

ENGINEERING
TOMORROW

Danfoss

User Guide

Danfoss Prosa telemetry solution Type **PR-SC4K Modbus**

Monitoring solution for food service



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1. Connection

The initial start guide is intended for connecting Prosa Modbus 300B4327 and Optyma cold room control AK-RC 111, 113, 251, 204B, 205C and 305W using iPhone/Android smartphone. The installer should be trained and competent and familiar with how to access and change the parameters on the Optyma cold room control for both level 1 and level 2 variables.

The parameter list can be found within the Optyma control installation guide. We recommend reading the control instructions prior to initial set up of the Prosa Modbus device. This Prosa set up guide is the same process with AK-RC 111 (1 phase), AK-RC 113 (3 phase), AK-RC 251, AK-RC 204B, AK-RC 205C and AK-RC 305W version of controller.

Note: If you ever move the Prosa telemetry device location, you need to open the app and go to “tools” and then 1. Disconnect equipment and 2. Delete equipment before you move the device.

2. Functions

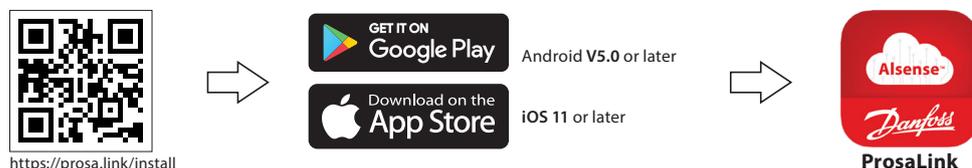
Prosa PR-SC4 Modbus functionality and how it works?

The ProsaLink app will mirror the Optyma cold room control alarms so please ensure that all the relevant parameters are changed and tested in the controller as necessary, and that you test the integrity of the alarm functions on the app when the initial set up process is completed. This includes any evaporator fan door switch and hi and low alarms and alarm delays parameters, personnel trapped alarm etc.

Note: the default alarm delay in AK-RC 111/113 parameter “ald” is 120 min. The default high temperature alarm “A2” is +99 and low temperature alarm “A1” is -45. The default alarm delay in AK-RC 251, 204B, 205C, 305W parameter “A5” is 30min. The default high temperature alarm “A1” is +99 and low temperature alarm “A2” is -50. Once the parameters are adjusted to site conditions - to check the alarm functionality “On site” is to off set the alarm parameters outside of the alarm trigger conditions and view the “Live Data” on the app when you are near the equipment. If an alarm is generated on the cold room control it will be mirrored on the ProsaLink app 5 min later.

Note: It is the installers responsibility to check, adjust and confirm any application specific control parameters.

Before downloading the app, please check that the smartphone you and the end user are using meets the following requirements. For example, android v5.0 Or later iOS 11 or later. For installer in settings before proceeding enable bluetooth and app notifications when prompted. It will ask you to share your location for the Prosa telemetry device to establish the geolocation.



Service subscription charges to be paid by either the end user or the installer. During initial set up a free 1 month trial period can be selected and then the bill payer will be sent email notification to subscribe. The bill payer credentials must be entered during the initial set up of Prosa Modbus.

- i. If the end user is paying the telemetry subscription charge, then you must enter the end user credentials during initial set up, so please ensure you have them to hand before setting the device.
- ii. A quick way to check the subscription status, is to press the IoT enabler icon on the ProsaLink app dashboard, the subscription will be either be "active" and green or "Disabled" and Red, if it is red the bill payer will need to subscribe the service to continue receiving the data, and they would have received email notification prior to the data not being transmitted.

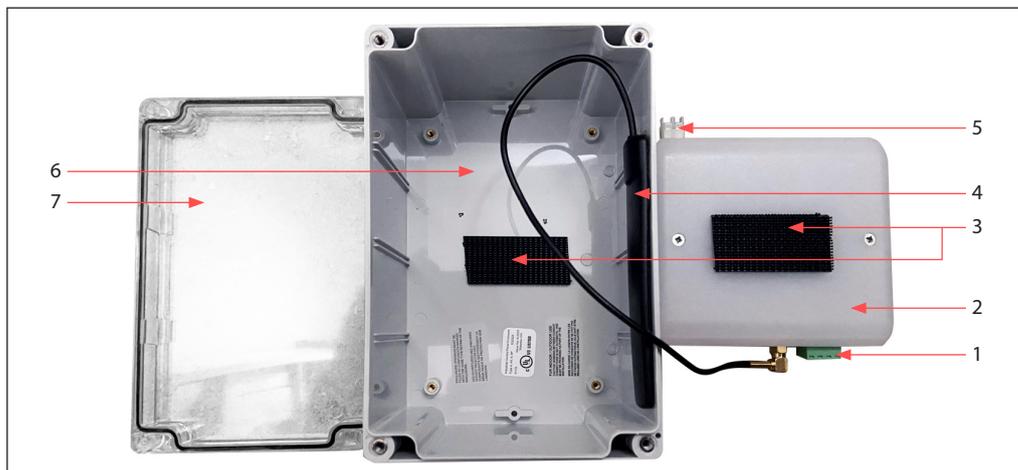
If you have never used the app before, you must create a new user account. The minimum requirements are 1. ProsaLink user name and 2. password. The user name which is case sensitive must be created with no spaces in between the first and second name for example "JohnSmith" If you ever forget either your "ProsaLink user name" or "Password" you can reset these by using the forgot user name/password function. Please remember to check the spam/junk folder. This process applies to both the end user (account owner/bill payer, and the installer).

3. Installation

3.1 Items within the ProsaLink kit (cable glands are excluded from the kit)

1. Modbus wiring connector block (Green)
2. Prosa Modbus device 300B4326
3. 2 pieces self adhesive velcro
4. Antenna
5. 230 V power supply connection (White)
6. Protection box (gasket must be installed to maintain IP rating)
7. Protection box lid, gasket and screws (supplied loose)

From item 3, 1 piece is to be stuck to the bottom of the Prosa device and 1 piece is stuck to the bottom of the protection box. This is to secure the Prosa device to the bottom of the junction box. If you need access the side of the device it can be removed from the velcro by pulling the hardware gently towards you.



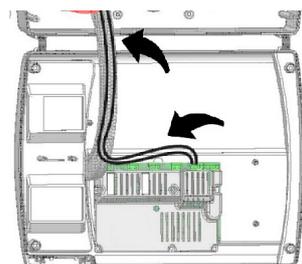
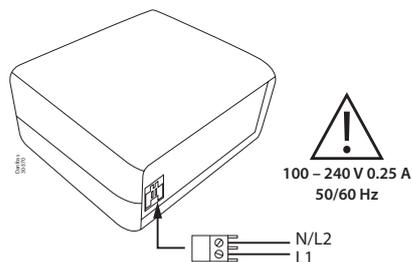
1. Red LED = Modbus communication
2. Green LED = communication to cloud



Assembled Prosa Modbus in protection box

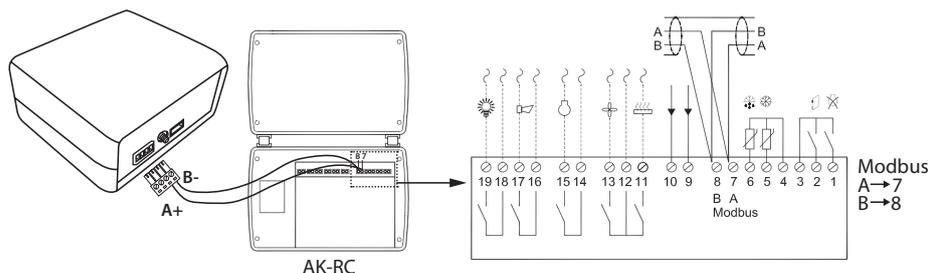
3.2.1 Power cable for AK-RC 111, 113

Field/Prosa link kit wiring to be carried out by the installer with 230 V power switched off. Connect 230 V fused power supply to white connector plug into the Prosa marked power supply.



In case panel is connected with Modbus network and/or Alarm/Aux relays are used, wirings must be done directly on the electronic card clamps. It's suggested to put that wirings beside the connection cables from electronic card and bottom of the box.

Connect 2 wire Modbus from Optyma cold room control to Prosa device



Note: *

Variable bdr	Set to 7 (default in 101/103)
Variable Ad	Set to 1
Variable AU	Set to 7 (only for 101/103)

Connect the 2 wire Modbus cables (which are polarity dependant) in the example below red and black singles are used for clarity

1. Wire the 2 cables into the Prosa device (Fig 1: A = Red, B = Black)
2. Connect the 2 wires to the terminals on the Optyma cold room control marked (Fig 2: A = Red, B = Black)



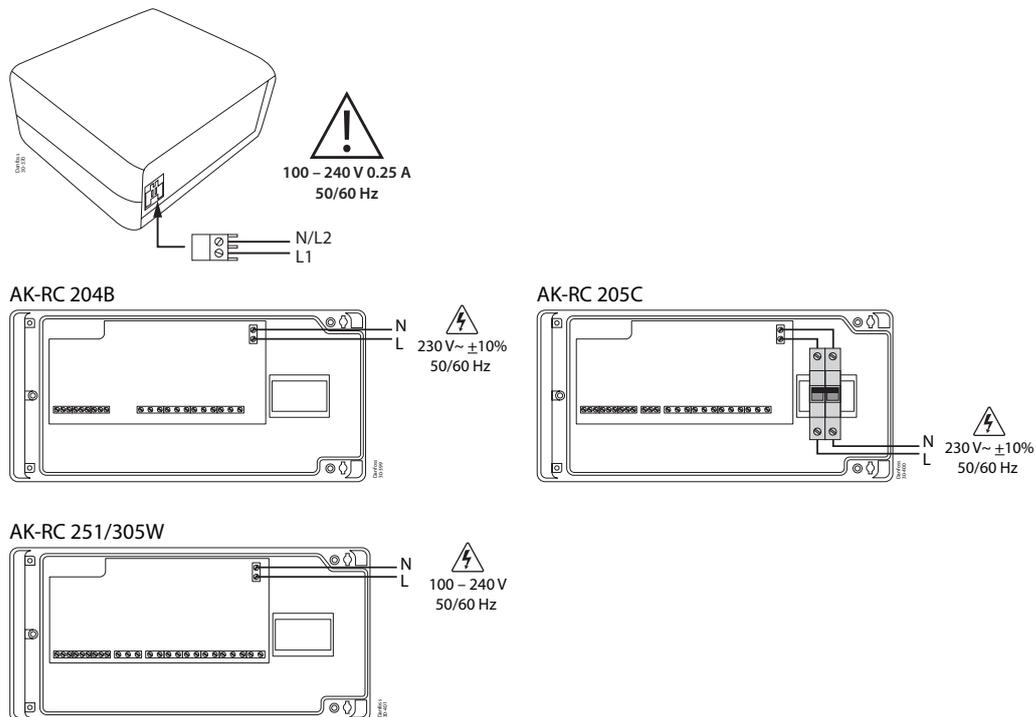
Fig 1: A = Red, B = Black



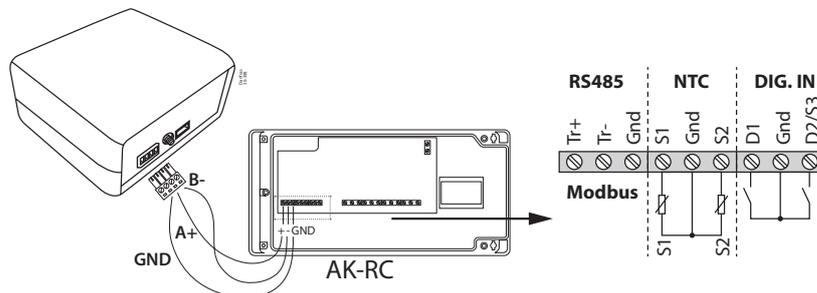
Fig 2: A = Red, B = Black

3.2.2 Power cable for AK-RC 251, 205B, 205C, 305W

Field/Prosa link kit wiring to be carried out by the installer with 230 V power switched off. Connect 230 V fused power supply to white connector plug into the Prosa marked power supply.



Connect 3 wire Modbus from Optyma cold room control AK-RC 251, 204B, 205C, 305W to Prosa device.



Note: *

Variable b20	Set to 1
Variable b21	Set to 1

Connect the 3 wire Modbus cables (which are polarity dependent) in the example below white, red and black singles are used for clarity.



3.3.1 Installation process for AK-RC 111, 113

- A. Complete all field, power and Modbus wiring, and connect the antenna into the antenna socket
- B. Switch on the power to the Optyma cold room control and Prosa Modbus device
- C. Set the parameters in the Optyma cold room control "bdr" =set to 7 (Fig 3) and ad=set to 1 (Fig 4) to enable the communication between the 2 devices. If the Optyma cold room control is an AK-RC 101/103 older version turn off the power and then remove the white plastic cover which covers the pcb by removing the screws and then move the plastic link jumper to terminals 3-2 as the default jumper position is 1-2 as shown in Fig 1 & 2 and set parameter "au" to 7. The type of control is specified on the data plate which can be found on the right-hand side of the Optyma control.

Fig 3: Parameter "bdr" set to 7



Fig 4: Parameter "ad" set to 1



Check that all the default parameter values within the Optyma cold room control are set to site specific requirements – please note that the default alarm delay is factory set to 120 mins the high temperature alarm is set to +99 and the low temperature alarm is set to -99.

It is the installers responsibility to check and adjust any site and application specific parameters. If the cold room controller is not configured to suit the site and application requirements then the Prosa will not send an alarm notification.

- D) On the Prosa device, observe the red and green LED located next to the antenna connection when they are both solid the device is ready to associate with your smartphone. The red LED is for the Modbus communication between the cold room control and the Prosa device, when you initially switch on this will flash for a few min and then go solid. The green LED is the connection to the cloud – when you first switch on the device this will blink on and off and then once the connection is established it will turn solid green. A blinking green LED can also be associated with the device signal so you may see both leds blinking at times if the signal strength varies due the location or if the data is being transmitted. The device signal strength can be checked on the Prosalink app → "Data" widget on the dashboard "Network status" in green bars and "live data" screen.

The communication to the cloud depends on the hardware signal. If you try and associate the Prosa device with your smartphone before the green and red LED are solid then you will be unable to communicate with the Optyma control to the Prosa device and app. This normally connects in a few minutes.

What the LED's mean and why they are important?

PR-SC4 Modbus	
Green LED	Off: No or poor GSM signal On: GSM Signal and transmission to the server are OK Blink: GSM Signal OK and transmission to the server in progress
Red LED	Off: device powered off On: device powered on and communicating with the controller Blink: device powered on but not communicating with the controller Fast blink: device powered on but has lost the communication with the controller

3.3.2 Installation process for AK-RC 251, 205B, 205C, 305W

- A. Complete all field, power and Modbus wiring and connect the antenna into the antenna socket
- B. Switch on the power to the Optyma cold room control and Prosa Modbus device
- C. Set the parameters in the Optyma cold room control “b20” Modbus address = 1 (default value) and “b21” Communication speed = 1 (19200 baudrate)

Fig. 5: Parameter “b20” set to 1 for Modbus address 1 (default value)



Fig. 6: Parameter “b21” set to 1, for baud rate 19200



Check that all the default parameter values within the Optyma cold room control are set to site specific requirements – please note that the default alarm delay is factory set to 30 mins the high temperature alarm is set to +99°C and the low temperature alarm is set to -50 °C.

It is the installers responsibility to check and adjust any site and application specific parameters. If the cold room controller is not configured to suit the site and application requirements then the Prosa will not send an alarm notification.

D) On the Prosa device, observe the red and green LED located next to the antenna connection when they are both solid the device is ready to associate with your smartphone. The red LED is for the Modbus communication between the cold room control and the Prosa device, when you initially switch on this will flash for a few min and then go solid. The green LED is the connection to the cloud – when you first switch on the device this will blink on and off and then once the connection is established it will turn solid green. A blinking green LED can also be associated with the device signal so you may see both leds blinking at times if the signal strength varies due the location or if the data is being transmitted. The device signal strength can be checked on the Prosalink app → “Data” widget on the dashboard “Network status” in green bars and “live data” screen.

The communication to the cloud depends on the hardware signal. If you try and associate the Prosa device with your smartphone before the green and red LED are solid then you will be unable to communicate with the Optyma control to the Prosa device and app. This normally connects in a few minutes.

What the LED’s mean and why they are important?

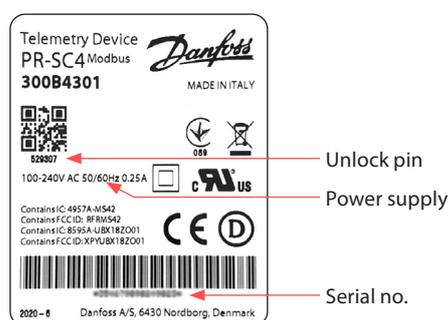
PR-SC4 Modbus	
Green LED	Off: No or poor GSM signal On: GSM Signal and transmission to the server are OK Blink: GSM Signal OK and transmission to the server in progress
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4. Configuration

Before downloading the app, please check that the smartphone you and the end user are using meets the following requirements. For example, Android v5.0 or later iOS 11 or later. For the installer, in settings enable bluetooth and app notifications when prompted. It will ask you to share your location for the telemetry device to establish the geolocation.



If you have never used the app before, you must create a new user account. The minimum requirements are 1. ProsaLink user name and 2. password. The user name which is case sensitive must be created with no spaces in between the first and second name for example "JohnSmith" If you ever forget either your "ProsaLink user name" or "Password" you can reset these by using the forgot user name/password function. Please remember to check the spam/junk folder. This process applies to both the end user (account owner/bill payer, and the installer).



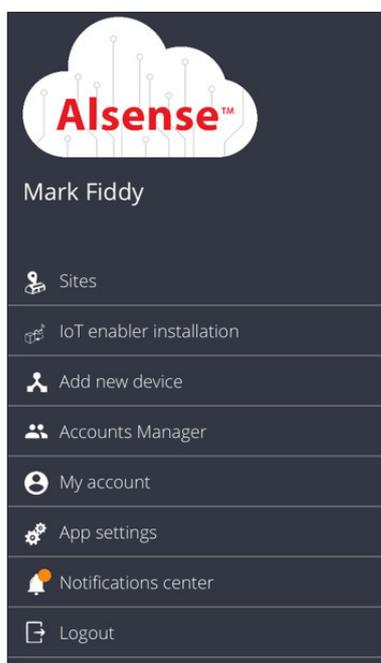
Download the **ProsaLink** App from Google Play or App Store (if you are a new user create a ProsaLink user name and password):

1. The wiring to the OPTYMA control is to be completed before attempting to associate the PRSC4 telemetry device with a smartphone.
2. Connect the Antenna to the Antenna connection.
3. Connect 230 V fused power supply to the Prosa and Cold room control
4. Connect the 2 wire Modbus + & - between the Optyma cold room control and the Prosa device as explained on Page 4. Switch on the power and check that the green and red LED are solid, as described on page 5 before you associate the Prosa device with a smartphone.
5. Open App and select **"Add new device"** which will automatically open the phones camera.
6. **Scan QR Code** on the Prosa device, the serial number and unlock pin will upload into your smartphone. In the unlikely event of the smartphone camera will not scan the QR code, enter the 15-digit device "serial no" (under the bar code) and the "unlock code" which is located under the QR code on the device manually.
7. Press **"Confirm"** on the app screen.
8. **"Establish a device connection"** blue tooth connection established and firmware up to date should be automatically ticked. If this does not automatically tick leave the app open until it completes the process.
9. Press **"next"** and the "telemetry mobile network status" page, the device signal strength and number of bars represents how strong the signal is to the cloud. **"Registered to 4G"** and **"Prosa cloud connection state"** will be ticked automatically.
10. Press **"Next"**
11. The device you have just scanned will be on the menu screen **"Search destination site"**
12. Press the name of the device you have just scanned.
13. **"Equipment nearby screen"** press add new equipment.
14. On **"Equipment details page"** press/enter the "name" of the equipment e.g., frozen food cold room etc and type of equipment "cold room" "display cabinet" and press save. You can rename the asset later if you need to in the "info" tab "name"
15. **"Test control board connectivity page"** this will indicate the controller type you are connected too → then press next.
16. **"Who will pay for the telemetry service subscription?"** Either me? or somebody else (end user) if you choose somebody else, you MUST insert the email address of the end user. If the end user is paying the subscription charge you must enter their email address details during the initial set up.
17. **"Installation procedure complete"** check the service subscriber details are correct" and press "close"

18. The asset will now be visible on the users ProsaLink dashboard.
19. On the **app** the name of the cold room or asset will be displayed, if you would like to rename the asset, look for **"info tab"** and then rename and then press the tick next to the name.
20. **"HACCP not configured"** will be displayed on the dashboard, you need to manually enter the HACCP data into the app – the values depend on the content of the item for example Frozen Food default HACCP is -18 to -21. This can be adjusted as per the user requirements/thresholds. The HACCP data is recorded every hour automatically and can be viewed and exported to an excel file on the app if required. The HACCP data is not connected with the temperature alarm data, HACCP data is for data logging purposes only.
21. The temperature data will start to log on the app (cloud) after approximately 30 min of powering on and setting up.
22. If you ever move the telemetry device location, you need go to **"Tools"** widget and 1. Disconnect equipment 2. Delete equipment before you move it
23. On App Dashboard → My Account → Notifications → Check Enable Notifications → App Notifications + Enable/Disable Email Notifications. Push notifications are on as default, but please check to ensure your needs are met. If you want to receive push notifications, for iOS phones you must leave the app open (running in the background), while this is not necessary for the Android phones
24. If near the device it will default to **"Live data"**, this is actual real time data generated by the controller, to check the **"Data from cloud"** this will start to appear on the app on your smartphone in 5 – 30 min from initial start-up.
25. Once the initial set up is complete, it is good practice to generate a false alarm on the cold room control by temporarily adjusting the alarm configuration outside the operating temperature, and confirming that the alarms have been activated, and notifications have been received.

Will Prosa send an alarm if the device loses it power? = YES, If the device cannot transmit data or the power has been switched off for 45 – 60 min a "no sign of life" alarm will be sent by pop up push message and email notification if the notifications are enabled in "My Account → Notifications" you can select if you would like to enable or disable "app notifications" or enable or disable "E-Mail alarm notifications" the default settings is notifications on, however as good practice we recommend checking the dash ProsaLink app settings.

4.1 ProsaLink app dashboard



Sites: are the list of assets or coldrooms associated with your account.

IoT enabler installation: you see all the devices around you visible by bluetooth. Associated and not associated. If you want to see only the not associated ones you can use the switch on the screen. Associated means that the setup is completed and configured in the system.

Add new device: to add a new Prosa device.

Accounts Manager: for giving permission and access to additional users to the site data. This will be the "account owner" / bill payers' privilege for security.

My account: to review your personal data, username, change your password, notification settings, privacy policy, or log out of app. You can disable and enable app and email notifications here. This is also where the subscription module is.

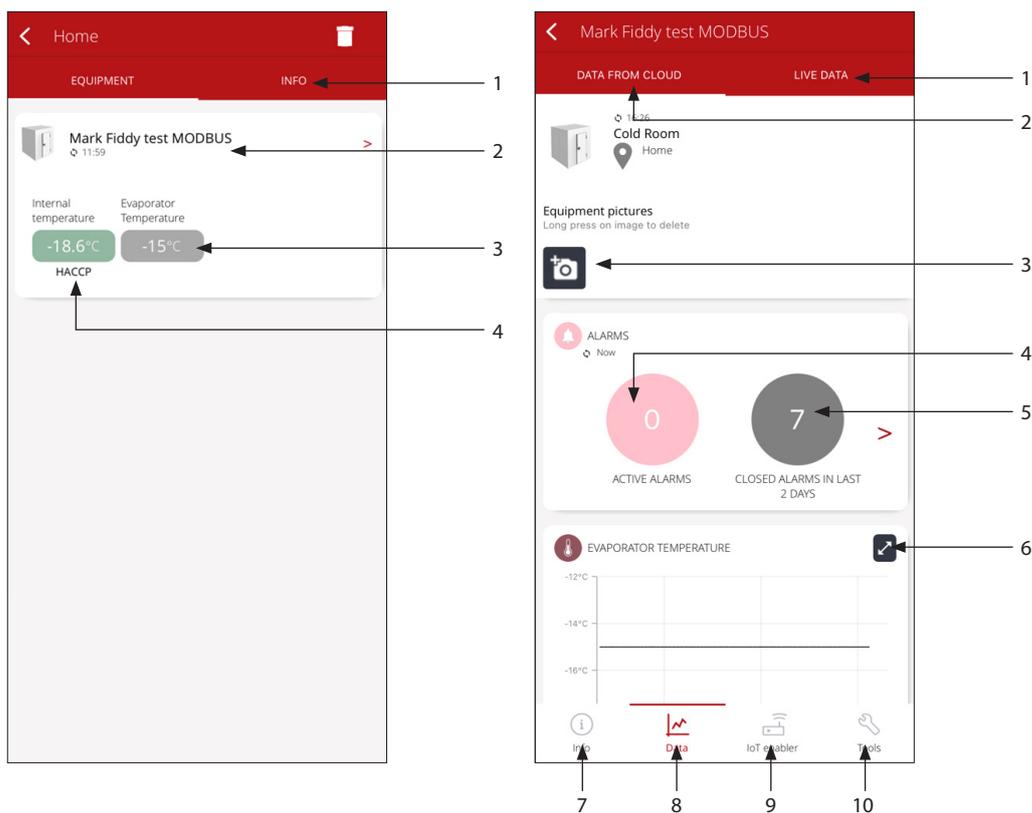
App settings: select language, unit of measure in km or miles, and default temperature to celsius or fahrenheit.

Notification center: here you can view all alarms associated with your account.

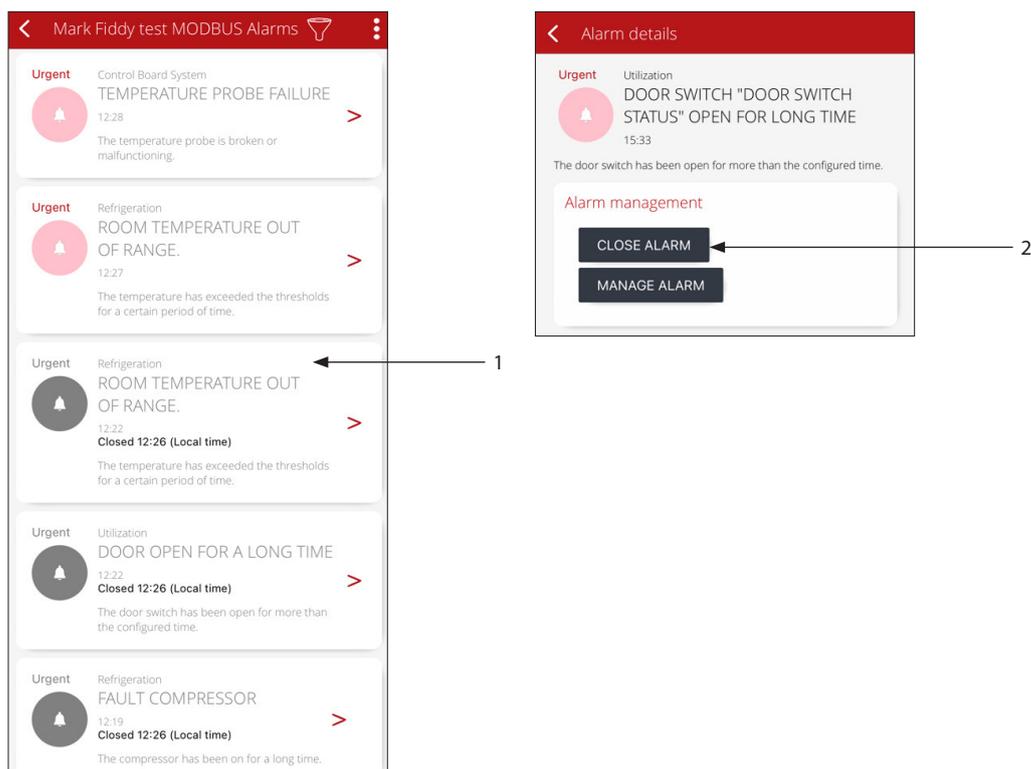
Logout: logout of the ProsaLink app.

A simple analogy of Prosa account designation is that an installer purchases the hardware for the "End user" customer, the installer "associates" the device with the smartphone and then enters their customer email credentials during set up. If the end user, then wants other people to have access to the site data they must go to the "Account management" tab and add another user by pressing the + symbol and entering the additional user credentials. The new user will then be sent a temporary log in to the Prosalink app where they can access the site data. The new user can then adjust the user name and password to one that is unique to them found in the "My account" section in "The account owner" bill payer can add or remove additional users at any time they wish by adding or removing from the "Accounts Manager" section. The installer does not have this privilege to do this if they do not own the equipment and account data.

4.2 ProsaLink app dashboard navigation

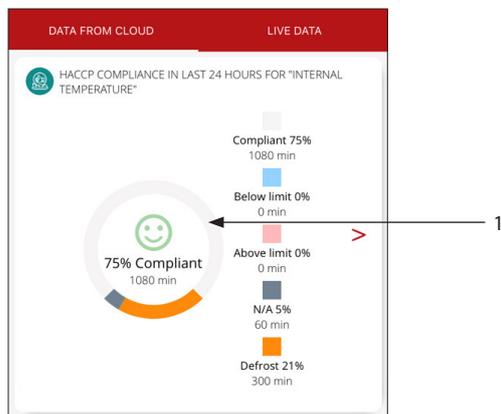


- | | |
|---|---|
| <ol style="list-style-type: none"> 1. "Info" is the contact and location details of the end user/account owner. 2. Type and name of equipment 3. Evaporator/Defrost sensor temperature 4. Internal Temperature, and HACCP traffic light. Green OK, Red High temperature. "HACCP" below temperature indicates HACCP has been configured. | <ol style="list-style-type: none"> 1. "Live Data" tab using Bluetooth – automatic selection when close to equipment. 2. "Data from cloud" is when away from equipment. 3. Picture of the asset if added will appear here 4. "Active Alarms" are alarms that are currently active. 5. All "closed alarms" are stored here, by pressing the symbol will show all the alarms in the log screen example below. 6. To expand graphical data for "evaporator/defrost" sensor press here, same format for "internal temperature". 7. "Info" tab displays the name of device, code, and address via geo-location. You can rename the asset here. Code and manufactures code is not used. 8. In "Data" tab either data from cloud or live data via Bluetooth. Here you can view the site data. 9. "IoT enabler" tab check "service status" active or disabled e.g., Subscription status, "active" or "disabled", "model no", "device serial number" and "firmware version" 10. "Tools" tab is for if you need to relocate the equipment you must: <ol style="list-style-type: none"> 1. Disconnect equipment 2. Delete equipment before moving. This can only be completed when you are close to the equipment and connected via Bluetooth. |
|---|---|

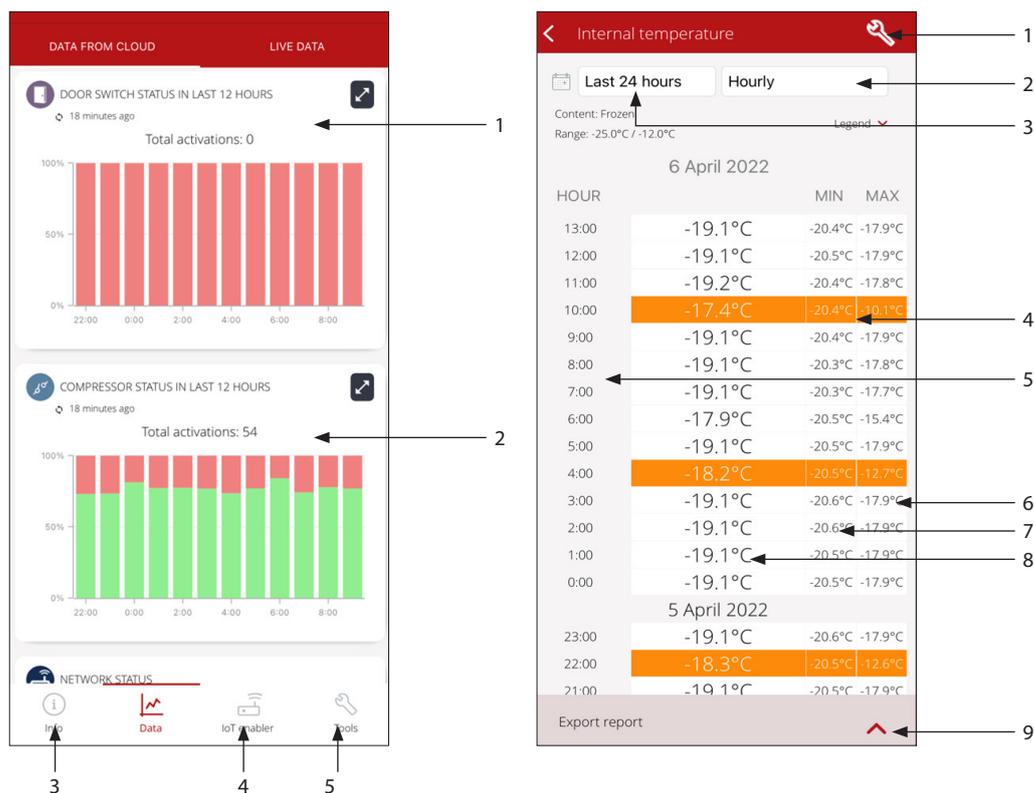


1. Example Alarm Log, type of alarm date and time.
2. "Alarm Management" the installer or account owner can manage the alarm by either "closing" or "manage".

The dashboard is for quick reference view of HACCP data, if you would like to view historical data then press here to open the tabular data view.



1. "HACCP compliance" Dashboard view, press here to reveal the tabular data.



1. "Door Switch Status" in last 12 hours. If a door switch is added the % of time will be shown.
 2. "Compressor Status in last 12 hours" this shows the % of time that the compressor relay has been active.
 3. Info tab, here you can adjust the name of the asset. The code and manufactures code are not relevant to SC4 Modbus.
 4. The IoT enabler widget shows the current subscription status. If this is red the end user/ bill payer has not subscribed to the service or the subscription has expired and needs to be reactivated. The account owner is notified by email prior to the service being stopped. If this is green the service status is active. The device serial number and firmware version is also displayed here.
 5. The tools widget allows you to make the following changes:
 1. Disconnect equipment
 2. Delete equipment
-
1. "Spanner" Symbol, press here to view and modify HACCP settings and type of product
 2. Change data from "hourly" to "Daily"
 3. "24 hours" or "Last Week" "last Month" or "custom time data"
 4. Orange colour represents a defrost cycle (info from the controller)
 5. Hourly temperature log intervals
 6. Minimum temperature recorded
 7. Maximum temperature recorded
 8. Average temperature – based on minimum and maximum values
 9. Export HACCP report to excel file

Note: HACCP data page = automatically records every hour
 From initial start this will start the report automatically 2 hours later

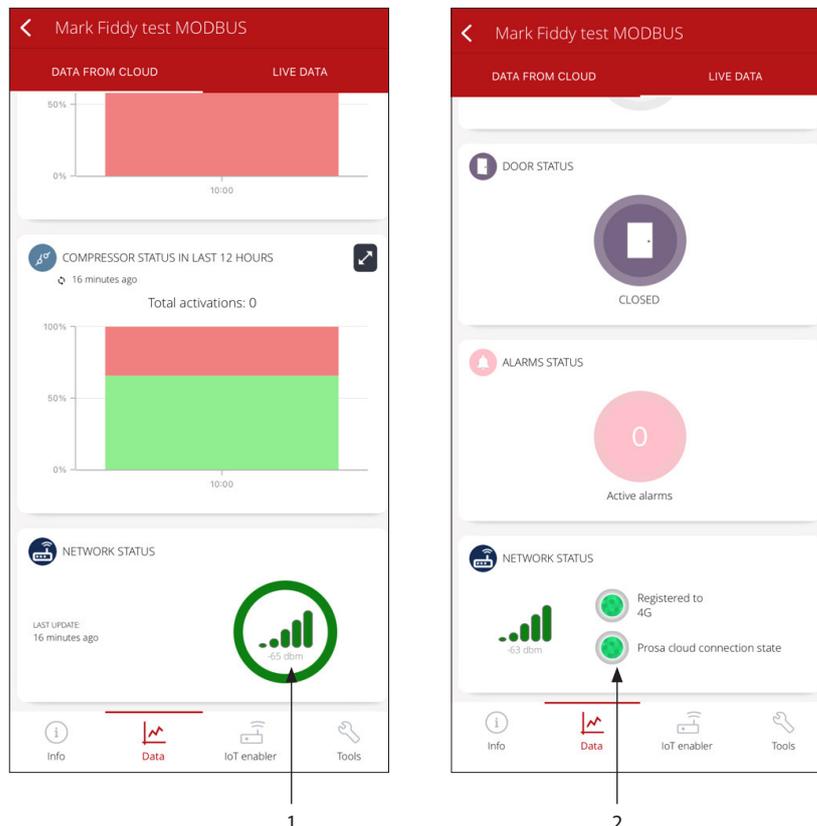
Note: HACCP is for temperature monitoring and data logging only.
 The System alarms are generated by the cold room controller and are mirrored by Prosa.
 We collect information from the site every 5 min and transmit to cloud every 20 mins.

4.3 Prosa device signal strength

The device signal strength can be checked by viewing “Live Data” or on “Data from Cloud”

“Data from Cloud” is when you are not connected via Bluetooth. For example, when you are not on site all data will be “Data from Cloud”

“Live Data” is when you are near the equipment and the smartphone is connected to the device via Bluetooth. 1 device at a time. If you have more than 1 device on site, these will be visible in the “IoT enabler installation” section for either devices already “associated” or “uninstalled devices”.



1. “Data from cloud” Prosa Device Signal (dbm) Strength Green OK, Amber, or Red signal reduced/ none.
2. “Live data” for viewing real time data, and alarms from the Optyma cold room control. Connected via Bluetooth.

Red Flag is if the signal strength is higher -93 dbm (barely acceptable) to -105 dbm (insufficient for the device to transmit)

A mobile phone/SIM signal (also known as reception and service) is the signal strength (measured in dBm) received by a mobile phone from a cellular network (on the downlink). Depending on various factors, such as proximity to a tower, any obstructions such as buildings or trees, etc. this signal strength will vary. Most mobile devices use a set of bars of increasing height to display the approximate strength of this received signal to the mobile phone user.

If the antenna needs to be relocated outside of the building, longer antenna can be purchased. An example of [Covvy Antenna Extension Cable](#).

5. Ordering

Model	Description	Code no.
PR-SC4K Modbus	Telemetry Kit (full kit)	300B4327

For aftersales support, subscription and account questions please contact support.prosa@danfoss.com

To access the PC version of the Prosa IoT portal, please follow this link and sign in using the same user credentials as if you were using the ProsaLink app <https://vbx.prosa.com/vebox/login?logout>

In the PC version it is among other things possible to find earlier HACCP data.

Installer check list before handing over to the customer/end user/subscription bill payer/account owner.

Have I,

1. Adjusted the application specific alarm parameters and time delay on the Optyma cold room control?
2. Set the HACCP min/max temperatures and is the tabular data logging?
3. Configured & tested any digital inputs connected to the Optyma cold room control? (the alarms should be mirrored on the app).
4. Entered the account owner/end user credentials into the app during initial set up?
5. Checked that app (push) and email notifications are enabled, installer and end user, to receive the alarm data?
6. Triggered a false alarm, to verify if the Prosalink app is emailing you and your customer (end user) the alarm data?
7. Are the connected assets clearly labelled, so that the end user can identify the name and where the equipment is located, for example "Fruit and Veg chiller" or "Frozen Food Cold room 1" the name on the asset on site, should be the same as the name on the Prosalink app or vice versa.

Danfoss A/S

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Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product.

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