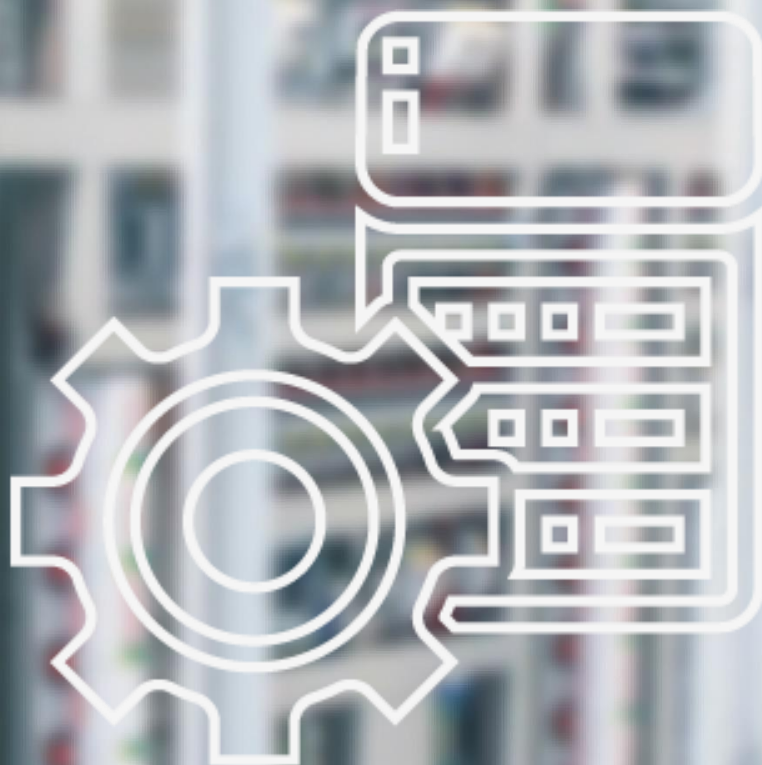




oasSmartRoomUtilities

Application Manual

Driver based on the Niagara firmware

This driver allows to integrate and to configure the Moehlenhoff Controllers and Systems under the Niagara Platform.

Software Version 1.1

Developed March 2021

→ www.openautomationsystems.store

IoT Solutions and Services
for Smart Automation



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1 Introduction

1.1 Description

The **oasSmartRoomUtilities** is a driver developed by OAS to have the possibility to integrate and to configure the Moehlenhoff Controllers and Systems under the Niagara Platform.

1.2 Symbol and Information Explanation

Warning of a danger point!



This symbol indicates a threat or immediate danger to the function of the system or parts of the system. Failure to heed these warnings could result in property damage and malfunction.

1.3 Assumptions

It is assumed that the person who wants to operate the **oasSmartRoomUtilities** via the Niagara Workbench has at least basic knowledge about the Niagara Framework.

It is assumed that the person who wants to operate/integrate the **OEM Alpha2 System** has at least basic knowledge about the Moehlenhoff products like **EZR Manager** and **Apha2.exe**.

It is recommended that you also have the corresponding documentation from Moehlenhoff (e.g. Alpha2-XML Interface description).

1.4 Software-Requirements

The **oasSmartRoomUtilities** driver requires at least Niagara 4.10 and a valid license specifically for this driver.

2 Description of the Product

2.1 Purpose of the Product

The **oasSmartRoomUtilities** is a driver developed by OAS to have the possibility to integrate and to configure the Moehlenhoff Controllers and Systems under the Niagara Platform.

2.2 Licensing

To access all the driver's features, you must have a valid license of **oasSmartRoomUtilities**. Please, contact the **OAS Open Automation Systems GmbH** to have a valid license.

2.3 Product Elements

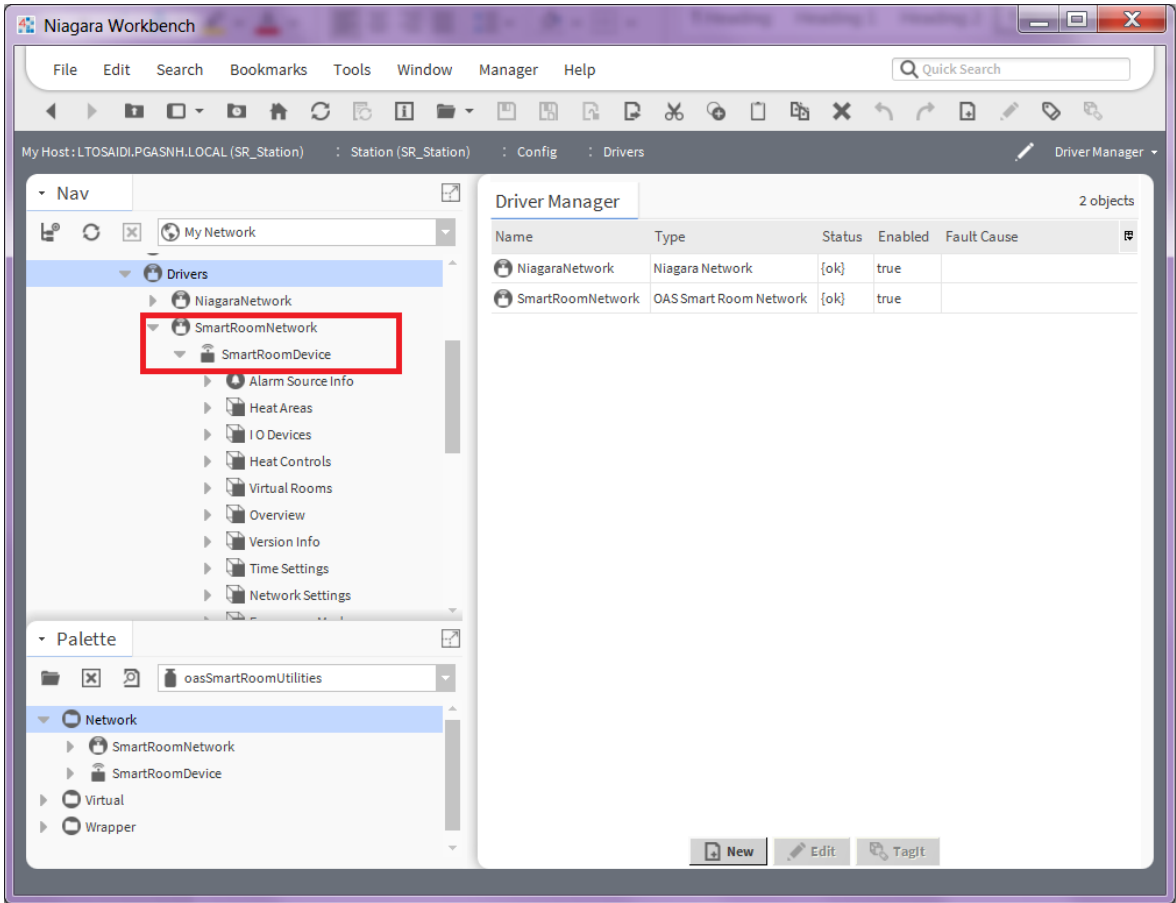


Figure 1: Driver Manager



The following steps can only be performed by an Admin-User.

To set up a working network, the following steps must be performed:

2.3.1 Network

Drag the **SmartRoomNetwork** component from the network folder of the **oasSmartroomUtilities** palette and drop it onto Drivers.

You can also see that the **Niagara default ping frequency** (5min) is changed and set to 22 seconds.

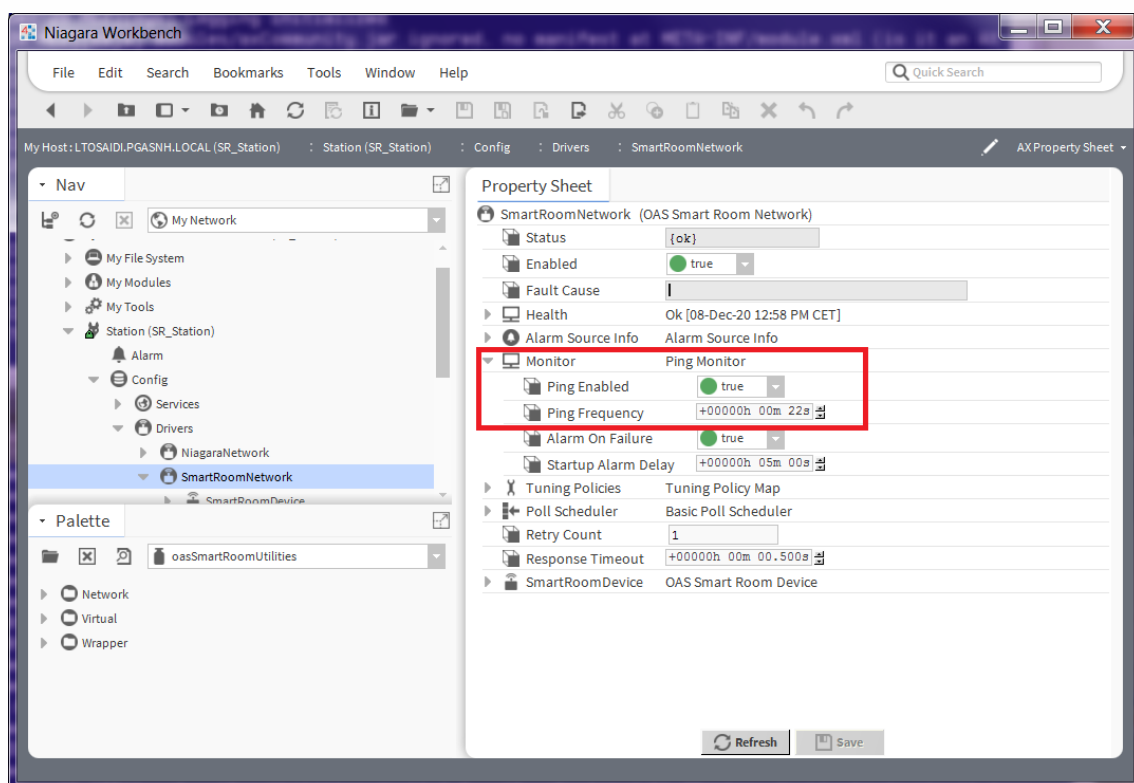


Figure 2: Property Sheet

2.3.2 Device

Drag the **SmartRoomDevice** component from the **Network** folder of the **oasSmartRoomUtilities** palette and drop it onto **SmartRoomNetwork**. The selected **SmartRoomDevice** component should correspond to a Moehlenhoff “**Base station Alpha 2**” which is connected to your Network.

The **SmartRoomDevice**-component could be also added from the **OASSmartRoomDeviceManager** View (see below).

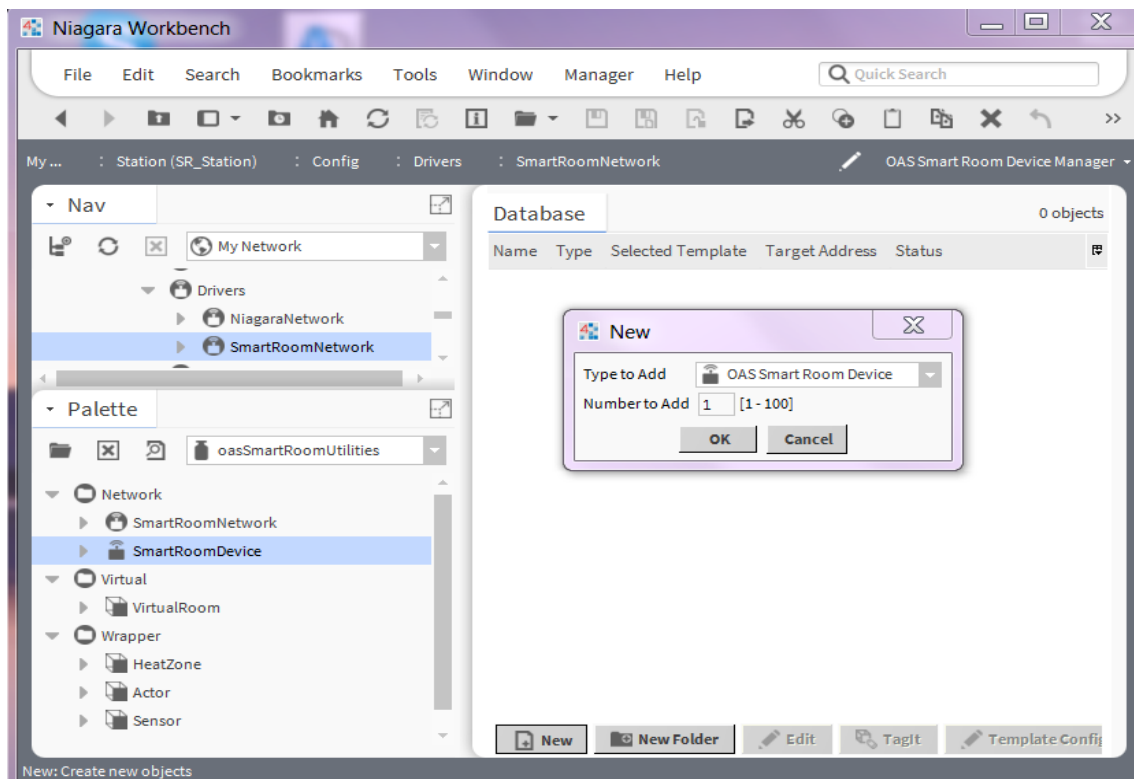


Figure 3: Add Smart Room Device

After triggering the OK button, the user can specify the **Target IP Address** of the Base Controller and choose the **Template** to use.

The **IP Address** matches the physical Address of the Moehlenhoff Controller already installed on your Local Network.

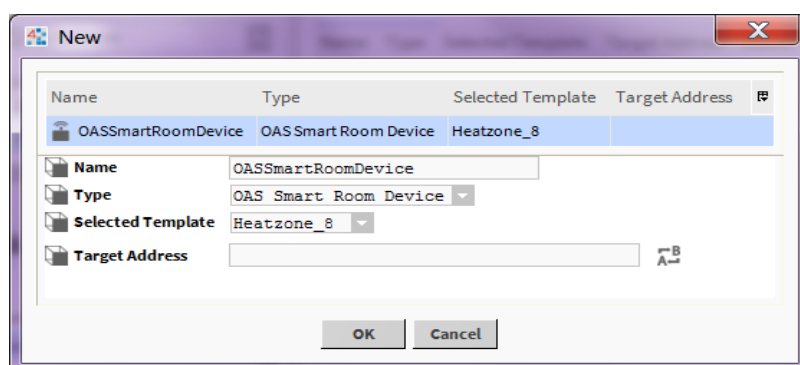


Figure 4: Template Selection

The driver has two defined templates:

- 8 Heat zones, if the Controller disposes 8 physical Heat zones.
- 12 Heat zones, if the Controller has 12 physical Heat zones.

You can also change the **target IP Address** and the **selected template** in the **property sheet** view of the device:

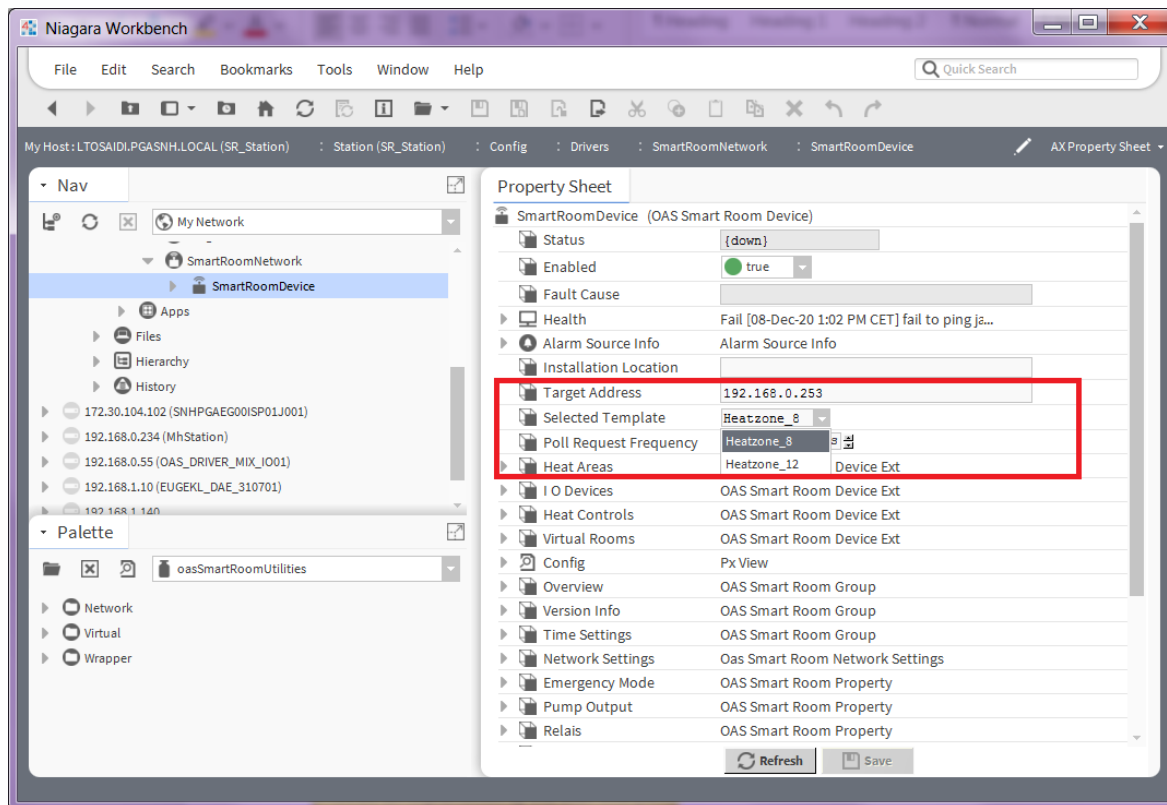


Figure 5: Property Sheet View



The default IP address of the Moehlenhoff “Base Station Alpha 2” is always **192.168.100.100**.

2.3.3 Heat Areas

The **Heat Areas** property has the type **OasSmartRoomDeviceExt** and contains all the **HeatArea** components paired physically or logically (via virtual room concept).

This property contains 8 or 12 Heat areas (depending on the chosen template).

This property will be automatically populated after each polling operation.

2.3.4 IO Devices

The **IO Devices** property has the type **OasSmartRoomDeviceExt** and contains all the **IO Device** components. The **IO Device** is the Room Controller or Sensor which is paired to the Heat zone.

This property will be automatically populated after each polling operation.



The **HEATAREA** and **IODEVICE** properties are always equal to the number of available connected room control units.

2.3.5 Heat Controls

The **Heat Controls** property has the type **OasSmartRoomDeviceExt** and contains all the **Heat Control** components. The **Heat Control** component represents the physical port where the actuator is connected to.

This property will be automatically populated after each polling operation.

2.3.6 Virtual Rooms

The **Virtual Rooms** property has the type **OasSmartRoomDeviceExt** and should contain all **Virtual Room** components. The virtual rooms were conceived for using the sensor system of a third-party installation.

To add a virtual room, drag the **Virtual Room**-component from the **Virtual** folder of the **oasSmartroomUtilities** palette and drop it onto **Virtual Rooms**.

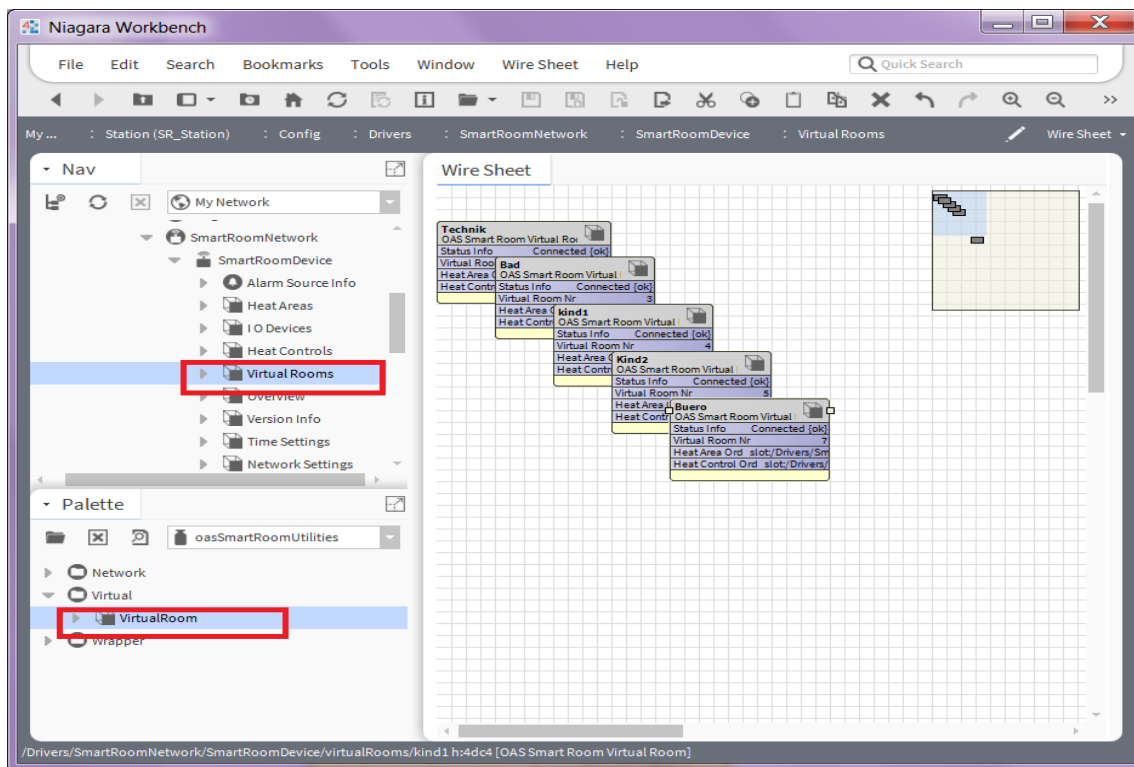


Figure 6: Adding a Virtual Room

The selected **Virtual Room Nr** slot should correspond to the physical Heat Zone number in **OEM Alpha Base station** which is connected to your third-party Sensor.

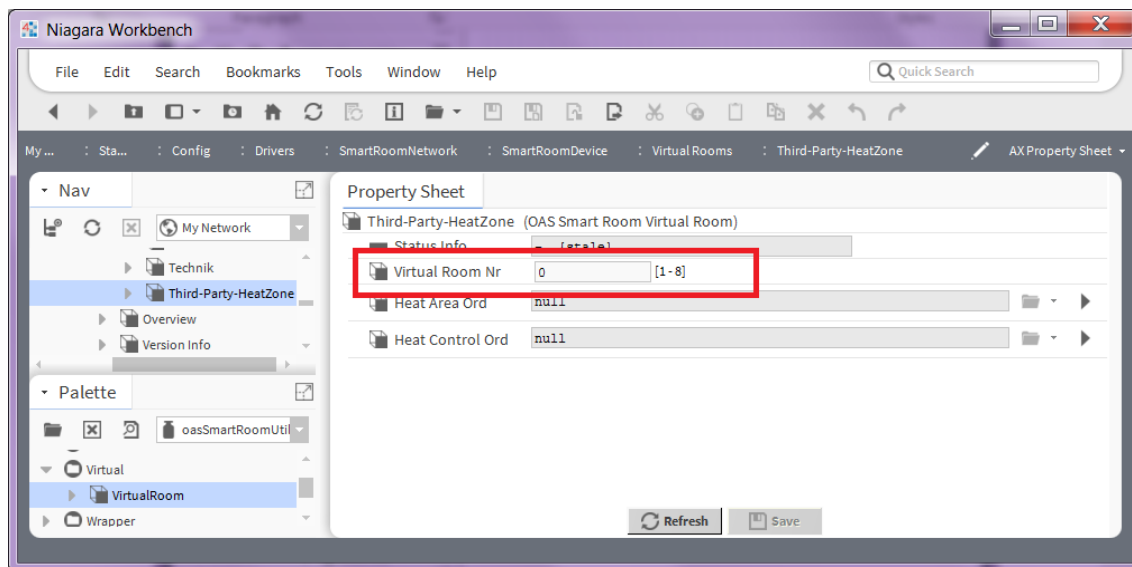


Figure 7: Specifying the Virtual Room Number

When the user specifies the **Virtual Room Nr** and the network communication to the controller is already established, the **Heat Area** should be created and by the next polling the **Status**-slot will be set to **Connected** and the links to the **Heat Area** and the **Heat Control** are modified respectively.

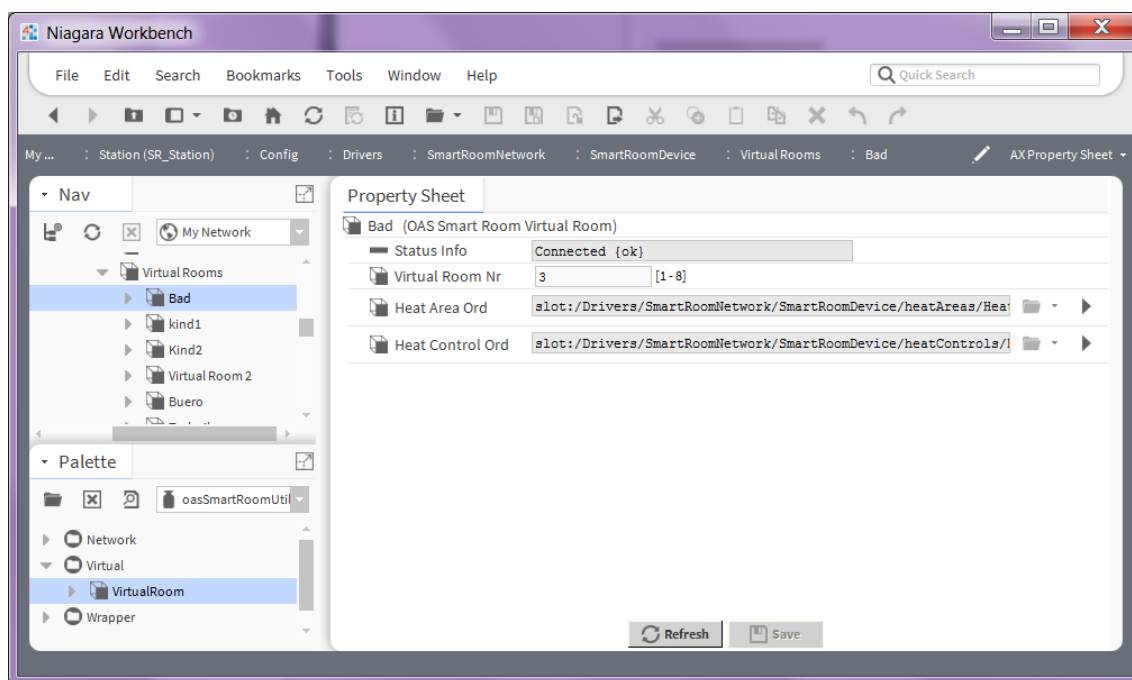


Figure 8: Virtual Room Number



If the specified **Virtual Room Nr** indicates an already paired Heat Zone, this one will be virtual and lose its relation/chaining to the existing IO Device.

2.3.7 Wrapper

Under the **oasSmartRoomUtilities** palette, the folder “**Wrapper**” contains 3 components “HeatZone”, “Actor” and “Sensor”. These components encapsulate the main components of the OasSmartRoomDevice (HeatArea, HeatControl, IODevice) and they are used for integration purposes.

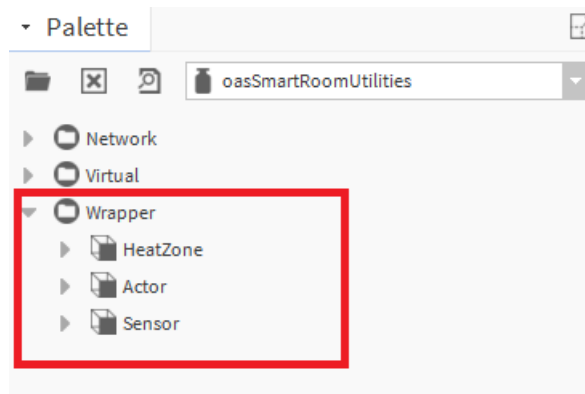


Figure 9: Wrapper

The integrator can prepare and visualize its station with these 3 components (HeatZone, Actor, Sensor). Then when he is ready with the installation/configuration of the **OasSmartRoomDevice**, he can link then to the connected/physical **HeatArea**, **HeatControl**, **IODevice**...

Doing it this way, we offer the integrator the possibility to prepare a template station with a reusable model view.

2.4 Understanding the User Interface

2.4.1 Smart Room Device View

Figure 10: Smart Room Device View

1-Network Settings: If the option DHCP is activated, the router/switch of your home network automatically assigns an IP Address to the base station.

DHCP must be deactivated for manual assignment. Subsequently the fields IP Address, Subnet Mask, Gateway are activated for editing.

2-Date and Time: Here you set time and date of the base station. With the “Sommer/Wintertime Switching” you activate/deactivate the automatic toggle between summer and winter time.

3-Change Over/Boiler relay: here you can modify the “Change Over/Boiler Relay” settings. You select whether the switching output shall be used for controlling a pump relay, or as CO Pilot (see also paragraph 8 CO Input).



Note: In the setting CO Pilot the change-over between heating/cooling is performed via the internet or a Room Control Unit with display. The CO input will not be evaluated any longer.

4-Pump Output: Here you can set the used type of pump (conventional pump or high efficiency pump).

If the base station is operated in a network and defined as master, the output can be set to “global”, for the change-over of all connected base stations. If a central pump is used, the setting “global” must be used.

Depending on the used type, you can set the line-up time and the follow-up time of a conventional pump, or the minimum standstill time and the minimum running time of a high efficiency pump, in minutes.

The control direction of the pump can be inverted via the control direction switching output.

5-Ranking Mode: This shows whether the base station is operated in stand-alone or in a network as master or slave unit.

6-Dew Point Sensor: If the installation is equipped with a dew point sensor, the valves of all heating zones are closed if it is detected that the conditions fall below the dew point (status = activated) in order to avoid damages due to humidity. The dew point sensor input is only used during cooling operation.

7-Temperature Limit: If an optional safety temperature limiter is used, all valves are closed when a critical temperature (status = activated) is exceeded in order to avoid damage to sensitive flooring.

8-CO Input: If an external change-over signal is used, the overall installation switches accordingly between heating and cooling.

9-Antifreeze Mode: This shows whether the antifreeze function is activated or deactivated. If the antifreeze function is activated, antifreeze is switched on automatically at a certain temperature in order to avoid a freezing of the pipes.

10-Smart Start: This shows the status of the Smart Start function. When activated, the base station automatically calculates the required line-up time for heating/cooling, using numerous values.

11-Eco Input State: The base station is equipped with an ECO input for connecting an external timer, if the internal clock of the room control unit Radio Display shall not be used. When the input is activated by the timer, the heating zones which are in the operating mode "automatic" are switched to night operation.

12-OperationModeCOInput: This shows the status of the Smart Start function. When activated, the base station automatically calculates the required line-up time for heating/cooling, using numerous values.

13-Change Over: This allows to change between the two modes Heating and Cooling. This can only be used if CO Pilot is active. If the CO Input is used, the current status (heating or cooling active) is displayed here.

14-Eco Input Mode: With this field you select the application for the external input. The functions Reduction and Vacations are available.

15-Lock Mode: With this field you select the Lock Mode for the Heat areas. In "restricted mode", the room temperature can still be adjusted (a kind of "hotel mode"). In "standard" mode, the complete operation is blocked.

2.4.2 Heating Area View

Heat Zone	Bad	1
Heat Zone ID	3.00	2
Control Mode	Control	3
Actual Temperature	25.0 °C	4
Target Temperature	21.0 °C [5.0 - 30.0]	5
State	Ok	6
External Sensor	No_Additional_Sensor	7

Figure 11: Heat Area View

1-Heat Zone: Freely definable name of the respective heating zone without the special characters: < > & " '.

2-Heat Zone ID: This is the ID of the connected room control units. It varies from 1 to 12, depending on the base station.

3-Control Mode: When the "Control Mode" field is set to "Control" then the properties "Operation Mode" and "Target Temperature" are specified or controlled by SmartRoomUtilities. Otherwise, when the "Control Mode" field is set to "View", all the heat area properties are only viewed from the Möhlenhoff device.

4-Actual Temperature °C: Shows the measured, current room temperature of the respective heat zone.

5-Target Temperature °C: Here, you can set the desired target temperature for the respective heat zone (not available for the analog control unit).

6-State: This status display shows whether the Room Control Unit is Ok or in Error state.

7-External Sensor: The Room Control Unit Radio Display can be equipped with an additional sensor. Here you can parametrize which type of sensor is used.

2.4.3 Heat Control View

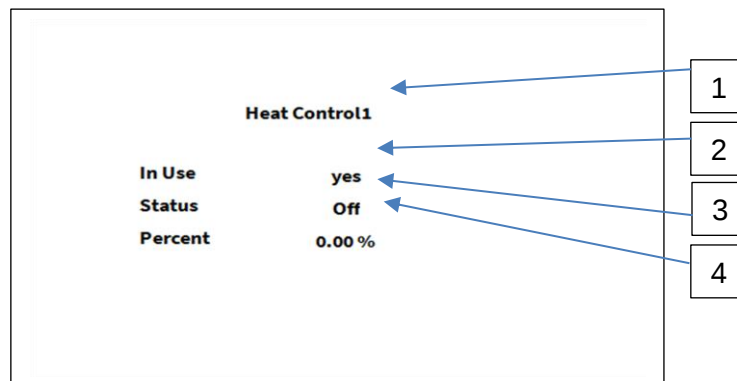


Figure 12: Heat Control View

1-HeatControl Name: This is the name of the respective heating control (Actor).

2-In Use: This shows whatever the Actor is in use or not.

3-Status: This shows the status of the Actor (On/Off/Error).

4-Percent %: This shows the Actor percent. 0%: the actor is Off. 100%: the actor is open and has reached the maximum value.

2.5 Time Program/Scheduling

To keep the oasSmartRoomUtilities driver conform to the Niagara platform, we adapt the heating programs (P1 to P4) provided by Moehlenhoff “Base Station Alpha 2” with a new dynamic concept that allow controlling a particular Heat Zone from a list of preconfigured modes and temperatures.

We provide three modes:

- **Day Mode:** This is generally used during the day when people are present in the house/school/building. In daytime operation, the heating area is operated with the day setpoint (for example 20°C).
- **Night Mode:** This is generally used for the night period or during the day when nobody is present in the house/school/building. The heating area is operated with the night setpoint (for example 16°C).
- **Standby Mode:** If the standby mode is activated, the heating area approaches the standby setpoint. With the standby mode the heating area is typically in minimum operation (for example 18°C). The heating area is running in standby mode until another operating mode is activated (Day or Night).

The following example will help you to understand the oasSmartRoomUtilities Time programs logic.

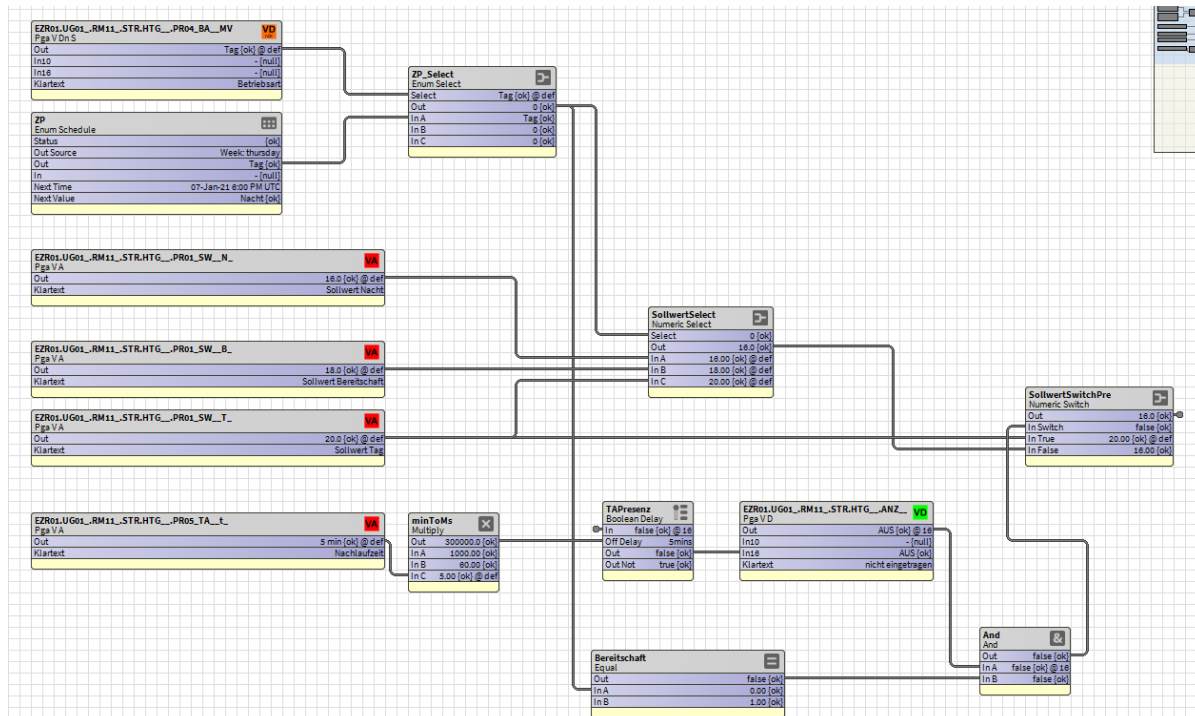


Figure 13: Time Program Logic Wiring Diagram

First, the admin should set the desired target temperatures (setpoints) for day, night, and standby mode. Then he must define the time program (Enum schedule) as required (period for the day mode/night mode). See example below:

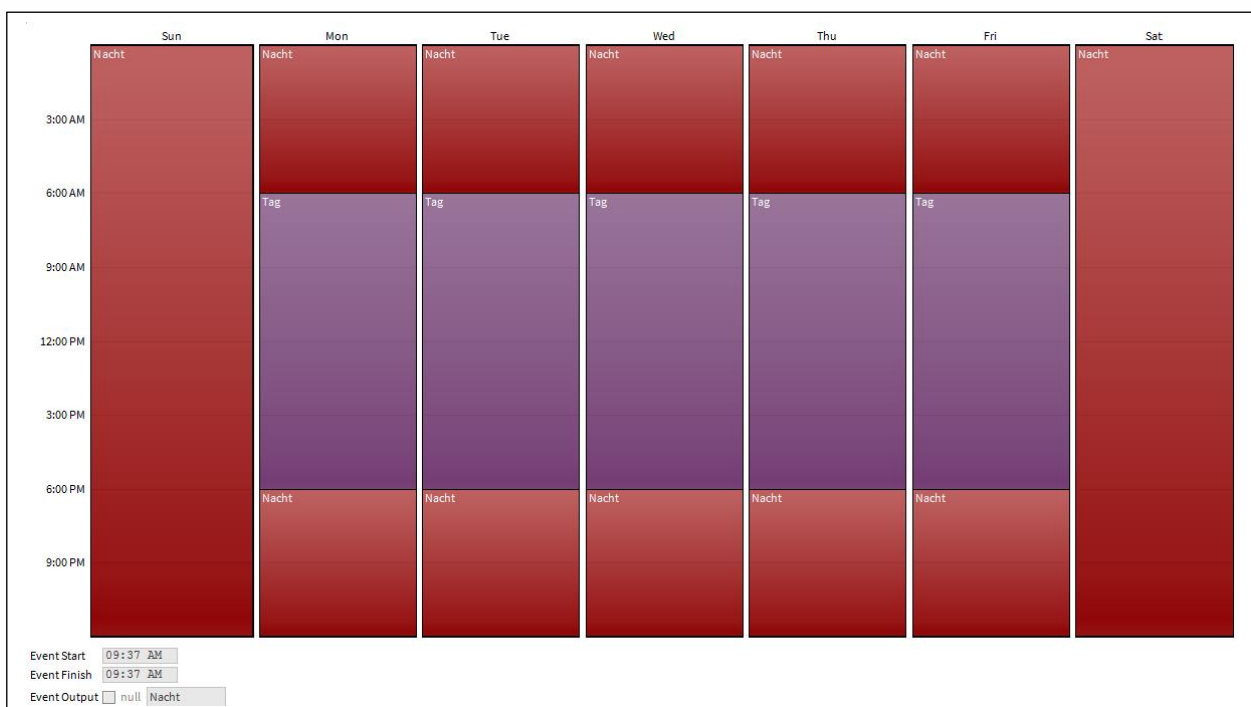


Figure 14: Example of a Time Program

In this example when a room/heat zone is in standby mode by default it should, after detecting a physical presence via motion detectors installed on the room/heat zone, switch the mode to day mode. The setpoint value for this room/heat zone will be equal to the value of the day mode only after a defined period (in the example, the admin set this period to 5 min).

With the logic programmed by the admin, the setpoint of a room such as the meeting room will be automatically adjusted by the physical presence and by the period of time elapsed. This logic is very useful to avoid switching to day mode if only a housekeeper or a cleaning agent enters the meeting room.

3 Practical User Case

As user-case, we will describe the main functionalities of the Station “SmartRoomDemo” installed in a typical “Meeting room”. This chapter explains how to access, use, and configure the station installed in the meeting room.

3.1 Configuration

The meeting room is divided into three zones. Each zone has its own radiator. The first two zones are physically connected to the Moehlenhoff “Base station” through the pairing process of the Moehlenhoff room control units. The room control units used in this case are “Möhlenhoff Alpha Regler direct STANDARD”.

The third zone is virtual and was linked to a third-party sensor which is the “PEHA SR04 RH EnOcean Easyclick solar room sensor for temperature and humidity”.

The meeting room has 2 presence detectors. These detectors are the basis of the logic to configure the automatic change of the setpoint of each zone.

When detecting a physical presence in the room, the setpoint will automatically change from the value of “Standby” to the value of “Day” which are already configured.

Of course, the end-user has the possibility to manually change the setpoints of zone 1 and 2 with the Moehlenhoff room control units available in the meeting room.

3.2 Operating Panels and screenshots:

3.2.1 Login:

To access the user interface, connect to the station web interface via web browser by using the Host IP address. The following login screen is shown.

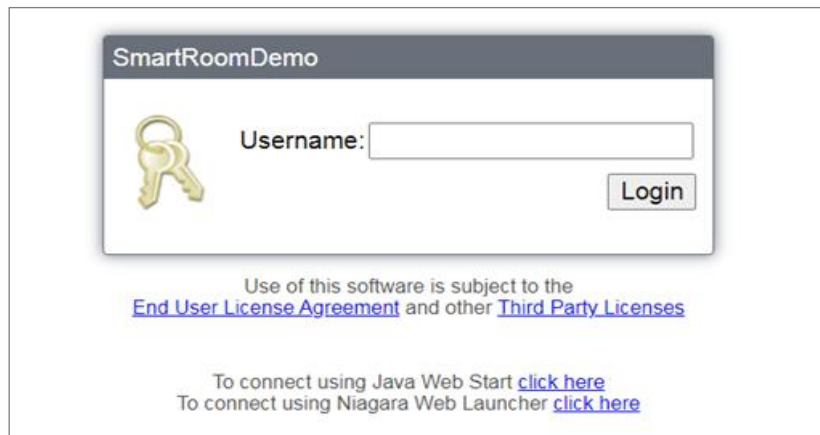


Figure 15: Login Screen

3.2.2 Home view:

After a successful login, the user gets following view displayed:

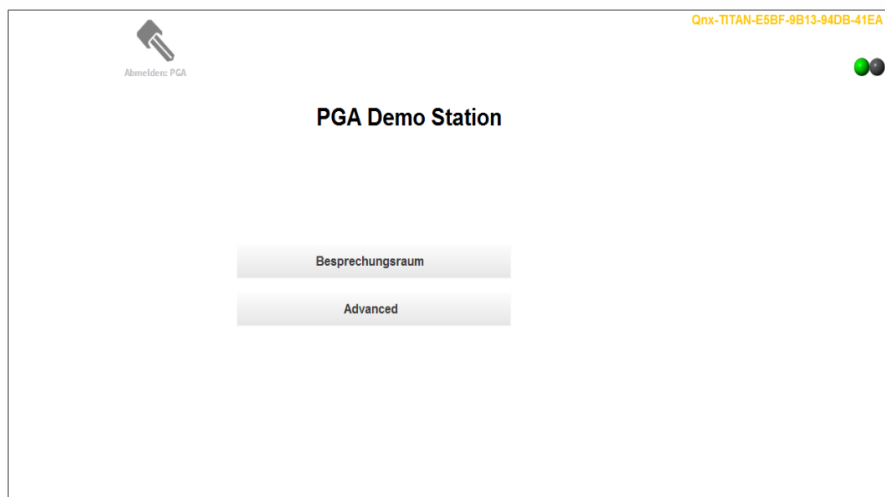


Figure 16: Home View

The Home view offers the following 2 choices:

1. Meeting room view
2. Advanced view

3.2.3 Meeting Room / Besprechungsraum View:

After selecting the choice “Meeting room”, you will be directed to this view:

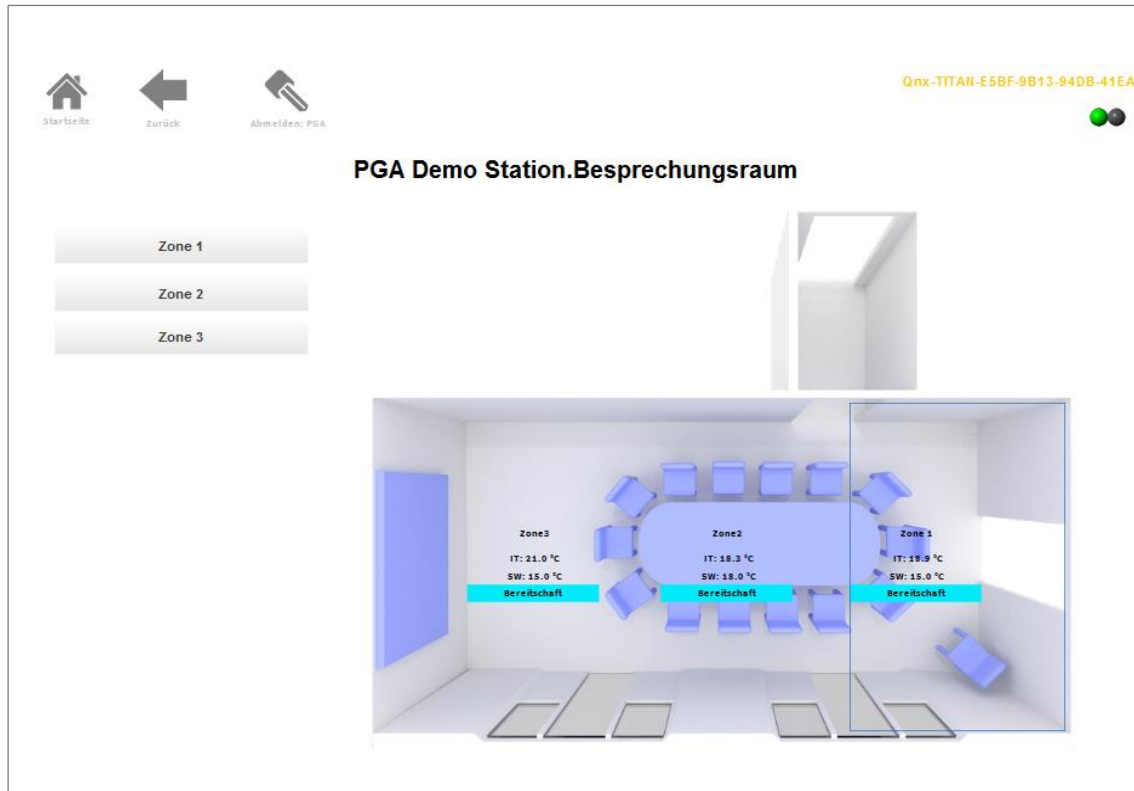


Figure 17: Meeting Room View

The main menu of this view offers the following 3 choices:

1. Zone1 view
2. Zone2 view
3. Zone3 view

On the image of the meeting room, we can:

- see the important information of each zone such as the actual temperature, setpoint, and the selected status planner.
- select the zone by clicking on it, so we will be redirected to the corresponding view.

3.2.4 Zone view:

When you select the “Zone1” from the menu or from the meetings room image you will be redirected to this view.

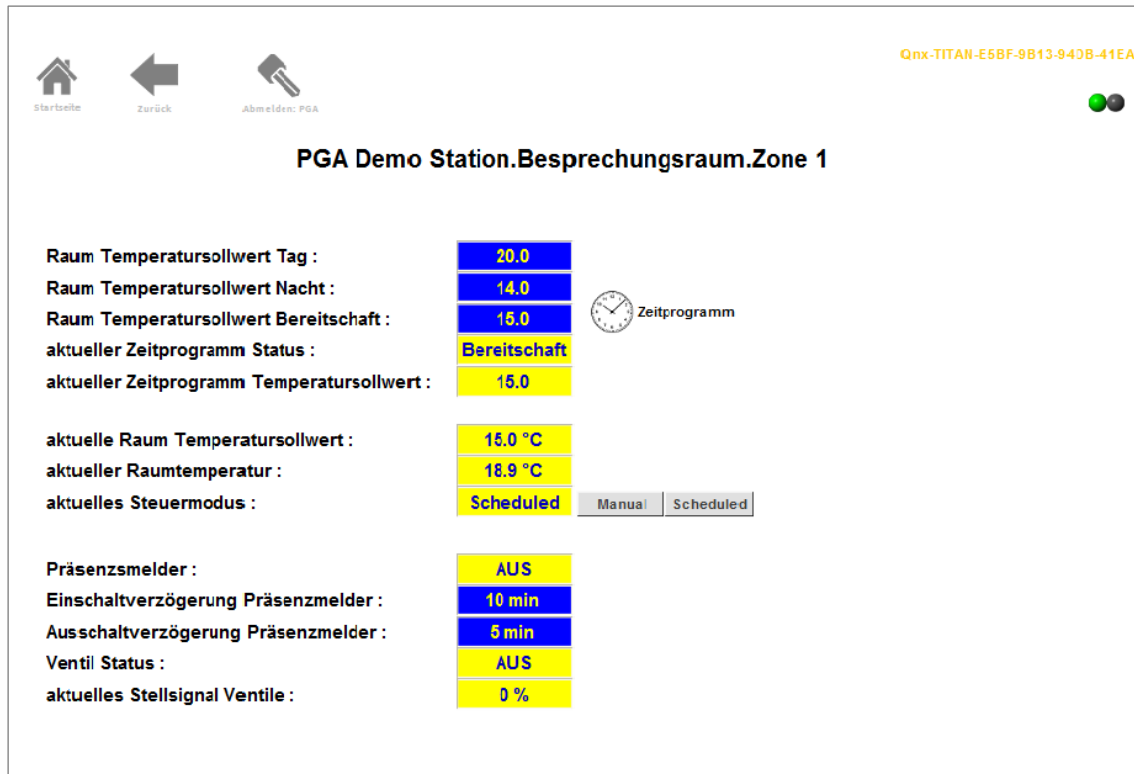


Figure 18: Zone view

This view allows you to see all the properties of zone1 and also allows you to change the list of parameters that are highlighted in blue color.

Note: When the “current control mode” is set to manual, the end user must specify the setpoint value by turning the room control units to the desired value. Then the end-user must press the right knob to acknowledge and send the new setpoint value to the “Base Station”. At the next polling process, the setpoint value will be displayed in the field “actual setpoint”.

3.2.5 Schedule View:

When the end-user selects the “Schedule/Zeitprogramm” from the Zone view, the schedule view will be displayed:

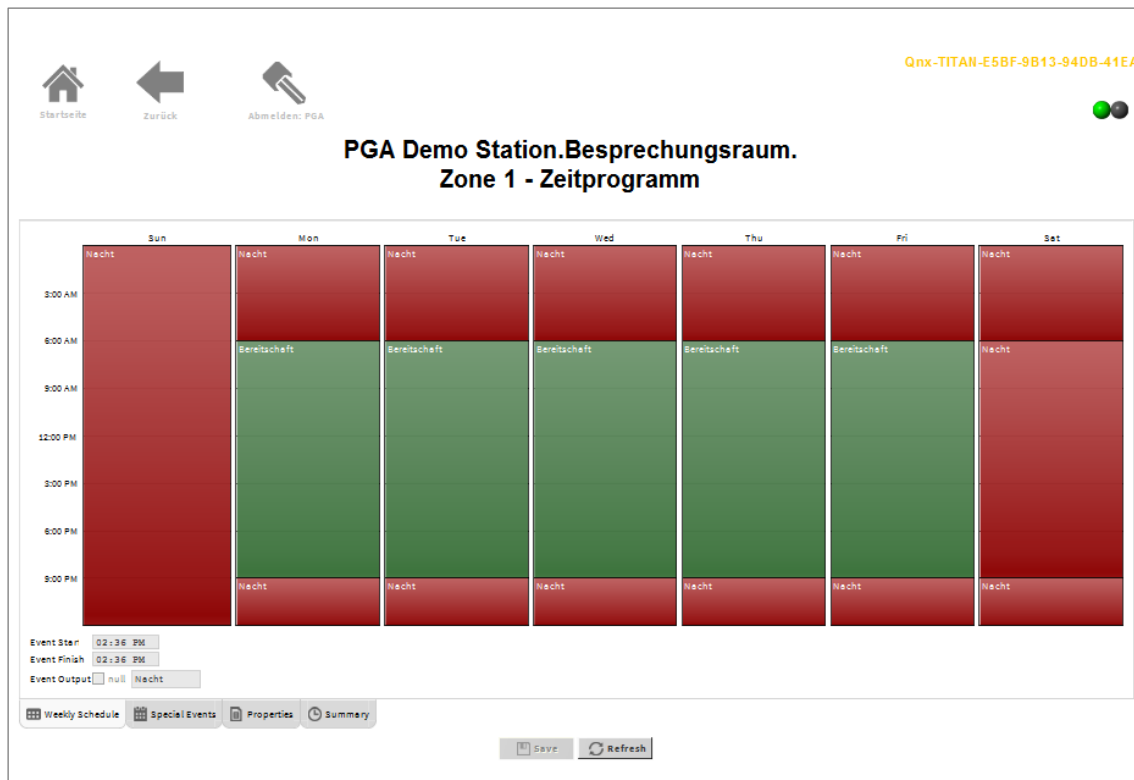


Figure5: Schedule View

In this view, you can set/change the period of each control mode as desired.

3.2.6 Advanced view:

From the Home view, when you select “Advanced” from the main menu, you will be directed to this view:

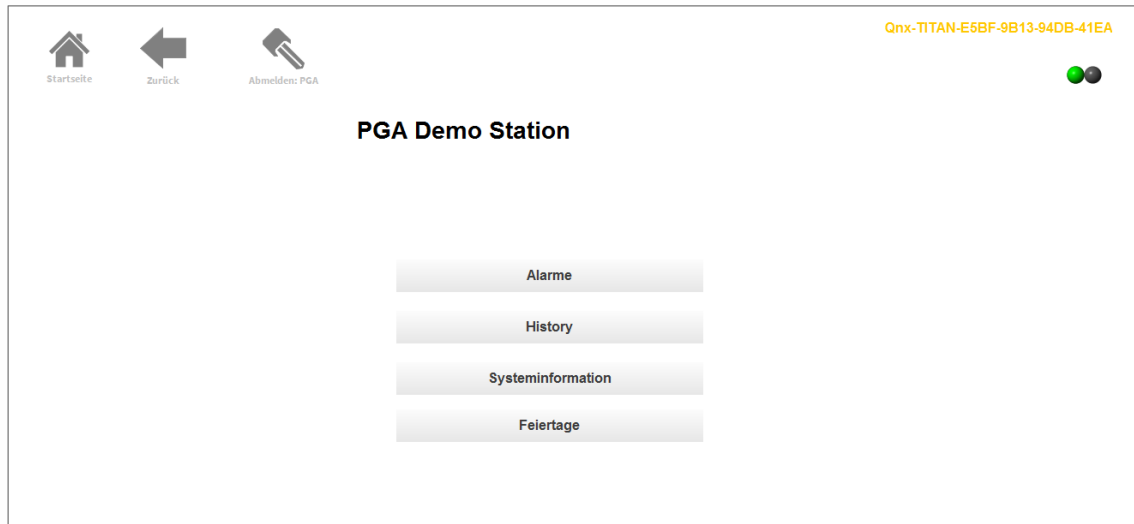


Figure 19: Advanced View

The Advanced View offers us the 4 following choices:

1. Alarm view
2. History view
3. System Information view
4. Holiday view

3.2.7 Alarm View:

When you select “Alarm” from the main menu of the “Advanced View”, you will be directed to the following view:

Qnx-TITAN-E58F-9B13-84DB-41EA

Startseite Zurück Abmelden: PGA

AX Alarm Console

Time Range ? to 1

Open Alarm Sources 11 Sources / 0 Alarms

Timestamp	Source State	Ack State	Source	Alarm Class	Priority	Message Text
11-Mar-21 12:05:44 PM CET	Normal	0 Acked / 8 Unacked	CentralineEnOceanNetwork EnOceanGateway_#922380	Default Alarm Class	255	Ping Success
10-Mar-21 6:07:28 PM CET	Normal	0 Acked / 10 Unacked	ModbusTcpNetwork Modbus Tcp Device1	Default Alarm Class	255	Ping Success
09-Mar-21 1:14:23 PM CET	Offnormal	0 Acked / 28 Unacked	EZR01.EG00_RM01_RM_SN01_ANF__MOD_BI-Control Mode	Default Alarm Class	255	Handbetrieb
05-Mar-21 5:39:50 PM CET	Normal	0 Acked / 4 Unacked	EZR01.EG00_RM01_RM_SN01_ANF__MOD_BI-Control Mode	Default Alarm Class	255	Automatikbetrieb
05-Mar-21 5:22:33 PM CET	Offnormal	0 Acked / 1 Unacked	EZR01.EG00_RM02_RM_SN01_ANF__MOD_BI	Default Alarm Class	255	Handbetrieb
03-Mar-21 12:03:08 PM CET	Normal	0 Acked / 4 Unacked	EZR01.EG00_RM01_RM_SN01_ANF__SW__T_	Default Alarm Class	255	Automatikbetrieb
02-Mar-21 2:47:51 PM CET	Normal	0 Acked / 4 Unacked	EZR01.EG00_RM01_RM_SN01_ANZ__SM__BI-RM01 SM Mode	Default Alarm Class	255	Pumpe o.k.
26-Feb-21 3:07:54 PM CET	Normal	0 Acked / 1 Unacked	EZR01.EG00_RM02_RM_SN01_ANF__MOD_BI	Default Alarm Class	255	Automatikbetrieb
26-Feb-21 2:28:51 PM CET	Normal	0 Acked / 7 Unacked	OASSmartRoomNetwork BESP_1	Default Alarm Class	255	Ping Success
25-Feb-21 4:38:50 PM CET	Offnormal	0 Acked / 1 Unacked	OASSmartRoomNetwork_Test OASSmartRoomDevice_Test	Default Alarm Class	255	Ping Failed
10-Feb-21 4:12:51 PM CET	Normal	0 Acked / 8 Unacked	OASSmartRoomNetwork OASSmartRoomDevice	Default Alarm Class	255	Ping Success

Acknowledge Hyperlink Notes Silence Filter Review Video

Figure6: Alarm View

By clicking on the bell symbol ( or ) in the tool bar, the main display will show the extended Alarm Console. It offers a more detailed list of the current alarms. By default, they are sorted from newest to oldest.

If the ‘bell’-symbol is green , there are currently no alarms in the Alarm Console. If the bell is red , it means that there are alarms in the Alarm Console (acknowledged and/or unacknowledged).

3.2.8 History View:

After selecting “History” from the main menu of the “Advanced View”, you will be directed to the chart view of the station:

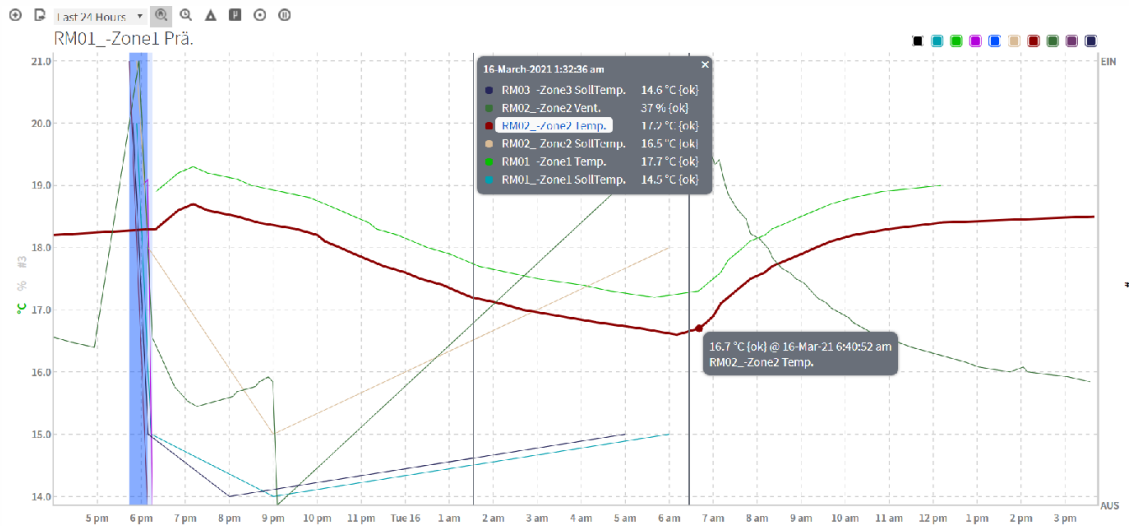


Figure 20: History View

More information about the history can be found in the Niagara Workbench Help function or in the Niagara documentation.

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IoT Solutions and Services for Smart Automation

Individual solutions for intelligent buildings / smart building solutions - we offer you everything you need for this. From the automation and control technology of your lighting and facade control to the automation of the heating, ventilation and air conditioning system, we offer you both individual components and standardized and proven SBS complete solutions.



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