

IoT Temp Data Logger RN400-T2TS User Manual



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About this Manual

This document contains instructions for usage and installation of the RADIONODE® RN400-T2TS. 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. Software screenshots may change after software updates.

Intellectual Property Rights

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Notational Conventions



Failure to follow instructions marked with "Warning" may result in slight injury to the user.



Failure to follow instructions marked with "Caution" may result in equipment damage or malfunction.



Additional helpful information is marked with "Note".

Introduction

The RADIONODE RN400-T2TS Data Logger periodically measures temperature and RH, then sends measurement data to the Radionode365 server. The RN400-T2TS has a total of 4 I/O channels.

| Channel 1 | External Temp sensor | Channel 2 | External Temp sensor |
|-----------|-------------------------|-----------|-------------------------|
| Channel 3 | External Temp Sensor | Channel4 | External Temp sensor |

Key Features

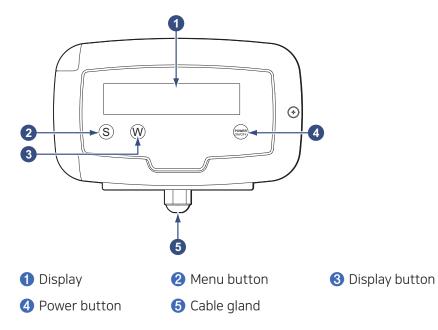
Key features of the RN400-T2TS include:



- Data Logger can be used with additional temp sensors.
- Use Wi-Fi connection to easily configure your Data Logger.
- Built-in buzzer that activates alarm when measurement is outside the margin of error.
- Measurement data can be viewed remotely from Radionode365 website. See Radionode365 on page 34.
- Measurement data can be logged on a micro SD card.

About this Manua

Exterior

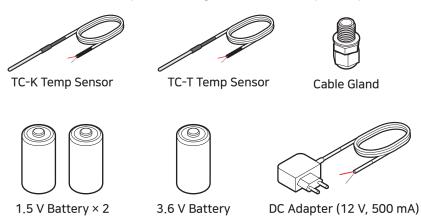


Power cables and cables of other devices, such as external sensors, are connected via cable glands to the internal terminal block.

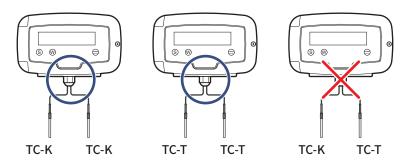
For instructions on how to use the buttons, see **Operation** on page 16.



All accessories, except for cable glands, are sold separately.



In the event of power failure, two C-type 1.5 V batteries or one 3.6 V battery must be placed in the Data Logger. RADIONODE Data Logger is designed to not operate without a battery, even when external power is connected.Use the same type of external temperature sensor for one device. Type K Thermocouple (TC-K) and Type T Thermocouple (TC-T) Sensor cannot be used together.

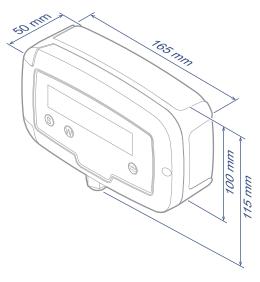


In the event of power failure, two C-type 1.5 V batteries or one 3.6 V battery must be placed in the Data Logger. RADIONODE Data Logger is designed to not operate without a battery, even when external power is connected.



Only use Energizer[®] batteries. The Data Logger's power consumption varies significantly depending on operation functions. Only Energizer batteries can keep performance stable despite extreme battery usage fluctuations.

Specifications



RN400-T2TS Data Logger

| External Temp SensorCh.1 TC- K/J/T/N/S/E/B/RCh.2 TC- K/J/T/N/S/E/B/RCh.3 TC- K/J/T/N/S/E/B/RCh.4 TC- K/J/T/N/S/E/B/RPartial Ch.4 TC- K/J/T/N/S/E/ | | | |
|--|----------------------|---|--|
| SensorCh.3 TC- K/J/T/N/S/E/B/R Ch.4 TC- K/J/T/N/S/E/B/R2.4 GHz IEEE 802.11 b/g/nWPA2-Enterprise HTTP Get/Post RS485 MODBUS RTUCable GlandPG-9Water Resistance RatingExternal DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | | Ch.1 TC- K/J/T/N/S/E/B/R | |
| ConstructionCh.3 TC R(J) (T/N/S)E/B/R Ch.4 TC- K/J/T/N/S/E/B/RCommunication2.4 GHz IEEE 802.11 b/g/n WPA2-Enterprise HTTP Get/Post RS485 MODBUS RTUCable GlandPG-9Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | External Temp | Ch.2 TC- K/J/T/N/S/E/B/R | |
| Communication2.4 GHz IEEE 802.11 b/g/nWPA2-EnterpriseHTTP Get/PostRS485 MODBUS RTUCable GlandPG-9Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | Sensor | Ch.3 TC- K/J/T/N/S/E/B/R | |
| CommunicationWPA2-Enterprise HTTP Get/Post RS485 MODBUS RTUCable GlandPG-9Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | | Ch.4 TC- K/J/T/N/S/E/B/R | |
| CommunicationHTTP Get/Post RS485 MODBUS RTUCable GlandPG-9Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | | 2.4 GHz IEEE 802.11 b/g/n | |
| HTTP Get/PostRS485 MODBUS RTUCable GlandPG-9Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | Communication | WPA2-Enterprise | |
| Cable GlandPG-9Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | Communication | HTTP Get/Post | |
| Water Resistance RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | | RS485 MODBUS RTU | |
| RatingIP65 (IP67 is optional)External DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | Cable Gland | PG-9 | |
| RatingExternal DC power5 ~ 30 V (Built in UPS)Size165 × 50 × 115mm | Water Resistance | IP65 (IP67 is optional) | |
| Size 165 × 50 × 115mm | Rating | | |
| | External DC power | 5 ~ 30 V (Built in UPS) | |
| Operating conditions -20 ~ 60 °C, 0 ~ 95% RH (non-condensed) | Size | 165 × 50 × 115mm | |
| | Operating conditions | -20 ~ 60 °C, 0 ~ 95% RH (non-condensed) | |

Optional acc. TC-K Temp Sensor

| M. Range | -50 ~ 200 °C |
|----------|--------------|
| Cable | 3 m or 15 m |

Optional acc. TC-T Temp Sensor

| M. Range | -200 ~ 200 °C |
|----------|---------------|
| Cable | 3 m or 15 m |



Note that the performance of the external temperature sensor separately may differ from when it is connected to the Data Logger.

Operation Configuration Radionode365 Maintenance Custome

Installation

The following procedure will guide from the installation procedure to the Radionode365 registration process.

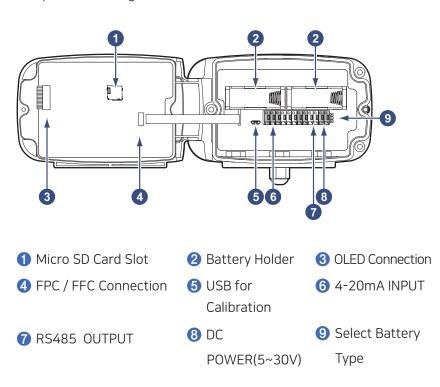
- Install sensors or connect other devices to the Data Logger as needed.
- 2. Connect power and insert the battery.
- **3.** Use the virtual Wi-Fi router feature to configure the Data Logger. See **Configuration** on page 21.
- **4.** Now that the Data Logger has been installed, it must be registered to Radionode365. See Radionode365 on page 34.

Depending on your installation circumstances and conditions, your installation process may vary. For example, if you are installing multiple Data Loggers, you might find it easier to:

- 1. Insert batteries into all Data Loggers before running.
- 2. Configure one Data Logger first.
- **3.** Use a micro SD card to set up additional Data Loggers. For this method, see Memory Card Usage Configuration on page 31.
- **4.** Register the Data Loggers onto Radionode365.
- **5.** Finally, install the Data Loggers.

Terminal Block

Terminal Blocks can be found inside of a Data Logger, with other components arranged as follows:



Micro SD card is used to log measurement data. See Memory Card for Data Logging on page 20.

The micro USB port is used for sensor calibration. As RN400 Series sensors are shipped after calibration, no further calibration is required. However, if the sensor malfunctions, contact DEKIST for inspection.

For more information on the terminal block, see Connecting Terminal Block on page 13.

- The USB port on the front panel is unused.

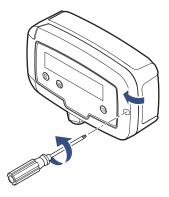


- Do not use the '6 USB port for calibration' on the bottom while the product is in operation after installation is complete.

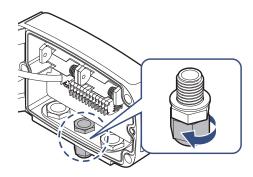
Data Logger Installation

The general procedure for installing a Data Logger is as follows:

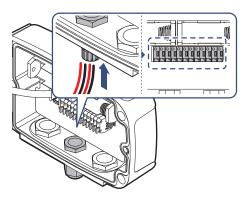
1. Loosen the screw on the right side of the front panel and open the front panel.



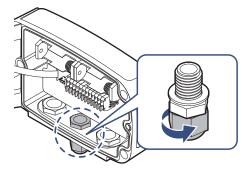
2. Loosen the cable gland.



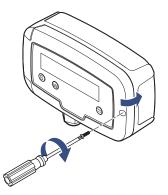
3. Route the cables of the device that will be connected through the gland and connect to the terminal block. Then, connect external DC power and insert the battery. For more information on terminal block connection, see Connecting Terminal Block on page 13.



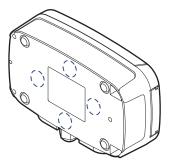
4. Tighten the gland firmly.



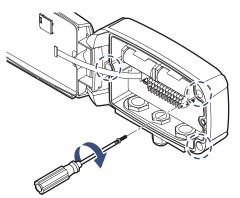
5. Cover the front panel and tighten the screws.



6. There Data Logger is equipped with a magnet at the rear. Place the Data Logger on a steel panel.



If necessary, use screws to secure. There are three screw holes on the back of the device.



Installation



When connecting cables to the terminal block, ensure that the flat cable does not get disconnected from the front connector.

Cable Gland

Connecting

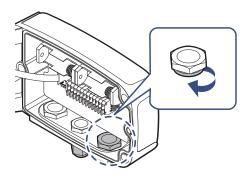
Terminal

Block

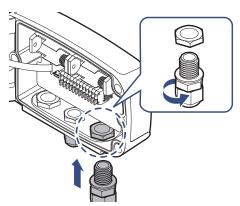
If Data Logger cable gland cannot sufficiently receive all cables, install additional cable glands. There are two more gland slots at the bottom of the Data Logger.



1. Loosen and remove the cap bolt from the left or right gland slot.

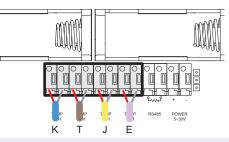


2. Insert the cable gland into the nut and tighten.

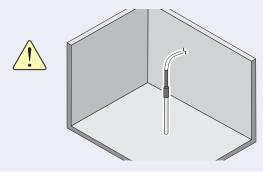


TC Temp Sensor

Connect Thermocouple cable to Temp.Ch1~CH4 Terminal terminal. Connect the red cable to the A(+) terminal, and the remaining cables to the B(-) terminal.

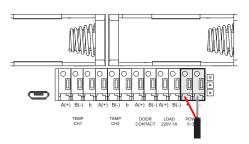


Install the external temperature sensor away from the wall and the floor. The sensor may not touch anything other than the ambient air.



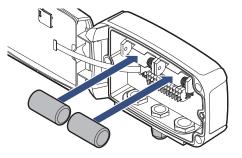
DC Power

Connect the Power cable to the **POWER** terminal. Connect the red cable to the + terminal, and the remaining cables to the - terminal.



Batteries

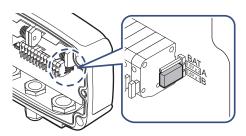
Insert two C-type 1.5 V batteries into the battery holder, or one 3.6 V battery into the left-hand battery holder.





Be careful not to connect batteries with opposite polarities. Doing so may damage the device.

If you are using a 3.6 V battery, move the **BAT** jumper to the **B** position.



Operation

When the data logger is turned on, the model number and other key information is displayed with the corresponding measurements. If no external power is supplied, the display will turn off shortly and the Data Logger will enter sleep mode.



- Viewing Channel Information: To view channel information, including measurements on sleep mode, press the \mathbb{W} button. Press the 🕦 button repeatedly to display different status information.
- Selecting a Menu: Press the 🕔 button, then press the S button. • Press the S button repeatedly to display different menu items. Press the 🕔 button to open the displayed menu. Press the 🕑 button to exit the menu.
- Turning Data Logger Off: Press the 🕔 button and hold the 🕑 button until PRESS 'P' ONE MORE TO POWER IT OFF appears. Hold the 🕑 button again.
- Turning Data Logger On: Press the 🕑 button. •

Viewing Channel Information

Press the \bigotimes button repeatedly to display the below channel data. A sensor channel that is not connected will appear as (none).

LAST SENSING :S:menu 1: 26.20 :2: 21.6%

LAST SENSING (S:menu 3: 24.7C (4: (none)

LAST TRANSMIT:S:menu 5 Min Ago, 9 smpl

WIFI SSID dB:S:menu xxxxxxxx, -50dB

LOCAL TIME :S:menu 2020-11-30 17:00

BATTERY STAT.:S:menu OK. :1.5Vx2:2.88V

DATA FILTER. S: menu SLOW LEVEL (1-15):1

GS CELL TEMP.:S:menu CELL Temp: 22 C Measurements of Channels 1 and 2

Measurements of Channels 3 and 4

Elapsed time since last transfer of measurement data to the server & number of datasets to transfer in the next cycle

Wi-Fi network name and signal strength

Current date and time

Type of battery inserted and current voltage. If the voltage is low, LOW will be displayed.

You can select the level of the digital filter. The higher the number, the less sensitive the sensor reacts (1 level: highest sensitive, 15 level: lowest sensitive). You can choose from the settings menu.

[ONLY RN400-T2GS] Displays the temperature value of the chemical cell inside the product.

Viewing Device Information

To view device information, select **1.** VIEW INFO. To view the next item, press the (S) button. To exit, press the (P) button.

INFO:S:next, P:exit 1.HOLDING DATA: 4 Number of datasets to send to the server in the next cycle.

(number of datasets to send = Transfer Interval ÷ Measurement Interval)

When measurement interval is set to 5 minutes and the transfer interval set to 20 minutes, 4 datasets are saved until the next transfer. If data transfer fails, datasets accumulate until successful.

| INFO¦S:next, P:exit 2.POWER: External DC | If no external power is connected or power failure occurs, Bat will appear. |
|---|---|
| INFO¦S:next, P:exit 3.SENSING: 1 Min | Measurement interval |
| INFO:S:next, P:exit 4.SENDING: 5 Min | Measurement data transmission to server interval |
| INFO¦S:next, P:exit 5.UPDATE: 1 Min Ago | Time elapsed since last transmission of measurement data to server |
| INFO¦S:next, P:exit 6.ID: xxxxxxxx | Radionode365 account ID |
| INFO!S:next, P:exit 7.IP:192.168.10.13 | Data Logger IP Address |
| INFO:S:next, P:exit 8.GW:192.168.1.1 | Gateway IP address |

| INFO:S:next, P:exit 9.DN:210.220.163.82 | DNS server IP address |
|---|--------------------------------------|
| INFO:S:next, P:exit 10.MAC:508CB16FA1B3 | Data Logger MAC address |
| INFO:S:next, P:exit 11.SW BUILD:20200720 | Firmware version |
| INFO:S:next, P:exit 12.MODEL:RN400T2TS | Model No. |
| INFO:S:next, P:exit 13.ALARM:OFF (BAT.) | Alarm relay status |
| INFO:S:next, P:exit 14.EX-SENSOR: TC-K | Type of external sensor installed |
| | |

Resetting Data Logger

All setting options (except for Wi-Fi network) can be reset. Select 4. FACTORY DEFAULT.

Memory Card for Data Logging

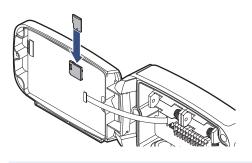
If a memory card is installed in the Data Logger, measurement data will be written to the memory card as a CSV file as follows:

Measurement date, timestamp, Mac address, value for Channel 1, \dots , value for Channel 4

| | А | В | С | D | E | F | G |
|---|----------------------|------------|--------------|-------|-------|-----|-----|
| 1 | CALENDAR(GMT 9) | TIMESTAMP | MACADDR | CH1 | CH2 | CH3 | CH4 |
| 2 | 2020-11-18T09:30:49Z | 1605659449 | 508CB16FA1B3 | 25.36 | 48.93 | 0 | 0 |
| 3 | 2020-11-18T09:31:49Z | 1605659509 | 508CB16FA1B3 | 25.38 | 48.9 | 0 | 0 |
| 4 | 2020-11-18T09:32:49Z | 1605659569 | 508CB16FA1B3 | 25.39 | 48.89 | 0 | 0 |
| 5 | 2020-11-18T09:33:49Z | 1605659629 | 508CB16FA1B3 | 25.36 | 48.93 | 0 | 0 |
| 6 | 2020-11-18T09:34:49Z | 1605659689 | 508CB16FA1B3 | 25.39 | 49.11 | 0 | 0 |

In the temp channel (Ch. 1 or Ch. 2), "n/a" means no external temp sensor is connected. In the door channel (Ch. 3), "0" means the door contact is not connected or "closed." Similarly, in the alarm channel (Ch. 4), "0" means the alarm beacon is not connected or "normal."

Open the front of the Data Logger and insert a micro SD card into the card slot inside the front panel.





Use an SD card (up to 16 GB) formatted with the FAT32 file system. Other file systems are not supported.

Operation

Configuration

The Data Logger is equipped with a virtual Wi-Fi router. The virtual router allows your smartphone or tablet to be linked to Data Logger for configuration.

 Select 2.CONFIG MODE(AP) to enable the virtual router. The following will appear in the display:

| SOFTAP: | _RN400-A1B3 |
|---------|-------------|
| ACCESS: | 192.168.1.1 |

2. On your smartphone, find the Wi-Fi network with the same name as shown on the display and connect to the network.

| | Wi-Fi | | |
|----|----------------------------------|---|--------------|
| ~ | _RN400-5466 Unsecured Network | | ∻ (i) |
| СН | OOSE A NETWORK | | |
| | DIRECT-3EC460 Series | ٩ | ∻ (i) |
| | DIRECT-74-HP OfficeJet Pro 8 | ٩ | ? (j) |

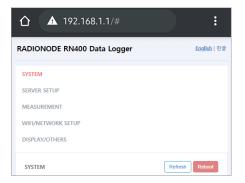
Depending on the version of your Android phone, user identification may be required, as Data Logger is not connected to the Internet.

| Internet unavailable |
|---|
| |
| The Internet is unavailable with "_RN400-5466". |
| ок |



Multiple mobile devices cannot be connected to the Data Logger at the same time.

3. Open your smartphone's web browser and type **"192.168.1.1"** in the address bar. The Settings page wiill appear.



- **4.** Change the settings on each page, then tap **Save**.
- **5.** To finish configuration, tap **Reboot**.

Tap **SYSTEM** to view Data Logger device information.

| Device |
|-------------|
| Information |

| SYSTEM | Refresh Reboot |
|---------------------|----------------|
| SYSTEM INFORMATION | |
| Tapaculo365 Owner | |
| yihoze | |
| MAC Address | |
| 50:8C:B1:6F:A1:B3 | |
| Model Name | |
| RN400H2EX | |
| Firmware Version | |
| 20200720 | |
| OTA Release Version | |
| Ver03 | |
| SDCARD Inserted | |
| Inserted | |
| WIFI SSID | |
| easymanual | |
| IP Address | |
| 192.168.0.15 | |
| Gateway Address | |
| 192.168.0.1 | |
| DNS | |
| 8.8.8.8 | |

| Radionode365 Owner | Radionode365 account ID |
|---------------------|---|
| Mac ADDRESS | Data Logger MAC address |
| Model Name | Data Logger model number |
| Firmware version | Firmware version |
| OTA Release Version | OTA Release Version |
| SDCARD Inserted | If a memory card is not inserted, No SDCard will appear. |
| WIFI SSID | The Wi-Fi network used by the Data Logger |
| IP Address | Data Logger IP Address |
| Gateway Address | The gateway IP address to which the Data Logger is connected |
| DNS | DNS server IP address |

Server

Tap **SERVER SETUP** to configure server receipt of measurement data.

| SERVER SETUP | Save | Reboot |
|----------------------|------|--------|
| Destination | | |
| O Tapaculo365 | | |
| User HTTP Server | | |
| O SDCard Logger | | |
| USER HTTP SERVER URL | | |
| Host | | |
| 1.2.3.4 | | |
| Port | | |
| 15500 | | |
| Checkin URL | | |
| /v1/checkin.jsp | | |
| Datain URL | | |
| /v1/datain.jsp | | |

| | Select Radionode365 to send measurement data to the Radionode365 server. | |
|-------------|---|--|
| Destination | Select User HTTP Server to send to a customer or third-party server, and configure the below items accordingly. | |
| | Select SDCard Logger to operate Data Logger independently without a server. | |
| Host | Server IP address | |
| Port | Server port number | |
| Checkin URL | URL of the server program that processes check-in requests | |
| Datain URL | URL of the server program that processes data-in requests. | |



For check-in and data-in request formats, see HTTP Radionode Protocol V2 on page 44.

This item will appear if **Destination** is set to **SDCard Logger**.

| [| ● st | OCard Logger | | |
|---|--------|---------------------------------|-------|--|
| | | | | |
| | SD Car | rd Data Logger | | |
| | 0 | (0: OFF, start after 1~30min) | Start | |

| SD Card Data Logger | If set to "0", measurement data will begin to | |
|---------------------|---|--|
| | be written to the memory card as soon as | |
| | booting completes. If set to "10", data will be | |
| | written 10 minutes after booting completes. | |
| | For more information, see Memory Card for | |
| | Data Logging on page 20. | |
| | | |

Measurement

Tap **MEASUREMENT** to configure sensor operation.



| Sensing - Sending Interval | Select the interval between sensor measurement and data transmission. For instance, if Sensing 1Min - Sending 5Min is selected, sensor measures every 1 minute, and measurement data is sent to the server every 5 minutes, or written on a memory card. | |
|------------------------------------|---|--|
| Temperature Scale | Select the unit of measurement to use when measuring temperature. | |
| External Temperature Probe Type | Select the type of external temperature sensor installed. | |
| Temp | Enter the calibration value to add to the temperature. | |
| RH | Enter the calibration value to add to the RH. | |

On the SERVER SETUP page, set the Destination to User HTTP Server to add seconds to the list of selectable options.



| AVG Filter(1[fast]~15[slow]) | |
|--|-----------|
| 1 | |
| SENSORS | |
| CH Info (Channel Count: 1) | |
| SL_G_CIF: undefined | |
| DOOR CONTACT | |
| ○ Enable | |
| DRY CONTACT (RELAY AND BUZZER SETTING) | |
| Target Channel | |
| ~ | |
| Normal Range | |
| ~ | IS OUT OF |
| Relay and Buzzer | |
| RELAY ON (MAX: 300V - 1A) | |
| BUZZER SOUND ON | |

| AVG Filter | Adjusts the sensor sensitivity. The margin of error ranges from 1 to 15, and the higher the value, the lower the sensitivity. | |
|----------------|---|--|
| CH info | Displays a list of I/O channels. | |
| Target Channel | Select the input channel that will trigger the alarm relay and specify the normal range. For example, if you select CH1 (Temp) and the normal range is set to "20 - 25", the alarm relay will turn on when the temperature measured by Channel 1's temp sensor is lower than 20 degrees or higher than 25 degrees. | |
| Buzzer | When BUZZER SOUND ON is selected, the built-in buzzer will sound when an alarm goes off. | |

this Manual Introduction

Wi-Fi Network

Tap **WIFI/NETWORK SETUP** to configure the Wi-Fi network that will be used by the Data Logger.

| WIFI/NETWORK SETUP | Save | Reboot |
|---------------------------|------|--------|
| WIFI SETUP | | |
| Access Point | | |
| | | * |
| | | |
| | | |
| | | |
| | | |
| | | |
| SSID | | |
| | | |
| easymanual | | |
| Security Type | | |
| Personal | | |
| O Enterprise | | |
| Personal Security Type | | |
| O OPEN | | |
| O WEP | | |
| WPA/WPA2 | | |
| Security KEY/PIN | | |
| easy12345@ | | |
| 683912343(g | | |
| NETWORK SETUP | | |
| DHCP/Static (Auto/Manual) | | |
| ● DHCP ○ Static | | |
| | | |

| Access Point | Select a network to use from the list of searched Wi-Fi networks. The closer the signal strength is to 0 dBM, the stronger the connection. If possible, use a Wi-Fi network with a signal strength of -70 dBm or higher. | |
|-------------------------------|--|--|
| SSID | The selected SSD will appear. | |
| Security Type | Select the type of security that your Wi-Fi network uses. | |
| Personal Security Type | If Security Type is set to Personal , select the current security type. | |
| Security KEY/PIN | Enter your Wi-Fi password. | |
| DHCP/Static (Auto/ Manual) | If DHCP is selected, the router will randomly assign an IP Address. If a static IP address is needed, select Static and configure additional settings. | |

If a static IP address is needed, select **Static** and configure additional settings as follows:



| IP | Data Logger IP Address |
|---------|------------------------|
| Gateway | Gateway IP address |
| Subnet | Subnet mask |
| DNS | DNS server IP address |

out this Manual Introduction

P Radionode O

Order List

Enterprise Security (WPA Enterprise) When connecting to a Wi-Fi network that uses enterprise security, the certificate is passed from Data Logger to the RADIUS server along with the RADIUS server account. Once user's access is authorized by the RADIUS server, access to the network is granted.

To connect to a network that uses enterprise security, adhere to the following procedure:

1. Copy the RADIUS server certificate to a micro SD card with the following path and filename:

/cert/ca.pem



Ask your network administrator for a certificate in a PEM format. Certificates in other formats are not supported.

2. On the **WIFI/NETWORK SETUP** page, set the **Security Type** option to **Enterprise** and configure the following additional settings:

| Enterprise Security Type | |
|--------------------------|--|
| O TLS | |
| O TTLS with TLS | |
| O TTLS with MSCHAPv2 | |
| O TTLS with PSK | |
| PEAPO with TLS | |
| O PEAPO with MSCHAPv2 | |
| O PEAPO with PSK | |
| O PEAP1 with TLS | |
| O PEAP1 with MSCHAPv2 | |
| O PEAP1 with PSK | |
| Security KEY/PIN | |
| easy12345@ | |
| RADIUS UserID | |
| easy | |
| RADIUS Password | |
| | |
| | |

| Personal Security Type | Security type |
|---------------------------|--------------------------|
| RADIUS UserID | RADIUS server account ID |
| RADIUS Password | RADIUS ID password |

Display

Tap **DISPLAY/OTHERS** to configure display and other options.

| DISPLAY/OTHERS | Save Reboot |
|------------------------------------|-------------|
| DISPLAY SCHEDULER (ONLY BATTERY) | |
| Display Timer OP Mode | |
| ~ | |
| Display Timer Start Time | |
| ~ | |
| TIMEZONE CONFIG | |
| TimeZone | |
| ~ | |
| BACKUP | |
| Copy to SD Card | |
| Copy Now | |
| OTHERS | |
| Debug Code | |
| 0 | Execute |

| Display Timer OP Mode | This setting can be configured with other settings to set the display operation interval during sleep mode. Select how long the display will stay on in minutes. Select Always to disable sleep mode. |
|-----------------------------|--|
| Display Timer Start Time | Select what time the display will turn on. |
| Timezone | Select which timezone to use. |
| Copy Now | See Memory Card Usage Configuration on page 31. |
| Debug Code | Enter a command to perform a specific function. See the following section for a detailed explanation. |

Commands

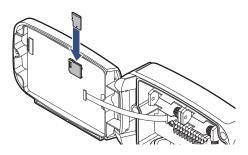
On the **DISPLAY/OTHERS** page, the following commands can be entered in **Debug Code**. Enter a command in uppercase, then tap **Execute**.

| ATVMAC xxxx0000xxxx | Enter the address that will be used as the virtual MAC address. |
|------------------------|---|
| ATCLF | The virtual MAC address is replaced by the original address. |
| ATNODNS 1 | DNS settings are ignored. |
| ATNODNS 0 | DNS settings become valid again. |
| ATLOG 1 | Event logs are saved on the memory card. |
| ATLOG 0 | No event logs are created. |

Memory Card Usage Configuration

Memory cards facilitate the configuration of multiple Data Loggers at once.

- **1.** Back up the setup data on a memory card in the configured Data Logger.
 - a) Insert a micro SD card into the Data Logger.



b) On the DISPLAY/OTHERS page, tap Copy to SD Card > Copy Now.



- c) Remove the SD card.
- 2. Copy the setup data from the SD card to another Data Logger.
 - a) Insert the SD card into the Data Logger.
 - b) Use the 🕑 button to turn the Data Logger off.
 - c) Press both the (S) and (W) buttons simultaneously and hold the
 (P) button to turn the Data Logger on.



If NEW CONFIG FILE IS LOADED appears, the setup data has been copied successfully.



Use an SD card (up to 16 GB) formatted with the FAT32 file system. Other file systems are not supported.

Checking Communication With Radionode365 Server

From the Data Logger, select 6. CHECK SYSTEM to ensure that data are successfully updated when adding I/O channels in Radionode. Measurements are displayed every 3 seconds and sent to the Radionode365 server. On the web page, verify that the displayed values match the ones shown. Press the P button to finish.

RS-485 Modbus Communication

The UA Calibarator program is required to change settings of Modbus RTU communication. Download and install UA Calibarator from the RadioNode web site at www.radionode365.com.

- 1. From the Data Logger, select 3. USB CALIBRATION.
- **2.** Connect the Data Logger to your computer using a USB cable.
- **3.** Run UA Calibrator on your computer. When the Data Logger is successfully recognized, the following will appear on the monitor:

| Radionode UA Calibrator | V8.16 | | | | |
|-------------------------|-------|-------------|-------------------|---------------------|-----------------|
| 일 Rate UA Device | | | | | |
| Model | | Serial numl | per | Build date time | |
| RN400T2-GS_ | .3v5 | Σ. | Ŷ <u>Ÿ</u> ŶŶŶŶŶŶ | 2020-01-17 09:00:00 | |
| MODBUS Mode | MODBL | S BaudRate | MODBUS Timeout | MODBUS ByteSwap | MODBUS Slave ID |
| ● Slave ○ Master | 9600 | | 1 Second 💌 🛃 | 🗌 ByteSwap 🛛 된 | 054 😫 🛃 |

- 4. Change Modbus settings accordingly.
- 5. Press the P button to finish.

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.

| Tapaculo ikke | ≡ | | | | | | | | | () Asla/Seoul(GMT+093) | 0) ★ Free A | ccount 🛷 Supp | iort DEKIST 🗸 |
|---------------------|---|---------------------------|------|-------|-------------|--------------------------------|------|-----------------------------|------|------------------------|-------------|---------------------|---------------|
| 🛱 Dashboard | | 🕫 BASIC DASHBOA | RD | | | | | | | +A | Id widget | 0) Dashboard settin | 8 0 2 |
| Q Data View | | < Temperature & | / × | < NH3 | ≠× | < Fine Dust | ≠× | <" Warehouse Door | / x | | | | |
| Report Device Setup | | RN400 H2EX CH1 22.51 < | =.4 | 0.77 | ppm al-7 | 8N400-T2PM-CH1 38.84 ug/m3 | * 4 | 0.00 | int. | | | | |
| Alarm Setup | | RN400-H2EX-CH2 19.86 % | = .4 | | 2011 | RN400-T2PM-CH2 39.28 ug/m3 | * 4 | < Nerm Bescen | / x | l I | | | |
| Audit Trail | | RN400-H2EX-CH3 20.80 < | = .4 | | | ямию-тарм-сна 246.79 ид/ист | 16 M | RN400-H2EX-OH6 | - 4 | | | | |
| | | RN400-T2EX-CH1 22.30 c | | | | RN400-T2PM-CH4 36.30 ug/m3 | × .1 | RN400-T2EK-CH4 0.00 tot. | • | | | | |
| | | | | | | RN400-T2PM-CH5 39.21 ug/m3 | * 4 | | | | | | |
| | | | | | | ямию-тарм-сна 0.59 е/ез | ¥ .1 | | | | | | |
| | | | | | | | | | | | | | |

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/memberjoin.html

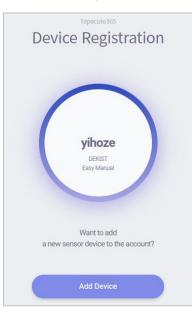
Adding Devices from Your Smartphone

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.

| | Ar less de la service non execte de l'acceletable de la service, l'hoge advise interprésent de la service, la service de la service, la s | ? What do you ✓ RADIONODEI | mean by "device"? | 72, RN400 are devices. E | | | | | connected. | | | | You can easily regist from your mobile ph the QR code below. | |
|--|---|---|-----------------------------|--------------------------|--------------------|---------------|--------------------|--------------------|----------------------|-----------------------|---------------------------|------------------------------|--|-------------|
| Plan Carlos Ability Construction of the Construction of Expendition of the Ability construction of Byte and Plan Carlos Pl | Part Count of the debug is another to the starter of or glasmands in the starter and regions the starter and regions and the starter and regions and the starter and regions and the starter and regions. Part Count of the debug is a first of the debug is a starter and the starter and regions. If the debug is a first of the debug | In case that a | device cannot acces | s the Tapaculo305® serv | | ernet, | | | | | | | 回殺 | 20 |
| # MODE of # 4 x CLOAD CHARM.ED on # 6 for thinks any 10 knownie, knows de traver is working table door is in registered. Clobing for | IN 1001. If See COADO CHRAILED are to be to be there used to sound, it means the interest is used by both dows and it agreement. Clocking the OKAND Data OKAND Data Duttion will complete the registration of the docke after entering the simple information. If International Control of the Coado Chrone of the docke after entering the simple information. If the Coado Chrone of Coado Chrone of the docke after entering the simple information. If International Control of the docke after entering the simple information. If the Coado Chrone of Coado Chrone of the docke after entering the simple information. If International Control of the docke after entering the simple information. If the Coado Chrone of Coado Chrone of the docke after entering the simple information. If International Control of the docke after entering the simple information. If the Coado Chrone of | ? How can I ch | eck if the device is | connected to the Inter | net and registered | | | | | | | | - N ED | 200 |
| Clicking the DALLEANS button will complete the registration of the device after entering the simple information. | Clicking the Counce of MAX Counce Potential Completes the registration of the device after entening the simple information. | | | | | | | | vorking, but the dev | ice isn't registered. | | | 1875 | 741 |
| en by KODE or Device O AMC Antio Please every par device mic address or KODE and doit die aaeeth batten] | en hy i COCC or Dense & D.M.C. Ang Plass areary your dense max address or i COCC and doit the manch human] | Clicking the | e + Add Device 2 | utton will complete | the registration | of the device | after entering the | simple information | 20. | | | | 1 116.2 | AHC. |
| nh by 4000 or Device & AMC Addy Plasa enter your device max address or 14000 and dol: the saveth button] | et higt CODE of Dense O MARC Adda Contra Di MARC Adda Contra CodE and date the manch buston.] Proces SEARCHED BY IP | | | | | | | | | | | | C 10 1 | 004X |
| nh by 4000 or Device & AMC Addy Plasa enter your device max address or 14000 and dol: the saveth button] | et higt CODE of Dense O MARC Adda Contra Di MARC Adda Contra CodE and date the manch buston.] Proces SEARCHED BY IP | | | | | | | | | | | | | |
| on a voice a verice (vince vince) | | | | | | | | | | | | | Https://s2.tap | aculo36 |
| | | | | | | | | | | | | | III https://s2.tap | aculo36 😵 |
| Grand Looper of Generic Principent | | | | | | | | | | | | | E https://s2.tap | aculo36 🛛 🗞 |
| Construction Dense Transmission | | | | | | | | | | | | | https://s2.tap | aculo36 🛛 🗞 |
| DEVICES SLARCHED BY IP | | | | | | | | | _ | | | | | eculo36 😵 |
| TEVICES SEARCHED BY IP | | Irch by I-CODE | or Device ID (MAC | Add) | | | | | ⊜ Search | (Please enter your o | levice mac address or I-O | DDE and click the sea | | iaculo36 😵 |
| ZETICES SEARCHED BT IP | | urch by I-CODE | or Device ID (MAC | Add) | | | | | ⊖ Search | (Please enter your o | Sevice mac address or I-O | DDE and click the sea | | aculo36 🛛 🎝 |
| | | | | ndd) | | | | | ⊕ Search | (Please enter your o | fevice mac address or I-O | DDE and click the sea | | aculo36 🛛 🕿 |
| Search 🔟 | | | | nda) | | | | | 🖨 Search | [Please enter your c | fence mac address or I-O | DDE and click the sea | arch button.] | eculo36 🛛 🤁 |
| | DMACL & Davide Model & Public IP & Private IP & REPower & REChannel & Network ID & Environment & Samiling Internal Samiling Internal Last Lindate Last Lindate Last Lindate | DEVICES SEAI | RCHED BY IP | | Private IP | BE Prover | BI Channel | Natural II | | | | | arch button.] | |
| DRMAC] Device Model Public IP Private IP MF Power MF Channel Network ID Firmware Sending Interval Sampling Interval Last Update Last Update time + Add Devi | | | RCHED BY IP Device Model | Public IP | | RF Power 0 | RF Channel | Network ID 💧 | Firmware 0 | Sending Interval | Sampling Interval | Last Update | erch button.] Starch Last Update time | |

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 the RN400 Series Data Logger first connects to Radionode365, its identification code (i-code) is displayed as follows:



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.

| Image: Constraint of the second se | | | |
|---|-----------------|----------------------|--------------------|
| displayed on your product's display for registration. Search by MAC address 1 2 3 4 5 6 | Devic | | ration |
| displayed on your product's display for registration. Search by MAC address 1 2 3 4 5 6 | | | |
| 4 5 6 | displayed on yo | ur product's display | ofor registration. |
| | 1 | 2 | 3 |
| 7 8 9 0 (| 4 | 5 | 6 |
| 0 | 7 | 8 | 9 |
| | | 0 | - |

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

| Tapaculo365 Registration |
|------------------------------------|
| Registration |
| |
| |
| RN400T2GS |
| E415F64F43FA |
| 61.101.112.152 |
| Gangnam-gu, Seoul, S outh Korea |
| 2021-01-19 17:02:36 |
| |
| Next |
| Home |
| |

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.

| | |) | |
|---------|----------------------------|--------|--|
| | RN400T2G | S | |
| | Please Enter Device | name | |
| | | | |
| | Please Enter Channe | l name | |
| \odot | | ppm | |
| \odot | | ppm | |
| | Next | | |

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**.

| Search by I-CODE o | or Device ID (MAC Add) | | | | | | Search | (Please enter your o | evice mac address or I-CO | ODE and click the sea | arch button.] | | |
|--------------------|------------------------|----------------|--------------|------------|------------|--------------|------------|----------------------|---------------------------|-----------------------|-----------------------|---------|--------|
| DEVICES SEAR | CHED BY IP | | | | | | | | | | | | |
| | | | | | | | | | | | Search | | |
| ID(MAC) 0 | Device Model 0 | Public IP 0 | Private IP 0 | RF Power 0 | RF Channel | Network ID 0 | Firmware 0 | Sending Interval | Sampling Interval | Last Update | Last Update time 💡 | Add D | evice |
| E415F64F43FA | RN400T2G5 | 61.101.112.152 | 192.168.0.10 | | | | 20200616 | (1200 sec | (1200 sec | G fimins ago | @ 2021-01-19 11:55:34 | • Add [| Jevice |
| 049162E32CF3 | RN171 | 61.101.112.152 | 192.168.0.42 | | | | Sep 4 2020 | 120 sec | (12) sec | C Emins ago | @ 2021-01-19 11:55:34 | O Add I | Device |
| E415F64F5466 | RN400T2PM | 61.101.112.152 | 192.168.0.45 | | | | 20200730 | 1800 sec | (IIII) pec | O Emins ago | @ 2021-01-19 11:55:34 | • Add I | Device |
| 508CB16FA1B3 | RN400H2EX | 61.101.112.152 | 192.168.0.40 | | | | 20200720 | (1200 sec | (1200) sec | C Emins ago | @ 2021-01-19 11:55:34 | O Add [|)evice |
| D436394C3987 | RN400T2EX | 61.101.112.152 | 192.168.0.39 | | | | 20200720 | tee sec | 1300 sec | C Emins ago | @ 2021-01-19 11:55:34 | O Add [| 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 RN400 Series first connects to Radionode365, its i-code is displayed as follows:

```
Enter iCode on TP365
iCode: 2024
```

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.

| After registering new device, new data ch | annel will come up on new data cha | nnel menu within interval time. |
|---|------------------------------------|---------------------------------|
| | Device Name | Device Name |
| | Device Comment | Device Comment |
| No Image | | |
| | | |
| 8 | | |

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.

| NEW DATA CHANNEL | | | | | | | | | | |
|-----------------------------------|-------------|----------------|------------|--------------|-------------|------------------|-------------------|--------------|-----------------------|---------------|
| | | | | | | | | | Search | |
| ID(MAC) | Device Name | 0 Device Model | Last Value | RF Signal | Battery | Sending Interval | Sampling Interval | Last Update | Last Update time | Add Channel |
| E415F64F43FA-0000E415F64F43FA-ch1 | RN400-T2GS | RN400T2GS | 0.68 | La Excellent | # D.C Power | (1200) sec | 5200 sec | O Brnins ago | @ 2021-01-19 11:55:34 | O Add Channel |
| E415F64F43FA-0000E415F64F43FA-ch2 | RN400-T2G5 | RN40072G5 | NULL | alExcellent | # D.C Power | (100) sec | (1200 sec | O 8mins ago | @2021-01-19 11:55:34 | O Add Channel |
| E415F64F5466-0000E415F64F5466-ch1 | RN400-T2PM | RN400T2PM | 1 | d Good | # D.C Power | (100) sec | (1800) Sec | O Brnins ago | © 2021-01-19 11:55:34 | O Add Chennel |
| E415F64F5466-0000E415F64F5466-ch2 | RN400-T2PM | RN400T2PM | 39.28 | | # D.C Power | (100) Sec | (IIII) sec | O 8mins ago | @2021-01-19 11:55:34 | O Add Channel |
| E415F64F5466-0000E415F64F5466-ch3 | RN400-T2PM | RN400T2PM | 246.79 | d Good | # D.C Power | sec | (1800) Sec | Smins ago | © 2021-01-19 11:55:34 | O Add Chennel |
| E415F64F5466-0000E415F64F5466-ch4 | RN400-T2PM | RN400T2PM | 36.30 | | # D.C Power | (1800) Sec | (1000 sec | O 8mins ago | @ 2021-01-19 11:55:34 | O Add Channel |
| E415F64F5466-0000E415F64F5466-ch5 | RN400-T2PM | RN400T2PM | 39.21 | | # D.C Power | (100) sec | (1930) sec | © Smins ago | @2021-01-19 11:55:34 | O Add Channel |
| E415F64F5466-0000E415F64F5466-ch6 | RN400-T2PM | RN400T2PM | 0.59 | | D.C.Power | (100) sec | (100) sec | O Bmins ago | @2021-01-19 11:55:34 | O Add Channel |

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.

| Channel ID | E415F64F43FA-0000E415F64F43FA-CH2 | Channel Model RN400T2G5 | |
|--------------------|-----------------------------------|-------------------------|--|
| * Channel Name | RN400-T2GS-CH2 | | |
| * Unit | Unit | Input | |
| Channel Comment | Channel Comment | | |

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

| CHANNEL LIST | | | | | | | | | | Add Virtual C | hannel 😣 🔿 🗸 |
|----------------|---|-------------|--------------|------------|--------|--------------|-------------|------------------|-------------------|---------------|---------------|
| | | | | | | | | | | Search | |
| Channel Name | * | Device Name | Device Model | Last Value | Unit ¢ | RF Signal | Battery | Sending Interval | Sampling Interval | Last Update | Modify/Delete |
| NH3 | | RN400-T2GS | RN400T2G5 | 0.77 | ppm | al Excellent | # D.C Power | (1200) sec | ໜ sec | ⊙ 5mins ago | □ Modify |
| RN400-H2EX-CH1 | | RN400-H2EX | RN400H2EX | 22.51 | °C | .al Good | Excellent | (1200) sec | (00) sec | ⊙ 5mins ago | IF Modify |
| RN400-H2EX-CH2 | | RN400-H2EX | RN400H2EX | 19.86 | 96 | .al Good | Excellent | (1200) sec | sec | Smins ago | C Modify |
| RN400-H2EX-CH3 | | RN400-H2EX | RN400H2EX | 20.80 | ~ | | Excellent | (1200) Sec | com sec | O 5mins ago | C? Modify |
| RN400-H2EX-CH5 | | RN400-H2EX | RN400H2EX | 0.00 | Int. | .al Good | Excellent | (1200) Sec | (933) Sec | Smins ago | C? Modify |
| RN400-H2EX-CH6 | | RN400-H2EX | RN400H2EX | 0.00 | Int | .al Good | Excellent | (1200) sec | (000 sec | O 5mins ago | IP Modify |
| RN400-T2EX-CH1 | | RN400-T2EX | RN400T2EX | 22.30 | < | .al Good | 🗁 Bəd | 1200 sec | sec | O 5mins ago | I Modify |
| RN400-T2EX-CH4 | | RN400-T2EX | RN400T2EX | 0.00 | Int. | .al Good | 🖂 Bəd | (1200) sec | (000 sec | O 5mins ago | 2 Modify |
| RN400-T2PM-CH1 | | RN400-T2PM | RN400T2PM | 38.84 | ug/m3 | .al Good | 🖉 D.C Power | (1800) sec | 600 sec | O 5mins ago | C Modify |
| RN400-T2PM-CH2 | | RN400-T2PM | RN400T2PM | 39.28 | ug/m3 | | D.C Power | (1803) Sec | (03) sec | O Smins ago | C? Modify |

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**.

| Widget Name * | | | | | | | |
|---------------------|------|-----------------------|-------------------|------------|--------|------------------|----------|
| Widget Type * | ۲ | Number Widget | Text Widget | | | | |
| Channel Selection * | | | | | | | |
| | | | | Sea | rch | E | · |
| | | Channel Name | Device Name | Last Value | Unit 🕴 | Sending Interval | Last Up |
| | | RN400-T2G5-CH1 | RN400-T2G5 | 0.68 | ppm | 1200 sec | © 14min |
| | | RN400-T2PM-CH1 | RN400-T2PM | 5.05 | ug/m3 | 1830 sec | © 14min |
| | | RN400-T2PM-CH2 | RN400-T2PM | 5.44 | ug/m3 | 1800 sec | © 14min |
| | | RN400-T2PM-CH3 | RN400-T2PM | 29.06 | ug/m3 | (1830) sec | © 14min |
| | | RN400-T2PM-CH4 | RN400-T2PM | 4.39 | ug/m3 | 1830 sec | () 14min |
| | 4 | | | | | | • |
| | Show | ving 1 to 5 of 7 rows | 5 . rows per page | | | < 1 | 2 > |

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

Maintenance

Maintenance

Cleaning

Use a dry cloth to clean the Data Logger. Do not use solvents or abrasives. Not only do these substances damage the surface of the Data Logger, but they may also affect sensor performance.

Batteries

Replace the battery when the battery status on the Radionode365 web page is **Bad**, or if it appears as follows:

WARNING! (S:menu Low Battery!



When the measurement interval and transfer interval are set to the lowest frequency, the battery is expected to last up to 1 year without external power.

Firmware

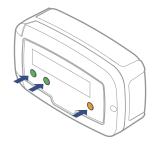
Update

The Data Logger can be updated with new firmware to correct errors or enhance features. Latest firmware is distributed optionally depending on your circumstances.

 Copy the firmware file to a micro SD card to the following path and insert it into Data Logger. The file name is the same as the model number.

/img/T2TS.bin

- 2. Insert a micro SD card into the Data Logger.
- 3. Use the 🕑 button to turn the Data Logger off.
- **4.** Press both the **S** and **W** buttons simultaneously and hold the **P** button to turn the Data Logger on.



If NEW IMAGE FILE IS LOADED appears, the firmware will be updated successfully.



Use an SD card (up to 16 GB) formatted with the FAT32 file system. Other file systems are not supported.

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.

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

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 RN17x 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 process 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=RN171&
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|

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></xml> |
|--|
| <root></root> |
| <ack>ok</ack> |
| <pre><timestamp>1501912142</timestamp></pre> |
| <pre><offset-ch1>0.6</offset-ch1></pre> |
| <pre><offset-ch2>1.3</offset-ch2></pre> |
| <sample-mode>3</sample-mode> |
| |
| |

The first two of the five tags are mandatory, whereas the remaining three tags are options, subject to change according to the server's reply.

- ack: Processing outcome (ok or error)
- timestamp: Current time of the server in UNIX timestamp format
- offset-ch1: Calibration Value of Channel 1
- offset-ch2: Calibration Value of Channel 2
- sample-mode: Measurement and Transfer Intervals.

If this tag's value is "3," the measurement interval changes to 5 minutes and the transfer interval to 20 minutes. See the following table:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-------------------------|------|-----|------|------|------|------|------|------|------|------|------|------|------|
| Measurement interval | 1 m | 1 m | 5 m | 5 m | 10 m | 10 m | 10 m | 10 m | 20 m | 30 m | 10 s | 10 s | 10 s |
| Transfer Interval | 10 m | 5 m | 20 m | 10 m | 10 m | 30 m | 20 m | 60 m | 40 m | 60 m | 10 s | 30 s | 60 s |



sample-mode Note that when setting a tag to a value greater than 10, setting measurement and transfer intervals in seconds may cause rapid battery depletion.

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&
volt=1|3.12&
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.

• volt: Battery type and current voltage.

"0" indicates two 1.5 V batteries are inserted and "1", one 3.6 V.

- 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=Timestamp|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>
```

Order List

rt this Manual Introduction Installation Operation

Order List

Data Logger

| Туре | Model No. | Compatible External Sensors |
|-----------------------|-------------|--------------------------------------|
| Temp, RH | RN400-H2PS | PR-P1-3, PR-P1-15, PR-K1-3, PR-K1-15 |
| Temp, RH, | RN400-H2FX | PR-P1-3, PR-P1-15, PR-K1-3, PR-K1-15 |
| Door | | AP-D1, AP-W1 |
| Temp | RN400-T2TS | PR-N1-20, PR-N1-150, RG20 |
| Temp, | RN400-T2FX | PR-P1-3, PR-P1-15, PR-K1-3, PR-K1-15 |
| Door | RIN400-12EA | PR-T1-3, PR-T1-15, AP-D1, AP-W1 |
| Temp | RN400-T2TS | PR-K1-3, PR-K1-15 PR-T1-3, PR-T1-15 |
| 4-20mA | RN400-T2CS | |
| Gas | RN400-T2GS | RG10-NH3, RG10-H2S |
| PM2.5 | | |
| Particulate matter | RN400-T2PM | |

Accessories

Temp Sensor

| Туре | Model No. | Cable |
|----------------------------|-----------|--------|
| PT100 | PR-P1-3 | 3 m |
| -200~200°C | PR-P1-15 | 15 m |
| Type K Thermocouple (TC-K) | PR-K1-3 | 3 m |
| -50~200°C | PR-K1-15 | 15 m |
| Type T Thermocouple (TC-T) | PR-T1-3 | 3 m |
| -200~200°C | PR-T1-15 | 15 m |
| NTC | PR-N1-20 | 20 cm |
| -100~200°C | PR-N1-150 | 150 cm |
| Temp & RH | RG20 | |

Gas Sensor

| Туре | Model No. | Cable |
|------------------|-----------|-------|
| Ammonia | RG10-NH3 | |
| Hydrogen Sulfide | RG10-H2S | |

Misc.

| Туре | Model No. | Cable |
|---------------------------------------|-----------|-------|
| Door Contact | AP-D1 | 1 m |
| Alarm Beacon | AP-W1 | 25 cm |
| DC Adapter (EMC Core sold separately) | AP-P1 | 3 m |



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