Setting up RFL100

This document is a quick guide for installation of the RFL100 Wireless Data Logger. For the complete user guide, see RFL100 Data Logger User Guide (M211861EN) available at docs.vaisala.com.

Start the installation of RFL100 by performing the appropriate setup procedure:

- If you are connecting 1 humidity or temperature probe, see Setup with 1 humidity or temperature probe.
- If you are connecting 2 temperature probes using the probe splitter accessory, see Setup with 2 temperature probes.
- If you are connecting a carbon dioxide (CO_2) probe, see Setup with CO_2 probe.

If you are unfamiliar with the way RFL100 data loggers join the VaiNet system, see How RFL100 joins a VaiNet network.

If you are installing data loggers into a system that takes advantage of VaiNet network segmentation, see Guidelines for Large VaiNet Systems (M212596EN) for important compatibility information and additional setup guidance.

CAUTION! viewLinc Enterprise Server version 5.0 or higher is required for connecting RFL100 data loggers. Setup instructions include additional firmware and hardware requirements for using RFL100 with 2 temperature probes, or a CO_2 probe. Make sure the components of your viewLinc Monitoring System are updated to the required levels.

Setup with 1 humidity or temperature probe
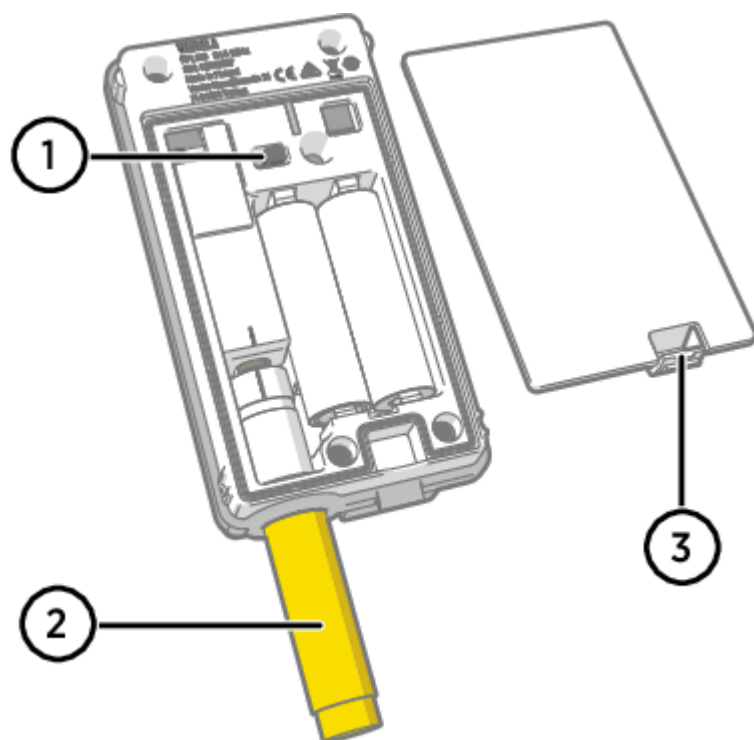
1   Power switch.
2   Transport protection cap (remove after installation)
3   Latch of the battery cover.

1. If any cable is connected to the service port of the data logger, disconnect it.
2. Open the battery cover of the data logger.
3. Make sure the power switch is in the Off position.
4. If a probe is not already connected to the data logger, connect it now:
    - To connect a probe directly to the data logger, first align the orientation mark on the probe with the line above the probe connector. Then push the probe in all the way, do not rotate.
    - To connect a probe using an extension cable, use an accessory cable that has been designed for RFL100. Insert the cable connector in the same way as a probe, and then connect the probe to the cable. Note that HMP110 and HMP110T probes must always be connected using a cable as they do not mechanically lock into the data logger when the battery cover is closed.
5. Move the power switch to the On position.
6. Close the battery cover of the data logger. **Push the latch down until you hear a click.** If the cover does not

close easily, push the probe (or extension cable) in and try again.
7. Look at the display and wait for the data logger to start up. Then verify the status:

- Data logger shows the word **NEW** on each affected channel when it detects that a probe has been changed [1]. The text is shown for a few seconds, after which the display shows the measurement reading(s).
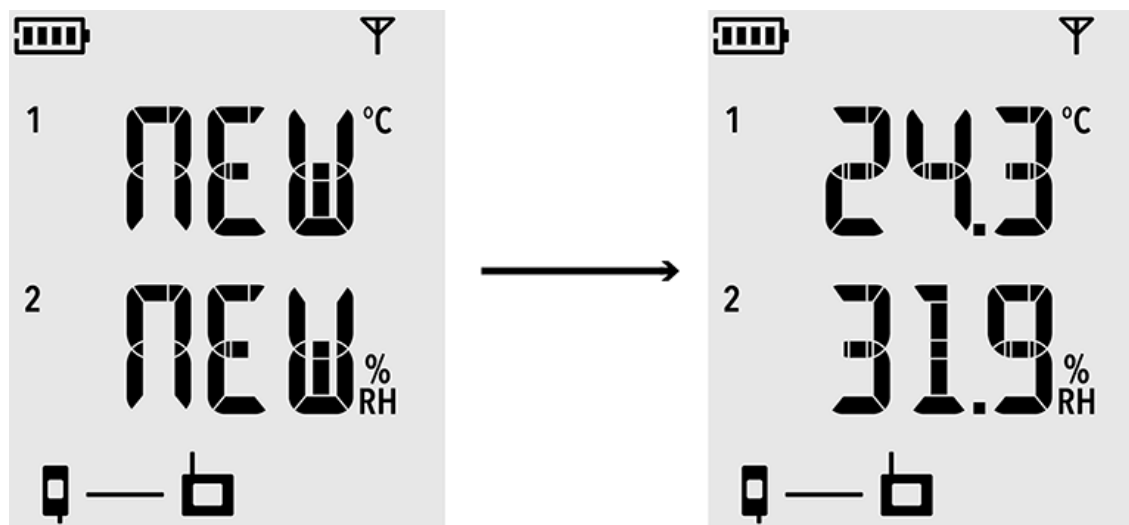
Figure 1. Detection of a new RH + T probe

- If dashes "- - -" are shown instead of measurement readings, check that the probe is properly connected. It is possible to disconnect the probe or cable by pulling it with the battery cover open.

- Battery indicator should show full batteries.

- There should be no error codes shown. If there are, see Error codes.

[1] This feature is included in RFL100 firmware version 1.2.0 and newer.

Setup with 2 temperature probes
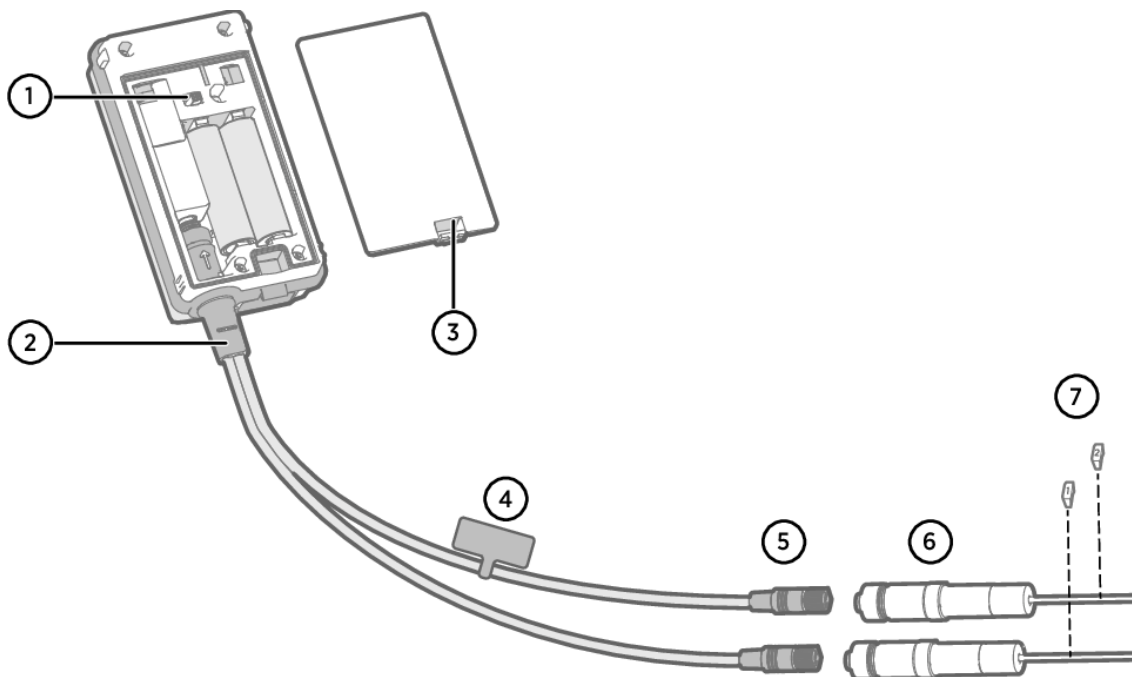
1   Power switch
2   Probe splitter
3   Latch of the battery cover
4   Instruction label with short version of this setup instruction
5   Probe connectors of the probe splitter
6   Temperature probes
7   Numbering labels for TMP115 probes (included in the probe mounting accessories)

- 2 temperature-only probes of following models: HMP110T, HMP115T and TMP115 (any combination)
- Probe splitter M8 (Vaisala item code CBL210834)
- Optional: probe extension cable(s)

CAUTION! To support operation with 2 temperature probes, the RFL100 data logger must have firmware version 1.2.0 or higher. Additionally, make sure the following components of your viewLinc Monitoring System are updated to at least the following firmware and software levels:

- AP10 firmware version 3.0
- viewLinc 5.0.2

CAUTION! You must follow the procedure below to set up RFL100 with the probe splitter. The procedure includes steps to label the probes to make it easy to identify the channel assignment later. You can also use the info mode of the RFL100 to check which probe serial number is connected to which channel.

For more information on the info mode, see *RFL100 User Guide (M211861EN)*.

1. If any cable is connected to the service port of the data logger, disconnect it.
2. Open the battery cover of the data logger.
3. Make sure the power switch is in the Off position.
4. If the probe splitter is not yet connected to the data logger, connect it:
   a. If a probe or cable is currently connected to the probe connector, pull it straight out without rotating it.
   b. Align the orientation mark on the probe splitter with the line above the probe connector. Push the probe splitter straight in all the way, do not rotate.
5. Connect the first temperature probe to the probe splitter, using an extension cable if necessary. The first connected probe will be assigned to channel 1.
6. Move the power switch to the On position.
7. Look at the display and wait for the data logger to start up. You should see the word **NEW** on channel 1 for a few seconds, after which it is replaced by the temperature reading.
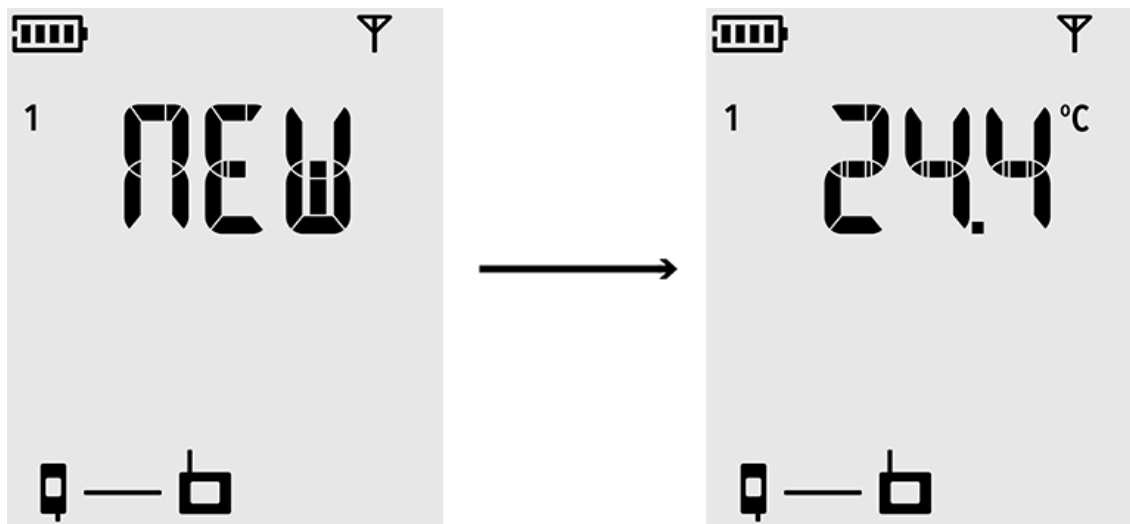
8. Attach a label with number 1 to the probe you just connected.
   If you are using TMP115 probes, use the included probe labels. Connect the label to the thin cable between the probe body and the sensor tip.
9. Move the power switch to the Off position.
10. Connect the second temperature probe to the probe splitter, using an extension cable if necessary.
11. Move the power switch to the On position.
12. Look at the display and wait for the data logger to start up. You should see the word **NEW** on channel 2 for a few seconds, after which it is replaced by the temperature reading.
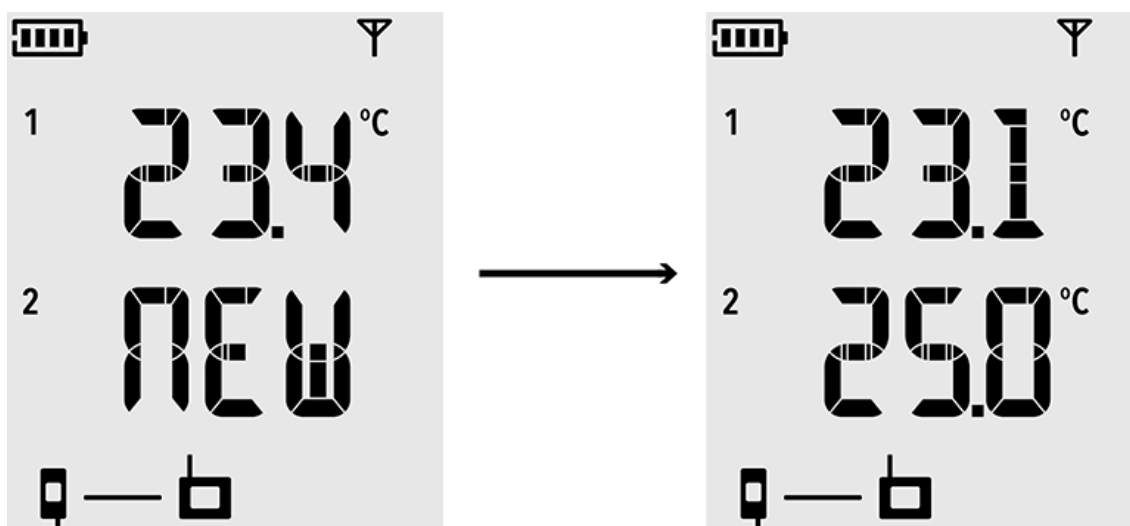

13. Attach a label with number 2 to the probe you just connected.
14. Look at the display:
    - If dashes "- - -" are shown instead of measurement readings, check that the probe and probe splitter are properly connected. It is possible to disconnect the probe splitter accidentally by pulling it with the battery cover open.

    - Battery indicator should show full batteries 🔋.

    - There should be no error codes shown. If there are, see Error codes.
15. Close the battery cover of the data logger. **Push the latch down until you hear a click.** If the cover does not close easily, push the probe splitter in and try again.

   Once the data logger has been set up for 2 temperature probes using the probe splitter, it requires a factory reset before it can be set up for one-probe mode or operation with a CO_2 probe.

   For the factory reset procedure, see *RFL100 User Guide (M211861EN)*.

Setup with CO_2 probe
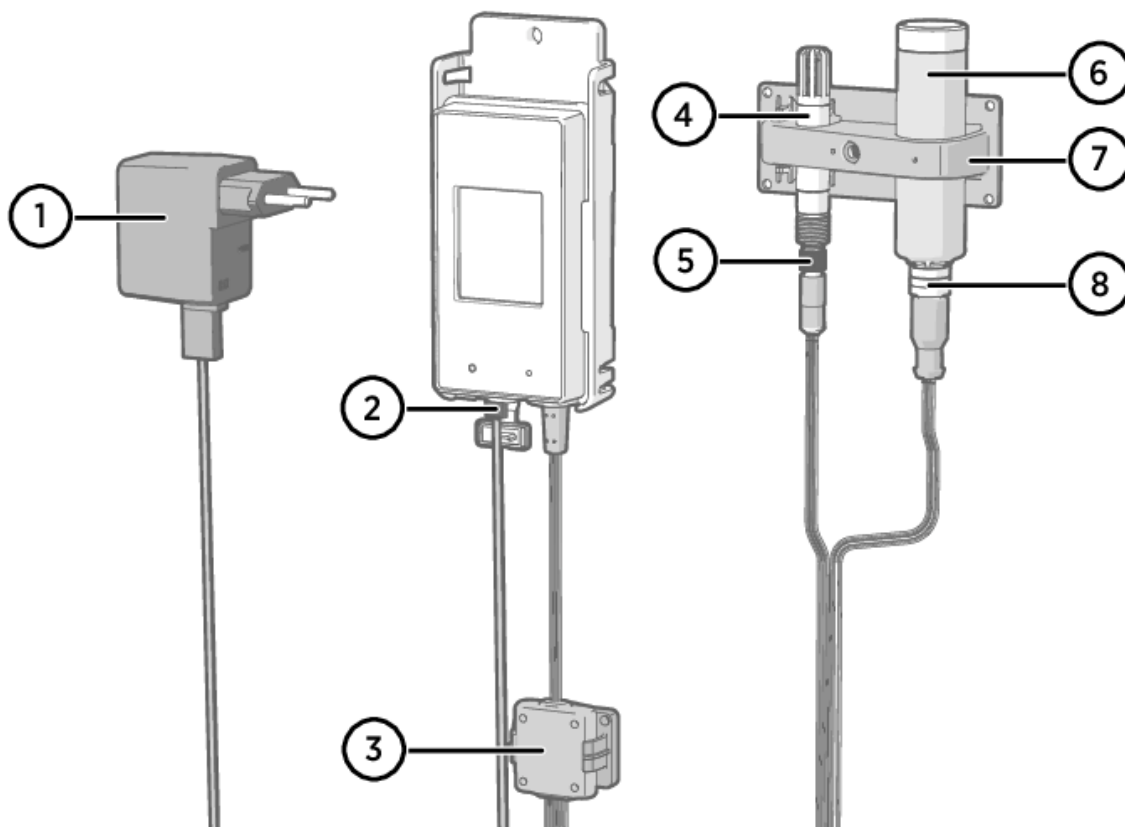
1   DC power supply with micro-USB connector
2   Power supply connection to service port
3   Electronics housing of the Probe Splitter M8/M12 accessory and its magnetic holder
4   Humidity or temperature probe
5   M8 connector of the probe splitter
6   GMP251 CO_2 probe
7   Probe support accessory
8   M12 connector of the probe splitter

- GMP251 CO_2 probe
- Probe splitter M8/M12 (item code CBL211050)
- DC power supply with micro-USB connector
- Optional: any supported humidity or temperature probe
- Optional: probe extension cable(s)

> **CAUTION!** To support operation with a CO_2 probe, the RFL100 data logger must have firmware version 1.4.0 or higher, and must be manufactured after July 2021. Additionally, make sure all AP10 access points at the location of use have firmware version 4.0.0.

External power supply is a requirement for operating the data logger with a CO_2 probe. Batteries are used as a backup power source if the external power fails. Lithium batteries are recommended as they provide a longer backup time, but even with lithium batteries the operation time is limited in CO_2 mode (typically at least 12 hours). The data logger will show the error code **Err 106** if it operates in CO_2 mode without a power supply.

1. If any cable is connected to the service port of the data logger, disconnect it.
2. Open the battery cover of the data logger.
3. Make sure the power switch is in the Off position.
4. Verify that the data logger has lithium batteries (type FR6) inserted. Replace the batteries if necessary.
5. If the probe splitter M8/M12 is not yet connected to the data logger, connect it now:
    a. If a probe or cable is currently connected to the probe connector, pull it straight out without rotating it.
    b. Align the orientation mark on the probe splitter with the line above the probe connector. Push the probe splitter straight in all the way, do not rotate.

You can also use a probe extension cable between the data logger and the probe splitter.

6. Connect the CO_2 probe to the M12 connector of the probe splitter, using a suitable extension cable if necessary.
7. Optional: connect the temperature or humidity probe to the M8 connector of the probe splitter, using a suitable extension cable if necessary. If you do not connect a probe to the M8 connector, make sure the connector is not inserted inside an incubator, for example.
8. Connect the micro-USB connector of the power supply to the service port of the data logger, and connect the power supply to a wall socket.
9. Move the power switch to the On position.
10. Look at the display and wait for the data logger to start up. The word **NEW** is shown for channels where a new probe has been connected. Note that the CO_2 probe is always connected on channel 3.
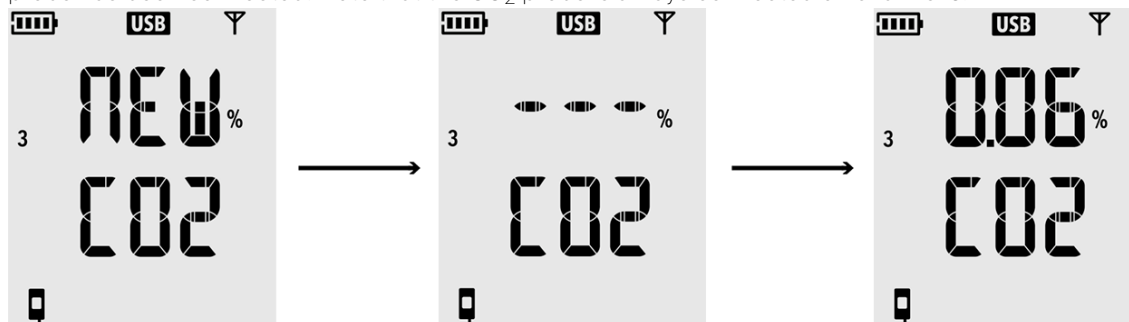
CO_2 measurement shows dashes "- - -" while waiting for the CO_2 probe to warm up. If dashes are not replaced by measurement readings within 30 seconds, check that the probe(s) and probe splitter are properly connected. It is possible to disconnect the probe splitter accidentally by pulling it with the battery cover open.

11. Check that:

    ○ Battery indicator shows full batteries ▚▚▚.

    ○ There are no error codes shown. If there are, see Error codes.
12. Close the battery cover of the data logger. **Push the latch down until you hear a click.** If the cover does not close easily, push the probe splitter in and try again.

    Once the data logger has been set up in CO_2 probe mode, it requires a factory reset to allow it to be set up for non-CO_2 operation. For the factory reset procedure, see *RFL100 User Guide (M211861EN)*.
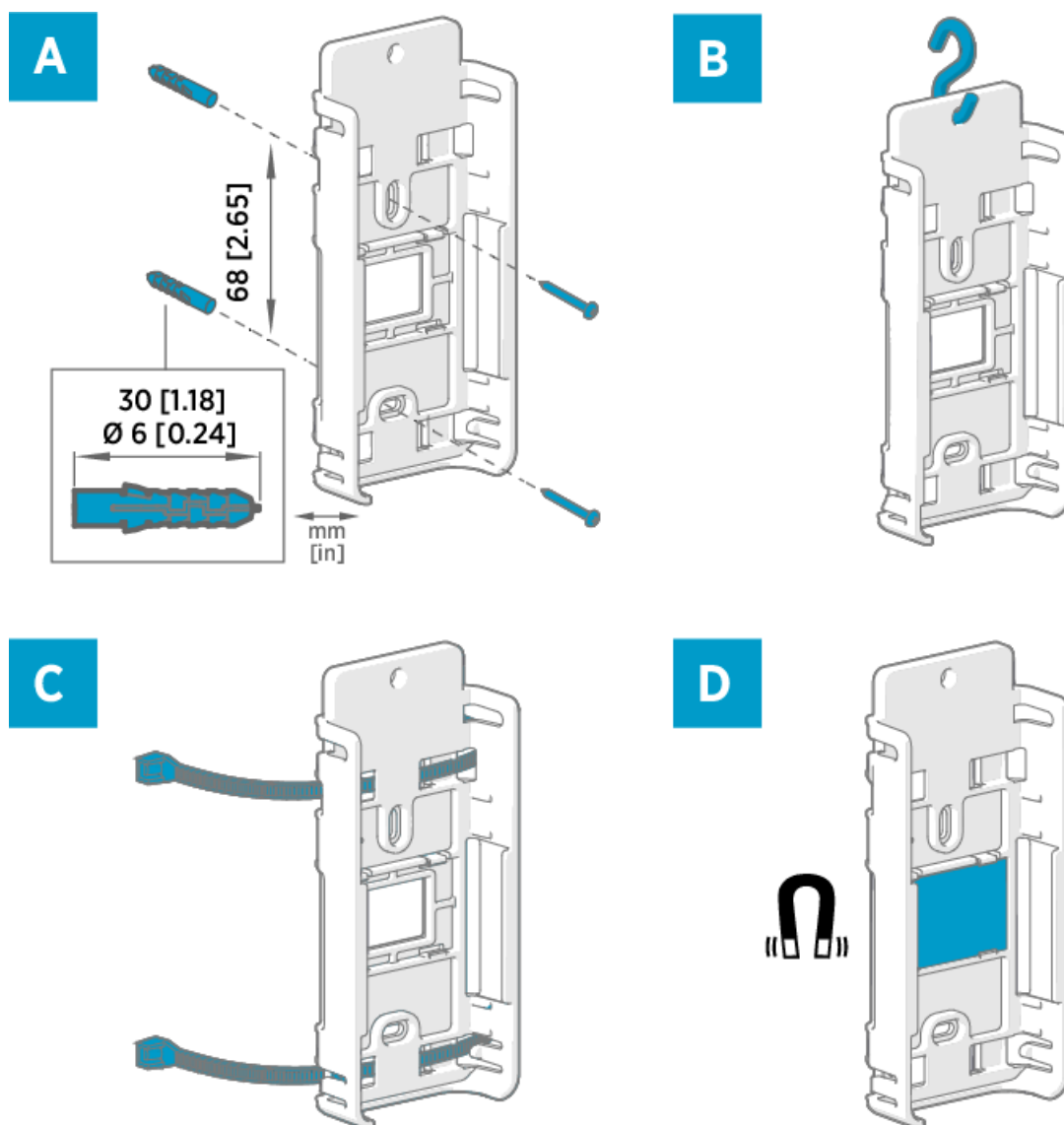
Mounting RFL100

Figure 1. RFL100 mounting methods

A   Mounting with screws. Screws and wall plugs are included with the data logger.
B   Mounting with a hook (hook not included)
C   Mounting with cable ties. Cable ties are included with the data logger.
D   Magnetic mounting (with optional magnetic mounting bracket)

1. Select a suitable mounting location. A good location is easily accessible, protected from water and condensation, and remains within the operating temperature range of RFL100:
   - +2 ... +60 °C (+35.6 ... +140 °F) with alkaline batteries
   - −20 ... +60 °C (−4 ... +140 °F) with lithium batteries

     If you need to measure a wider temperature range, use a HMP110 or TMP115 probe and connect it using an extension cable. This way you can leave the data logger in an environment that is suitable to its specification.

2. Attach the mounting bracket using one of the mounting methods shown in Figure 1. Orient the bracket vertically so that the probe or extension cable points down after installation. Do not attach RFL100 without the mounting bracket.

   > **CAUTION!** If you are mounting the data logger higher than 2 m (6 ft) or in a location where it would pose a hazard if dropped, ensure the mounting bracket is securely fixed with screws or cable ties.

3. Slide the logger into the mounting bracket from the top, with the probe or cable pointing downward.
4. Peel off the protective film from the display and remove the yellow transport protection cap from the probe.

5. If the probe(s) are connected using an extension cable or a probe splitter, mount the probes in the desired measurement locations and secure the cable(s) using the included accessories.
6. Recommended: Apply location labels to the mounting bracket and RFL100 according to your installation plan and company policy.

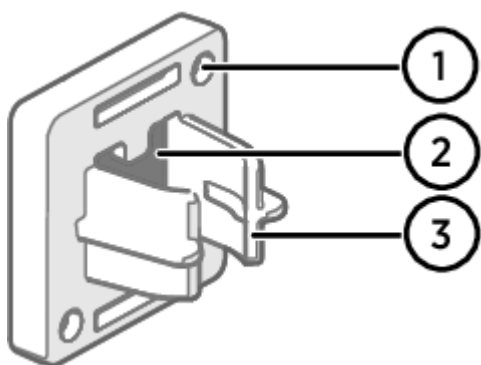## Mounting probes

### Probe holder ASM213382

Figure 1. Probe holder ASM213382

1   Holes for attaching the holder with screws (screws not included)
2   Magnet
3   Probe attachment

The probe holder is a versatile mounting accessory for securing Ø 12 mm diameter cable mounted probes.

One probe holder is included in the RFL100 data logger package for each applicable cable mounted probe. Additional probe holders are available as an accessory (Vaisala item ASM213382SP, includes 5 probe holders).

Figure 2. HMP110 probe in the probe holder

To attach the probe, simply press the body of the probe into the probe attachment. HMP115 and TMP115 probes have a groove that locks the probe in the holder when it is centered in the probe attachment.
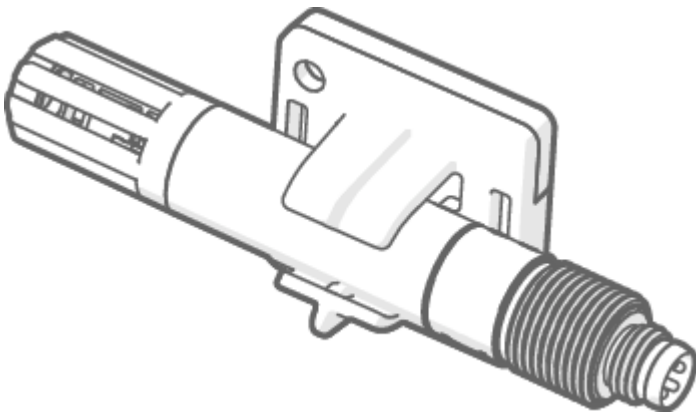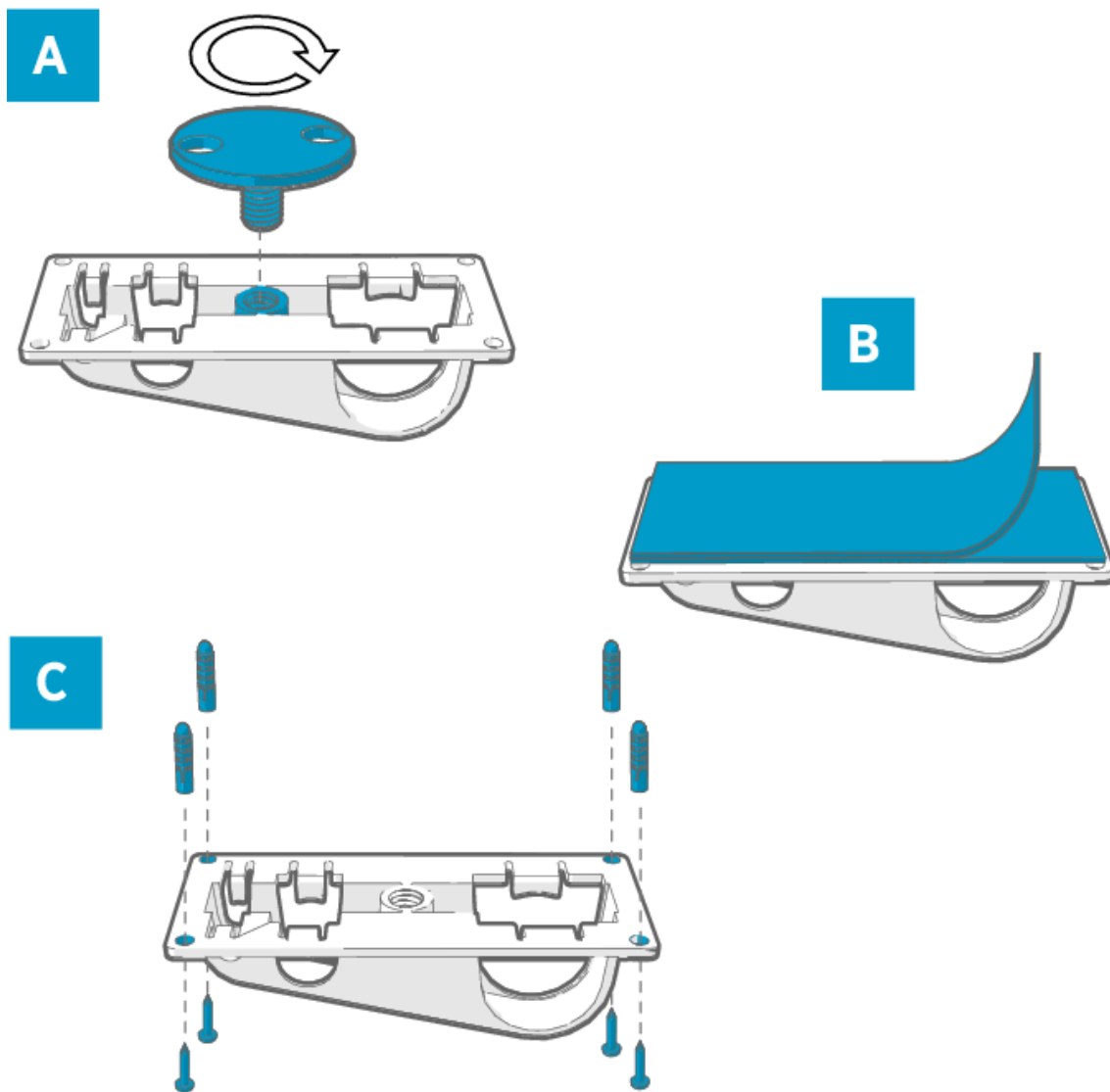

Probe support accessory

Figure 1. Probe support accessory mounting options.

When the data logger is purchased with a GMP251 CO$_2$ measurement probe, a CO$_2$ probe mounting kit (Vaisala item ASM214253SP) is included. The kit includes a versatile probe support accessory that has attachments for GMP251, a Ø 12 mm probe, and the sensor tip of the TMP115 probe. It also provides sufficient separation between the probes to prevent the mild heating effect of the GMP251 from affecting the measurement of the other probe. For this reason, it is best not to attach the GMP251 to a second probe using a cable tie, for example.

A   Mounting through a hole using the screw-on attachment part.
B   Mounting using a reusable fastener strip. Clean the attachment surfaces using the included cleaning pad before applying the strip.
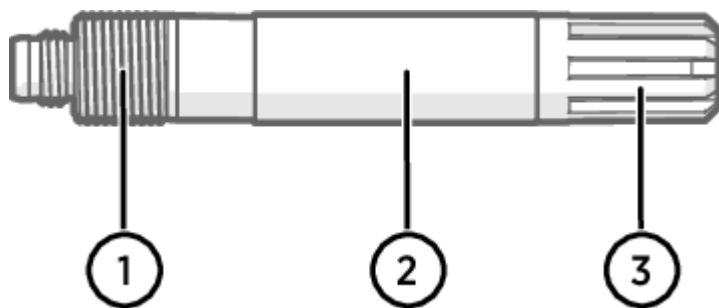C   Mounting with screws and wall plugs.

Mounting HMP110 probes

Figure 1. HMP110 probe.

HMP110 is a robust stainless steel probe for humidity and temperature measurement in demanding conditions. Suitable for measurement inside chambers, fridges, and freezers in temperature range -40 ... +80 °C (-40 ... +176 °F). Must be connected using a cable, as the probe is not designed to be integrated with RFL100 housing. Probe diameter 12 mm (0.47 in).

1   M12×1 thread for through-wall installation using mounting nuts.
2   Attach from this area using probe holder ASM213382 or cable tie.
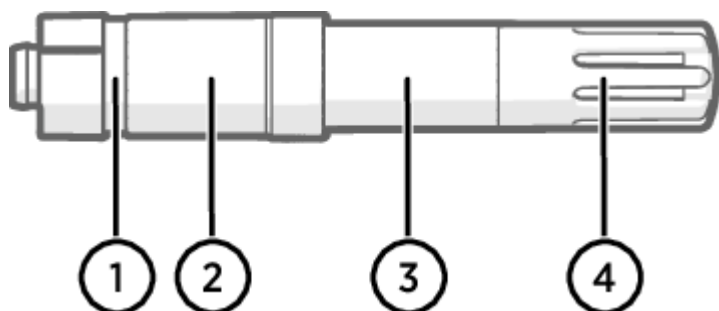3   Sensor protection filter. Do not attach from this area.

Mounting HMP115 probes

Figure 1. HMP115 probe.

HMP115 is a general purpose humidity and temperature measurement probe. It is designed to be integrated with the RFL100 housing for minimum footprint, but can be connected using a cable as well. Operating temperature range –40 ... +60 °C (–40 ... +140 °F).

1   If using a probe holder, align it to this groove.
2   Plastic sleeve that locks the probe in place when integrated with RFL100. Diameter 14 mm (0.55 in) at this point.
3   Attach from this area if using a cable tie. Diameter 12 mm (0.47 in) at this point.
4   Sensor protection filter. Do not attach from this area.
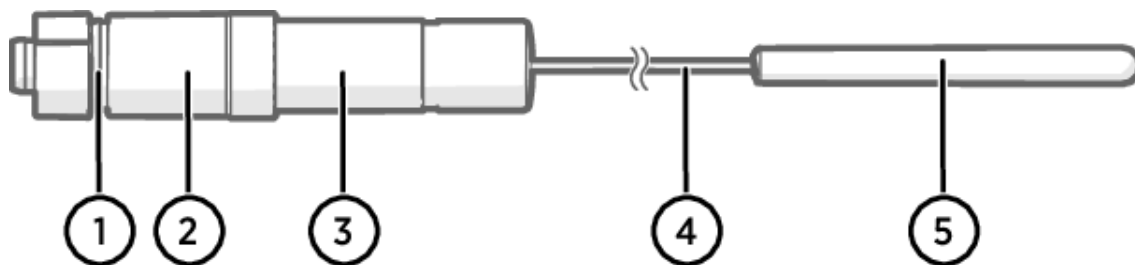
Mounting TMP115 probes

Figure 1. TMP115 probe.

TMP115 is a wide-range temperature-only probe for measurement in extreme conditions. The probe body can be integrated with RFL100 or connected using a cable. The sensor tip is permanently connected to the probe body with a thin cable. Available as 50 cm (1 ft 7.7 in) and 3 m (9.8 ft) long versions.

1 If using a probe holder, align it to this groove.
2 Plastic sleeve that locks the probe body in place when integrated with RFL100. Diameter 14 mm (0.55 in) at this point.
3 Probe body with measurement electronics. Attach from this area if using a cable tie. Diameter 12 mm (0.47 in) at this point. Operating temperature range −40 ... +60 °C (−40 ... +140 °F).
4 Sensor cable. Do not cut or bend into a tight loop. Numbering labels included with the probe splitter accessory are designed to be attached to this cable.
5 Sensor tip, diameter 4.8 mm (0.19 in). Secure using a cable tie or insert into thermal dampener block for added thermal mass. Insert into the probe support accessory when using together with a CO_2 probe. Operating temperature range −196 ... +90 °C (−320.8 ... +194 °F).

> **CAUTION!** The operating temperature range of the sensor tip is much wider than that of the probe body. Leave the probe body outside the measured environment if possible, and avoid inserting it in environments that are outside its operating range.

> When working with equipment in extremely cold temperatures, use appropriate personal protective equipment such as thermally insulated gloves and clothing. Wear protective eyewear if working with coolants such as liquid nitrogen, and observe safe handling and storage precautions.
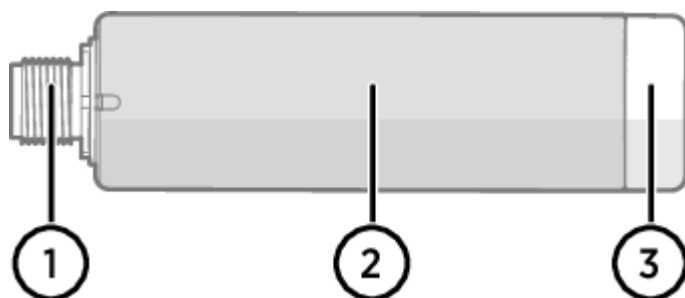
Mounting GMP251 probes

Figure 1. GMP251 probe.

GMP251 is a robust carbon dioxide (CO_2) measurement probe for use in demanding applications such as life science incubators. Operating temperature range −40 ... +60 °C (−40 ... +140 °F).

1 M12 5-pin male connector. Must be connected to the M12 connector of the Probe Splitter M8/M12 accessory.
2 Ø 25 mm probe body.
2 Sensor protection filter. Do not attach from this area.

Connection indicators

Table 1. Symbols

Symbol	Description	Symbol	Description
	Data logger	—	Connection OK
	Access point		Connection currently unavailable
	viewLinc Enterprise Server		

Table 2. Connection states

Symbols on display	Description
	Data logger is searching for an access point.
	Data logger has failed to find an access point that is in installation mode. viewLinc server icon is not shown, as the data logger has not been accepted to a viewLinc system yet.
	The data logger has failed to connect to an access point that belongs to its own network.
	Data logger is successfully connected to an access point, but there is no connection between the access point and viewLinc server. Data logger has not been accepted to a viewLinc system yet.
	Data logger is successfully connected to an access point, but there is no connection between the access point and viewLinc server. Data logger has been accepted to a viewLinc system.
	Data logger is successfully connected to an access point, and connection between the access point and viewLinc server is also OK. The viewLinc symbol is flashing to indicate that the data logger is waiting to be accepted to the viewLinc system as a new device.
	Data logger is successfully connected to an access point, and connection between the access point and viewLinc server is also OK. Data logger has been accepted to the viewLinc system.

RFL100 overview

Vaisala RFL100 data logger is a wireless, battery powered data logger. It supports several types of Vaisala probes for measurement of humidity, temperature, and carbon dioxide (CO_2). RFL100 is intended as a data collection point in a Vaisala viewLinc Monitoring System.
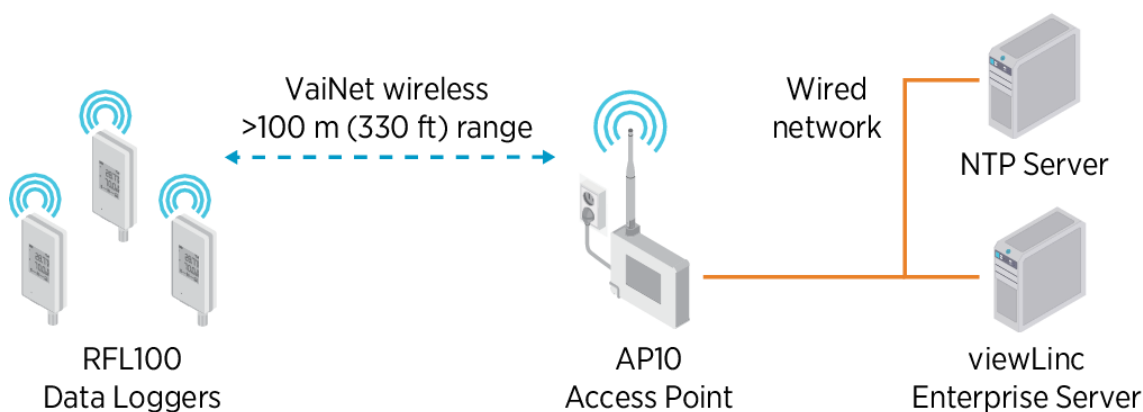

Figure 1. Connecting RFL100 to the viewLinc Monitoring System

The wireless connection of RFL100 requires a Vaisala AP10 access point. A single AP10 can connect up to 32 loggers to the viewLinc Monitoring System. In a typical indoor space, install the AP10 within 100 meters (328 ft) of the RFL100. In an open space with line-of-sight and no interfering structures, the range can be over 500 m (1640 ft).

RFL100 is optimized for low power operation. It reads the probe once a minute, and transmits measurement data to the access point every 4 minutes. Because the radio link is not continuous, remote management actions and system joining status may take some time to be updated on the display of the data logger.

> Before you start installing RFL100 data loggers, install viewLinc Enterprise Server and one or more AP10 access points within range of RFL100. This way RFL100 can immediately join your system.
>
> For more information on viewLinc Monitoring System installation, see the *viewLinc Setup Guide* and *viewLinc User Guide* for your viewLinc Enterprise Server version.

RFL100 models and radio compatibility

There are several models of the RFL100 data logger. The models differ from each other by the implementation of the wireless connection and its operating frequency band. Only use a model that is approved for use in your country. You can verify the model and operating frequency of the RFL100 from its type label.

The RFL100 can only connect to an AP10 access point if its wireless model is compatible. For example, the AP10E model that operates on the 868 MHz frequency band will only connect 868 MHz models of the RFL100 data logger.

How RFL100 joins a VaiNet network

1. When you switch on an RFL100 data logger that is not connected to a VaiNet network, it turns on its radio and scans for VaiNet access points that are in **installation mode** and have **available capacity**. This means you must first install the necessary access point(s) and make sure they are in installation mode.

   > RFL100 will turn off its radio and try again later if there are no access points that meet the criteria. This can add a long joining delay as the retry interval becomes longer with repeated attempts, up to a maximum of 8 h 30 min.

2. After determining there is at least 1 access point that can be joined, the RFL100 connects to the access point with the **best signal strength**.

   This initial connection also determines the **VaiNet segment** of the RFL100, as the segment of its first connecting access point becomes its home segment. A data logger will not leave its home segment unless it is released from the network.

Support for VaiNet network segments was added in AP10 access point firmware version 5.0.0. If your access points are using an earlier firmware version, your VaiNet network does not have segments.

RFL100 data loggers with firmware earlier than 1.8.0 can only join access points in the default A segment, and cannot join segments B–D.

3. The connected RFL100 comes up in the connected viewLinc system as a new device. No measurement data is transferred and stored until the RFL100 is **accepted** into the system by a viewLinc administrator. If the RFL100 has been previously accepted and is now joining again, this step is skipped.
4. If the RFL100 is rejected, it clears its VaiNet home segment information and starts the joining process from the beginning by scanning for access points to join.

RFL100 parts
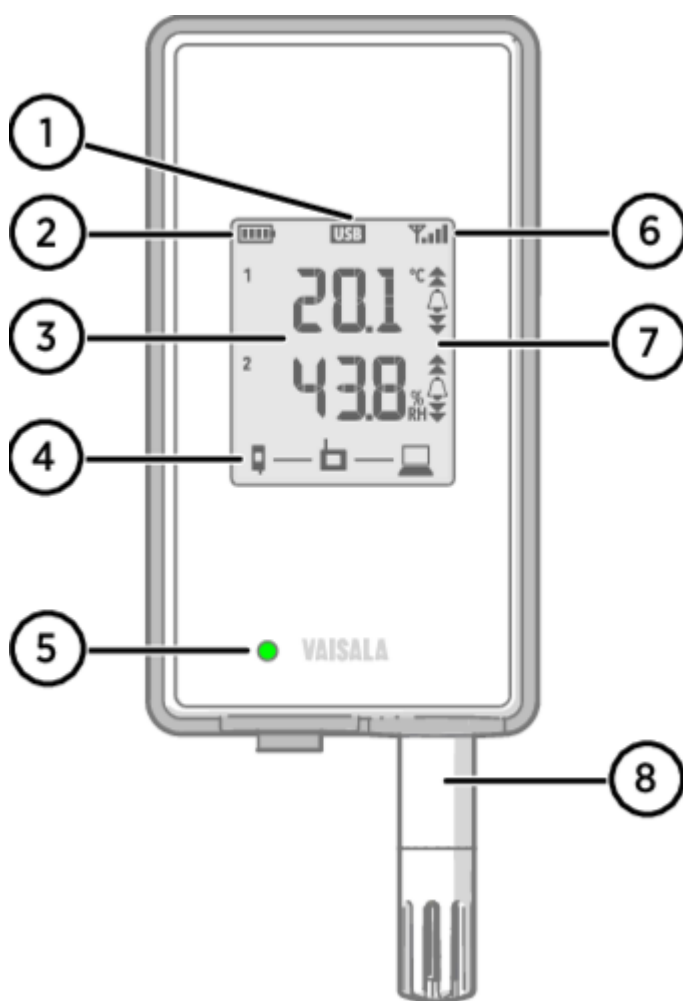
Figure 1. Front and display

1	Service port connection indicator
2	Battery level indicator
3	Currently measured values
4	Connection indicators
5	Status LED. Blinks green for normal operation, red for error or alarm.
6	Signal strength of access point connection
7	Alarm indicators. Alarms are configured in viewLinc Enterprise Server software.
8	Detachable probe, or extension cable
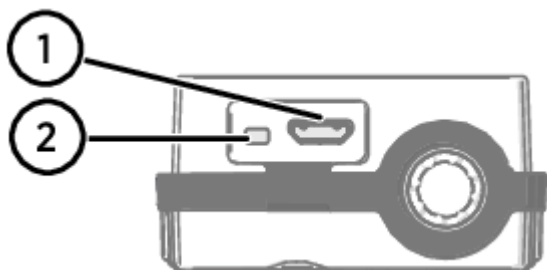
Figure 2. Under the silicone plug

1   Service port (micro-USB). If using external power supply, connect it here.
2   Info button. Push to enable info mode for 1 hour, and again to end the info mode. Info mode cycles through information screens, and also enables faster wireless scanning.

> See *RFL100 User Guide (M211861EN)* for more information on service port and info mode.
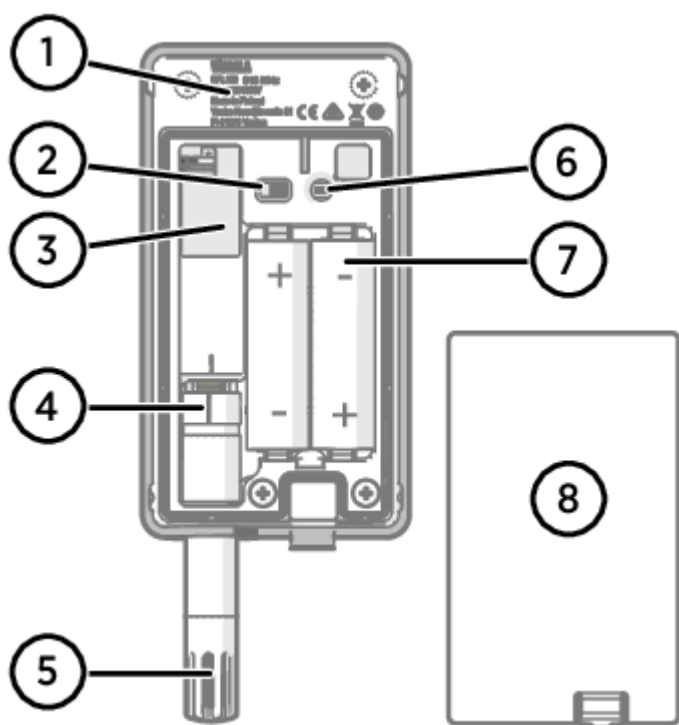
Figure 3. Rear and inside

1   Type label
2   On/off switch
3   Clock battery
4   Probe orientation mark. When connecting the probe, line up the markings on the probe and above the connector before pushing the probe to the connector.
5   Humidity and/or temperature sensors under the filter
6   Release button. Push to release RFL100 from its current viewLinc system, and allow it to connect to any viewLinc system.
7   Main batteries. Use only non-rechargeable, AA size, 1.5 V alkaline (LR6) or lithium (FR6) batteries.
8   Battery cover

Figure 4. Mounting bracket

1   6 mm (0.23 in) hole for hook mounting
2   Holes for mounting with cable ties
3   Strong magnet (in magnetic mounting bracket only). **Handle with care.**
4   Suitable area for attaching labels
5   3.80 mm (0.15 in) holes for screw mounting

RFL100 batteries

Main batteries

RFL100 data logger is powered by 2 AA size primary (non-rechargeable) batteries with 1.5 V nominal voltage. Starting the data logger always requires that compatible batteries with sufficient voltage are in place, even if external power is supplied through the service port.

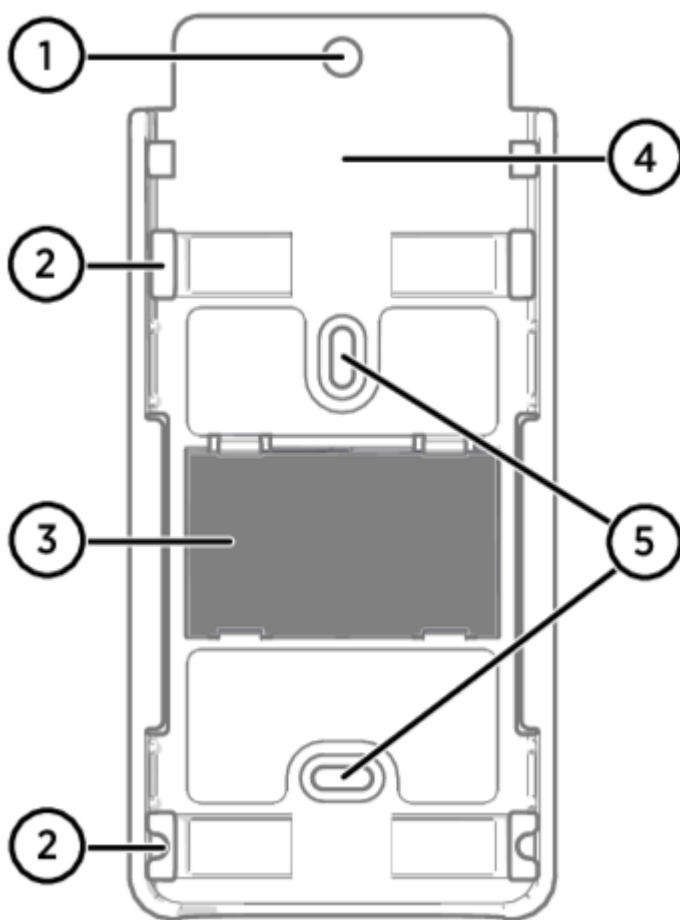When replacing batteries, always use new batteries, not partially discharged ones. Minimum battery voltage for operation is 2.15 V in series.

Compatible battery types are:

- 1.5 V alkaline batteries, designation IEC-LR6, ANSI 15A. Standard choice for most humidity and temperature measurement applications.

- 1.5 V lithium batteries, designation IEC-FR14505 (FR6), ANSI 15-LF. Typically higher capacity and better in cold temperatures. Recommended for CO_2 measurement as lithium batteries provide a longer battery backup time if external power becomes unavailable.

> **CAUTION!** Do not use batteries with a nominal voltage higher than 1.5 V.

Use of rechargeable batteries is not recommended. RFL100 will not charge batteries even if the service port is connected to a power supply.

Clock battery

RFL100 also has a separate 3 V lithium battery (type CR1/3N button cell) to keep the real-time clock powered when the device is switched off. This battery is good for 10 years, and should only be replaced if the data logger display shows the low clock battery error code **Err 200**.

Error codes

Table 1. RFL100 error codes

Error code	Cause	Recommended action
Err 100	User parameter bank checksum failure.	Power cycle the data logger. If the error persists, contact Vaisala.
Err 101	Factory parameter bank checksum failure.	
Err 102	Real-time clock of the data logger has lost accurate time.	Restore the wireless connection to an AP10 access point. RFL100 will synchronize its clock with the time from the access point.
Err 103	Main battery voltage is critically low. When this error appears, the data logger will soon stop radio communication to conserve energy. It will continue to record measurement data in the local memory as long as possible.	Replace the main batteries of the data logger.
Err 103	External power supply is connected but the power switch of the data logger is in the **Off** position.	Move the power switch to the **On** position. Note that it will take some time for the error to clear if the data logger remains continuously powered.
Err 104	Incorrect factory configuration parameters.	Power cycle the data logger. If the error persists, contact Vaisala.
Err 105	Real-time clock hardware error.	
Err 106	Data logger is operating in CO_2 mode without external power.	Connect an external power supply to the service port of the data logger to avoid draining the batteries.
Err 110	If using 1 probe with the data logger: • No probe connected at startup • Incompatible probe detected • Trying to switch from 2-probe mode to 1-probe mode without performing a factory reset	1. Verify that a compatible probe is connected to the data logger. 2. Power cycle the data logger to re-detect the probe. 3. If the error persists, it is likely that the data logger has been set up in 2-probe mode. Perform the factory reset procedure to allow 1-probe use again, then power cycle the logger to re-detect the probe.
Err 110	If using 2 temperature probes with the probe splitter: • No probes connected at startup • Two probes connected at same time without following proper setup or probe swap procedure • Data logger is in 2-probe mode but 1 probe is missing • Unsupported probe combination • At least 1 incompatible probe detected	1. Verify that that probe splitter and 2 supported temperature-only probes are connected to the data logger. 2. If you reconnected any probes, power cycle the data logger to re-detect the probe(s). 3. If the error persists, perform the 2-probe setup again.
Err 200	Real-time clock battery voltage is low.	Replace the clock battery.
Err 202	Communication failure with at least 1 probe that was detected at startup.	1. Check that the probe(s) are connected properly. 2. If you reconnected any probes, wait 1 minute for the display to update and verify that the error is gone. 3. If the error persists, power cycle the data logger to re-detect the probe(s).
Err 203	Probe error. Can be caused by probe damage or a wet humidity sensor.	Inspect the probe and replace it if necessary. If the error has been caused by a wet humidity sensor, wait for it to dry out.

Error code	Cause	Recommended action
Err 204	Real-time clock temperature compensation problem.	If error code **Err 200** is also active, replace the clock battery. If the error persists, contact Vaisala.

Installation safety specification

Table 1. RFL100 installation safety specification

Property	Specification
Operating environment	Indoor use
For use in wet locations	No
Operating humidity	0–100 %RH, non-condensing
Operating altitude	Max. 2000 m (6500 ft)
IP rating	IP54: Limited protection against dust. Protected from water splashes from any direction.
IP rating with external power supply	IP20: Protected against solid foreign objects of 12.5 mm Ø and greater.
Pollution degree	2
Frequency band	See type label on device
Batteries	2 × AA sized, 1.5 V (LR6 or FR6)
Supply voltage from external power supply	5 V DC
Power consumption	Max. 1 W
Operating temperature [1]	
with alkaline batteries	+2 ... +60 °C (+35.6 ... +140 °F)
with lithium batteries	−20 ... +60 °C (−4 ... +140 °F)
with external power supply	0 ... +60 °C (+32 ... +140 °F)

[1] Verify operating temperature specification when using batteries and power supplies not supplied by Vaisala.

Maintenance and calibration services

Vaisala offers comprehensive customer care throughout the life cycle of our measurement instruments and systems. Our factory services are provided worldwide with fast deliveries. For more information, see www.vaisala.com/calibration.

- Vaisala Online Store at store.vaisala.com is available for most countries. You can browse the offering by product model and order the right accessories, spare parts, or maintenance and calibration services.

- To contact your local maintenance and calibration expert, see www.vaisala.com/contactus.

Technical support

Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information as applicable:

- Product name, model, and serial number
- Software/Firmware version
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see www.vaisala.com/support.

Warranty

For standard warranty terms and conditions, see www.vaisala.com/warranty.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Recycling

When preparing to recycle the data logger, open the battery cover and remove the main batteries and the clock battery.

> Recycle all applicable material according to local regulations.