

ICP DAS
IoTstar Bot Service
For Telegram
User Manual

[Version 1.0.0 - 2023/09/23]



泓格科技
ICP DAS CO., LTD.

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Through the communication mechanisms provided by Telegram FZ LLC (hereinafter referred to as Telegram), this controller can send the notification messages and information regarding this controller to the related Telegram personal account. However, this function may not be available due to Telegram closes or terminates the communication mechanisms of their systems.

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1 Introduction

IoTstar is a software developed by ICP DAS for WISE/PMC/PMD controllers for use in a variety of Industrial IoT applications. IoTstar can be installed on a general PC platform and works as a Private IoT Cloud system, or on the VM (Virtual Machine) platform of Microsoft Azure, IBM Bluemix, Google Cloud or Amazon AWS, etc. and works as a Public IoT Cloud system. By using IoTstar to build an IoT Cloud system, it can provide 5 major services:

1. **Controller Remote Access Service:** Status Monitoring, System Setting, and Firmware Update for WISE/PMC/PMD controllers.
2. **Sensor Data Collection Service:** Collect the data of the sensor connected to the controller and import the data into the Database on cloud.
3. **Sensor Data Visualization Service:** Review the data of the sensor connected to the controller through Dashboard interface.
4. **Sensor Data Report Service:** Provide statistical report for the data of the sensor connected to the controller.
5. **Bot Service with Mobile Phone:** Review the data of the sensor connected to the controller by mobile phone Bot service.



Figure 1-1: System Architecture of IoTstar

IoTstar Bot Service for Telegram is an optional software package for IoTstar that provides users a Two-way message interaction between the WISE/PMC/PMD controllers managed by IoTstar and Telegram chat room. Through IoTstar Bot Service for Telegram, the users can query the real-time I/O channel data (or power data) of the I/O module (or power meter) connected to the WISE/PMC/PMD controllers, and instantly change the values of the DO/AO output channels of the I/O modules (or power meters) connected to WISE/PMC/PMD controllers.

In addition, IoTstar Bot Service for Telegram can receive the text message sent by the WISE/PMC/PMD controllers through the trigger of IF-THEN-ELSE logic rule and send the text message to the Telegram chat room for the event notification. If WISE enables the image or video file forwarding function, IoTstar Bot Service for Telegram can also send the photo or video file to the Telegram chat room along with the text message, and user can also review the event list and the corresponding images of controller in the past.

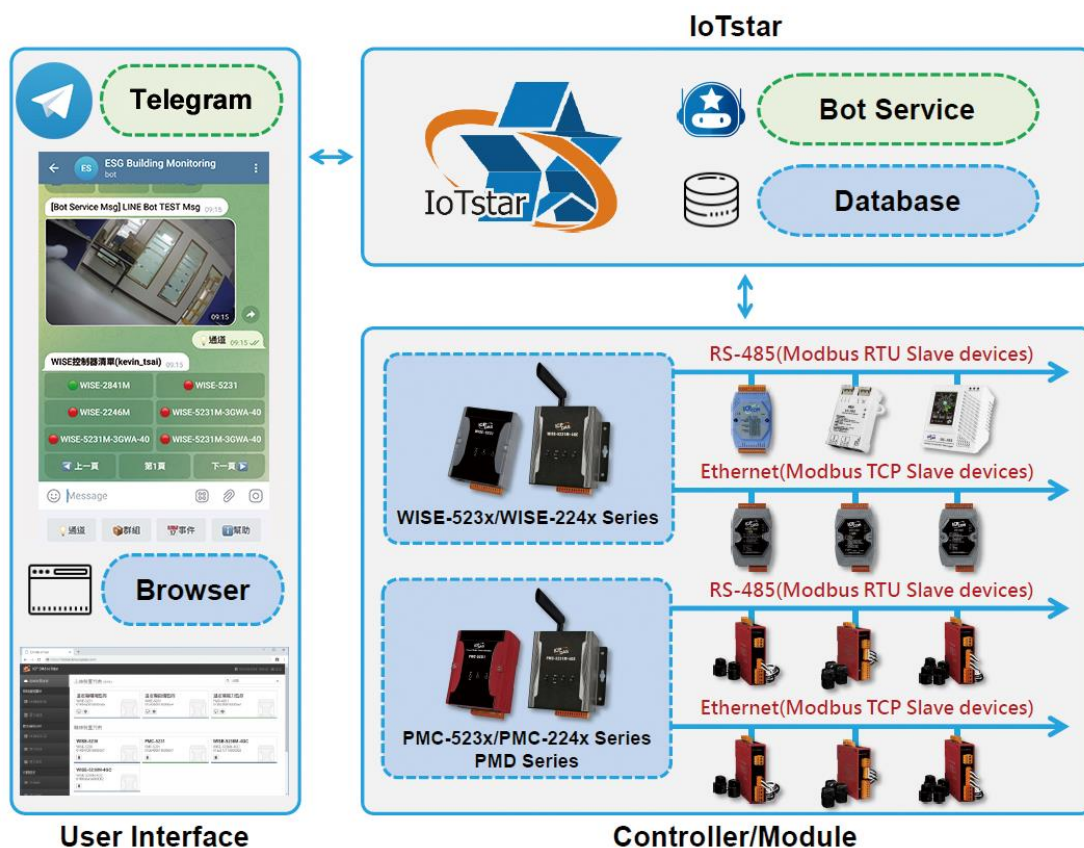


Figure 1-2: System Architecture of IoTstar Bot Service for Telegram

2 Before Installation

2.1 Precondition

Before using IoTstar Bot Service for Telegram, you must first complete the setting of the following preconditions.

- ◆ Complete the installation of IoTstar, and complete the connection setting of IoTstar and WISE/PMC/PMD controllers.
- ◆ The network setting of the computer that installs IoTstar needs to be set as "**Public Network IP**" or "**Dynamic IP + DDNS**", and the user has to apply the **SSL certification** for the IoTstar website.
 - The HTTPS server must use a SSL certificate issued by a certificate authority widely trusted by general web browsers.
 - "[Appendix I](#)" provides the Step-by-Step document for the application of the free SSL certificate from Let's Encrypt. Before apply the SSL certificate from Let's Encrypt, the IoTstar website must complete the setting of **Domain Name**.
- ◆ Make sure the Telegram Bot official account can be applied in the country that IoTstar Bot Service for Telegram installed, and make sure the functions of Telegram Bot can be enabled.
 - The user needs to apply the Telegram Bot official account by himself. For the detailed process, please refer to the section [2.3 Application of Telegram Bot account and Token acquisition](#).
 - The chat room corresponding to the Telegram Bot account can send up to 20 messages per minute
 - The chat room corresponding to the Telegram Bot account can send the following information:
 - ✓ Text message
 - ✓ Image (JPG or PNG format, smaller than 10MB)
 - ✓ Video (MP4 format, smaller than 50MB)

2.2 Software Requirements

- ◆ IoTstar requires v3.6.0 or later.

2.3 Application of Telegram Bot account and Token acquisition

The following will introduce how to create a Telegram Bot account and obtain the corresponding Token through the Telegram official website, and then use the information for the setting of IoTstar Bot Service for Telegram.

- i Key in BotFather in the search field of the Telegram APP on the mobile phone, and then click the "BotFather" item that appears in the interface to enter the official chat room to apply the Telegram Bot account. Please follow the instructions below to obtain the Telegram Bot account's username and Token information required to activate IoTstar Bot Service for Telegram.



Figure 2-1: Enter the Telegram BotFather official chat room

- ii In the message field, key in the message `"/newbot"` to create a Telegram Bot account, and then input the "name" and "username" for the Telegram Bot account. The "username" must be end with the "bot" string. After the Telegram Bot account is created, click the Telegram Bot account's link Telegram provide in the following message to enter the dialog window of the Telegram Bot account, and then click on the corresponding Token of the Telegram Bot account and copy (keep) it. The username and Token information of the Telegram Bot account will be used in the setting of IoTstar to enable the operation of IoTstar Bot Service for Telegram.

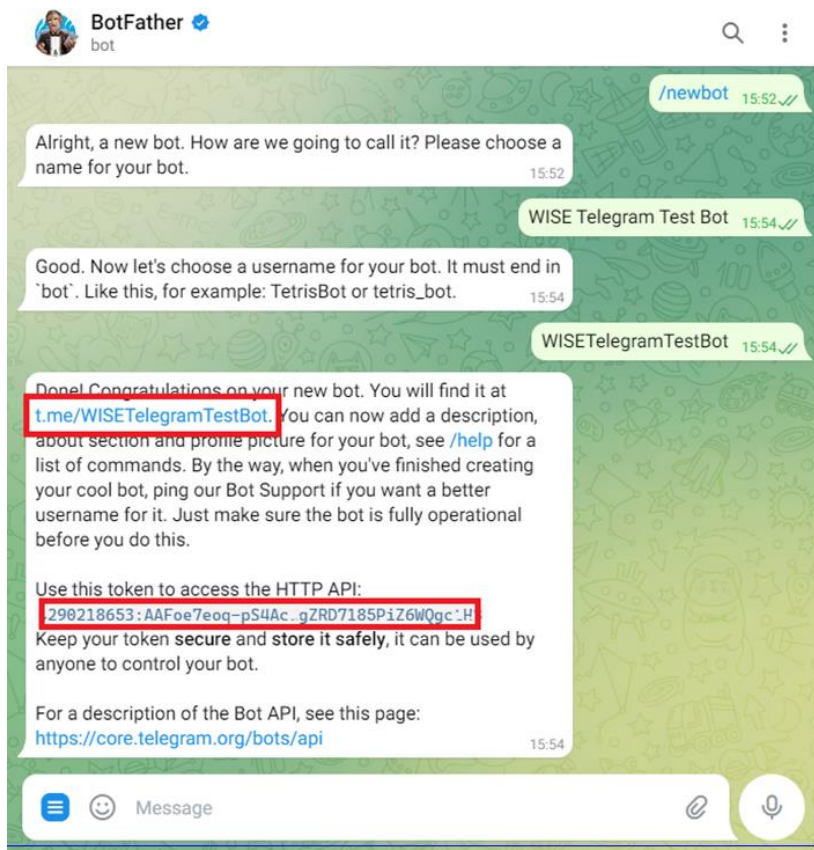


Figure 2-2: Create Telegram Bot account and get Token

iii If you had created a Telegram Bot account, key in “/mybots” in the message field, and select the username of the Telegram Bot account, and then click the “API Token” button. Now click the Telegram Bot account’s link in the following message to enter the dialog window of the Telegram Bot account, and then click on the corresponding Token of the Telegram Bot account and copy (keep) it. The username and Token information of the Telegram Bot account will be used in the setting of IoTstar to enable the operation of IoTstar Bot Service for Telegram.

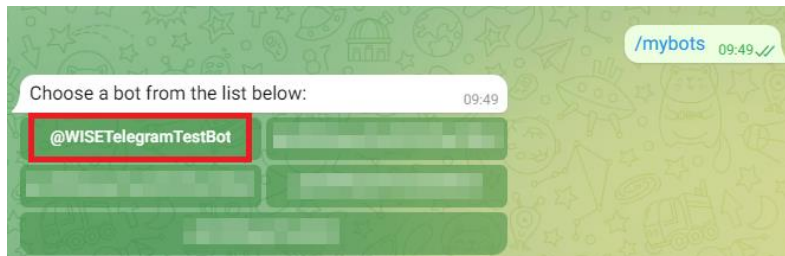




Figure 2-3: Use the established Telegram Bot account and get Token

2.4 Enable IoTstar Bot Service for Telegram

To enable the IoTstar Bot Service for Telegram function, users have to install the IoTstar v3.6.0 (and later version) first, and then get the license file of trial service (or formal service) to enable the Bot Service for Telegram function for IoTstar. Users can obtain a full-function trial service for 90 days on the website, or contact with ICP DAS to purchase the upgrade code of formal service. The following sections will introduce the process to enable the Bot Service for Telegram function.

Please Note: Before activate the operation of IoTstar Bot Service for Telegram, please make sure IoTstar is connected to the network and the Internet connection between IoTstar and Telegram official server is also in normal status.

2.4.1 Obtain and enable the license file of trial service

- i Click the "Download" button on the [IoTstar official webpage](#).

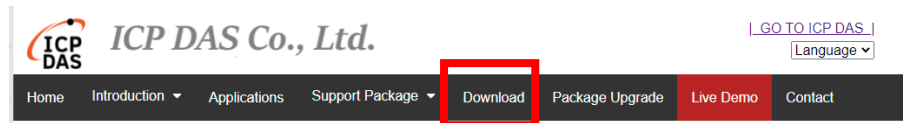


Figure 2-4: Obtain and enable the license file of trial service (1)

- ii On the download page, click the "Apply for trail" button of "Trail Service for Support Package" section to enter the IoTstar "Trail Service for Support Package" page.

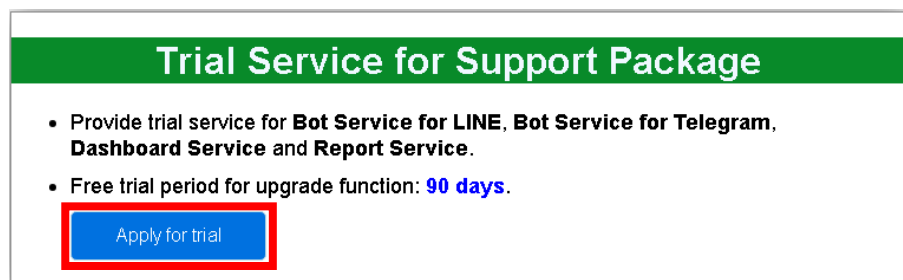


Figure 2-5: Obtain and enable the license file of trial service (2)

- iii On the IoTstar "Trail Service for Support Package" page, select the "Bot Service for Telegram" on the "Trail service option" field and enter the Hardware ID in the "Hardware ID" field. Click the "Download Trial License" button. If the above information is correct, users can obtain the license file of trial service.

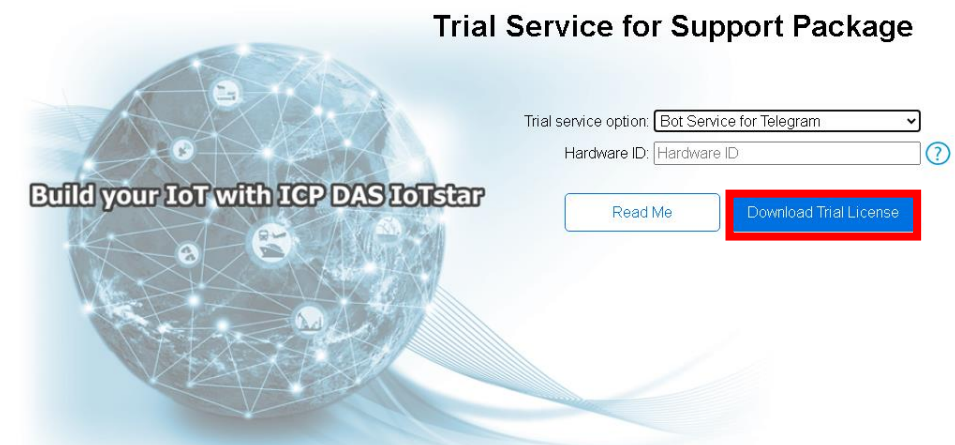


Figure 2-6: Obtain and enable the license file of trial service (3)

- iv After getting the License file for Bot Service for Telegram, please open the IoTstar system interface, click "License" button to enter the License setting window, and click "Browse" button to import the License File, and then click "OK" to enable the Bot Service for Telegram function of the IoTstar. (The trial service will be displayed the expiration date of bot service.)

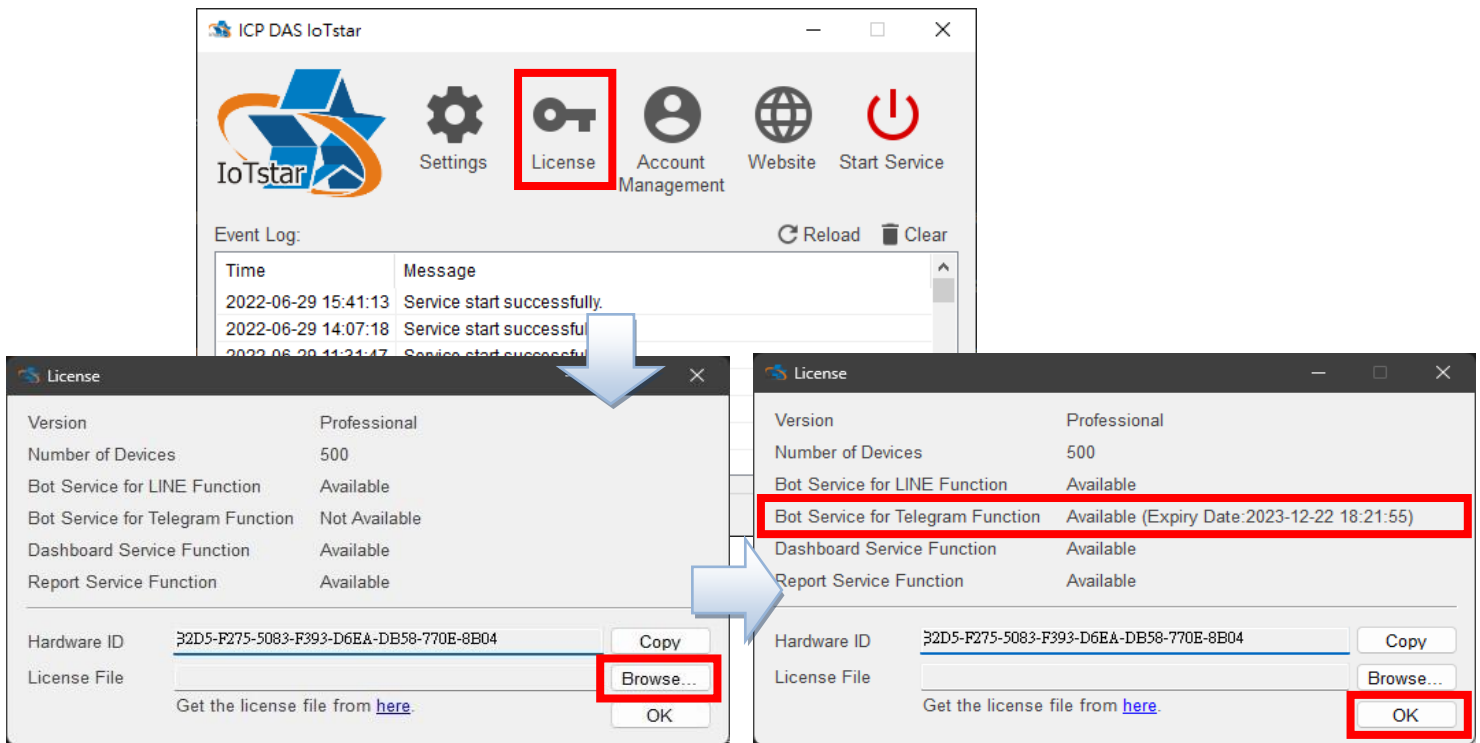


Figure 2-7: Obtain and enable the license file of trial service (4)

2.4.2 Obtain and enable the license file of formal service

To enable IoTstar Bot Service for Telegram (Formal service), user have must install the IoTstar Professional version v3.6.0 (and later version) first, and then contact with ICP DAS to purchase the upgrade code to enable the IoTstar Bot Service for Telegram (Formal service). The following steps will introduce the process to enable the IoTstar Bot Service for Telegram (Formal service).

- i Click the "Package Upgrade" button on the [IoTstar official webpage](#).

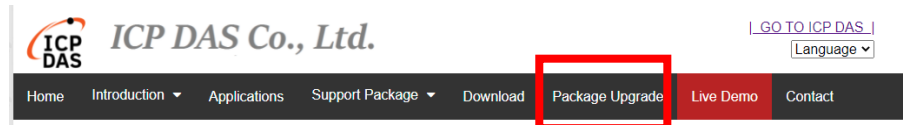


Figure 2-8: Obtain and enable the license file of formal service (1)

- ii Enter the Serial Number of IoTstar (professional version) and the Upgrade Code to enable Bot Service for Telegram, and click the "Upgrade" button to upgrade your IoTstar Serial Number with the authorization to use IoTstar Bot Service for Telegram. Click "Generate the License File" to go to the registration page.

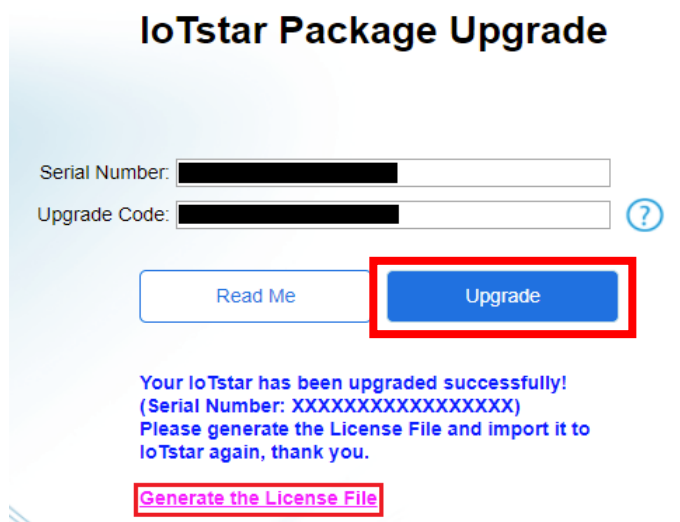


Figure 2-9: Obtain and enable the license file of formal service (2)

- iii Enter the required information and click the "Registration" button to get the license file of formal service.

Registration & Getting License File for IoTstar (Professional Version)



Figure 2-10: Obtain and enable the license file of formal service (3)

- iv After getting the License file for Bot Service for Telegram, please open the IoTstar system interface, click "License" button to enter the License setting window, and click "Browse" button to import the License File, and then click "OK" to enable the Bot Service for Telegram function of the IoTstar.

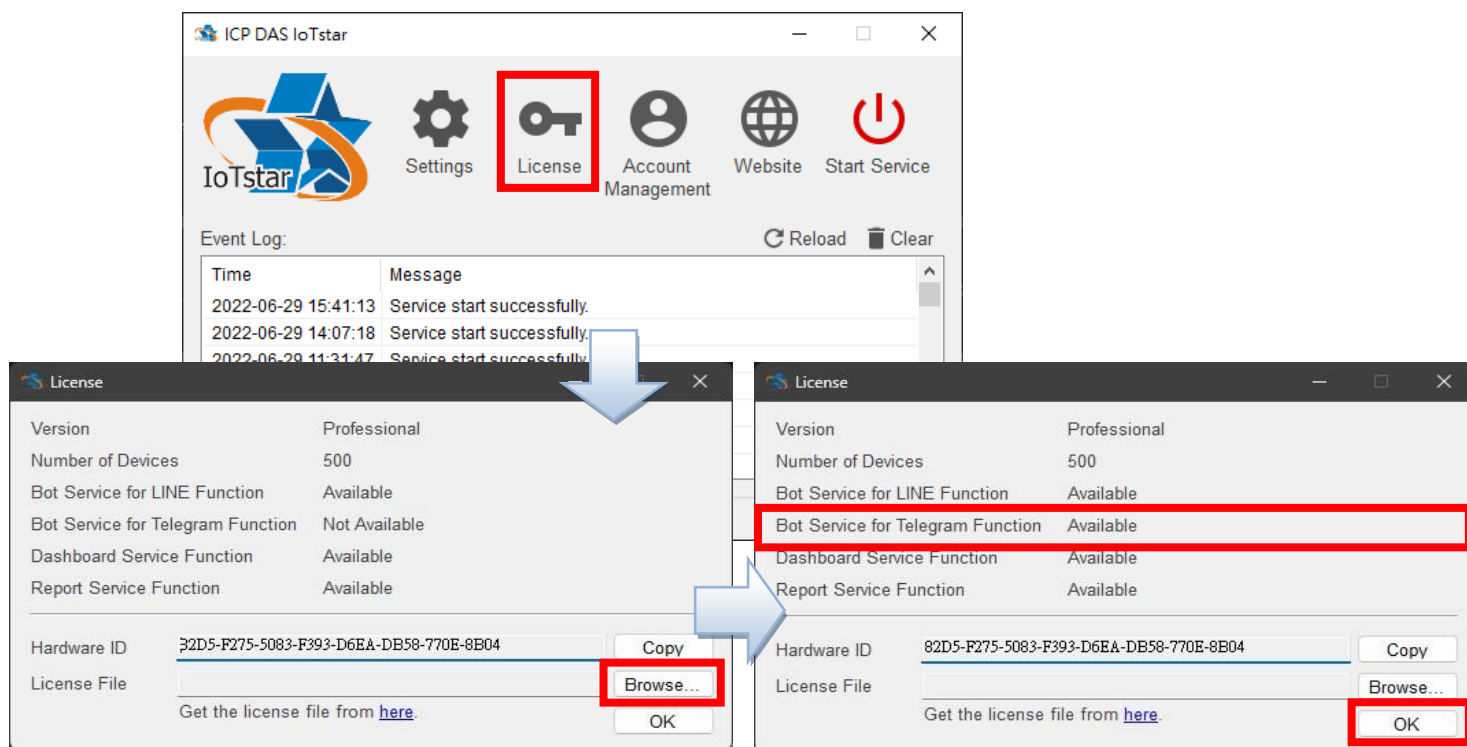


Figure 2-11: Obtain and enable the license file of formal service (4)

2.4.3 Enable IoTstar

- i Click "Settings" button on the IoTstar system interface to enter the setting window. Select the tab of "Website" and select https of the "Type" field. If you have modified the IP/Domain Name of IoTstar when create Bot Service, you need to modify the "IP/Domain Name" field.

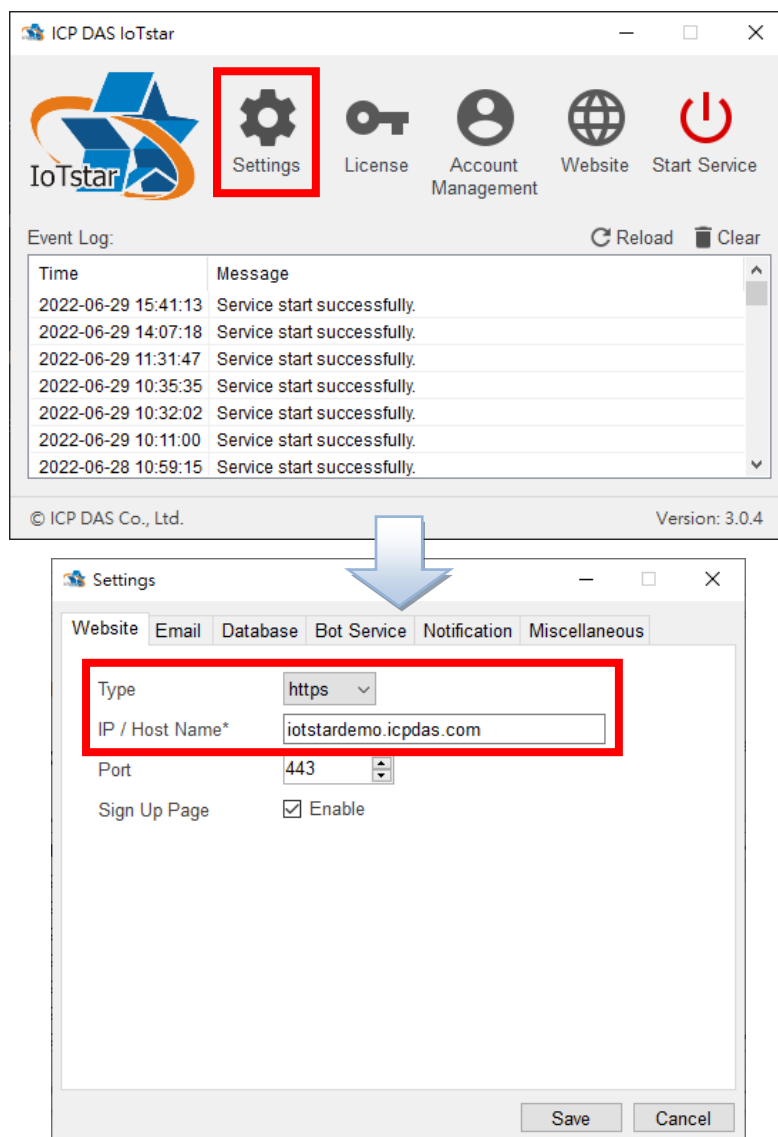


Figure 2-12: Setting of IoTstar Bot Service for Telegram (1)

- ii Continue to select the "Miscellaneous" tab of the IoTstar system interface, then you can assign the folder path for controller event video and photo file storage in the "Video & Photo Folder" field. Click the "OK" button to complete the settings.

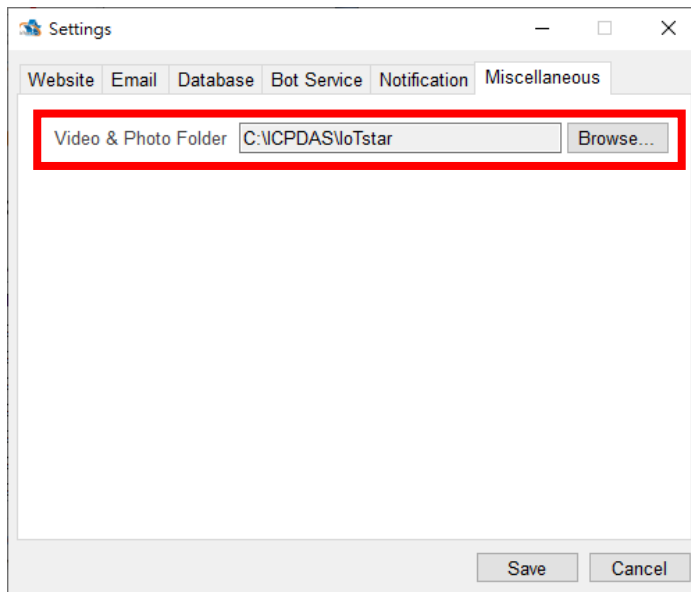


Figure 2-13: Setting of IoTstar Bot Service for Telegram (2)

- iii Click "Start Service" to enable IoTstar, then the Bot Service for Telegram will also be enabled at the same time.

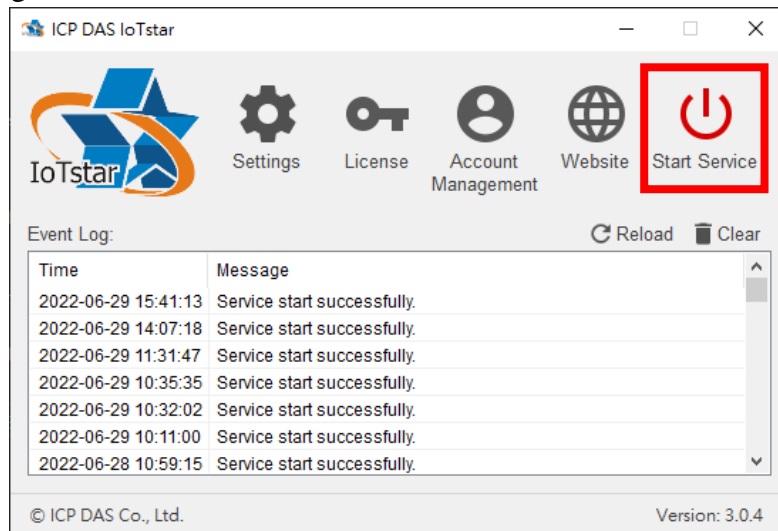


Figure 2-14: Activation of IoTstar

2.5 Import SSL certificate

To enable IoTstar Bot Service for Telegram, user has to import the SSL certificate into IIS (Internet Information Service). The SSL certificate can be obtained for free or for a fee. So please use the IP or Domain Name of the IoTstar website to obtain its corresponding SSL certificate first, and

then perform following steps to import the SSL certificate into IIS, or refer to "[Appendix I](#)" to apply the free SSL certificate of Let's Encrypt and import it into IIS. **Please Note: If user follows the steps of Appendix I, the software will help user to get the SSL certificate, import it to IIS automatically. So please skip the steps in the section 2.5.**

- i Launch "Internet Information Services (IIS) Administrator" and click on the "Server Certificates".

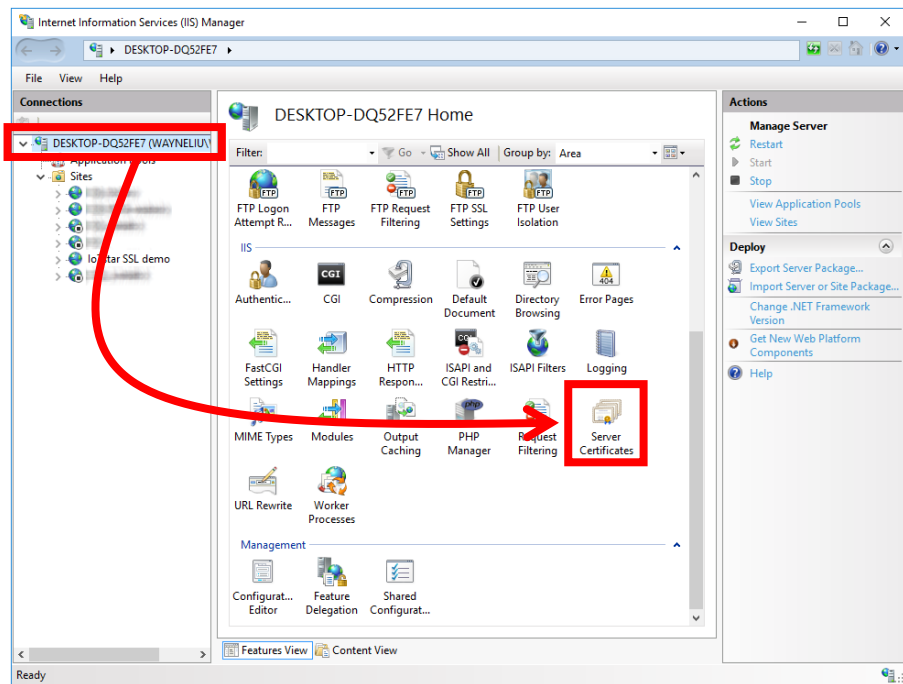


Figure 2-15: Launch IIS and go into SSL Certificates interface

- ii Click the "Import..." on the right side of the "Server Certificates" window. Browse the SSL certificate in the **px** file format, enter the password of the certificate, and click the "OK" button to finish the import process.

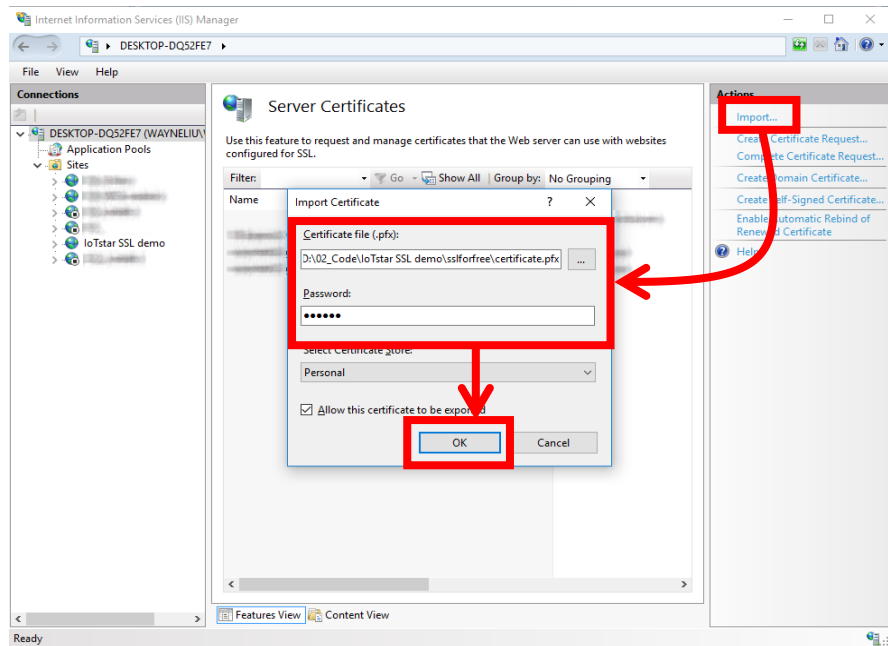


Figure 2-16: Import the SSL certificate

- iii Select the IoTstar website on the left side of the IIS window, and click on the "Binding..." on the right side of the IIS window, and then select the IP/Host Name setting by the IoTstar. Finally, select the SSL certificate and click the "OK" button.

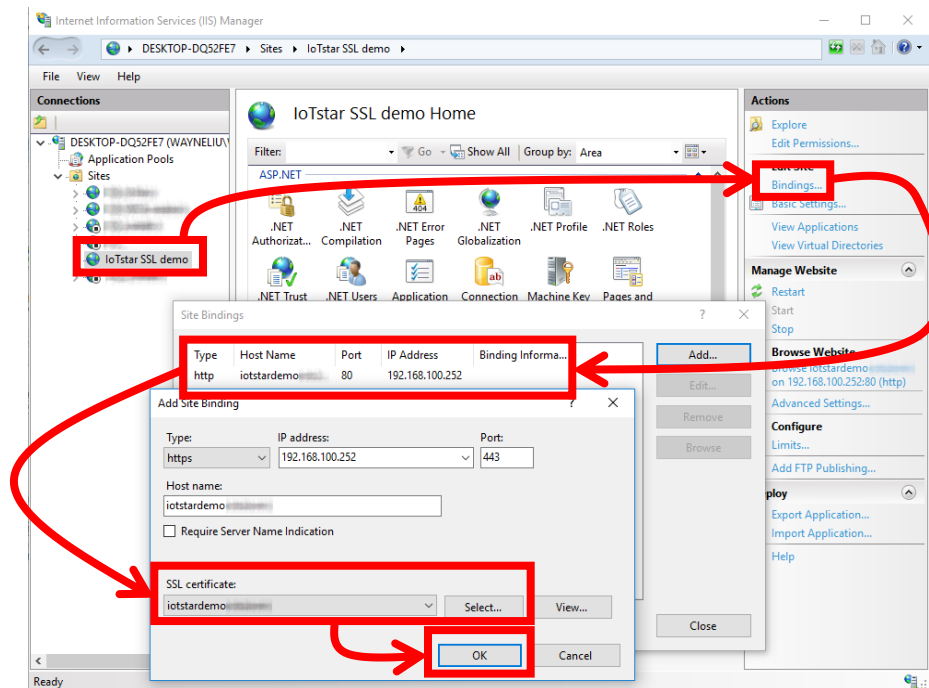


Figure 2-17: Enable the HTTPS connection of the IoTstar website

2.6 Message sending from WISE/PMC/PMD to Telegram Bot

The user can edit the WISE/PMC/PMD's IF-THEN-ELSE logic rule setting to trigger the message sending operation. When WISE/PMC/PMD sends the message, it will be sent to the corresponding Telegram user account via IoTstar Bot Service for Telegram. The content of message can include the Real-Time I/O channels data, power data or Internal Register data. In addition, WISE also provide image or video data sending function to send the image or video data to the corresponding Telegram user account.

2.6.1 Setting of text message sending by WISE

- i Launch a Browser to login into the WISE-523x/WISE-2x4x, and enter the "IoT Platform Setting" Page. Click the "Bot Service Message Setting" button under the "IoTstar Setting" section on the left side of the webpage to enter the "Bot Service Message Setting" page.

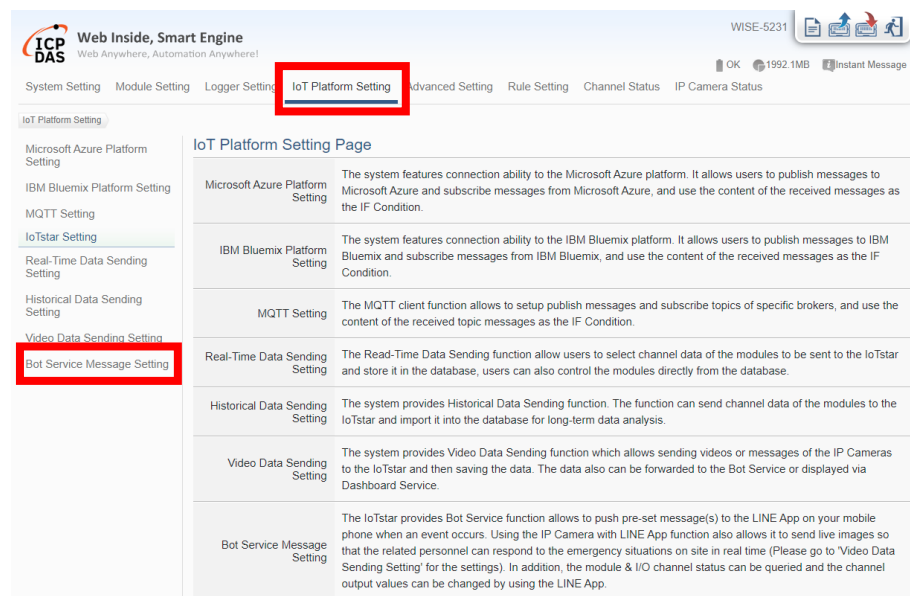


Figure 2-18: WISE Web Site - Bot Service Message Setting Page (1)

- ii Click on "Add new Message" to open the "Bot Service Message Setting" Page.

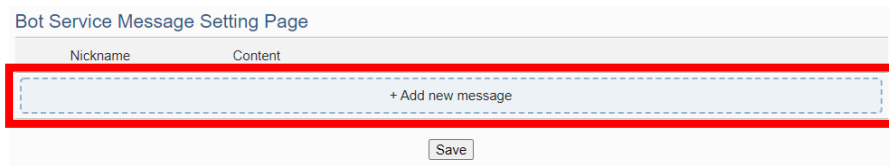


Figure 2-19: WISE Web Site - Bot Service Message Setting Page (2)

- iii Input name in the "Nickname" field, and you could also input the description of this Bot Service message in the "Description" field. Enter the message in the "Content" field. The Bot Service message provides an encoded string for you to add current I/O channel data or Internal Register data into the Bot Service message. To make it easy to add the encoded string, WISE-523x/WISE-2x4x provides "Real-time variable editor" for users. Click on "OK" to confirm the setting and leave the setting page.

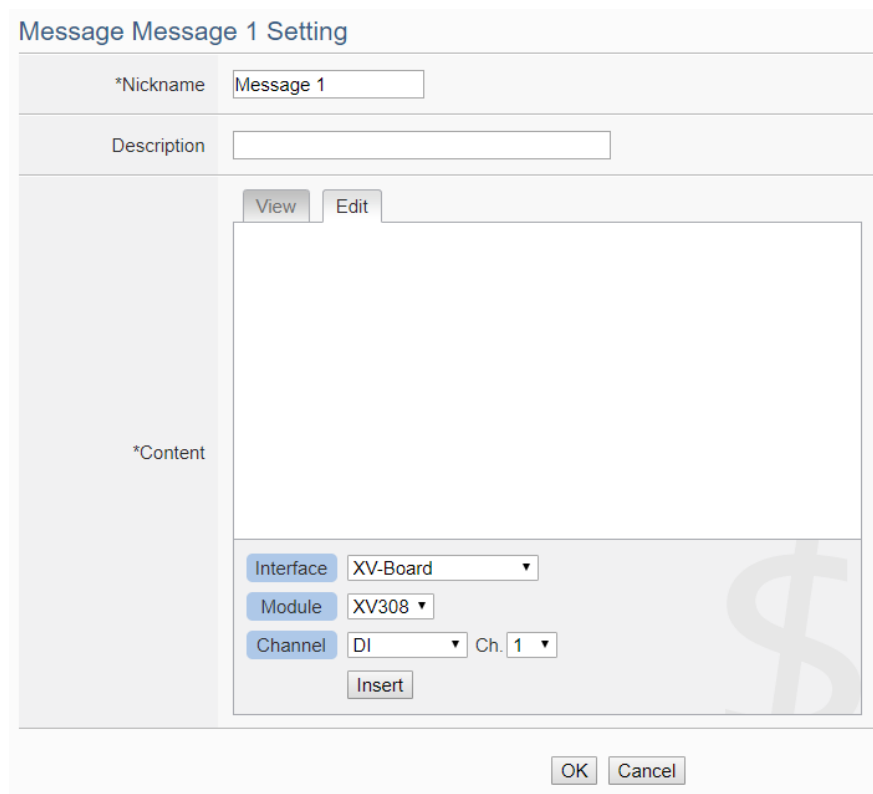


Figure 2-20: WISE Web Site - Bot Service Message Setting Page (3)

- iv Repeat steps ii~iii to complete the settings of all Bot Service message. After you finish all the Bot Service message settings, click "Save" button to save the settings.

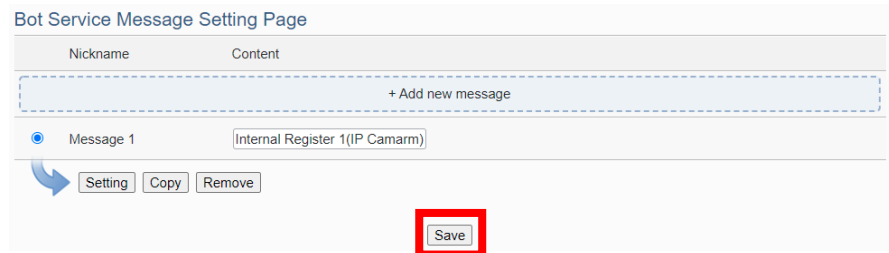


Figure 2-21: WISE Web Site - Bot Service Message Setting Page (4)

- v Go to the "Rule Setting" page and click "Add new rule". The "Rule Setting" page will be shown. Click the "Bot Service" option under the THEN/ELSE section, and select the Bot Service message. Now if the evaluation of the "IF statement" is "true", the selected Bot Service message will be sent, and the user will receive the messages WISE-523x/WISE-2x4x sent in the corresponding Telegram Bot chat room.

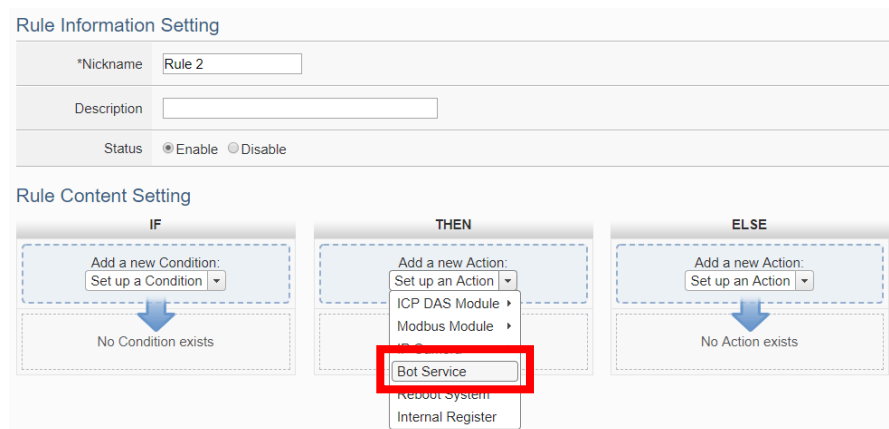


Figure 2-22: WISE Web Site - Rule setting with Bot Service Message

2.6.2 Setting of image/video message sending by WISE

- i Launch a Browser to login into the WISE-523x/WISE-2x4x, and enter the "IoT Platform Setting" Page. Click the "Video Data Sending Setting" button under the "IoTstar Setting" section on the left side of the webpage to enter the "Video Data Sending Setting" page.

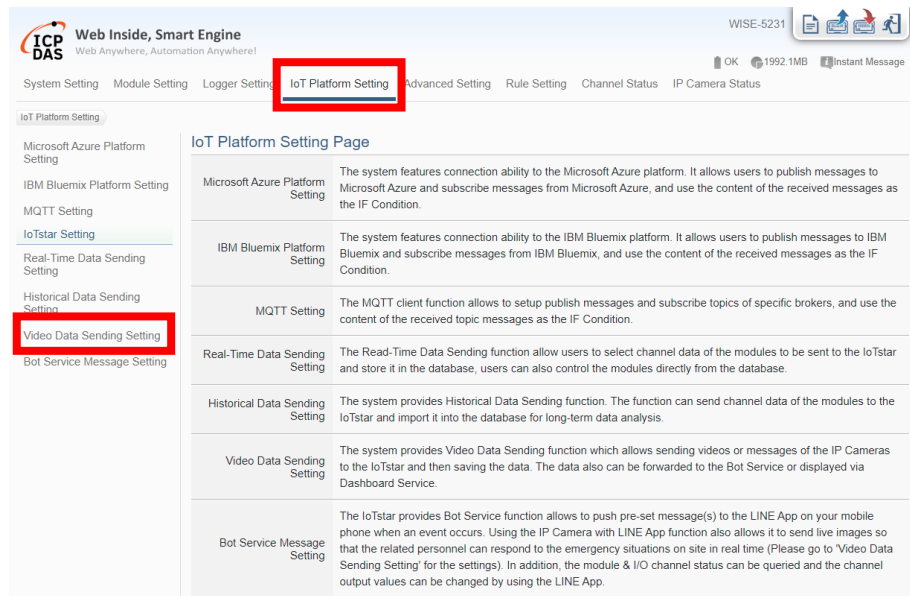


Figure 2-23: WISE Web Site - Bot Service Forward Setting Page (1)

- ii Click the tab on the right-top corner of "Video Data Sending Setting" page. Choose the data source, and click the "Setting" button to enter the setting page.

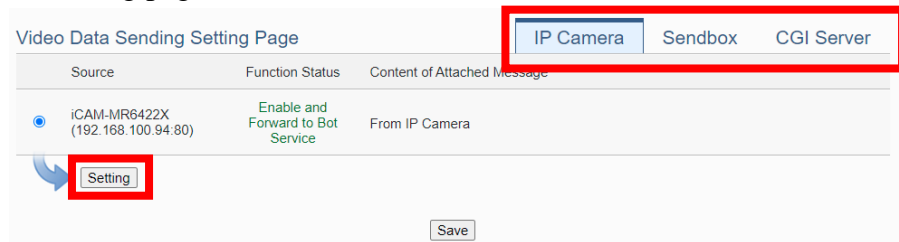


Figure 2-24: WISE Web Site - Bot Service Forward Setting Page (2)

- iii Check the "Enable" function, and then the message setting interface will be shown as below. Enter the message in the "Content of Attached Message" field. Check "Forward to Bot Service" in the "Bot Service" field. Click on "OK" to confirm the setting and leave the setting page.

The screenshot shows a web interface titled "IP Camera iCAM-MR6422X(192.168.100.94:80) Video Data Sending Setting". It features a "Function Status" section with a checked "Enable" checkbox. Below this is a large text area labeled "*Content of Attached Message" with "View" and "Edit" buttons above it. The text area contains the text "From IP Camera". A note below the text area states "The image will be sent with this message." At the bottom, there is a "Bot Service" section with a checked "Forward to Bot Service" checkbox, and "OK" and "Cancel" buttons.

Figure 2-25: WISE Web Site - Bot Service Forward Setting Page (3)

- iv After you finish all the settings, click "Save" button to save the settings. Now if WISE received the image or video data sending from the data source, WISE-523x/WISE-2x4x will send the image or video data with the text message to the corresponding Telegram Bot chat room.

2.6.3 Setting of text message sending by PMC/ PMD

- i Launch a Browser to login into the PMC-523x/PMC-2x4x/PMD, and enter the "IoT Platform Setting" Page. Click the "Bot Service Message Setting" button under the "IoTstar Setting" section on the left side of the webpage to enter the "Bot Service Message Setting" page.

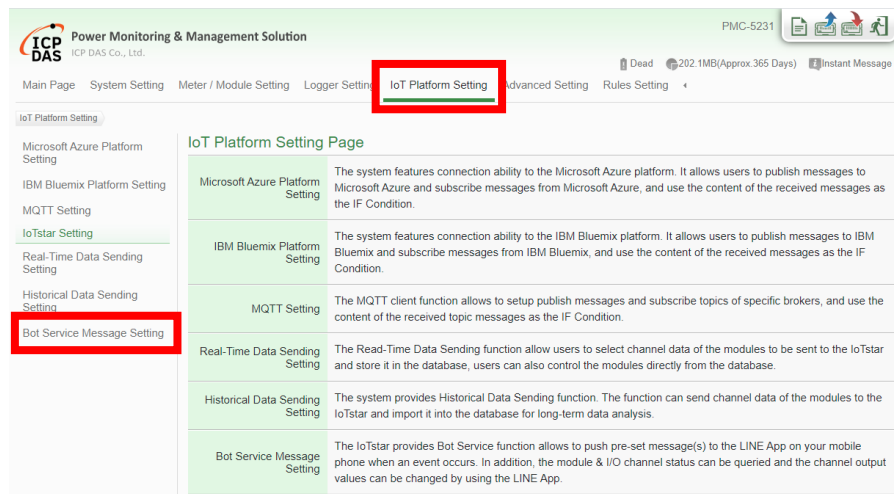


Figure 2-26: PMC/PMD Web Site - Bot Service Message Setting Page (1)

- ii Click on "Add new Message" to open the "Bot Service Message Setting" Page.

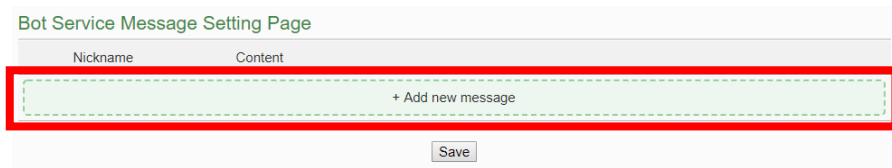


Figure 2-27: PMC/PMD Web Site - Bot Service Message Setting Page (2)

- iii Input name in the "Nickname" field, and you could also input the description of this Bot Service message in the "Description" field. Enter the message in the "Content" field. The Bot Service message provides an encoded string for you to add current power data or Internal Register data into the Bot Service message. To make it easy to add the encoded string, PMC-523x/PMC-2x4x /PMD provides "Real-time variable editor" for user. Click on "OK" to confirm the setting and leave the setting page.

Figure 2-28: PMC/PMD Web Site - Bot Service Message Setting Page (3)

iv Repeat steps ii to iii to complete the settings of all Bot Service message setting. After you finish all the Bot Service message settings, click "Save" button to save the settings.

Figure 2-29: PMC/PMD Web Site - Bot Service Message Setting Page (4)

v Go to the "Rule Setting" page and click "Add new rule". The "Rule Setting" page will appear. Click the "Bot Service" option under the THEN/ELSE section, and select the Bot Service message, Now if the evaluation of the "IF statement" is "true", the selected Bot Service message will be sent, and the user will receive the messages

PMC-523x/PMC-2x4x/PMD sent in the corresponding Telegram Bot chat room.

The screenshot displays the 'Rule Information Setting' and 'Rule Content Setting' sections. The 'Rule Information Setting' section includes a 'Nickname' field with the value 'Rule 1', a 'Description' field, and a 'Status' section with 'Enable' selected. The 'Rule Content Setting' section is divided into three columns: 'IF', 'THEN', and 'ELSE'. The 'IF' column has a 'Set a Condition' dropdown and a 'No Condition exists' message. The 'THEN' column has a 'Set an Action' dropdown with a menu open showing options: 'ICP DAS Module', 'Power Meter', 'Bot Service' (highlighted with a red box), and 'Internal Register'. The 'ELSE' column has a 'Set an Action' dropdown and a 'No Action exists' message. 'Save' and 'Cancel' buttons are at the bottom.

Figure 2-30: PMC/PMD Web Site - Rule setting with Bot Service Message

2.7 Real-time data sending setting from WISE/PMC/PMD

All I/O channel data (or Power data) displayed on IoTstar Bot Service are real-time data. Therefore, user need to complete the Real-time Data Sending Setting on the WISE/PMC/PMD controllers to show real-time data on Telegram Bot chat room by IoTstar Bot Service for Telegram.

2.7.1 Real-time data sending setting by WISE

- i Launch a Browser to login into the WISE-523x/WISE-2x4x, and enter the "IoT Platform Setting" Page.
- ii Click the "Real-time Data Sending Setting" button under the "IoTstar Setting" section on the left side of the webpage to enter the "Real-time Data Sending Setting" page.
- iii Check the "Enable" function, and add channels to be displayed.
- iv After all settings are completed, click "Save" button to save the setting.

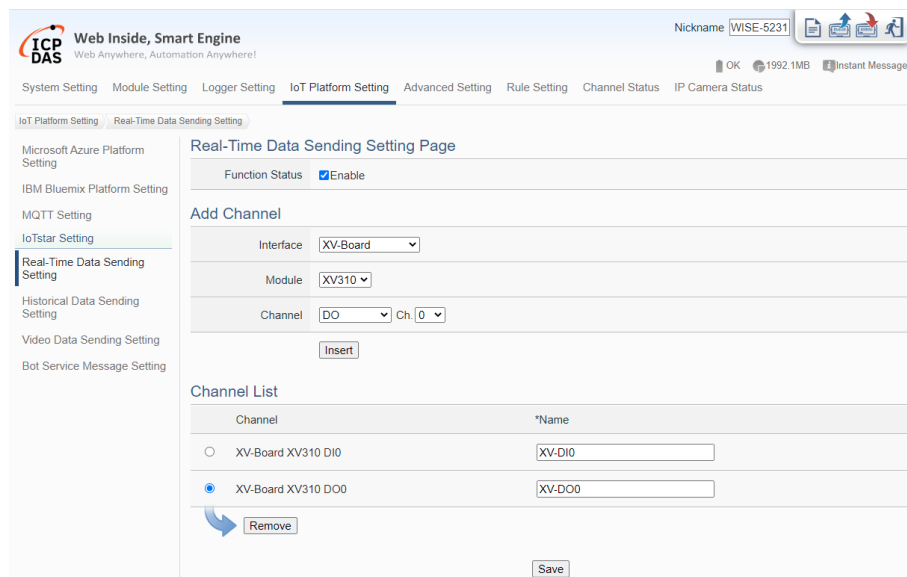


Figure 2-31: WISE Web Site - Real-time data sending setting

2.7.2 Real-time data sending setting by PMC/PMD

- i Launch a Browser to login into the PMC-523x/PMC-2x4x/PMD, and enter the "IoT Platform Setting" Page.
- ii Click the "Real-time Data Sending Setting" button under the "IoTstar Setting" section on the left side of the webpage to enter the "Real-time Data Sending Setting" page.
- iii Check the "Enable" function, and add channels to be displayed.
- iv After all settings are completed, click "Save" button to save the setting.

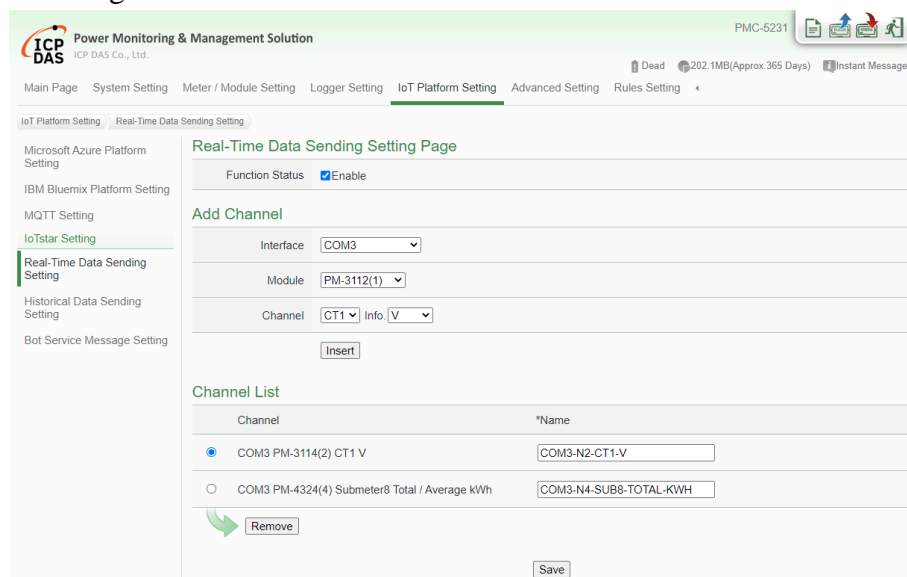



Figure 2-32: PMC/PMD Web Site - Real-time data sending setting

3 The Interface and Feature of IoTstar Bot Service for Telegram

After the application and setting of the Telegram Bot account as described in the above chapter is completed, users can start the linkage setting between the Telegram Bot account and the IoTstar account. After the linkage setting completed, the Two-way message communication interaction between WISE/PMC/PMD controllers managed by IoTstar's account and the Telegram user can be performed within the Telegram Bot chat room. The following are the functions IoTstar Bot Service for Telegram provides for Telegram user, the operation interface of each function will be also described in later section.

- **Monitoring/Control of the I/O channel data (or power data):** Review the real-time I/O channel data (or power data) and change the value of the DO/AO channel of the I/O modules (or power meter) connected to WISE/PMC/PMD.
- **Monitoring of the grouping data:** With the IoTstar's grouping function, Telegram user can quickly review the real-time data of the grouping I/O channels (or power loop).
- **Event Notification:** The logic rule of Event notification can be set on the WISE/PMC/PMD controller. When the conditions of the IF-THEN-ESLE logic rule are met, the action of "Event message sending" will be triggered to send the message to the corresponding Telegram Bot chat room.
- **Review the historical events of controllers:** Records the event messages sent by the WISE/PMC/PMD controller and user can review the content of the event message from the event list, including the message text, images and videos.

3.1 Set up linkage of IoTstar account and Telegram Bot

- i. Log in to IoTstar website, click on "Account Maintenance" button on the "System Information & Setting" section on the IoTstar Webpage; the Account Maintenance Setting page will be displayed as below. Find the "Bot Service for Telegram" section, then click the  icon on the right side of the "Bot Service for Telegram" section.

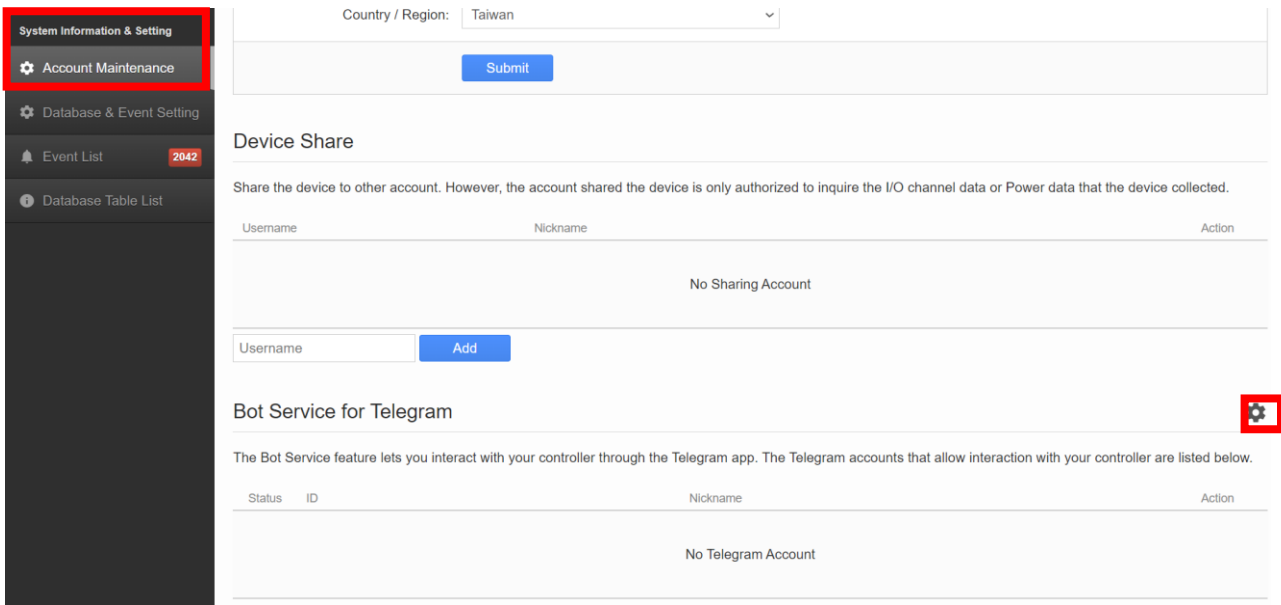
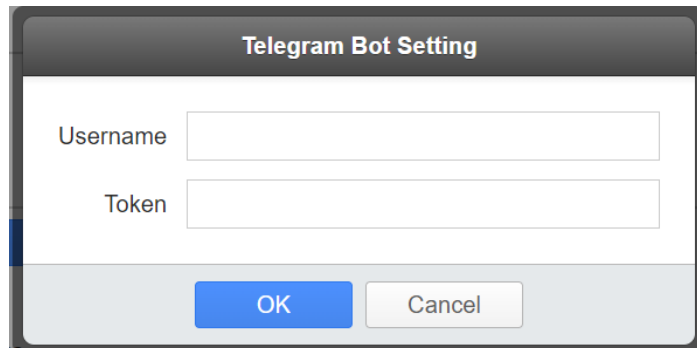
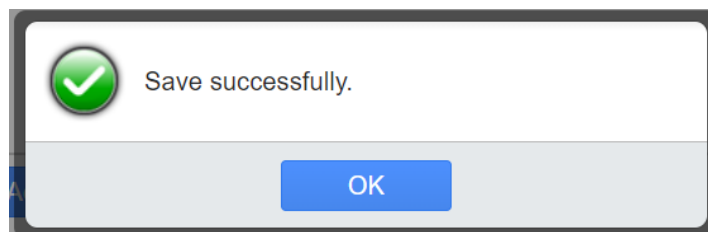


Figure 3-1: Set up linkage of Telegram Bot and IoTstar account (1)

- ii. IoTstar will display the Telegram Bot account setting window, key in the Telegram Bot account information(username & Token) you will use to link with the current IoTstar user account, and click the "OK" button.



After complete the setting, IoTstar will display a message of "Save successfully", please click the "OK" button.




Please Note.

1. Each IoTstar user account can only link with one Telegram Bot

account.

2. For the acquisition of Telegram Bot account information (username & Token), please refer to [2.3 Application of Telegram Bot account and Token acquisition](#).

- iii. Go to the Account Maintenance Setting page of IoTstar. Find the "Bot Service for Telegram" section, and click the  icon on the right side of the "Bot Service for Telegram" section to open the QR Code window of the Telegram Bot account. For the Telegram users who want to join the Telegram Bot chat room, they can scan the QR code with the mobile phone QR code scanning software, and then the Telegram user's mobile phone will display the corresponding link for the Telegram Bot account, please click the link.

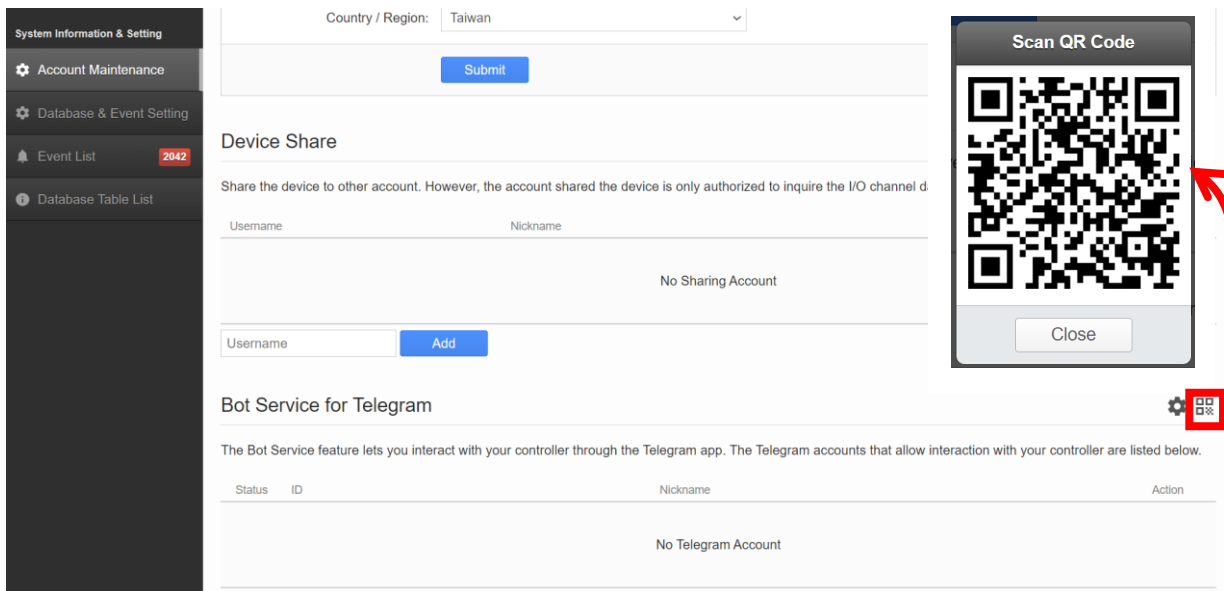


Figure 3-2: Set up linkage of Telegram Bot and IoTstar account (2)

- iv. After click the link, the mobile phone will launch Telegram and a "START" button will be shown at the bottom of the Telegram Bot chat room window, then click this button to enter the Telegram Bot chat room.

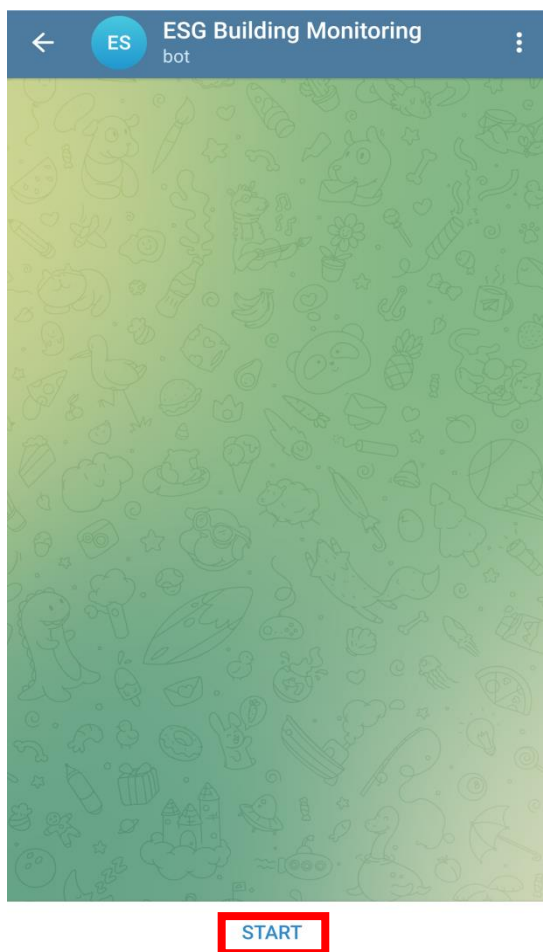


Figure 3-3: Set up linkage of Telegram Bot and IoTstar account (3)

- v. After enter the Telegram Bot chat room, Telegram will display the relevant operation interface.



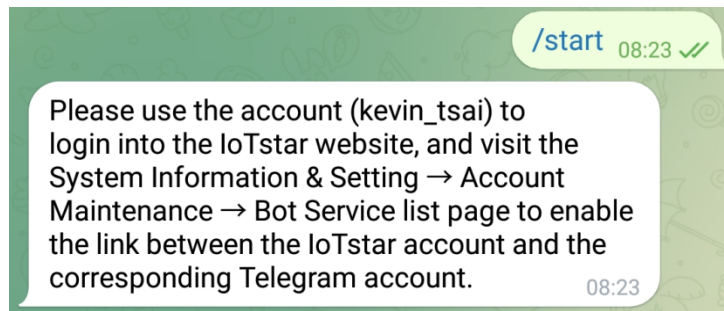

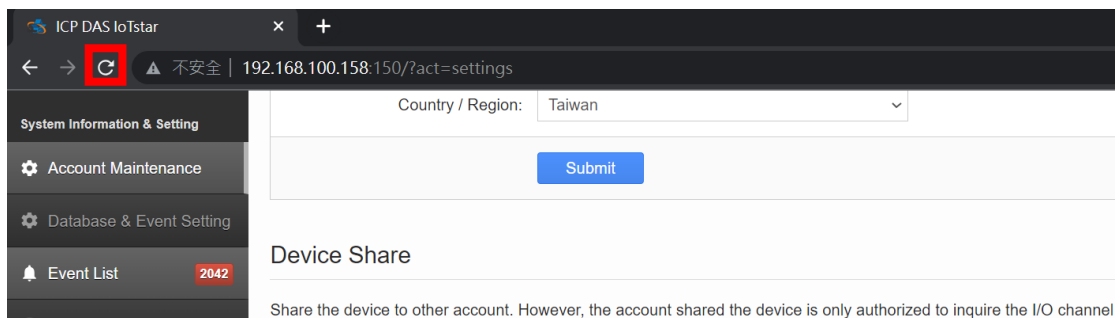


Figure 3-4: Set up linkage of Telegram Bot and IoTstar account (4)

- vi. Now go to the Account Maintenance Setting page of IoTstar, and then reload the content of this page (If you use Google's Chrome browser, you can click the  icon at the top right of the browser for the reload operation).



- vii. After complete the reload operation, the Telegram users who want to join the Telegram Bot chat room will be shown in the "Bot Service for Telegram" list. Please enable the Telegram user in the "Status" field to complete the linkage between the Telegram user account you select and the IoTstar user account. After complete the linkage setting, the Two-way message communication interaction between WISE/PMC/PMD controllers managed by the IoTstar's user and the Telegram user account can be performed within the Telegram Bot chat room. In addition, IoTstar also provides the functions of "Disable" and "Delete" Telegram user accounts on the page.

Bot Service for Telegram ⚙️

The Bot Service feature lets you interact with your controller through the Telegram app. The Telegram accounts that allow interaction with your controller are listed below.

Status	ID	Nickname	Action
<input checked="" type="checkbox"/>	59*****98	✎ [Redacted]	Remove
<input checked="" type="checkbox"/>	94*****72	✎ [Redacted]	Remove

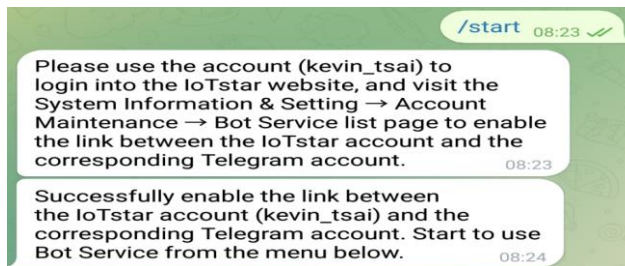


Figure 3-5: Set up linkage of Telegram Bot and IoTstar account (5)

3.2 Chat room Interface for IoTstar Bot Service for Telegram

After completing the linkage of IoTstar user account and Telegram user account, Telegram user can see the function menu created by IoTstar Bot Service for Telegram under the lower area of Telegram Bot chat room. There are four function buttons as Channel, Group, Event and Help, and users can click the button to perform the corresponding function.



Figure 3-6: Interface of IoTstar Bot Service for Telegram

3.3 The function of Channel and Group

- The following will describe the interface and generated messages of the "Channel" function

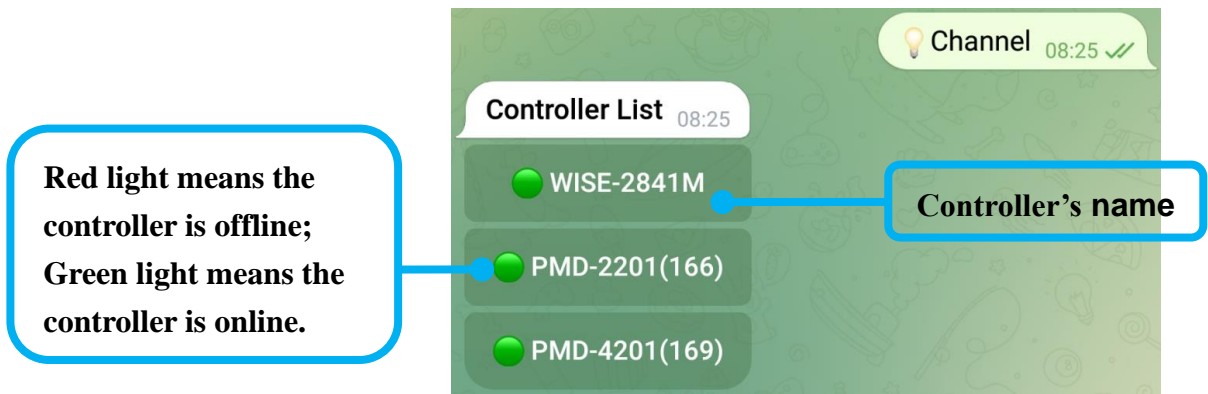


Figure 3-7: IoTstar Bot Service for Telegram – "Controller list"

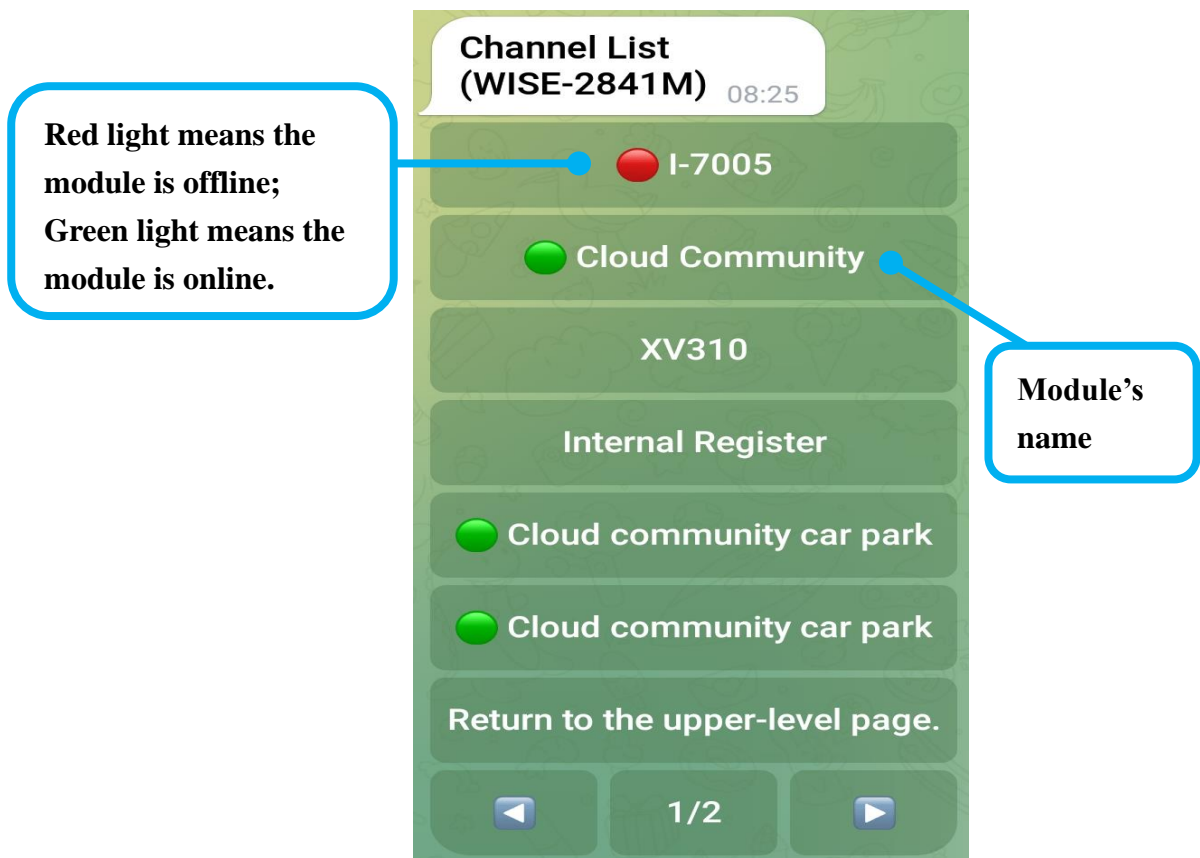


Figure 3-8: IoTstar Bot Service for Telegram – "Controller->Module" list

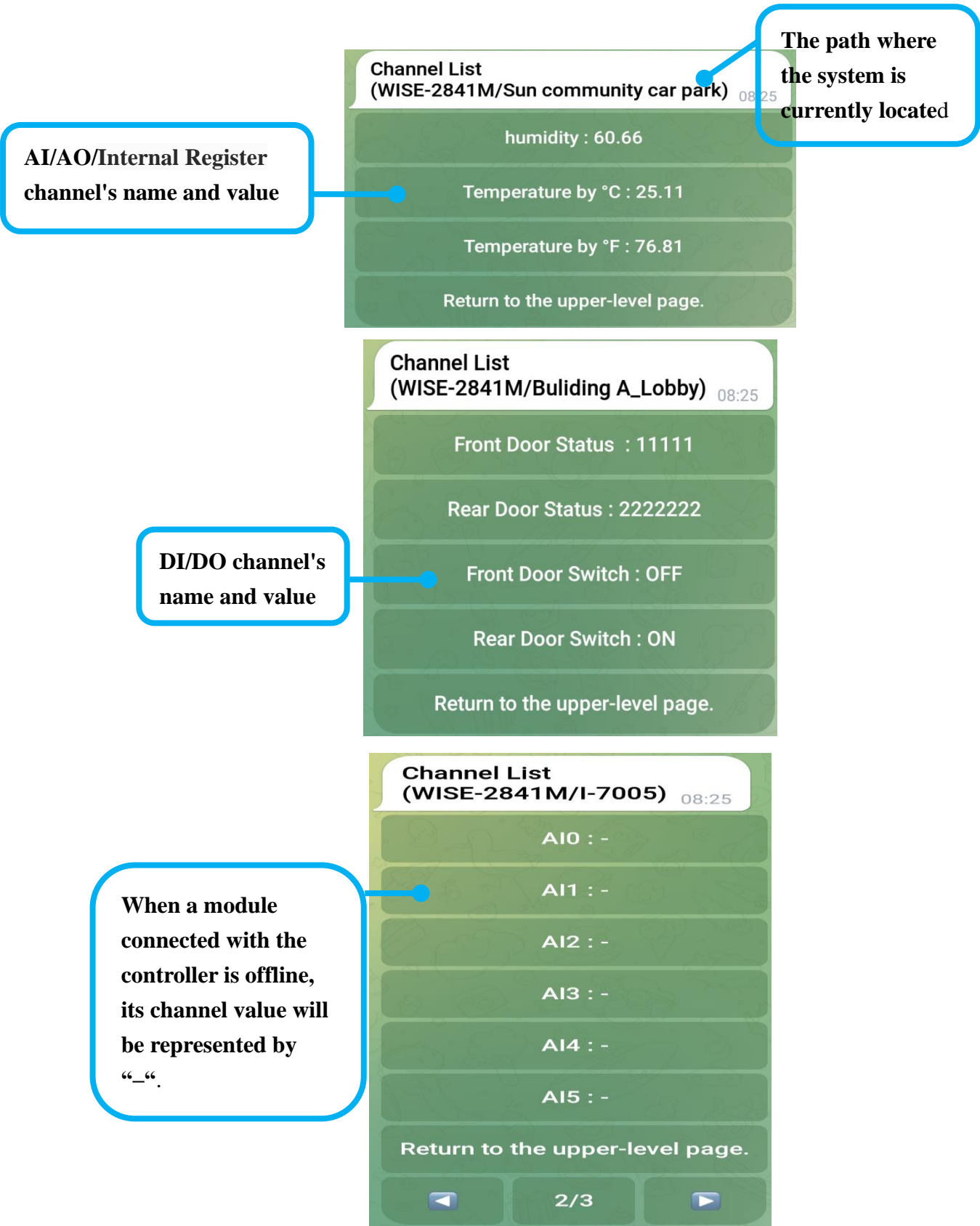


Figure 3-9: IoTstar Bot Service for Telegram — “Controller->Module->Channel“ list

- The following will describe the interface and generated messages of the "Group" function

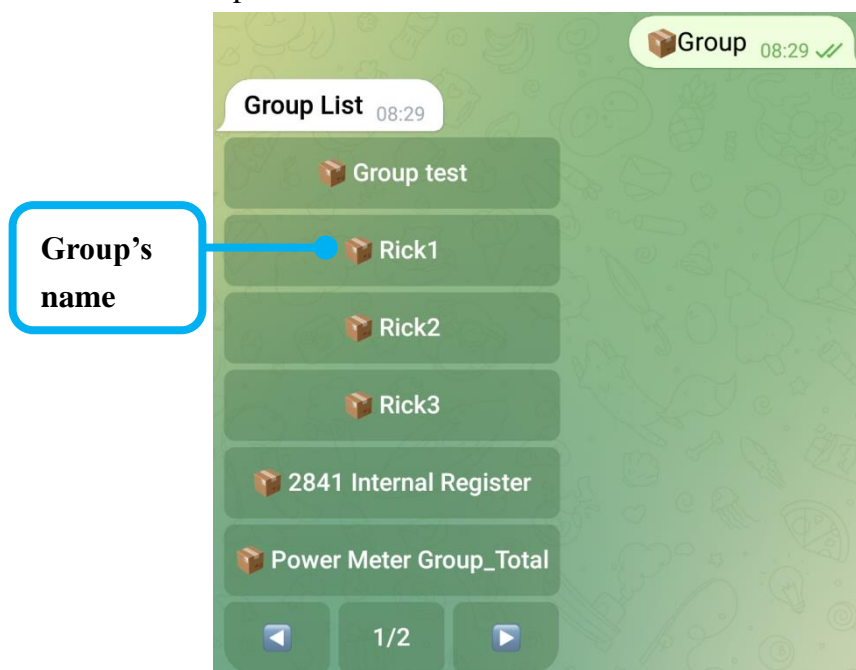


Figure 3-10: IoTstar Bot Service for Telegram – “Group list”

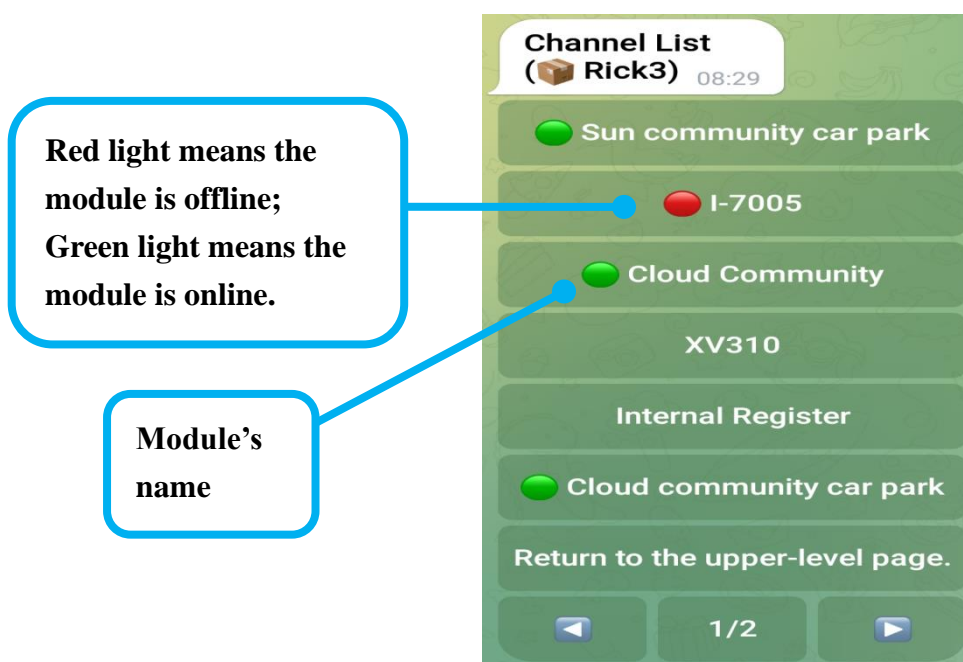


Figure 3-11: IoTstar Bot Service for Telegram – “Group->Module” list

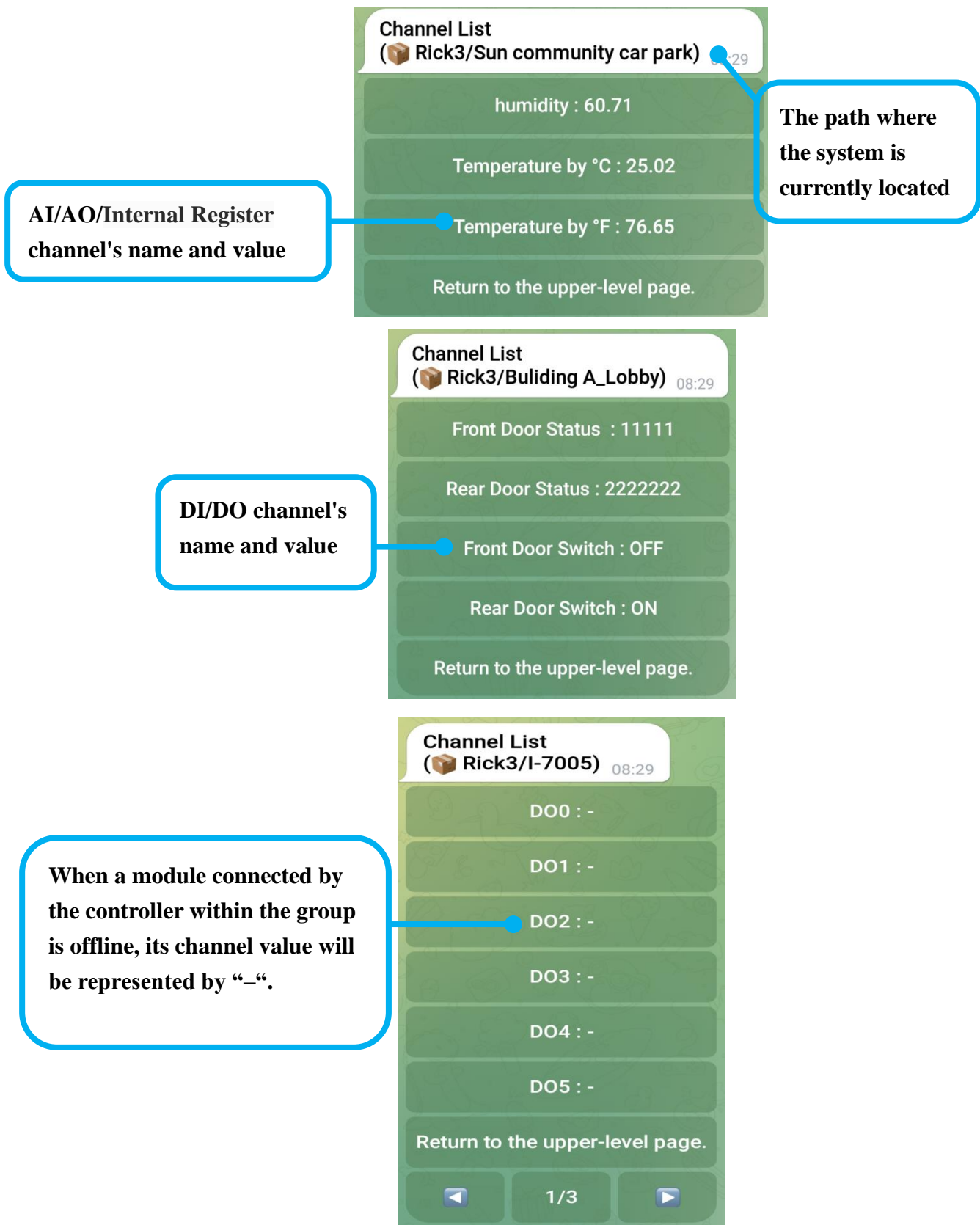
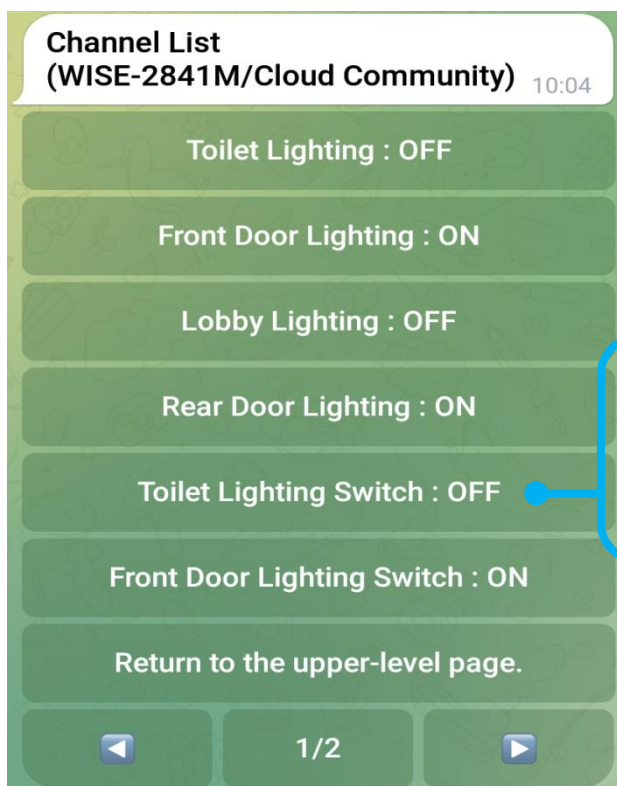
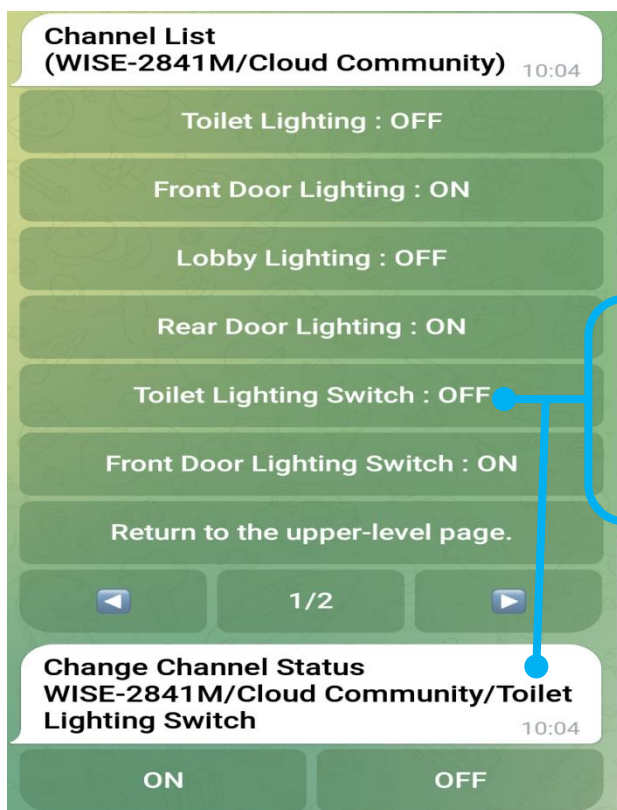


Figure 3-12: IoTstar Bot Service for Telegram – “Group->Module->Channel“ list

- The following will describe the interface and generated messages of the AO/Internal Register/DO channel value setting



Change the module's DO channel value through ON/OFF button

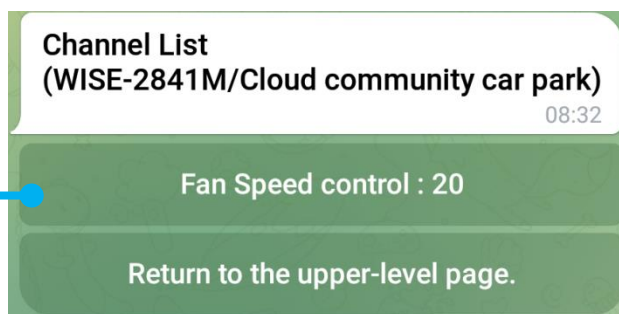


Change the module's DO channel value through ON/OFF button



Figure 3-13: IoTstar Bot Service for Telegram – Module’s DO channel value setting

Change the module’s AO channel value or controller’s Internal Register value through numerical input



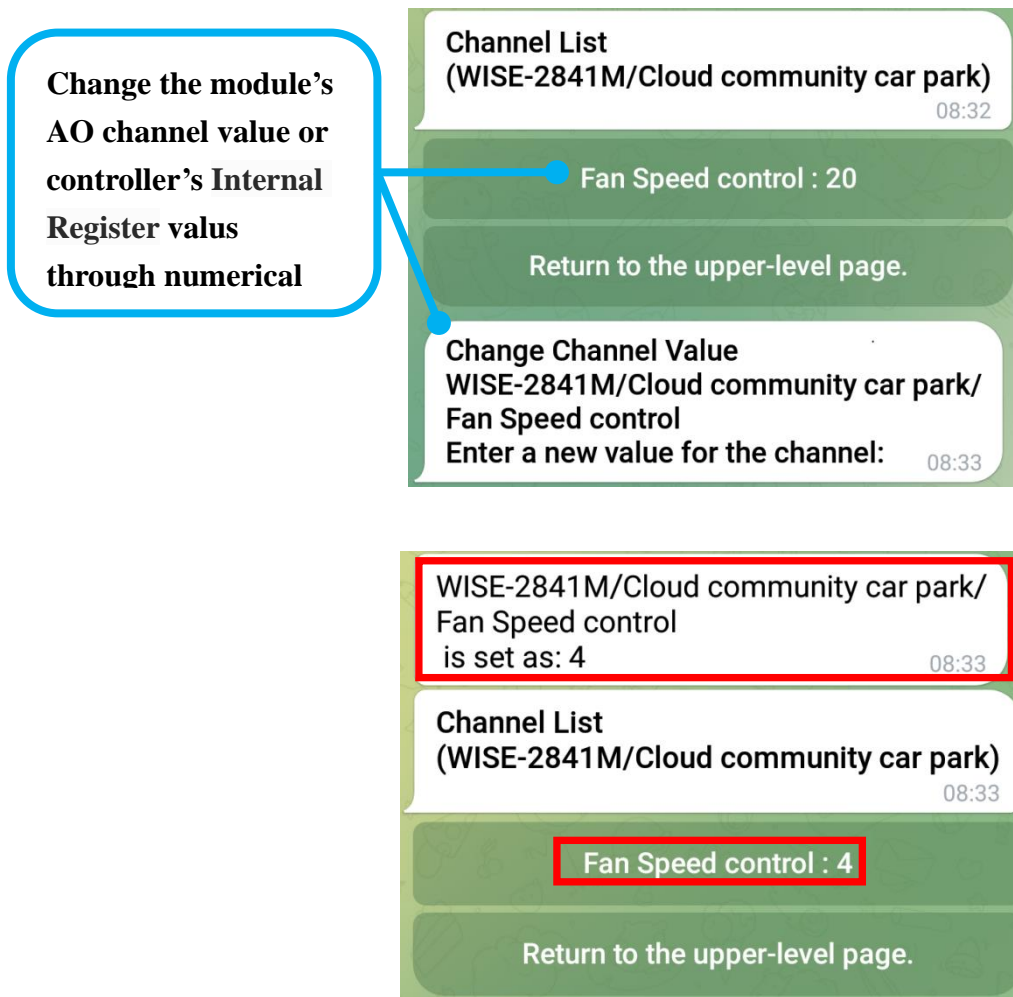


Figure 3-14: IoTstar Bot Service for Telegram – Module's AO channel value setting

Please Note: To display I/O channel data (or power data) in the list of Channel/Group interfaces as above, users need to follow [2.7 Real-time data sending setting from WISE/PMC/PMD](#) section to perform the settings of real-time data sending. Besides, to show I/O channel data (or power data) in Group list, users have to perform the grouping settings on IoTstar webpage: create the group and add real-time channels into it, and then the channels would be shown on the Group list.

3.4 The function of Real-time Event Notification

The IF-THEN-ELSE logic rule can be set on WISE/PMC/PMD controller to send a notification message to the Telegram Bot chat room when the event is triggered, and the WISE controller can use the image or video file forwarding function to send the picture or video files at the same time. For

more detail, please refer to [2.6 Message sending setting from WISE/PMC/PMD to IoTstar Bot Service](#) section.

The Telegram Bot chat room can receive three message formats sent by the controller, which are text messages (📄), picture messages (🖼️) and image messages (🏠). Users can identify the message type through the icon attached with message.

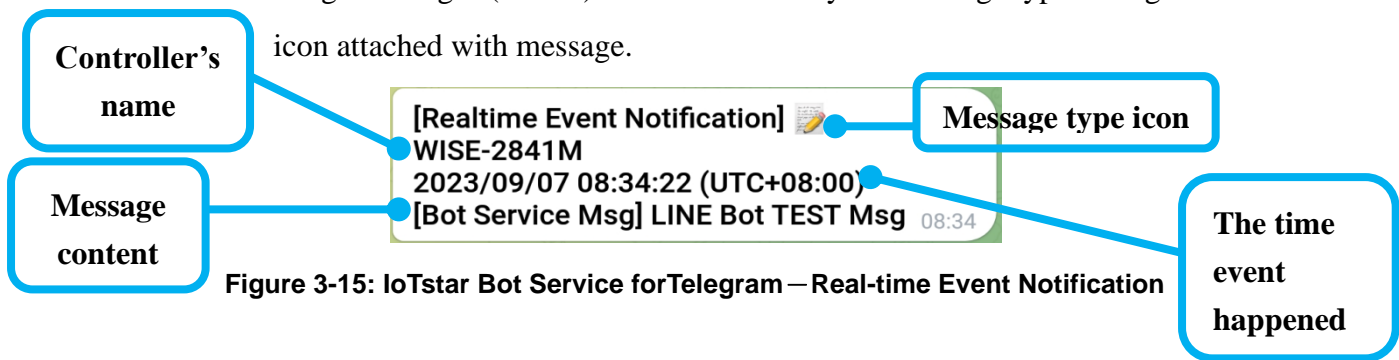


Figure 3-15: IoTstar Bot Service forTelegram – Real-time Event Notification

3.5 The function of Historical Event Review

Click "Event" in the menu, the "Event Browsing Function" message will be generated, and the "Search by time" and "The last 10 events" functions will be provided to query the past events.

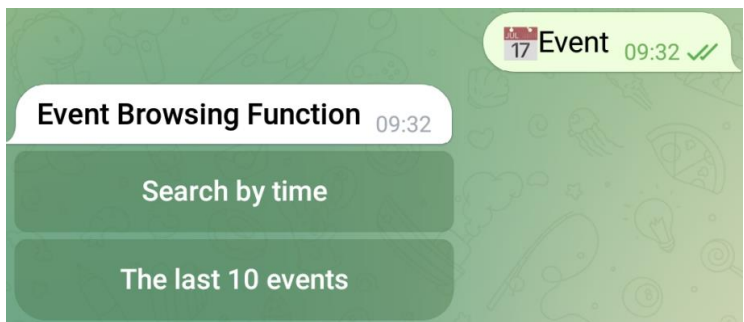


Figure 3-16: IoTstar Bot Service forTelegram – Historical Event Browsing

The event list is displayed in the units of 6 events each time. If the number of events is greater than 6 events, click the "Next page" button, it will continue to display the next 6 events until the end of the events list.

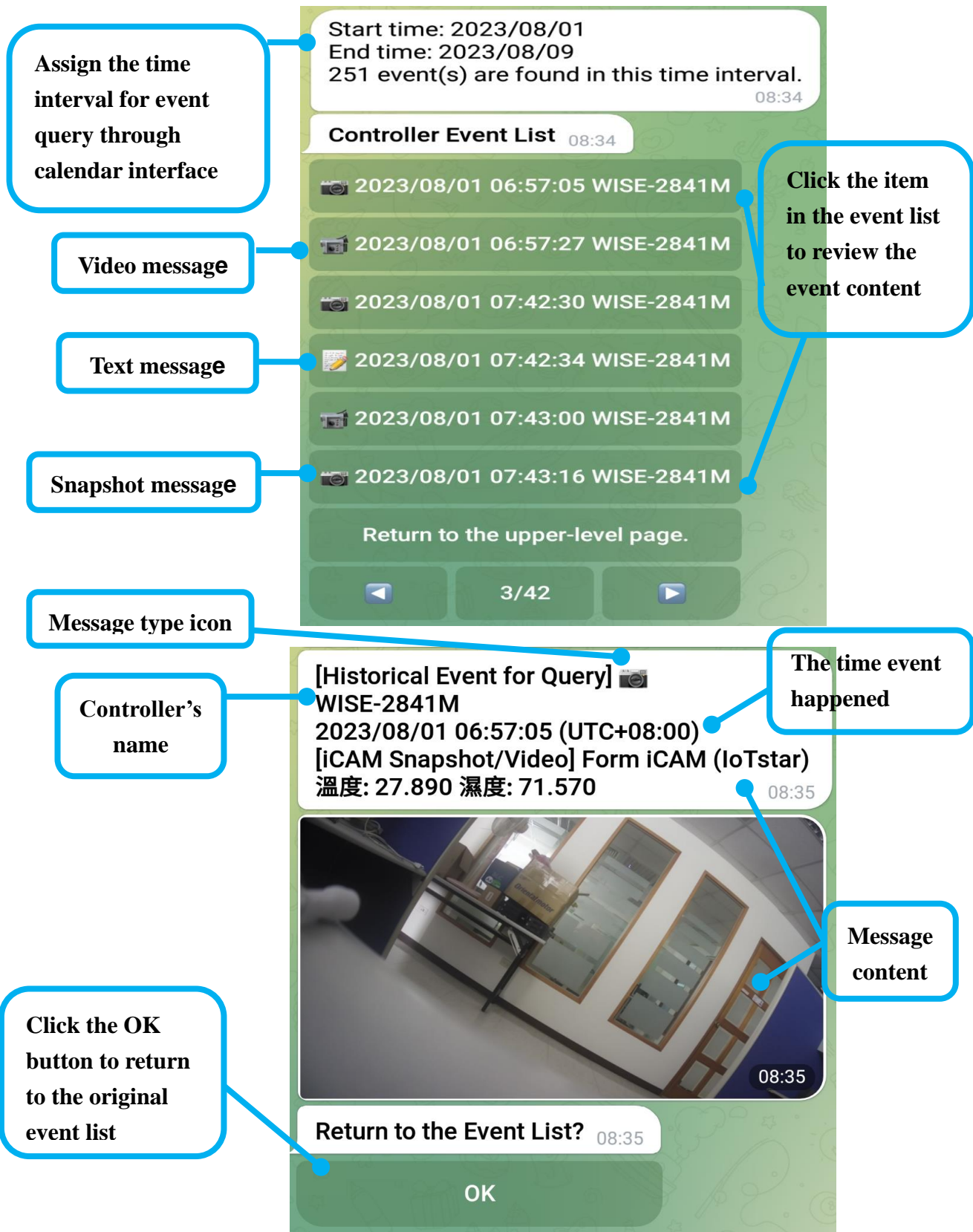


Figure 3-17: IoTstar Bot Service forTelegram – Historical Event List

3.6 The function of Help

After click the "Help" button in the menu, it will provide user with the information as online help documents.

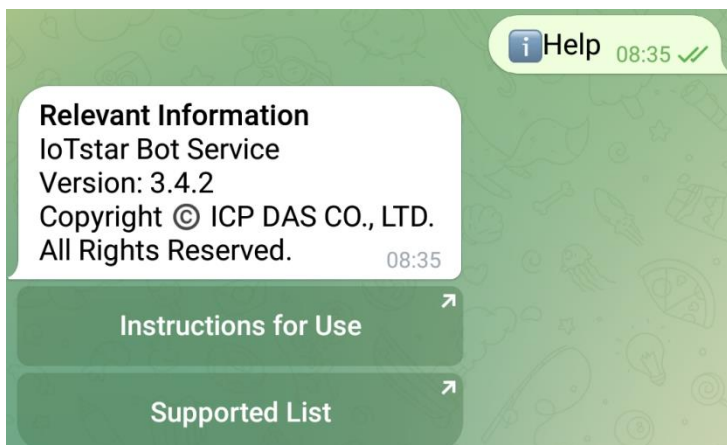


Figure 3-18: IoTstar Bot Service forTelegram – Help Menu

Appendix I : Apply free SSL from "Let's Encrypt"

[Let's Encrypt](#) is a free, automated and open digital certificate authority service (Certificate Authority; CA) provided by [Internet Security Research Group \(ISRG\)](#). For the detailed information of "How the Let's Encrypt Digital Certificate Authority (CA) performs the issuance/cancellation of the Domain certification and digital certificate", please refer to the [URL link](#) .

Let's Encrypt uses the ACME protocol to verify if the Domain is controlled by the user and then will issue the certificate for the Domain if the application is approved. In order to get the certificate, you need to use an ACME Client software. So we suggest you to select an ACME Client software which is suitable for the installed environment of IoTstar from the [recommended list](#). Following we use the win-acme as an example to demonstrate the steps to apply a free SSL certificate from Let's Encrypt:

- (1) Please confirm that IoTstar has been installed successfully and work smoothly, and make sure the IoTstar website has its own Domain Name. If the above 3 conditions are met, then you can issue an application of SSL certificate from Let's Encrypt.

(Before performing the following steps, please confirm that the relevant settings of IIS and the path of the website will not be changed anymore. If the settings of IIS are changed after you completing the following steps, please delete the certificate and re-create a new certificate from step 4 to avoid the failure of automatic certificate update.)

- (2) Download the latest 64 or 32 bit pluggable version of [win-acme](#) , create a folder in any directory and unzip the file into this folder (If the directory location is determined, please do not change the location again, it is recommend using C:\Program Files or C:\Program Files (x86)).
- (3) After unzipping the file you download, right click on the wacs.exe, select "execute as system administrator" to launch the file, and perform the following steps to complete the application and creation of SSL certificate:

- A. Select "N: Create new certificate (simple for IIS)" to perform the creation of a new certificate.

```
A simple Windows ACMEv2 client (WACS)
Software version 2.1.6.768 (RELEASE, PLUGGABLE)
ACME server https://acme-v02.api.letsencrypt.org/
IIS version 10.0
Running with administrator credentials
Scheduled task not configured yet
Please report issues at https://github.com/win-acme/win-acme

N: Create new certificate (simple for IIS)
M: Create new certificate (full options)
R: Run scheduled renewals (0 currently due)
A: Manage renewals (0 total)
O: More options...
Q: Quit

Please choose from the menu: n
```

- B. Select the number of the IoTstar website and apply a certificate for it.

```
Please select which website(s) should be scanned for host names. You may
input one or more site identifiers (comma separated) to filter by those
sites, or alternatively leave the input empty to scan *all* websites.

1: 88_IoTstar (1 binding)
7: 88_LIFF Tester (1 binding)

Site identifier(s) or <ENTER> to choose all: 1
```

- C. Select "3: Pick *all* bindings" to select all bindings of IoTstar website.

```
You may either choose to include all listed bindings as host names in your
certificate, or apply an additional filter. Different types of filters are
available.

1: Pick specific bindings from the list
2: Pick bindings based on a search pattern
3: Pick *all* bindings

How do you want to pick the bindings?: 3
```


- D. After the steps above, if all selections are correct, input "yes", the software will start the process to create the certificate. During the process, you can see the information and update time in the information list. After the process is completed, the software will automatically return to the main menu.

```
Continue with this selection? (y*/n) - yes
Target generated using plugin IIS: www.letstar.com
Authorize identifier www.letstar.com
Authorizing www.letstar.com using http-01 validation (SelfHosting)
Authorization result: valid
Requesting certificate [IIS] www.letstar.com, (any host)
Store with CertificateStore...
Installing certificate in the certificate store
Adding certificate [IIS] www.letstar.com, (any host) @ 2020/3/30 10:38:32 to store WebHosting
Installing with IIS...
Adding new https binding *:443:www.letstar.com
Committing 1 https binding changes to IIS
Adding Task Scheduler entry with the following settings
- Name win-acme renew (acme-v02.api.letsencrypt.org)
- Path C:\Program Files\win-acme.v2.1.6.768.x64.pluggable
- Command wacs.exe --renew --baseuri "https://acme-v02.api.letsencrypt.org/"
- Start at 09:00:00
- Time limit 02:00:00
Adding renewal for [IIS] www.letstar.com, (any host)
Next renewal scheduled at 2020/5/24 10:38:39

N: Create new certificate (simple for IIS)
M: Create new certificate (full options)
R: Run scheduled renewals (0 currently due)
A: Manage renewals (1 total)
O: More options...
Q: Quit

Please choose from the menu:
```

Please Note:

If you are using Let's Encrypt for the first time, you will be asked to provide an email address for the notification of the "Automatic Update Failure" event, input "yes" to agree the "Let's Encrypt Subscriber Agreement" for the proceeding.

```
Enter email(s) for notifications about problems and abuse (comma seperated): www.letstar.com
Terms of service: C:\ProgramData\win-acme\acme-v02.api.letsencrypt.org\LE-SA-v1.2-November-15-2017.pdf
Open in default application? (y/n*) - yes
Do you agree with the terms? (y*/n) - yes
```

※Maximum Application Frequency:

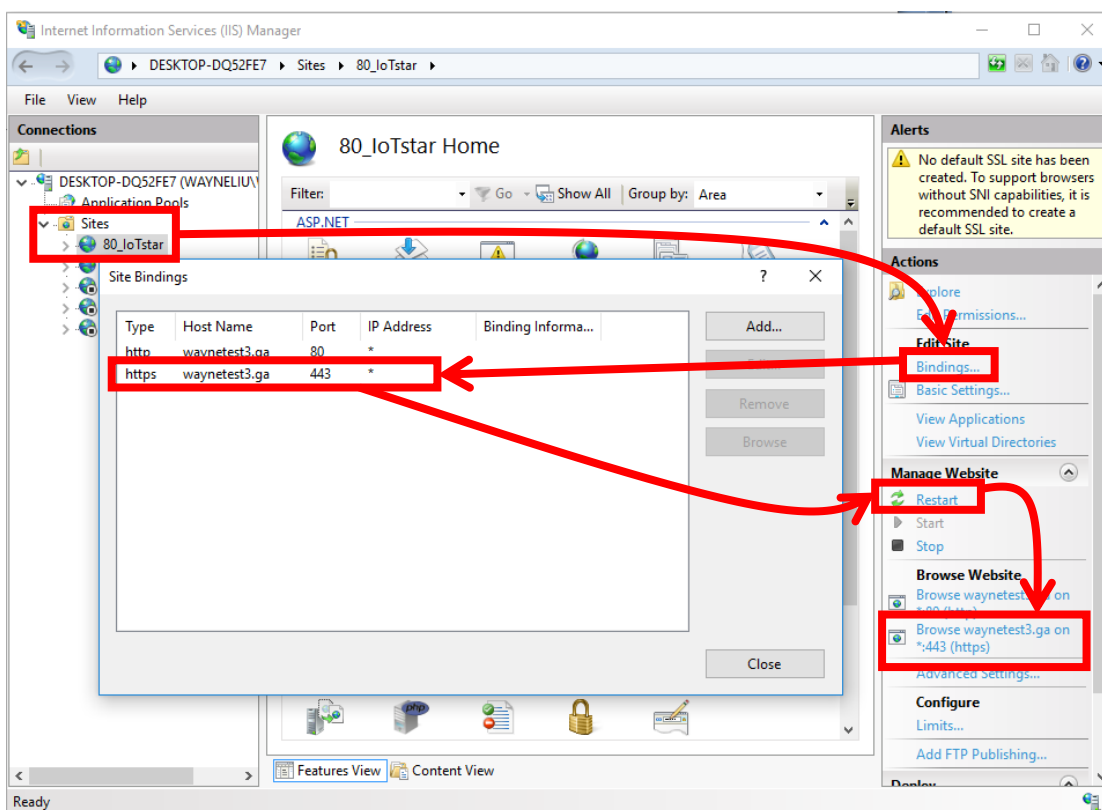
For the same Registered Domain: 20 times a week

For the same Domain Name: 5 times a week

For the same IP Address: 10 times every three hours

Due to the maximum application frequency includes the frequency of both creation and update operations, please do not launch the Application of certificate frequently to avoid exceeding the limitation.

(4) Launch "Internet Information Services (IIS) Administrator", select the IoTstar platform, and click on the "Binding" on the right side of the window. You will see an HTTPS type binding being automatically generated. Click "Restart" and then click on the HTTPS website to check if the IoTstar website can be executed successfully.



※Troubleshooting: Port 443 has been occupied

- A. Launch "Command Prompt" in the "Start Menu" of Windows. After the "Command Prompt" window is opened, input "**netstat -ano**" and press Enter.
- B. Find the item which Proto is "TCP", and the number after the ":" of the "Local Address" is 443; record its PID value. In this example, the following figure shows the PID is 4.

Proto	Local Address	Foreign Address	State	PID
TCP	0.0.0.0:80	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:88	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING	1084
TCP	0.0.0.0:443	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:1230	0.0.0.0:0	LISTENING	13824
TCP	0.0.0.0:1231	0.0.0.0:0	LISTENING	13824
TCP	0.0.0.0:1232	0.0.0.0:0	LISTENING	13824
TCP	0.0.0.0:1233	0.0.0.0:0	LISTENING	13824
TCP	0.0.0.0:1234	0.0.0.0:0	LISTENING	13824
TCP	0.0.0.0:1235	0.0.0.0:0	LISTENING	13824
TCP	0.0.0.0:1433	0.0.0.0:0	LISTENING	6396
TCP	0.0.0.0:1883	0.0.0.0:0	LISTENING	4264
TCP	0.0.0.0:3306	0.0.0.0:0	LISTENING	4400
TCP	0.0.0.0:3389	0.0.0.0:0	LISTENING	1328

- C. In the "Command Prompt" window, input "**tasklist / FI "PID eq 4"**" (please replace 4 with the PID value you got from the previous step). If the "Image Name" is "System" (shown as below); it indicates that the port 443 has been used properly by System. If not, it means the port is occupied by other program.

Image Name	PID	Session Name	Session#	Mem Usage
System	4	Services	0	6,556 K

- D. If the "Image Name" is not "System", it means the port 443 is occupied by other program. Please close the program which occupies port 443, and re-start the application of the SSL certificate again.

(If Skype have been installed on the Windows system, Port 443 may be occupied by Skype. You can open the Skype window, then click on the Tools menu and select Options. Click on the Advanced tab, and go to the Connection sub-tab. Untick or uncheck the checkbox for "Use port 80 and 443 as an alternative for additional incoming connections" option. Click on the Save button and then restart Skype to make the change effective.)