

# GIOT ODU-LBT User Guide WMDS-183 LoRa RF Borad

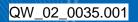


## **Device Photo**



## 1. Open Admin GUI

Access ODU WebUI via WAN IP address assigned by dhcp. The WAN IP address will configure to 192.168.77.1 after enabling 3G/4G LTE. Default username is "admin" and password is "admin"





## Figure 1

SODU-AB6D22

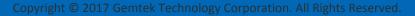
Authoriz	zation Required
Please enter your use	ername and password.
Username	admin
Password	I

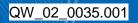
## 2. GloT

The GIoT menu consists of the following categories: Status, Provision, Configuration and Network Server.

#### 2.1 GIoT - Status

The purpose of this category is to view GIoT information as in its provision code, gateway type, gateway ID or LoRa modules, channels and spreading factor.







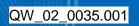
GloT Status Provision	GloT Status	
Configurations Network	GIoT Info	
	Provisioning Code	80001158 (Provision)
	Area Code	80001158
	Gateway Type	Micro
	LoRa Module 1	ON
	Gateway ID	1c497ba84631
	Rac	Ch0: ON 922.625MHz Ch1: ON 922.875MHz Ch2: ON 923.125MHz Ch3: ON 923.375MHz
	Rac	Ch4: ON 923.625MHz Ch5: ON 923.875MHz Ch6: ON 924.125MHz Ch7: ON 924.375MHz

#### 2.2 GIoT - Provision

GIOT provision code can be setup on this page.

Figure 3 - Pro	vision Code
GIoT Status Provision	Provision Code
Configurations Network	System will reboot when provision code is applied successfully. Code 80001158
	APPLY

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#### 2.3 GIoT - Configuration

Click "PERFORM RESTART" button to restart LoRa server.

LoRa provides 3 modes: Normal AP, Repeater AP and Repeater. Users can set up the required mode in LoRa Configuration.

#### Figure 4 - GIoT Management

GloT Status Provision	GloT Management
Configurations Network	LoRa Management
	LoRa Restart PERFORM RESTART
	LoRa Configurations
	Repeater Mode: Normal-AP   APPLY

#### 2.4 GIoT - Network Server

Users can configure ODU to connect to mqtt broker over the network server. The proper provision code has to be in place to reveal and access the network server features on the system menu. Please contact GIoT personnel if needed.

Eiguro	E	CIAT	Network	Corvor
rigure	<b>J</b> -	GIUI	Network	Server

GIOT					
Status	Network Serve	er			
Provision	The description for the Network Server.				
Configurations					
Network Server					
.oraWAN	Protocol:	MQTTS .			
letwork	Hostname:	127.0.0.1			
	Username:	admin			
	Password:	admin			
	Publish topic:	GIOT-GW/DL/			
	Subscribe topic:	GIOT-GW/UL/			
	Downlink ACK:	GIOT-GW/DL-report/			





#### 3. LoRaWan

The LoRaWan menu consists of the following categories: OTAA Status, Node Parameters, OTAA and ABP. The proper provision code has to be in place to reveal and access the LoRaWan features on the system menu. Please contact GIoT personnel if needed.

#### 3.1 LoRaWan - OTAA Status

The purpose of this category is to view the process status of a node joining Network Server via OTAA, which includes DevAddr, Device EUI, App EUI, OTAA Group Index and Latest Update Time.

-igure 6 - OTA	AA Status				
GIoT LoraWAN	OTAA St	atus			
OTAA Status	The description for the O	TAA Status.			
Node Parameters OTAA					1/
ABP					
Network	DevAddr	Device EUI	App EUI	Group Index	Latest Update Time
	08000000	080000000000000000000000000000000000000	0800000000000000	1	2017:07:20:09:13:15
	08000001	080000000000001	080000000000001	1	2017:07:20:09:13:15
	08000002	080000000000002	080000000000002	1	2017:07:20:09:13:15
	08000003	080000000000003	080000000000003	1	2017:07:20:09:13:15
	08000004	080000000000004	080000000000004	1	2017:07:20:09:13:15

#### Fiaure 6 - OTAA Status

#### Click "**REFRESH**" to renew OTAA information.

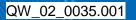
When there are over 20 OTAA Status entries on the page, users can click on the page number on the upper-right corner to move on to the next page.

Definition of OTAA Status Fields:

DevAddr: The device address of node assigned by network server
Device EUI: The unique device EUI of node.
App EUI: The unique app EUI of node.
OTAA Group Index: The unique index of OTAA EUID group.
Latest Update Time: The last time an uplink data was sent (sync per hour)

#### 3.2 LoRaWan - Node Parameters

The purpose of this category is to view node parameters, which includes DevAddr, Rx1DrOffset, Rx2DataRate, Delay, Rx2Freq and LastDownMsgSeqNo.





#### Figure 7 - Node Parameters

GIoT LoraWAN OTAA Status						
Node Parameters OTAA ABP Network	Search for this DevAr	ldr :	APPLY	CLEAR		1
	DevAddr	Rx1DrOffset	Rx2DataRate	Delay	Rx2Freq	LastDownMsgSeqNo
	00000001	0	0	1	9265000	0
	00000002	0	0	1	9265000	0
	00000006	0	0	1	9265000	0
	000000c	0	0	1	9265000	0

User can input a device address in the blank field and click "**APPLY**" to filter, click "**CLEAR**" to cancel filter.

9265000

Click "**REFRESH**" to renew Node Parameter information.

When there are over 20 Node Parameters entries on the page, users can click on the page number on the upper-right corner to move on to the next page.

Definition of Node Parameters Fields:

00000011

DevAddr: The unique device address of node. Rx1DrOffset: The downlink data rate offset of Rx1. Rx2DataRate: The downlink data rate of Rx2. Delay: The delay between TX and RX. Rx2Freq: The downlink frequency of RX2. LastDownMsgSeqNo: The number of downlink data sent.

#### 3.3 LoRaWan - OTAA

The purpose of this category is to view and configure OTAA rules.

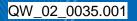
Click "**ADD**" button to enter OTAA add page and input Group Index, AppEUI Start, AppEUI Counts, DevEUI Start, DevEUI Counts, Devaddr Start, Devaddr Counts, Appkey and Aging Out Time, then click "**SAVE**" to create an OTAA rule. User will leave OTAA add page after clicking "**CANCEL**".

Following information on the OTAA:

Group Index: The unique index of OTAA EUID group.
AppEUI Start: The start number of AppEUI.
App Counts: The number of AppEUI in this Group.
DevEUI Start: The start number of DevEUI.
DevEUI Counts: The number of DevEUI in this Group.

**DevAddr Start**: The start number of DevAddr.

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DevAddr Counts: The number of DevAddr in this Group.AppKey: Appkey for OTAA join request.Aging Out Time(Minutes): If the Node hasn't sent uplink within the aging out time limit, the allocated OTAA DevAddr will be expired and released.

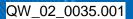
#### Note: The Aging Out Time must be at least 60 minutes.

GloT			
LoraWAN	OTAA-Add		
OTAA Status	The description for the OTAA.		
Node Parameters			
OTAA			
ABP	Paremeter	Format	
Network	Group Index	INT (1~255)	253
	AppEUI Start	16 HEX digits	0011223344556670
	AppEUI Counts	Digit (1~4096)	100
	DevEUI Start	16 HEX digits	0011223344556670
	DevEUI Counts	Digit (1~4096)	100
	DevAddr Start	8 HEX digits	2530ff00
	DevAddr Counts	Digit (1~4096)	100
	АррКеу	32 HEX digits	53A6B13B1E372D384C57;
	Aging Out Time	Minute (60~65535)	65

To delete entries, select one or more OTAA rule entries and click "DELETE" button.

GloT	<b>ОТ</b> 4									
oraWAN	OTA	A								
OTAA Status Node Parameters	The descript	ion for the OTAA.								
OTAA										
ABP	_									
letwork	~	Group Index	AppEUI Start	AppEUI Counts	DevEUI Start	DevEUI Counts	DevAddr Start	DevAddr Counts	АррКеу	Aging Out Time (Minutes)
	×	253	00112233 44556670	100	00112233 44556670	100	2530 ff00	100	53A6B13B 1E372D38 4C577BA3 F76B429C	65 EDIT

To edit an entry, select a rule entry and click "EDIT" button to proceed. Edit AppEUI Start, AppEUI Counts, DevEUI Start, DevEUI Counts, Devaddr Start, Devaddr Counts, Appkey and Aging Out Time, then click "SAVE" to edit the OTAA rule. User will leave OTAA edit page after clicking "CANCEL".





GIoT LoraWAN OTAA Status Node Parameters	OTAA-Edit The description for the OTAA.		
OTAA ABP	Paremeter	Format	
Network	Group Index	INT (1~255)	253
	AppEUI Start	16 HEX digits	0011223344556670
	AppEUI Counts	Digit (1~4096)	100
	DevEUI Start	16 HEX digits	0011223344556670
	DevEUI Counts	Digit (1~4096)	100
	DevAddr Start	8 HEX digits	2530ff00
	DevAddr Counts	Digit (1~4096)	100
	АррКеу	32 HEX digits	53A6B13B1E372D384C57
	Aging Out Time	Minute (60~65535)	65

#### 3.4 LoRaWan - ABP

The main function of this feature is to add/delete/edit ABP rule entries on this page. The ABP menu consists of the following categories: INDIVIDUAL and NETID GROUP.

### **3.4.1 INDIVIDUAL** Click "**INDIVIDUAL**" button to enter the INDIVIDUAL function page.

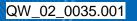
Figure 9.A -		UAL			
GloT LoraWAN	ABP -	INDIVIDUA	L		
OTAA Status Node Parameters OTAA	The description fo				1_/1
ABP Network					
Network		DevAddr	NwkSKey	AppSKey	
		00ffffaa	11111111111111111111 111111111111	111111111111111111111 11111111111	EDIT
					DELETE ADD

Click "**ADD**" button to enter ABP add page and input DevAddr, NwkSKey and AppSKey then click "**SAVE**" to create an ABP (INDIVIDUAL) rule. User will leave ABP add page after clicking "**CANCEL**".

Definition of ABP (INDIVIDUAL) Fields:

DevAddr: The unique device address of node.NwkSKey: The network session key.AppSKey: The app session key.

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#### Figure 9.B – INDIVIDUAL–Add

GloT LoraWAN	ABP Individual-Ado	ł	
OTAA Status	The description for the ABP.	-	
Node Parameters	INDIVIDUAL NETID GROUP		
ABP			
Network	Paremeter	Format	
	DevAddr	8 HEX digits	01111111
	NwkSKey	32 HEX digits	2222222222222222222222222
	AppSKey	32 HEX digits	222222222222222222222222

To delete entries, select one or more ABP (INDIVIDUAL) rule entries and click "DELETE" button.

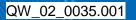
Figure 9.C -	- INDIVID	UAL–Delet	е		
GloT					
LoraWAN	ABP -	INDIVIDUA	AL		
OTAA Status	The description for	or the ABP.			
Node Parameters	INDIVIDUAL	NETID GROUP			
OTAA					1_/1
ABP					
Network					
	~	DevAddr	NwkSKey	АррЅКеу	
		00ffffaa	111111111111111111 11111111111	11111111111111111111 11111111111	EDIT
					DELETE ADD

To edit an entry, select a rule entry and click "EDIT" button to proceed. Edit NwkSKey and AppSKey then click "SAVE" to edit the ABP (INDIVIDUAL). User will leave ABP edit page after clicking "CANCEL".

Figure 9.D -	- INDIVIDUAL–Edit		
GloT	ABP Individual-U	ndata	
LoraWAN	ABP Individual-O	puale	
OTAA Status	The description for the ABP.		
Node Parameters	INDIVIDUAL NETID GROUP		
OTAA			
ABP			
Network	Paremeter	Format	
	DevAddr	8 HEX digits	00ffffaa
	NwkSKey	32 HEX digits	111111111111111111111111111111111111111
	AppSKey	32 HEX digits	111111111111111111111111111111111111111
			SAVE CANCEL

#### **3.4.2 NETID GROUP** Click **"NETID GROUP"** button to enter NETID GROUP function page.

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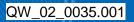


GloT LoraWAN	AE	P - NETID GROU	JP				
OTAA Status Node Parameters OTAA ABP	The de	scription for the ABP.					1_/
Network		NwkiD	NwkAddr Start	Total number	NwkSKey	АррЅКеу	
						C	DELETE ADD
Nwk ABP User Defi Nwk Nwk	Addr 1 (NETII r will le nition (ID: Th Addr 5 (Addr 5 (SKey:	" button to enter Total Number ,N O GROUP) rule. eave ABP add pag of ABP (NETID G e unique NETID G <b>Start</b> : The start i <b>Fotal Number</b> : T The network ses The app session	wkSKey an ge after cli ROUP) Fie of ABP gro number of he numbe ssion key in	d AppSKey cking " <b>CAN</b> lds: up. ABP device r of ABP de the Group	then click " <b>S</b> ICEL". e address in t	AVE" to cro he Group.	eate an
Eiguro 10 B	NET	D GROUP - Add					
GIOT							
LoraWAN OTAA Status Node Parameters OTAA	The d	estiD-Add escription for the ABP. IMIDUAL NETID GROUP					
ABP Network	- 1	Paremeter		ormat			
		NwkID	0:	0~0xFE	10		
		NwkAddr Start	61	EX digits	10 fff000		
		NwkAddr Total Number		Digits	11		
		NwkSKev	32	HEX digits	8888888888	888888888888888888888888888888888888888	

To delete entries, select one or more ABP (NETID GROUP) rule entries and click "**DELETE**" button.

32 HEX digits

AppSKey



SAVE CANCEL



#### Figure 10.C - NETID GROUP - Delete

GloT LoraWAN	AB	P - NE		OUP			
OTAA Status	The des	cription for the ABF					
Node Parameters	INDIV	/IDUAL NE	ETID GROUP				
OTAA							1_/
ABP							
Network							
		NwkID	NwkAddr Start	Total number	NwkSKey	AppSKey	
	8	<b>≥</b> 10	10fff000	11	88888888888888888888888888888888888888	aaaaaaaaaaaaaaaa aaaaaaaaaaaa	EDIT

To edit an entry, select a rule entry and click "EDIT" button to proceed. Edit NwkAddr Start, NwkAddr ,NwkSKey and AppSKey then click "SAVE" to edit the ABP (NETID GROUP).

User will leave ABP edit page after clicking "CANCEL".

#### Figure 10.D - NETID GROUP - Edit

GloT LoraWAN OTAA Status Node Parameters OTAA	NetID-Update The description for the ABP. INDIVIDUAL NETID GROUP		
ABP Network	Paremeter	Format	
	NwkiD	0x0~0xFE	10
	NwkAddr Start	6 HEX digits	10 fff000
	NwkAddr Total Number	Digits	11
	NwkSKey	32 HEX digits	888888888888888888888888888888888888888
	AppSKey	32 HEX digits	aaaaaaaaaaaaaaaaaaaaaaa
			SAVE CANCEL





## 4. Network

The System menu consists of the following categories: WAN. Introduction and input procedures for each category are described in the following paragraphs.

#### 4.1 Network - WAN

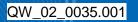
Είσμερ 11 Δ - Μ/ΔΝ

The purpose of this category is to view current WAN settings. This category is further divided into three sectors: Ethernet Wan and 3G/4G LTE. These individual options are lodged and labeled above the main content panel.

GIT EVENT WAN 3G4G LTE Network WN VAN Wan Type DHCP MAC-Address: 1C.49.78,A0 EE:1C PM4 Address: 12.2181.120 A.1.1 Ethernet WAN This page is to setup the connection type in terms of Static IP and DH The three different options can be selected in the drop-down menu i "WAN Type". Please fill in the respective fields exhibited under each Please make sure the Ethernet cable is connected to a WAN port. Figure 11.A - WAN: Static IP GIO GIT Network WN Ethernet WAN System wit redooff sufficiency are system successfully. WAN Type <u>Static IP</u> P Address 192,188.11.10 Gateway 192,188.11.10 DNS Server					ODU 3.00.12
WAN         Wan Type       DHCP         Image: State of the state of			/4G LTE	Ethernet WAN 3G/4G LTE	
WAN       MC-Address: 10: 4078 ABEE: 10         eind       MC-Address: 192:188.1.120         Jack Address: 192:188.1.120       Her Address: 192:188.1.120         Jack Address: 192:188.1.120       This page is to setup the connection type in terms of Static IP and DH The three different options can be selected in the drop-down menu i "WAN Type". Please fill in the respective fields exhibited under each Please make sure the Ethernet cable is connected to a WAN port.         State ILA - WAN: Static IP       Odd IE         Not       Ethernet WAN         Vin       Ethernet WAN         Static IP       IP Address         IP Address       192.168.11.10         Subnet Mask       255.255.255.0         Gateway       192.168.11.10				WAN	
Address: 10:34 / 64 Address: 10:24 / 64 Addres					
This page is to setup the connection type in terms of Static IP and DH The three different options can be selected in the drop-down menu i "WAN Type". Please fill in the respective fields exhibited under each Please make sure the Ethernet cable is connected to a WAN port.			MAC-Address	ež-	
This page is to setup the connection type in terms of Static IP and DH The three different options can be selected in the drop-down menu i "WAN Type". Please fill in the respective fields exhibited under each Please make sure the Ethernet cable is connected to a WAN port.				ernet W/AN	411 Ether
gare 11.A - WAN: Static IP         Jor Ethernet WAN         Odd autocossfully:         WAN         Detternet WAN         System will reboot if settings are applied successfully:         WAN       WAN Type       Static IP         IP Address       192.168.11.10         Subnet Mask       255.255.255.0         Gateway       192.168.11.10	lown menu in	elected in the drop-down	options can be s	e different option	The three
IoT Ethernet WAN 3G/4G LTE etwork WAN Ethernet WAN System will reboot if settings are applied successfully. WAN Type Static IP IP Address 192.168.11.10 Subnet Mask 255.255.255.0 Gateway 192.168.11.10	AN port.	e is connected to a WAN p			
WAN          Ethernet WAN         System will reboot if settings are applied successfully.         WAN Type       Static IP         IP Address       192.168.11.10         Subnet Mask       255.255.255.0         Gateway       192.168.11.10					
WAN Type         Static IP         •           IP Address         192.168.11.10         •           Subnet Mask         255.255.255.0         •           Gateway         192.168.11.10         •			VAN	Ethernet WAN	
IP Address 192.168.11.10 Subnet Mask 255.255.255.0 • Gateway 192.168.11.10			attings are applied successfully.	System will reboot if settings are applied	
Subnet Mask 255.255.255.0 • Gateway 192.168.11.10		•	WAN Type Static IP	WAN Typ	
Gateway 192.168.11.10			IP Address 192.168.11.10	IP Addres	
		•	Subnet Mask 255.255.255.0	Subnet Mas	
DNS Server 🗧			Gateway	Gatewa	
		<u></u>	DNS Server	DNS Serve	

#### Figure 11.B - WAN: DHCP Client

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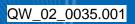


GloT	Ethernet WAN	3G/4G LTE		
Network				
WAN	Etherne	et WAN		
	System will rebo	oot if settings are applied successfully.		
		WAN Type DHCP Client	•	
				APPLY RESET

#### 4.1.2 3G/4G LTE

This page is to setup required information for 3G/4G LTE. Note: Make sure the SIM card is installed.

GIoT	Ethernet WAN	3G/4G LTE		
Vetwork				
WAN	3G/4G	LTE		
	System will re	boot if settings are applied successfully		
		APN		
		PIN	(optional) 🌮	
		Dial number	<ul> <li>(optional)</li> </ul>	
		Username	(optional)	
		Password	(optional)	





#### Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### **IMPORTANT NOTE:**

#### **Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/CANADA

Operation of this device is restricted to indoor use only





#### This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,

As long as 2 conditions above are met, further <u>transmitter</u> test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

#### **IMPORTANT NOTE**

In the event that these conditions <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID <u>can not</u> be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

#### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID:" MXF-WMDS183".

#### Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.





## **Professional installation instruction**

Please be advised that due to the unique function supplied by this product, the device is intended for use with our interactive entertainment software and licensed third-party only. The product will be distributed through controlled distribution channel and installed by trained professional and will not be sold directly to the general public through retail store.

#### 1. Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

#### 2. Installation location

The product shall be installed at a location where the radiating antenna can be kept 20cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

#### 3. External antenna

Use only the antennas which have been approved by Gemtek Technology Co., Ltd. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

#### 4. Installation procedure

Please refer to user's manual for the detail.

#### 5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.

