ZX Lidars

Wind speed at light speed

ZX300 External Modem Guide

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ZXL/CS/UML/00010

Local Office:

ZX Lidars,
Willow End,
Blackmore Park Rd,
Malvern,
WR13 6BD,
UK

Tel: +44 (0) 1531 651 000

Registered Office:

ZephIR Limited
The Green House
Forrest Estate, Dalry,
Castle Douglas
Kirkcudbrightshire,
DG7 3XS

Company No. SC317594
VAT No: 2436926 48

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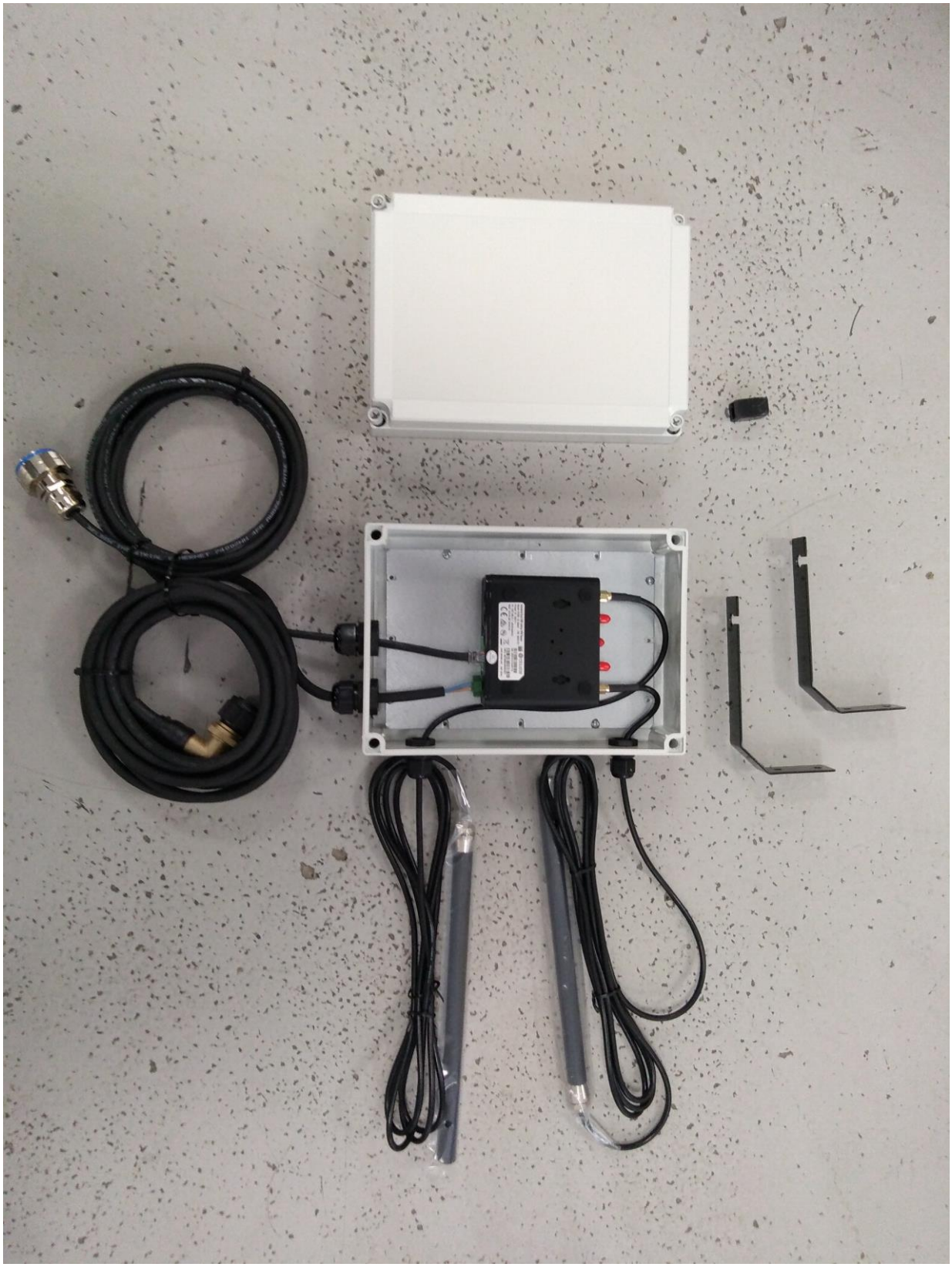

1.1 Components

Part	Quantity	Image
Modem	1	
Housing	1	
LTE Cellular Antenna	2	
Antenna Mounting Bracket	2	
Ethernet Cable	1	
DC Power cable	1	

Table 1: Familiarisation of components

2 SIM card selection

The modem is supplied with 36-month access to a VPN service that allows you to access the modem securely no matter what data SIM is used in the modem. However, it is still recommended to use an appropriate M2M-type SIM, due to their design and better customer support for this application.

The SIM must not block incoming connections. This can often be a common feature of standard cell phone SIMs.

The modem is “Global”, however this does not guarantee that it can work on every cell network in a particular country.

It is recommended that you check the following resources before selecting the SIM card:

2.1 Certifications and Approvals list

https://www.robustel.com/en/certifications/

- **PN B056705 for Japan**
- **PN B056701 for Everywhere Else**

ZX Lidars will provide the appropriate SKU based on deployment location

2.2 Frequency Bands

The following is a table that shows which frequency bands and technology the modem will be compatible with:

4G	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28
	LTE TDD: B38/B39/B40/B41
3G	WCDMA: B1/B2/B4/B5/B6/B8/B19
2G	GSM: 850/900/1800/1900MHz

Your SIM provider will be able to tell you which frequency bands are used by the SIM.

3 Cyber Security

The modem is configured with the following settings for strong cyber-security out of the box.

It is recommended to review this configuration also and check that it meets the requirements of the Lidar deployment.

3.1 Cyber Security Configuration

- Incoming connections are only possible via secure RVPN server and VPN Manager application.
- Incoming connections are dropped unless they originate from either the RVPN Virtual Group connection, or a local LAN connection. These rules are located under **Firewall > Custom Rules.**

  Warning: Be careful if choosing to edit these rules. If the rule allowing local connections is deleted individually, access to the modem GUI will be blocked.
- Unused ports are closed except for those used by the Lidar
- Incoming WAN traffic is routed only to the Lidar IP address 10.10.8.1. This means that any other devices locally connected to the modem cannot be reached over the remote WAN connection.
- Outgoing traffic (i.e. Wind data sending) from the Lidar is assumed safe and travels without restriction and outside the VPN tunnel. This means it can still work in low signal quality deployments where the VPN connection may be more intermittent.

4 Pre-Assembly

4.1 Obtaining the RVPN details from ZX Lidars

The modem cyber-security is configured in the factory and is added to the RVPN portal under the ZX Lidars company account.

To access these services, please send a list of email addresses to support@zxlidars.com, along with the modem number printed on the enclosure (format is "EXM*xxx*").

These email addresses will become Users on the RCMS portal and will have permission to connect to the modem/ZX300.

Note that a Microsoft account will need to be associated with each email. If you do not already have one, you will be prompted to make one when you first log in to the RCMS portal.

ZX Lidars Customer Experience team will then provide you with:

- A password to connect locally to the modem GUI (**see Section 6.2 below**)
- A Virtual IP address to connect to the modem/ZX300 remotely (**see Section 7.5 below**)

5 Modem Assembly

Note: It is strongly recommended that you familiarise, configure and test the modem before it is deployed on site.

5.1 Inserting the SIM Card and Assembling

1. Unscrew and remove the housing lid
2. Insert the SIM card into SIM port 1 on the modem. Take care to use the correct orientation as seen on the symbol. **See Figure 1**
3. Re-fit the housing lid using the 4 off inset screws in the lid

   Note: It is strongly recommended to configure and test the modem before the lid is fixed in place

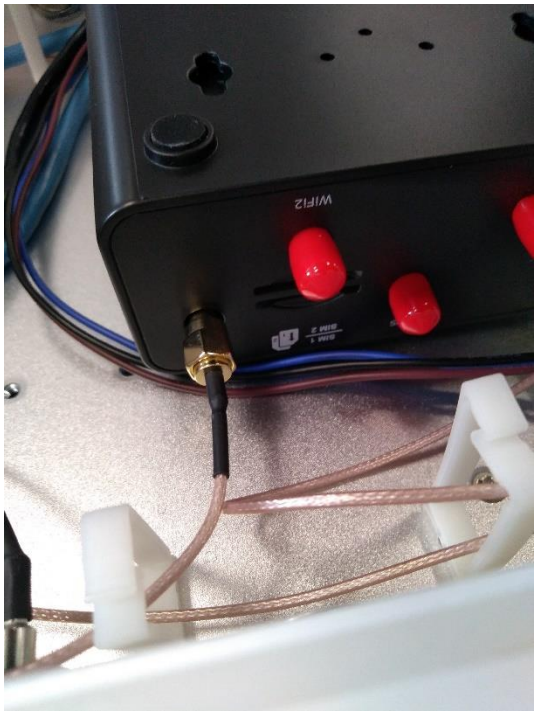

Figure 1: Inserting SIM

5.2 Cable and Antenna Assembly

1. Connect the **DC Power Cable** to the **MODEM** port on the Lidar connector panel
2. Mount the **LTE Cellular Antennas** onto a flat surface using the **Antenna Mounting brackets**.
3. Connect the **Ethernet Cable** to the **Ethernet** port on the Lidar connector panel

5.3 Configuring the Lidar IP details

1. Open Waltz and click the IP configuration button in the top right of the window
2. Enter the Unit number, LAN IP address and tick “Send request to specific IP address”
3. Enter the “New network settings” as seen in the image below, then press “Change IP”

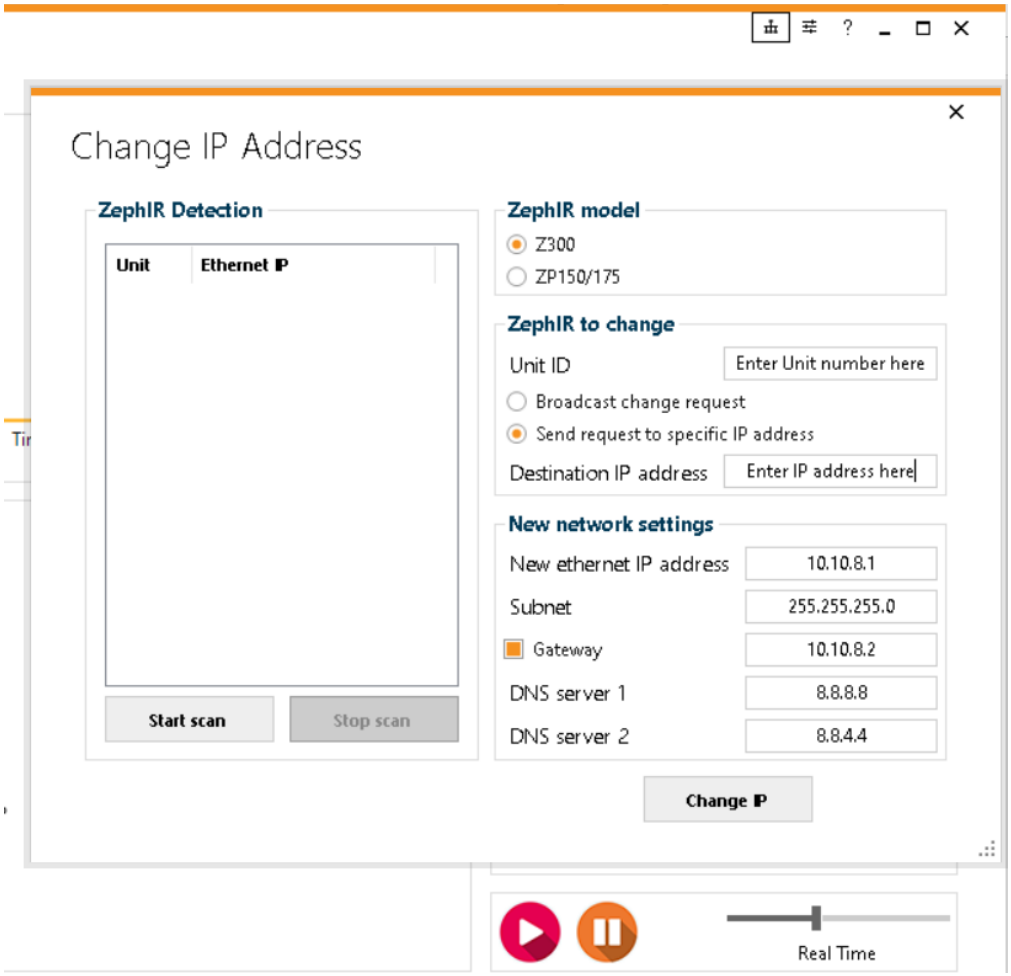

Figure 2: Changing Lidar IP

6 Configuring SIM APN on the Modem

In most cases, the SIM APN is set automatically by the modem. However, if the SIM provider explicitly asks for an APN to be entered, this can be configured in the modem GUI.

6.1 PC configuration

1. Remove Ethernet cable from Lidar and connect to your PC. Either use the RJ45 coupler or insert another Ethernet cable into a different **Eth** port on the modem
2. On your PC, go to Control Panel > Network and Internet > Network Connections
3. Right click on your Ethernet adapter and go to “Properties”
4. Double click on “Internet Protocol Version 4”
5. Change your Adapter settings to 10.10.8.1 / 255.255.252.0
6. Press OK twice to save the settings

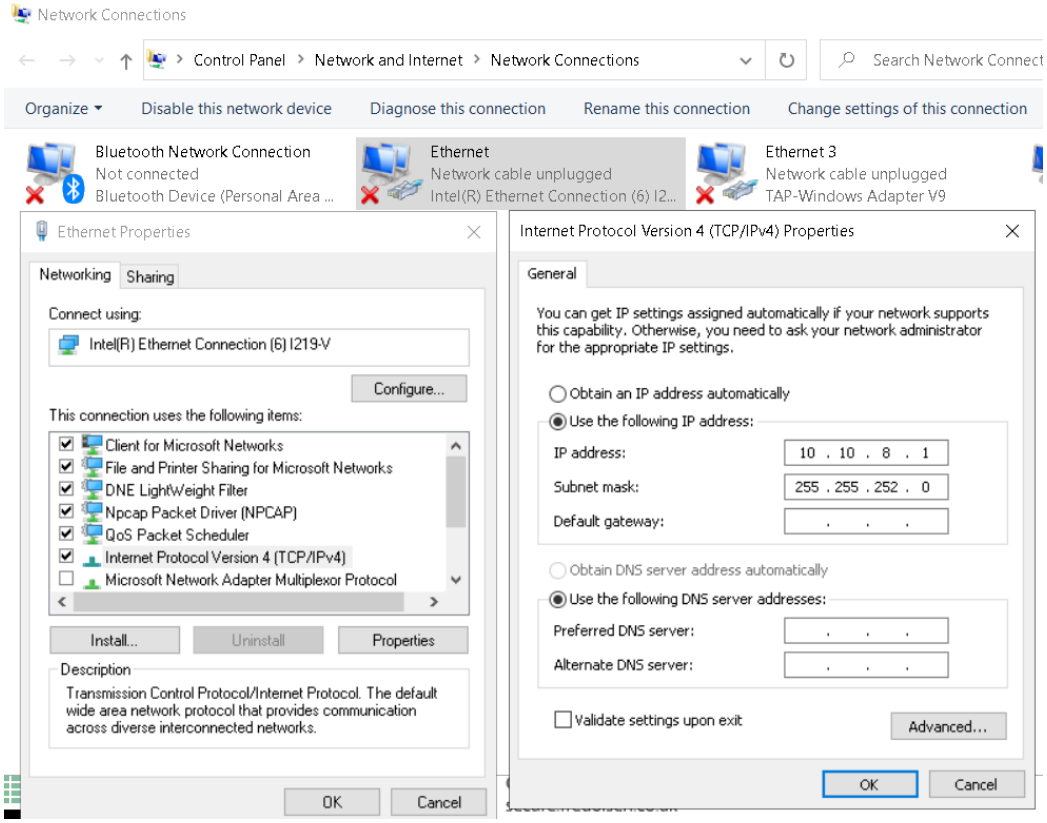

Figure 3: Changing LAN adapter settings on PC

6.2 Connecting to the Modem GUI

1. Make sure the modem is powered and your PC is connected to the Eth0 port on the modem housing
2. Open your web browser (recommend Chrome) and type **10.10.8.2:81** in the address bar
3. Use the following details to log in:
   a. Username: **admin**
   b. Password: **<this will be provided by ZX Lidars>**

6.3 Configuring the APN

1. Navigate to Interface > Link Manager > Link Settings
2. Click the edit button next to WWAN1

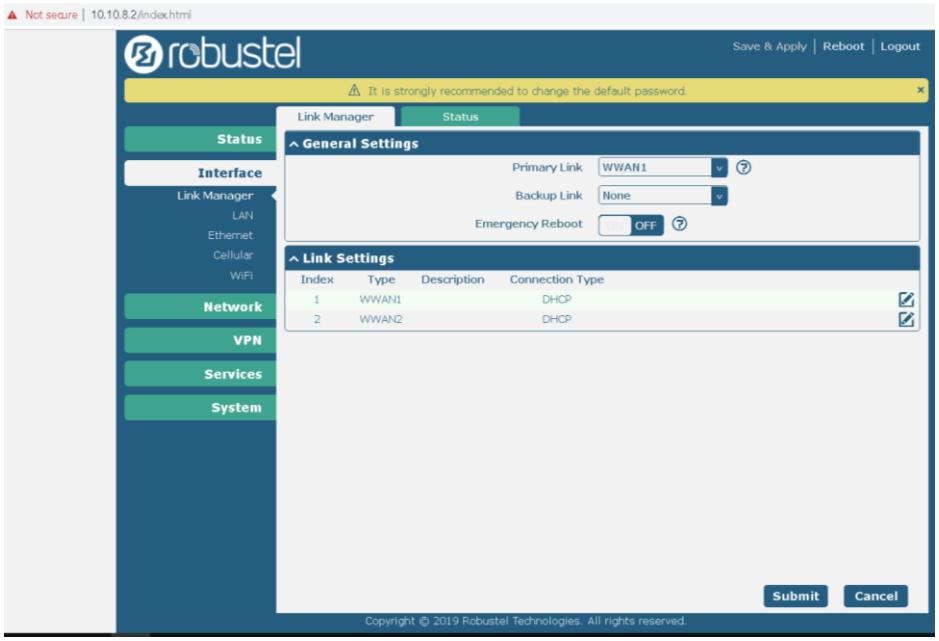

Figure 4: Link manager page on modem GUI

3. Under “WWAN Settings”, set “Automatic APN Selection” to OFF

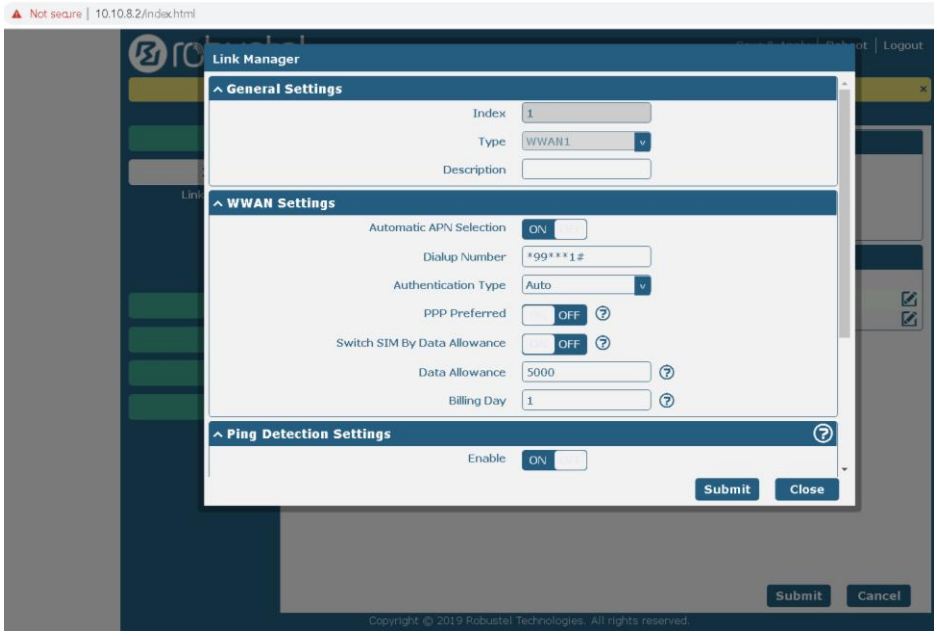

Figure 5: Configuring APN details

4. Enter the SIM APN details in the boxes that appear. If the SIM fails to register on a network, then you may need to enter a PIN or change **Authentication Type** to PAP or CHAP. Check with the SIM provider if required.
5. Press **Submit > Save & Apply > Reboot**
6. Once the modem has rebooted, you should see it connect to the network in the Status window

7 Connecting to the VPN

7.1 Downloading the RVPN Manager

This manager **must be used** in order to access the modem and Lidar via the VPN tunnel from your PC.

It can be downloaded from the RCMS Cloud monitoring site, where you can also see the status of the modem device.

1. In your browser, navigate to: https://rcms-cloud.robustel.net/
2. Log in using your Microsoft Account that ZX Lidars has added to the VPN Group.
3. Go to “Support > Resources” and download and install “RVPN Manager” for your version of Windows

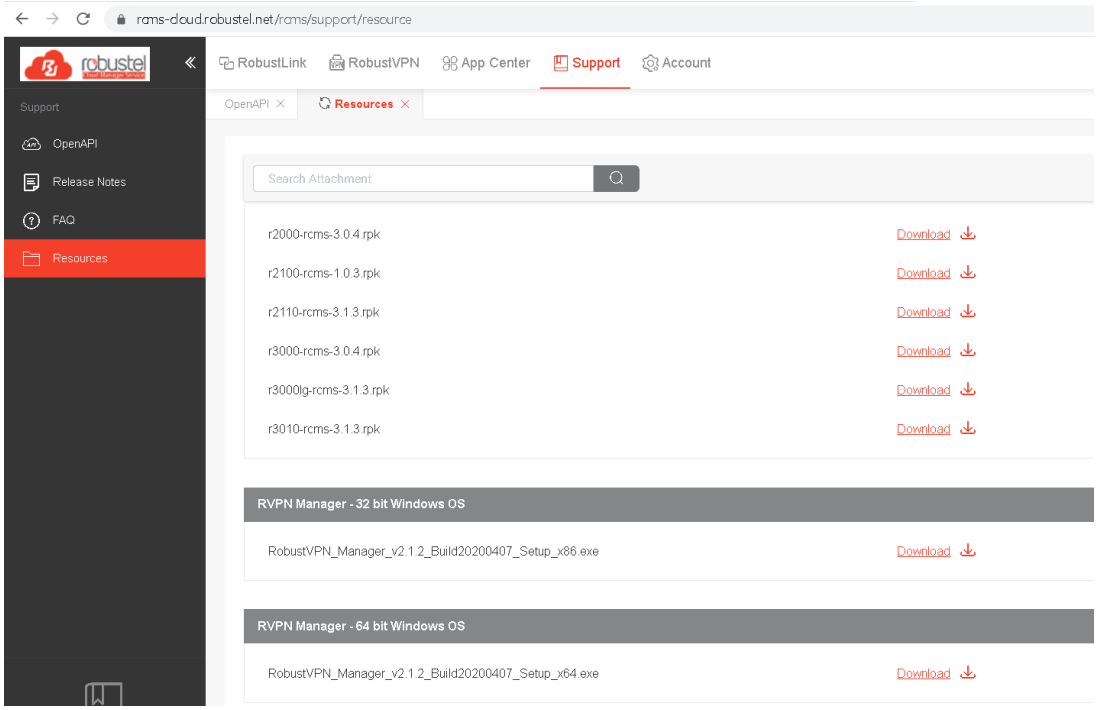

Figure 6: Downloading RVPN Manager

7.2 Connecting to the server via RVPN Manager

1. Make sure that you have no other VPN connections running
2. Open Robustel VPN Manager
3. Click “Cloud”
4. Make sure “Global Default” is selected
5. Click “Login”

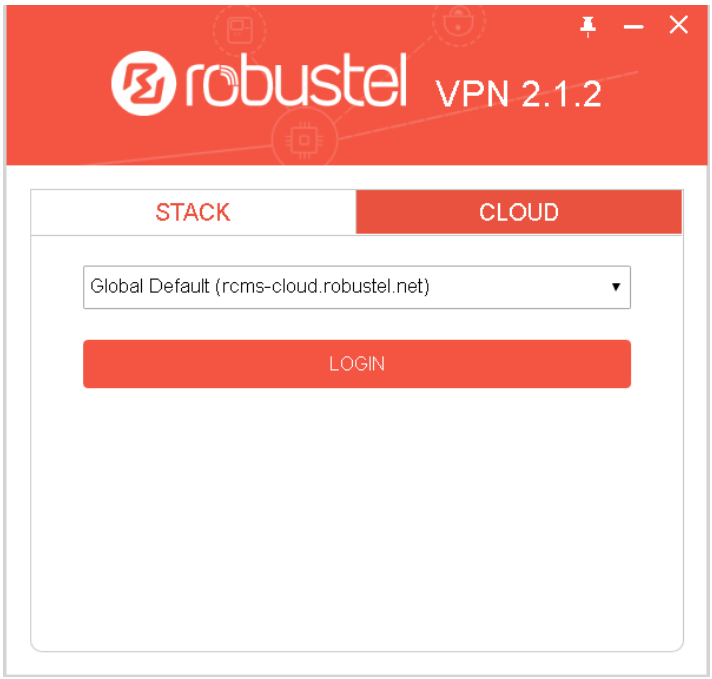

Figure 7: Login screen on RVPN Manager

7.3 Sign-in to the server

You must sign in using the provided Microsoft Account.

Please contact ZX Lidars if you wish to have more Microsoft accounts added to the VPN.

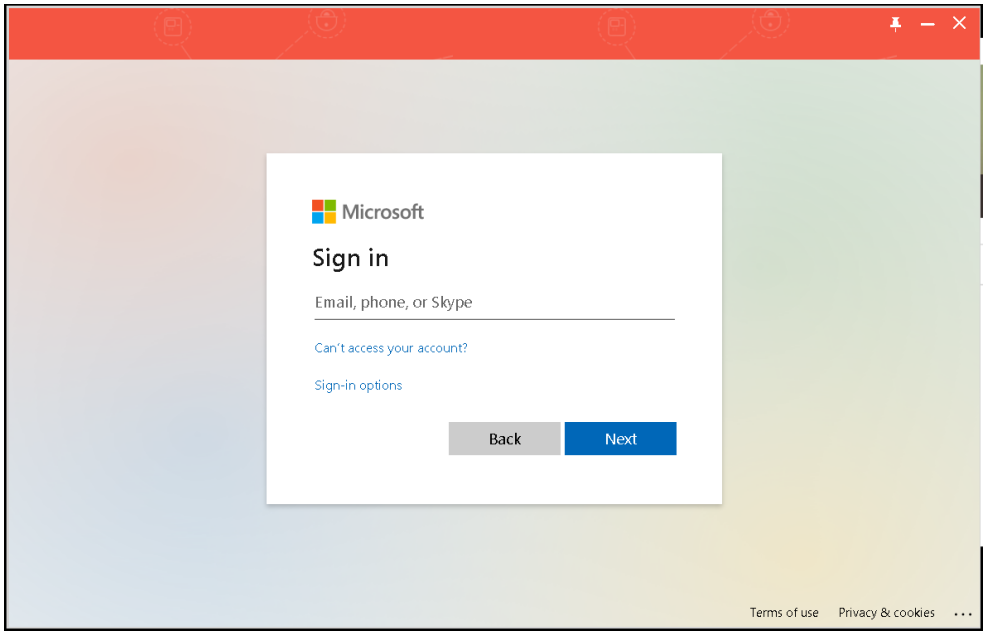

Figure 8: Sign-in using Microsoft Account

7.4 Connecting to the Modem's VPN Group

You should see a list of modem groups on the left that you are permitted access to.

Click on the desired group name then press “Start” to connect to the modem’s VPN Group.

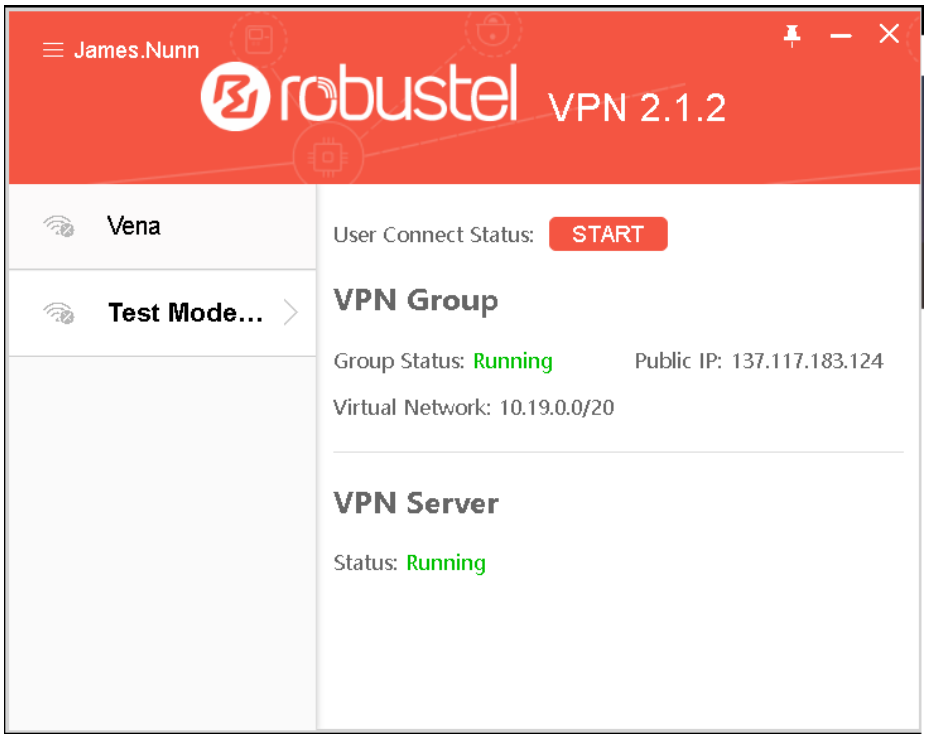

Figure 9: Connect to the modem's VPN group

7.5 Connecting to the Lidar

Once you have established a connection to the correct Modem VPN Group, you can now connect to the Lidar using the Virtual IP provided by ZX Lidars.

7.6 Monitoring the modem via RCMS

The modem status can be monitored using the portal at:

https://rcms-cloud.robustel.net/

Log in using the same details as used for the VPN Manager.

A Contact Details

ZX Lidars Customer Support

Zephir Ltd

ZX Lidars,

Willow End,

Blackmore Park Rd,

Malvern,

WR13 6BD,

UK+44 (0) 1531 651 000

support@zxlidars.com