RT - Room transmitter

User Guide

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Contents

1 Introduction

RT transmitters are versatile room temperature and CO_2 transmitters for simple measuring applications in building automation.

The transmitters can be equipped with following options:

- relative humidity measurement (-RH models)
- Modbus communication (-MOD models)

The -MOD models have Modbus RTU communication via the RS-485 connection.

> **Note:** -MOD models don't include any other outputs.

The device commissioning is done by using MyProdual® smartphone application and MyTool® Connect commissioning tool. Some of the basic settings can be also configured via bus in -MOD models.

1.1 About this user guide

This user guide contains important information about the installation, wiring, configuration and use of the product. Read this guide carefully before you install the product, connect the wires, or operate the product. Make sure that you fully understand all instructions before you start work. If you are not sure what the instructions mean, contact the seller or the manufacturer.

Follow all instructions in this user guide carefully. Always obey the applicable local rules and regulations.

The original instructions were written in English. If there are differences between the English instructions and the translations, refer to the English instructions.

If you find a mistake in the English instructions or in the translations, please send the details to the manufacturer.

1.2 Intended use

Versatile RT room transmitters are intended to be used for measuring temperature, humidity and CO_2 in room environment.

These transmitters are intended to be connected to building automation systems in the HVAC/R industry.

2 Safety precautions

The product is developed, manufactured and tested according to high quality standards. However, instructions for safe use shall be taken account when installing, using or disposing the product or parts of product.

Read this user guide carefully before commissioning, using or servicing this device. To avoid any kind of damage to people or property, follow the instructions carefully. Produal is not liable for any hazards or damages to people or property which are caused by ignoring the using or installation instructions.

To avoid electrical shock or damage to equipment, disconnect power before installing or servicing the product. Use only a proper wiring rated for the full operating voltage and maximum current in the system even in the event of a fault.

To avoid potential fire and/or explosion, do not use the product in potentially flammable or explosive atmosphere.

The product condition must be checked before installation. Do not drop the product or use excessive force during installation. Do not use the product if any damages are visible.

After installation the product will be part of a system whose specifications and performance characteristics are not designed or controlled by Produal. Refer to national and local authorities to ensure that the installation is functional and safe.

The product should only be used in professionally designed applications. Unauthorised modifications are not allowed. The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or property.

In this document, there are different kind of warnings and notes. The warning and note types are defined in the following table.

Sign		Description
⚠️	WARNING:	The warning symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠️	CAUTION:	The caution symbol indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
❗	Important:	The important symbol indicates a potentially hazardous situation which, if not avoided, could result in damage to the device or property.
❗	Note:	The note symbol indicates a useful tip or a recommended way to complete a task. These notes also provide information that is useful but not critical to the user.

3 Main components
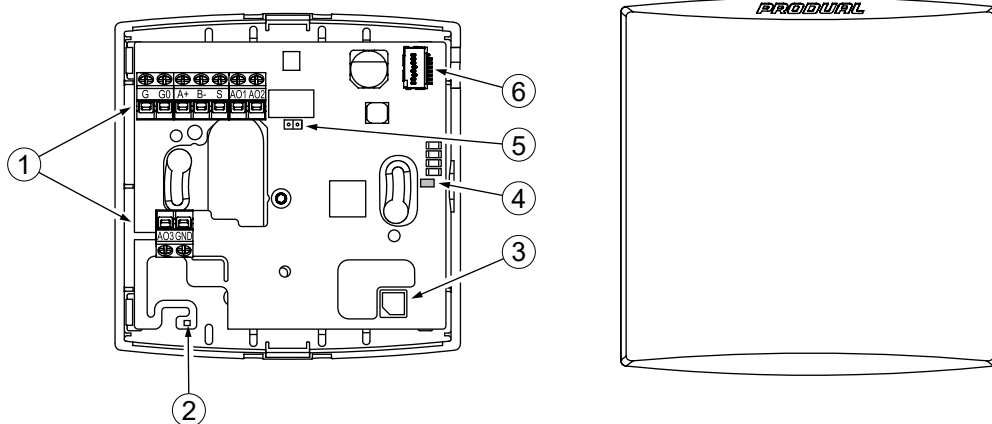
1	Terminal block	2	Temperature sensor / Temperature and humidity sensor (-RH models)
3	CO_2 sensor	4	Communication indicator light (-MOD models)
5	Modbus termination jumper (-MOD models)	6	MyTool® Connect connector

4 Functional description

4.1 Multifunctional outputs

The device has three configurable outputs. The outputs can be configured for the following purposes:

- analogue measurement output (freely scalable inside 0...10 Vdc)
- two-state output (e.g. 0/10 Vdc)
- control the output via communication bus

You can use the two-state output for a simple thermostat type control by setting the wanted measurement value contact settings and selecting the measurement contact to control the output.

Configuration can be done via communication bus or by using MyTool® Connect and MyProdual®.

4.2 Indicator lights

The -MOD models have an indicator light on the circuit board. The indicator light can be set for following functions:

- off
- data transmit indication
- data receiving indication
- data transmit and receiving indication

⚠️ **CAUTION:** When the power supply is connected, be extra careful when handling the product without the cover.

5 Commissioning

5.1 Mounting room transmitters

The device can be installed in dry surroundings (IP20) by screws on the wall surface or on the standard flush mounting box. The recommended installation height is 150...180 cm.

The device position should be selected carefully. All the error factors that can affect to the measurements should be eliminated as well as possible. The following list defines the typical measurement error factors.

- direct sun light
- occupant proximity
- air flow coming from windows or doors
- air flow coming from ventilation nozzles
- air flow coming from the flush mounting box
- differential temperature caused by external wall

5.2 Wiring

WARNING: Device wiring and commissioning can only be carried out by qualified professionals. Always make the device wirings in de-energised electricity network.

WARNING: External power sources and power wiring must be protected with a fuse or circuit breaker. Rating depends on the overall system load, but the maximum rating for the external circuit breaker is 16 A (limited by internal structure of the product).

WARNING: The minimum power rating for the external power source must be 170 VA / 170 W to ensure proper operation of the internal fusing of the product in case of a failure condition. Otherwise, the overall system power consumption shall be less than 15 W also in the failure condition.

WARNING: This product is appliance class III product according to IEC 60664-1. The product may only be connected to SELV (separated extra low voltage) electricity network.
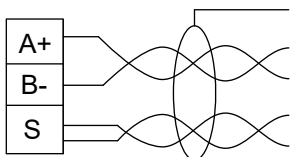
Important: This product has no capability to detect an abnormal condition of output ports. External supervising (automated/human) may be needed depending on the application where this product is used.

CAUTION: The product may only be connected to overvoltage category I, II or III electricity network according to IEC 60664-1.
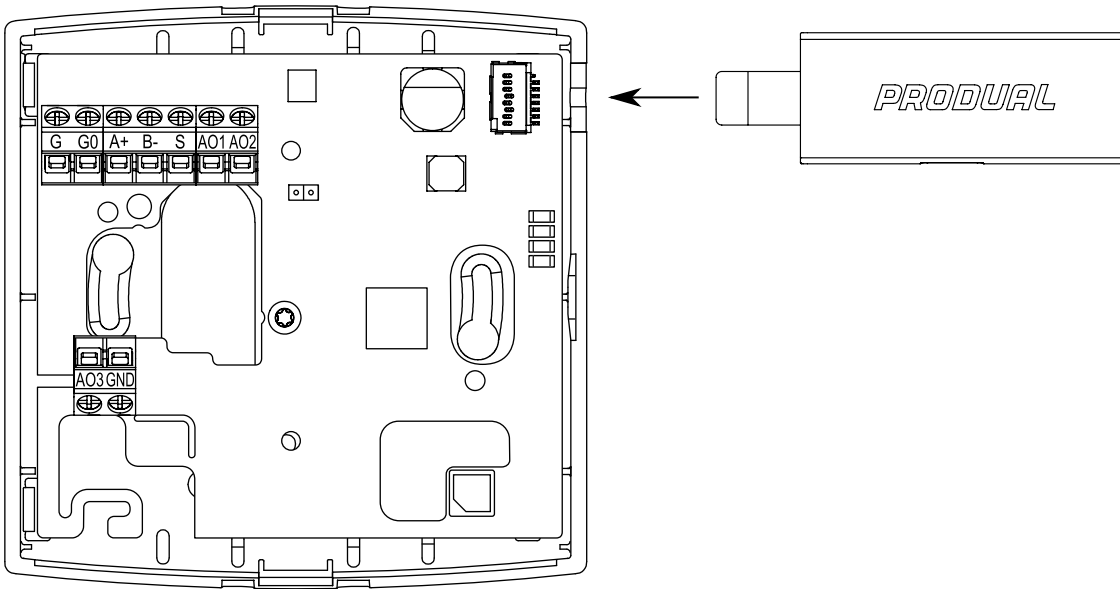
G	Supply, 24 Vac/dc, < 1 VA
G0	0 V
A+	Modbus RTU, RS-485 (-MOD models).
B-	**Note:** Connector S can only be used for chaining the cable shield pair.
S	
AO1	Voltage output 1, 0...10 Vdc, < 2 mA (freely scalable within this range). Not available in -MOD models.
AO2	Voltage output 2, 0...10 Vdc, < 2 mA (freely scalable within this range). Not available in -MOD models.
AO3	Voltage output 3, 0...10 Vdc, < 2 mA (freely scalable within this range). Not available in -MOD models.
GND	Ground

The nominal wire terminal screw tightening torque is 0.4 Nm.

Important: Do not use excessive force when tightening the wiring terminal screws.

CAUTION: Ensure that all covers are closed before connecting supply voltage to the product. Don't remove the covers when the supply voltage is connected.

5.3 Configuring transmitter using MyProdual®

To configure the device, you first need to connect it to MyProdual® application. When the device is connected to application, you can make changes to the configuration.

Note: You need MyTool® Connect for connecting MyProdual® to the device.

1. Connect the supply voltage to the device.

Note: You can also power the device by connecting a USB cable to MyTool® Connect.

2. Insert the MyTool® Connect to the connector.
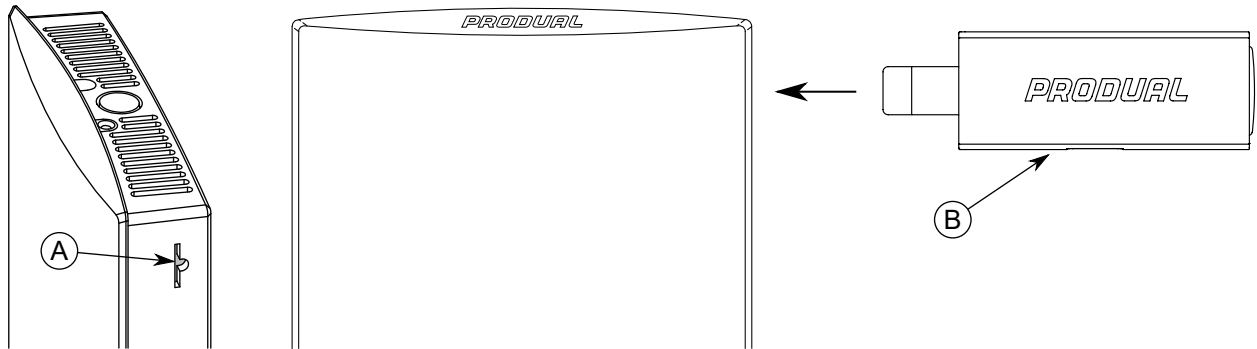
A. MyTool® Connect connector
B. MyTool® Connect

The indicator light in MyTool® Connect flashes when the Bluetooth is ready for connecting.

3. Start MyProdual®.

4. Tap the *Quick access* button.

5. Tap the *Bluetooth connection* button.
The device list shows the devices that have Bluetooth activated.

6. Tap the device to from the list to connect.

The indicator light in MyTool® Connect is illuminated continuously when MyProdual® is connected to the device.

7. Tap the *Configuration* button.

8. Tap the *Component setup* button.
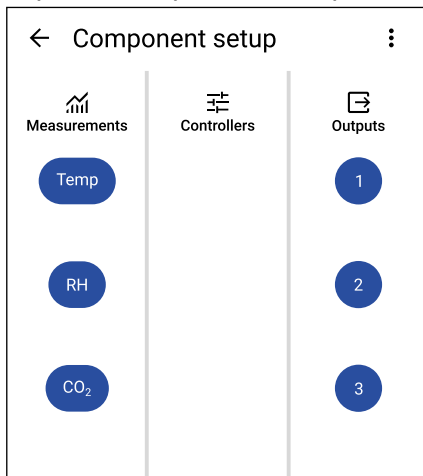
Component setup view is divided in sections:

Measurements Set up measurements.

Outputs Set up outputs.

See more information about the settings from the following chapters.

9. Make the changes to configuration.

10. In -MOD models, press the *General communication settings* button to configure communication settings

The following parameters are available for configuration:

Parameter name	Values	Default	Description
Communication mode	*Off / Modbus RTU*	*Modbus RTU*	Communication mode.
RS485 baud rate	*9600 / 14400 / 19200 / 38400 / 56000 / 57600 / 76800 / 115200*	*9600*	Bus speed.
Parity	*None / Even / Odd*	*None*	Bus parity.
Stop bits	*1 bit / 2 bits*	*1 bit*	Stop bits.
Communication led mode	*Off / Tx / Rx / Tx + Rx*	*Tx + Rx*	Communication indicator light function.
			Off — Indicator light is off
			Tx — Indicator light is on when the device transmits data to bus.
			Rx — Indicator light is on when the device receives data from bus.
			Tx + Rx — Indicator light is on when the device transmits data to bus or receives data from bus. When this option is selected, the transmit hold on time is ten times the hold on time setting.
Communication led hold on time	*5…1000 ms*	*25 ms*	Communication indicator light hold on time.
Modbus slave ID	*1…247*	*1*	Modbus address.
Modbus broadcast	*Disabled / Enabled*	*Enabled*	Modbus broadcast.

11. Tap *Install to device* button to write the changes to the device.

> ⚠ **Note:** The changes can also saved to device in each configuration view tapping the *Save* button.

12. Tap the ← button.

13. Tap the connection info button to disconnect the device.

> 📶 -87 dBm   🕐 18 minutes ago
> **Connected via Bluetooth**
> Tap to disconnect and deactivate

14. Remove the MyTool® Connect.

5.3.1 Configuring measurement settings

All device models include temperature and CO_2 measurements. Other measurements available for configuration depend on the model.

1. Tap the *Component setup* button on the *Configuration* page to open the *Component setup* page.

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measure-be sure.

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2. Tap a button in the *Measurements* column for the measurement you want to configure.

The *Measurements* column can have the following measurement settings available depending on the device model:

Temp	Set up temperature measurement settings.
RH	Set up relative humidity measurement settings. Available for -RH models.
CO₂	Set up CO₂ measurement settings.

5.3.1.1 Temperature measurement settings

Tap the *Temp* button on the *Component setup* page to open the temperature measurement settings. Tap a parameter on the list to change its value.

The following parameters are available for configuration:

Parameter name

Values

Default

Description

Measurement scale min

-100.0...100.0 °C

0.0 °C

Temperature measurement at 0 %. Set the value for temperature measurement when the transmitter output is 0 %. For example, if this value is 0 °C, then 0 % voltage is interpreted as 0 °C.

Measurement scale max

-100.0...100.0 °C

100.0 °C

Temperature measurement at 100 %. Set the value for temperature measurement when the transmitter output is 100 %. For example, if this value is 50 °C, then 100 % voltage is interpreted as 50 °C.

Time constant multiplier

60...3600 s

120 s

This value defines how quickly the transmitter responds to a rapid change in temperature. The measurement reaches 63 % of its final value by this time. Advanced settings.

Contact on level

-100.0...100.0 °C

25.0 °C

This temperature is interpreted as contact ON value. This function works as a "software contact", and it can be linked to the digital output. If the measured temperature is higher than the value set for this parameter, then the output signal is at the maximum value set for the output.

Contact off level

-100.0...100.0 °C

24.0 °C

This temperature is interpreted as contact OFF value. This function works as a "software contact", and it can be linked to the digital output. If the measured temperature is lower than the value set for this parameter, then the output signal is at the minimum value set for the output.

Contact turn on delay

0...65535 s

0 s

The delay in seconds before the contact is turned on after the *Contact on level* condition is fulfilled. Advanced settings.

Contact hold on time

0...65535 s

0 s

Contact hold on time (seconds). This time defines how long the contact stays on even if the *Contact off level* condition is fulfilled. Advanced settings.

Contact turn off delay

0...65535 s

0 s

The delay in seconds before the contact is turned off after the *Contact off level* condition is fulfilled. Advanced settings.

Contact hold off time

0...65535 s

0 s

Contact hold off time (seconds). This time defines how long the contact stays off even if the *Contact on level* condition is fulfilled. Advanced settings.

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Parameter name	Values	Default	Description
Measurement correction	Off Offset Span	Off	You can use the measurement correction to adjust the temperature measurement values, if necessary. If you select *Offset*, you can set the temperature offset in degrees. The same offset is used at all temperatures. If you select *Span*, you can define two temperatures and a measurement correction value for each. Advanced settings.
Temperature offset	-100.0...100.0 °C	0.0 °C	Temperature offset in degrees. Set the offset that will be used at all temperatures to correct the measurement values. Shown if *Offset* is selected in the *Measurement correction* parameter.
Point 1 measurement	-100.0...100.0 °C	0.0 °C	Temperature for point 1 measurement correction. Set the temperature at which the measurement correction is applied to the measurement. For example, if you want to correct the measurement by 0.5 °C at 0 °C, set this parameter value to 0.0 °C. Shown if *Span* is selected in the *Measurement correction* parameter.
Point 1 correction	-100.0...100.0 °C	0.0 °C	The amount of measurement correction for point 1. Set the measurement correction in degrees. For example, if you want to correct the measurement by 0.5 °C at 0 °C, set this parameter value to 0.5 °C. Shown if *Span* is selected in the *Measurement correction* parameter.
Point 2 measurement	-100.0...100.0 °C	0.0 °C	Temperature for point 2 measurement correction. Set the temperature at which the measurement correction is applied to the measurement. For example, if you want to correct the measurement by -1 °C at 25 °C, set this parameter value to 25.0 °C. Shown if *Span* is selected in the *Measurement correction* parameter.
Point 2 correction	-100.0...100.0 °C	0.0 °C	The amount of measurement correction for point 2. Set the measurement correction in degrees. For example, if you want to correct the measurement by -1 °C at 25 °C, set this parameter value to -1.0 °C. Shown if *Span* is selected in the *Measurement correction* parameter.

5.3.1.2 Relative humidity measurement settings

Relative humidity measurement settings are available in -RH models. Tap the *RH* button on the *Component setup* page to open the relative humidity measurement settings. Tap a parameter on the list to change its value.

The following parameters are available for configuration:

Parameter name	Values	Default	Description
Measurement scale min	0.00...100.00 rH%	0.00 rH%	Relative humidity measurement at 0 %. Set the value for humidity measurement when the transmitter output is 0 %. For example, if this value is 0.00 rH%, then 0 % voltage is interpreted as 0 %rH.

Parameter name	Values	Default	Description
Measurement scale max	*0.00...100.00 rH%*	*100.00 rH%*	Relative humidity measurement at 100 %. Set the value for humidity measurement when the transmitter output is 100 %. For example, if this value is 80.00 rH%, then 100 % voltage is interpreted as 80 %rH.
Time constant multiplier	*60...3600*	*120*	This value defines how quickly the transmitter responds to a rapid change in relative humidity. The measurement reaches 63 % of its final value by this time. Advanced settings.
Contact on level	*0.00...100.00 rH%*	*50.00 rH%*	This humidity value is interpreted as contact ON value. This function works as a "software contact", and it can be linked to the digital output. If measured humidity is higher than the value set for this parameter, then the output signal is at the maximum value set for the output.
Contact off level	*0.00...100.00 rH%*	*49.00 rH%*	This humidity value is interpreted as contact OFF value. This function works as a "software contact", and it can be linked to the digital output. If measured humidity is lower than the value set for this parameter, then the output signal is at the minimum value set for the output.
Contact turn on delay	*0...65535 s*	*0 s*	The delay in seconds before the contact is turned on after the *Contact on level* condition is fulfilled. Advanced settings.
Contact hold on time	*0...65535 s*	*0 s*	Contact hold on time (seconds). This time defines how long the contact stays on even if the *Contact off level* condition is fulfilled. Advanced settings.
Contact turn off delay	*0...65535 s*	*0 s*	The delay in seconds before the contact is turned off after the *Contact off level* condition is fulfilled. Advanced settings.
Contact hold off time	*0...65535 s*	*0 s*	Contact hold off time (seconds). This time defines how long the contact stays off even if the *Contact on level* condition is fulfilled. Advanced settings.
Measurement correction	*Off* *Offset* *Span*	*Off*	You can use the measurement correction to adjust the humidity measurement values, if necessary. If you select *Offset*, you can set the humidity offset in rH%. If you select *Span*, you can define two humidity points and a measurement correction value for each. Advanced settings.
Humidity offset	*-100...100 rH%*	*0 rH%*	Relative humidity offset. Set the offset that will be used at all humidity levels to correct the measurement values. Shown if *Offset* is selected in *Measurement correction*.
Point 1 measurement	*0...100 rH%*	*0 rH%*	Relative humidity for point 1 measurement correction. Set the humidity value at which the measurement correction is applied to the measurement. For example, if you want to correct the measurement by 2 rH% at 15 rH%, set this parameter value to 15 rH%. Shown if *Span* is selected in *Measurement correction*.

Parameter name	Values	Default	Description
Point 1 correction	*0...100 rH%*	*0 rH%*	The amount of measurement correction for point 1. Set the measurement correction in rH%. For example, if you want to correct the measurement by 2 rH% at 15 rH%, set this parameter value to 2 rH%. Shown if *Span* is selected in *Measurement correction*.
Point 2 measurement	*0...100 rH%*	*0 rH%*	Relative humidity for point 2 measurement correction. Set the humidity value at which the measurement correction is applied to the measurement. For example, if you want to correct the measurement by 3 rH% at 80 rH%, set this parameter value to 80 rH%. Shown if *Span* is selected in *Measurement correction*.
Point 2 correction	*0...100 rH%*	*0 rH%*	The amount of measurement correction for point 2. Set the measurement correction in rH%. For example, if you want to correct the measurement by 3 rH% at 80 rH%, set this parameter value to 3 rH%. Shown if *Span* is selected in *Measurement correction*.

5.3.1.3 CO_2 measurement settings

CO_2 measurement settings are available in -CO2 models. Tap the *CO₂* button on the *Component setup* page to open the CO_2 measurement settings. Tap a parameter on the list to change its value.

The following parameters are available for configuration:

Parameter name	Values	Default	Description
Measurement scale min	*0...10000 ppm*	*0 ppm*	CO_2 measurement at 0 %. Set the value for CO_2 measurement when the transmitter output is 0 %. For example, if this value is 0 ppm, then 0 % voltage is interpreted as 0 ppm.
Measurement scale max	*0...10000 ppm*	*2000 ppm*	CO_2 measurement at 100 %. Set the value for CO_2 measurement when the transmitter output is 100 %. For example, if this value is 2000 ppm, then 100 % voltage is interpreted as 2000 ppm.
Time constant multiplier	*60...3600*	*120*	This value defines how quickly the transmitter responds to a rapid change in CO_2 level. The measurement reaches 63 % of its final value by this time. Advanced settings.
Contact on level	*0...10000 ppm*	*1200 ppm*	This CO_2 value is interpreted as contact ON value. This function works as a "software contact", and it can be linked to the digital output. If the measured CO_2 level is higher than the value set for this parameter, then the output signal is at the maximum value set for the output.
Contact off level	*0...10000 ppm*	*1100 ppm*	This CO_2 value is interpreted as contact OFF value. This function works as a "software contact", and it can be linked to the digital output. If the measured CO_2 level is lower than the value set for this parameter, then the output signal is at the minimum value set for the output.
Contact turn on delay	*0…65535 s*	*0 s*	The delay in seconds before the contact is turned on after the *Contact on level* condition is fulfilled. Advanced settings.

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Parameter name	Values	Default	Description
Contact hold on time	*0…65535 s*	*0 s*	Contact hold on time (seconds). This time defines how long the contact stays on even if the *Contact off level* condition is fulfilled. Advanced settings.
Contact turn off delay	*0…65535 s*	*0 s*	The delay in seconds before the contact is turned off after the *Contact off level* condition is fulfilled. Advanced settings.
Contact hold off time	*0…65535 s*	*0 s*	Contact hold off time (seconds). This time defines how long the contact stays off even if the *Contact on level* condition is fulfilled. Advanced settings.
Measurement correction	*Off* *Offset* *Span*	*Off*	You can use the measurement correction to adjust the CO_2 measurement values, if necessary. If you select *Offset*, you can set the CO_2 offset in ppm. The same offset is used at all CO_2 levels. If you select *Span*, you can define two CO_2 levels and a measurement correction value for each. Advanced settings.
CO_2 offset	*-10000…10000 ppm*	*0 ppm*	CO_2 offset in ppm. Set the offset that will be used at all CO_2 levels to correct the measurement values. Shown if *Offset* is selected in *Measurement correction*.
Point 1 measurement	*0…10000 ppm*	*0 ppm*	CO_2 level for point 1 measurement correction. Set the CO_2 level at which the measurement correction is applied to the measurement. For example, if you want to correct the measurement by 10 ppm at 420 ppm, set this parameter value to 420 ppm. Shown if *Span* is selected in *Measurement correction*.
Point 1 correction	*0…10000 ppm*	*0 ppm*	The amount of measurement correction for point 1. Set the measurement correction in ppm. For example, if you want to correct the measurement by 10 ppm at 420 ppm, set this parameter value to 10 ppm. Shown if *Span* is selected in *Measurement correction*.
Point 2 measurement	*0…10000 ppm*	*0 ppm*	CO_2 level for point 2 measurement correction. Set the CO_2 level at which the measurement correction is applied to the measurement. For example, if you want to correct the measurement by 20 ppm at 900 ppm, set this parameter value to 900 ppm. Shown if *Span* is selected in *Measurement correction*.
Point 2 correction	*0…10000 ppm*	*0 ppm*	The amount of measurement correction for point 2. Set the measurement correction in ppm. For example, if you want to correct the measurement by 20 ppm at 900 ppm, set this parameter value to 20 ppm. Shown if *Span* is selected in *Measurement correction*.
CO_2 ABC calibration	*Disabled* *Enabled*	*Enabled*	Automatic self-calibration of CO_2 measurement. If this function is enabled, it eliminates the possible long-term drift in CO_2 measurement accuracy.
CO_2 ambient pressure correction	*Disabled* *Enabled*	*Disabled*	Ambient pressure correction for CO_2 measurement. If this function is enabled, you can use the local ambient pressure for CO_2 measurement. If this function is disabled, the transmitter uses the ambient pressure at sea level.

Parameter name	Values	Default	Description
CO_2 ambient pressure correction value	700...1200 hPa	1013 hPa	Set this value to the local ambient pressure. Shown if the CO₂ ambient pressure correction parameter value is Enabled.

5.3.2 Configuring output settings

1. Tap the *Component setup* button on the *Configuration* page to open the *Component setup* page.

2. Tap a button in the *Outputs* column for the output you want to configure.

   The *Outputs* column can have the following measurement settings available depending on the device model:

1	Output 1 settings.
2	Output 2 settings.
3	Output 3 settings.

3. Tap the *Output type* button.

4. Select the output type and tap *Ok*.
   The following output types are available:

Off	Not in use.
Analog	Analogue output.
Digital	Digital output.

5. Make the settings for the output.
   See more information about the settings from the following chapters.

5.3.2.1 Analogue output settings

Tap the output number button on the *Component setup* page to open the output settings. Select *Analog* for output type. Tap a parameter on the list to change its value.

The following parameters are available for configuration:

Parameter name	Values	Default	Description
Analog output source	T measurement RH measurement CO₂ measurement Bus	T measurement	Analogue output source.
	0-10 V 2-10 V 0-5 V Custom	0-10 V	Analogue output signal range.
	0.000...10.000 V	-	Custom analogue output voltage range.
	0.00...100.00 %	-	Custom analogue output effective range.

5.3.2.2 Digital output settings

Tap the output number button on the *Component setup* page to open the output settings. Select *Digital* for output type. Tap a parameter on the list to change its value.

The following parameters are available for configuration:

Parameter name	Values	Default	Description
Digital output selection	*Temperature contact* *RH contact* *CO₂ contact* *Bus*	*Temperature contact*	Digital output control source.
	0-10 V *2-10 V* *0-5 V* *Custom*	*0-10 V*	Digital output signal range.
	0.000...10.000 V	-	Custom digital output voltage range.
	0.00...100.00 %	-	Custom digital output effective range.

5.3.3 Saving and uploading configurations

If you have several devices to configure, you can save the configuration and then upload it to other devices. Configurations are model-specific.

You can save configurations to MyCloud® or locally to your smartphone.

5.3.3.1 Saving the configuration to MyCloud®

1. After you have configured the settings, tap the three dots in the upper right corner of the *Configuration* page.
2. Tap *Save to MyCloud* to save the new configuration to MyCloud®.
3. Enter a name for the configuration in the *Configuration name* field.
4. If necessary, enter an optional description in the *Description* field.
5. Tap *Next* to select the saving location.
6. Select *Personal workspace* or *Shared workspace*, if your company has a shared workspace.
7. Tap *Save* to save the configuration.

5.3.3.2 Uploading a saved configuration to a transmitter from MyCloud®

1. Connect the transmitter to MyProdual® application.
   See section Configuring transmitter using MyProdual® on page 8 for the connection instructions.
2. Tap the cloud icon on top of the *Configuration* page.
3. Tap a saved configuration on the *Open configurations* page to select it.
4. Tap the *Open* button in the top right corner.
5. Select the settings you want to import in the *Import settings* popup.
6. Tap the *Open* button to open the configuration settings.
7. Tap the *Install to device* button at the bottom of the *Configuration* page to upload the settings to the device.

5.3.3.3 Saving the configuration locally

You can save configurations locally to your smartphone.

1. After you have configured the settings, tap the three dots in the upper right corner of the *Configuration* page.
2. Tap *Save configuration locally* to save the configuration to the smartphone MyProdual® is installed in.

3. Enter a name for the configuration in the *Configuration name* field.

4. If necessary, enter an optional description in the *Description* field.

5. Tap *Next* to select the saving location.

6. Navigate to the correct folder.
   a. In Android, tap the Save button to save the configuration file.
   b. In iOS, tap Open to save the configuration file.

5.3.3.4 Uploading a locally saved configuration to a transmitter

1. Connect the transmitter to MyProdual® application.

   See section Configuring transmitter using MyProdual® on page 8 for the connection instructions.

2. Tap the three dots in the upper right corner of the *Configuration* page.

3. Tap *Open local file* in the menu.

4. Tap a saved configuration to select it.

5. Select the settings you want to import in the *Import settings* popup.

6. Tap the *Open* button to open the configuration settings.

7. Tap the *Install to device* button at the bottom of the *Configuration* page to upload the settings to the device.

5.4 Updating device firmware

You can update the device firmware when the MyProdual® notifies about the update.

1. Start MyProdual®.

2. Connect the device to MyProdual®.

3. Tap the *accept* button on the update notification.

ℹ	New firmware update available for this device
	dismiss accept
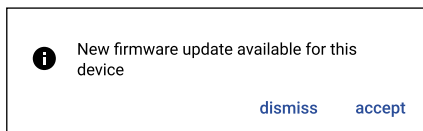
4. Review the update details and tap the *Install* button to start the update.

5. Wait for the firmware installation process to complete.

   ⚠ **Important:** Keep the mobile phone near the device to keep Bluetooth active. If the connection is lost, the firmware update process can not complete.

6. Tap the *Ok* button in the firmware update completion dialog.

7. Tap the *Close* button.

8. Tap the connection info button to disconnect the device.

✳	▮ -87 dBm 🕐 18 minutes ago
	Connected via Bluetooth
	Tap to disconnect and deactivate

6 Modbus

The -MOD models are equipped with Modbus RTU communication via RS-485 connection.

6.1 Modbus properties

Protocol	RS-485 Modbus RTU
Bus speed	9600*/14400/19200/38400/56000/57600/76800/115200 bit/s
Data bits	8
Parity	none*/odd/even
Stop bits	1* / 2
Modbus ID	1*
Unit load	1/8 UL
	* factory setting

6.2 Modbus function codes

The device supports the following Modbus function codes.

Decimal	Hexa-decimal	Function
3	0x03	Read Holding Registers
4	0x04	Read Input Registers
6	0x06	Write Single Register
16	0x10	Write Multiple Registers
23	0x17	Read/Write Multiple Registers

6.3 Modbus registers

The device uses the whole Modbus register space from 1 to 65535. Holding registers and input registers are not tied to classic 4xxxx and 3xxxx areas. There are also many registers that has the same register number but the function depends on the register type.

⚠️ **Important:** Some BMS systems may need extra configuring to able to use the whole register space. Contact the system vendor support if needed.

The registers are grouped according to the user guide. You can read or write only registers from one group with the same Modbus command.

6.3.1 Input registers

6.3.1.1 Input registers for measurements

Input register	Parameter description	Data type	Values	Range
0	Temperature measurement (°C).	S16	*-10000...10000*	-1000.0...1000.0 °C
1	Relative humidity measurement.	U16	*0...100*	0...100 %
2	CO_2 measurement.	U16	*0...10000*	0...10000 ppm
3...12	Not in use.	U16	-	-

Input register	Parameter description	Data type	Values	Range
13	Voltage output 1.	U16	*0…10000*	0.000…10.000 V
14	Voltage output 2.	U16	*0…10000*	0.000…10.000 V
15	Voltage output 3.	U16	*0…10000*	0.000…10.000 V
16	Not in use.	U16	-	-
17	Average temperature (°C).	S16	*-10000…10000*	-1000.0…1000.0 °C
18	Dew point (°C).	S16	*-10000…10000*	-1000.0…1000.0 °C
19	Relative humidity with one decimal.	U16	*0…1000*	0.0…100.0 %
20	Relative humidity with two decimals.	U16	*0…10000*	0.0…100.0 %
21	Absolute humidity.	U16	*0…1000*	0.0…100.0 g/m^3
22	Mixing ratio of water vapour.	U16	*0…1000*	0.0…100.0 (g/kg)
23	Enthalpy.	U16	*0…10000*	0.0…1000.0 kJ/kg
24…31	Not in use.	U16	-	-
32	Temperature measurement (°F).	S16	*-17680…18320*	-1768.0…1832.0 °F
33	Not in use.	U16	-	-
34	Average temperature (°F).	S16	*-17680…18320*	-1768.0…1832.0 °F
35	Dew point (°F).	S16	*-17680…18320*	-1768.0…1832.0 °F

6.3.1.2 Input registers for contacts

Input register	Parameter description	Data type	Values	Range
52	Measured temperature contact.	U16	*0 - 1*	0. Off 1. On
53	Measured humidity contact.	U16	*0 - 1*	0. Off 1. On
54	Measured CO_2 contact.	U16	*0 - 1*	0. Off 1. On
55…57	Not in use.	U16	-	-
58	Output 1 contact.	U16	*0 - 1*	0. Off 1. On
59	Output 2 contact.	U16	*0 - 1*	0. Off 1. On
60	Output 3 contact.	U16	*0 - 1*	0. Off 1. On

6.3.1.3 Input registers for device status

Input register	Parameter description	Data type	Values	Range
63	Device status.	U16	*0 - 1*	0. Ok 1. Fault
64	Temperature sensor status.	U16	*0 - 1*	0. Ok 1. Fault

Input register	Parameter description	Data type	Values	Range
65	Humidity sensor status.	U16	0 - 1	0. Ok 1. Fault
66	CO_2 sensor status.	U16	0 - 1	0. Ok 1. Fault

6.3.2 Holding registers

6.3.2.1 Holding registers for measurement values in Celsius

Holding register	Parameter description	Data type	Values	Range	Default
0	Temporary override timer.	U16	0...1440	0 = override disabled, 1...1440 = override enabled in minutes	0
1	Temporary override selection.	U16	0...65535	16-bit binary value. Bits are designated as follows: 1. Not in use. 2. Not in use. 3. Not in use. 4. Not in use. 5. Not in use. 6. Not in use. 7. Not in use. 8. Not in use. 9. Not in use. 10. Not in use. 11. Output 1 power 12. Output 2 power 13. Output 3 power 14. Not in use. 15. Not in use. 16. Not in use.	0
2...11	Not in use.	U16	-	-	0
12	Output 1 power.	U16	0...10000	0.00...100.00 %	0
13	Output 2 power.	U16	0...10000	0.00...100.00 %	0
14	Output 3 power.	U16	0...10000	0.00...100.00 %	0

6.3.2.2 Holding registers for communication

Holding register	Parameter description	Data type	Values	Range	Default
100	Communication mode.	U16	0 - 1	0. Off 1. Modbus RTU	0

Holding register	Parameter description	Data type	Values	Range	Default
101	Bus speed.	U16	0 - 1 - 2 … - 7	0. 9600 bit/s 1. 14400 bit/s 2. 19200 bit/s 3. 38400 bit/s 4. 56000 bit/s 5. 57600 bit/s 6. 76800 bit/s 7. 115200 bit/s	0
102	Bus parity.	U16	0 - 1 - 2	0. None 1. Even 2. Odd	0
103	Stop bits.	U16	1 - 2	0. 1 stop bit 1. 2 stop bits	1
104	Communication indicator light mode.	U16	0 - 1 - 2 - 3	0. Off 1. Tx 2. Rx 3. Tx and Rx	3
105	Communication indicator light hold time.	U16	5…1000	5…1000 ms	25
106	Modbus address.	U16	1…247	1…247	1
107	Modbus broadcast status.	U16	0 - 1	0. Disabled 1. Enabled	1

6.3.2.3 Holding registers for temperature measurement settings

Holding register	Parameter description	Data type	Values	Range	Default
300	Temperature measurement power scale, minimum limit.	S16	-10000…10000	-1000.0…1000.0 °C	0
301	Temperature measurement power scale, maximum limit.	S16	-10000…10000	-1000.0…1000.0 °C	1000
302	Temperature measurement time constant multiplier.	U16	1…60	60…3600	2
303	Temperature contact, on level.	S16	-10000…10000	-1000.0…1000.0 °C	250
304	Temperature contact, off level.	S16	-10000…10000	-1000.0…1000.0 °C	240
305	Temperature contact, turn on delay.	U16	0…65535	0…65535 s	0
306	Temperature contact, hold on time.	U16	0…65535	0…65535 s	0
307	Temperature contact, turn off delay.	U16	0…65535	0…65535 s	0
308	Temperature contact, hold off time.	U16	0…65535	0…65535 s	0
309	Temperature measurement correction method.	U16	0 - 1 - 2	0. Off 1. Offset 2. Span	0
310	Temperature offset.	S16	-10000…10000	-1000.0…1000.0 °C	0
311	Measured temperature, point 1.	S16	-10000…10000	-1000.0…1000.0 °C	0

Holding register	Parameter description	Data type	Values	Range	Default
312	Corrected temperature, point 1.	S16	*-10000...10000*	-1000.0...1000.0 °C	*0*
313	Measured temperature, point 2.	S16	*-10000...10000*	-1000.0...1000.0 °C	*0*
314	Corrected temperature, point 2.	S16	*-10000...10000*	-1000.0...1000.0 °C	*0*

6.3.2.4 Holding registers for relative humidity measurement settings

Holding register	Parameter description	Data type	Values	Range	Default
400	Relative humidity measurement power scale, minimum limit.	U16	*0...10000*	0.00...100.00 %	*0*
401	Relative humidity measurement power scale, maximum limit.	U16	*0...10000*	0.00...100.00 %	*10000*
402	Relative humidity measurement time constant multiplier.	U16	*1...60*	60...3600	*2*
403	Relative humidity contact, on level.	U16	*0...10000*	0.00...100.00 %	*5000*
404	Relative humidity contact, off level.	U16	*0...10000*	0.00...100.00 %	*4900*
405	Relative humidity contact, turn on delay.	U16	*0...65535*	0...65535 s	*0*
406	Relative humidity contact, hold on time.	U16	*0...65535*	0...65535 s	*0*
407	Relative humidity contact, turn off delay.	U16	*0...65535*	0...65535 s	*0*
408	Relative humidity contact, hold off time.	U16	*0...65535*	0...65535 s	*0*
409	Relative humidity measurement correction method.	U16	*0 - 1 - 2*	0. Off 1. Offset 2. Span	*0*
410	Relative humidity offset.	S16	*-10000...10000*	-100.00...100.00 %	*0*
411	Measured relative humidity, point 1.	U16	*0...10000*	0.00...100.00 %	*0*
412	Corrected relative humidity, point 1.	U16	*0...10000*	0.00...100.00 %	*0*
413	Measured relative humidity, point 2.	U16	*0...10000*	0.00...100.00 %	*0*
414	Corrected relative humidity, point 2.	U16	*0...10000*	0.00...100.00 %	*0*

6.3.2.5 Holding registers for CO_2 measurement settings

Holding register	Parameter description	Data type	Values	Range	Default
500	CO_2 measurement power scale, minimum limit.	U16	*0...10000*	0...10000 ppm	*0*
501	CO_2 measurement power scale, maximum limit.	U16	*0...10000*	0...10000 ppm	*2000*
502	CO_2 measurement time constant multiplier.	U16	*1...60*	60...3600	*2*
503	CO_2 contact, on level.	U16	*0...10000*	0...10000 ppm	*1200*

Holding register	Parameter description	Data type	Values	Range	Default
504	CO_2 contact, off level.	U16	0...10000	0...10000 ppm	1100
505	CO_2 contact, turn on delay.	U16	0...65535	0...65535 s	0
506	CO_2 contact, hold on time.	U16	0...65535	0...65535 s	0
507	CO_2 contact, turn off delay.	U16	0...65535	0...65535 s	0
508	CO_2 contact, hold off time.	U16	0...65535	0...65535 s	0
509	CO_2 measurement correction method.	U16	0 - 1 - 2	0. Off 1. Offset 2. Span	0
510	CO_2 offset.	S16	-10000...10000	-10000...10000 ppm	0
511	Measured CO_2, point 1.	U16	0...10000	0...10000 ppm	0
512	Corrected CO_2, point 1.	U16	0...10000	0...10000 ppm	0
513	Measured CO_2, point 2.	U16	0...10000	0...10000 ppm	0
514	Corrected CO_2, point 2.	U16	0...10000	0...10000 ppm	0
515	ABC calibration function.	U16	0 - 1	0. Off 1. On	1
516	Ambient pressure correction function.	U16	0 - 1	0. Off 1. On	0
517	Ambient pressure correction value.	U16	700...1200	700...1200 hPa	1030

6.3.2.6 Holding registers for output settings

Table reading instruction: The register numbers include an X in the middle. Replace the X with the output number you are adjusting.

Holding register	Parameter description	Data type	Values	Range	Default
3X00	Output type.	U16	0 - 1 - 2	0. Off 1. Analogue 2. Digital	1
3X01	Analogue output source.	U16	0 - 1 - 2 … - 7	0. Temperature 1. Relative humidity 2. CO_2 3. Not in use. 4. Not in use. 5. Not in use. 6. Not in use. 7. Bus	0
3X02	Digital output source.	U16	0 - 1 - 2 … - 7	0. Temperature contact 1. Relative humidity contact 2. CO_2 contact 3. Not in use. 4. Not in use. 5. Not in use. 6. Not in use. 7. Bus	0
3X03	Bus control start value.	U16	0...10000	0.00...100.00 %	0

Holding register	Parameter description	Data type	Values	Range	Default
3X04	Effective range, minimum value.	U16	0...10000	0.00...100.00 %	0
3X05	Effective range, maximum value.	U16	0...10000	0.00...100.00 %	10000
3X06	Voltage range, minimum value.	U16	0...10000	0.00...100.00 %	0
3X07	Voltage range, maximum value.	U16	0...10000	0.00...100.00 %	10000

7 Disposal

The device is considered as electrical and electronic equipment for disposal in terms of the applicable European Directive. At the end of life the product must enter the recycling system at an appropriate collection point.

• The device must be disposed through channels provided for this purpose.
• The disposal must be completed according to the local and currently applicable laws and regulations.

Generally all metals can be recycled as material. Plastics and cardboard packaging material can be used in energy recovery. Printed circuit boards need selective treatment according to IEC 62635 guidelines. To aid recycling, plastic parts are marked with an appropriate identification code. Contact your local Produal distributor for further information on environmental aspects and recycling instructions for professional recyclers.