



User Manual

V 2.0.0

DL-100TMS-ZT

(ZigBee Temperature and Humidity Module)



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Important Information

Warranty

All products manufactured by ICP DAS are under warranty regarding defective materials for a period of one year, beginning from the date of delivery to the original purchaser.

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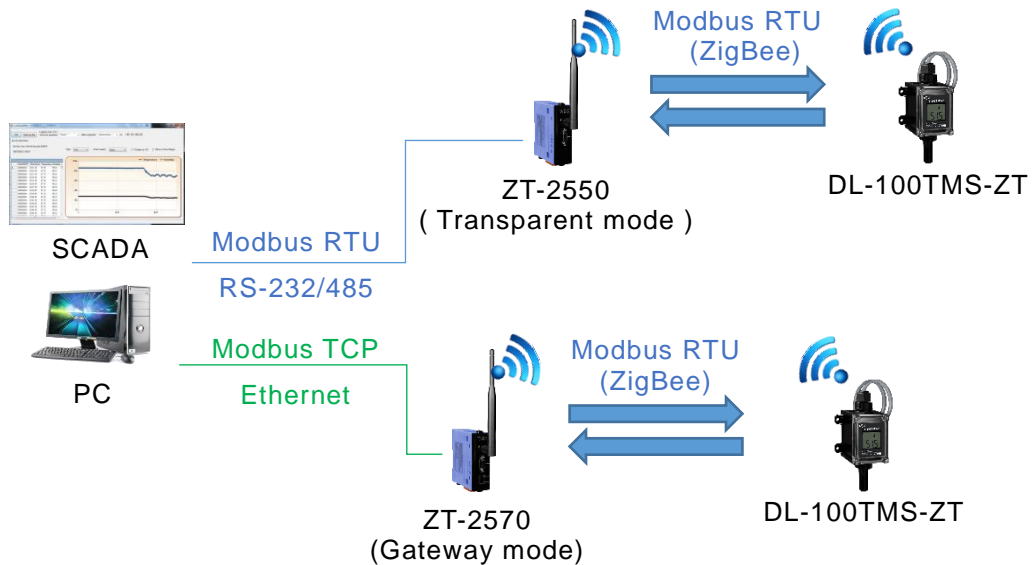
Contact us

If you encounter any problems while operating this device, feel free to contact us via mail at: service@icpdas.com .

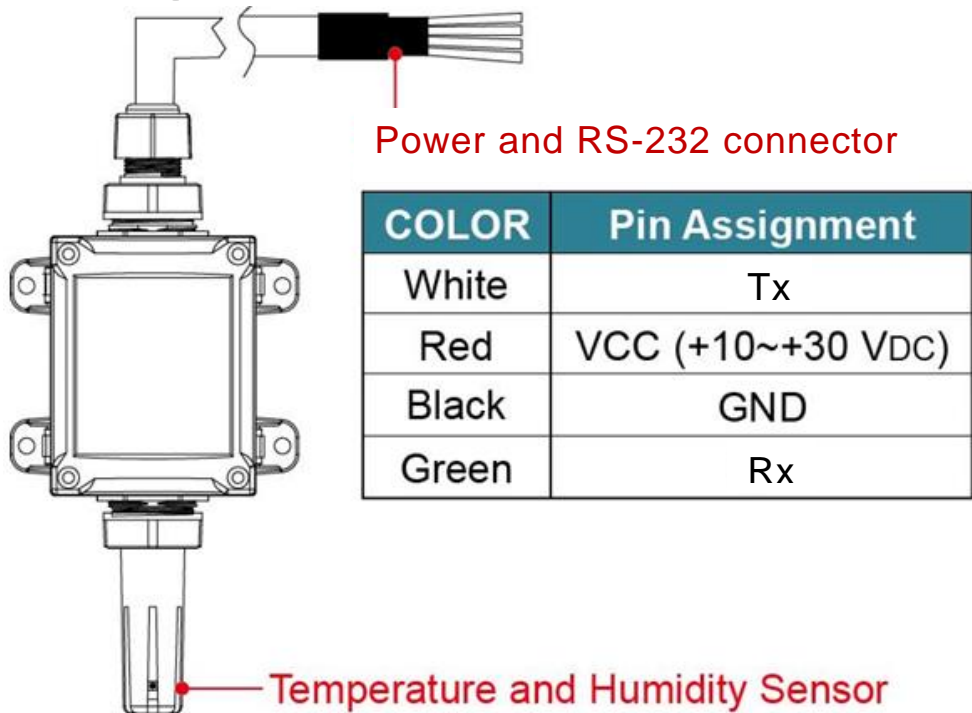
1. Product description

1.1 Introduction

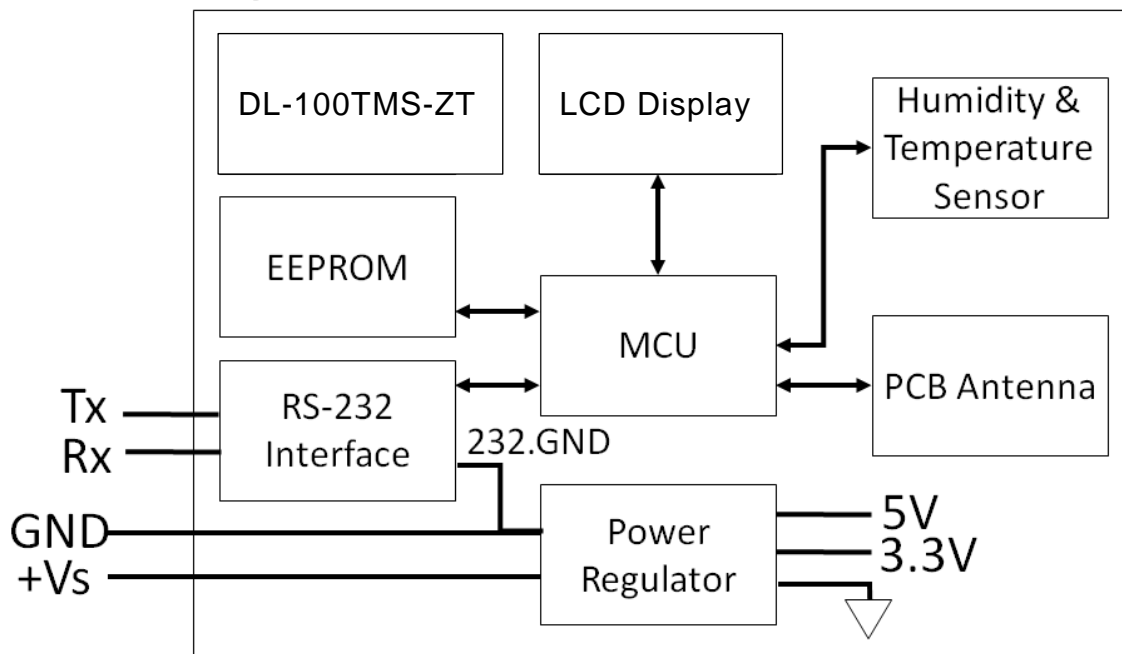
DL-100TMS-ZT is a temperature and humidity logging module that can regularly detect and log temperature and humidity according to the parameters set by the user, and display the temperature, humidity, wireless parameters and other information sequentially on the screen. In addition, this module supports Modbus RTU protocol. Users can refer to the structure below and use SCADA software to send Modbus commands to read back the current temperature and humidity through wireless communication of ZT-2550 or ZT-2570, or use DL-100TMS-ZT Utility through the ZT-2550 to read back the temperature and humidity information logged in the module, and saves it as a CSV file (*.csv) or text file (*.txt).



1.2 Pin Assignments



1.3 Block Diagram



2. Get started

2.1 Software download and module connection

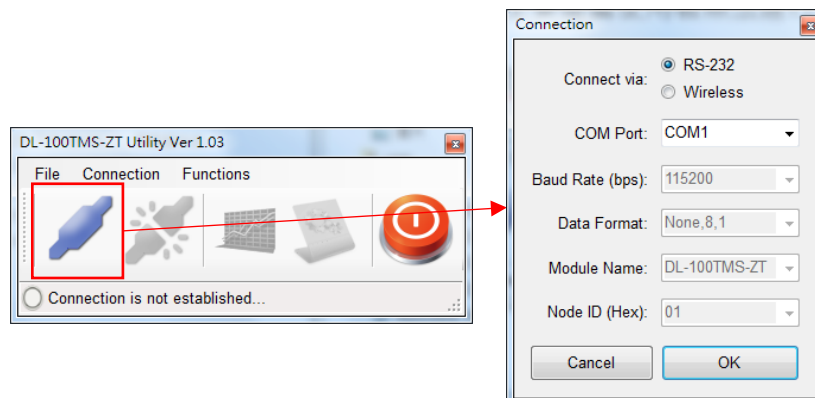
The module supports two communication methods to connect to it, namely RS-232 and ZigBee. Users can use DL-100TMS-ZT Utility to read and write module parameters or read temperature and humidity information through one of the communication methods. Among them, the DL-100TMS-ZT Utility is linked as follows. Users can download and install it first: <https://www.icpdas.com/tw/download/show.php?num=8942&model=DL-100TMS-ZT>

In addition, the connection steps for these two communication methods are as follows:


- RS-232

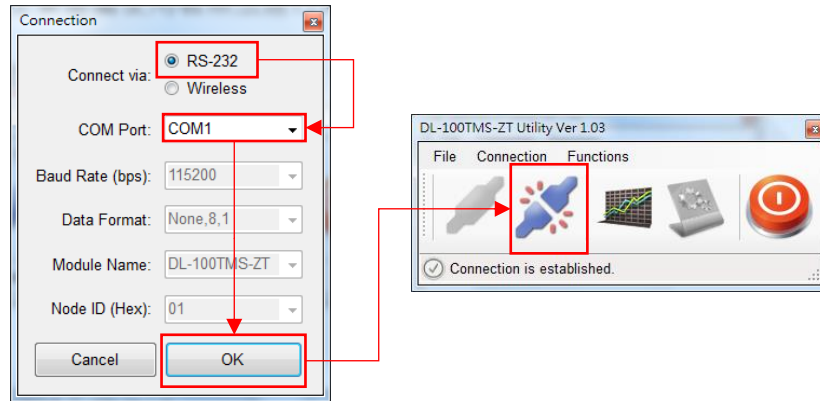
This communication method is mainly used when the user cannot perform wireless communication (for example: the wireless parameters of the module are not sure), so the fixed baud rate 115200, none, 8, 1 and Modbus station number 1 can be used to communicate with the module. Steps as follows:

- Step 1: Connect RS-232 to the TX, RX and GND pins of the module.
- Step 2: After opening the Utility and clicking the Connection button, the “Connection” window will pop up.



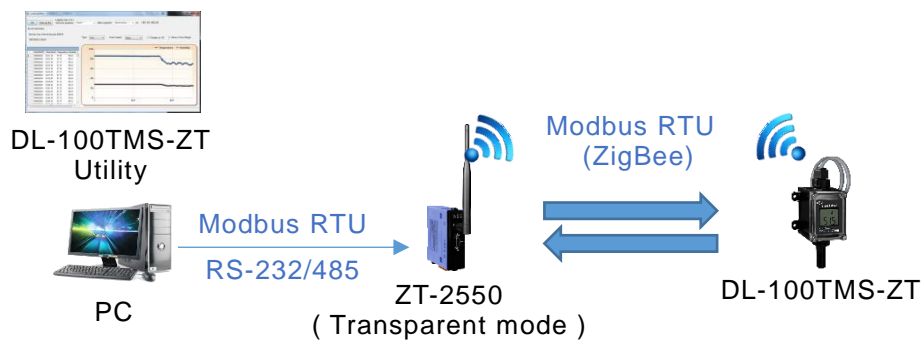
- Step 3: Select RS-232 and the COM Port to be used and click the OK button.

If  appears, the connection is successful. (Note: Each manufacturer may have different definitions of the TX and RX pins of RS-232. If the connection fails, you can try to swap the TX and RX pins and try again)



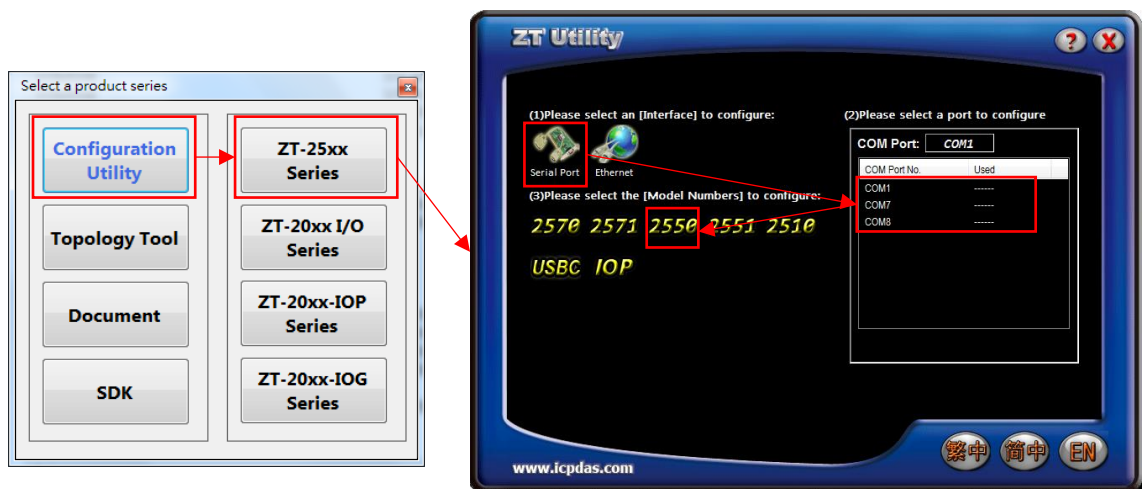
- **Wireless communication**

This communication method is through the relevant parameters of the wireless read-write module, as shown in the structure below. The DL-100TMS-ZT Utility needs to communicate with the DL-100TMS-ZT through the ZT-2550, so the ZT-2550 module needs to be set first, and then use DL-100TMS-ZT Utility to read and write the relevant parameters of DL-100TMS-ZT.

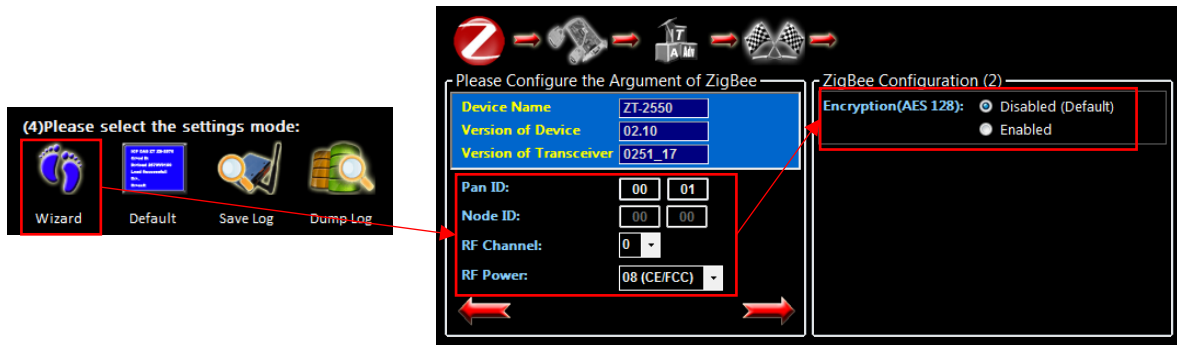


The setting steps for ZT-2550 are as follows:

- Step 1: Download and install "ZT-2000 Configuration Utility" from the link below.
<https://www.icpdas.com/tw/download/show.php?num=6637&model=ZT-2550>
- Step 2: Power off the ZT-2550, turn the dip switch next to the terminal block to ZBSET, and then power on the ZT-2550 again.
- Step 3: Connect RS-232 or RS-485 between the PC and ZT-2550, open the ZT-2000 Configuration Utility on the PC, and select the COM port to communicate.

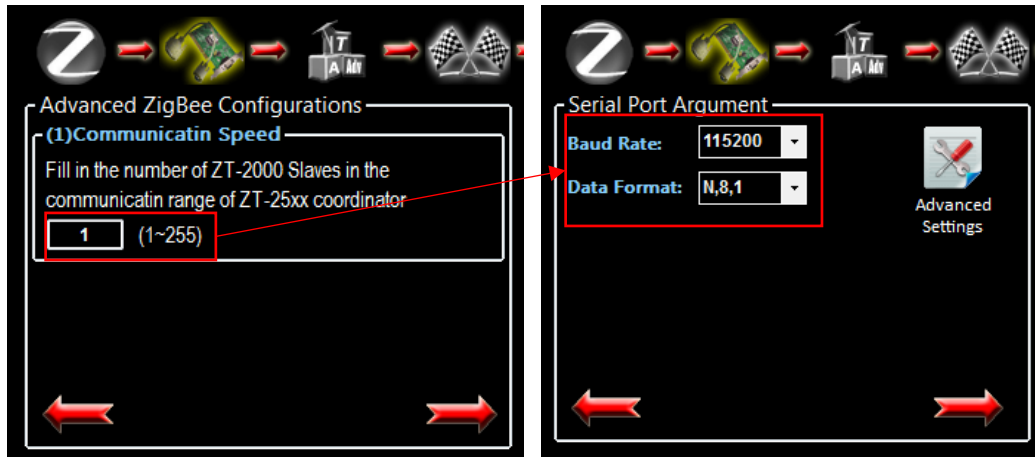


- Step 4: Set the wireless communication parameters of ZT-2550. In addition, the wireless parameter default values of DL-100TMS-ZT are as follows. When using DL-100TMS-ZT for the first time, the Pan ID and RF Channel of ZT-2550 must be the same as DL-100TMS-ZT.

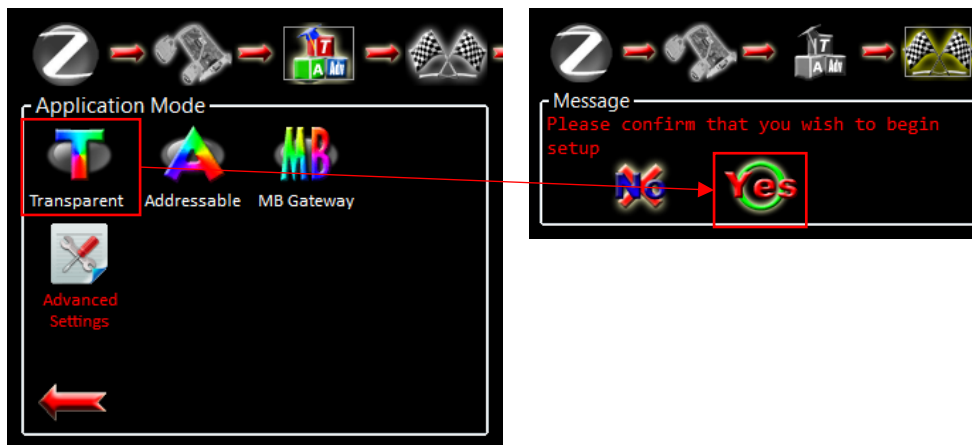


| DL-100TMS-ZT | | |
|-----------------------|---------------|--|
| Parameter name | Default value | Description |
| PAN ID | 0x0001 | The group number of the ZigBee wireless network, the settable range of DL-100TMS-ZT is 0x0000~0x00FF. (Note) The wireless modules need to be set to the same group to communicate. |
| Node ID | 0x0001 | The node number of the ZigBee wireless network cannot be repeated in the same wireless group. In addition, this node number is also the Modbus RTU station number of the module. The settable range of DL-100TMS-ZT is 0x0001~0x00FF. |
| RF Channel | 0x00 | The channel of ZigBee wireless network, the settable range of DL-100TMS-ZT is 0x00~0x0F. In addition, 4 channels including 0x04, 0x09, 0x0E and 0x0F will not overlap with Wi-Fi channels, so they are recommended channels with priority. (Note) The wireless modules need to be set to the same channel to communicate. |
| RF Power | 0x08 | Wireless transmission power, the settable range of DL-100TMS-ZT is 0x00~0x0F. Among them, 0x08 is about 11±1dBm and 0x0F is about 18±1dBm. |
| Encryptions (AES 128) | Disable | Encryption function of wireless packets. (Note) When DL-100TMS-ZT receives the first wireless packet from ZT-2550, it will determine whether the wireless packet is encrypted, and then automatically enable or disable the encryption function of the wireless packet. Therefore, DL-100TMS-ZT does not require additional to set encryption function.. |

- Step 5: Set the relevant parameters of ZT-2550 in RS-232 or RS-485. in addition,
 - Baud Rate: Including 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps and other values, it is recommended to use 115200bps.
 - Data Format: Since DL-100TMS-ZT Utility only supports N, 8, 1, please select N, 8, 1.





- Step 6: Select the communication mode of ZT-2550, please click Transparent.



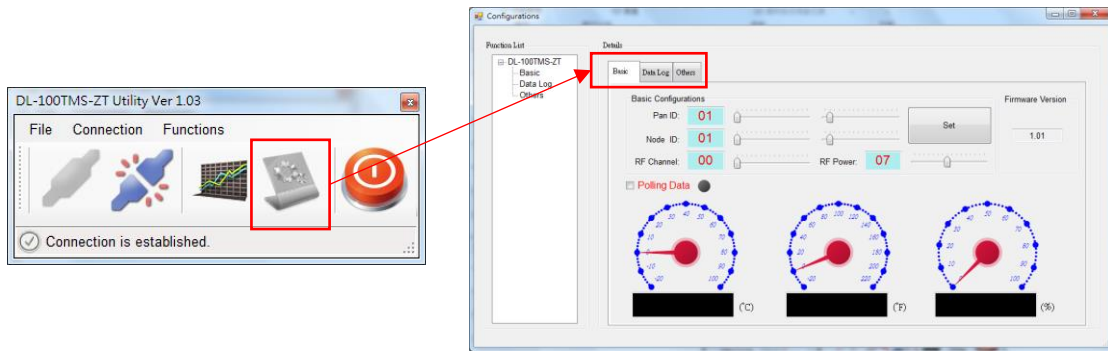
- Step 7: Power off the ZT-2550 and switch the dip switch next to the terminal block to RUN. Then power on the ZT-2550 again and confirm that the ZBNET (LED green light) is always on.

- Step 8: Power on the DL-100TMS-ZT again and confirm the wireless connection symbol on the LCD screen.

| Wireless connection symbol | Description |
|---|---|
|  | <p>There are 4 wireless signal bars in total. As long as 1 signal bar appears, the connection is successful. In addition, the greater the number of signal bars, the better the signal. It is recommended to have at least 2 signal bars when deploying at the site. (Note) Updated every 16 seconds.</p> |
|  | <p>Wireless signal timeout. This symbol indicates that the wireless signal is disconnected.</p> |

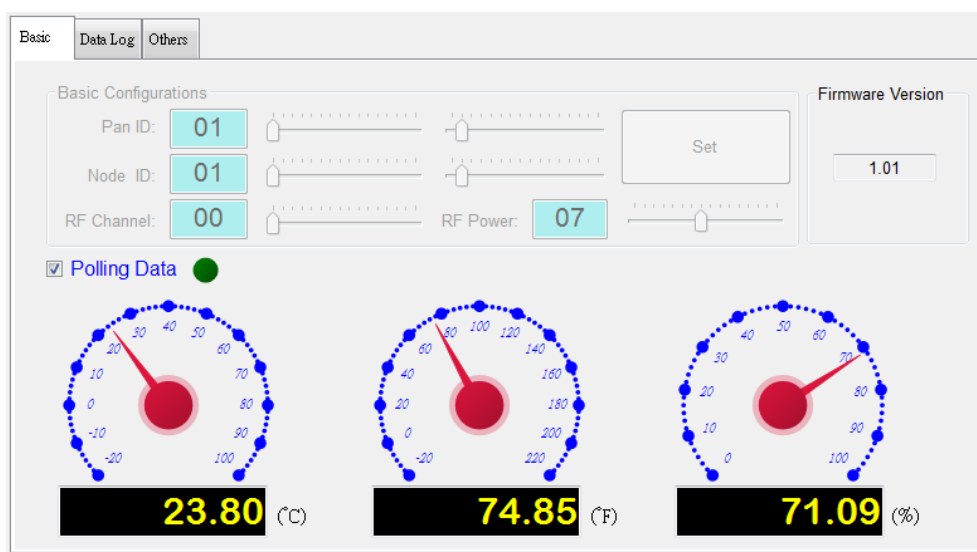
2.2 Module parameter setting

After the DL-100TMS-ZT Utility is successfully connected to the module in Section 3.1, you can click the "Configurations" button to open the "Configuration" window, as shown in the figure below. This window can be divided into three categories: Basic, Data Log and Others. Page tabs are explained in order as follows.



- **Basic tab**

This tab is mainly used to set the wireless communication parameters of DL-100TMS-ZT, as explained below.



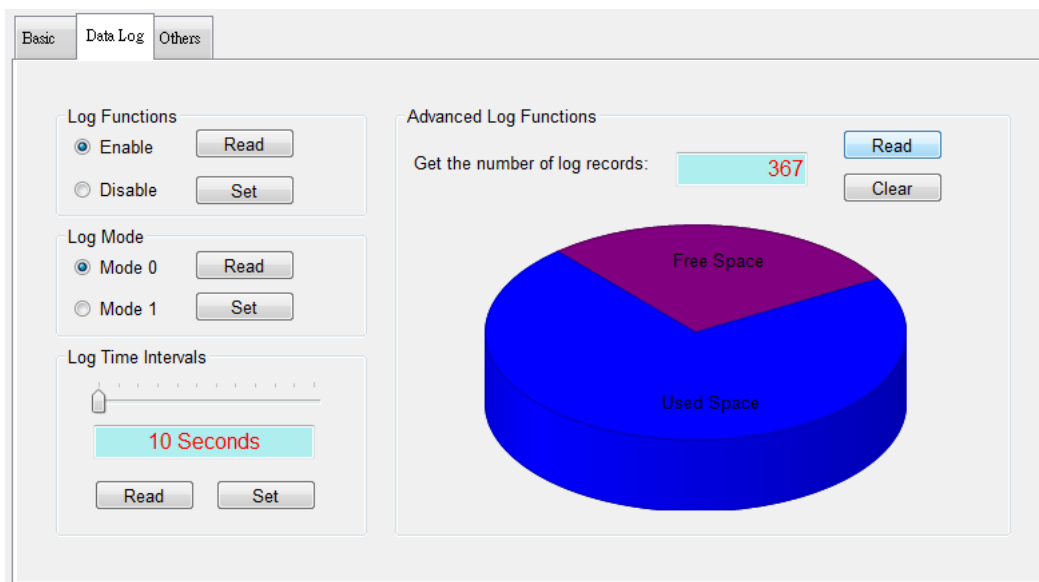
| Parameter name | Description |
|----------------|---|
| PAN ID | The group number of the ZigBee wireless network, the settable range of DL-100TMS-ZT is 0x0000~0x00FF. (Note) The wireless modules need to be set to the same group to communicate. |
| Node ID | The node number of the ZigBee wireless network cannot be repeated in the same wireless group. In addition, this node |

| | |
|---|---|
| | number is also the Modbus RTU station number of the module. The settable range of DL-100TMS-ZT is 0x0001~0x00FF, and the default value is 0x0001. |
| RF Channel | The channel of ZigBee wireless network, the settable range of DL-100TMS-ZT is 0x00~0x0F, and the default value is 0x00. In addition, 4 channels including 0x04, 0x09, 0x0E and 0x0F will not overlap with Wi-Fi channels, so they are recommended channels with priority. (Note) The wireless modules need to be set to the same channel to communicate. |
| RF Power | Wireless transmission power, the settable range of DL-100TMS-ZT is 0x00~0x0F, and the default value is 0x07. Among them, 0x07 is about 11±1dBm and 0x0F is about 18±1dBm. |
| Firmware Version | Firmware version of DL-100TMS-ZT. |
| <input checked="" type="checkbox"/> Polling Data ● | <p>After checking, Utility will send Modbus commands to DL-100TMS-ZT, read back the current temperature and humidity and display it in the figure below.</p> |

In addition, when DL-100TMS-ZT receives the first wireless packet from ZT-2550, it will determine whether the wireless packet is encrypted, and then automatically enable or disable the encryption function of the wireless packet, so there is no need to set additional encryption functions. Among them, if DL-100TMS-ZT receives the first wireless packet from ZT-2550 and finds that the encryption status of the two modules is different, DL-100TMS-ZT will not respond to this wireless packet, but will directly switch encryption status, it will not respond until the next time it receives a wireless packet with the same encryption status.

- Data Log tab

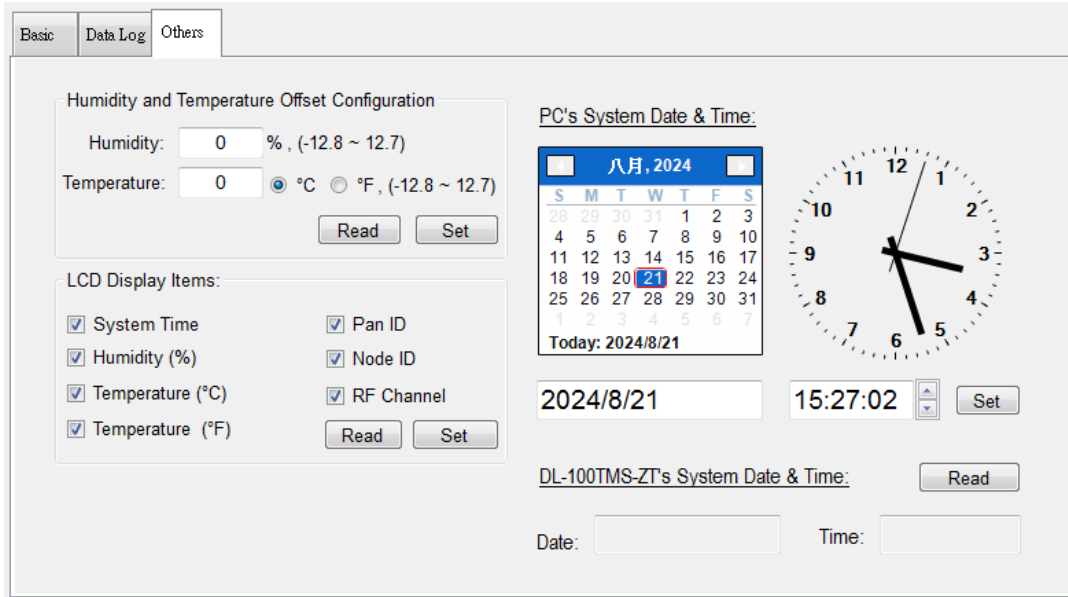
This tab is mainly used to set the data recording parameters of DL-100TMS-ZT, as explained below.










| Parameter name | Description | | | | | | |
|------------------------|---|-------------|-------------|---|--|---|--|
| Log Functions | Whether to enable the logging function, the default value is Disable. In addition, if the module is powered off, the internal time will stop and the logging function will be automatically disabled. Therefore, the logging function needs to be re-enabled after the module is powered on. (Note) Same as Modbus address 00257 in Section 3.2. | | | | | | |
| Log Mode | Logging mode, the default value is Mode 0. (Note) Same as Low byte at Modbus address 365525 in Section 3.2. | | | | | | |
| | <table border="1"> <thead> <tr> <th>Mode</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>In fill mode, data logging will stop when the space is full, and a maximum of 510 records of temperature and humidity can be recorded.</td> </tr> <tr> <td>1</td> <td>Loop mode, automatically overwrites the oldest log when the space is full.</td> </tr> </tbody> </table> | Mode | Description | 0 | In fill mode, data logging will stop when the space is full, and a maximum of 510 records of temperature and humidity can be recorded. | 1 | Loop mode, automatically overwrites the oldest log when the space is full. |
| | Mode | Description | | | | | |
| 0 | In fill mode, data logging will stop when the space is full, and a maximum of 510 records of temperature and humidity can be recorded. | | | | | | |
| 1 | Loop mode, automatically overwrites the oldest log when the space is full. | | | | | | |
| | | | | | | | |
| Log Time Intervals | The logging time intervals include 10 seconds, 20 seconds, 30 seconds, 1 minute, 5 minutes, 10 minutes, 30 minutes, 1 hour, 2 hours, 6 hours, 12 hours and 24 hours. The default value is 10 Second. (Note) Same as Low byte at Modbus address 365526 in Section 3.2. | | | | | | |
| Advanced Log Functions | When the logging mode is fill mode (mode 0), the number of records can be read. (Note) Same as Modbus address 365524 in Section 3.2. | | | | | | |

- Others tab

This tab is mainly used to set other parameters of DL-100TMS-ZT, as explained below.

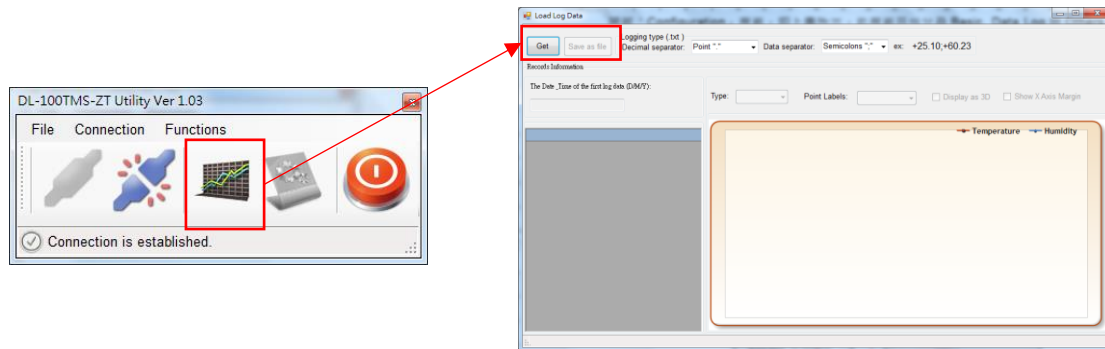


| Parameter name | Description | |
|---|--|--|
| Humidity and Temperature Offset Configuration | Manual offset value of temperature and humidity. Users can use this parameter to compensate the value of temperature and humidity. The unit is 0.1 and the default value is 0. (Note) Same as Modbus address 365527 in Section 3.2. | |
| LCD Display Items | LCD screen display items. After checking and setting items, the screen will display one item in turn every second. (Note) Same as the High byte at Modbus address 365526 in Section 3.2. | |
| | Items | Description |
| | System Time |  This screen indicates that the system time of the module is 15:35. |
| | Humidity (%) |  This screen indicates that the current humidity is 69.0%. |
| Temperature (°C) |  This screen indicates that the current temperature is 23.6°C. | |


| | | | |
|-----------------------------------|---|---|---|
| | Temperature (°F) |  | This screen indicates that the current temperature is 74.5°F. |
| | Pan ID |  | This screen indicates that the Pan ID is 0x34. |
| | Node ID |  | This screen indicates that the Node ID is 0x01. |
| | RF Channel |  | This screen indicates that the RF Channel is 0x0E. |
| PC's System Date & Time | This is the date and time of the PC. Click the "Set" button to write this date and time to DL-100TMS-ZT. (Note) Same as Section 3.2 at Modbus address 365530~365532. | | |
| DL-100TMS-ZT's System Date & Time | Click "Read" to read the current date and time of DL-100TMS-ZT. (Note) Same as Modbus address 365533 in Section 3.2. | | |

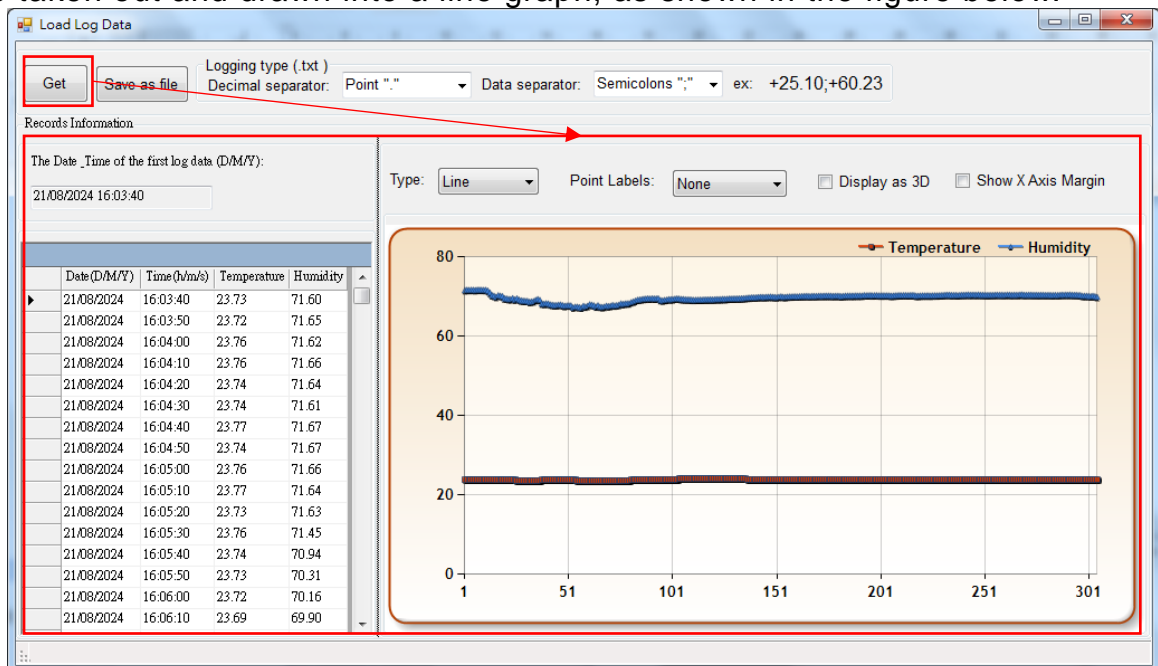
2.3 Logging Data

After the DL-100TMS-ZT Utility is successfully connected to the module in Section 3.1, you can click the "Load log data" button to open the "Load log data window, as shown in the figure below. This window mainly consists of "Get data" and "Save as file" consists of two functions, which are explained in sequence as follows.

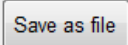


● Get data

After clicking the  button, the temperature and humidity logs in the module can be taken out and drawn into a line graph, as shown in the figure below.



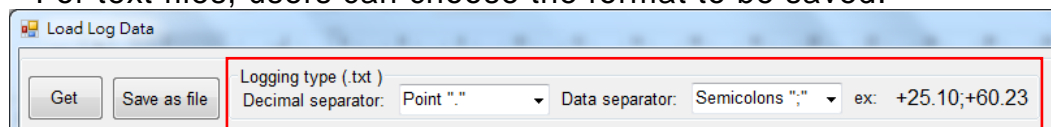
- Save as file

After getting the log, click the  button to save the log as a CSV file (*.csv) or text file (*.txt). The storage format is as follows.

- For CSV files, the decimal point commonly used in the region is a point "." or a comma ",", and different delimiters are automatically selected in the log.

| Format | Decimal point | Separator | Example |
|--------|---------------|---------------|----------------------------------|
| (A) | Point 「.」 | Comma 「,」 | 23/07/2024,09:52:10,+25.16,+63.8 |
| (B) | Comma 「,」 | Semicolon 「;」 | 23/07/2024;09:52:10;+25,16;+63,8 |

- For text files, users can choose the format to be saved.



| Format | Decimal point | Separator | Example |
|--------|---------------|---------------|----------------------------------|
| (A) | Point 「.」 | Space 「 」 | 23/07/2024 09:52:10 +25.16 +63.8 |
| (B) | | Semicolon 「;」 | 23/07/2024;09:52:10;+25.16;+63.8 |
| (C) | Comma 「,」 | Space 「 」 | 23/07/2024 09:52:10 +25,16 +63,8 |
| (D) | | Semicolon 「;」 | 23/07/2024;09:52:10;+25,16;+63,8 |

3. Modbus RTU Protocol

3.1 Format description

The Modbus protocol was originally developed by Modicon Inc. for Modicon controllers. For detailed information, please refer to <http://www.modbus.org> to find more information.

| Byte 0 | Byte 1 | Byte 2~3 | Byte 4~n | Byte n+1~n+2 |
|----------------|---------------|-------------------|-------------------------|--------------|
| Station number | Function code | Reference Address | Data length and content | CRC16 |

| Function code | Description | Address |
|---------------|-------------------------------|---------|
| 0x01 | Read coils | 0xxxx |
| 0x02 | Read discrete inputs | 1xxxx |
| 0x03 | Read multiple registers | 4xxxx |
| 0x04 | Read multiple input registers | 3xxxx |
| 0x05 | Write single coils | 0xxxx |
| 0x06 | Write single registers | 4xxxx |
| 0x0F | Write multiple coils | 0xxxx |
| 0x10 | Write multiple registers | 4xxxx |

If the module receives an illegal message, it will respond with a message in the following format. In addition, if the station number or CRC16 is incorrect, the module will not respond to messages and actions.

| | Byte 0 | Byte 1 | Byte 2 | | Byte 3~4 |
|-------------|----------------|----------------------|----------------|-----------------------|----------|
| Description | Station number | Function code | Exception code | | - |
| Value | 0x01~0xFF | Function code + 0x80 | 0x01 | Illegal function code | CRC16 |
| | | | 0x02 | Illegal address | |
| | | | 0x03 | Illegal data value | |

3.2 Modbus table

| Address (base1) | Address (base0) | Function code | Property | Data type | Description | Remark |
|-----------------|-----------------|------------------|----------|-----------|--|--|
| 00257 | 256 (0x0100) | 01, 02 05, 15 | R/W | Uint8 | Enable or disable logging function. | The default value is 0 0: Disabled. 1: Enabled. |
| 00258 | 257 (0x0101) | 01, 02 05, 15 | R/W | Uint8 | Whether to reset the log index value to 0. (Note) The number of records is at address 365524. | The default value is 0. 0: No. 1: Yes. |
| 10260 | 259 (0x0103) | 01, 02 | R | Uint8 | Has the module been rebooted? | The default value is 1. (Note) The first reading after power-on is fixed as 1, and subsequent readings are fixed as 0. 0: No. 1: Yes. |

| Address (base1) | Address (base0) | Function code | Property | Data type | Description | Remark |
|-----------------|--------------------|---------------|----------|-----------|-----------------------|---|
| 30001 | 0 (0x0000) | 03, 04 | R | Int16 | Humidity, unit %. | The value divided by 100 is the humidity (%). |
| 30002 | 1 (0x0001) | 03, 04 | R | Int16 | Temperature, unit °C. | Divide the value by 100 to get the temperature (°C). |
| 30003 | 2 (0x0002) | 03, 04 | R | Int16 | Temperature, unit °F. | Divide the value by 100 to get the temperature (°F). |
| 30503 | 502 (0x01F6) | 03, 04, 06 | R/W | Uint16 | RF Power value. | The larger the value, the higher the wireless power. The settable range is 0x0000~0x000F, and the new value will be enabled after the module is restarted. Among them, 0x08 is about 11±1dBm and 0x0F is about 18±1dBm. |
| 365521 | 65520 (0xFFFF0) | 03, 04 | R | Uint16 | Firmware version. | [High byte] Major version. [Low byte] Minor version. For example: 0x0102 means v1.02. |
| 365522 | 65521 (0xFFFF1) | 03, 04 | R | Uint16 | Module name. | [High byte] Fixed character D (0x44) [Low byte] Fixed character L (0x4C) |
| 365523 | 65522 (0xFFFF2) | 03, 04 | R | Uint16 | | [High byte] Fixed character Z (0x5A) [Low byte] Fixed character T (0x54) |
| 365524 | 65523 (0xFFFF3) | 03, 04 | R | Uint16 | Log the index value. | The value range is 0~509, with a total of 510 entries. |

| Address (base1) | Address (base0) | Function code | Property | Data type | Description | Remark |
|-----------------|-------------------|-------------------|----------|-----------|--|---|
| 365525 | 65524 (0xFFF4) | 03, 04, 06, 16 | R/W | Uint16 | [High byte] Module station number (same as Node ID). | The value range is 1~255. |
| | | | | | [Low byte] Log Mode. | 0: Fill mode, data logging will stop when the space is full, and a maximum of 510 temperature and humidity logs can be logged. 1: Loop mode, the oldest log is automatically overwritten when the space is full. |
| 365526 | 65525 (0xFFF5) | 03, 04, 06, 16 | R/W | Uint16 | [High byte] LCD display items | The value range is 0x00~0x7F, where bit is 0 means disabled and bit is 1 means enabled. Bit7: Reserved, fixed to 0. Bit6: Display Node ID. Bit5: Display Pan ID. Bit4: Display RF Channel. Bit3: Display system time. Bit2: Display humidity (%). Bit1: Display temperature (°F). Bit0: Display temperature (°C). |

| | | | | | | <p>The value range is 0x00~0x0B.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Interval</th> </tr> </thead> <tbody> <tr> <td>0x00</td> <td>10 seconds</td> </tr> <tr> <td>0x01</td> <td>20 seconds</td> </tr> <tr> <td>0x02</td> <td>30 seconds</td> </tr> <tr> <td>0x03</td> <td>1 minute</td> </tr> <tr> <td>0x04</td> <td>5 minutes</td> </tr> <tr> <td>0x05</td> <td>10 minutes</td> </tr> <tr> <td>0x06</td> <td>30 minutes</td> </tr> <tr> <td>0x07</td> <td>1 hour</td> </tr> <tr> <td>0x08</td> <td>2 hours</td> </tr> <tr> <td>0x09</td> <td>9 hours</td> </tr> <tr> <td>0x0A</td> <td>12 hours</td> </tr> <tr> <td>0x0B</td> <td>24 hours</td> </tr> </tbody> </table> | Value | Interval | 0x00 | 10 seconds | 0x01 | 20 seconds | 0x02 | 30 seconds | 0x03 | 1 minute | 0x04 | 5 minutes | 0x05 | 10 minutes | 0x06 | 30 minutes | 0x07 | 1 hour | 0x08 | 2 hours | 0x09 | 9 hours | 0x0A | 12 hours | 0x0B | 24 hours |
|--------|-------------------|-------------------|-----|-------|---|---|-------|----------|------|------------|------|------------|------|------------|------|----------|------|-----------|------|------------|------|------------|------|--------|------|---------|------|---------|------|----------|------|----------|
| Value | Interval | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x00 | 10 seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x01 | 20 seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x02 | 30 seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x03 | 1 minute | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x04 | 5 minutes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x05 | 10 minutes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x06 | 30 minutes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x07 | 1 hour | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x08 | 2 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x09 | 9 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0A | 12 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0B | 24 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 365527 | 65526 (0xFFF6) | 03, 04, 06, 16 | R/W | Int16 | [High byte] Humidity (%) offset value. | The value range is -12.8% ~ 12.7%, and the unit is 0.1%. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | [Low byte] Temperature (°C) offset value. | The value range is -12.8°C ~ 12.7°C, and the unit is 0.1°C. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 365528 | 65527 (0xFFF7) | 03, 04, 06, 16 | R/W | Word | Pan ID | The value range is 0x0000~0x3FFF. However, since the LCD screen can only display Low byte, it is recommended to use 0x0000~0x00FF. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 365529 | 65528 (0xFFF8) | 03, 04, 06, 16 | R/W | Word | RF Channel | The value range is 0x0000~0x000F. | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Address (base1) | Address (base0) | Function code | Property | Data type | Description | Remark |
|-----------------|--------------------|------------------|----------|-----------|------------------------------------|--|
| 365530 | 65529 (0xFFFF9) | 03, 04 06, 16 | R/W | Word | Base year and month values | [High byte] year [Low byte] month |
| 365531 | 65530 (0xFFFFA) | 03, 04 06, 16 | R/W | Word | Base date and hour value | [High byte] Date [Low byte] hours |
| 365532 | 65531 (0xFFFFB) | 03, 04 06, 16 | R/W | Word | Base minutes and seconds values | [High byte] minutes [Low byte] seconds |
| 365533 | 65522 (0xFFFFC) | 03, 04 | R | Word | Current year and month values | [High byte] Current year [Low byte] Current month |
| 365534 | 65533 (0xFFFFD) | 03, 04 | R | Word | Current date and hour value | [High byte] Current date [Low byte] Current hour |
| 365535 | 65534 (0xFFFFE) | 03, 04 | R | Word | Current minutes and seconds values | [High byte] Current minute [Low byte] Current seconds |

3.3 Example

This section provides examples of the Modbus table as follows:

➤ Read the log function whether is enabled or disabled

| | Transmit / Receive data | Description | |
|----------|-------------------------|--|--------|
| Request | 01 01 01 00 00 01 FC 36 | Using function code 0x01 to read address 256 (0x0100) to confirm whether the logging function is enabled? | |
| | | Station number | 0x01 |
| | | Function code | 0x01 |
| | | Starting address | 0x0100 |
| | | Bit Count | 0x0001 |
| | CRC16 | 0xFC36 | |
| Response | 01 01 01 00 51 88 | The Bit value of the response is 0x00, it means that the logging function has been disabled. (Note) If the Bit value is 0x01, it means the logging function is enabled. | |
| | | Station number | 0x01 |
| | | Function code | 0x01 |
| | | Byte count | 0x01 |
| | | Bit value | 0x00 |
| | CRC16 | 0x5188 | |

➤ Write and enable logging function

| | Transmit / Receive data | Description | |
|----------|-------------------------|---|--------|
| Request | 01 05 01 00 FF 00 8D C6 | Using function code 0x05 to write address 256 (0x0100) to enable the logging function. (Note) If Value is written as 0x0000, it is disabled. | |
| | | Station number | 0x01 |
| | | Function code | 0x05 |
| | | Starting address | 0x0100 |
| | | Value | 0xFF00 |
| | CRC16 | 0x8DC6 | |
| Response | 01 05 01 00 FF 00 8D C6 | The value of the response is same as the command, it means that the writing is successful. | |
| | | Station number | 0x01 |
| | | Function code | 0x05 |
| | | Starting address | 0x0100 |
| | | Value | 0xFF00 |
| | CRC16 | 0x8DC6 | |

➤ Read humidity and temperature

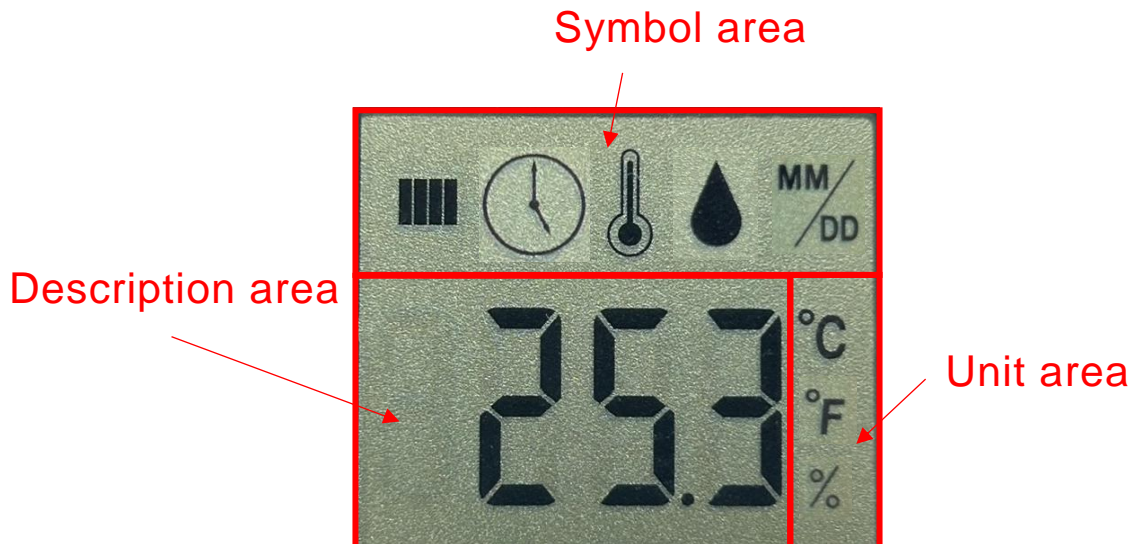
| | Transmit / Receive data | Description | |
|----------|-------------------------------------|--|----------------------|
| Request | 01 04 00 00 00 03 B0 0B | Using function code 0x04 to read address 0~2 (0x0000~0x0002) to confirm the current humidity and temperature. | |
| | | Station number | 0x01 |
| | | Function code | 0x04 |
| | | Starting address | 0x0000 |
| | | Word Count | 0x0003 |
| | CRC16 | 0xB00B | |
| Response | 01 04 06 1B 06 09 BC 1E 06 A0 A2 | The response Values are 6918 (0x1B06), 2492 (0x09BC), and 7686 (0x1E06), it means that the humidity is 69.18%, 24.92°C, and 76.86°F. | |
| | | Station number | 0x01 |
| | | Function code | 0x04 |
| | | Byte count | 0x06 |
| | | Value | 0x1B06、0x09BC、0x1E06 |
| | CRC16 | 0xA0A2 | |






➤ Write and modify LCD display items and logged time intervals










| | Transmit / Receive data | Description | |
|----------|-------------------------|---|--------|
| Request | 01 06 FF F5 75 03 CF 7D | Using function code 0x06 to write to address 65525 (0xFFF5) to modify the LCD display item and the logging time interval. | |
| | | Station number | 0x01 |
| | | Function code | 0x06 |
| | | Starting address | 0xFFF5 |
| | | Value | 0x7503 |
| | CRC16 | 0xCF7D | |
| Response | 01 06 FF F5 75 03 CF 7D | The value of the response is same as the command, it means that the writing is successful. Among them, 0x75 means that the LCD displays temperature (°C), humidity (%), RF Channel, Pan ID and Node ID. In addition, 0x03 means that the logging time interval is 1 minute. | |
| | | Station number | 0x01 |
| | | Function code | 0x06 |
| | | Starting address | 0xFFF5 |
| | | Value | 0x7503 |
| | CRC16 | 0xCF7D | |

4. LCD screen information

LCD screen information can be divided into three areas, namely the symbol area, description area and unit area, as described below.



| Area | Symbol | Description |
|-------------|---|---|
| Symbol area |  | There are 4 wireless signal bars in total. As long as 1 signal bar appears, the connection is successful. In addition, the greater the number of signal bars, the better the signal. It is recommended to have at least 2 signal bars when deploying at the site. (Note) Updated every 16 seconds. ° |
| |  | Wireless signal timeout. This symbol means that the wireless signal is disconnected. |
| |  | The temperature symbol means that the value displayed in the description area is temperature. |
| |  | The humidity symbol means that the value displayed in the description area is humidity. |
| |  | The date symbol means that the value in the description area is the current module time. |

| | | |
|------------------|---|---|
| Description area |  | Numeric type, means the value of temperature or humidity. |
| |  | Time type, means the current module time. |
| |  | Pan ID, means Pan ID is 0x34. |
| |  | Node ID, means Node ID is 0x01. |
| |  | RF Channel, means RF Channel is 0x0E. |
| |  | Serr, "Sensor Error" means that the internal temperature and humidity sensor is abnormal. |
| Unit area |  | The Celsius symbol means that the value displayed in the description area is temperature (°C). |
| |  | The Fahrenheit symbol means that the value displayed in the description area is temperature (°F). |
| |  | The percentage symbol means that the value displayed in the description area is humidity (%). |