

Wind speed at light speed

# ZX300 External Modem Guide

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# 1 Hardware Familiarisation





## 1.1 Components

Part	Quantity	Image
Modem	1	
Housing	1	3
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 <u>does not</u> 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:

40	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28
40	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"

ZephIR D	etection	ZephIR model	
Unit	Ethernet IP	<ul> <li>Z300</li> <li>ZP150/175</li> </ul>	
		ZephIR to change	
		Unit ID	Enter Unit number he
		<ul> <li>Broadcast change req</li> </ul>	uest
		<ul> <li>Send request to specif</li> </ul>	ic IP address
		Destination IP address	Enter IP address here
		New network settings	
		New ethernet IP addre	ss 10.10.8.1
		Subnet	255.255.255.0
		Gateway	10.10.8.2
		DNS server 1	8.8.8.8
Start	scan Stop s	DNS server 2	8.8.4.4

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

•						
ganize   Disable this net	work device Dia	ignose this cor	nection	Rename this connection	<ul> <li>Change settings of this cor</li> </ul>	nnect
Bluetooth Network Co Not connected Bluetooth Device (Per	sonal Area	Ethernet Network	cable ui ithernet	nplugged Connection (6) I2	Ethernet 3 Network cable unplugged TAP-Windows Adapter V9	
Ethernet Properties		×	Inte	rnet Protocol Version 4 (TCP/I	IPv4) Properties	
Vetworking Sharing			Ger	neral		
Connect using:	ion (6)  219-V		Yi th fo	ou can get IP settings assigned is capability. Otherwise, you ne or the appropriate IP settings.	automatically if your network suppo ed to ask your network administrati	orts or
This connection uses the followi	Co ng items:	nfigure		<ul> <li>Obtain an IP address autom</li> <li>Use the following IP address</li> </ul>	atically	
<ul> <li>Elient for Microsoft Net</li> <li>Elie and Printer Sharing</li> </ul>	works for Microsoft Networks	^		IP address:	10 . 10 . 8 . 1	
<ul> <li>✓ ₩ DNE LightWeight Filter</li> <li>✓ ₩ Npcap Packet Driver (I</li> <li>✓ ₩ QoS Packet Scheduler</li> </ul>	NPCAP)			Default gateway:		
<ul> <li>Internet Protocol Version</li> <li>Microsoft Network Ada</li> </ul>	n 4 (TCP/IPv4) pter Multiplexor Protoco	a v		Obtain DNS server address a	automatically	
<		>		Use the following DNS serve	r addresses:	
Install Ur	install Pro	operties		Preferred DNS server:		
Description				Alternate DNS server:		
Transmission Control Protoco wide area network protocol th across diverse interconnecter	l/Internet Protocol. The at provides communica d networks.	default ation		Validate settings upon exit	Advanced	l

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

A	Not	seaure	10.10.8.2/index.html	

Brobust	el						Save & Apply   R	eboot   Logo
		🛆 It is str	ongly recommen	ded to change the	e default passv	vord.		
	Link Man	ager	Status					
Status	^ Genera	al Setting	s					
Interface				Primary Link	WWAN1	v	1	
Link Manager				Backup Link	None	v		
LAN			Em	ergency Reboot	ON OFF	1		
Ethernet						0		
Cellular WiFi	^ Link S	ettings	Description	Gamma stian T				
	Index	WWAN1	Description	DHCP	ре			6
Network	2	WWAN2		DHCP				
VPN								
Services								
System								
							Submit	Cancel
							Subline	cuncer

Figure 4: Link manager page on modem GUI

3. Under "WWAN Settings", set "Automatic APN Selection" to OFF
A Net seare | 1010.82/index.html

∧ General Settings		
Index	1	
Туре	WWAN1	
Description		
Link A WWAN Settings		
Automatic APN Selection	ON THE	
Dialup Number	*99***1#	
Authentication Type	Auto	
PPP Preferred	OFF 😨	
Switch SIM By Data Allowance	OFF 😨	
Data Allowance	5000	
Billing Day	1	
> Ping Detection Settings		
Enable	ON OF	
		Submit Clo

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.
- Go to "Support > Resources" and download and install "RVPN Manager" for your version of Windows

← → C 🌲 rams-doud.r	obustel.net/roms/support/resource	
	记 RobustLink   圇 RobustVPN   祭 App Center <mark> </mark>	
Support	OpenAPI × C Resources ×	
کې OpenAPI		
Release Notes	Search Attachment Q	
FAQ	r2000-rcms-3.0.4.rpk	Download J
Presources	r2100-rcms-1.0.3.rpk	Download
	r2110-rcms-3.1.3.rpk	Download
	r3000-rcms-3.0.4.rpk	Download
	r3000lg-rcms-3.1.3.rpk	Download
	r3010-rcms-3.1.3 rpk	Download
	RVPN Manager - 32 bit Windows OS	
	RobustVPN_Manager_v2.1.2_Build20200407_Setup_x86.exe	Download
	RVPN Manager - 64 bit Windows OS	
	RobustVPN_Manager_v2.1.2_Build20200407_Setup_x84.exe	Download 🕁

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"



<b>B</b> robust	■ - × El vpn 2.1.2
STACK	CLOUD
Global Default (rcms-cloud.rob	ustel.net) 🔹
LO	GIN

#### 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.

				<b>∓</b> - ×
Microsoft				
Sign in				
Email, phone, or S	kype			
Can't access your acco	ount?			
Sign-in options				
	Back	Next		
			_	
			Terms of use	Privacy & cookies

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.



≡ James.Nunn	DUSTEL VPN 2.1.2
🔞 Vena	User Connect Status: START
Test Mode	VPN Group   Group Status: Running   Public IP: 137.117.183.124   Virtual Network: 10.19.0.0/20 VPN Server Status: Running

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

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