MERITEK
Automation reliable & smart

MBs-CMWLC

User Manual

Wireless Communication Converter

目錄

Version	Revision date	Author	Detail
V1.0	2018/08/08	Hank	
V1.1	2018/10/19	Hank	
V1.2	2019/01/14	Albert	
V1.3	2022/06/08	Calvin	

1 Introduction of MBs-CMWLC

1.1 Overview

MBs-CMWLC is one of the communication modules in MBs-PLC series. Via the MBs-CMWLC module installed with a 4G LTE USB dongle*, MBs-PLC could trigger active call back and do the remote maintenance tasks.

With the use of the CMWLC module, we could easily connect to the PLC through 4G signal; do the remote control and maintenance tasks; log out the data in the PLC and so on. Adding this communication module could help PLC installed in remote area or complicated network environment overcomes the difficulties of monitoring and maintaining.

SMS alarm will send out message when set condition is triggered, users can set up to 32 SMS alarm and 8 numbers can be informed in a rapid time. For data log, 16 log groups can be set up and triggered by 4 different methods (period, schedule bit and SMS) to log out PLC register data. The MBs-CMWLC module also supports Micro SD card. With the SD card we could not only save log data and alarm messages, but also do configuration file importing and firmware updating.

MBs-CMWLC also has the SMS remote command feature. By sending SMS command to the module, we can not only read and write the data of the PLC. Furthermore, it could do the settings and controls such as active call back, data log, Run/Stop to the module and PLC

*DLINK DWM-222

The MBs-CMWLC module supports the MERITEK IoT service. Through iMonitor remote monitoring, data log, and alarm notification, the latest device status can be grasped and IoT applications can be achieved.

1.2 Main Product Functions

SMS Planning

User could pre-edit the content and the recipient of the sending message and set the PLC trigger condition. When the PLC bit is triggered the MBs-CMWLC will send the SMS message to the recipient.

Data Log

Could collect MBs-PLC's 1-Bit, 16-Bits, 32-Bits data with 4 different triggering modes, including Period, Bit, Schedule and SMS Message command. The collected PLC data can be stored in the device or memory card.

Active Callback

Through the active callback feature, even if the network address of the MBs-CMWLC cannot be known, we still can easily create the connection between the local PC and the remote MBs-CMWLC and do the maintenance and control of the MBs-PLC.

SMS Remote Control

By sending SMS command to the module, we can read and write the data of the PLC. Furthermore, it could do the settings and controls such as active call back, data log, Run/Stop to the module and PLC.

MERITEK IoT Service

Provide iMonitor remote monitoring solution, support MERITEK IoT service without having to go through Gateway or HMI to easily achieve IoT applications

1.3 Product Features

- Configuration can be exported and imported to facilitate device settings backup.
- Can plan 32 groups of SMS tasks, each of which can deliver 8 different contact calls at the same time.
- 12 built-in SMS instructions in the SMS editor.
- SMS history feature could view the SMS sent and received.
- Sampling number and condition could be set in the data log.
- Can plan 16 white list numbers which the module could only be remotely controlled by them.
- Provides internet clock synchronization function, ensures the module to accurately record the event occurrence time.
- The Administrator password secures the execution of some features and SMS message commands.
- SMS reply option can return the execution status after receiving the SMS command.
- Event log can record the module's operation status.
- Supports SMS sending function.
- Could set multiple groups of phone numbers in the phonebook and load it at once when needed.
- Supports configuration file loading and firmware updating with micro SD card.
- iMonitor allows PLCs to be scattered in different regions, and at the same time monitors the register data on the device, provides alarm message sending when necessary, and supports data log, historical trend graphs and other functions.

1.4 Specification

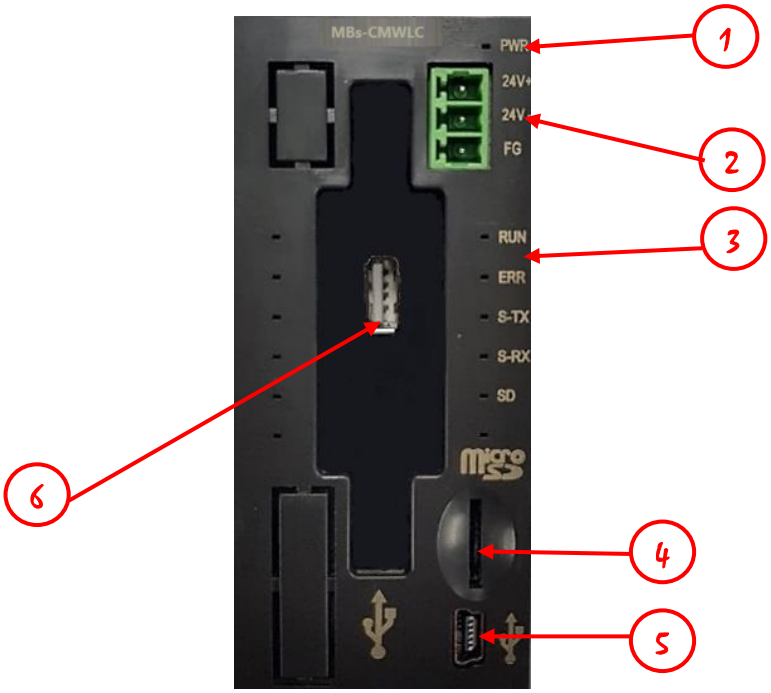
CMWLC Specification

Item	Characteristics
USB 2.0	Device
Micro SD	SDHC
PLC interface	Port3, Port4
Application Protocol	MERITEK
Remote MERITEK PLC Programming	Yes
Remote CMWLC Configuring	Yes
Indication LEDs	PWR, RUN, ERR, S-TX, S-RX, SD status
Firmware upgrade method	Mini-USB · Micro-SD
Voltage/Current	DC 24V, 200mA
Operating Temperature	0 ~ 60 ℃
Storage Temperature	-20 ~ 80 ℃

*SD card does not support hot swapping, please do not remove SD card during Configurator connection.

1.5 Product Appearance

The appearance and function parts of the MBs-CMWLC wireless communication conversion module are briefly introduced as follows:



① Power LED: It will light red light when is the power in on.

② Input Power: CMWLC needs DC 24V/200mA.

③ LED indicators: Status Indicators of the CMWLC.

④ Micro-SD card slot: Supports Micro SD for saving SMS and data log files.

⑤ Mini-USB port: Connect PC to edit “Configuration File”.

⑥ USB Type-A receptacles: Connect to 4G Dongle.

1.6 LED Indicators

- CMWLC at start up

LED / Per sec	RUN	ERR	S-TX	S-RX	SD	Reserve
Stage 1	light	light	light	light	light	light
Stage 2	light	light	light	light		

- CMWLC finish booting

LED / Per sec	RUN	ERR	S-TX	S-RX	SD
Off					No SD Card
1 Flash	CMWLC ready				
2 Flash			Send SMS	Receive SMS	
3 Flash					
4 Flash					
On	SMS ready	System Error			SD Card

- Firmware update

RUN	ERR	S-TX	S-RX
1 Flash/Sec	2 Flash/Sec	3 Flash/Sec	4 Flash/Sec

1.7 CMWLC communication settings

- CMWLC and MBs PLC series

The MBs-CMWLC wireless communication converter should be installed on the left
side extension of the MBs PLC and it communicates with PLC via Port3、Port4.

The Port3 and Port4 communication parameters of the PLC must be correctly set to communicate with the module. The settings are as follows:

PLC Port parameter table

Port	Port3	Port4
Parity Bit	Even Parity	Even Parity
Data Bit	7Bits	8Bits
Stop Bit	1Bit	1Bit
Protocol	MERITEK	Modbus RTU(Slave)

- CMWLC and 4G LTE USB Dongle

In order to have wireless communication function, insert a 4G LTE USB dongle, which has a SIM card in it, into ⑥ USB Type-A receptacles (4G Dongle)

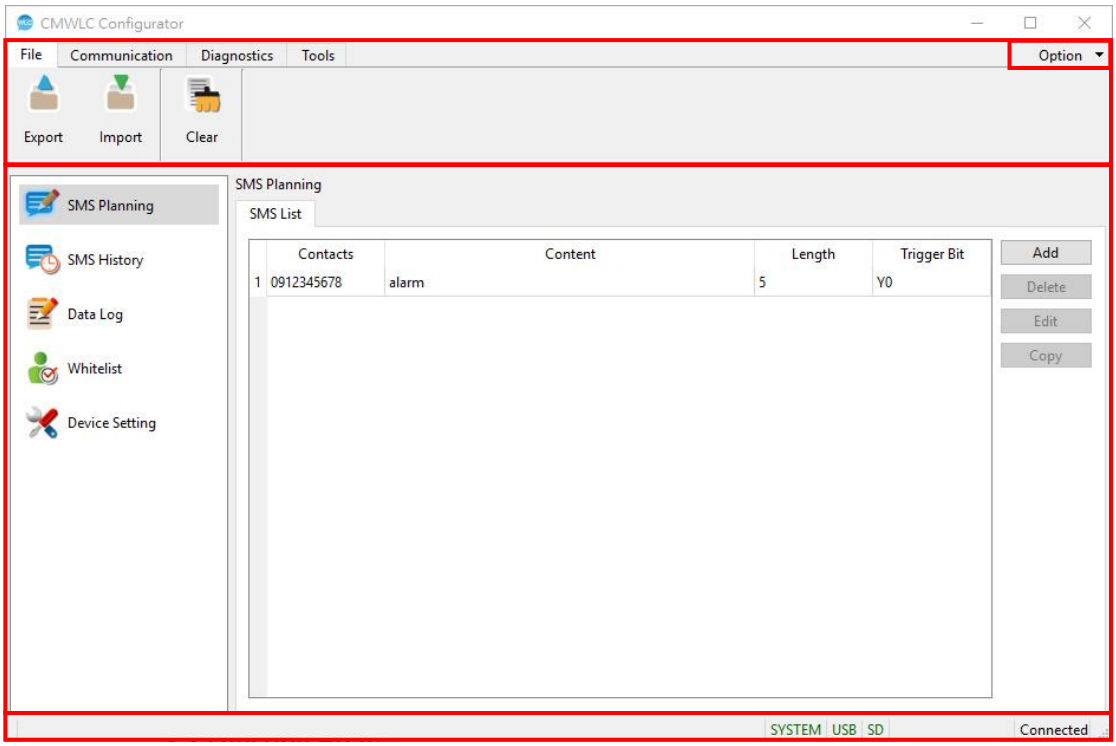
MBs-CMWLC supports the following model of 4G LTE USB Dongle

Brand	**D-LINK**
Model	DWM-222
Appearance	

2 CMWLC Configurator Software Operation

Users can set the CMWLC via CMWLC Configurator software.

2.1 Window Configuration



< Functions >

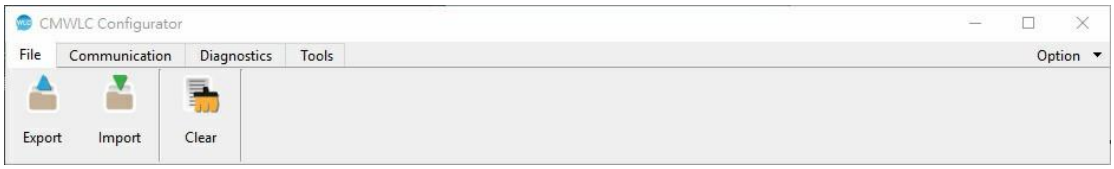
< Option>

< Workspace>

< Status Bar>

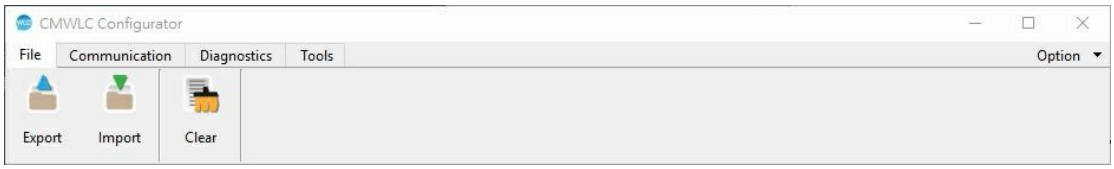
2.2 Function Area

The function area will display the function according to the different pages selected in the lower window, there are four pages in this area, which are file, communication, diagnostics and tools. The function description is as follows:



Function	Description
【File】	Export and import【Configuration file】.
【Communication】	Connecting device and upload/download【Configuration file】.
【Diagnostics】	Provides users to view/clear/export the device's system log.
【Tools】	Factory Reset, Reboot Device, Firmware Update, Send SMS and Phonebook, etc.

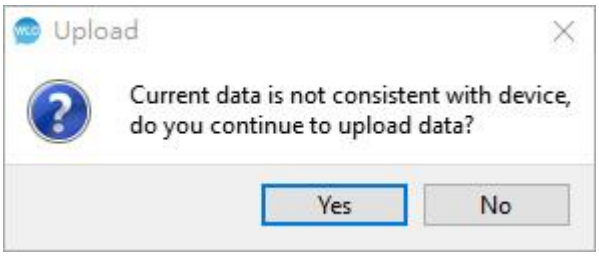
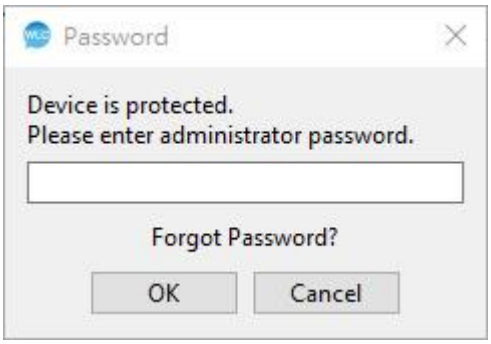
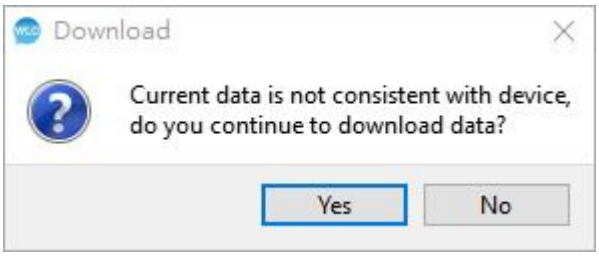
2.2.1 File

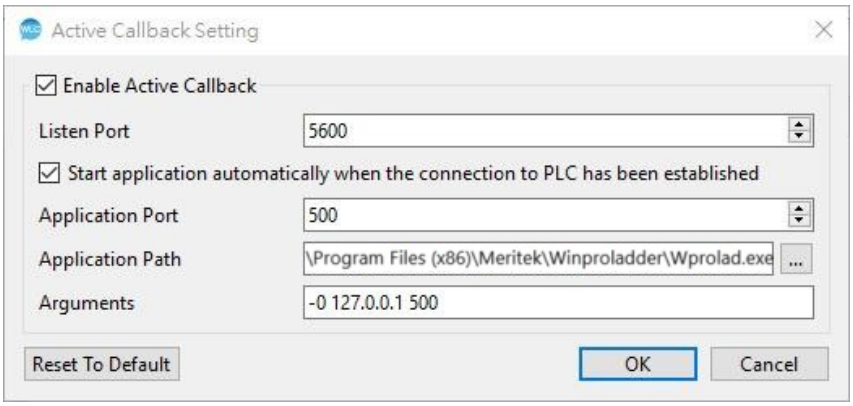


Function	Description
【Export】	Export the configuration settings of the current workspace to facilitate user backup device settings. When clearing the workspace, 【Export】button will turn gray.
【Import】	Provide user to import the backup configuration settings into the workspace. (Currently providing a file path for memory)
【Clear】	Clear the configuration settings of the current workspace.

2.2.2 Communication

Function	Description
【Online】	This function only supports Mini-USB port to connect with the device, ethernet connection needs to connect via Active Callback function. After confirming that the Mini-USB cable on the computer is properly connected to the Mini-USB port on the device, select the label of the function area【Communication】→【Online】. When connected successfully, the【Online】button will turn gray. * To connect via the network, needs to use the active callback function.
【Offline】	Disconnect with the current device, including Mini-USB port and network connection. Under the offline status,【Offline】button will stay in gray status.
【Upload】	Upload the internal configuration setting to workspace. Select the label of the function area【Communication】→【Upload】. After uploading success, the workspace will display the last configuration settings. If the configuration setting already exists in the workspace is inconsistent with the upload content, the user will be asked whether to continue uploading. select【Yes】the program will continue uploading and overwrite the workspace setting ; select【No】to cancel the upload. *Default upload password: 12345678

	 【Forgot Password】 If forget the administrator password, select the forgot password in the uploaded password window. CMWLC will send the administrator password to the administrator's mobile phone. 
【Download】	Download the workspace configuration setting to device. If the download content the workspace is inconsistent with the device, the user will be asked whether to continue uploading. select【Yes】the program will continue downloading and overwrite the device setting ; select【No】to cancel the download. 
【Active Callback】	Set the active callback parameter of the PC end CMWLC Configurator. Select the label of the function area



【Enable Active Callback】

Check the check box to enable and provides listen port function, if not check then disable the function.

【Listen Port】

Set the network port of the active callback that program provided, the default is 5600.

【Start application automatically when the connection 】

Check the check box to execute the application according to the set of the application parameters, disable if it's not checked.

【Application Port】

It's an application 's foreign service port. If the application is WinProladder software then the port set as 500, default is 500.

【Application Path】

After the connection between the workstation and maintenance center is successful, needs to fill in the path to open the application if you need to open the application, the default path is WinProladder .

【Arguments】

When opening the application, if you need to add additional command then fill in this field, default is WinProladder's parameter.

【Reset To Default】

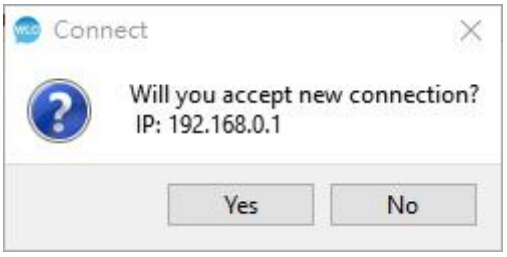
Reset to factory settings.

Active callback function can trigger via sending SMS command or setting PLC register*.
*please refer to chapter4 - Active Callback

When the active callback service is enabled, the CMWLC Configurator is in the state of waiting for the active callback service while offline, and the status bar is displayed as shown below.

Wait for active callback service...

When the module successfully triggers the active callback function, the CMWLC Configurator software will pop up the window to confirm the connection, once confirmed, you can establish a connection with the CMWLC module.

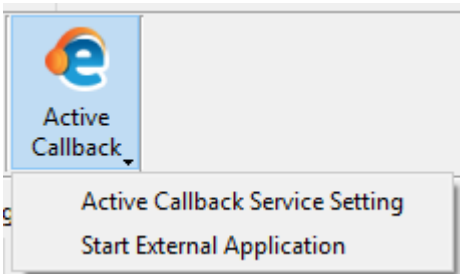


After the connection is established:
The status bar will display the active callback service has been established.

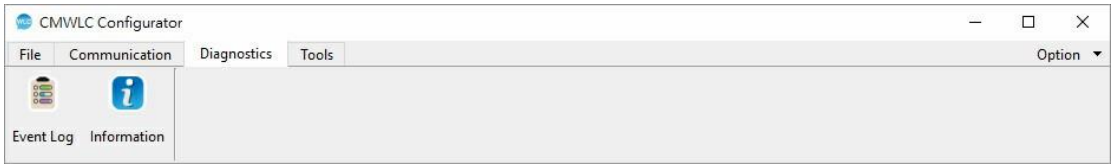
Active callback service has been established.

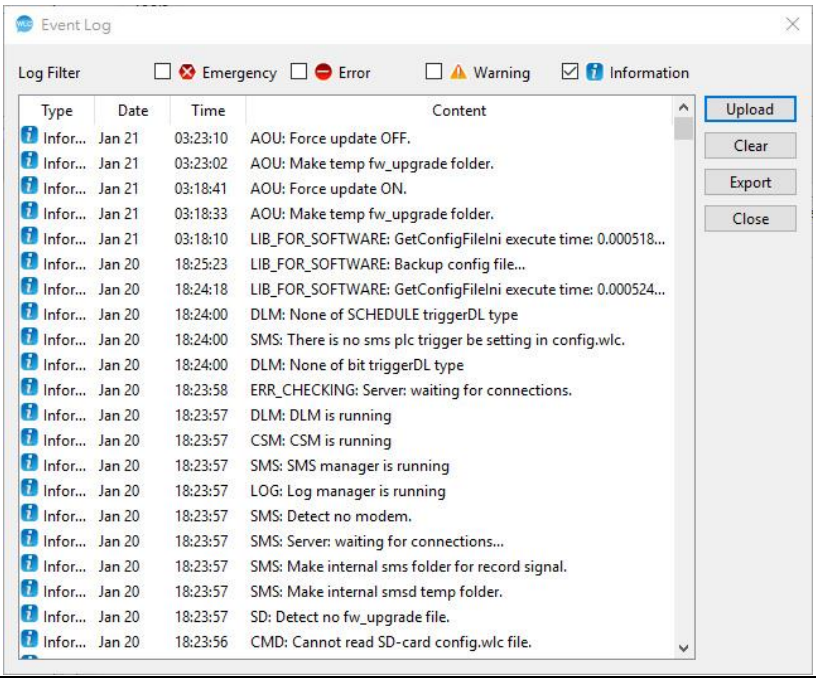
The active callback will menu will show【Start External

Application】option, click to open WinProladder* and connecting

	to enter the project.  * Open the corresponding application based on the application parameters, the default is WinProladder

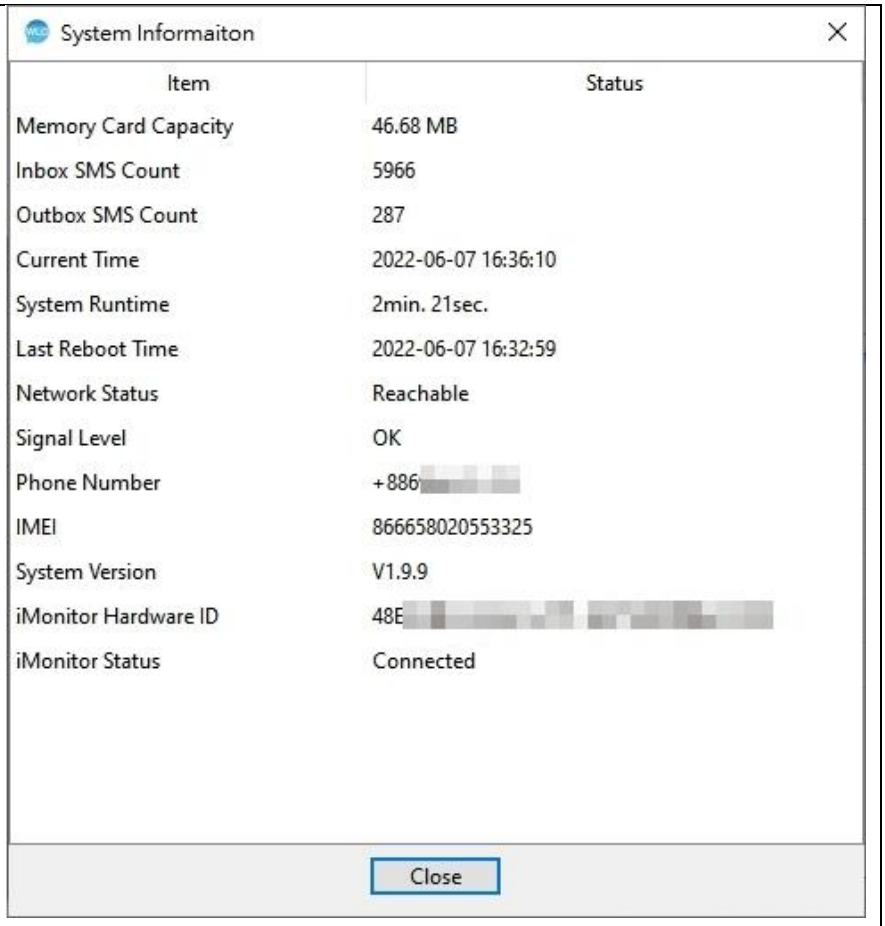
2.2.3 Diagnostics



Function	Description
【Event Log】	Provide to view / clear / export the device's data log. Select the label of the function area【Diagnostics】→【Data Log】. 

Type	Date	Time	Content
Infor...	Jan 21	03:23:10	AOU: Force update OFF.
Infor...	Jan 21	03:23:02	AOU: Make temp fw_upgrade folder.
Infor...	Jan 21	03:18:41	AOU: Force update ON.
Infor...	Jan 21	03:18:33	AOU: Make temp fw_upgrade folder.
Infor...	Jan 21	03:18:10	LIB_FOR_SOFTWARE: GetConfigFilelni execute time: 0.000518...
Infor...	Jan 20	18:25:23	LIB_FOR_SOFTWARE: Backup config file...
Infor...	Jan 20	18:24:18	LIB_FOR_SOFTWARE: GetConfigFilelni execute time: 0.000524...
Infor...	Jan 20	18:24:00	DLM: None of SCHEDULE triggerDL type
Infor...	Jan 20	18:24:00	SMS: There is no sms plc trigger be setting in config.wlc.
Infor...	Jan 20	18:24:00	DLM: None of bit triggerDL type
Infor...	Jan 20	18:23:58	ERR_CHECKING: Server: waiting for connections.
Infor...	Jan 20	18:23:57	DLM: DLM is running
Infor...	Jan 20	18:23:57	CSM: CSM is running
Infor...	Jan 20	18:23:57	SMS: SMS manager is running
Infor...	Jan 20	18:23:57	LOG: Log manager is running
Infor...	Jan 20	18:23:57	SMS: Detect no modem.
Infor...	Jan 20	18:23:57	SMS: Server: waiting for connections...
Infor...	Jan 20	18:23:57	SMS: Make internal sms folder for record signal.
Infor...	Jan 20	18:23:57	SMS: Make internal smsd temp folder.
Infor...	Jan 20	18:23:57	SD: Detect no fw_upgrade file.
Infor...	Jan 20	18:23:56	CMD: Cannot read SD-card config.wlc file.

	【Log Filter】 The list will be filtered according to the filtering options selected by the user, and only the selected event content will be displayed. 【List】 Display the data log of the current device. 【Upload】 Click to upload the data log recorded of the device. 【Clear】 Click to clear the data log recorded of the device. 【Export】 Click to export the current data log into a text file. 【Close】 Click to close the data log.
【Information】	Provides to view the device information, including System Runtime, SMS counts, Network Status and System version, etc. Select the label of the function area【Diagnostics】→ 【Information】.



【Memory Card Capacity】

Display the capacity of the memory card, when there is no memory card it will not display.

【Inbox SMS Count】

Display the device received SMS numbers

【Outbox SMS Count】

Display the device sent SMS numbers.

【Current Runtime】

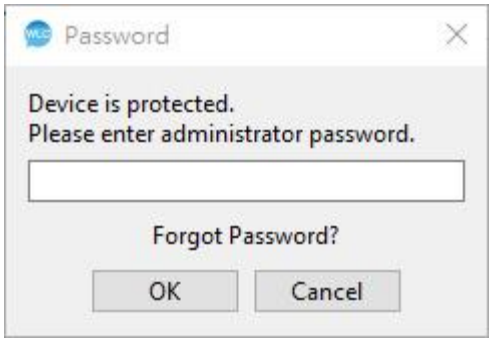
Display the current time.

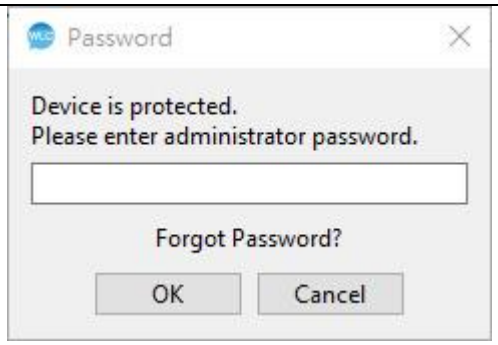
【System Runtime】

	Display the system runtime from the previous reboot time. 【Last Reboot Time】 Display the device last reboot time. 【Network Status】 Display the device's 4G network state. There are two states: Reachable and Unreachable. 【Signal Level】 Display the 4G network signal level, there are five states: ''None'' , ''Marginal'' , ''OK'' , ''Good'' , and ''Excellent''. 【Phone Number】 Display current SIM card phone number, some SIM cards cannot provide phone number, can be set by the user in the device settings. *Please refer to chapter 2.4.7 – Device Setting 【IMEI】 Display the IMEI of the current 4G LTE USB Dongle. 【System Version】 Display the device firmware version. 【iMonitor Hardware ID】 Display the unique identification code of the device, which needs to be entered when creating the device on the MERITEK IoT website.

	【iMonitor Status】 Display the connection status between the device and iMonitor.

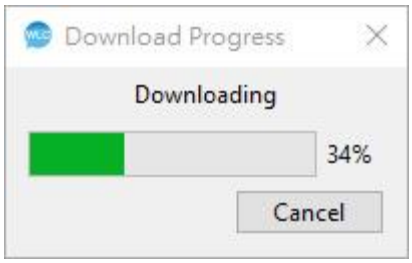
2.2.4 Tools

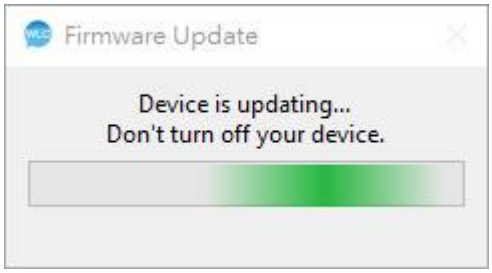
Function	Description
【Factory Reset】	Reset the device to factory settings. Select the label of the function area【Tools】→【Factory Reset】. If the device has already set the administrator's password then it will show up the window to enter password, enter the correct password to execute the factory reset. The device will offline automatically after execution, please wait for the device return to the standby state and then reconnected. 
【Reboot Device】	Reboot the device. Select the label of the function area【Tools】→【Reboot Device】. If the device has already set the administrator's password then it will show up the window to enter password, enter the correct password to execute device reboot. The device will offline automatically after execution, please wait for the device return to the standby state and then reconnected.

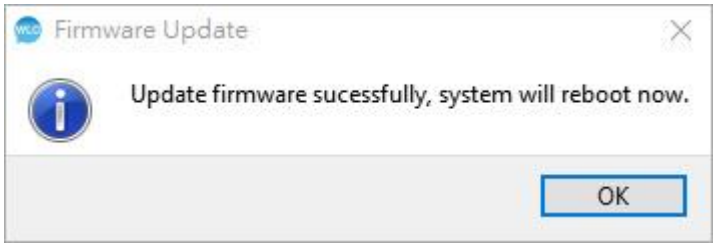
<table>
<tr><td></td><td> 
</td></tr>
<tr><td>【Firmware

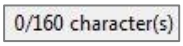
Update】</td><td>Update the device firmware.

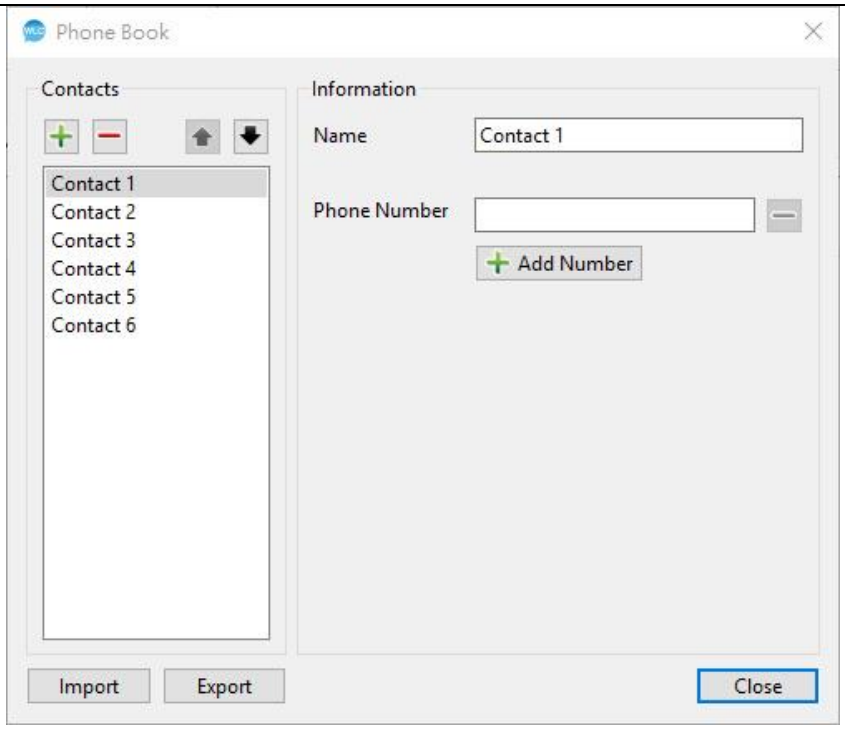
Select the label of the function area【Tools】→【Firmware Update】.

After loading the new firmware file in the file window, the program will start downloading, as shown in the following figure.
 

After the download is successful, the system will start to enter the firmware update mode. Do not turn off the power in this time.
 

After the firmware is updated, the device will reboot. Please wait for the device to return to the standby state and then reconnect it.
 
</td></tr>
</table>

【Send SMS】	Control the device to send SMS. Select the label of the function area【Tools】→【Send SMS】. 【Phone Number】 Set the phone number to receive the SMS. Click  to select the contact in the phonebook and fill in phone number. 【Undo】  Undo action. 【Cancel Undo】  Cancel the undo action. 【SMS Command】  Insert the default SMS command. *please refer to **chapter 3 – SMS Command** 【Text Editor】 Edit the SMS content. 【Count】  The word count of the text editor, the maximum number of words is 160 characters in English / 70 characters in Chinese.
【Phonebook】	Provide users to edit and store contacts. Select the label of the function area【Tools】→【Phonebook】.



【Contacts】

Display the contact list of the current phone book.

【Information】

Edit the contact name and phone number, each of the contact can add up to 8 numbers.

【Add】 

Click to add a new contact to the below table.

【Delete】 

Click to delete the selected contact from the below table.

【Move UP】 

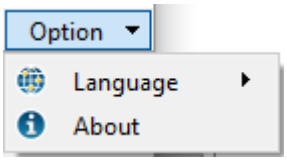
Click to move up the selected contact.

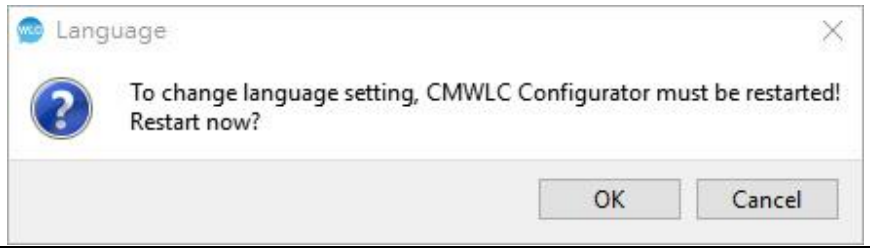
【Move Down】 

	Click to move down the selected contact. 【Import】 Click to import the CSV file into the phone book. 【Export】 Click to export the phone book to CSV file.

2.3 Option

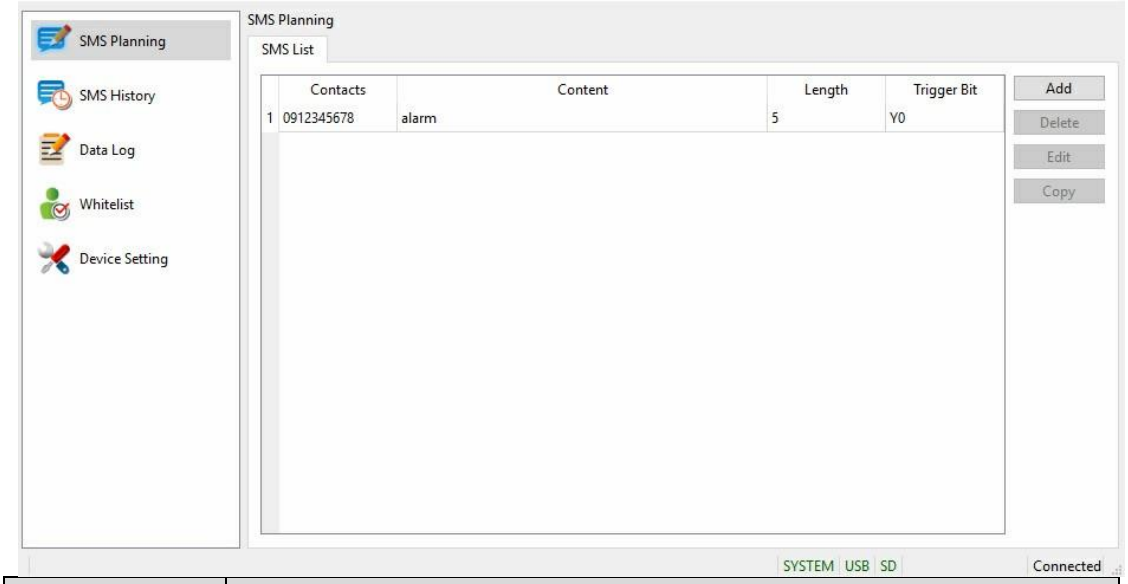
Provide interface language switching and program version information.



Function	Description
【Language】	Provide interface language switching, currently available in English, Traditional Chinese and Simplified Chinese. To change language setting, configurator must be restarted. Select the label of the option【Language】. 
【About】	Display software version and relative information. Select the label of the option【About】. 

2.4 Workspace Configuration Settings

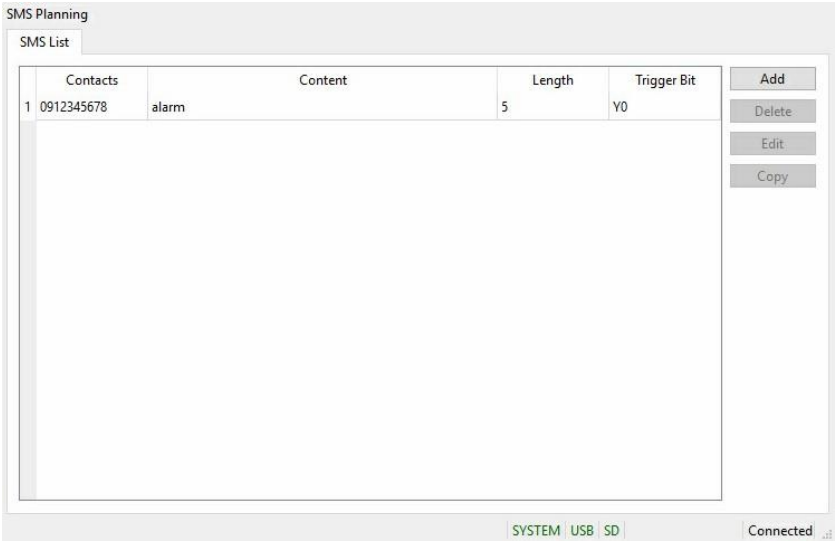
The workspace will be displayed when users upload or import the configuration settings, mainly to provide users to modify the settings and to view the SMS and data log.

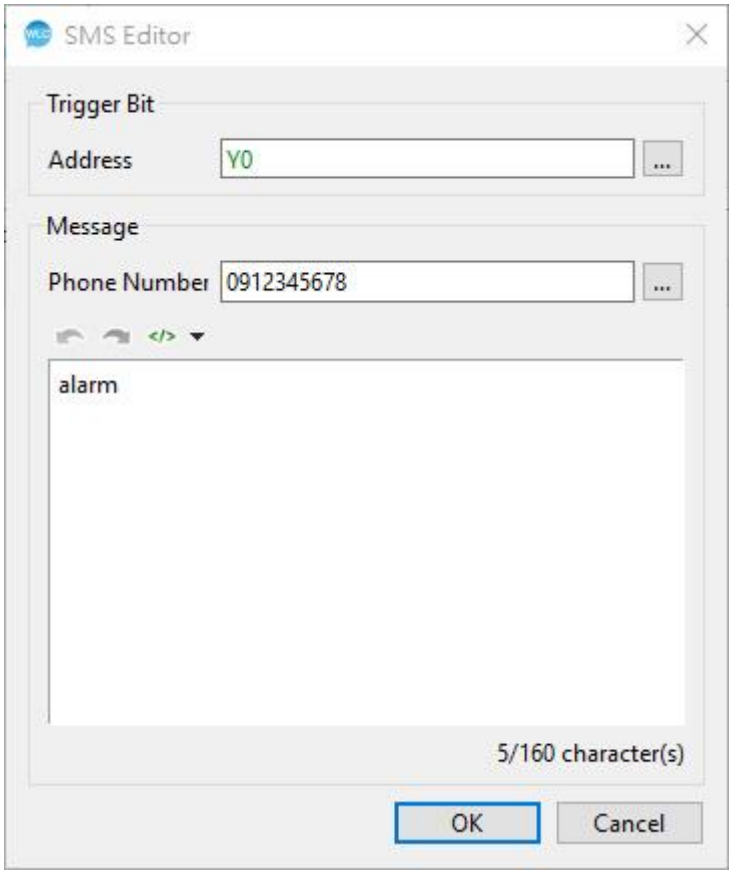


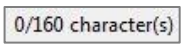
Function	Description
【SMS Planning】	Provide user with the function of planning the delivery of the SMS, user can pre-edit the content and recipient, and customize the triggered PLC bit register.
【SMS History】	Provide user to view or clear SMS that currently in the device, includes sent and received SMS.
【Data Log】	PLC register data can be recorded into files through data log tasks and stored in the device. Provide users setting period, bit and schedule three modes to trigger data log, and view device's file.
【Whitelist】	Set the phone number list for receiving SMS and SMS commands. If receive a SMS or command sent by an unset number, the device will ignore the message directly.
【Device Setting】	Provide user to plan the device's system, mobile network and server, etc.

2.4.1 SMS Planning

Provide user with the function of planning the delivery of the SMS, user can pre-edit the content and recipient, and customize the triggered PLC bit register. When the bit register is triggered, the device will send the corresponding SMS content. Currently provides user to plan 32 groups of SMSs.

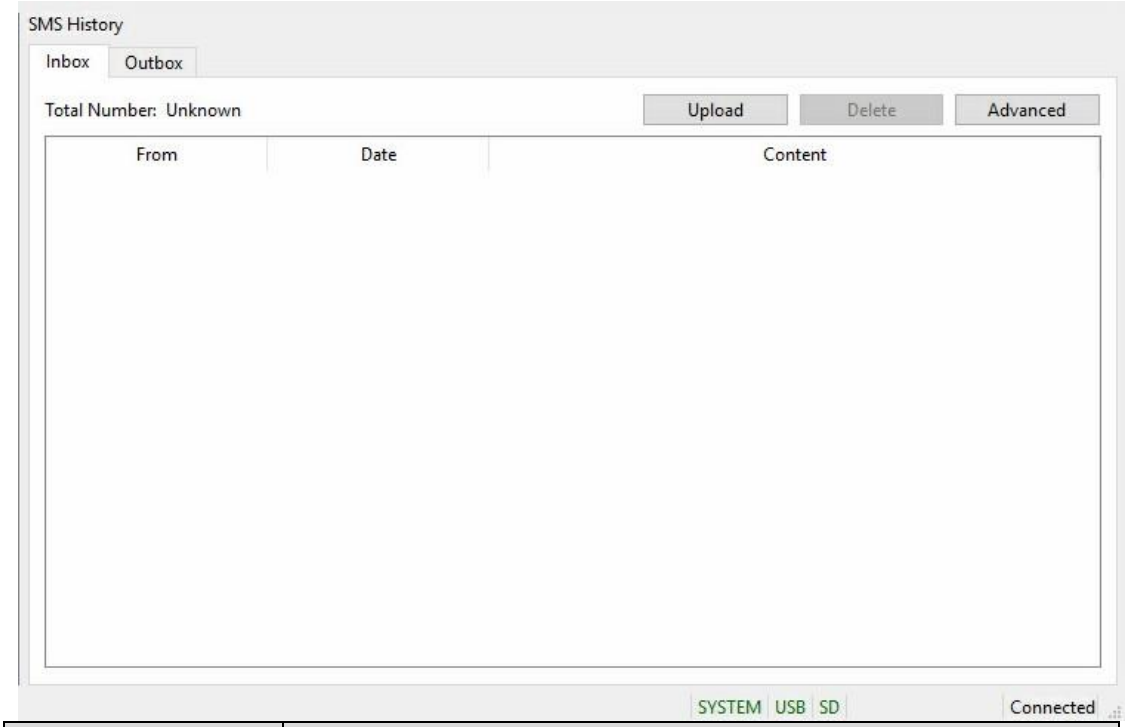
Function	Description
【SMS List】	Provide users planning SMS, the sending SMS that has been set up will be displayed on the list in order. Select the【SMS Planning】option of the workspace.  【Add】 Pop up the SMS Editor window after clicked, it will add a new SMS to the left table after editing is complete 【Delete】 Delete the selected outgoing SMS of the left side table. 【Edit】 Edit the selected SMS of the left side table.

	【Copy】 Copy the selected data of the left side table.
【SMS Editor】	Provide users to edit SMS contents and trigger condition. Select【Edit】of the SMS Planning.  【Trigger Bit】 Set PLC bit register as switch, when bit changes from 0 to 1 then send the SMS. click  can select the PLC register to set. 【Phone Number】 Set the phone number to receive the SMS. Can set up to 8 sets of phone numbers, and the phone numbers will be divided by

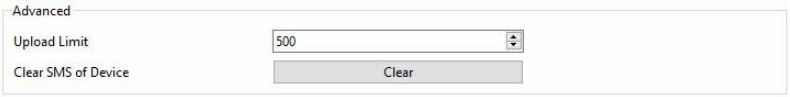
	semicolon. Click  can select the contact in the phone book and fill in phone number. 【Undo】  Undo action. 【Cancel Undo】  Cancel undo action. 【SMS Command】  Insert the default SMS command. Can be used to control other CMWLC. The information returned by other CMWLC will be stored in the inbox. *Please refer to **chapter 3 SMS Command** 【Text Editor】 Edit the SMS content. 【Count】  The word count of the text editor, the maximum number of words is 160 characters in English / 70 characters in Chinese.

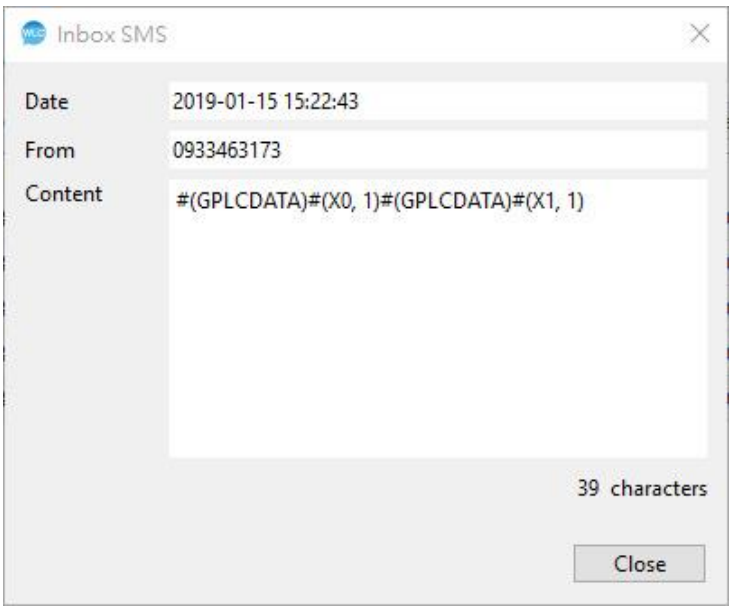
2.4.2 SMS History

Provide users to view or clear SMS that in the device currently, includes sent and received SMS.



Function	Description
【Inbox】	Display the SMS on the device that has been received. Provides a capacity of at least 10,000 text messages, the total number depends on the memory card capacity SMS Warning When inbox or outbox stored SMSs less than or equal to 1000, 500, 200, 100, a warning message will be sent to the administrator. Software Warning When inbox or outbox stored SMSs less than or equal to 1000, 500, 200, 100, will pop up a warning window.
【Outbox】	Display the SMS on the device that has been sent. Provides a capacity of at least 10,000 text messages, the total number depends on the memory card capacity.

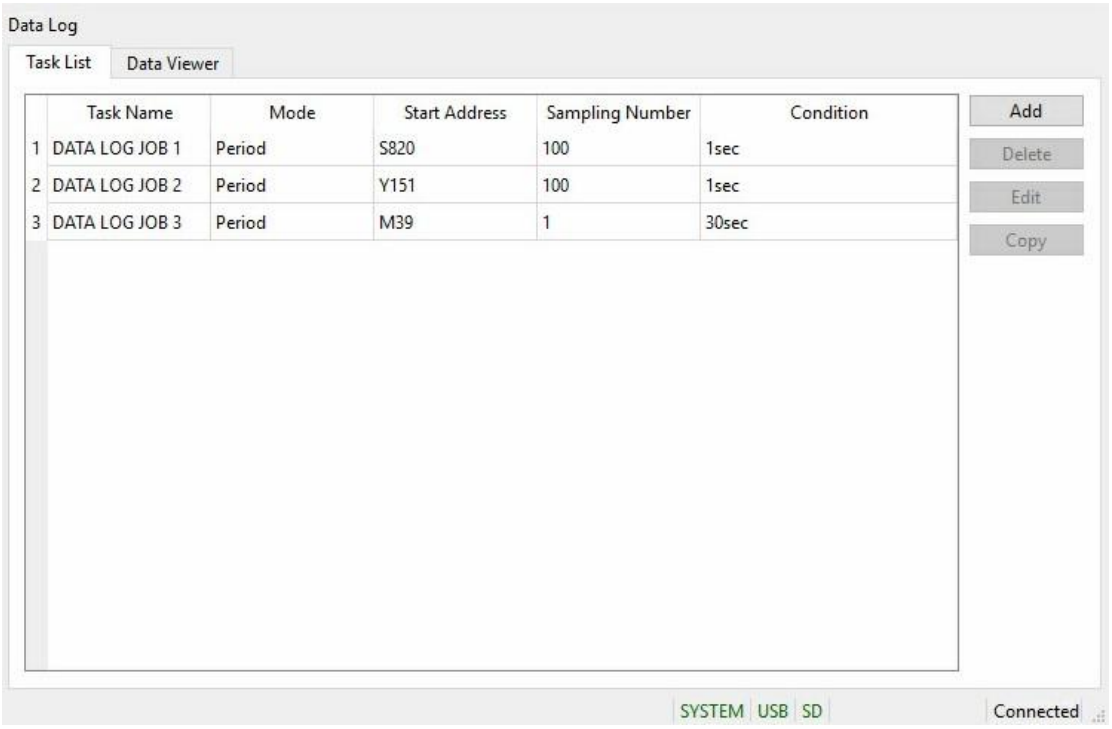
	SMS Warning When inbox or outbox stored SMSs less than or equal to 1000, 500, 200, 100, a warning message will be sent to the administrator. Software Warning When inbox or outbox stored SMSs less than or equal to 1000, 500, 200, 100, will pop up a warning window.
【Total number of SMS】	Display total number of SMSs on the device currently.
【Upload】	Upload the SMSs that were stored in the internal memory or memory card.
【Delete】	Delete the currently selected SMS on the device.
【Advanced】	There will appear advanced item to provide user setting after clicked the Advanced button.
【Upload Limit】	Maximum number of SMS per upload. The default is 500 SMSs. 
【Clear SMS of Device】	Clear all SMS of the current page.
【List】	Display the uploaded SMSs and part of the content. Double click the list option will pop up dialogue to show the entire message.

Inbox SMS
Date
2019-01-15 15:22:43
From
0933463173
Content
#(GPLCDATA)#(X0, 1)#(GPLCDATA)#(X1, 1)
39 characters
Close

2.4.3 Data Log

PLC register data can be recorded into files through data log tasks and stored in the device. Provide user setting period, bit and schedule three modes to trigger data log, and view device's file.



Function	Description
【Add】	Pop up the SMS Editor window after clicked, it will add a new SMS to the left table after editing is complete.
【Delete】	Delete the selected SMS of the left table.
【Edit】	Edit the currently SMS settings selected in the left table.
【Copy】	Copy the selected data.
【List】	Display the currently set task, the upper limit is 16 groups.

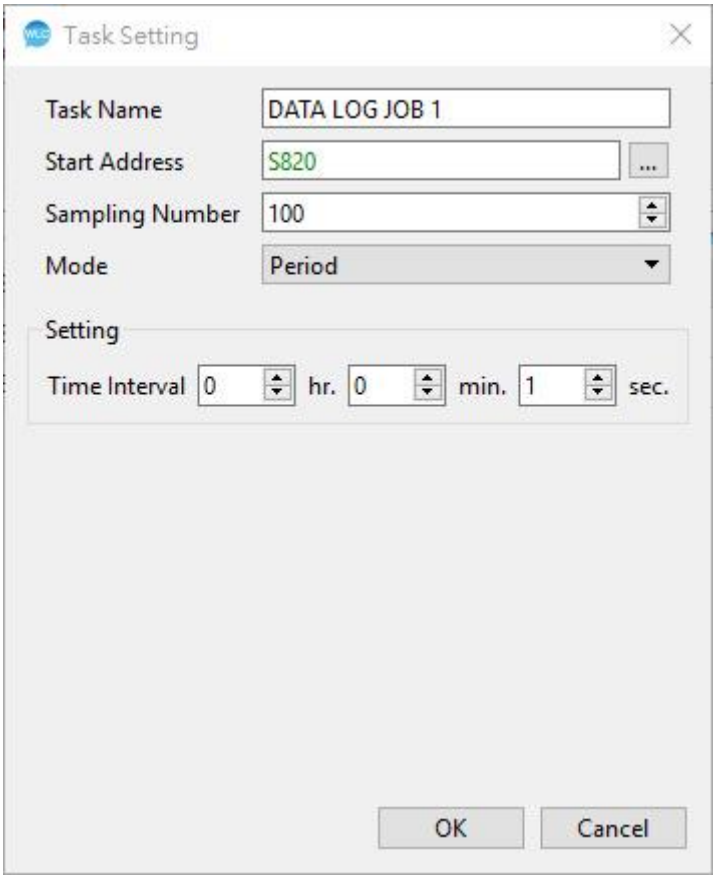
Data Log will be divided into 1 file for every 6MB

The SD card reserves 64MB for the historical SMS. If the SD card is full of data logs and left only 64MB, the data log will delete the oldest data log file and write new data log.

When the SD card is lower than 100MB, when the data log is written to the next 6MB, the SMS will be sent to the administrator, and the warning message will not stop until the SD card capacity returns to 100MB or more.

2.4.4 Task Setting

Provide user to edit tasks in the task list.



Function	Description
【Task Name】	Set the name of data log task.
【Start Address】	Set the PLC register address to be sampled. Click ... to set the PLC register address.
【Sampling Number】	Set the number of consecutive samples, such as set 256 for sampling X0~X255.
【Mode】	Provide users different kinds of trigger modes, when the trigger condition is met, the device will immediately record the data of PLC register.

【Period】

Periodically sample the register data, needs to set the time interval when select this mode. The minimum time interval is 1 second.

【Bit】

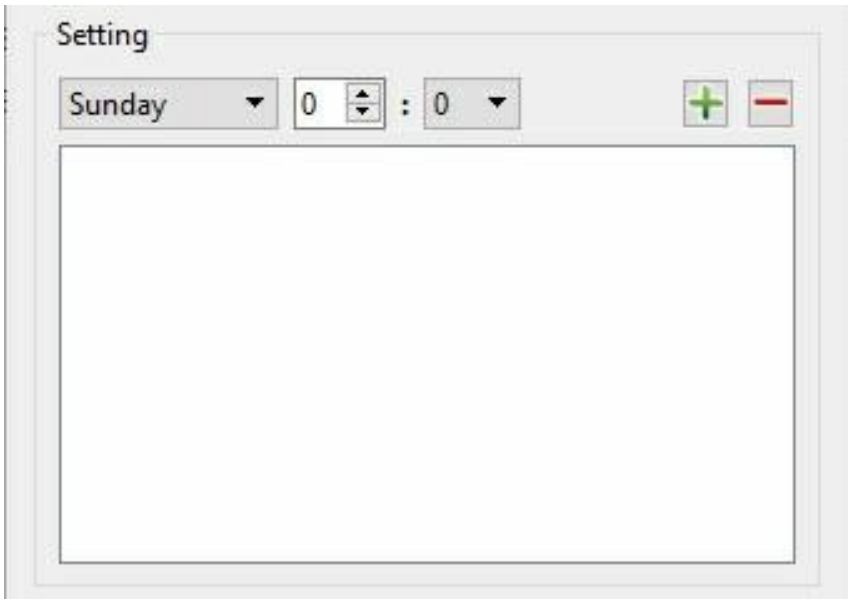
Monitor the change of the specified bit register, sample the register data according to the change status, needs to set the bit register and trigger condition when select this mode.

Trigger Condition

【Bit OFF → ON】	Process the task when the bit changes from 0 to 1.
【Bit ON → OFF】	Process the task when the bit changes from 1 to 0.
【Bit Change】	Process the task when the bit changes.

【Schedule】

The device will sample the register data according to the specified date and time, needs to set the trigger date and time when select this mode.



【Date】

Set the execute date to trigger sampling.

【Time】

Set the execute time to trigger sampling, 15 minutes per unit.

【Add】

Click to add the current date and time to the table below.

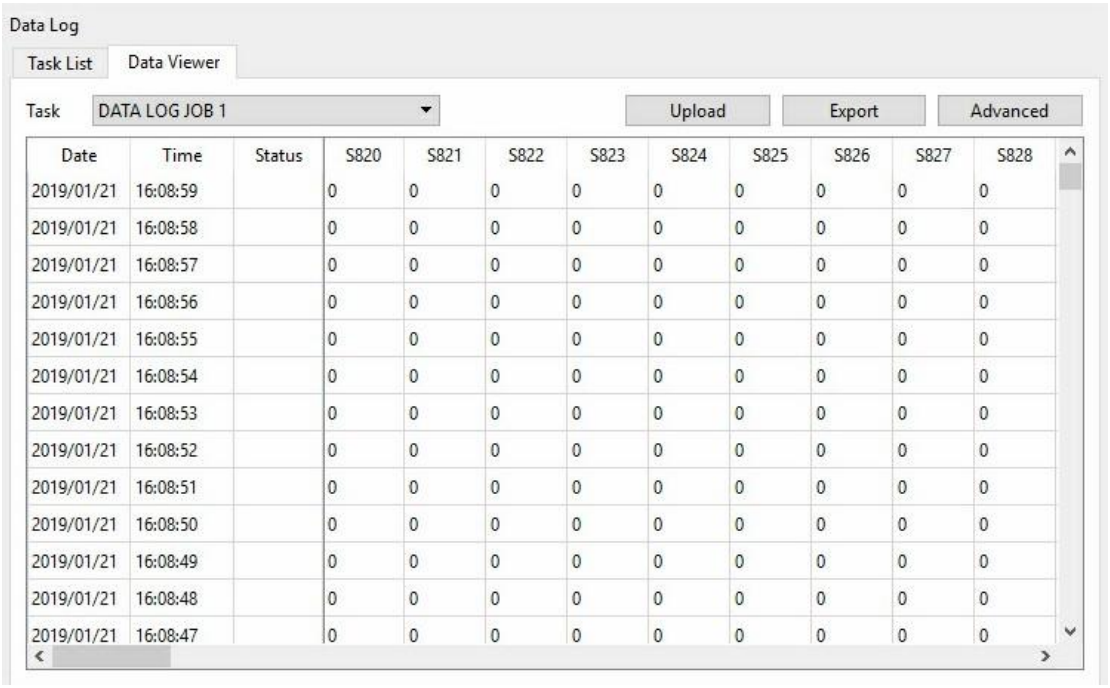
【Delete】

Click to delete the selected date and time of the table below.

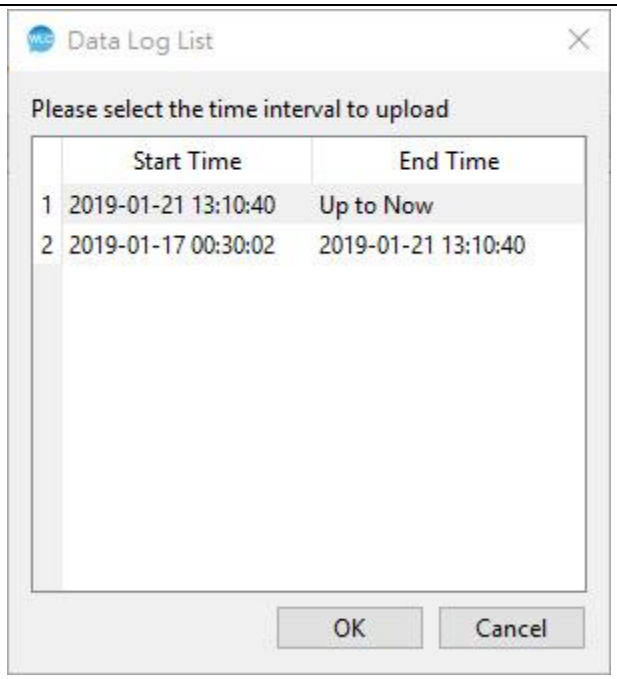
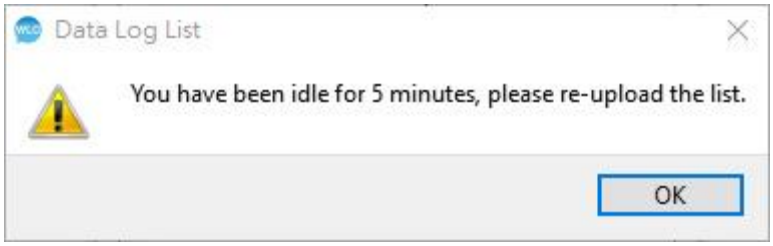
【List】

Display the date and tine list of the current task settings.

2.4.5 Data Viewer

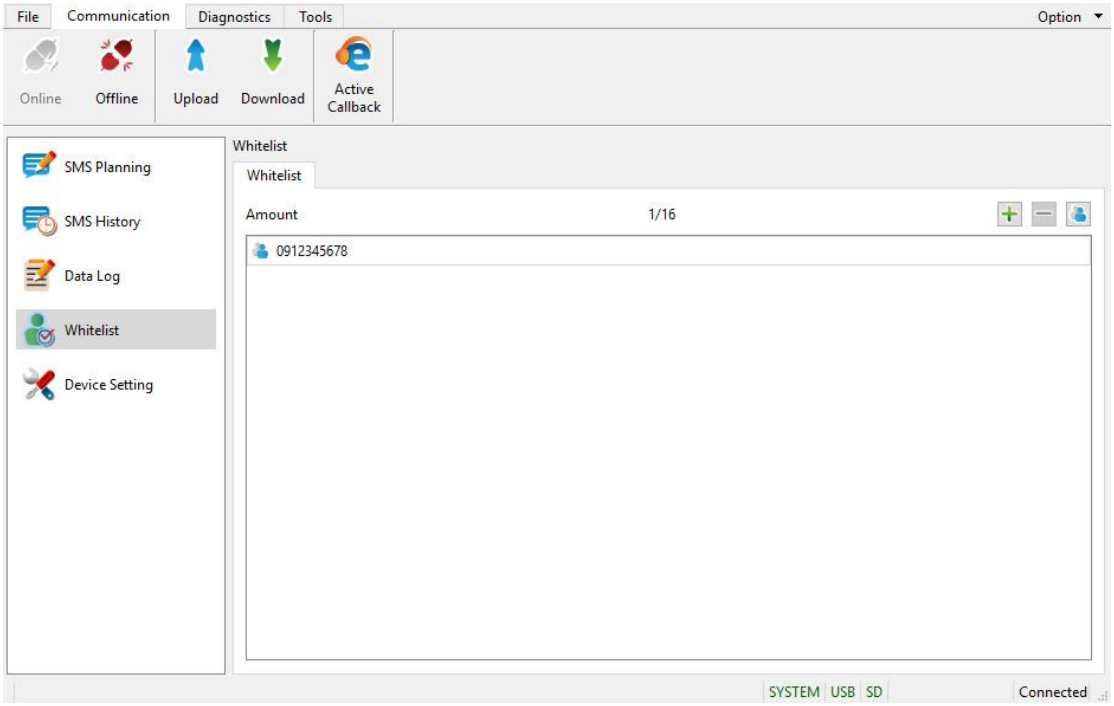


Function	Description
【Task】	Display the task list of the upload file, when the user selects different task, the list below will display the data of the specified task.
【Upload】	After clicking, the data log list window* will display the file records existing on the current device according to the time interval, and the user can select the file record to be uploaded for viewing.

	 The device will continue to do sample during select list. When the user has not selected the upload interval for a while, the program will prompt the user to re-acquire the collection list.  * When data reached to a certain number, system will divide the data into different intervals according to the time series. If the data does not reach this number, the partition interval will not be displayed and the data log list window will not pop up.
【Export】	Click to export the selected task records into CSV file.
【Advanced】	Click the button then will appear the following advanced options let user to set.
【Clear Data Log of Device】	Clear the device's data log file.
【List】	Display the uploaded task record, double click to change the displays status.

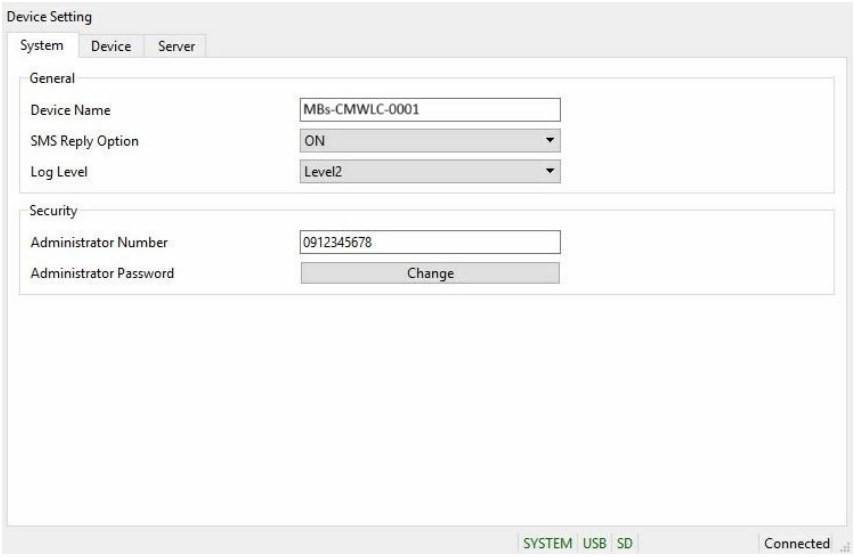
2.4.6 Whitelist

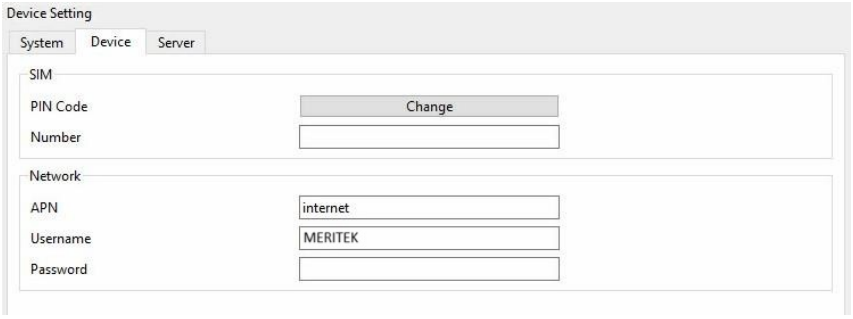
Set the phone number list for receiving SMS and SMS commands. If receive a SMS or command sent by an unset number, the device will ignore the message directly. The whitelist is limited to 16 groups of numbers.

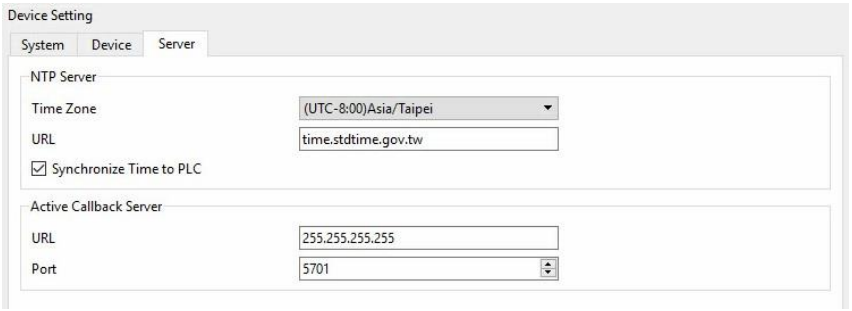


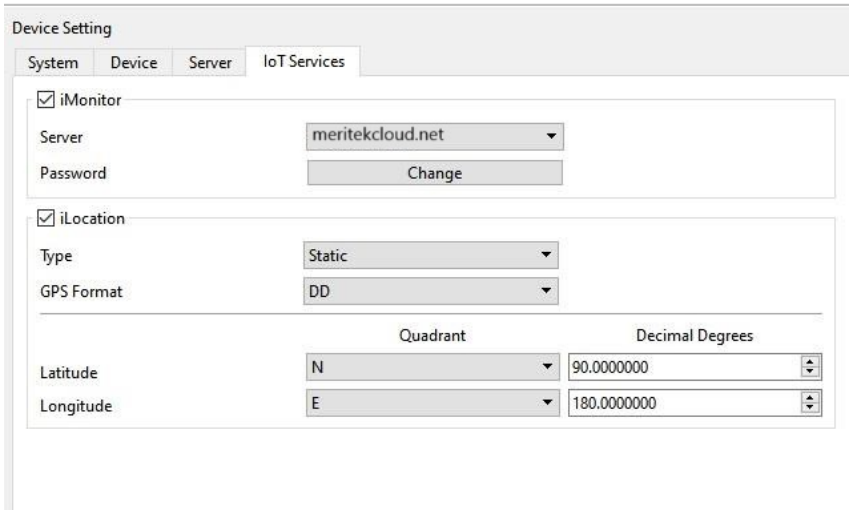
Function	Description
【Account】	The number of phone numbers that currently set, up to 16 groups.
【Add】 	Click to add a new phone number to the table below.
【Delete】 	Click to delete the selected phone number of the table below.
【Contact】 	Click to add the contact from the phone book to list.
【List】	The current set whitelist, double click to edit.

2.4.7 Device Setting

Function	Description
【System】	Provide users to set the device's administrator and device name, when forgetting password*, also can ask CMWLC to send password message to administrator. *please refer to 2.2.2【Communication】【Upload】 Select the label of the workspace【Device】→【System】.  【Device Name】 Provide users to set device name. 【SMS Reply Option】 Set whether to send reply message after device received SMS command. Example: Reply "successfully set plc value" when the PLC register is successfully set. Reply "successfully active callback" when successfully execute active callback.

	Reply “[Error]format wrong” when the command is wrong. Reply “[Error]need correct password” when the password is incorrect. 【Log Level】 Set the log level of the device system. Level 1 record emergency events. Level 2 record emergency and error events. Level 3 record emergency, error and warning events. Level 4 record all events. 【Administrator Number】 Set the administrator’s phone number. 【Administrator Password】 Set the administrator’s password, part of the functions and SMS commands need to enter password to use.
【Device】	Provide PIN code unlock and Network login for the user’s SIM card. Select the label of the workspace【Device Setting】→【Device】  【PIN Code】 Set the SIM card PIN code of the network module.

	【Number】 If the SIM card does not provide a phone number for Dongle to read, here you can let the user enter the phone number. 【APN】 The default is internet, the APN of some mobile operators may not be internet, please confirm with your mobile operator. 【Username】 Optional, the mobile operator requires that you need to enter a username to connect to the 4G network. 【Password】 Optional, the mobile operator requires a user password to connect to the 4G network.
【Server】	Provide users the remote computer IP and port when setting the NTP time zone and CMWLC active callback. Select the label of the workspace【Device Setting】→【Server】  【Time Zone】 Set the device's time zone. 【URL】 Set the server's URL. Default is time.stdtime.gov.tw

	【Synchronize Time to PLC】 Synchronize CMWLC time to PLC. CMWLC will be synchronized once during power-on, once in 5 minutes, and once every 24 hours. When 4G Dongle is connected to the device and can access the Internet, it will be synchronized again. The PLC must be in the RUN state to be synchronized. 【Active Callback Server】 To use the active callback function, it needs to fill in the server's IP and port. When the device active callback function is triggered, the module will connect to the CMWLC Configurator via network according to this setting. 【URL】 Set the IP or domain name of the remote callback server. 【Port】 Set the network port of the remote callback server.
【IoT Services】	

	【iMonitor_Server】 Set the server connected to MERITEK IoT. 【iMonitor_Password】 Set the password for module and MERITEK IoT connection, when adding device on the website, fill in the same password on the website. 【iLocation_Type】 There are two types: static and dynamic. Static means that the software is set and downloaded to the module; dynamic means it is set through the PLC register. 【iLocation_GPS Format】 Provide DD, DMM, DMS three GPS formats. 【iAccress_Latitude】 Set 0 degrees to 90 degrees north and south. 【iAccress_Longitude】 Set 0 degrees east to 180 degrees west.

2.5 Status

Left side displays active callback status, the right most side displays connection status.

After connection has been established, system, 4G LTE USB Dongle and microSD card status will be displayed.

Function	Description
【Active Callback Status】	Display the active callback status of the current program. 【Wait for active callback service】 Active callback is enabled but not connected. 【Active callback service has been established】 Active callback is enabled and connected. 【No display】 Stop the active callback service.
【Connection Status】	Display the connection status of the current device. 【Connected】 Device is connected. 【Disconnected】 Device is disconnected.

3 SMS Message Command

By sending SMS command to the module, we can read and write the data of the PLC. Furthermore, it could do the settings and controls such as active call back, data log, Run/Stop to the module and PLC.
The function and format of the SMS command and the reply from module when receiving the command are as follows.

Function	Format
【Factory Reset】	#(%1)#(FACTORYRESET)
【Reboot】	#(%1)#(REBOOT)
【Get System Status】	#(GSYSSTAT)
Reply from module: system run time: Hour-Minute-Second last reboot time: system version: command run time:	
【Get SD Card Capacity】	#(GSDSTAT)
Reply from module: SD-card capacity: command run time:	
【Get Mobile Status】	#(GMBSTAT)
Reply from module: network status: reachable signal status: excellent command run time: __(sec)	
【Get PLC Status】	#(PLCSTAT)
Reply from module: plc status: stop battery status: normal	

<table>
<tr><td colspan="2">checksum status: normal
memory pack: off
WDT: normal
ID setting: off
emergency: no emergency</td></tr>
<tr><td>【Read PLC Data】</td><td>#(GPLCDATA)#(%2, %3)</td></tr>
<tr><td colspan="2">Could read consecutive data of a register address each time.
*Not allowed to add command after.

The upper limit:
Bit: 128
16Bit:60
32Bit: 32
Ex: Read 5 consecutive data from R0
Send: #(GPLCDATA)#(R0,5)
Reply: R0:100(64H) R1:101(65H) R2:102(66H) R3:103(67H) R4:104(68H)</td></tr>
<tr><td>【Write PLC Data】</td><td>#(SPLCDATA)#(%2, %4)</td></tr>
<tr><td colspan="2">Could write multiple register addresses each time.
Add H or h after the number to write in Hex form.
Not allowed to add command after.
Ex: Write Y0=1 M0=1 R0=10 D0=15H
Send: #(SPLCDATA)#(Y0,1)(M0,1)(R0,10)(D0,15H)</td></tr>
<tr><td>【Control PLC START】</td><td>#(%1)# (PLCSTART)</td></tr>
<tr><td>【Control PLC STOP】</td><td>#(%1)# (PLCSTOP)</td></tr>
<tr><td>【Active Callback】</td><td>#(ACTIVECBK) #(%5:%6)</td></tr>
<tr><td colspan="2">When command is #(ACTIVECBK) ,call back to the Active Callback Server set in
【Device Setting】.
When command is #(ACTIVECBK)#(IP:PORT),call back to the Active Callback Server according to the IP:PORT.
Not allowed to add command after.
Ex: Active call back to the server at IP: 61.216.95.30 Port:5700
Send:#(ACTIVECBK)#(61.216.95.30:5700)</td></tr>
</table>

【Trigger Data Log】	#(DATALOG%7)

Note:

A SMS message command can enter multiple commands

%1: Administrator Password

%2: PLC Register Address. Ex: R0 , D100.

%3: Sampling Number

%4: Value to write in

%5: Active Callback Server Address

%6: Active Callback Server Port

%7: No. of the Data Log in the CMWL Configurator, from 1~16

4 Active Callback

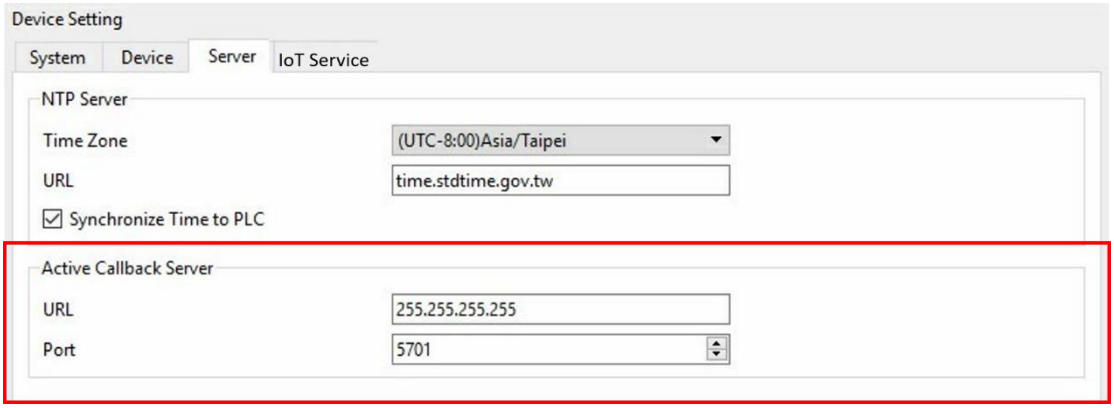
MBs-CMWLC's Active Callback could be triggered by SMS message command or PLC register, and then connect back to the PC's Active Callback Server*.
Through the active callback feature, even if the network address of the MBs-CMWLC cannot be known, we still can easily create the connection between the local PC and the remote MBs-CMWLC and do the maintenance and control of the MBs-CMWLC and MBs-PLC.
*Settings for the Active Callback Server on CMWLC configurator please refer to the descriptions in **chapter 2.2.2 Communication_Active Callback**.

4.1 Trigger by SMS Message Command

Send #(ACTIVECBK) to CMWLC

Call back to the Active Callback Server set in【Device Setting】.

Send #(ACTIVECBK)#(IP:PORT) to CMWLC
Call back to the Active Callback Server according to the IP:PORT.
*For SMS Message Command please refer to the descriptions in **chapter 3 - SMS Message Command**.



4.2 Register Function Description for PLC and CMWLC

PLC module and CMWLC module communicate via CPU register block D3000~D3001 data transfer.

Register's description as follows:

<table>
<tr><th colspan="3">Active Callback</th></tr>
<tr><td>Register</td><td colspan="2">Description</td></tr>
<tr><td rowspan="3">D3000</td><td colspan="2">Active Callback Command Code</td></tr>
<tr><td>Setting value</td><td>Status</td></tr>
<tr><td>3359H</td><td>Execute active call back, value zero must be
entered when terminating connection.</td></tr>
<tr><td rowspan="7">D3001</td><td colspan="2">Call Status</td></tr>
<tr><td>Content value</td><td>Description</td></tr>
<tr><td>0000H</td><td>Standby</td></tr>
<tr><td>0001H</td><td>Connecting</td></tr>
<tr><td>0002H</td><td>Connected</td></tr>
<tr><td>0003H</td><td>Retrigger connection under connected.</td></tr>
<tr><td>0004H</td><td>Connection failed _waiting for retriggered connection</td></tr>
<tr><td>0005H</td><td>Software disconnected _ waiting for retriggered connection</td></tr>
<tr><td colspan="3">iMonitor</td></tr>
<tr><td>D3002</td><td>Connect Status</td><td>0: Off line
1: On line
2: Try connecting
-300: Invalid service password
-301: Device has not been registered
-400: DNS error
Others: Reserved</td></tr>
<tr><td>DD3003(D3003~D3004)</td><td>GPS Latitude</td><td>-900000000~900000000</td></tr>
<tr><td>DD3005(D3005~D3006)</td><td>GPS Longitude</td><td>-1800000000~1800000000</td></tr>
<tr><td>D3007</td><td>Service Sever</td><td>1: GCP
2: Ali
Other: GCP</td></tr>
</table>

5 Configure and Update Firmware with micro-SD Card

In addition to CMWLC Configurator software, we could also import configuration file and update firmware of the MBs-CMWLC through micro-SD Card. With this feature, it can substantially increase the speed and convenience of operation in field.

5.1 Configure with micro-SD Card

Step (1). Load the WLC file exported from the CMWLC Configurator into the micro-SD card with the file name and path shown below.

File path: SD : fourG/config.wlc

Step (2). Insert the micro-SD card into CMWLC

Step (3). Finish loading

Successfully loaded: SD card indicator will flicker 2sec and remain on.

Not loaded: SD card indicator remain on without flickering.

Note

The updated configuration file will be renamed to config_used.wlc to avoid double updates.

5.2 Update Firmware with micro-SD Card

Step (1). Load the firmware update file into the micro-SD card with the file path shown below.

File path: SD : fourG

Step (2). Insert the micro-SD card into CMWLC

Step (3). LED indicators when updating

RUN	ERR	S-TX	S-RX
1 Flash/Sec	2 Flash/Sec	3 Flash/Sec	4 Flash/Sec

Step (4). Finish updating

Device will reboot and LED will turn back to normal.

5.3 SD Card Capacity Warning

When the SD card is used 50%, 75%, 85%, 90% of the capacity, a warning message will be sent to the administrator.