



**Norsat**  
International Inc.

---

# Median

**16/25/40 Watt KU BUC**

## *User Manual*

---

**NOTICE:** Norsat International Inc. ("Norsat") assumes no responsibility for errors or omissions that may appear in this publication. Norsat reserves the right to change this publication at any time, without notice.

**NORSAT Median – Manual. Copyright © 2016. Norsat International Inc. All rights reserved.**

All materials contained in this user guide are the property of Norsat International Inc. except as noted here below:

All materials in this user guide are protected by United States and international copyright laws. The compilation of all content in this user guide is the exclusive property of Norsat.

**110 – 4020 Viking Way | Richmond | British Columbia | Canada V6V 2L4  
support@norsat.com | Tel: +1.604.821.2800 | Toll Free: +1.800.644.4562  
www.norsat.com**

**Printed in Canada**

<b>PREFACE.....</b>	<b>3</b>
Purpose and Scope of the User Guide.....	4
Audience.....	4
Revision History.....	4
<b>1 SUMMARY.....</b>	<b>5</b>
<b>2 MAINTENANCE &amp; SERVICE .....</b>	<b>7</b>
<b>3 SAFETY INSTRUCTIONS.....</b>	<b>9</b>
<b>4 FUNCTION INSTRUCTIONS .....</b>	<b>12</b>
4.1 Working Principle .....	13
4.2 Interface .....	14
<b>5 CONFIGURATION INSTRUCTIONS.....</b>	<b>21</b>
5.1 Configuration .....	21
5.2 GUI.....	23

# Preface

# Preface

## Purpose and Scope of the User Guide

The user guide explains the system specifics of the Norsat Median 16/25/40 Watt KU BUC.

This user guide is specifically written for the Median 16/25/40 Watt KU BUC

## Audience

The guide will be of interest to the following personnel:

- Field users
- Systems administrators (or IT; Lifecycle/Sustainment Managers)

## Revision History

Date	Nature of Revision	Release
	Initial Release	1.0

**READ THE MANUAL BEFORE YOU INSTALL OR OPERATE THE  
Product Line™**

# 1 Summary

# Summary

This document is the user manual for Norsat's Median block up converter (BUC). It describes the safety instructions, application scenarios, working principles, mechanical structure, product type and other information for the BUC.

## **2 Maintenance & Service**



## 2 Maintenance & Service

If the equipment appears inconsistent with the guide when using, please contact Norsat customer service.

NORSAT INTERNATIONAL, INC.

110-4020 Viking Way

Richmond, BC, Canada

V6V 2L4

Tel: +1 604 821-2843

Email: [support@norsat.com](mailto:support@norsat.com)

During the warranty period manufacturing, performance and operational deficiencies will be addressed and repaired at an authorized repair facility. The warranty does not apply and is not limited to incorrect installation, unintended use, accident, acts of god (lightning, flooding, etc...), improper storage, transportation, and etc.

Please contact our customer service department listed below for warranty service.

<b>EMAIL</b>	<a href="mailto:Support@norsat.com">Support@norsat.com</a>
<b>TOLL-FREE</b>	+1 (800) 644-4562
<b>TEL</b>	+1 (604) 821-2800

## **3 Safety Instructions**

# 3 Safety Instructions

This product contains components and assemblies susceptible to electrostatic discharge (ESD) and produces high RF energy. Please read the safety instructions carefully in this section before installation and operation.

Please use a proper protective bag and store the product in a clean and dry environment.



## **WARNING!**

Repair work is to be performed by authorized repair and return locations only. Any unauthorized repair behavior will void any remaining warranty.



## **DANGEROUS HIGH POWER RF!**

The equipment's RF Out port emits high power RF energy that can cause physical injury. Ensure that the RF Out port is connected to an antenna system or a high power load before powering and operating the equipment.



## **HIGH SPEED FANS! DO NOT TOUCH!**

The equipment's fan speed is high during operation. Do not touch or move it by hand.



## **HOT SURFACE! DO NOT TOUCH!**

The equipment's surface temperature is high during operation. Do not touch or move it by hand.

# 3 Safety Instructions

- Do not turn on power supply before the equipment is connected to an antenna system or a high power load, avoiding high power RF energy injury.
- Wrap the connection ports (IF Input, RF Output, power supply, and monitoring interface) with high temperature, UV resistant and waterproof tape.
- The installation location must be ventilated to ensure optimum fan cooling.
- Ensure the supply voltage range and polarities are correct.
- The equipment is an outdoor product. Proper grounding techniques are required to reduce the potential impact of lighting-produced surge signal.
- The equipment casing is not to be opened unless instructed by authorized Norsat personnel. Personal injury may occur; equipment may be damaged by ESD and warranty will be void.

## 4 Function Instructions

# 4 Function Instructions

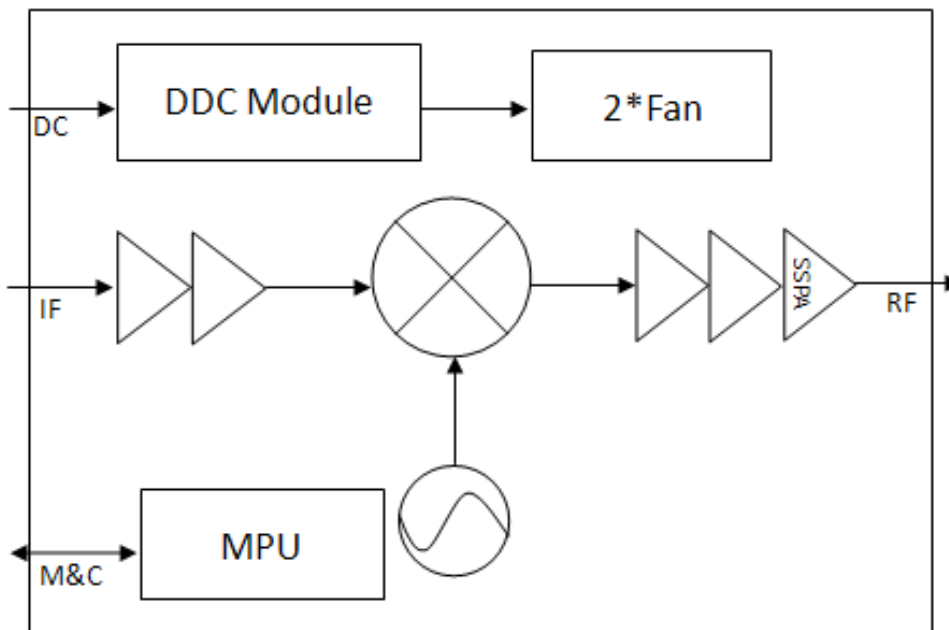
## 4.1 Working Principle

### 4.1.1 Ku-Band BUC function and working principle

L-band signal from the modem is converted to Ku-band RF signal, at the same time the power from the waveguide output port is amplified, transmitted to the communication satellite through the satellite antenna system.

### 4.1.2 BUC block diagram of the composition

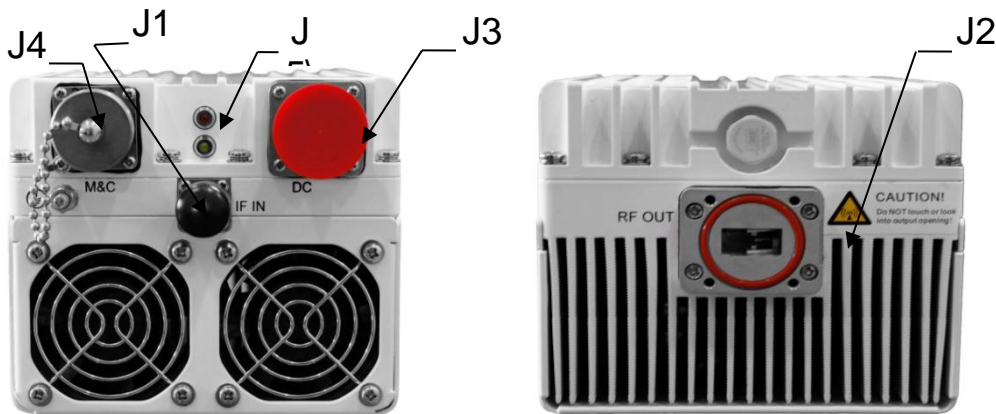
The main modules of the Ku-Band BUC are Up Converter, Power Amplifier, Frequency Synthesizer, DC converter, Monitor module and other components.



# 4 Function Instructions

## 4.2 Interface

### 4.2.1 BUC Interface Description

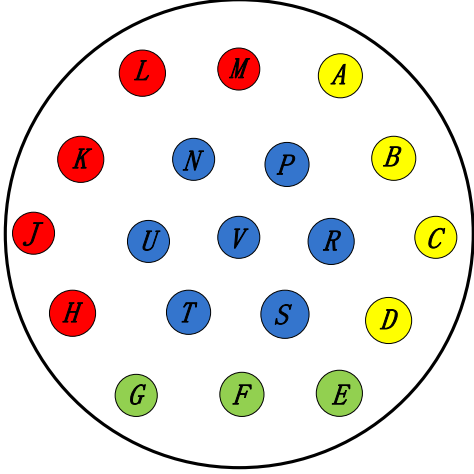


**Table 1 BUC Interface Parameters**

NO	Interfaces	Model	Parameters
J1	IF INPUT	N Type –Female	Standard Frequency: 950 to 1450 MHz Extended Frequency: 950 to 1700 MHz
J2	RF OUT	WR75 waveguide flange (Grooved)	14.0 to 14.5 GHz (Standard) 13.75 to 14.5 GHz (Extended)
J3	DC INPUT	ACS02E16-11P	+36 to +72 V
J4	M&C	PT02E-14-19P	RS-485/ RS-232/ Ethernet
J5	LED	N/A	Yellow/ Red

# 4 Function Instructions

Table 2 PIN Description

PIN	Protocol	Signal	19 PIN Connector
A	RS-485	TX+	
B		TX-	
C		RX+	
D		RX-	
E	RS-232	TX	
F		RX	
G		232_GND	
H	ETHERNET	ETX+	
J		ETX-	
K		ERX+	
L		ERX-	
M		E_GND	
N	N/A		
P	N/A		
R	N/A		
S	N/A		
T	N/A		
U	N/A		
V	RS485_GND		

## LED:

The equipment provides two LED indicator lights (yellow and red) that provide information on the following operational conditions of the BUC:

- 1) LEDs off: Equipment is functioning properly;
- 2) Yellow LED on: PLL alarm;
- 3) Yellow LED flashing: High temperature alarm;
- 4) Red LED on: HPA (high output PA) alarm;
- 5) Red LED flashing: Fan alarm.

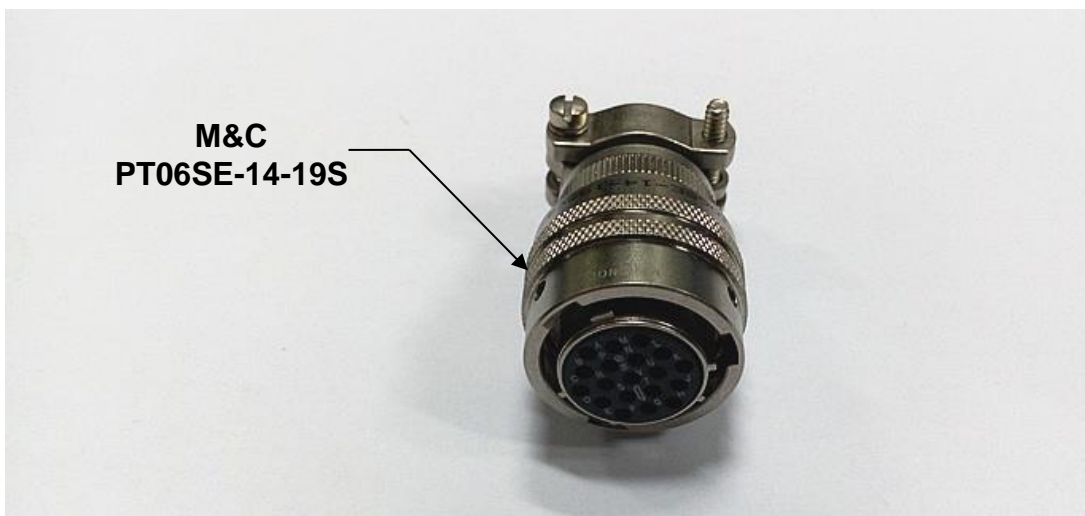


# 4 Function Instructions



LED Indicators

## 4.2.2 BUC Power and Monitor Interface Cable



M&C Interface Type



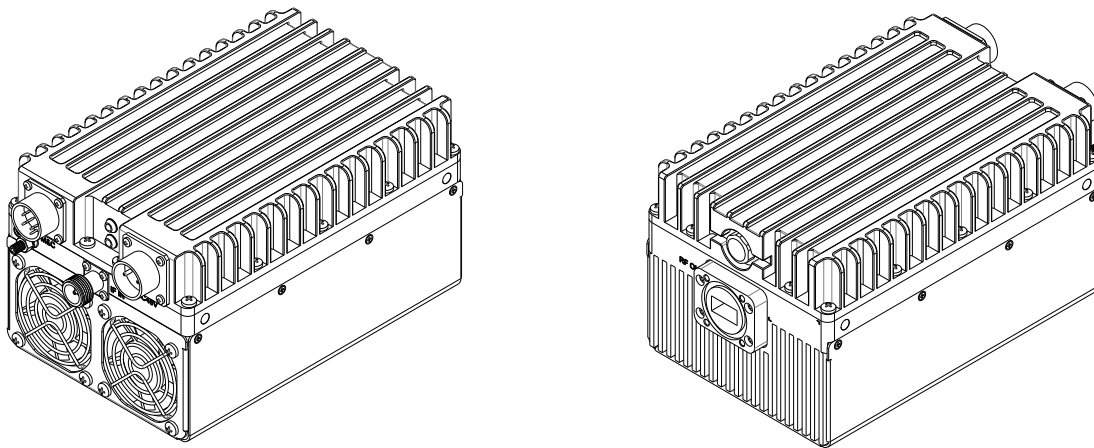
Positive Pole: Red; Negative Pole: Black

# 4 Function Instructions



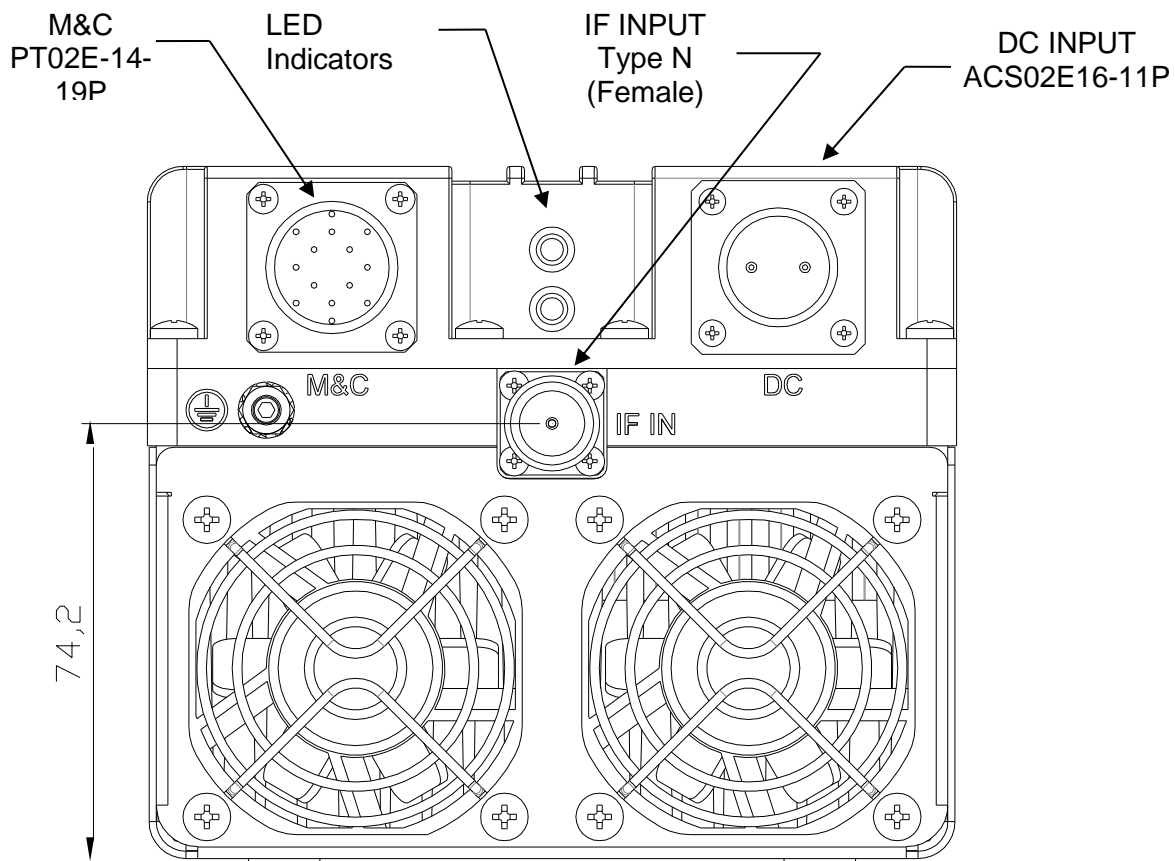
**Independent DC Supply**

## **4.3 Mechanical Structure**



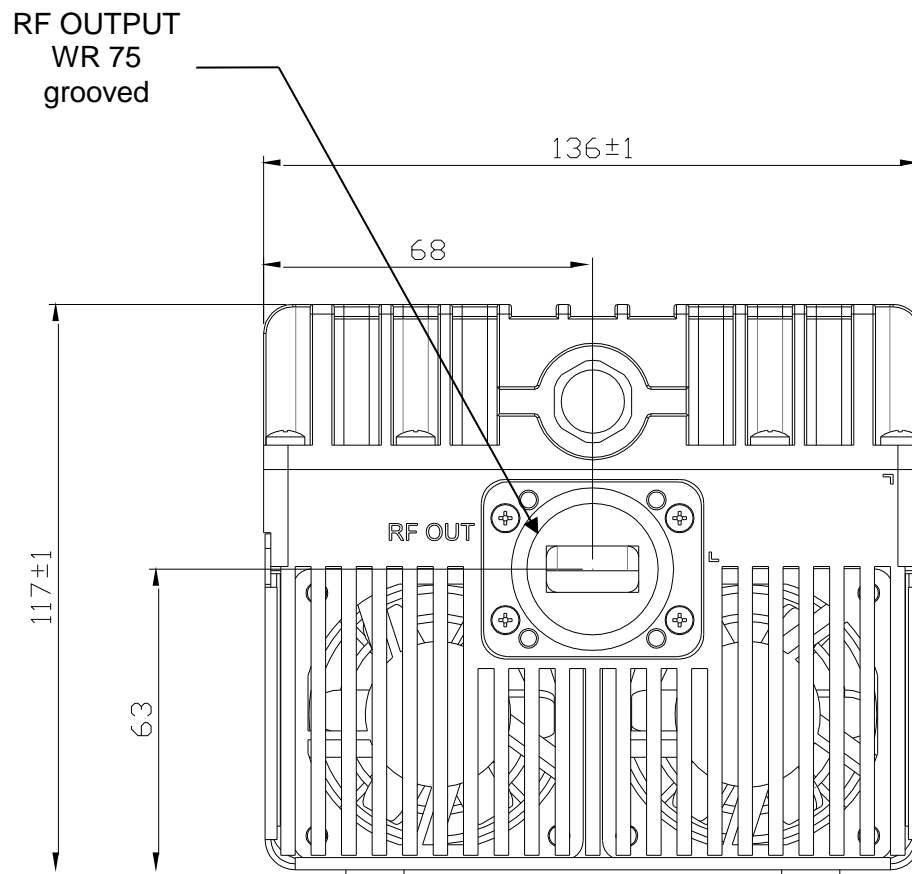
**BUC 3D Structure**

# 4 Function Instructions



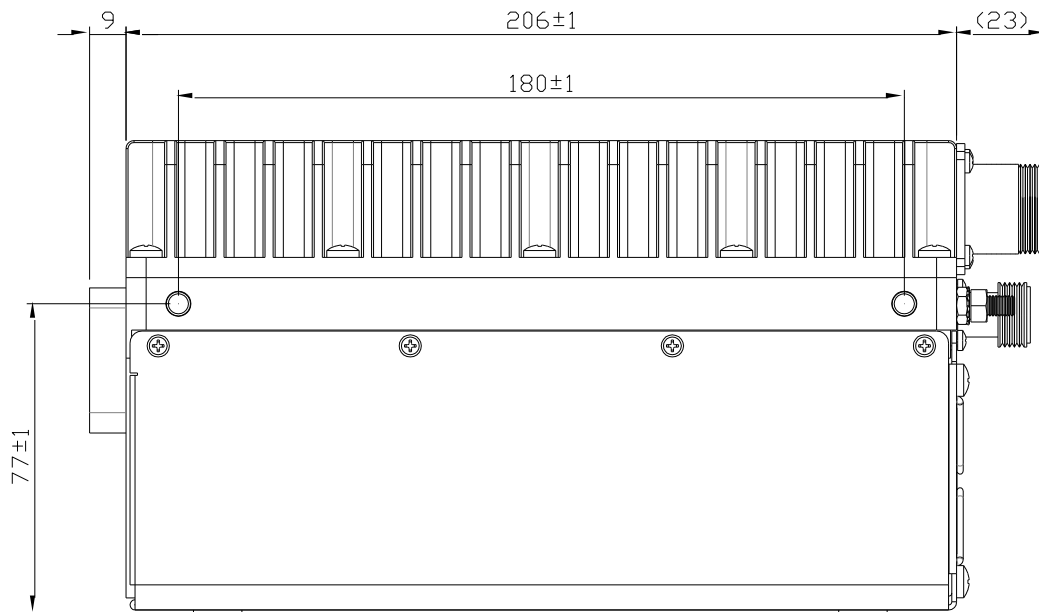
**BUC Interface Type**

# 4 Function Instructions



**BUC Width, Height Dimensions**

# 4 Function Instructions

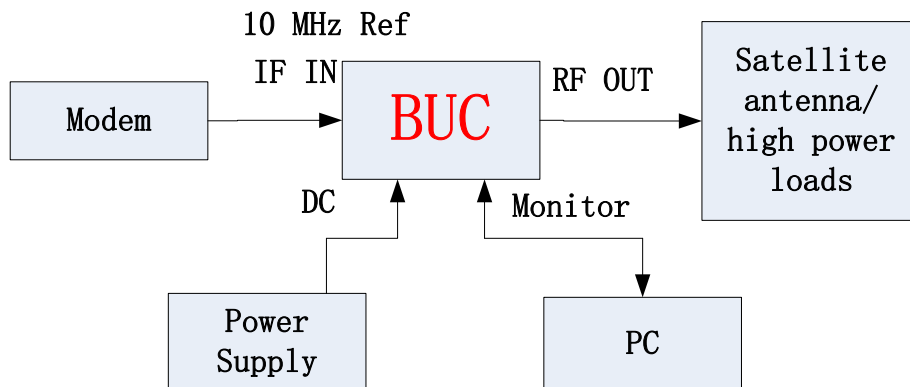


**BUC Length, Width Dimensions**

## 5 Configuration

# 5 Configuration

## 5.1 Configuration



### BUC Configuration

#### BUC System Connecting Steps

- Step 1: Unpack the box and check the unit and accessories to make sure there is no damage or missing items.
- Step 2: Install the unit by following the instructions. Laboratory testing requires the unit be horizontally placed in a dry and ventilated environment.
- Step 3: Connect BUC IF IN to Modem IF Out.
- Step 4: Install the antenna interface to antenna system or high power load tightly and ensure it is water-proof. Do not pinch the O-ring.
- Step 5: Ensure the power supply voltage range and polarity meet requirements.  
This equipment only supports independent power supply.
- Step 6: Connect BUC to computer through M&C to monitor and adjust available settings.

# 5 Configuration

## 5.2 GUI

### 5.2.1 GUI Installation

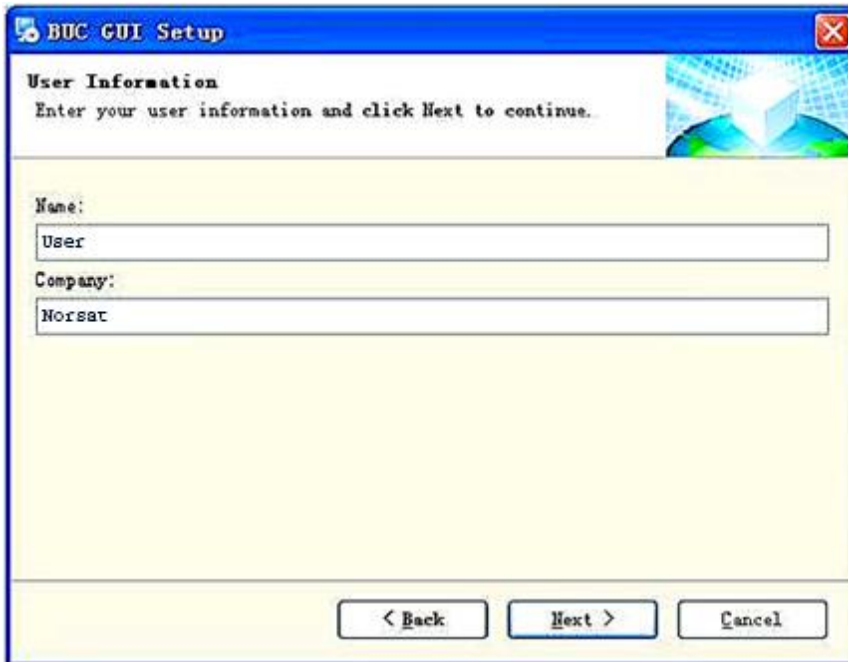
Double-click setup.exe to access installation interface, install GUI by following the prompts.





# 5 Configuration

Enter user name and company name.



The screenshot shows the 'BUC GUI Setup' window with the 'User Information' tab selected. The window has a blue title bar and a decorative graphic on the right. The main area is yellow and contains two text input fields: 'Name:' with 'User' entered and 'Company:' with 'Norsat' entered. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

**BUC GUI Setup**

**User Information**  
Enter your user information and click Next to continue.

Name:  
User

Company:  
Norsat

< Back   Next >   Cancel

Select the installation path.



The screenshot shows the 'BUC GUI Setup' window with the 'Installation Folder' tab selected. The window has a blue title bar and a decorative graphic on the right. The main area is yellow and contains a text input field for the installation path, currently showing 'C:\Program Files\BUC GUI'. To the right of the field is a 'Change...' button. Below the field, it displays 'Space required: 3.02 MB' and 'Space available on selected drive: 25.87 GB'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

**BUC GUI Setup**

**Installation Folder**  
Where would you like BUC GUI to be installed?

The software will be installed in the folder listed below. To select a different location, either type in a new path, or click Change to browse for an existing folder.

Install BUC GUI to:  
C:\Program Files\BUC GUI   Change...

Space required: 3.02 MB  
Space available on selected drive: 25.87 GB

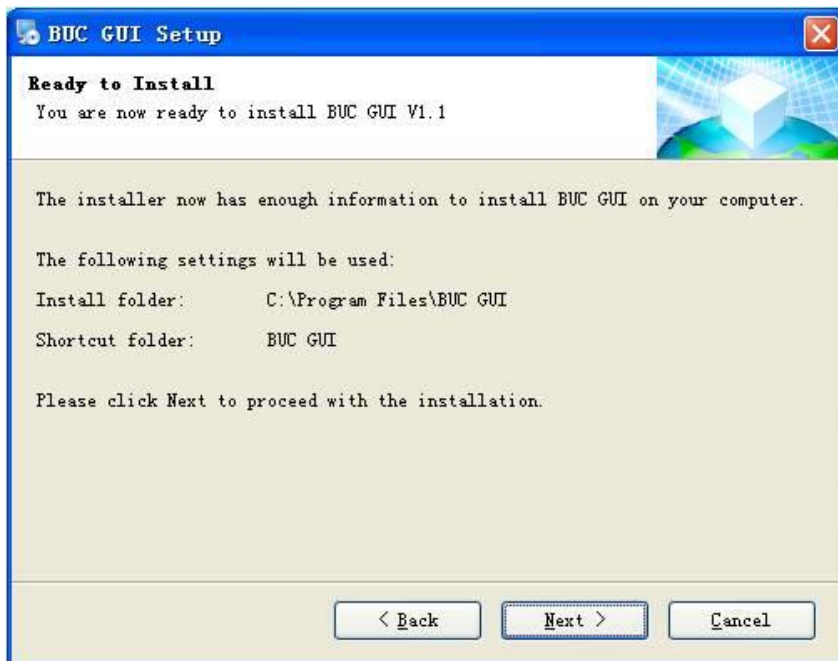
< Back   Next >   Cancel

# 5 Configuration

Select the storage directory of shortcut folder.



Review the information.



# 5 Configuration

This interface shows the installation is completed.



# 5 Configuration

## 5.2.2 Uninstall

Enter the uninstall program interface.



When the uninstallation is completed, click finish.



# 5 Configuration

## 5.2.3 Operation

**BUC GUI** [X]

Reset Help

**Norsat**  
International Inc.

☒ RS-232 ☐ RS-485 ☐ Ethernet

1 192.168.1.1

Connect BUC Check Status Exit Clear

---

**Unit Information** **Unit Status** **Temperature Status**

Model Number PLL Unlock Alarm Temperature Alarm

Serial Number HPA Alarm Temperature — deg C

Firmware Version Tx Enable Gain dB Fan Status

Fan Alarm Fan Speed

---

**Tx Status Set**

Tx Enable Gain

ON Min 0 Max dB

Set Tx Enable Set Gain

---

**IP Address Set**

IP Address

192 168 1 1

Set IP Address

Welcome to BUC GUI.....

# 5 Configuration

Run the application to launch the software interface.

Chose one of the three supported communication protocols: Ethernet/RS-232/RS-485 to connect BUC to PC.

*Ethernet:* Set BUC's IP addres in the blank space, and then click the button **Connect to BUC**. The computer's IP and BUC's IP should be the same network segment.

*RS-232 Port:* Select the RS-232 port and then click the button **Connect to BUC**.

*RS-485 Port:* Select the RS-485 port and then click the button **Connect to BUC**.

The image shows a software interface with a light blue background. On the left, there are three radio buttons for selecting a communication protocol: RS-232 (selected), RS-485, and Ethernet. To the right of these buttons are input fields. For RS-232, there is a dropdown menu showing the number '1'. For Ethernet, there is a text input field containing the IP address '192.168.1.1'. On the right side of the interface, there are two buttons: 'Connect BUC' and 'Check Status'.

Click the **Check Status** button to confirm the device status.

The image shows a single button with a dashed border and the text 'Check Status' inside.

# 5 Configuration

## Unit Status

**PLL Unlock Alarm:** Indicator will appear Red when BUC signal is unlocked.

**HPA Power Alarm:** Indicator will appear Red when BUC HPA current TX power is higher than its threshold.

**TX Enable:** Unit TX enable status.

**Gain:** Unit current Gain.

**TX Power:** BUC TX power value.

Unit Status		
PLL Unlock Alarm		
HPA Alarm		
Tx Enable	--	
Gain	--	dB
Tx Power	--	dBm

## Temperature Status

**Temperature Alarm:** Indicator will appear Red when the BUC's internal temperature is above the upper limit.

**Detected Temperature:** Displays the temperature of unit's internal M&C board.

Temperature Status	
Temperature Alarm	
Temperature	25 deg C

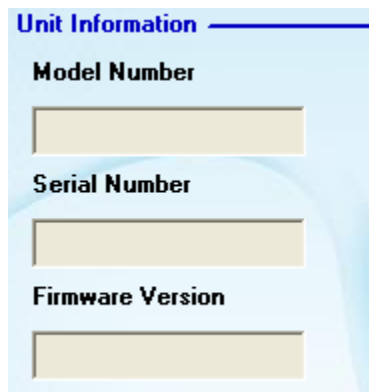
# 5 Configuration

## Unit Information

**Model Number:** Unit Model number.

**Serial Number:** Unit serial number.

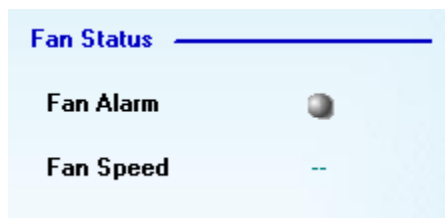
**Firmware Version:** The version of the firmware on the unit.

A screenshot of a web interface titled "Unit Information". It contains three input fields: "Model Number", "Serial Number", and "Firmware Version". Each field is represented by a light blue rectangular box with a thin border. The labels are in bold black text above their respective boxes.

## Fan Status

**Fan Alarm:** Indicator is red when the fan rotation is abnormal.

**Fan Speed:** The speed of the fan.

A screenshot of a web interface titled "Fan Status". It contains two rows. The first row is "Fan Alarm" with a red circular indicator to its right. The second row is "Fan Speed" with a green "--" indicator to its right.

## TX Status Set

**TX Enable:** On/Off TX enable.

**Gain:** Set the Gain of unit.



# 5 Configuration

**Tx Status Set**

<b>Tx Enable</b>	<b>Gain</b>
<input type="text" value="ON"/>	Min <input type="text" value="0"/> Max dB
<input type="button" value="Set Tx Enable"/>	<input type="button" value="Set Gain"/>