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USER GUIDE

RT-CO2

Produal

Distributed by AKRIBIS



PRODUAL

RT – Room transmitter

USER GUIDE

Made in Finland

5 years warranty

MANAGEMENT SYSTEM CERTIFICATION DNV ISO 9001 · ISO 14001

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1 Introduction

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

The transmitters options include:

- relative humidity measurement (-RH models)
- Modbus RTU communication (-MOD models)
- BACnet MS/TP communication (-BAC models)

The -MOD models have Modbus RTU communication and -BAC models have BACnet MS/TP communication via the RS-485 connection.

Note: -MOD and -BAC models do not include output connectors.

You can commission devices using the MyProdual smartphone application and the MyTool® Connect dongle. You can also configure some basic settings via bus in -MOD and -BAC 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

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.

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2 Safety precautions

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

Read this user guide carefully before you commission, use or service this device. To avoid any kind of damage to people or property, follow the instructions carefully. Produal is not liable for any hazards, injury to people, or damage to property caused by incorrect installation or misuse of the device.

To avoid electrical shock or damage to equipment, disconnect power before you install or service the product. Use only proper wiring that is rated for the full operating voltage and maximum current in the system. The wiring must also withstand fault conditions.

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

Make sure that the product is not damaged before installation. Do not drop the product or use excessive force during installation. Do not use the product if you can see any damages.

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.

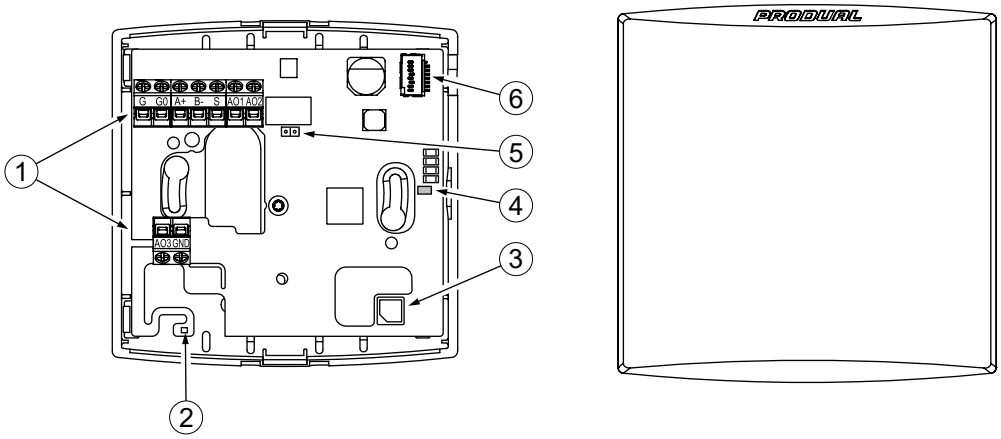
The product should only be used in professionally designed applications. Unauthorised modifications are not allowed. The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals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

In this document, there are different 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.

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3 Main components



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

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4 Functional description

4.1 Multifunctional outputs

The device has three configurable outputs. You can configure the outputs for the following purposes:

- analogue measurement output (freely scalable inside 0...10 Vdc)
- two-state output (e.g. 0/10 Vdc)

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

You can configure the outputs via communication bus or by using the MyTool® Connect dongle and the MyProdual application.

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5 Commissioning

5.1 Mounting the room transmitter

The device must be installed in dry environment. You can install the device on the wall surface or on a standard flush mounting box with screws. The recommended installation height is 150...180 cm.

Select the mounting position carefully. If possible, eliminate all the error factors that can affect the measurements. Typical measurement error factors include:

- 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).

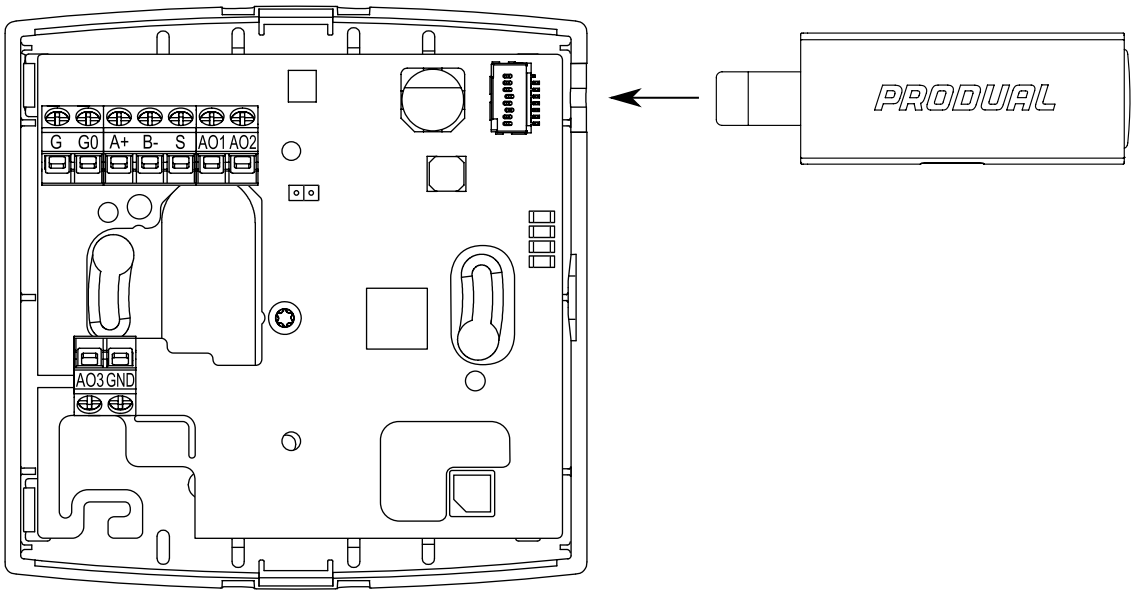
WARNING: The minimum power rating for the external power source must be 170 VA / 170 W to ensure proper operation of the internal fusing of the product in case of a failure condition. Otherwise, the overall system power consumption shall be less than 15 W also in the failure condition.

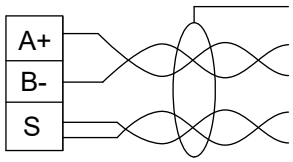
WARNING: This product is appliance class III product according to IEC 60664-1. The product may only be connected to SELV (separated extra low voltage) electricity network.

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.

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G	Supply, 24 Vac/dc, < 1 VA
G0	0 V
A+ *B-* *S*	 Modbus RTU, RS-485 (-MOD models). BACnet MS/TP, RS-485 (-BAC models). **Note:** Connector *S* can only be used for chaining the cable shield pair.
AO1	Voltage output 1, 0...10 Vdc, < 2 mA (freely scalable within this range). Not available in -MOD and -BAC models.
AO2	Voltage output 2, 0...10 Vdc, < 2 mA (freely scalable within this range). Not available in -MOD and -BAC models.
AO3	Voltage output 3, 0...10 Vdc, < 2 mA (freely scalable within this range). Not available in -MOD and -BAC models.
GND	Ground. Not available in -MOD and -BAC models.

The nominal tightening torque for wire terminal screws is 0.4 Nm.

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

CAUTION: Ensure that all covers are closed before you connect the supply voltage to the product. Do not remove the covers when the supply voltage is connected.

5.3 Configuring transmitter using the MyProdual application

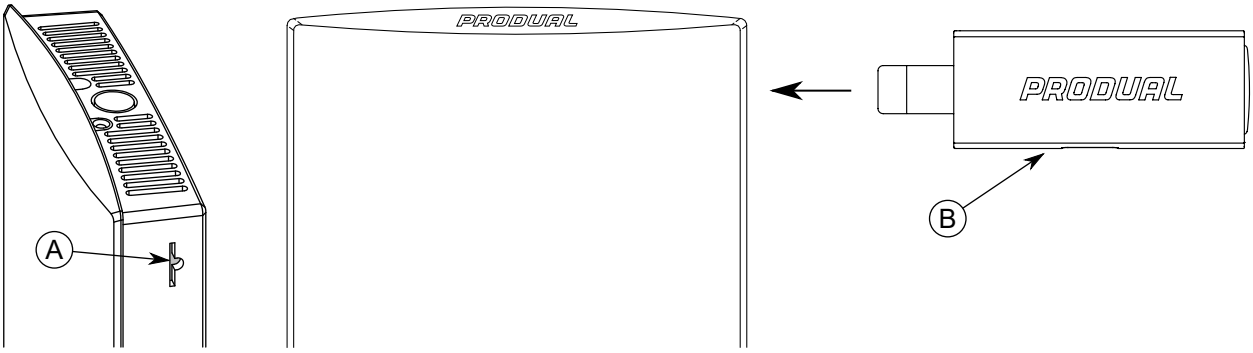
To configure the device, you first need to connect it to the MyProdual application. When the device is connected to the application, you can make changes to the configuration.

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

1. Connect the supply voltage to the device.

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2. Insert the MyTool® Connect dongle to the connector.

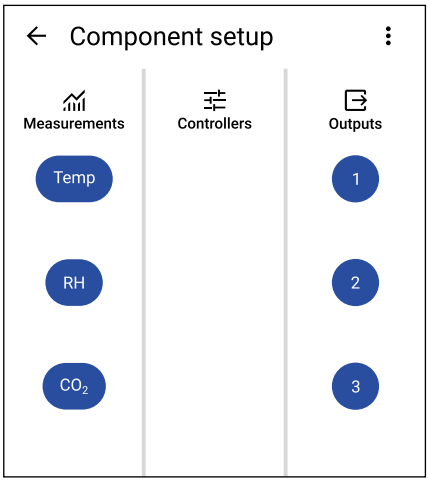


A. MyTool® Connect dongle connector
B. MyTool® Connect dongle

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

3. Start the MyProdual application.
4. Tap the *Quick access* button.
5. Tap the *Bluetooth connection* button.
   The device list shows the devices that have Bluetooth activated.
6. Tap a device to from the list to connect.

   The indicator light on the MyTool® Connect dongle is illuminated continuously when the MyProdual application is connected to the device.
7. Tap the *Configuration* button.
8. Tap the *Component setup* button.



Component setup page is divided in sections:

Measurements	Set up measurements.
Outputs	Set up outputs.

See the following chapters for more information about the settings.

9. Make the changes to the configuration.
10. In -MOD and -BAC models, tap the *General communication settings* button to configure the communication settings.
11. Tap *Install to device* button to write the changes to the device.

    Note: You can also tap the *Save* button on each configuration page to save the changes to the device.
12. Tap the ← button.

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



14. Remove the MyTool® Connect dongle.

5.3.1 Configuring communication settings

1. Tap the *General communication settings* button on the *Configuration* page to open the *Communication settings* page.
2. Tap a parameter on the list to change its value.

5.3.1.1 Communication settings

The following parameters are available for configuration:

Parameter name	Values	Default	Description
Communication mode	*Off* *Modbus RTU* *Bacnet MSTP*	*Modbus RTU* (-MOD models) *Bacnet MSTP* (-BAC models)	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.

Parameter name	Values	Default	Description
Communication led hold on time	*5…1000 ms*	*25 ms*	Communication indicator light hold on time.
Modbus slave ID	*1...247*	*1*	Modbus address. This parameter is available only in -MOD models.
Modbus broadcast	*Disabled* *Enabled*	*Disabled*	Modbus broadcast. This parameter is available only in -MOD models.
Device instance	*0...4194303*	*10000*	BACnet device instance. This parameter is available only in -BAC models.
Mac address	*0...127*	*0*	BACnet MAC-address. This parameter is available only in -BAC models.
Maximum number of masters	*1...127*	*127*	Maximum number of BACnet masters. This parameter is available only in -BAC models.
Maximum number of infoframes	*1...255*	*16*	Maximum number of BACnet infoframes. This parameter is available only in -BAC models.
Temperature unit	*Celsius* *Fahrenheit*	*Celsius*	BACnet temperature unit. This parameter is available only in -BAC models.

5.3.2 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.
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 CO_2 measurement settings.

5.3.2.1 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*	*50.0 °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.

Parameter name	Values	Default	Description
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.
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 20 °C, set this parameter value to 20.0 °C. Shown if *Span* is selected in the *Measurement correction* parameter.

Parameter name	Values	Default	Description
Point 1 correction	*-100.0...100.0 °C*	*0.0 °C*	The corrected measurement for point 1. Set the corrected measurement in degrees. For example, if you want to correct the measurement by 0.5 °C at 20 °C, set this parameter value to 20.5 °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 corrected measurement for point 2. Set the corrected measurement in degrees. For example, if you want to correct the measurement by -1 °C at 25 °C, set this parameter value to 24.0 °C. Shown if *Span* is selected in the *Measurement correction* parameter.

5.3.2.2 Relative humidity measurement settings

Relative humidity measurement settings are available for configuration 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%.
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.

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Parameter name	Values	Default	Description
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*.
Point 1 correction	*0...100 rH%*	*0 rH%*	The corrected measurement for point 1. Set the corrected measurement in rH%. For example, if you want to correct the measurement by 2 rH % at 15 rH%, set this parameter value to 17 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 corrected measurement for point 2. Set the corrected measurement in rH%. For example, if you want to correct the measurement by 3 rH % at 80 rH%, set this parameter value to 83 rH %. Shown if *Span* is selected in *Measurement correction*.

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5.3.2.3 CO_2 measurement settings

CO_2 measurement settings are available for configuration 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.
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.

Parameter name	Values	Default	Description
CO2 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 corrected measurement for point 1. Set the corrected measurement in ppm. For example, if you want to correct the measurement by 10 ppm at 420 ppm, set this parameter value to 430 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 corrected measurement for point 2. Set the corrected measurement in ppm. For example, if you want to correct the measurement by 20 ppm at 900 ppm, set this parameter value to 920 ppm. Shown if *Span* is selected in *Measurement correction*.
CO2 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.
CO2 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.
CO2 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*.

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

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

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

5.3.3.1 Analogue output settings

Tap the output number button on the *Component setup* page to open the output settings. Select *Analog* in the *Output type* field. 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.

5.3.3.2 Digital output settings

Tap the output number button on the *Component setup* page to open the output settings. Select *Digital* in the *Output type* field. 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.

5.3.4 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® cloud service or locally to your smartphone.

5.3.4.1 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.

5.3.4.2 Uploading a saved configuration to a transmitter from MyCloud®

1. Connect the transmitter to MyProdual application.
   See section Configuring transmitter using the MyProdual application 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.

5.3.4.3 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.

5.3.4.4 Uploading a locally saved configuration to a transmitter

1. Connect the transmitter to MyProdual application.
   See section Configuring transmitter using the MyProdual application 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 application notifies you about the update.

1. Start the MyProdual application.
2. Connect the device to MyProdual.
3. Tap the *accept* button on the update notification.



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 cannot 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.



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	Hexadec-imal	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 full Modbus register range from 1 to 65535. Holding registers and input registers are not tied to the classic 4xxxx and 3xxxx ranges. The device has are also many registers that have the same register number but the function depends on the register type (e.g. input register 18 and holding register 18).

Important: To use the full register range, it may be necessary to update the settings in some BMS systems. Contact the system vendor for support, if necessary.

The registers are grouped as described in this user guide. You can only read or write registers from one group with the same Modbus command.

6.3.1 Input registers

6.3.1.1 Input registers for measurements

Input reg-ister	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

Input register	Parameter description	Data type	Values	Range
3...12	Not in use.	U16	-	-
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	Not in use.	S16	-	-
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	Not in use.	S16	-	-
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
54	Measured temperature contact.	U16	*0 - 1*	0. Off 1. On
55	Measured humidity contact.	U16	*0 - 1*	0. Off 1. On
56	Measured CO_2 contact.	U16	*0 - 1*	0. Off 1. On
57...59	Not in use.	U16	-	-
60	Output 1 contact.	U16	*0 - 1*	0. Off 1. On
61	Output 2 contact.	U16	*0 - 1*	0. Off 1. On
62	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
65	Device status.	U16	*0 - 1*	0. Ok 1. Fault

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

6.3.2 Holding registers

6.3.2.1 Holding registers for control 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*
15...28	Not in use.	-	-	-	*0*
29	Output 1 power override value.	U16	*0...10000*	0.00...100.00 %	*0*
30	Output 2 power override value.	U16	*0...10000*	0.00...100.00 %	*0*
31	Output 3 power override value.	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 - 2*	0. Off 1. Modbus RTU 2. BACnet MSTP	*1*
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*	1. 1 stop bit 2. 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	*0*
108	BACnet device instance identifier, first two digits.	U16	*0...63*	0...63	*0*
109	BACnet device instance identifier, last five digits.	U16	*0...65535*	0...65535	*10000*
110	BACnet MAC address.	U16	*0...127*	0...127	*0*
111	Maximum BACnet address of a master device.	U16	*1...127*	1...127	*127*
112	Maximum number of BACnet information frames that a node can send before it has to pass the token.	U16	*1...32*	1...32	*16*
113	BACnet temperature unit.	U16	*0 - 1*	0. Celsius 1. Fahrenheit	*0*

6.3.2.3 Holding registers for temperature measurement settings

Holding register	Parameter description	Data type	Values	Range	Default
300	Temperature measurement scale, minimum limit.	S16	*-10000...10000*	-1000.0...1000.0 °C	*0*

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Holding register	Parameter description	Data type	Values	Range	Default
301	Temperature measurement scale, maximum limit.	S16	*-10000...10000*	-1000.0...1000.0 °C	*500*
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*
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 scale, minimum limit.	U16	*0...10000*	0.00...100.00 %	*0*
401	Relative humidity measurement 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*

Holding register	Parameter description	Data type	Values	Range	Default
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 scale, minimum limit.	U16	*0...10000*	0...10000 ppm	*0*
501	CO_2 measurement 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*
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] *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	[1] *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*
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*

[1] The default value depends on the product variant.

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7 BACnet

The -BAC models are equipped with BACnet MS/TP communication via RS-485 connection.

7.1 BACnet properties

Protocol	BACnet MS/TP
Device profile	BACnet Application specific controller (B-ASC)
Bus speed	9600*/14400/19200/38400/57600/76800/115200 bit/s
Stop bits	1
Unit load	1/8 UL
	* factory setting

7.2 Object descriptions

Note: Objects become visible based on the device configuration. All objects cannot be visible at the same time.

7.2.1 Binary value objects

ID	Object name	Values	Default
54	*MEASURED-TEMPERATURE-CONTACT*	*0 - 1*	*0*
55	*MEASURED-RH-CONTACT*	*0 - 1*	*0*
56	*MEASURED-CO2-CONTACT*	*0 - 1*	*0*
59	*CONDENSATION-CONTACT*	*0 - 1*	*0*
60	*OUTPUT-1-CONTACT*	*0 - 1*	*0*
61	*OUTPUT-2-CONTACT*	*0 - 1*	*0*
62	*OUTPUT-3-CONTACT*	*0 - 1*	*0*
65	*UNIT-FAULT*	*0 - 1*	*0*

7.2.2 Analog input objects

ID	Object name	Values	Resolu-tion	Units
0	*TEMPERATURE*	*-1000...1000*	*0.1*	*degrees-celsius (62) / degrees-fahrenheit (64)*
1	*HUMIDITY*	*0...100*	*1.0*	*percent-relative-humidity (29)*
2	*CO2*	*0...10000*	*1.0*	*parts-per-million (96)*

7.2.3 Analog value objects

ID	Object name	Values	Reso-lution	Units	Default
13	*OUTPUT1-VOLTAGE*	*0...10*	*0.001*	*volts (5)*	*0*
14	*OUTPUT2-VOLTAGE*	*0...10*	*0.001*	*volts (5)*	*0*

ID	Object name	Values	Reso-lution	Units	Default
15	OUTPUT3-VOLTAGE	0...10	0.001	volts (5)	0
17	EXT-INT-TEMP-AVERAGE	-1000...1000	0.1	degrees-celsius (62) / degrees-fahrenheit (64)	0
18	DEW-POINT	-1000...1000	0.1	degrees-celsius (62) / degrees-fahrenheit (64)	0
21	ABSOLUTE-HUMIDITY	0...100	1.0	grams-per-cubic-meter (217)	0
22	MIXING-RATIO	0...100	0.1	grams-per-kilogram (210)	0
23	ENTHALPY	0...1000	0.1	kilojoules-per-kilogram (125)	0
36	INSTALLATION-QUALITY-SCORE	1...4	1.0	no-units (95)	0
1000	BUS-TEMPORARY-OVERDRIVE-TIMER	0...1440	1.0	minutes (72)	0
1001	BUS-TEMPORARY-OVERDRIVE-SELECTION	0...65535	1.0	no-units (95)	0
1012	BUS-OUTPUT1-POWER	0...100	0.01	percent (98)	0
1013	BUS-OUTPUT2-POWER	0...100	0.01	percent (98)	0
1014	BUS-OUTPUT3-POWER	0...100	0.01	percent (98)	0

7.2.4 Network port objects

With the network port object you can set the communication settings. The available settings are:

- bus speed
- MAC address
- maximum number of masters
- maximum number of infoframes

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8 Disposal

This 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.



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