikes in electrical discharges that may cause damage to the RCU or other connected components. A TPB is connected to both AC input ports of the RCU.

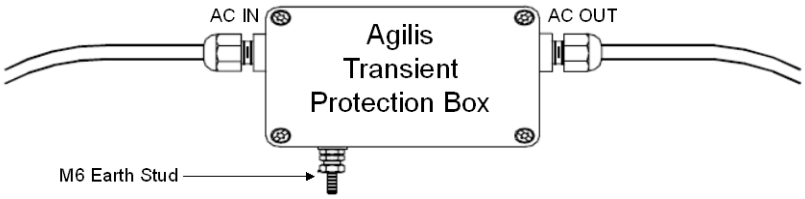


Figure 2.3 Transient Protection Box (P/N: 1001520980)

For the TPB to work effectively, please keep clean outgoing lines away from the incoming or earth leads.

🕮 **Note:** Ground the TPB by connecting the M6 Earth Stud to a grounding rod. Note that this is vital to the proper operation of the TPB.

Chapter 3 Installation

This chapter explains a step-by-step process to safely mount and install your Agilis product.

WARNING: Always handle the BUC with care. Dropping or knocking it may cause damage to the unit. Agilis' warranty does not extend to defects due to excessive shock or vibration.

Do not operate the BUC without a cable or a RF load connected to the RF OUTPUT waveguide port. The load should be at least double the BUC wattage.

3.1 Unpacking the Box

Before unpacking the box, check if it had been damaged or opened. If the shipment may have been tempered with, open the box in front of a representative from the shipping company.

Upon opening the box, carefully remove the items in the package and check them against the packing list. If any of the items are damaged or missing, please contact Agilis or your local Agilis representative before proceeding.

We recommend that you keep the original packing materials until you have completed the checks and confirmed that the unit is in working order.

If you need to repack the product for shipping, please use the original shipping container and packing materials whenever possible. Alternatively, you may also use high quality commercial packing materials to repack the unit. Please seal the container firmly and clearly mark "**FRAGILE Electronic Equipment"** on the exterior.

3.2 Pre-Installation Preparations

3.2.1 Environmental Considerations

The ALB190 Low Power C-BUC is an outdoor unit with an aluminium chassis that is coated with white, enamelled epoxy for environmental protection. All interface connectors are sealed to prevent air and moisture from entering the unit.

According to the instructions supplied by the antenna manufacturer, locate and install the antenna in an area that is free from RF interference from motors and electronic equipment. A clear line of sight from the antenna to the satellite is essential. To ensure safety and protection of personnel and equipment, lightning arresters should also be used at the site. Size 3/0 or 4/0 stranded copper wire should be used to bond the Converter, LNB and Booster to the antenna frame and to the lightning protection ground rod. The grounding resistance of the antenna should not be more than 10 Ω.

Before proceeding with the mounting process, please ensure that the environmental conditions in the area where the BUC is to be mounted is appropriate for its optimal operation. These include:

- Temperature: -40ºC to +85ºC
- Relative Humidity: Up to 100%

3.2.2 Tools Required

We highly recommend having the following tools on hand before starting the installation:

- 1 complete set of socket wrench
- 1 Philips head screwdriver
- 1 cutter
- 1 bag of cable ties (long and medium length)
- 1 multi-meter

3.2.3 Site Preparation Checklist

The following table provides a checklist to help you ensure that your site is adequately equipped to perform the installation.

Checklist Item	Y/N
Equipment required for site survey	☐ Inclinometer ☐ Compass / DataScope ☐ 1-meter rectangular bar ☐ Scientific calculator ☐ 100-meter measuring tape ☐ Site location map ☐ GPS receiver

Checklist Item	Y/N
	☐ Road distance wheel ☐ Vernier calliper ☐ Location markers / flags
Is site in the satellite footprint?	☐ Yes ☐ No
Approximate length of cables between ODU and IDU	
IF cable routing method	☐ Underground ☐ Surface
Is there a clear path for cables from ODU to IDU?	☐ Yes ☐ No
Proposed mounting location	☐ Antenna structure ☐ Near the antenna ☐ Inside the shelter ☐ Other: _____
Does the mounting location provide the best route for cables from IDU to ODU to antenna?	☐ Yes ☐ No
Is there an unobstructed view from the satellite(s) of interest?	☐ Yes ☐ No
Are there any hazards near the site location that may damage or obstruct the ODU? (old buildings, trees, planned future construction)	☐ Yes ☐ No If yes, please specify: _____
Are there possible RF interference from other nearby telecommunication towers?	☐ Yes ☐ No
Will your installation cause interference to other nearby setup?	☐ Yes ☐ No
Is sufficient power supply available?	☐ Yes ☐ No
Is grounding available?	☐ Yes ☐ No
Is the site prone to the following?	☐ Heavy wind ☐ Heavy rainfall ☐ Ice/snow accumulation ☐ Extreme temperatures ☐ Sand/Dust storms ☐ Others: _____

3.2.4 Power Supply

The Low Power C-BUC requires an AC power source of 230VAC (range 90V to 264VAC).

SELECTING AN APPROPRIATE AC POWER SOURCE

When selecting the AC power source to connect your indoor and outdoor units, please ensure that the voltages are within the limits specified in the table below. You are recommended to use an Automatic Voltage Regulator if your power source falls outside of these limitations.

Tolerance	X VAC, where X is the AC requirement of the device
Live – Neutral	230 VAC ± 15%
Live – Earth	230 VAC ± 15%
Neutral – Earth	< 5 VAC

🕮 **Note:** The equipment may be damaged if the Neutral – Earth tolerance exceeds 5VAC. Please check your grounding setup if this occurs.

🕮 **Note:** Please note that you may interchange the wiring connection between the live and neutral pins. Interchanging these two pins will still power up the RCU but may affect the switching operation of the setup.

3.2.5 Pre-Installation Test

Performing a pre-installation test prior to the actual field installation helps you to:

- Confirm that the unit has not been damaged during shipment.
- Check that the unit is in working order before performing a tiring and costly mounting procedure on your antenna.
- Following are the test procedures for the ODU system. There are two tests that are recommended; namely, the uplink and downlink tests.

🕮 Note: Ensure that no alarm or fault appears on the Low Power C-BUC before performing any test.

🕮 Note: To avoid damaging the C-BUC accidentally, connect a 30 dB, > 20W power attenuator to the RF output.

UPLINK TEST PROCEDURE

Step 1 Connect the C-BUC as shown in the figure below and power up the system.

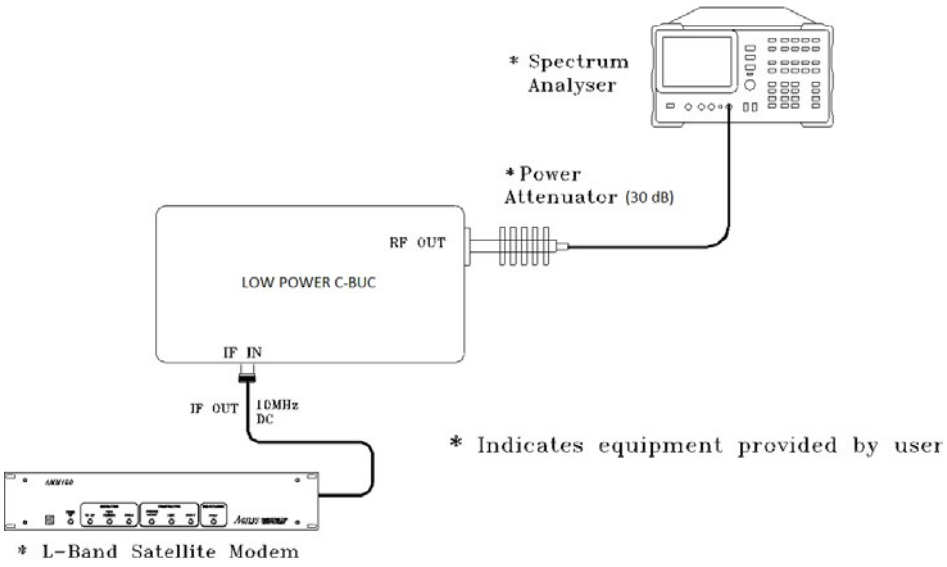


Figure 3.1 Connection for uplink test procedure

🕮 Note: * represents equipment not provided by Agilis

Step 2 Use the modem to input an L-Band pure carrier (by turning on the transmit carrier and set the pure carrier feature to ON). Adjust the modem output power so that the IF level input to C-BUC is -25 dBm.

Step 3 Measure the RF OUT of the C-BUC using a spectrum analyzer at C-band.

1. Calculate the total transmit gain based on this formula: Output power – Input power + Amount of attenuation.

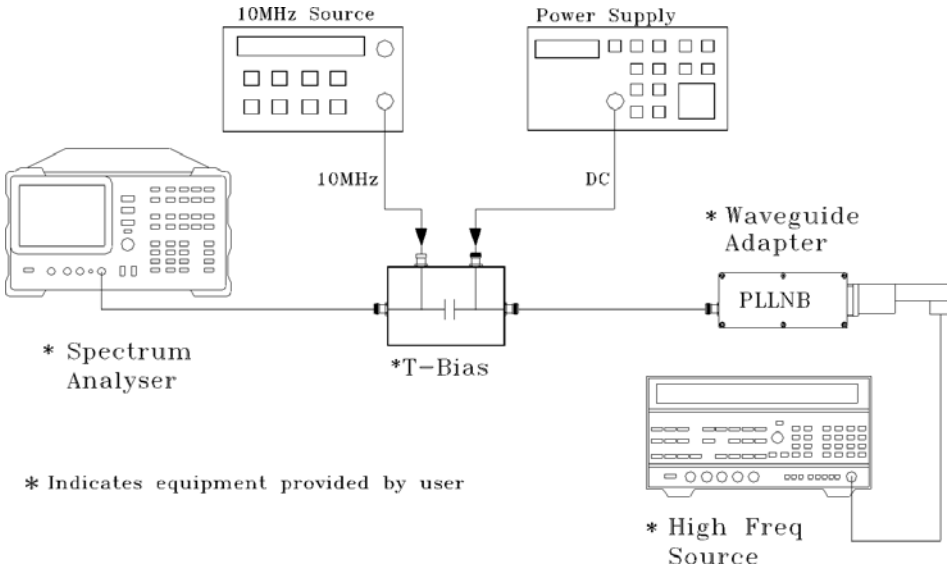
2. Compare the result against the specifications (Appendix B Unit Specifications & Outline). If there is no signal, check that the channel setting is correct.

   Example:

   Transmit gain = RF OUT power - IF IN power + Attenuation = 8 - (-25) + 30 = 63 dB

DOWNLINK TEST PROCEDURE

Step 1 Connect a waveguide adapter to the LNB and connect the IF out of the LNB to the spectrum analyzer via a T-Bias as shown figure below. Connect an external 10 MHz reference signal to the T-Bias, LNB supply voltage and power up the T-Bias DC supply.



Step 2 Input a -90 dBm C-Band CW signal to the LNB.

Step 3 Measure the IF OUT of the C-LNB by a spectrum analyzer. Set the Spectrum Analyzer to 100 kHz span. Calculate the LNB receive gained by subtracting the input power from the output power.

3.2.6 Installing the BUC & Other Components

Step 1 All Agilis components in this system are outdoor mounted equipment designed to withstand most weather conditions.

A set of mounting accessories is provided to mount the C-BUC to the frame of the antenna. The LNB is fixed to the receive port (or via a transmit rejection filter) of the OMT.

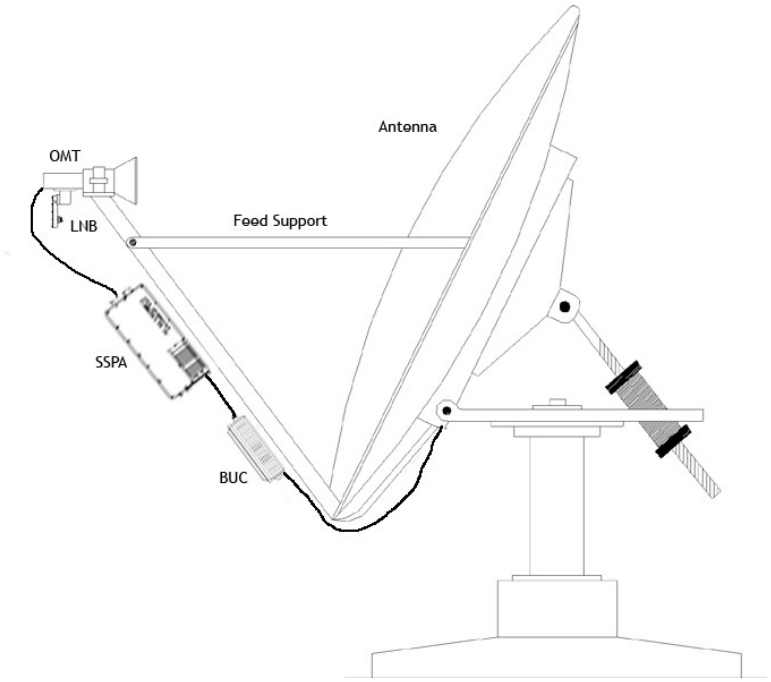


Figure 3.2 Typical Mounting of the BUC and LNB on the antenna

Step 2 Connecting the BUC

1. Connect the L-BD IN port of the BUC to an indoor modem using a standard IF coaxial cable.

2. Connect the RF OUT port of the BUC to an SSPA.

3. Connect the M&C port of the BUC to an indoor terminal (such as a PC) for monitoring purposes. The following diagrams show the cable connections between the BUC and PC.

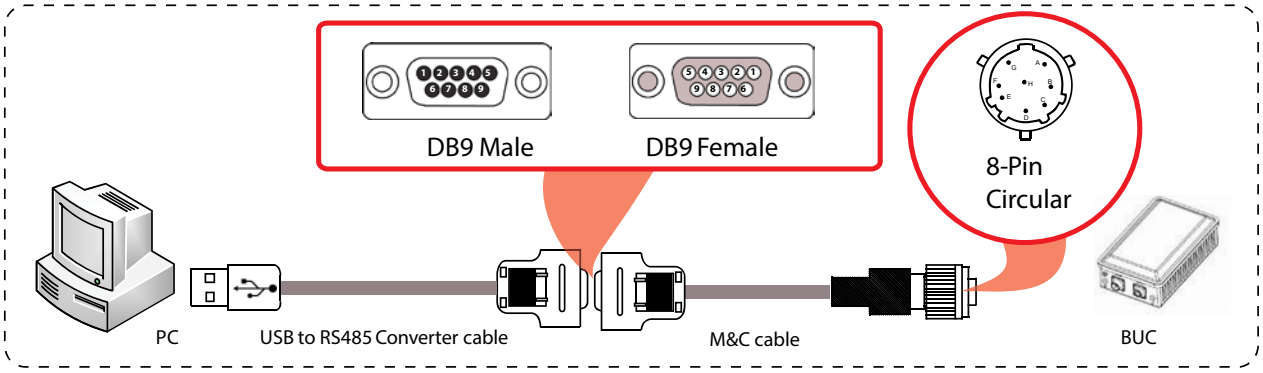


Figure 3.3 Connecting via USB to RS485 Converter

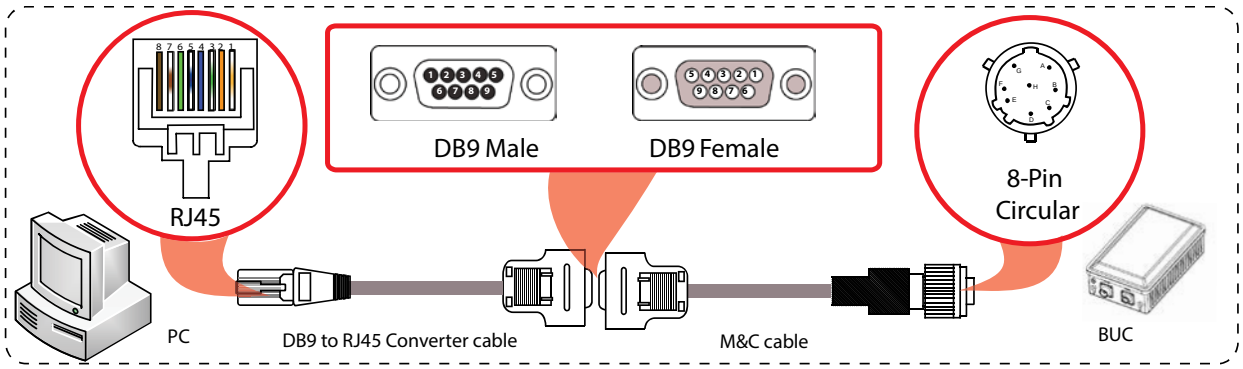


Figure 3.4 Connecting via RJ45-DB9 Converter

Step 3 Grounding the Installation

This process provides a conductive path for static electrical charges to be discharged safely from the equipment to the ground. This prevents a build up of static charges that may cause the equipment to spark.

1. Locate an appropriate grounding spot. Most soil has sufficient conductivity to allow for an efficient grounding connection. Soils that are mainly rock may need to be treated with additional minerals like rock salt, copper sulphate or magnesium sulphate to increase their conductivity.

2. Drive a 3m lightning rod into the ground about 30cm from the antenna pole. Bolt an aluminium wire, minimum 9mm in diameter, to the ground pole. A tight clamp is used to make contact at the top end. Avoid sharp bends when routing the wire as these may impede current flow.

3. Using size 3/0 or 4/0 stranded wires, bond the Low Power C-BUC and other components to the antenna frame and lightning protection ground rod.

🕮 **Note:** Grounding resistance of the antenna should be no more than 10Ω.

WARNING: Please ensure that the wire is tightly connected between the rod and the equipment to prevent sparks.

Step 4 Switch on the unit

Connect the AC power source to the BUC using the Transient Protection Box. Ensure that all connections have been completed before turning on the power supply.

The BUC will automatically power on when an appropriate AC current is fed into the unit.

WARNING: Please ensure that the power source is off from the modem before connecting the IFL cable to BUC.

Step 5 Sealing the Cables

To complete the physical installation, all connectors and important joints in the system must be sealed. Note that the sealing must begin from the chassis of the ODUs up to the heatshrink of the cable.

All unused connections must be sealed to prevent water ingress. Waveguide joints must be equipped with an appropriate gasket. Please ensure that all connectors are hand tightened before sealing.

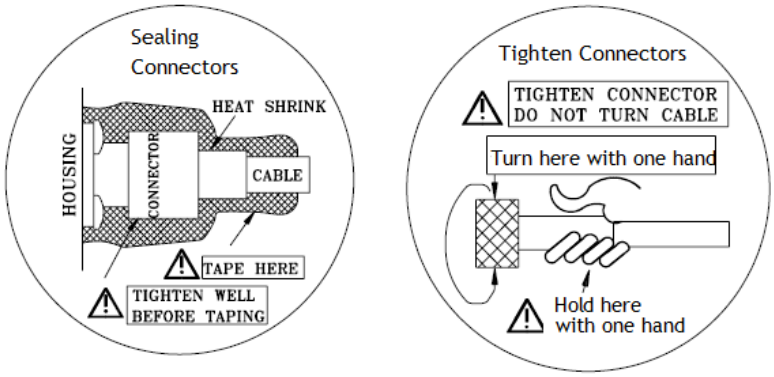


Figure 3.5 Sealing the connectors

Chapter 4 Setup and Management

4.1 Monitor & Control

Agilis' devices can be monitored and controlled remotely via various methods including:

- Agilis EMS Software
- Optional web browser (HTTP) and SNMP protocol

This chapter looks at how you can set up and manage your BUC system using the various tools above.

4.2 Using the Agilis EMS software

The Agilis EMS Software is a lightweight network management software that allows the user to monitor and control the Low Power C-BUC remotely through a PC.

4.2.1 Connecting the PC to the BUC

Connect your PC to the BUC using the provided M&C cable and the USB to RS485 converter cable as shown in the figure below.

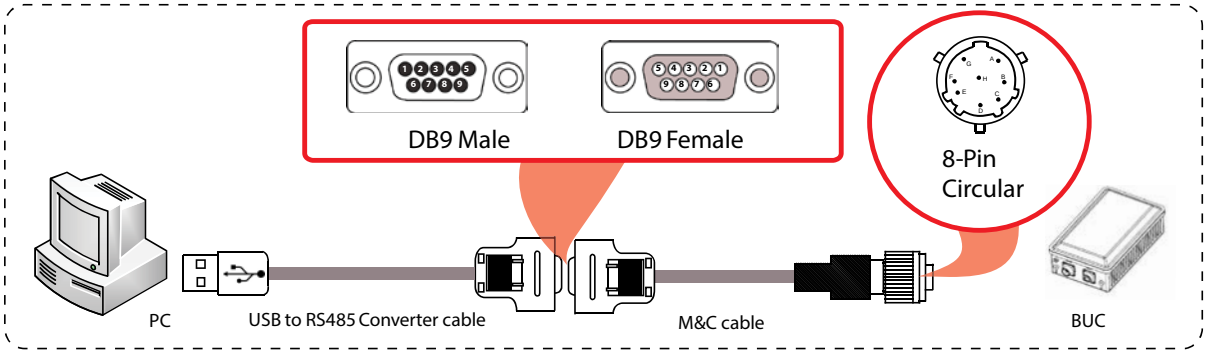


Figure 4.1 Connecting the Converter to PC via RS485

Table 4-1 M&C cable (P/N: 2502041169) pin-out configuration

M&C cable			USB-RS485 converter	
Male Circular	Female DB-9	Signal	Male DB-9	Signal
Pin E	Pin 2	Data+	Pin 2	Data+
Pin F	Pin 1	Data-	Pin 1	Data-
Pin B	Pin 5	Ground	Pin 5	Ground

4.2.2 Installing the Agilis EMS Software

The Agilis EMS software must be installed into a PC terminal to be used to monitor your Agilis devices.

MINIMUM SYSTEM REQUIREMENTS

- Windows XP / Windows 7 operating system
- At least 1GB Hard Disk free space
- 2GB RAM (Recommended)
- An M&C serial interface

SOFTWARE INSTALLATION

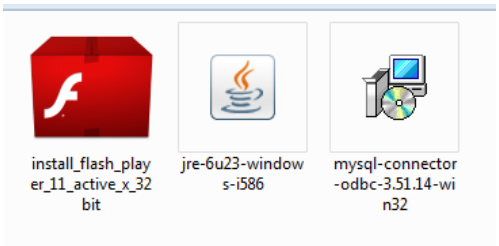
🕮 Note: For detailed information on the Agilis EMS Software, refer to IM02960173 Agilis EMS Software Installation and Operation Manual which can be downloaded from the www.agilissatcom.com.

Step 1 Install the USB-RS485 converter driver into your PC. Please insert the CD that was included in your package into your disc drive and run the driver installation.

Step 2 If the Agilis EMS installation CD was included in your package, please insert the CD into your PC's disc drive and unzip the setup file.

🕮 Note: You can download the latest version of the Agilis EMS Software from the Agilis company website using this link: http://www.agilissatcom.com/M-C-Software/39/0/page_content.html.

Step 3 Install the Flash player, Java applet, and the mysql ODBC software inside the 3rd Party Software folder.



🕮 Note: The 3rd party software must be installed before launching the EMS application; otherwise, the EMS software will not be able to establish communication with the BUC.

Step 4 Launch the setup file

Locate the setup file and double click the file to start the setup.

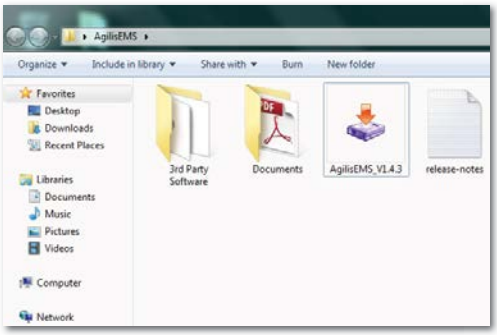


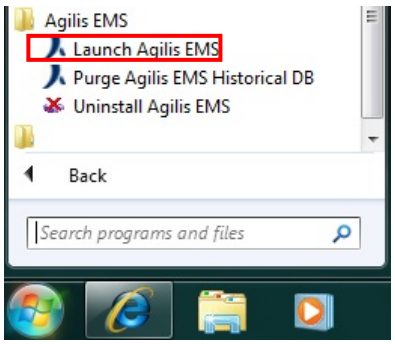
Figure 4.2 **AgilisEMS.exe** icon

📖 Note: You must have administrator permission on your Windows PC to install the software.

Step 5 Follow the step-by-step installation instructions to install the EMS software.

4.2.3 Launching the Agilis EMS Software

To Launch the Agilis EMS Software, click on **Start** > **All Programs** > **Agilis EMS**, click on the **Launch Agilis EMS** to start Agilis EMS.



Once all the required services are started, an Agilis icon would be displayed in the notification area usually found in the bottom right hand corner. This would indicate that the startup of services has been initiated.

An IE (Internet Explorer) window will automatically pop-up upon successful startup.

4.2.4 Main User Interface

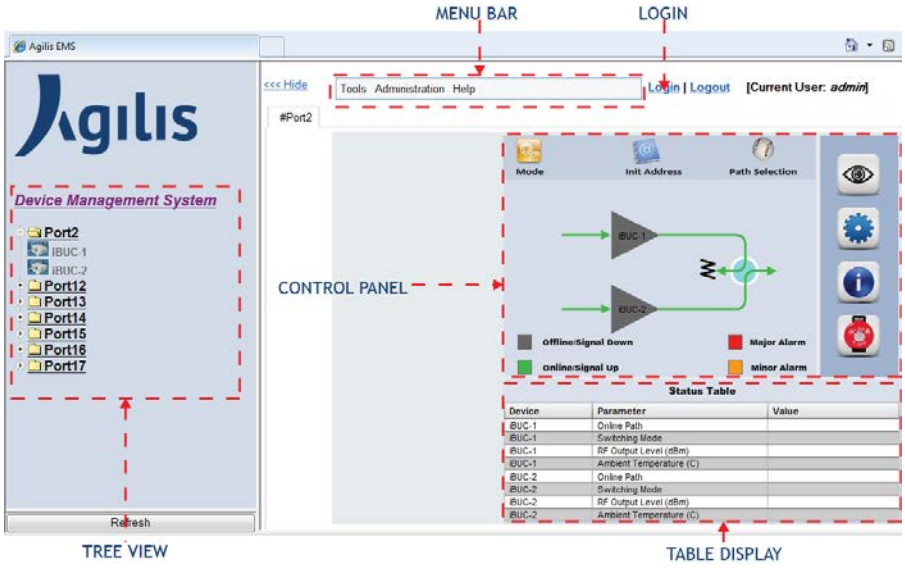


Figure 4.3 Agilis EMS Main User Interface

4.2.5 Types of Users

Table 4-2 Types of Users

User	Password	Options Available
Operator (Guest)	NA	• Analog Charts • Device Configuration
admin	admin	• Analog Charts • Device Configuration • User Management

🕮 **Note:** It is recommended to login as an admin when configuring a device. Configuring a device using an operator account has limitations such as, the need to exit then re-launch the EMS software for the changes to take effect.

4.2.6 Selecting the Device to Manage

The Agilis EMS Software can be used to monitor and control a wide range of Agilis products (BUC, MBUC, iBUC, SSPA, LNB, RCU, AUC, SPT and OHT). The Low Power Compact C-Band BUC is under the BUC category.

Before configuring a device, the user must first identify the COM Port assigned to the Agilis device. To identify the COM Port, follow these steps:

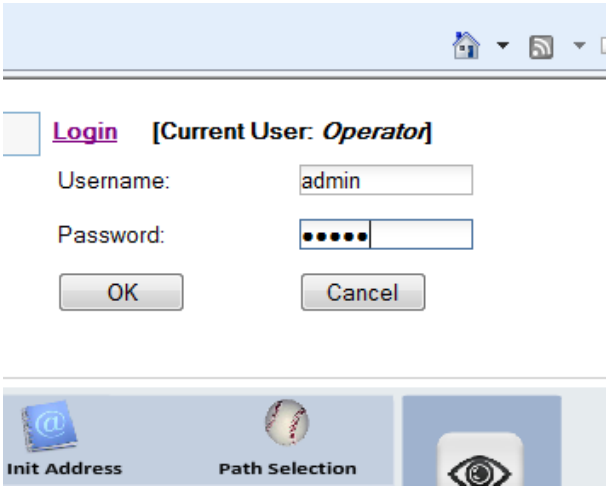
Step 1 Right click '**Computer**', and select '**Properties**'.

Step 2 Click **'Device Manager'**.

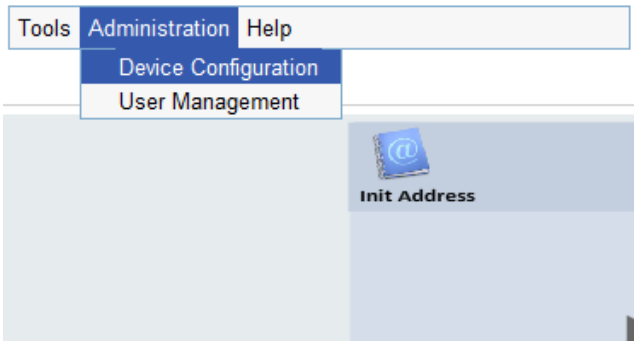
Step 3 Double-click '**Ports (COM & LPT)**' and take note of the Port number assigned to the device.

4.2.7 Configuring a Standalone BUC

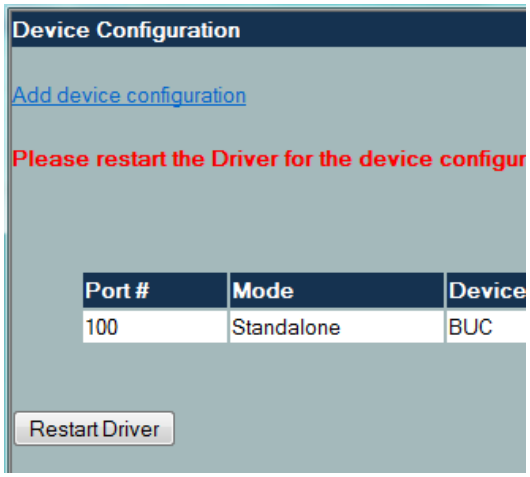
1. Login as an '**admin'**. The default password is '**admin**'.



2. Click '**Device Configuration**' under the Administration option in the Menu Bar.



3. Click on the '**Add device configuration**' option in the Device Configuration window.



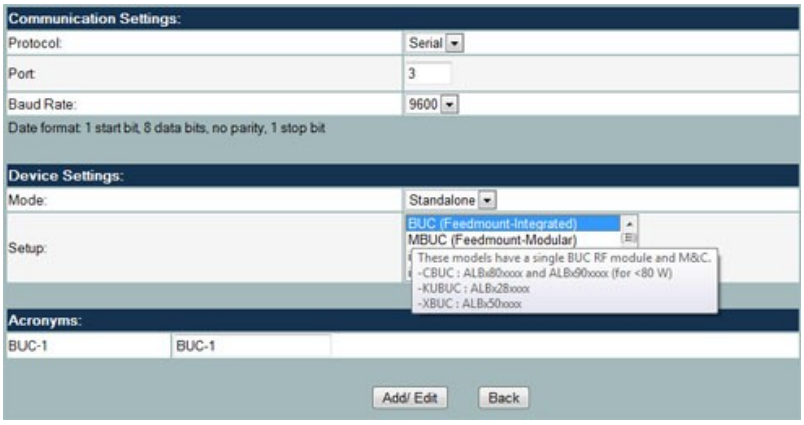
4. Under **Communication Settings**.

   For this example, the Protocol used is '**Serial**', the COM Port assigned is **3** and the Baud Rate is **9600**.

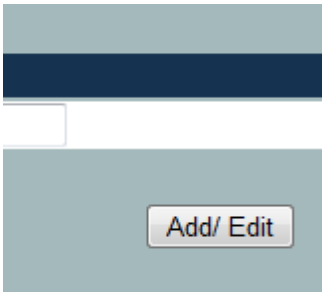
   Under **Device Settings**.

   For this example, the Mode selected is '**Standalone**' and the device selected on the Setup list is '**BUC (Feedmount-Integrated)**'.

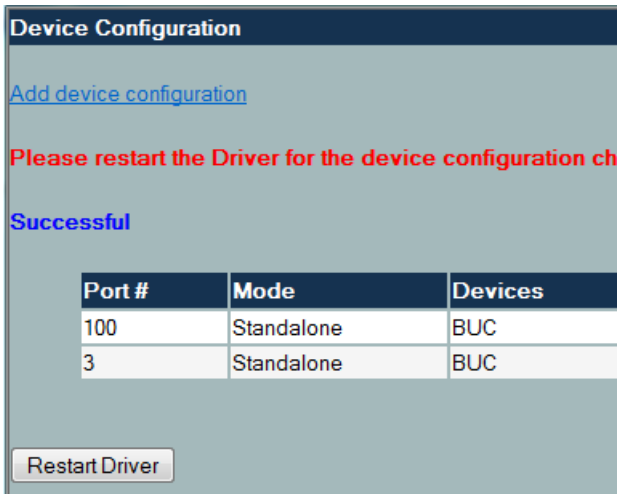
   The '**Acronyms**' used in this example is the default '**BUC-1**'.



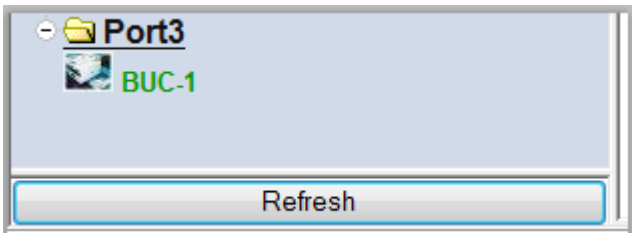
5. Click '**Add/Edit**' button.



6. Click '**Restart Driver**' for the changes to take effect.



7. Click '**Refresh**' to refresh the display on the Agilis EMS main window. The Tree Menu should display the newly configured device along with the port number.



8. The block diagram of the newly configured device will now be displayed on the Agilis EMS main window.

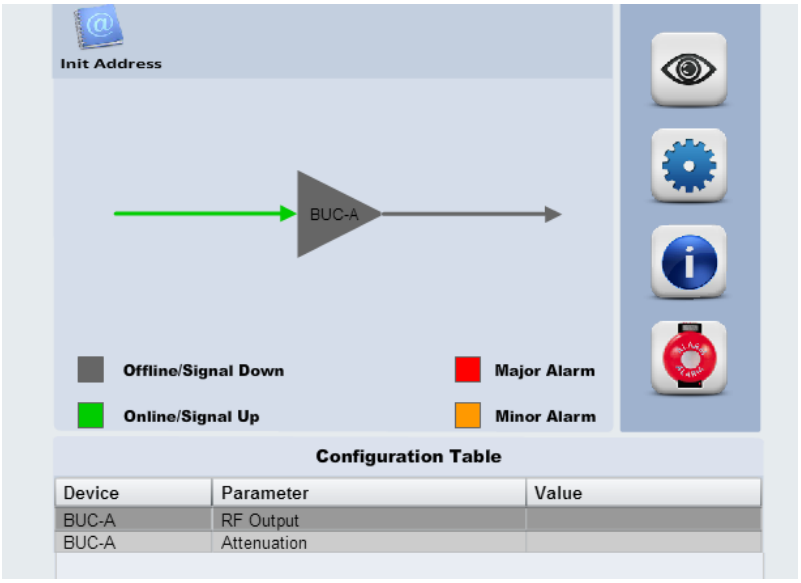


Figure 4.4 1mW C-BUC Block Diagram in Agilis EMS

4.2.8 Modifying BUC Configuration Parameters

Click on the **[Configuration]** icon from the control panel to set the BUC device configuration parameters.

📖 **Note:** Configuration parameters are subjective to equipment type. For the 1mW C-BUC, the configurable parameters are the **RF Output** and **Attenuation**.

Table 4-3 Device Configuration options

BUC Parameter	Available Editing Options	Description
RF Output	On, Off	Select to enable or disable the RF output power.
Attenuation	0-30dB by 0.5dB step	Set the user attenuation.

EXAMPLE: ENABLE/ DISABLE THE RF OUTPUT

To enable or disable the RF Output power, perform these steps:

1. Click the box beside the 'RF Output' parameter; it is found under the 'Value' column. A new window pop-up window appears where the user can select the desired value.

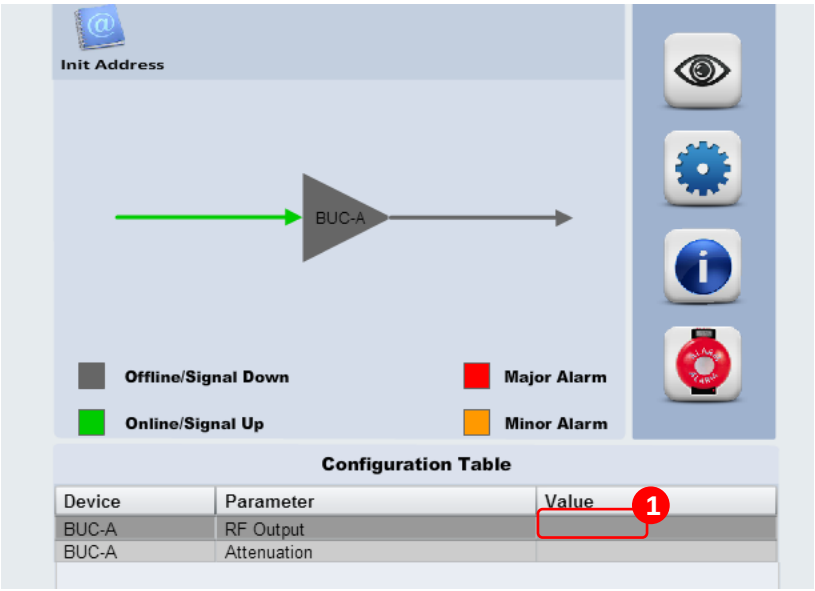


Figure 4.5 Configuration button

2. Select 'On' to enable RF Output or 'Off' to disable it.
3. Click **OK**.

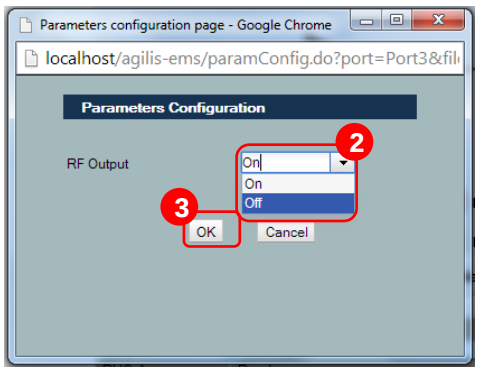


Figure 4.6 Configuring Parameter

EXAMPLE: SET THE ATTENUATION

To set the attenuation of the BUC, perform these steps:

1. Click the box beside the 'Attenuation' parameter; it is found under the 'Value' column. A new window pop-up window appears where the user can enter the desired value.

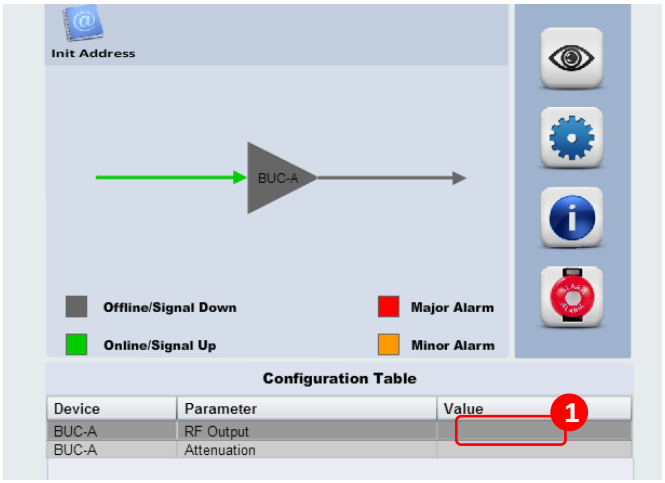


Figure 4.7 Configuration button

2. Type the new value of the Attenuation parameter.
3. Click **OK**.

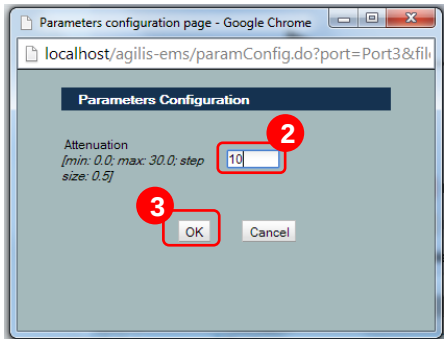


Figure 4.8 Configuring Attenuation

4.2.9 Device Status

Click the **[Device Status]** button to view the status of the C-BUC operating parameters such as Output Power level, Input Power level, and Temperature.

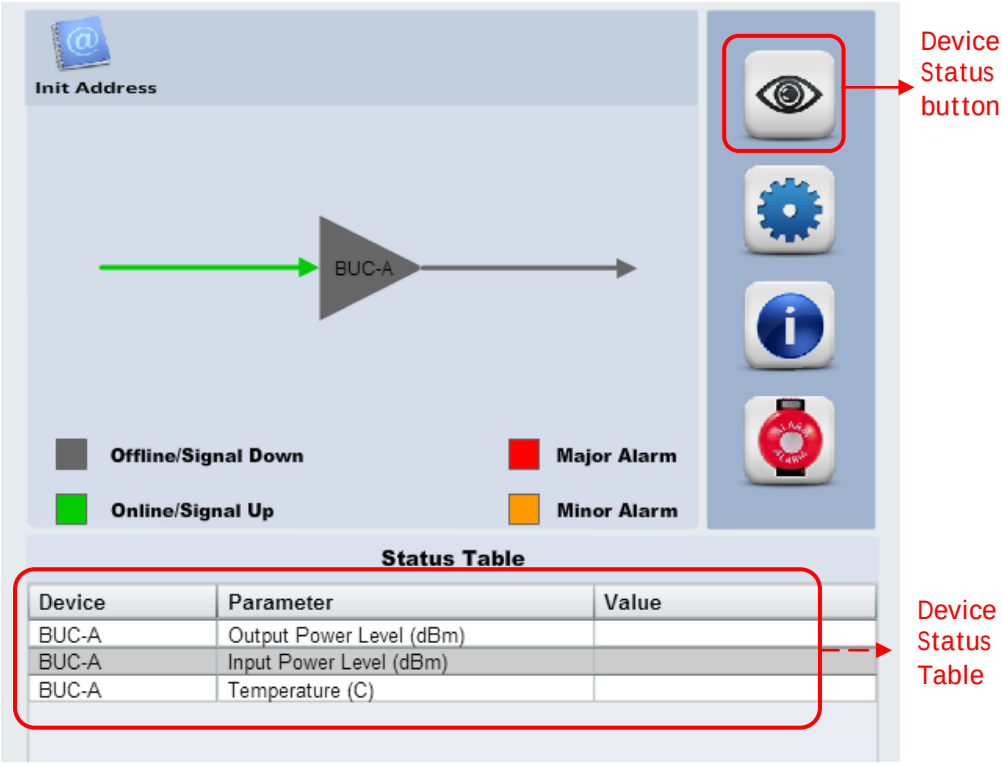


Figure 4.9 Device Status Screen

The Device Status screen automatically refreshes every 500ms to provide an updated summary of the C-BUC's operating parameters. You can also click the "**Refresh Status"** button at the bottom of the screen to manually refresh the page.

4.2.10 Device Information

Click the **[Device Information]** button to view the BUC's hardware information.

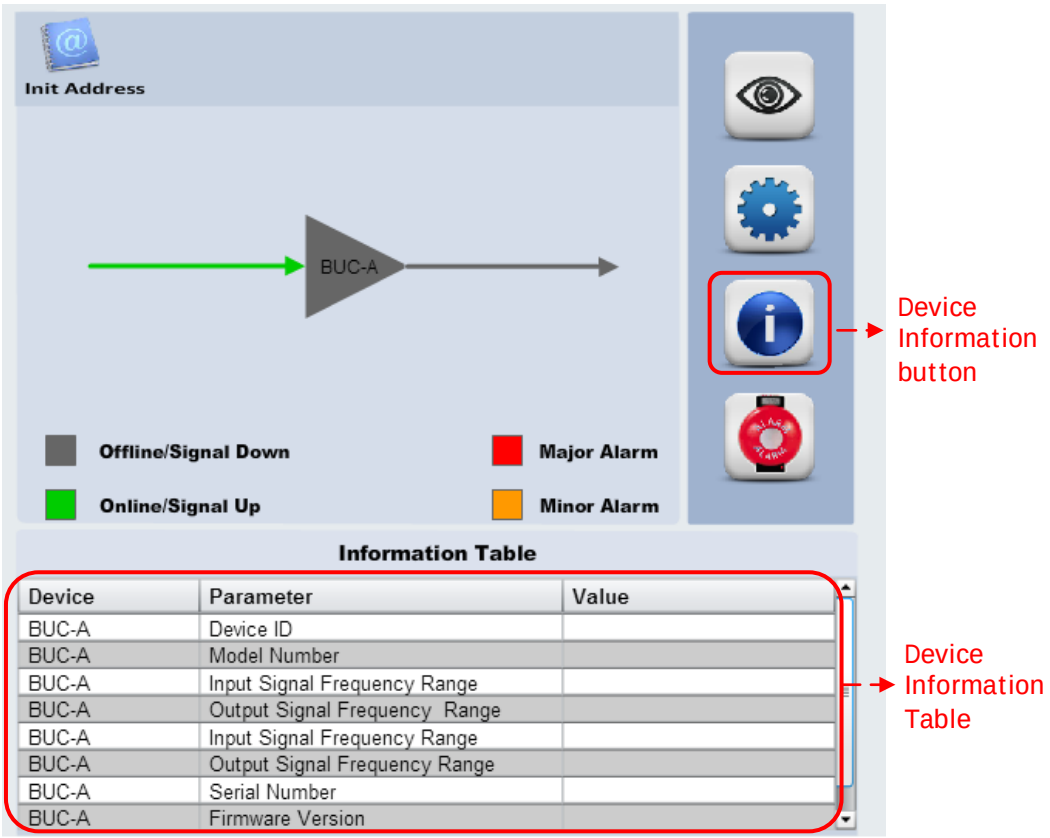


Figure 4.10 Device Information screen

The Device Information screen displays the C-BUC's device information such as Device ID, model number, input frequency range, output frequency range, serial number, firmware version, the SSPA's firmware version and the BUC family.

4.2.11 Device Alarms

Click the **[Device Alarms]** button to display the alarm statuses of the Low Power C-BUC.

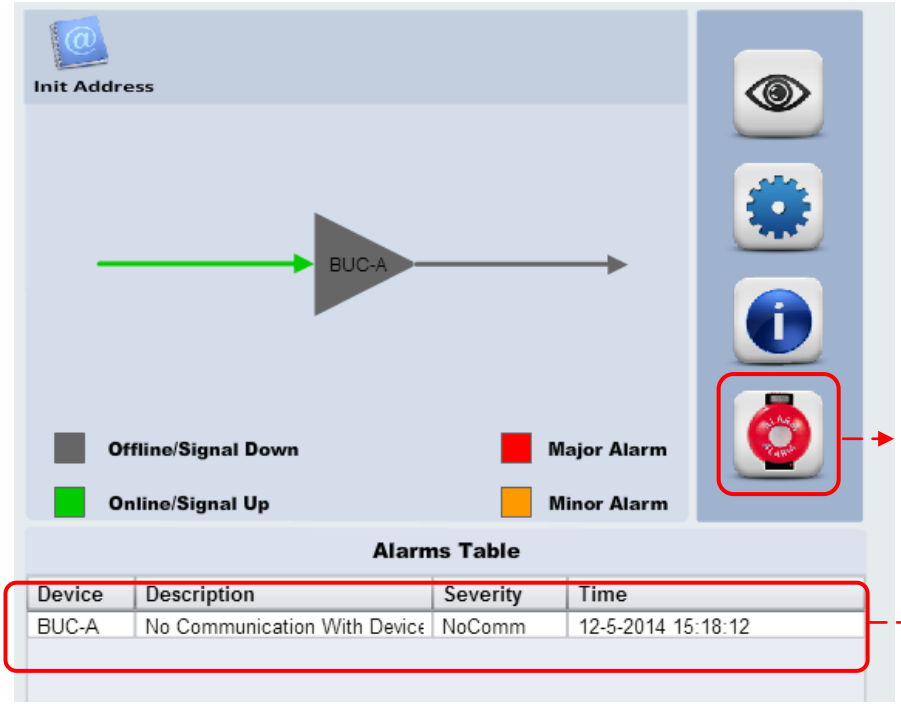


Figure 4.11 Device Alarms screen

The Device Alarms screen displays a list of alarms and their corresponding status related to the Ku-BUC operations.

Each alarm can display one of four colour states.

- **Green:** Indicates that there is no alarm for the corresponding status.
- **Red:** Indicates a major alarm. Corrective action should be taken immediately.
- **Amber:** Indicates a minor alarm. Correction action should be taken if necessary.
- **Grey:** Indicates that this status is not applicable for the BUC being monitored.

This screen automatically refreshes every 500ms to provide an updated summary of the BUC's operating parameters. You can also click **"Refresh Status"** at the bottom of the screen to manually refresh the page.

4.2.12 Tools (Chart, Debug, and Alarm Report)

The Agilis EMS software provides tools that enable you to monitor and debug the performance of your BUC through the Chart, Debug Tools, and Alarm Report options.

ABOUT THE DEVICE TOOLS OPTIONS

- **Chart**

  The Chart tool enables you to visually monitor the real-time values of the Converter's various parameters such as Temperature, Input Power Level, and so forth. The data can be exported as an Excel spreadsheet file and can also be printed.

- **Debug**

  The Debug Tool enables you to identify existing issues in the BUC. To start debugging, press the **Start** button. The details of the debugging process are then displayed on the screen as shown below.

  🕮 **Note:** Make sure to stop the debugging process before you close the Debug Tools page.

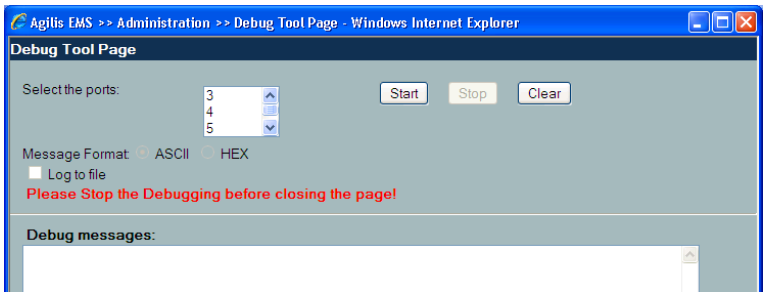


Figure 4.12 Debug Tool screen

- **Alarm Report**

  The Alarm report provides detailed information on the device alarms statuses. Selecting the **Tools→Alarm Report** menu option pops up an Excel spreadsheet file that you can save on your local drive.

4.3 Monitor & Control via HTTP (Web)

If you have purchased the optional Ethernet M&C component, you can monitor and manage the BUC from your PC by simply using a standard web browser.

The new generation of devices from Agilis provides the capability to monitor and control the device through a ubiquitous web browser available on any PC. This simple interface offers a very user-friendly mechanism to maintain and configure a device for any system configuration and settings.

At the heart of the device is an embedded http web server. It is a software component that implements the HTTP protocol and allows any web browser to access information from the device. This architecture provides the following benefits:

- It provides a thin-client interface for a traditional application and any application running the http protocol.
- It provides support for http protocol for the distribution and acquisition of information to be displayed in the regular interface — possibly a web service, and possibly using XML as the data format.
- HTTP is a well-studied cross-platform protocol and there are mature implementations freely available. It is seldom blocked by firewalls and intranet routers.
- HTTP clients (e.g. web browsers) are readily available with all modern computers.

4.3.1 Connecting the PC to the Converter

To monitor and control the BUC using the web interface via an Ethernet connection, connect your PC LAN port to the BUC's RJ45. A DB9 to RJ45 converter may be provided by Agilis for this connection (P/N: 2502041166).

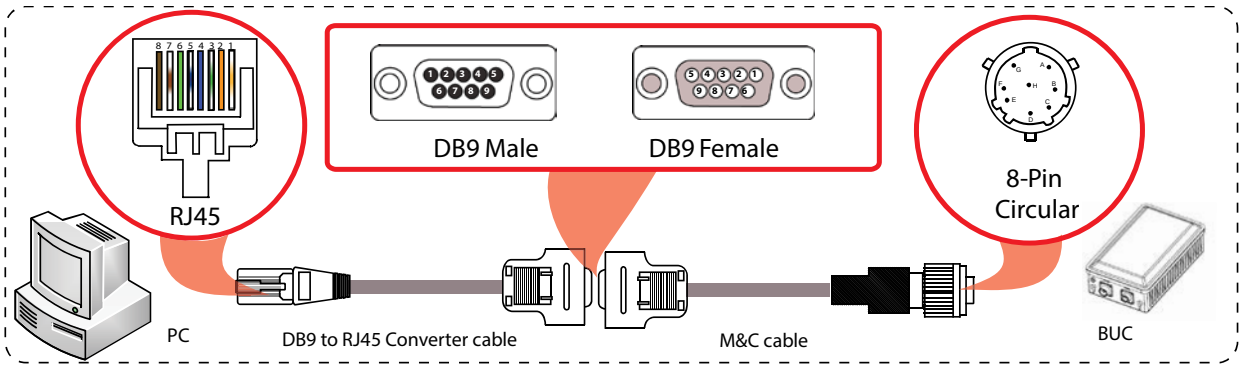


Figure 4.13 Connecting via RJ45

Table 4-4 Cable pin-out configuration

RJ45 Converter Cable			RS485 Cable	
RJ45	**DB9 Male**	**Signal Details**	**DB9 Female**	**Circular**
Pin 1	Pin 6	TX +	Pin 6	Pin A
Pin 2	Pin 7	TX -	Pin 7	Pin C
Pin 3	Pin 8	RX+	Pin 8	Pin G
Pin 6	Pin 9	RX-	Pin 9	Pin H

4.3.2 Connecting to the Web Interface

Once your BUC is physically connected to the PC, follow the procedure below to view the monitoring interface.

Step 1 Setup a static IP address for your LAN connection.

1. Navigate to your LAN connection properties. If you are using Windows 7, this is located in the "Network and Sharing Center" window. If you are using any other Windows system, please navigate to the "Network Connections" window. Both windows can be accessed via your PC's "Control Panel".
2. Click the network connection corresponding to the Ethernet port that the BUC is connected to and open the "Properties" window.
3. Scroll to the "**Internet Protocol (TCP/IP)**" option and click the **[Properties]** button. This will open the "Internet Protocol (TCP/IP) Properties" dialog window.
4. Here, select **Use the following IP address** and configure as follows:

   IP Address: 192.168.1.10

   Subnet mask: 255.255.255.0

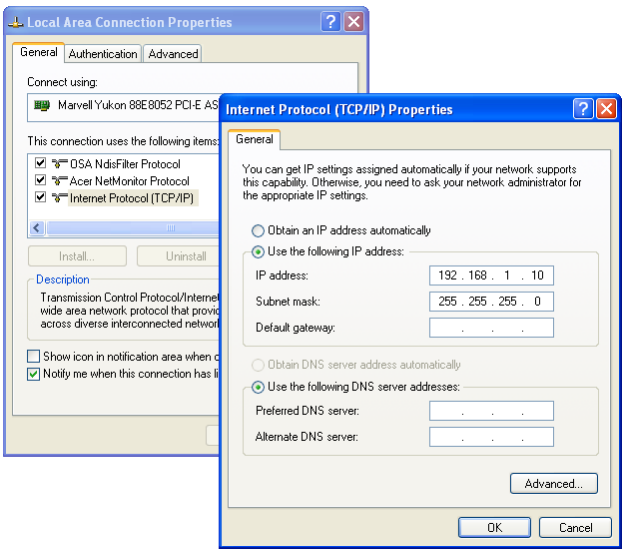


Figure 4.14 Configuring static IP

5. Click [OK] and exit both properties window.

Step 2 Activate your Microsoft Internet Explorer web browser.

🕮 Note: The BUC's HTTP module is designed to work in Internet Explorer. If you are using any other web browser, alignments may be different and some functions may not work properly.

Step 3 Disable proxy server on the web browser.

1. Select "Tools > Internet Options" from your menu bar.

2. Click the "Connections" tab. At the bottom of this window, click the [LAN Settings] button.

3. In the new dialog window that appears, ensure that the "Proxy Server" checkbox is unchecked.

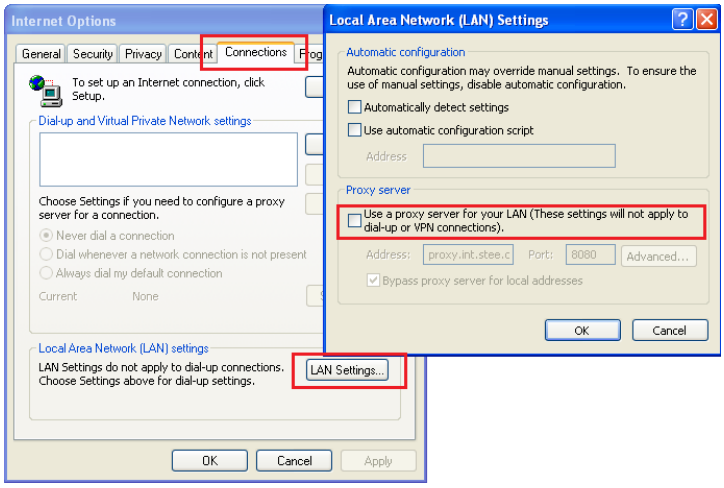


Figure 4.15 Disable proxy server

4. Click [OK] to exit the screen.

Step 4 In the address bar, enter the BUC's access IP address. The BUC's default IP address is 192.168.1.1. A Welcome page similar to the one below should display.

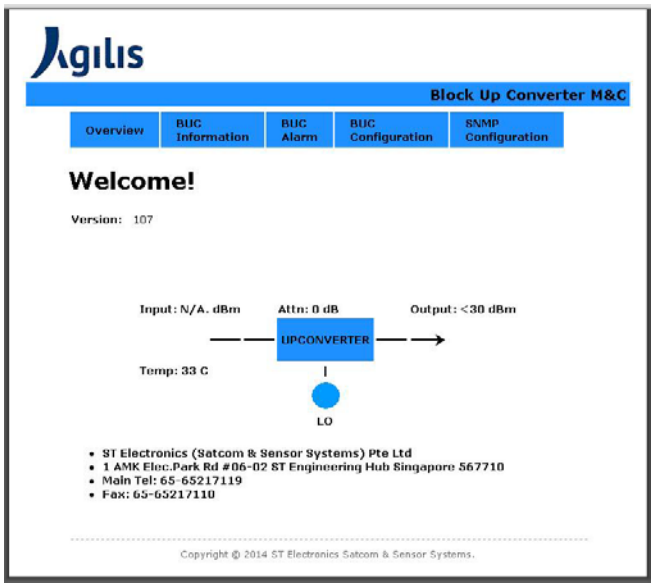


Figure 4.16 BUC web configuration interface

4.3.3 BUC Status Overview

Click the **[Overview]** menu button to view an overview of the BUC operating status as shown in the following screenshot. The same page displays during initial start-up of the HTTP/ Web interface.

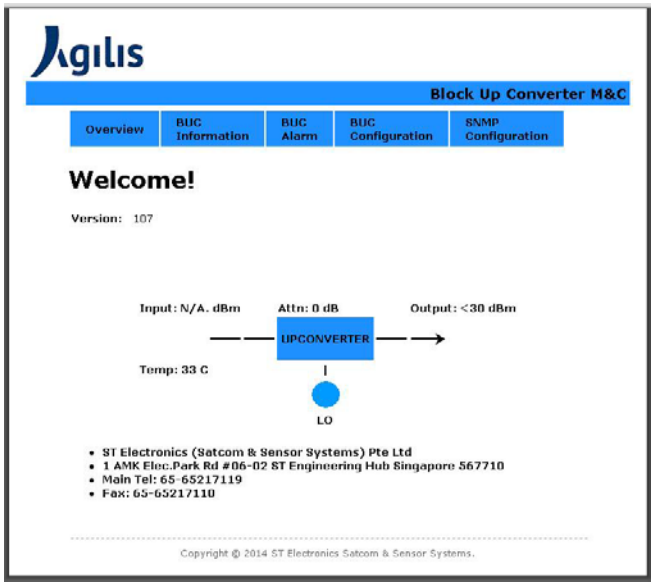


Figure 4.17 BUC Overview information screen

The BUC Overview screen shows the status of the BUC operating parameters such as Input Power level, Output Power level, and Temperature that are illustrated through a block diagram.

This screen automatically refreshes every 500ms to provide an updated status of the BUC's operating parameters.

4.3.4 BUC Information

Click **[BUC Information]** to view information about the BUC such as hardware information, network configurations, and the status of the BUC operating parameters.

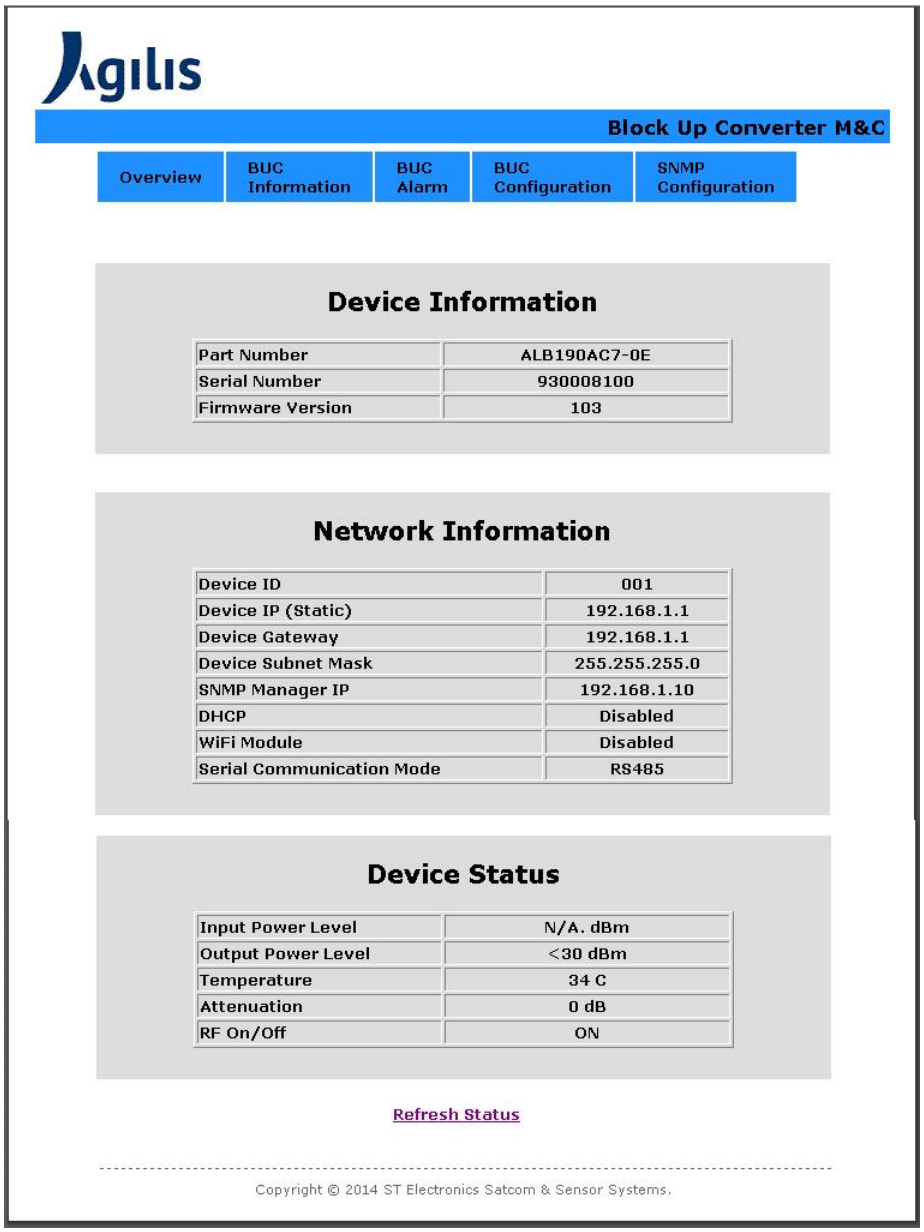


Figure 4.18 BUC Information web page

The BUC Information screen includes three sets of information.

- **Device Information**

  This panel displays information such as the BUC part number, serial number, and the firmware version.

- **Network Information**

  This panel defines the network configurations of the BUC such as Device ID, Device IP (Static), Device Gateway, Device Subnet Mask, SNMP Manager IP, DHCP, WIFi Module, and the Serial Communication Mode used to connect to the PC.

- **Device Status**

  The Device Status lists the status of the BUC operating parameters such as Input Power Level, Temperature, Attenuation, and the RF Output enable/ disable setting.

This screen automatically refreshes every 500ms to provide an updated status of the BUC's operating parameters. You can also click **"Refresh Status"** at the bottom of the screen to manually refresh the page.

4.3.5 BUC Alarms

To display all the alarm status of the BUC, click **[BUC Alarm]** from the top menu.

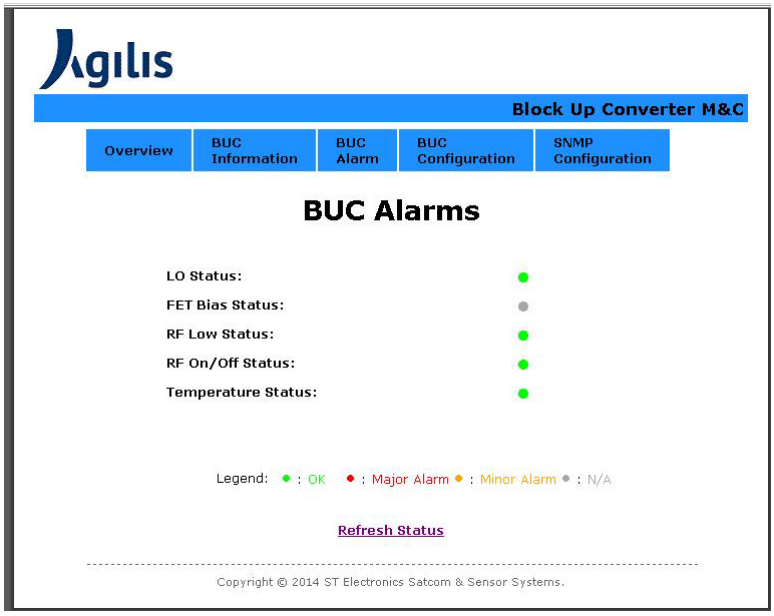


Figure 4.19 BUC alarm status information

The BUC Alarm screen displays the alarm condition of the BUC operating parameters such as RF LO status, FET Bias Status, RF Low Status, RF Output Status, and Temperature Status. The alarms are categorized as major or minor.

Each alarm can display one of four colour states.

- Green: Indicates that there is no alarm for the corresponding status.
- Red: Indicates a major alarm. Corrective action should be taken immediately.
- Amber: Indicates a minor alarm. Correction action should be taken if necessary.
- Grey: Indicates that this status is not applicable for the BUC being monitored.

This screen automatically refreshes every 500ms to provide an updated summary of the BUC's alarms. You can also click **"Refresh Status"** at the bottom of the screen to manually refresh the page.

4.3.6 Configuring the BUC

You must login to edit any configuration of the BUC via this HTTP interface. Click **[BUC Configuration]** and the login window will appear. Enter the login name and password and click **[OK]** to enter the configuration screen.

🕮**Note:** The factory default login name and password is "**admin**" and "**admin**" respectively.

🕮 **Note:** Both the **"Device Configuration"** and **"SNMP Configuration"** screens can only be accessed after logging in. Access to both screens is maintained after logging in until the browser is closed.

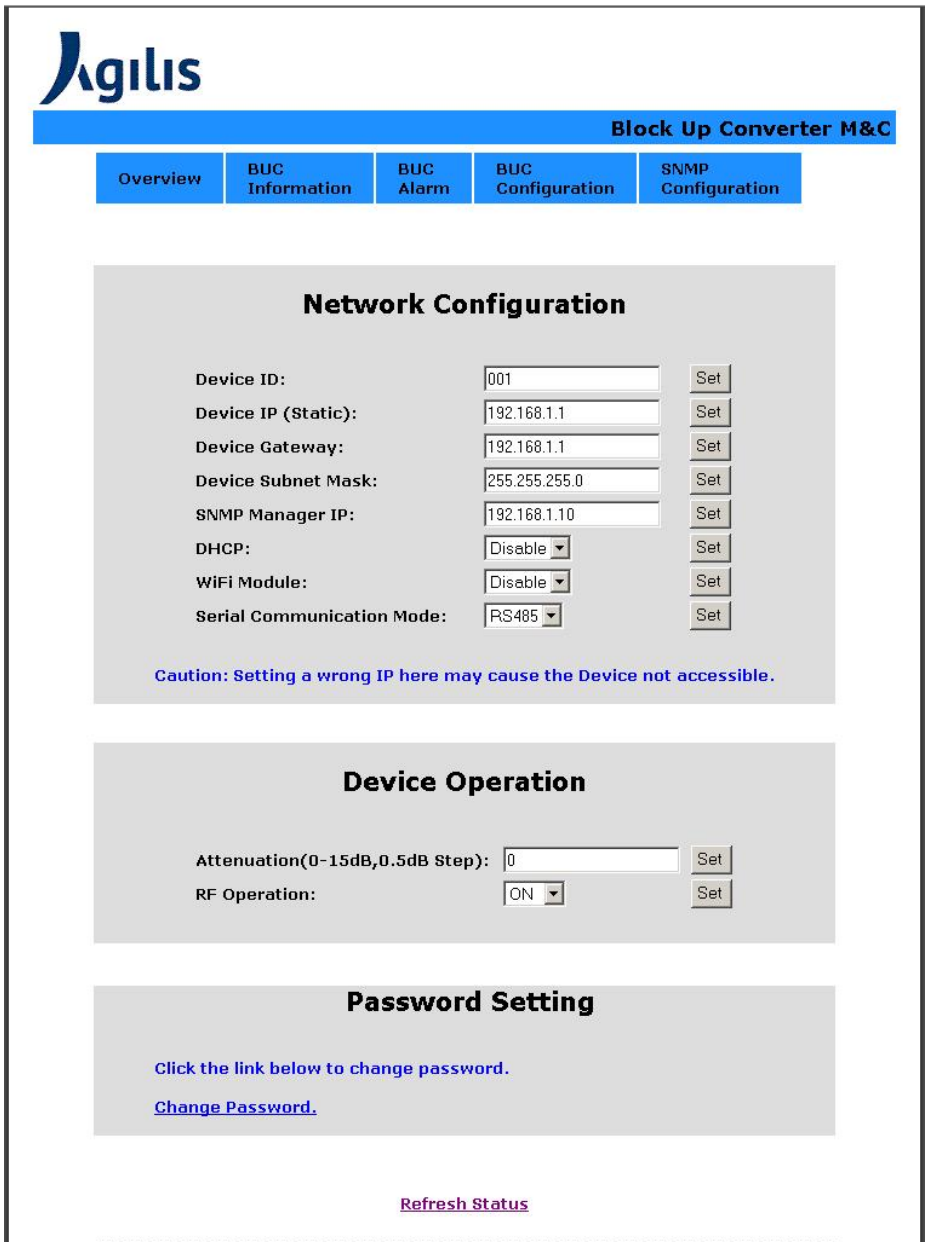


Figure 4.20 Device Configuration screen

The BUC Configuration screen includes three sets of configurations - "Network Configuration", "Device Operation", and "Password Setting".

MODIFYING BUC NETWORK SETTINGS

"Network Configuration" allows you to configure the BUC network information including the Device ID, Device IP (Static), Device Gateway, Device Subnet Mask, SNMP Manager IP, DHCP, WiFi module, and Serial Communication Mode.

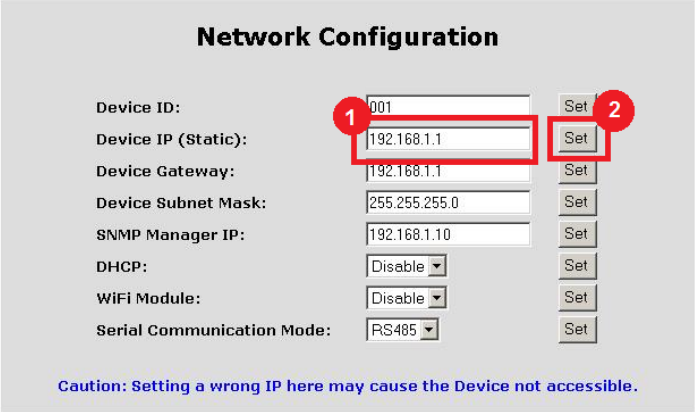
Using this panel, you can specify the IP address of the SNMP Manager that communicates with this BUC, enable or disable DHCP setting, and select the Serial Communication Mode used to connect to the PC.

WARNING: Enabling the DHCP requires power cycle of the unit. When DHCP is disabled, the unit is restored to its old static IP.

EXAMPLE: CHANGE THE DEVICE IP ADDRESS

1. To modify the Device IP address, enter the desired value into the textbox beside the 'Device IP (Static)' field.

2. Click the corresponding **[Set]** button.



WARNING: Setting a wrong IP in Network Configuration may cause the Device to be not accessible.

MODIFYING THE BUC OPERATION PARAMETERS

The "Device Operation" panel allows you to configure the BUC operating parameters such as RF Output, and Attenuation.

EXAMPLE: MODIFY THE RF OUTPUT SETTING

The following example shows how to edit the RF Operation by using the dropdown menu. To change the RF Operation settings, perform these steps:

1. Click the dropdown menu beside the RF Operation field.
2. Select the options (On/ Off) from the dropdown menu.
3. Click the corresponding **[Set]** button.

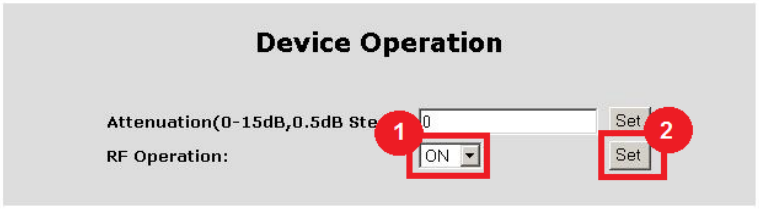


Figure 4.21 RF Output dropdown menu

CHANGING THE PASSWORD

"Password Setting" allows you to change your current password.

To change password, click on the Change Password link and fill out the required information.

4.3.7 Setting Up SNMP Parameters

"SNMP Configuration" lets you specify how the BUC communicates with the SNMP Manager. If you have yet to login to the HTTP interface, you will be prompted to do so when clicking the "SNMP Configuration" menu option. The factory default username and password is "admin", "admin" respectively.

🕮 **Note:** Both the "Device Configuration" and "SNMP Configuration" screens can only be accessed after logging in. Access to both screens is maintained after logging in until the browser is closed.

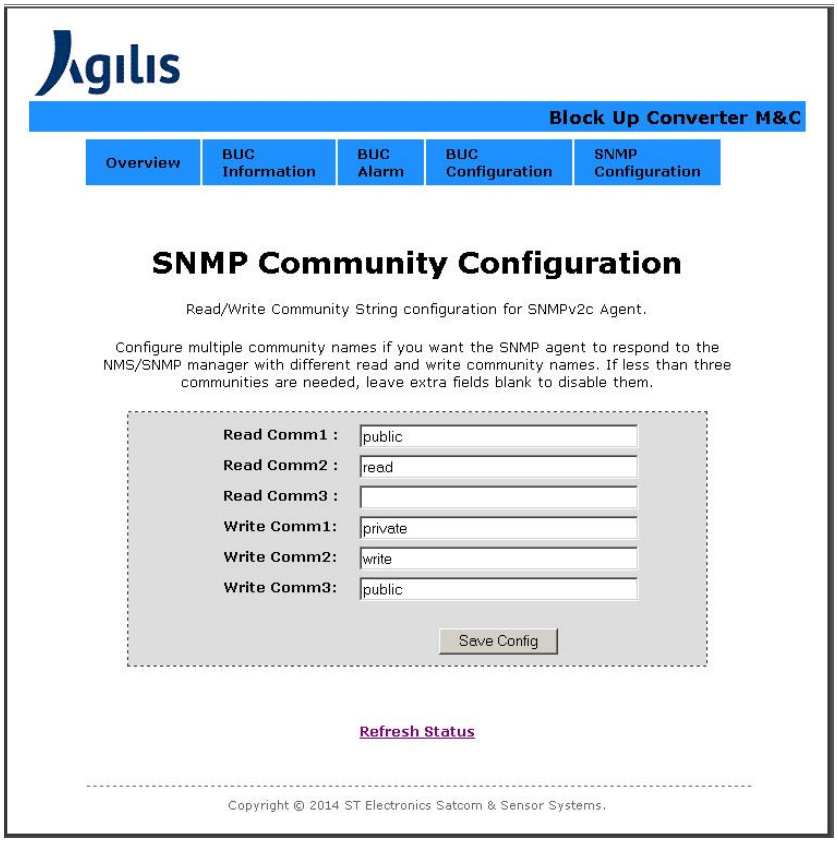


Figure 4.22 SNMP configuration settings

4.4 Monitor & Control via SNMP

Simple Network Management Protocol (SNMP) provides a framework for the definition of management information and the exchange of that information. A SNMP manager is a software module that manages part or all of the system configurations while an agent is a software module in the unit that is being managed. Transfer of information can be initiated by both the manager (via polling) and the agent (via SNMP Trap).

By default, the manager initiates requests and receives responses via port161. The agent sends SNMP Trap messages via port 162.

A database describing the unit's application parameters is stored in the SNMP agent. This SNMP Management Information Base (MIB) database is used to interpret the signals requested and received between the manager and agent. The database includes both a standard set of values common to hardware nodes on a network and a private set of values that is unique to the specific unit.

Object Identifiers (OID) are a series of numbers that uniquely identify variable to an SNMP agent. OIDs are arranged in a hierarchical tree structure.

The figure below shows the categorization of BUC parameters that are used in defining the MIBs for SNMP enabled Agilis products. These categories help define various device parameters very distinctly and help for easy access and navigation when using any manager.

🕮 **Note:** This figure shows the full set of categories and does not apply to all Agilis products. These categories are closely used in defining the product MIBS for all the SNMP enabled devices. The set of parameters that are available in each Agilis product will differ.

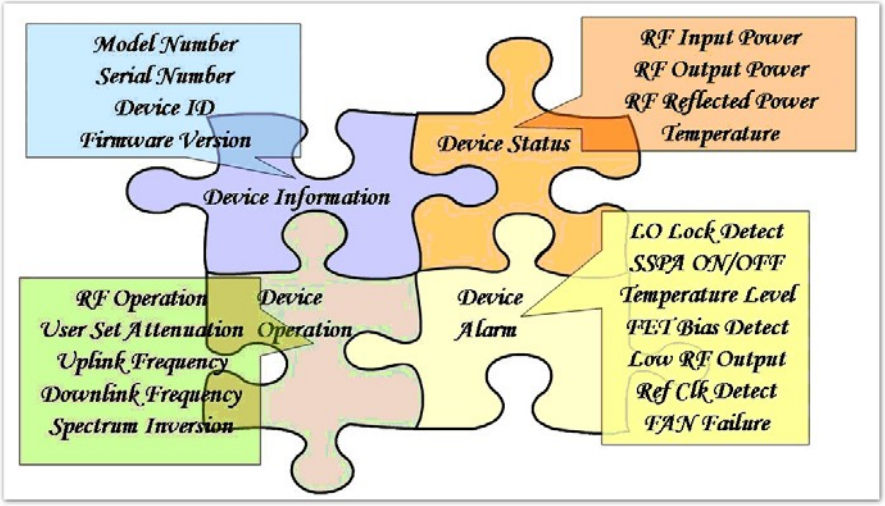


Figure 4.23 SNMP MIB categories

4.4.2 Connecting PC to the Converter

If you have purchased the optional Ethernet M&C component, you can monitor and control the BUC using an SNMP manager via an Ethernet connection. Connect your PC LAN port to the BUC RJ45 port using either a cross LAN cable or an Ethernet hub. A DB9 to RJ45 converter may be provided by Agilis for this connection (P/N: 2502041166).

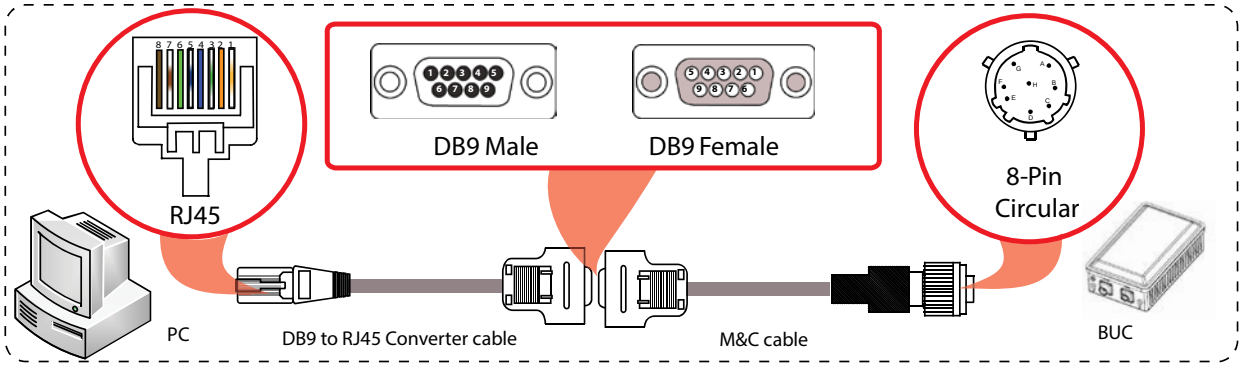


Figure 4.24 Connecting via RJ45

Table 4-5 Cable pin-out configuration

RJ45 Converter Cable			RS485 Cable	
RJ45	**DB9 Male**	**Signal Details**	**DB9 Female**	**Circular**
Pin 1	Pin 6	TX +	Pin 6	Pin A
Pin 2	Pin 7	TX -	Pin 7	Pin C
Pin 3	Pin 8	RX+	Pin 8	Pin G
Pin 6	Pin 9	RX-	Pin 9	Pin H

4.4.3 Connecting to the SNMP Interface

Once your BUC is physically connected to the PC, follow the procedure below to connect the SNMP agent module to a SNMP manager in your PC.

Step 1 Activate your SNMP manager. Agilis products will work with most standard SNMP managers available in the market.

🕮 **Note:** For the purpose of this manual, all screenshots in this section are made using the SNMP Manager from iReasoning. You can download or purchase any standard third party SNMP Manager software and install it into your PC.

Step 2 In the SNMP manager, enter the BUC's access IP address. The following show the default configuration:

Agent IP: 192.168.1.1

Subnet Mask: 255.255.255.0

SNMP Manager: 192.168.1.10

Step 3 Insert the CD included in your package into your PC's disc drive and load the MIB definition file ("AGILIS-PROD-XXX-MIB.mib") into your SNMP manager.

You can also download the MIB definition file from our website at www.agilissatcom.com.

Once the file has been loaded, a tree structure should be displayed in your manager as shown below.

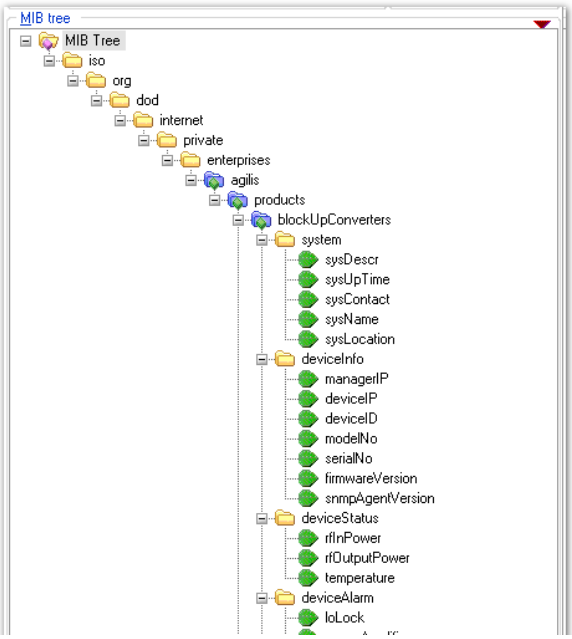


Figure 4.25 Example MIB Tree

4.4.4 Managing the Converter via SNMP Manager

NAVIGATING THE MIB TREE

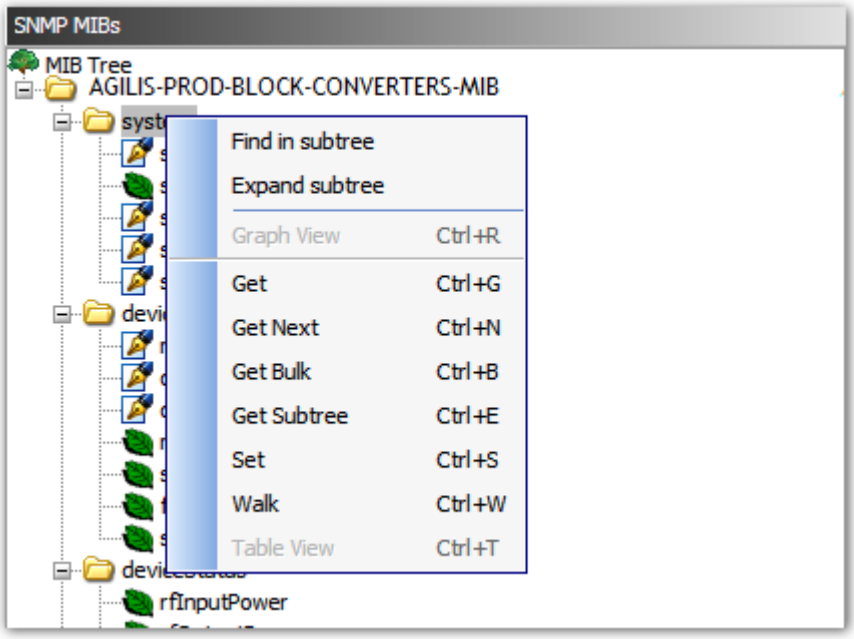


Figure 4.26 MIB tree

Each item in the tree is called a node. A parent or root node can be expanded into branches. You can view each branch by clicking the +/- icons in the tree. Each branch eventually terminates at leaf nodes.

To search for a specific node within a branch, right-click on the parent node of that branch and select “Search” and type the name of the node to search for.

You can expand or collapse the entire tree or branch by right-clicking on the parent node and selecting the “Expand subtree” or “Collapse subtree” option.

UNDERSTANDING SNMP OPERATIONS

The full set of SNMP commands that can be initiated from the SNMP manager is explained in the table below.

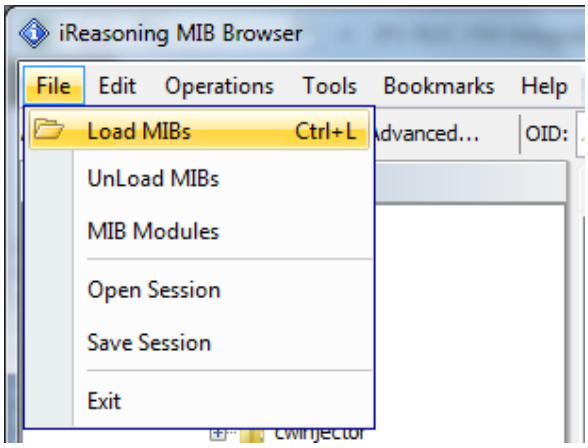
To execute a command on any node in the tree, simply select the node and right-click. From the menu that appears, select the command to execute. Note that not all commands are available for every object in the tree.

SNMP Command	Explanation
GET	Used to obtain a single piece of information from the BUC such as the BUC ID etc.
GET NEXT	Used to obtain two pieces of information from the selected object and the next object.
GET BULK	Used to obtain multiple pieces of information from the BUC at once.

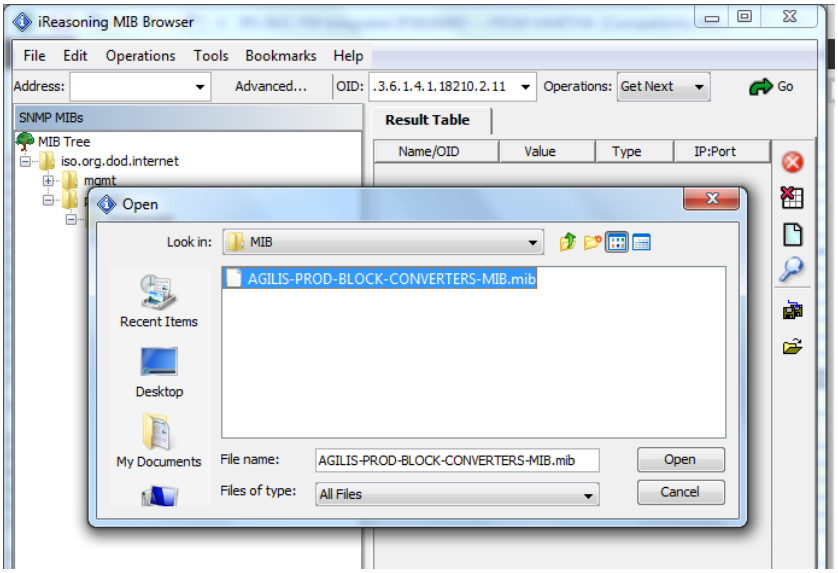
SNMP Command	Explanation
GET SUBTREE	Used to poll for information corresponding to all objects within the subtree.
SET	Used to configure a specific parameter in the BUC. Note that this command will only be available for configurable parameters.
WALK	Used to poll for all data from the objects within the tree.
TABLE VIEW	Used to poll for and view data table of an object. Note that this is only available if the selected object stores tabulated data.

USING THE MIB BROWSER

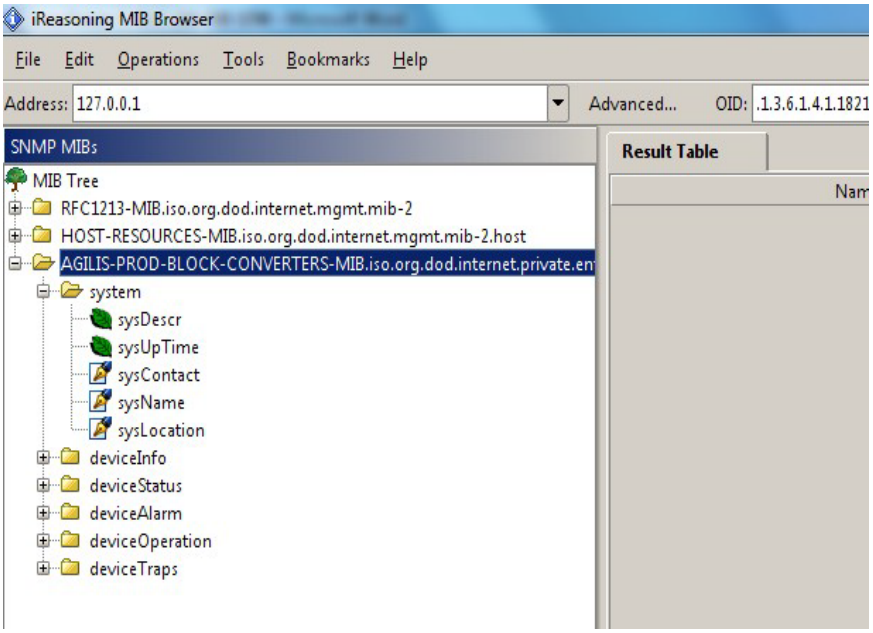
1. Open the MIB Browser. In this example, we use iReasoning MIB Browser to configure SNMP. Click File and select Load MIBs.



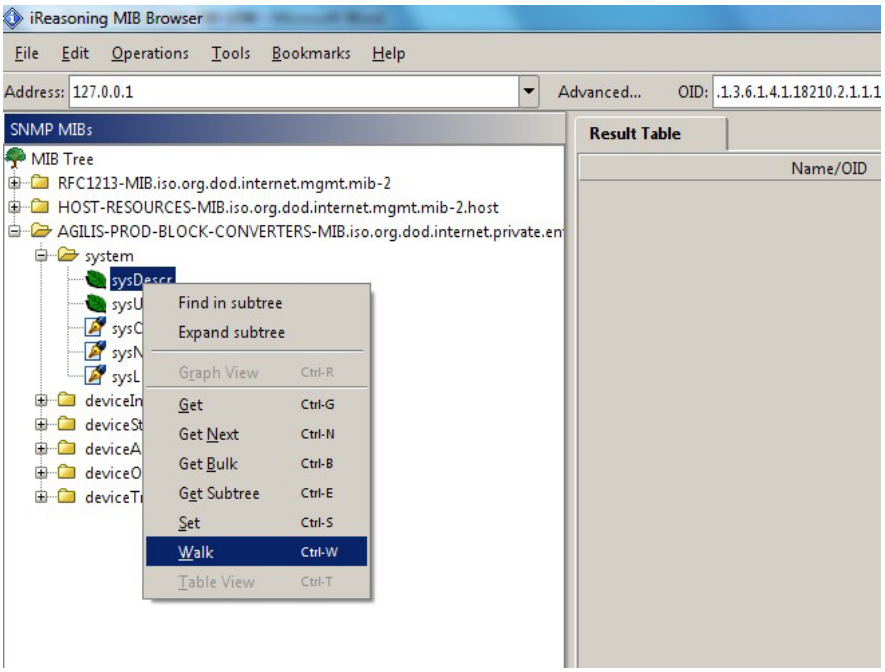
2. Once done, locate the MIB file in your system.



3. Once the MIB file is loaded, the SNMP MIB details will appear. Click on the folders to view more information.



4. Execute a command on any node in the tree. Right click on the node and select a command you want to execute. In this example, "Walk" is selected.



5. SNMP values will be retrieved once a command is selected. Below is an example once "Walk" is selected. Once "Walk" is selected, all nodes' information in the tree will be retrieved.

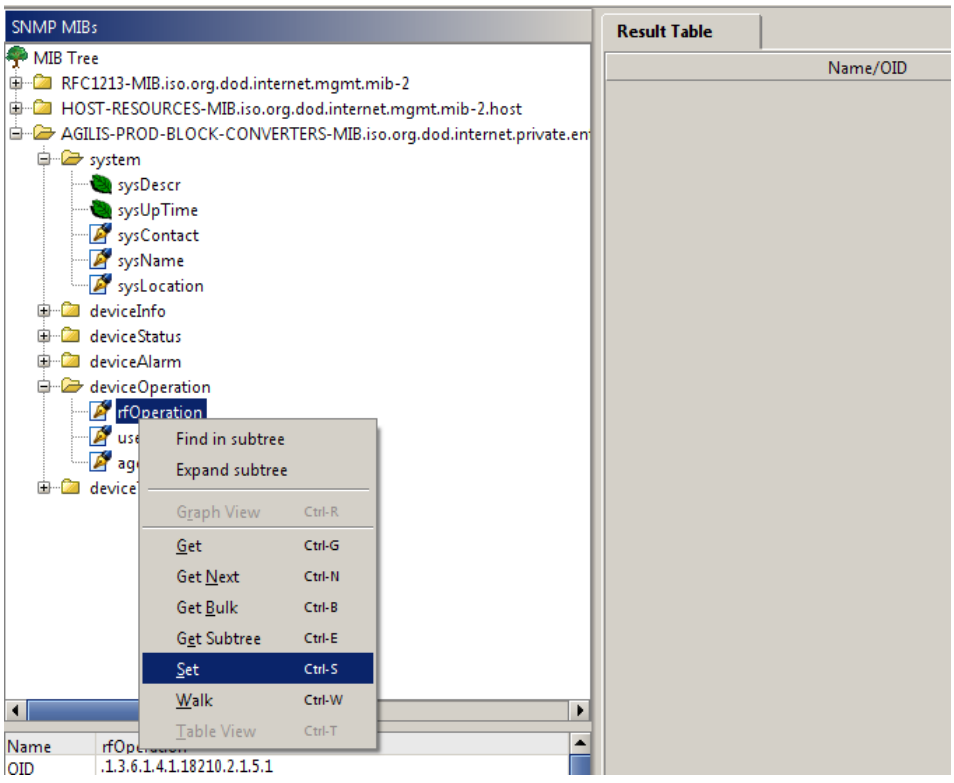
The figure below shows an example of the parameters retrieved by the "WALK" command.

Result Table

Name/OID	Value	Type
sysDescr.0	AGILIS INTEGRATED BUC	OctetString
sysUpTime.0		TimeTicks
sysContact.0	Customer-Service +65-65217959	OctetString
sysName.0	ALBX-SERIES INTEGRATED BUC	OctetString
sysLocation.0	ST ELECTRONICS, SINGAPORE	OctetString
managerIP.0		IpAddress
deviceIP.0		IpAddress
deviceID.0		OctetString
modelNo.0		OctetString
serialNo.0		OctetString
firmwareVersion.0		OctetString
snmpAgentVersion.0		OctetString
rfInputPower.0		OctetString
rfOutputPower.0		OctetString
temperature.0		OctetString
rfReflectedPower.0		OctetString
loLock.0		Integer
fetBias.0		Integer
reserved1.0		Integer
rfLow.0		Integer
powerAmplifier.0		Integer
tempLevel.0		Integer

Figure 4.27 SNMP "WALK"

6. To configure and update the SNMP values, right click on the nodes in deviceOperation folder and select "Set".



Chapter 5 Maintenance & Troubleshooting

This chapter details various system maintenance operations to help ensure that your system works under optimal conditions.

WARNING: Disconnect all power sources before performing any system maintenance and repair.

5.1 Preventative Maintenance

This section explains the various maintenance checks that should be routinely carried out to ensure that the system is working correctly and in optimal condition.

Ideally, you should perform a complete maintenance on the system at least twice a year and record all updates and changes made to each ODU "SETUP RECORD". Notify all users that may be affected of a system down time of roughly two hours prior to maintenance.

WARNING: Disconnect and re-connect cables during maintenance properly to avoid causing any damage to the cables that may result in intermittent problems in the future.

Connect the output interface of the equipment to a proper load.

5.1.1 Gains Testing

The test procedure is as follows:

Step 1 Look at the demodulator status (DEMODULATOR LOCK indicator on the modem) and check that is "LOCKED" to the receive signal.

Step 2 Check that the transmit and receive configurations on both the modem and the Converter complies with the SETUP RECORD. If there are any discrepancies, contact the personnel responsible for the previous record for clarifications before proceeding.

Step 3 Turn on the pure carrier of the modem and measure the power level using a spectrum analyzer.

Step 4 If your modem is connected to an AC power supply, measure the indoor AC power supply to the modem to check that the voltages are within the tolerance limits. You are recommended to use an Automatic Voltage Regulator if your power source falls outside of these limitations.

🕮 **Note:** The limit range will differ according to your modem's AC voltage requirements. Please use the table as a guideline only.

Table 5-1 AC power tolerance

Tolerance	X VAC 50 Hz, where X is the AC requirement of the device
Live – Neutral	X VAC ± 15%
Live – Earth	X VAC ± 15%
Neutral – Earth	< 5 VAC

Step 5 Check that all IFL and RF cables are labelled.

Step 6 Ensure that all cables are in good working condition by performing the following procedure:

1. Remove cables at both ends of the connection before taking measurements.
2. Using a mega ohm meter, measure both ends of the cables.

Step 7 Again using a mega ohm meter, measure the ground resistance of the antenna. This value should not be greater than 10Ω

Step 8 Reconnect the transmit cable to the modem and measure the power level of the pure carrier transmitted into the Converter's input port. Calculate the IFL loss and check that it is similar to the value recorded in the SETUP RECORD.

⚠ **WARNING:** Turn off the Converter and connect a power attenuator (30dB, >30W) to the RF OUT port of the BUC before step 8 below.

Step 9 Turn on the Converter and connect the IF IN cable. Record the RF OUT power level and calculate the uplink gain. Check that the resultant gain complies with both the SETUP RECORD and the gain setting on the Converter.

Step 10 Measure the power level and C/N_0 of the receive carrier under consideration at the Converter's RF OUT port. Check the readings against the SETUP RECORD. If there is a significant variation in the two, contact the transmit site for confirmation.

Step 11 Measure the level at the modem's IF input to determine the Rx IFL loss. Match this value against the SETUP RECORD.

5.1.2 Completing the Maintenance

Completing each maintenance service requires the following actions:

- Check the sealing on existing connections and re-seal if necessary.
- Tighten and re-seal all connections and important joints that were disconnected for maintenance.
- Check and ensure that all waveguide joints are properly equipped with a gasket and sealed.
- Cover all unused connectors with a cap and seal.
- Update the SETUP RECORD.

5.2 Understanding Faults in the BUC

The table below lists the faults that may arise in the BUC. The following information can be found in this table:

- Fault Indication: How do you tell that a fault has occurred?
- Possible Causes: What may have caused the fault and how do you check?
- Solution: How do you resolve the fault?

Table 5-2 Troubleshooting faults in the BUC

Fault Indication	Possible Causes	Solution
LED is off	BUC is not on	Turn on the AC power source connected to the power supply unit.
	Cables are loose	Hand-tighten all cable connections between the AC power source and the BUC.
	Power cables are faulty	Test the voltage at each end of the cables. Replace any faulty cables.
LO unlock	Circuit failure	Please contact Agilis for further support.
	10MHz reference power level might be low from the modem	Check 10MHz signal level from modem. It should be ± 5 dBm at L-Band input of the BUC.
LED is RED	LO unlock	Check 10MHz might be low from the modem
	SSPA is off	Check the M&C Software option to power ON the SSPA.
	Temperature alarm	Needs to cool down the unit. Also, check whether the fan is working or not.

Fault Indication	Possible Causes	Solution
No RF output power	BUC is overheated	RF output is automatically disabled if the BUC is overheated. Allow the unit to cool to a safe operating temperature before enabling RF.
	RF ON/OFF Enabled	Check the BUC settings using the M&C software and enable RF ("On").
	Internal modules failure	One or more of the internal modules, such as the power module, driver and internal RF circuit, have may have failed. Please contact Agilis for further support.
	LO unlock	Check 10MHz might be low from the modem
RF output power is low	Attenuation setting is too high	Check the attenuation setting using the M&C Software and adjust accordingly.
	L-Band power level might be very low to get rated power from BUC	Please contact Agilis for further support. Check the L-Band signal level (~-30dBm) from the modem.

5.3 Understanding Faults in Remote Management

The following table lists the errors that you may face when managing the BUC remotely via the Agilis EMS software.

Table 5-3 Troubleshooting errors in the Agilis EMS software

Fault Indication	Possible Causes	Solution
Agilis EMS is not starting	Installation was not done properly	Reinstall the application again as stated in this document
	Windows Firewall	Shut down the Windows Firewall service
	Port 80 is being utilized by another application	Shut down the application that is using port 80
Agilis EMS started but the flash images are not shown	Flash plug-in may be outdated	Reinstall Flash Player preferably from http://get.adobe.com/flashplayer/
Agilis EMS is not logging alarm details /analog parameters	MYSQL ODBC connecter is not installed/corrupted	Install the application from EMS CD (/3rd Party Software/mysql-connector-odbc-3.51.14-win32.exe)
PC is not showing the COM number	M&C cable driver is not installed	Install the drivers that came together with the purchased M&C cable (RS232 to USB or RS485 to USB)
M&C cable is connected and COM number is seen but still there's no communication	M&C cable could be faulty	Replace cable and try again
	Wrong M&C cable is used	Refer to the product manual and ensure that the pin configuration is correct i.e. RS232 or RS485
	For standalone mode, the address must be set to 'A'.	Start the application; click the Init Address button to set the device address to 'A'.
'Another instance of Agilis EMS is running' message is displayed when I try to start the application	Agilis EMS application is already started	Open IE and type http://localhost/agilis-ems in the URL
How do I find out the current version number?	NA	Start the application, click on Help, click on About Us
Equipment is not displaying its status properly (e.g. Status toggling online and offline in EV)	Equipment Initializing is not done	Start the application, click the Init Address button.
	Equipment Configuration could be wrong	Refer to the system manual to make sure the correct configuration is set.
System Slowing down	Analog and Alarm data is not cleared in the database	Purge the historical Analog and Alarm data in the database.

Appendix A Customer Service

Agilis provides a variety of after-sales services. This chapter explains some of the services offered including warranty information, the Return Material Authorization process, parts replacement etc.

A.1 Warranty Information

If the unit fails due to defects in materials or workmanship, Agilis will, at its sole discretion, repair or replace the defective parts, free of charge, within two years from the date of its shipment from the Agilis production factory.

Note that shipping cost to Agilis will not be covered under this warranty guarantee.

This warranty will be voided, freeing Agilis from any liability or obligation to the Purchaser with respect to the product in the following situations:

- The product has been damaged during shipment
- Failure caused by products not supplied by Agilis or its authorized contractors and agents.
- Failure caused by operation of the product outside of its published electrical and environmental specifications or any causes other than ordinary use.
- Water ingress due to improper installation.

A.2 Return Material Authorization (RMA)

PRE-RMA CHECKLIST

Shipping the unit to and from your supplier or the factory for repair is a costly and time consuming procedure that may cause disruption in your system for a prolonged period of time. Hence, please inspect your system thoroughly using the checklist below to help us determine if a return shipping is necessary.

Table A-1 Pre-RMA Request Checklist

Please check		
Product model / serial no:		
When did the unit fail:	☐ Initial startup ☐ Unit worked normally before failure	
Initial Fault Symptom:		
Consistent or intermittent fault	☐ Consistent ☐ Intermittent	
Duration of operation before the failure		
Are fans working normally?	☐ Yes ☐ No	
Is the airflow path blocked?	☐ Yes ☐ No	
10 MHz Ref. level at failure		
IF input level at failure		
Output power at failure		
LED status		
Is the device and setup properly grounded?	☐ Yes ☐ No	
Weather conditions just before failure	Air Temperature: _____ Heavy rain/snowfall/storms: _____	
AC Potential	Live – Neutral	
	Live – Ground	
	Neutral – Ground	
AC-DC converter working status		
Is the primary power source working and free of power spikes?	☐ Yes ☐ No	
Was there any recent power outages that affected the device?	☐ Yes ☐ No	

Please check	
Are connectors properly sealed and free from debris/water?	☐ Yes ☐ No
Replace the device with a working one (if available) and check if the system works.	☐ Works with the new device ☐ Does not work with the new device
Detail the diagnosis performed that localized the fault to the unit as the point of failure	

If you need to return the devices or any components to Agilis for repair, please contact Agilis to obtain a Return Material Authorization (RMA) number by filling in our RMA Request form. You can obtain this form via our website at www.agilissatcom.com. Once you receive a RMA number, carefully repack the unit and attach this number to the unit to be shipped to Agilis.

Agilis provides repair services for products under or out of warranty.

A.3 Additional Technical Support

If you require further technical support, please contact Agilis using the contact information below:

Address:	ST Electronics (Satcom & Sensor Systems) Pte Ltd. 6 Ang Mo Kio Electronics Park Road Singapore 567711
Service Hotline:	(+65) 6521 7959
Fax:	(+65) 6521 7333
Email:	techsvc_satcoms@stee.stengg.com

You can also visit www.agilissatcom.com for the addresses and contact information of our regional service centres.

Appendix B Unit Specifications

B.1 System Specification Tables

Table 5-4 Unit Specifications of ALB190 C-BUC

ALB190 Series Low Power C-BUC, Outdoor			
Frequency Range			
	Input (MHz)	Output (MHz)	Low LO (MHz)
Intelsat	950 to 1525	5850 to 6425	4900
ST-1 / Palapa C	1150 to 1450	6425 to 6725	5275
Insat	1100 to 1400	6725 to 7025	5625
Full C	950 to 1825	5850 to 6725	4900
Extended Full C	975 to 1200	5725 to 6725	4750
Extended Full C	950 to 1725	5725 to 6725	5000
Measat C	950 to 1750	5925 to 6725	4975
Transmit			
Conversion Gain	20~25dB		
Gain Stability over Temperature	±2dB		
Gain Flatness (Full bandwidth)	5.850~6.725 GHz	3dB max	
	5.850~6.425 GHz	2dB max	
	6.425~6.725 GHz	2dB max	
	6.725~7.025 GHz	2dB max	
36MHz Gain Flatness @ maximum slope	1.5dB max		
Output P_{RATED}	0dBm		
Phase Noise	@1kHz offset	-80 dBc/Hz	
	@10kHz offset	-90 dBc/Hz	
	@100kHz offset	-100 dBc/Hz	
In-band Spurious @ P_{MEAS}	SPAN FULL BANDWIDTH	-60dBc	

ALB190 Series Low Power C-BUC, Outdoor		
IMD3 (with 2 carriers +/- 1MHz apart, combined carrier power 3dB back-off from P_{MEAS})	-33dBc	
Input/ Output Interfaces		
Input VSWR	2.0 max	
IF Input level without damage	15dBm max	
Output VSWR	2.0 max	
Input Interface	50Ω N-type female	
Output Interface	50Ω N-type female	
Monitor and Control		
Interface	RS485, Ethernet	
10MHz switching level from External to Internal 10MHz	-8.0 to 10.0dBm	
Attenuation Adjustment Range	30dB by 0.5dB resolution	
External Reference		
Frequency	10MHz	
Power to BUC	-5 to +5dBm	
Phase Noise (OCXO)	frequency offset 10 Hz	-120dBc/Hz
	frequency offset 100 Hz	-140 dBc/Hz
	frequency offset 1 KHz	-150 dBc/Hz
	frequency offset 10 KHz	-155 dBc/Hz
	frequency offset 100 KHz	-160 dBc/Hz
Environmental		
Operating Temperature	-40°C to +60°C	
Storage Temperature	-45°C to +85°C	
Relative Humidity	Up to 100%	
Altitude	15,000 AMSL feet	
Power Supply		
AC Voltage	230VAC (range 90V ~ 264VAC)	
Interface	3-pin Male Connector	
Mechanical		
Dimensions(LxWxH)	240 x 150 x 80 mm	
Weight	2.5kg	
Colour	Clear Chromate	

B.2 Unit Outline Drawings

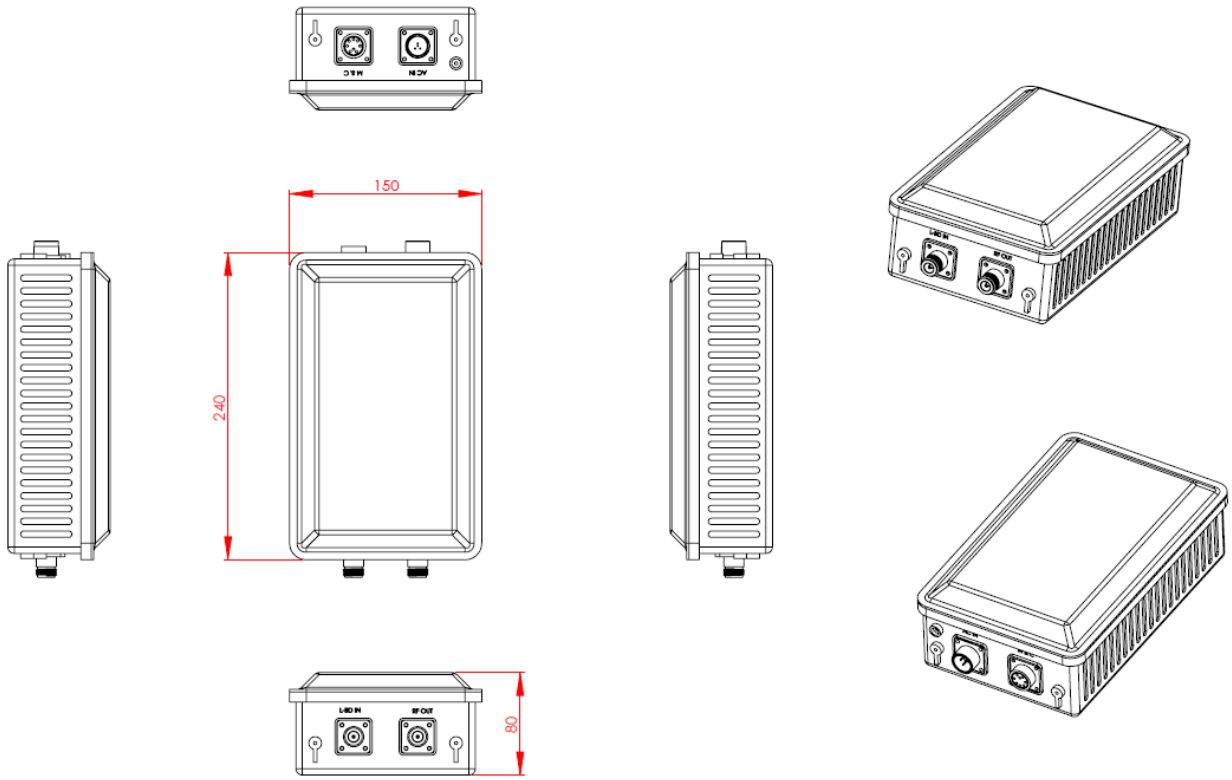


Figure 5.1 ALB190 1mW C-BUC Outline Drawing

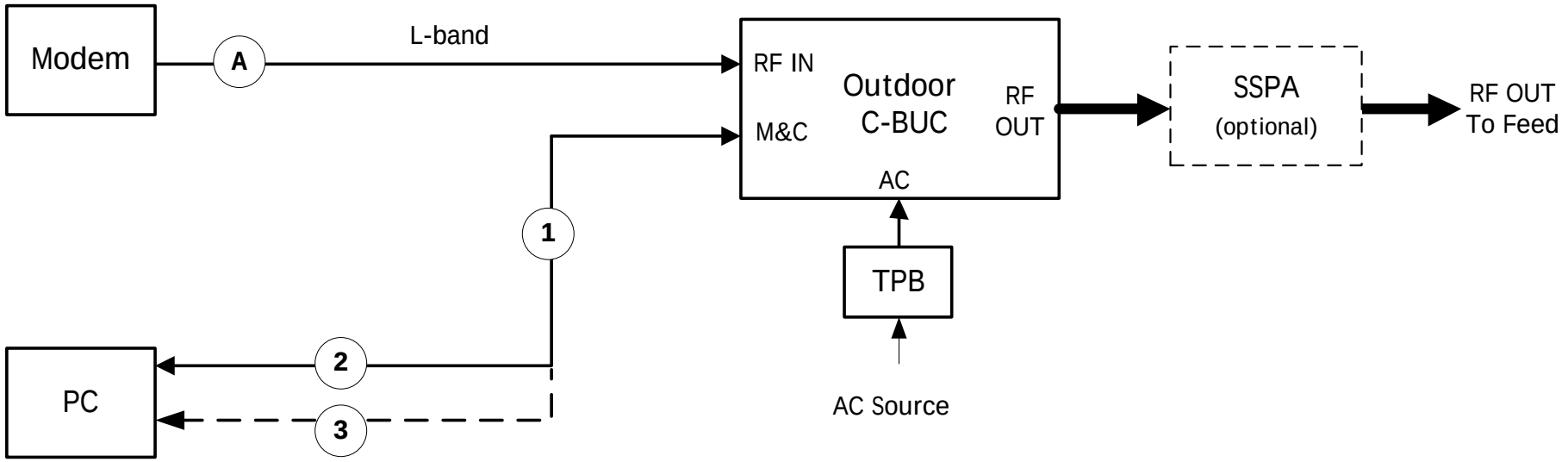
Appendix C Compliance Standard

IEC 609501-2nd Edition	International Safety Standard for Information Technology Equipment
ETSI EN 301 489-12	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility Standard for Radio Equipment and Services; Part 12: Special conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4GHz and 30GHz in the Fixed Satellite Service (FSS).
FCC Class A	Two levels of radiation and conducted emissions Limits for unintentional radiators (FCC Mark).

Appendix D Document Revision Log

Revision	Date	Description
A	May 2014	Initial Release

ALB190 Low Power C-BUC Standalone System

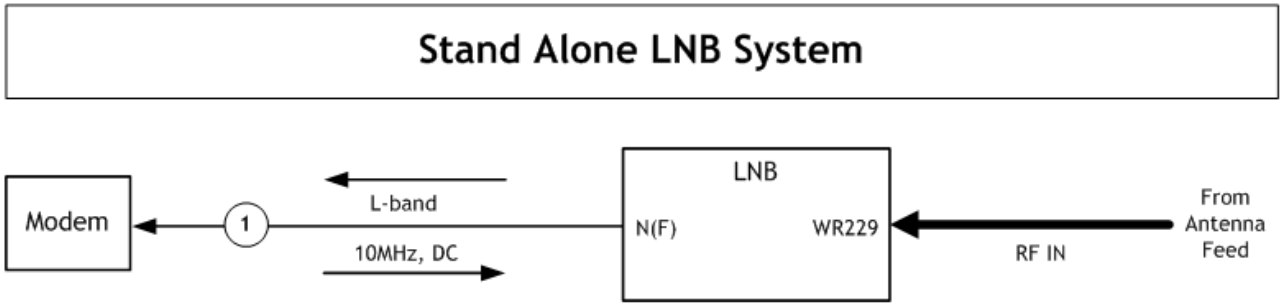


List of System Accessories and Components

Item No.	Part Number	Description	Length (m)	Quantity
1	2502041169	C/A M&C VSAT (Eth, RS485)	2	1
2	2502041166	C/A VSAT Eth-DB9 to	2	1
3	6103480008	Converter RS485 to USB	1.5	1
4	1001520980	Transient Protect Box	-	1
A	-	RF Cables	To be arranged by customer	

Item No.	Part Number	Description	Length (m)	Quantity
-	ALB190xxxx	C-BUC	-	1
-	AAA11xxxxx	C-band SSPA	-	1
-	2503160038	BUC Feed Mounting Accessories	-	1

🕮 **Note:** Depending on your purchase order, your BUC package may not include certain optional cables. Please contact Agilis if you wish to purchase any of the accessories listed in the table.



Item No.	Agilis Part No.	Description	Length (m)	Quantity
1	-	Provided customer by the customer	-	-
-	ACA11XXXXX	C-Band LNB	-	2

🕮 **Note:** The table above is a typical accessories list for the BUC Stand Alone LNB System. Depending on your purchase order, your BUC package may not include certain optional cables. Please contact Agilis if you wish to purchase any of the above accessories.