RADIONODE®

Wi-Fi Sensor Data Transmitter

RN172WCD User Manual

2024 | Rev. 1.01

Keep this document nearby so that it may be referred to when needed.

CONTENTS

About this Manual

This document contains instructions for usage and installation of the RADIONODE® RN172WC. Product specifications and certain features herein may be subject to change without prior notice. Figures used in this manual are for explanatory purposes only, and may differ from your system depending on installation conditions. Screen image may change after software updates.

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Notation Guide

If the instructions given with “Warning” are not followed, the user may suffer minor injuries.

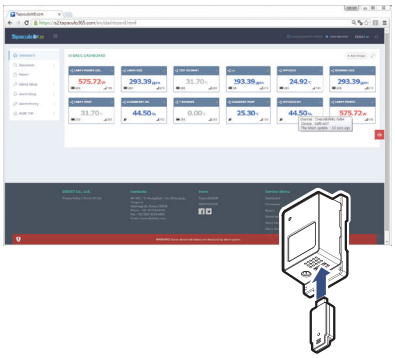
If the instructions given with “Caution” are not followed, the equipment may be damaged or malfunction.

Additional useful information is provided with “Note.”

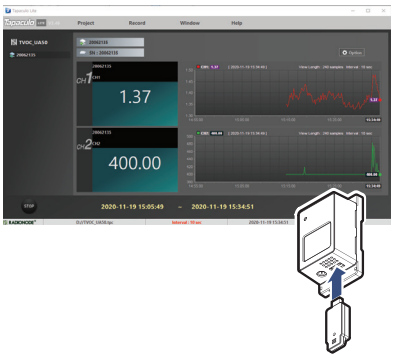
Introduction

The RN172WC is a data transmitter for UA series sensors, transmitting the measured values of the sensors to the Radionode365 server or the Tapaculo Lite program via the network.

Radionode365



Tapaculo® Lite

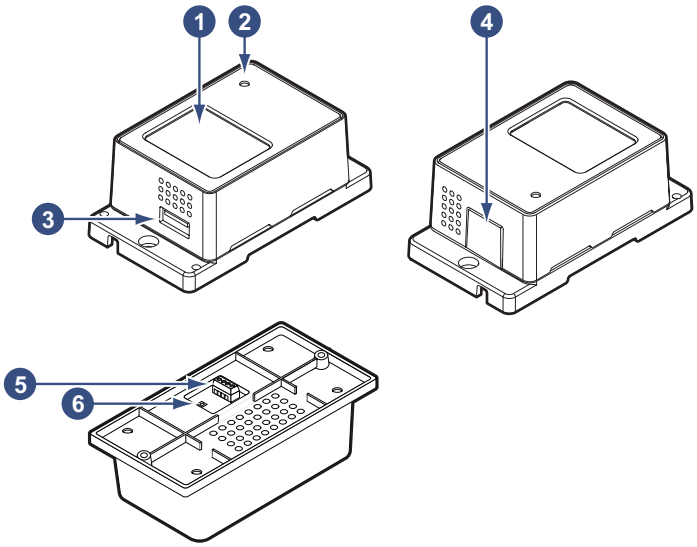


feature

The main features of the RN172WC are as follows:

- Compatible with various UA sensors.
- Transmits measured values to Radionode365 or the customer's server via the internet. Refer to page 18 for Radionode365.
- Sends measured values to a computer with Tapaculo Lite installed via a local network. Refer to page 25 for Tapaculo Lite.
- Allows device access via Telnet.
- Supports reading measured values using MODBUS communication for devices like PLCs.
- Supports Wi-Fi connectivity.

Exterior



1. Display
2. Indicator Light
3. USB Port
4. Built-in Wi-Fi Antenna
5. 12V Power Connector
6. Rear Reset Button

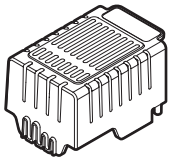
Compatible UA Sensors

The following UA sensors can be used with the RN172WC:

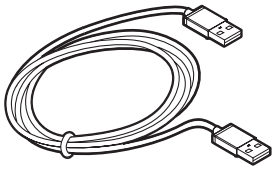
UA10	Temperature, Humidity
UA11-K	Temperature (Type K Thermocouple)
UA11-T	Temperature (Type T Thermocouple)
UA13	Temperature (PT100)
UA20A	4 ~20 mA
UA20B	0 ~20 mA
UA20C	0 ~1 V
UA50	TVOC
UA52-O2-25-F	Oxygen (O2), Atmospheric Pressure
UA52-CO2-20	Carbon Dioxide (CO2)
UA53-CO-1000	Carbon Monoxide (CO)
UA53-NO2-50	Nitrogen Dioxide (NO2)
UA53-SO2-50	Sulfur Dioxide (SO2)
UA54-NH3-100	Ammonia (NH3)
UA54-H2S-50	Hydrogen Sulfide (H2S)
UA54-HCL-20	Hydrogen Chloride (HCl)
UA54-EO-10	Ethylene Oxide (C2H4O)
UA54-C2H4	Ethylene (C2H4)
UA54-H2-4	Hydrogen (H2)
UA54-O2-21	Oxygen (O2)
UA59	Dioxide (CO2)

Accessories

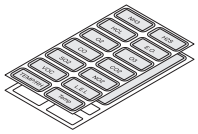
다음과 같은 액세서리들이 제품과 함께 제공됩니다.



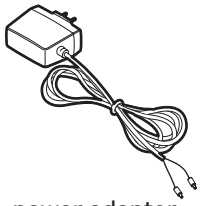
UA Sensor
Protective Cover



USB Cable



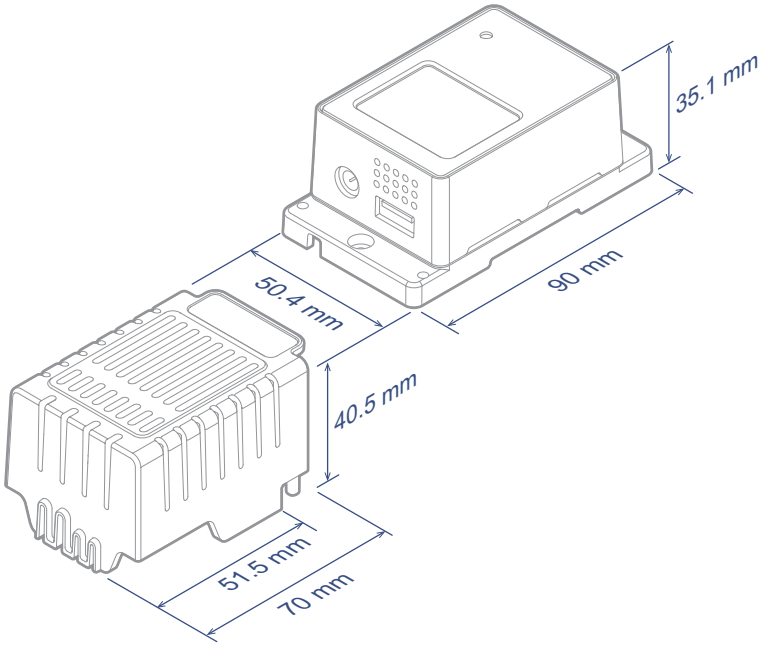
Sensor
Identification
Stickers



power adapter

※ This product can only be used in a Wi-Fi environment.

Specification

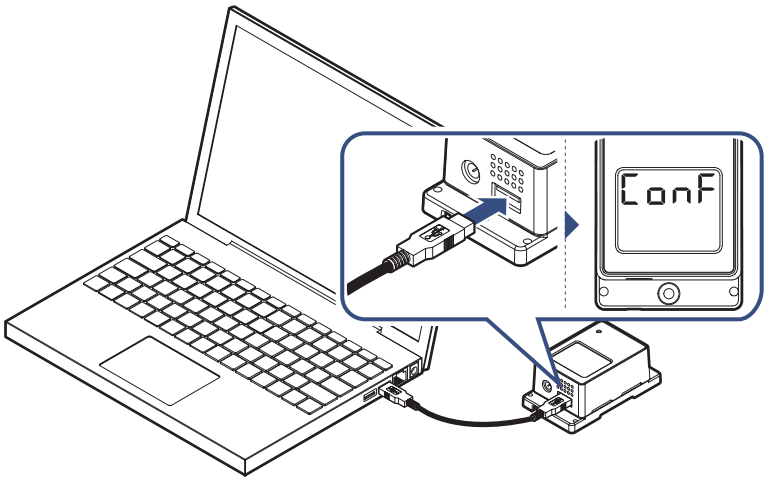


Product Name	RN172 plus
Model Name	RN172WCD
Wi-Fi	IEEE 802.11 b/g
MODBUS Port	502
HTTP Port	80
USB	2.0
Power Supply	DC 6 ~ 24V
Power Consumption	1.4 W
Dimensions	Width 50.4 x Length 90.4 x Height 35.1 mm Dimensions when combined with the Sensor Protective Cover: Width 50.4 x Length 141.9 x Height 40.5 mm

Configuration

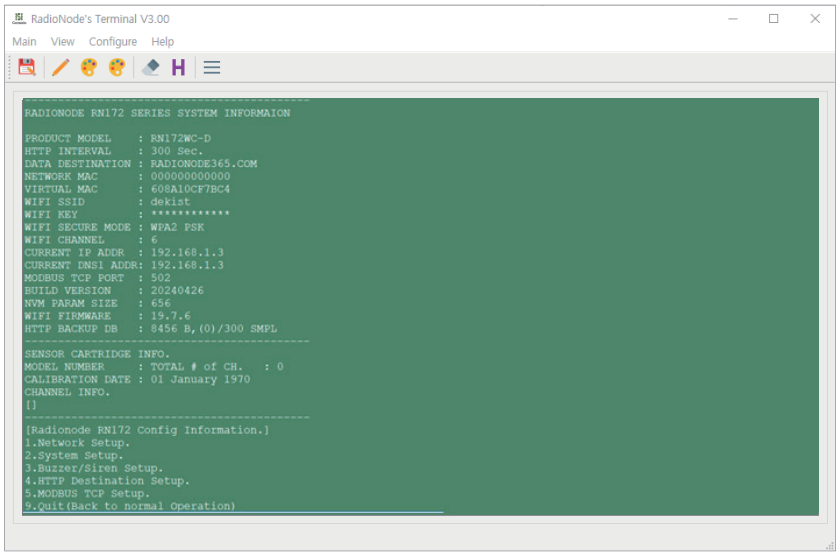
Before installation, connect the RN172WC to your computer and use Radionode's Terminal program to change the settings.

Download and install Radionode's Terminal from the Radionode website (https://en.radionode365.com).



Connect the RN172WC to your computer using the USB cable without connecting the power supply ConF will be displayed on the screen.

Run the Radionode Terminal. If the background color of the screen is turquoise, the device is recognized correctly. Enter "radionode114." Device information and five menu options will be displayed.




```
1.Network Setup.
2.System Setup.
3.Buzzer/Siren Setup.
4.HTTP Destination Setup.
5.MODBUS TCP Setup.
```

Enter the number to select a menu.

Network

To set up the network for the device, select 1. Network Setup. The current settings and options will appear. To return to the main menu, enter “q”.

```
[ 1 .NETWORK SETUP MENU . ]
A.Set DHCP [ON]
```

To use a static IP address, select “OFF” and configure the following options:

```
B.Set IP Address [xxx.xxx.xxx.xxx]
```

Enter the IP address assigned to the RN172WC.

```
C.Set GATEWAY Address [192.168.xxx.xxx]
```

Enter the IP address of the gateway.

```
D.Set DNS1 Address [xxx.xxx.xxx.xxx]
```

Enter the IP address of the primary DNS server.

```
E.Set DNS2 Address [xxx.xxx.xxx.xxx]
```

Enter the IP address of the secondary DNS server.

```
F.Set SUBNET MASK [255.255.255.000]
```

Enter the subnet mask.

```
G.Set VMAC [xxxxxxxxxxxx]
```

Enter the address to be used as the virtual MAC address.

```
H.Set UDP Broadcasting Port [50000]
```

Specify the port number for UDP broadcast.

```
I.Set TELNET Port [23]
```

Specify the port number for Telnet access.

```
J.Set WIFI SSID [ dekist ]
```

Select the SSID of the Wi-Fi AP.

```
K.Set WIFI PASSWORD [ radionode114 ]
```

Enter the password of the Wi-Fi AP.

```
L.Set WIFI SECURITY MODE [ WPA2 PSK ]
```

Select the security settings of the Wi-Fi AP.

```
S. Scan WIFI AP
```

Search for the SSID of the Wi-Fi you want to connect to.

```
Q.Quit.
```

Return to the previous menu.

System

To change the system settings of the device, select **2.System Setup**

```
[ 2 .SYSTEM SETUP MENU . ]
```

A.Set Device Name [DEVICE-xxxxxxxxxxxx]

Set the device name. The name is used for broadcasting when searching for the device.

B.Set Destination of HTTP [RADIONODE365]

To send measurement data to the Radionode365 server, select RADIONODE365.

For sending data to customer or third-party servers using the POST method, select 2: CUSTOMER_V2. To reduce data transmission volume, select 4: CUSTOMER_V2BIN. Then, go to 4. HTTP Destination Setup to change the server options. Refer to page 12 for customer server setup.

C.Set HTTP Update Interval [300 Sec.]

Set the data transmission interval in minutes. The input value will be converted to seconds. If using Radionode365, you can set it from 1 minute to 60 minutes; if using a customer server, you can set it from 5 seconds to 600 seconds.

D.Set Operation Mode [PERIODIC]

0 : PERIODIC : Continuously display values on the screen.

1 : EVENT : Send data and display values on the screen whenever an event occurs on the UA sensor.

E.Reset Holding Samples [0 smp1]

Display and clear the data stored on the device.

F.Use DNS (1 : YES, 0 : NO) [1]

YES : Use DNS to convert the domain name to an IP address for connection attempts.

NO : Do not use DNS and directly enter the IP address to connect to a specific server.

G.Set FND Display Brightness [Low]

Adjust the brightness of the device display. Brightness adjustment options are [0: Max, 1: High, 2: Medium, 3: Low, 4: OFF].

H.Set Debug Print [OFF]

A function used by service engineers to enable or disable the debug function.

I.Set Factory Default

Reset the device to factory default settings.

Q.Quit.

Return to the previous menu.

Alarm

To set the alarm conditions, select `3.Buzzer/Siren Setup`

`[ 3. BUZZER&SIREN SETUP MENU ]`

`A.Set Alarm Trigger Mode [ UA Default Setting ]`

0. NO ALARM : Disable the alarm function.

1. CH1 : Set the alarm to trigger based on the deviation of channel 1.

2. CH2 : Set the alarm to trigger based on the deviation of channel 2.

3. CH1 AND CH2 : Set the alarm to trigger when both channel 1 and channel 2 deviate simultaneously.

4. CH1 OR CH2 : Set the alarm to trigger when either channel 1 or channel 2 deviates.

5. CH1 : 4-RO(MANUAL) : Use the 4-RO (manual setting) mode for channel 1.

6. UA Default Setting : Automatically set the alarm values according to the default settings of the UA product.

`B.Set Alarm CH1 [ ] Normal [0.00~0.00]`

Enter the minimum and maximum normal range values for channel 1.

`C.Set Alarm CH2 [ ] Normal [0.00~0.00]`

Enter the minimum and maximum normal range values for channel 2.

`D.Set Alarm CH3 [ ] Normal [0.00~0.00]`

Enter the minimum and maximum normal range values for channel 3.

`E.Set Alarm CH4 [ ] Normal [0.00~0.00]`

Enter the minimum and maximum normal range values for channel 4.

`F.Set BUZZER Alert Enable [ SOUND1 ON ]`

Choose whether to use the built-in buzzer.

`G.Set Remote SIREN DEVICES Enable [ OFF ]`
`(QLIGHT MODEL : ST56EL-ETNS-2-WS)`

If a remote beacon light is installed, choose whether to use the beacon light.

Qlight's ST56EL-ETNS-2-WS beacon light is supported.

`H.Set Remote SIREN DEVICE1 IP [ xxx.xxx.xxx.xxx ]`

Enter the IP address for the ST56EL - ETNS - 2 - WS beacon light 1.

`I.Set Remote SIREN DEVICE (1, 2, 3) Port [ 2000 ]`

Enter the port used by the ST56EL - ETNS - 2 - WS beacon light.

`J.Set Remote SIREN DEVICE2 IP [ 0 ]`

Enter the IP address for the ST56EL - ETNS - 2 - WS beacon light 2.

`K.Set Remote SIREN DEVICE3 IP [ 0 ]`

Enter the IP address for the ST56EL - ETNS - 2 - WS beacon light 3.

`Q.Quit.`

Return to the previous menu.

Customer Server

To configure a customer or third-party server, select **4.HTTP Destination Setup**

```
[ 4. HTTP DESTINATION SETUP MENU ]
```

A.Set HTTP Host URL [xxx.xxxx.xxx.xxx]

Enter the IP address or domain of the server.

B.Set HTTP Host Port [80]

Enter the port used by the server.

C.Set HTTP NMAC [xxxx0000xxxx0000]

Enter the MAC address of the server, appending "0000" at the end.

> The MAC address is originally 12 digits, but for compatibility with Zigbee devices that use a 16-digit MAC address, append "0000" to the MAC address. This setting is generally not required.

D.Set HTTP DATAIN|DATAIN File(Get) [/xxxx.php]

Enter the URL of the server program that handles the Data In request. Entering "0" will disable this request function.

E.Set HTTP TIMESTAMP|CHECKIN File(Get) [/xxx.php]

If using POST method HTTP requests, enter the URL of the server program that handles the Checkin request. Entering "0" will disable this request function.

F.Set HTTP BACKUPIN|(NONE) File(Get) [/0]

If using POST method HTTP requests, enter "0" to disable this function.

G.Test HTTP Checkin

Attempt to send a Checkin request to the server's IP address or domain.

H.Test HTTP Datain.

Attempt to send a Datain request to the server's IP address or domain.

I.Enable Recovery for HTTP [1]

For CUSTOMER V1, this is the transmission I/F for recovery. In V2, Datain supports both functions, so it is not used.

Q.Quit

Return to the previous menu.

For detailed instructions, refer to page 35, HTTP Radionode Protocol V2

MODBUS

MODBUS TCP communication is supported for integration with PLCs. To change the system settings of the device, select, `5.MODBUS TCP Setup`

```
[ 5. MODBUS TCP SETUP MENU ]
A.Set MODBUS TCP PORT [502]
```

Enter the port number to be used for MODBUS communication. Typically, 502 is used.

```
B.Set ByteReverse [ 1 ] (1:reversed, 0 : None )
```

Choose whether to reverse the byte order. (Check if your PLC uses reverse byte order.)

```
C.Set Timeout to Keep a live [ 60 ] Sec
```

Specify the timeout period for disconnecting the communication.

```
Q.Quit
```

Return to the previous menu.

Connecting to Wi-Fi

Follow the steps below to attempt a Wi-Fi connection.

Refer to page 8 for connecting the device to the PC: Settings → Network.

1. DHCP (ON) : Dynamic IP

① Enter “1” and press Enter to access Network Setup.

② Enter “m” and press Enter to scan for WiFi APs.

③ Enter the corresponding number of the SSID you want to connect to and press Enter.

④ Enter the password and press Enter.

2. DHCP (OFF) : Static IP

① Enter “1” and press Enter to access Network Setup.

② Enter “a” and press Enter to change Set DHCP to OFF.

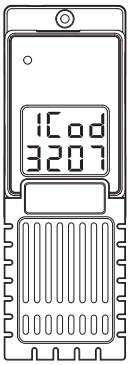
③ In Enter DHCP [0: OFF, 1: ON], enter “0” and press Enter to set DHCP to OFF.

④ Accurately enter the “B. Set IP Address,” “C. Set GATEWAY Address,” “D. Set DNS1 Address,” “E. Set DNS2 Address,” and “F. Set SUBNET MASK” as assigned by your internal network administrator.

⑤ Enter “m” and press Enter to scan for WiFi APs.

⑥ Enter the corresponding number of the SSID you want to connect to and press Enter.

⑦ Enter the password and press Enter.

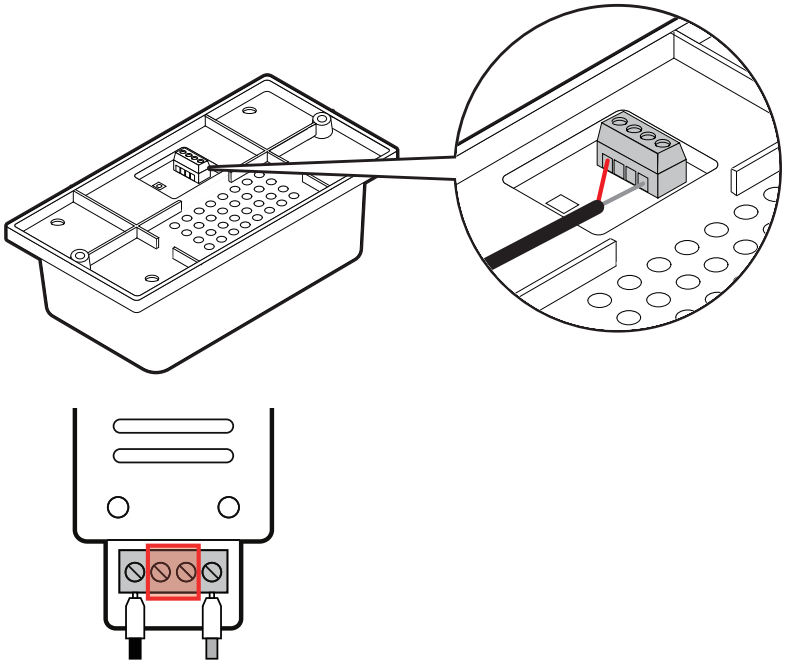


⑧ After completing the Wi-Fi setup, connect the UA product and the DC power adapter.When the ICODE screen appears, the device is successfully connected to the Wi-Fi. Now, it will start sending data to Radionode365

Installation

Connecting UA Sensors

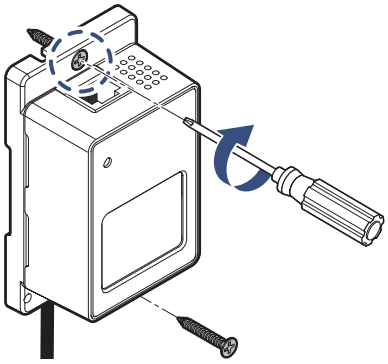
Connect the power adapter to the power jack.



※ The two ports in the center are not used by the user.

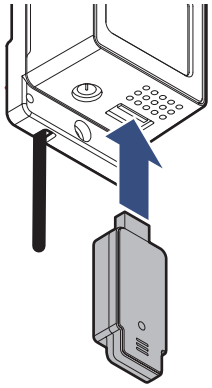
Connecting Power

Use two screws to secure the main unit to the wall.



Connecting UA Sensors

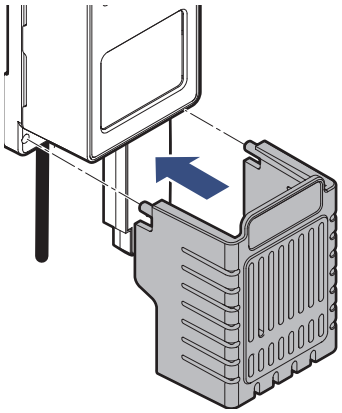
Insert the UA sensor into the USB port.



Connecting Power

The sensor protective cover has two protrusions on the top, and there are two holes on the bottom of the main unit.

Place the sensor protective cover over the UA sensor so that the two protrusions fit into the two holes.



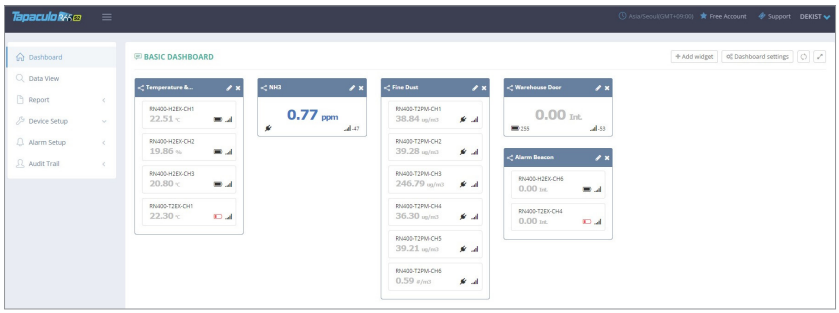
Display

The display shows measurements and the status of the device.

19.20 42.10	Channel 1 measurement appears at the top of the display and Channel 2 measurement appears at the bottom.
-000 -042	When the device is turned on, the last six digits of the assigned IP address will appear. For example, if the IP address is 192.168.0.42, it will appear according to the left image.
---- ----	Indicates that no sensor is inserted in the device.
oooo	If the oooo appears to be vibrating it indicates that data transfer to the server has failed.
HOLd 0005	This indicates the number of data sets waiting when data transfer fails (after oooo appears).
0000	This indicates that re-transfer of a data set was successful.
[onn FA iL	This indicates that the device has failed to connect to the Internet.
[onF	This indicates that the device is connected to the computer via a USB cable.
[HEt USb	The device checks UA sensor recognition when it powers on.
USb rEd4	This indicates that the UA sensor has been successfully connected.
USb nOnE	This indicates that the UA sensor connection has failed.
iCod 3207	When using Radionode365 cloud, a 4-digit number code is displayed on the screen for easy device registration.

Radionode 365

Radionode365 is a cloud-based sensor monitoring web application operated by DEKIST, a radionode manufacturer. We offer data storage for all sensor-measured data, and provide various features such as emergency alarms, reports, and real-time status based on stored data.



This chapter outlines how to add new devices and channels to Radionode365. For more information on Radionode365, see the information provided on the web page below:

https://help.radionode365.com/article-categories/tp365-manual

Key features of Radionode365 include:

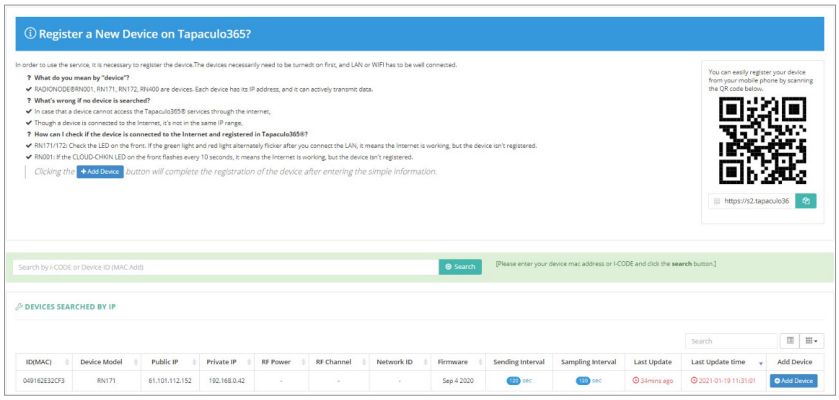
- Measurement data displayed in real-time;
- View measurement data records via charts;
- Create and email periodic reports;
- Alarms notifications sent via e-mail, text, or voice message in the event of an alarm.

Create a user account at the address below to access Radionode365.

`https://s2.radionode365.com/html/createaccount.html`

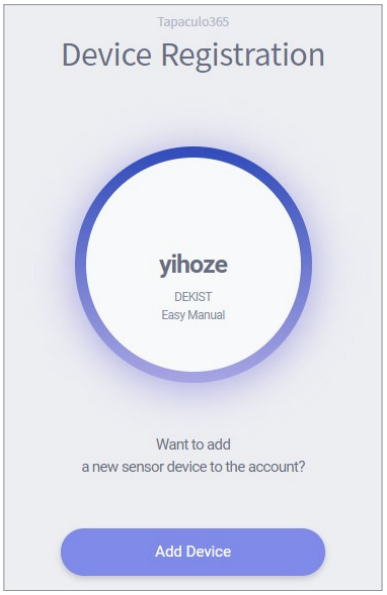
Adding Devices from Your Smartphone

At the **New Device** page, you will find a unique QR code for your account. The QR code allows you to easily add devices and channels to your smartphone.



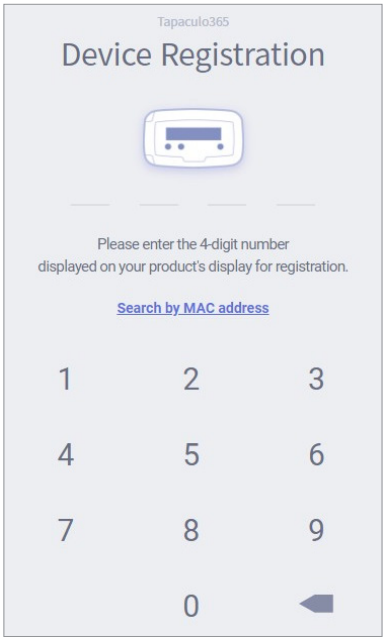
Scan the QR code with your smartphone. Alternatively, copy the link address from the QR code image and send it to your smartphone.

1. Your smartphone's default web browser will open with your user information. Tap **Add Device**.



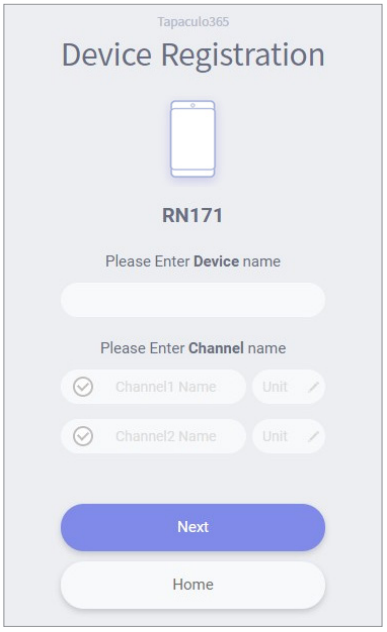
When RN17xWC Series first connects to Radionode365, the following identification code (i-code) will appear:

2. Enter the i-code on the device display. If you do not see an i-code on the display, tap **Search by MAC address** and enter your MAC address.



3. If the i-code or MAC address is accurate, the device information will appear as below. Tap **Next**.

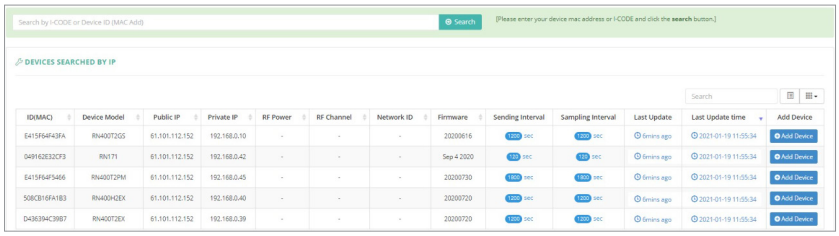
4. Enter your device name, check the box of the channel that will be used, then enter the channel name and unit that will be used. Tap **Next** to finish.



Adding Devices from Your Computer

Adding Devices

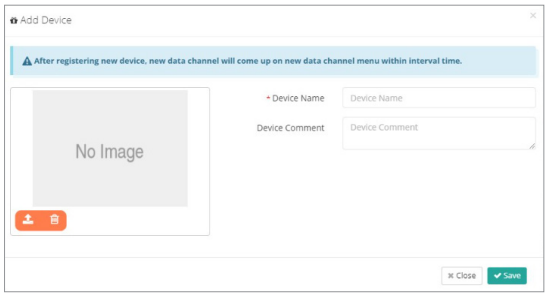
The **New Device** page will appear if there is no added device on login. To add a device that was added later, click **Device Setup** > **New Device**.



Devices found in the same IP band are listed here. If you do not see your device in the list, you can add it using its i-code. When RN17xWC Series first connects to Radionode365, its i-code is displayed as follows:

Enter the i-code above the device list and click **Search**. Devices can also be searched via MAC address instead of their i-code. The device will be then be added to the list.

To add your device, click the **Add Device** button in the last column.

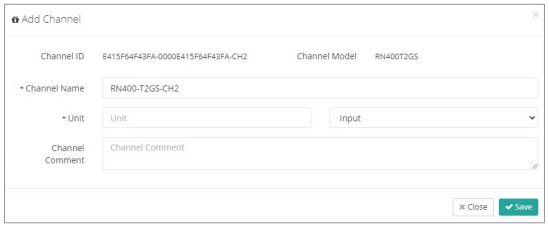


Enter your device name in the window that appears, upload a picture of the installed device, then click **Save**.

Adding Channels

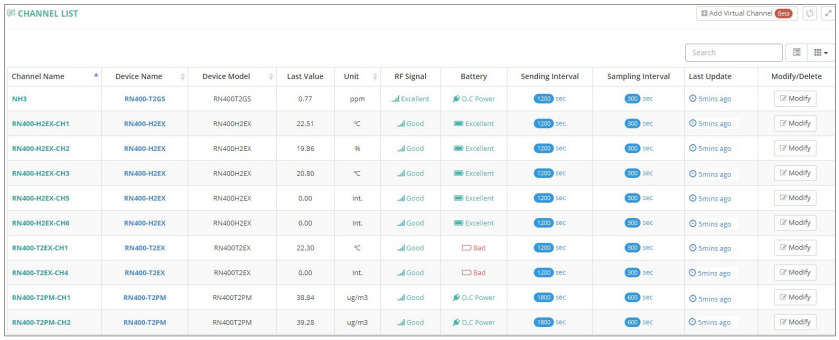
Once your device has been added, click **Device Setup** > **New Data Channel**. All added device channels will be listed.

This list also includes channels not associated with external sensors or other devices. Adding a channel essentially means selecting a channel to monitor. To add a channel, click the **Add Channel** button in the last column.



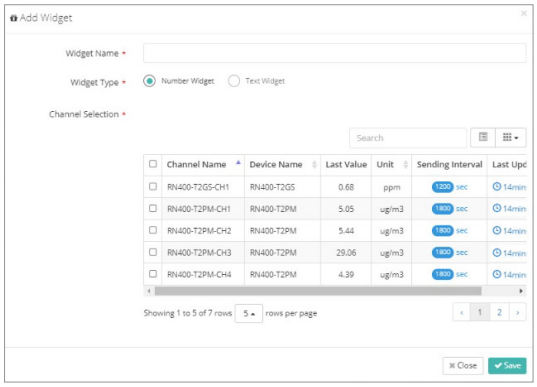
Enter the channel name in the window, select/enter a unit to use, then click **Save**.

To view the list of added channels, click **Device Setup** > **Channel List**.



Adding Widgets

A widget contains one or several channels. You can add a widget to the dashboard by clicking **Dashboard**, then **Add widget**.



Enter the widget name in the window, select channels, then click **Save**.

Tapaculo Lite

This chapter outlines how to use Tapaculo Lite. For more information on Tapaculo Lite, see the information provided on the web page below:

`https://help.radionode365.com/article-categories/tapaculo-lite`

Installing Software

To view sensor measurements on your computer, download and install the following software package from the Radionode website at www.radionode365.com.

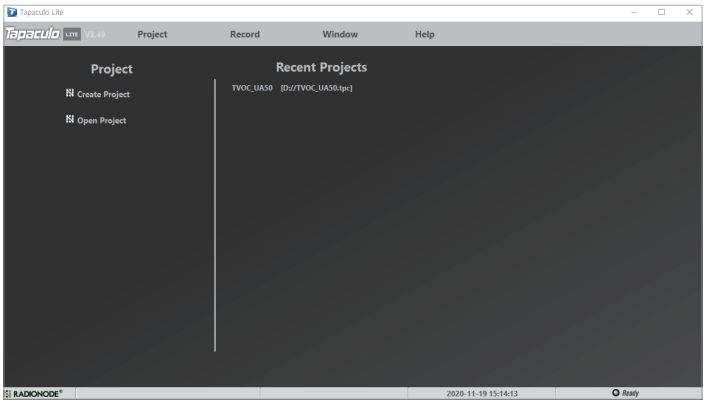
- Tapaculo Lite program (Windows or Mac version)
- USB drivers for Windows for UA products

Starting Tapaculo Lite

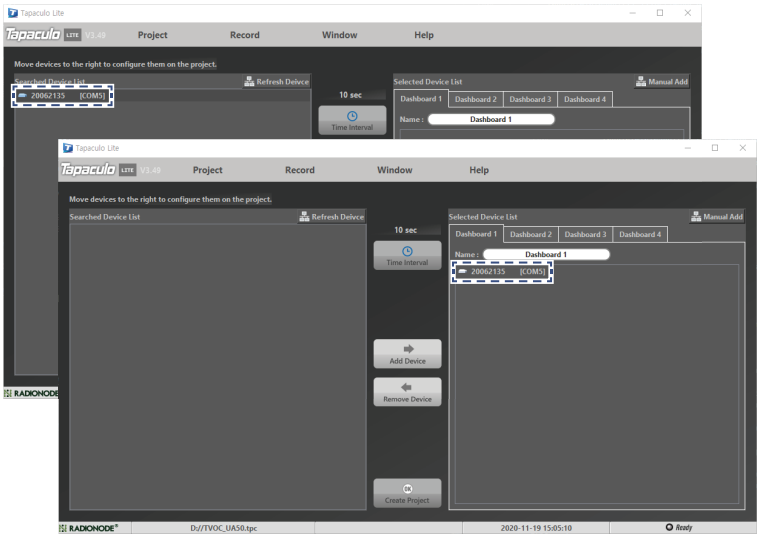
A new project must be created first before combining Tapaculo Lite and the sensor. A project may include multiple sensors. Refer to the following procedure when using Tapaculo Lite:

A project is a file that stores and manages sensor data.

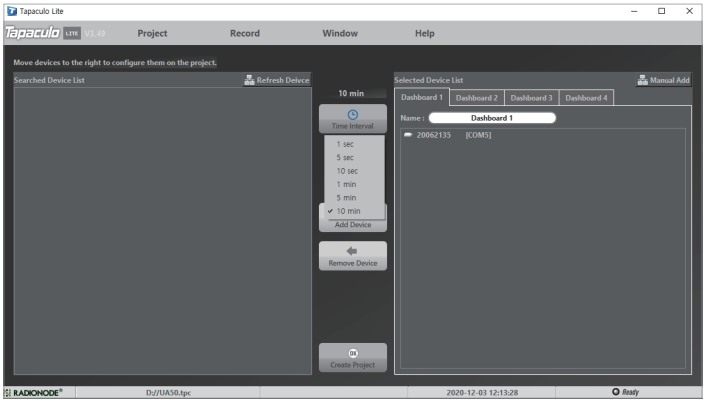
1. Click **Create Project** and enter a file name. The new file will contain sensor information.



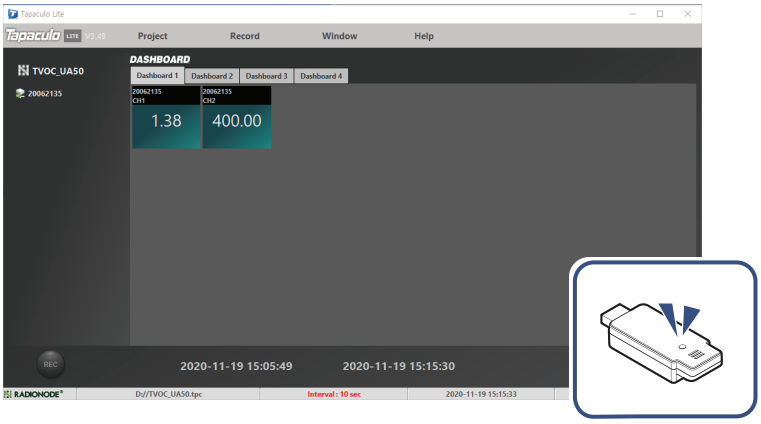
2. Searched sensors appear in the left panel. Select a dashboard and sensor, then click **Add Device**. The sensor will be added to the dashboard.



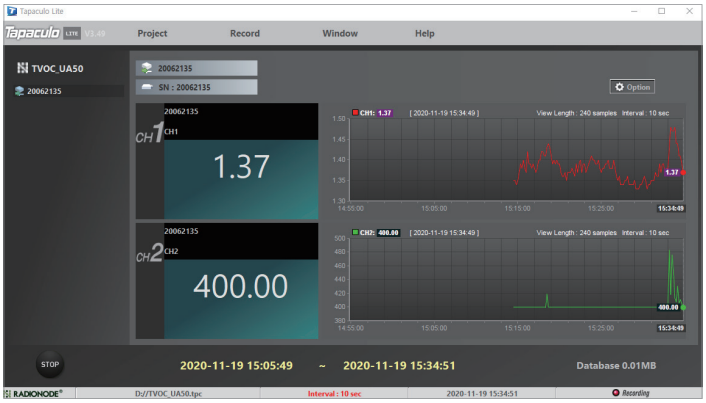
3. Click **Time Interval** and select the measurement interval.



4. Click **OK Create Project** at the bottom of the menu. The Dashboard menu will open and display measurements of sensors registered in the project, and sensor indicators will blink.



5. Click **REC** at the lower-left corner to start logging data. The **REC** button will change to **STOP**.



6. To exit the program, click **STOP**. You cannot exit the program until data logging is stopped.

Customer Service Information

Manufacturer Contact Information

DEKIST Co., Ltd. provides repair service and replacement parts for RADIONODE products. To request customer service, contact us via one of the following methods.

- Tel: +(82) 1566-4359
- Fax: (+82) 31-8039-4400
- E-mail: master@dekist.com

Warranty

Repairs are provided free of charge for product failure under normal operating conditions within one year of the product installation date.

Limit of Liability

Warranty repairs are not provided in the event of:

- Failure caused by unapproved installation methods;
- Failure caused by user negligence;
- Failure caused after alteration, disassembly, or repair of the product by a person unauthorized by DEKIST;
- Failure caused by corrosion, falling, submersion, or other improper storage methods;
- Failure caused by natural disaster or other unforeseen circumstances, such as storms, floods, earthquakes, lightning, or abnormal voltage;
- Service requested for actions that the user can take, such as replacing consumables;
- Alteration of the software through decompilation or the like

Certifications

FCC Class A Digital Device

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

KC

This equipment has passed conformity testing for use in work environments, and is likely to cause interference when used in a household environment.

Telnet Commands

Telnet can be used to access your RN171WC. The default port number is 23.

```
C:\>telnet 192.168.xxx.xxx 23
ATDC
ATDC   3.89,537.00
ATSQUIT
```

- **ATDC**: Shows the Channel 1 and Channel 2 values.
- **ATSQUIT**: Severs the current connection.
- **ATSCON**: Enables terminal mode. Device settings can be changed as you would for a RadioNode terminal.
- **ATSRESET**: Reboots the device.
- **ATSMODEL**: Shows the device model number.
- **ATBSET**: Sounds the built-in buzzer once.
- **ATBAL**: Selects a channel to link alarms.

```
ATBAL OFF
ATBAL CH1
ATBAL CH2
ATBAL CH1 OR CH2
ATBAL CH1 AND CH2
```

- **ATBMIN1**: Sets the lower limit of the normal range allowed for Channel 1.
- **ATBMAX1**: Sets the upper limit of the normal range allowed for Channel 1.
- **ATBMIN2**: Sets the lower limit of the normal range allowed for Channel 2.
- **ATBMAX2**: Sets the upper limit of the normal range allowed for Channel 2.

HTTP Radionode Protocol V1

Radionode users can build their own servers that receive measurement data from radionode devices including RN400 Series data loggers and RN17xWC Series data transmitters, instead of using Radionode365. This chapter describes GET-method HTTP request format used by radionode devices for customer server developers.

Customer servers must proceed the following three requests:

- A radionode device requests transmission of measurement data from the server at a set time. This request is called data-in.
- When data transfer fails, a request is made to the server to transfer accumulated data at once. This request is called backup-in.
- Device makes a timestamp request to the server to obtain current time in the event that a backup-in transaction requires a server time reset.

Data-in

Data-in requests are in the following format:

```
http://SERVER-ADDRESS/DATAIN
  ?gwid=0004a316d728
  &model=RN171WC
  &interval=300
  &ipaddr=192.168.0.31
  &utc=1459249259
  __device=00000004a316d728
  &nodeid=00000004a316d728
  &lqi=255
  &child=0
  &nodetype=2
  &batt=255
  &sd1=20.28
  &sd2=20.29
```

In http://SERVER-ADDRESS/DATAIN, **DATAIN** is the server program name that processes checkin requests, which can be either **datain.php, datain.asp** or **datain.js**.

- **gwid**: MAC address of the device
- **model**: Model number of the device
- **interval**: Data transfer interval
- **ipaddr**: IP address of the device
- **utc**: Transfer time (information provided by www.ntppool.org)
- **__device**: The device's MAC address, preceded by 0000
- **nodeid**: The device's MAC address, preceded by 0000
- **lqi**: Indicates the strength of wireless signal, but for RN17xWC Series, this parameter is fixed as 255.
- **child**: Indicates the number of child nodes, but for RN17xWC Series, this parameter is fixed as zero.
- **nodetype**: Indicates the type of node, but for RN17xWC Series, this parameter is fixed as 2.
- **batt**: Indicates the battery status of the device, but for RN17xWC Series, this parameter is fixed as 255.
- **sd1**: Measurement of Channel 1
- **sd2**: Measurement of Channel 2

Measurements can include a negative sign and up to 2 decimal places.

The server should reply to a datain request with a process outcome in the following XML format:

```
<xml>
<root>
<ack>ok</ack>
</room>
</xml>
```

Abnormal replies include error messages.

```
<ack> MESSAGE </ack>
```

Backup-in

Backup-in requests are in the following format:

```
http://SERVER-ADDRESS/BACKUPIN
  ?gwid=0004a316d728
  &P000=1459249259|00000004a316d728|UA-DEVICE|-1
  |-1|-12.10|23.02|
  &P001=1459249319|00000004a316d728|UA-DEVICE|-1
  |-1|-12.40|23.42|
  &P002=1459249369|00000004a316d728|UA-DEVICE|-1
  |-1|-12.50|23.82|
```

A serial number preceded by `P` becomes a parameter name, and several values (including timestamps) are separated by vertical lines (|) and grouped together as parameter values.

```
Pxxx=timestamp|nodeid|device|battery|lqi|ch1|ch2|
```

One parameter value consists of the following elements:

- `Pxxx`: Data number
- `timestamp`: Measurement time
- `nodeid`: The device's MAC address, preceded by 0000
- `device`: For RN17xWC Series, this parameter is fixed as `UA-DEVICE`.
- `battery`: For RN17xWC Series, this parameter is fixed at -1.
- `lqi`: For RN17xWC Series, this parameter is fixed at -1.
- `ch1`: Measurement of Channel 1
- `ch2`: Measurement of Channel 2

The server's reply format to the backup-in request is the same as that to data-in.

```
<xml>
<root>
<ack>ok</ack>
</room>
</xml>
```

Timestamp

Timestamp requests are in the following format:

```
http://SERVER-ADDRESS/TIMESTAMP
  ?gwid=0004a316d728
```

Normal replies to this request include a timestamp.

```
<root>
    <timestamp> 1459249259 </timestamp>
</root>
```

HTTP Radionode Protocol V2

Radionode users can build their own servers that receive measurement data from radionode devices, such as the RN400 Series data loggers or RN17xWC Series data transmitters, instead of the Radionode365. This chapter describes the POST-method HTTP request format used by radionode devices for customer server developers.

Customer servers must proceed the following two requests:

- The radionode device requests transmission of device information from the server at the start of operation and every six hours thereafter. This request is called check-in.
- The device requests transmission of measurement data from the server at the set time. This request is called data-in.

Check-in

Check-in requests are in the following format:

```
POST / HTTP/1.1
Host: 192.168.10.1/checkin
Content-Type: application/x-www-form-urlencoded
Content-Length: 589

mac=0000xxxx0000&
ver=20201031&
model=RN171WC&
ip=192.168.100.11&
splrate=60&
interval=300&
tags=xxx|xxx|xxx
```

In `192.168.10.1/checkin`, `checkin` is the server program name that processes check-in requests, which can be either `checkin.php`, `checkin.asp` or `checkin.js`.

- `mac`: MAC address of the device
- `ver`: Firmware version
- `model`: Model No.
- `ip`: IP address
- `splrate`: Measurement interval
- `interval`: Data transfer interval
- `tags`: CH info

  This parameter is separated by vertical lines (|) and indicates the nature of each channel.

  ```
  tags=TEMP|RH|NTC_TEMP|NULL|NULL|NULL
  ```

  In this example, there are a total of six channels with Channel 1 indicating temperature, Channel 2 indicating RH, and Channel 3 indicating the temperature measured by NTC external temperature sensor. The remaining channels are not associated sensors or devices.

The server must reply to a check-in request in the following XML format:

```
<xml>
<root>
<ack>ok</ack>
<timestamp>1501912142</timestamp>
</root>
</xml>
```

- `ack`: Processing outcome (`ok` or `error`)
- `timestamp`: Current time of the server in UNIX timestamp format

Data-in

Data-in requests are in the following format:

```
POST / HTTP/1.1
Host: 192.168.10.1/datain
Content-Type: application/x-www-form-urlencoded
Content-Length: 589

mac=0000xxxx0000&
sig=40&
bat=255&
SMODEL=RN400H2EX&
C000=1505912142|23.22|12.44|122.11|123&
P000=1505911542|23.19|12.40|121.96|123&
P001=1505910942|23.18|12.52|122.04|123&
```

- `mac`: MAC address of the device
- `sig`: Strength of wireless signal
- `bat`: Battery status.

  The value ranges from 0 to 255. The battery must be replaced when the value is "5" or less. "-1" is displayed when DC power is connected.
- `SMODEL`: Model number of the device
- `Cxxx`: Current measurement of each channel.

  This parameter is separated by vertical lines (|) and indicates the values of the timestamp and each channel.

  ```
  C000=   |Ch. 1|Ch. 2|Ch. 3|Ch. 4
  ```
- `Pxxx`: Past channel measurements

The server must reply to a data-in request with a process outcome in the following format:

```
<xml>
<root>
<ack>ok</ack>
</root>
</xml>
```

Modbus Registration

Modbus TCP communication allows reading of the measurement stored in the RN171WC holding register. Measurements of each channel are stored as a floating point real number simultaneously. House number consists of two bytes and a floating point real number is represented by four bytes, thus the real value of a channel is divided into two.

	Channel 1		Channel 2	
	Floating decimal real number		Floating decimal real number	
Address	0	1	2	3
Bytes	0x3333	0x41DF	0x999A	0x41E9
Reverse bytes	0x3333	0xDF41	0x9A99	0xE941
Values	27.9		29.2	

The function code for reading measurements is 3, and other packet components, including transaction ID, are ignored.

	채널 1		채널 2		채널 3	
	부동 소수점 실수		부동 소수점 실수		부동 소수점 실수	
번지	0	1	2	3	4	5
바이트	0x3333	0x41DF	0x9999	0x41E9	0x3333	0x41a7
역순 바이트	0x3333	0xDF41	0x9A99	0xE941	0x3333	0xa741
값	27.9		29.2		20.9	

	채널 4		채널 5		채널 6	
	부동 소수점 실수		부동 소수점 실수		부동 소수점 실수	
번지	6	7	8	9	10	11
바이트	0x9999	0x3f99	0x0000	0x3f00	0x0000	0x4060
역순 바이트	0x9999	0x993f	0x0000	0x003f	0x0000	0x6040
값	1.2		0.5		3.5	

Order List

UA Sensor

Type	Order No.	External Sensor
Temperature, Humidity	UA10	
High Temperature	UA11-K	PR-K1-3, PR-K1-15
Normal Temperature	UA11-T	PR-T1-3, PR-T1-15
Cryogenic Temperature	UA13	PR-P1-3, PR-P1-15
4-20mA Transmitter	UA20-A	
4-20mA Transmitter	UA20-B	
0-1V Transmitter	UA20-C	
tVOC, CO2eq, Absolute Humidity	UA50	
Oxygen, Atmospheric pressure, Temperature	UA52-O2-25 UA52-O2-25-F	
Carbon dioxide, Temperature	UA52-CO2-20	
Carbon monoxide, Temperature	UA53-CO-1000	
Sulfur dioxide, Temperature	UA53-SO2-50	
Nitrogen dioxide, Temperature	UA53-NO2-50	
Ammonia, Temperature	UA54-NH3-100 UA54-NH3-1000	
Hydrogen sulfide, Temperature	UA54-H2S-50	
Hydrogen chloride, Temperature	UA54-HCL-20	
Ethylene oxide, Temperature	UA54-EO-10	
Ethylene, Temperature	UA54-C2H4-10 UA54-C2H4-100	
Carbon dioxide, Temperature	UA59-CO2-20-U UA59-CO2-100-U UA59-CO2-100-C	
Hydrogen, Temperature	UA54-H2-4	
Oxygen, Temperature	UA54-O2-21	
Carbon monoxide, Oxygen, Hydrogen sulfide, Carbon dioxide	UA58	

Accessories

Temperature Sensor

Type	Order No.	Cable Length
K Type Thermocouple (TC-K) -50 ~ 200°C	PR-K1-3	3 m
	PR-K1-15	15 m
T Type Thermocouple (TC-T) -200 ~ 200°C	PR-T1-3	3 m
	PR-T1-15	15 m
PT100 -200 ~ 200°C	PR-P1-3	3 m
	PR-P1-15	15 m

Sensor Data Transmitter

Type	Order No.	Remark
LAN	RN171WC	Support PoE
WiFi	RN172WC	Support WiFi ENT

DEKIST
Embedded Web Service

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