S7 MOBILE HMI

TRAEGER.DE INDUSTRY COMPONENTS

Version 1.35



SPS-Types

- S7-1500
- S7-1200
- S7-300/400 with TCP/IP on Board / PN or CP 343-x/443-x
- S7-300/400 MPI/Profibus with S7-LAN
- Win AC RTX
- S7-200 with CP 243-1
- S7-Soft-PLC
- SIMATIC-S5 over S5-LAN

Operating systems

Windows

- 10
- 8
- 7

Windows Server

- 2012 R2
- 2012
- 2008 R2
- 2008

Functions overview

- Visualization / control via web browser / mobile device (optional)
- OPC-UA-Server possible
- User account control
- Automatically generating the display
- To define your own scaling

Areas of application

- Visualisation
- Control
- Data transfer via OPC-UA

Installation

Start “S7 OPC UA & Mobile HMI Setup 1.0.36.0.exe”. The installation checks whether you have installed the required software packages.

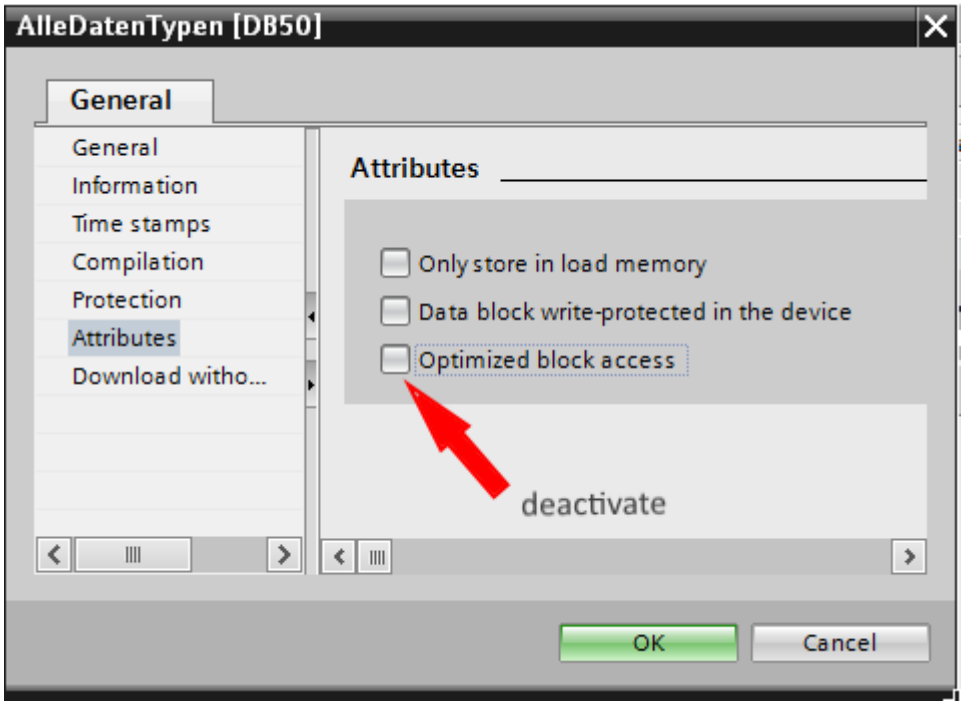
Deinstallation

- System Control → Programs and Features → S7 OPC UA & Mobile HMI → Uninstall
- Remove the folder where the configuration data is stored

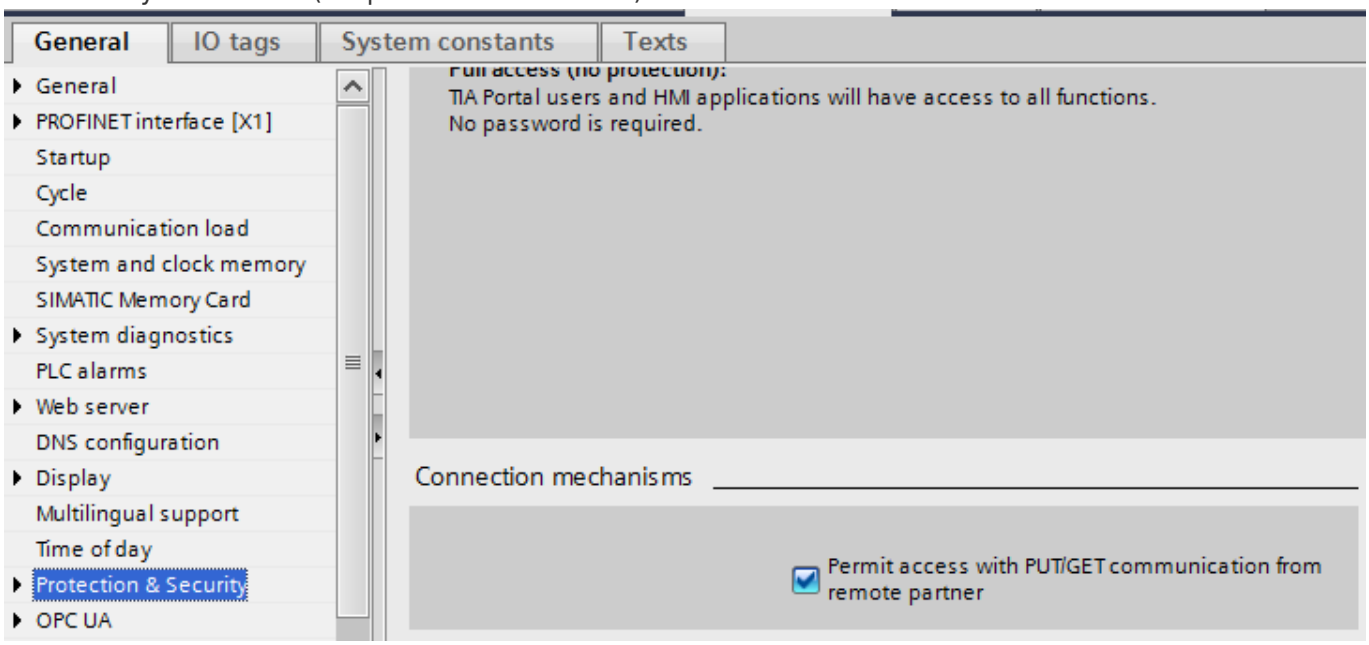
PLC - Settings

S7-1200/1500

The optimized block access needs to be deactivated in the data block attributes for access to the S7-1500 and S7-1200.

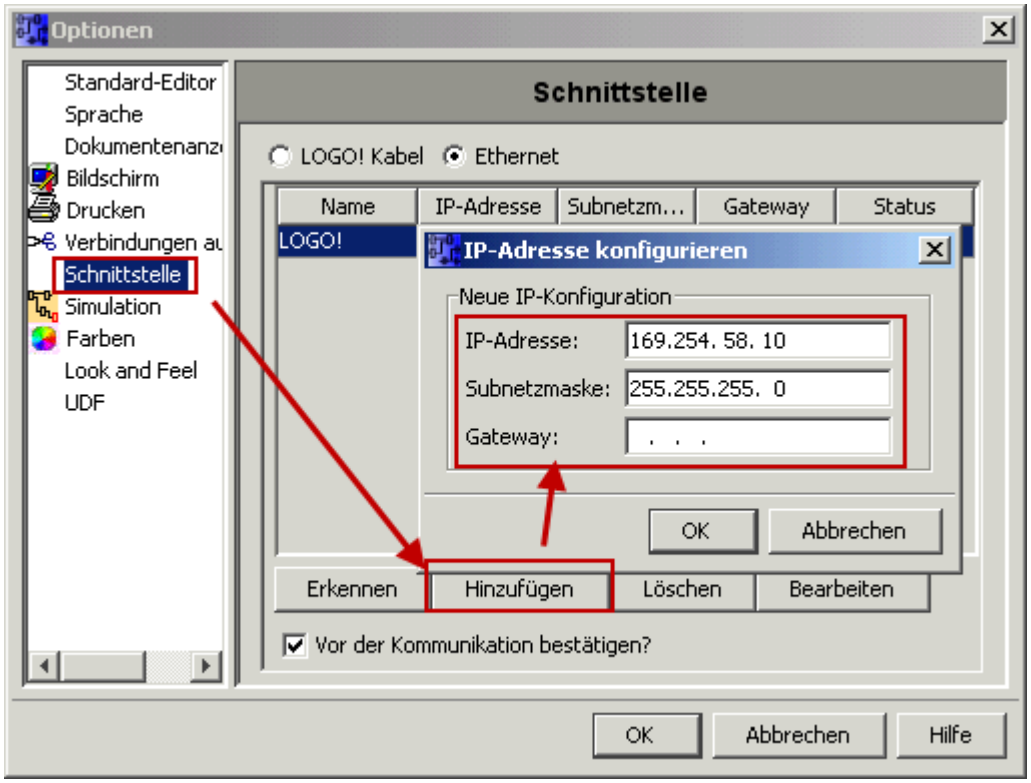


In the S7-1500 must be enabled in the communication setting in addition to the PUT / GET access . How this works you see here (snapshot from TIA Portal) .

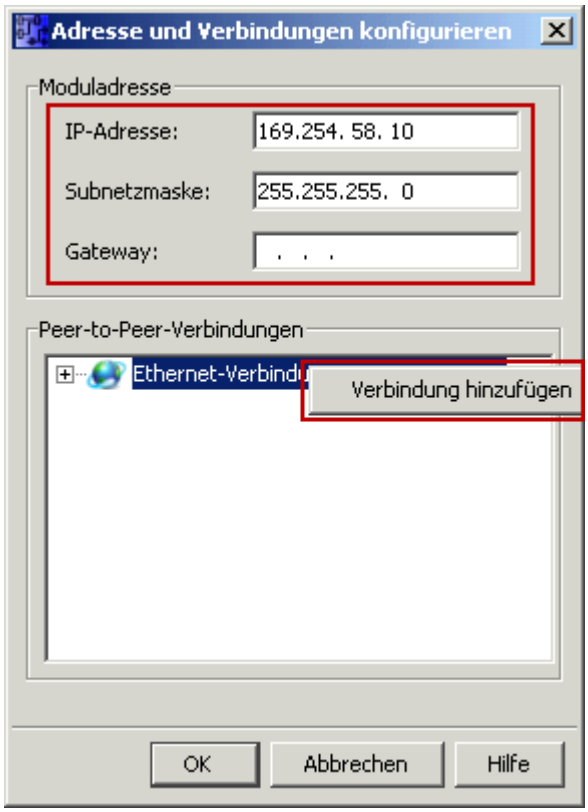


LOGO!

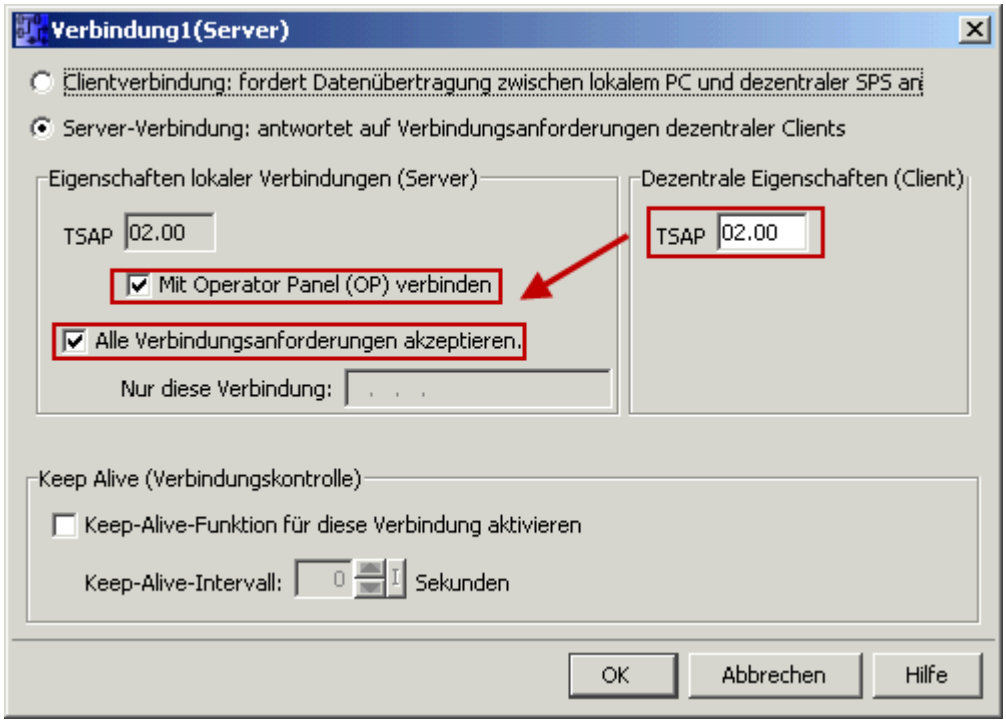
1. Use the Logo Soft Comfort the IP address of a logo! PLCs:



2. Configure PLCs so that connections from an HMI device accepted the Logo!. To do so, go to “Tools- > Ethernet Connections” and then add a new connection.



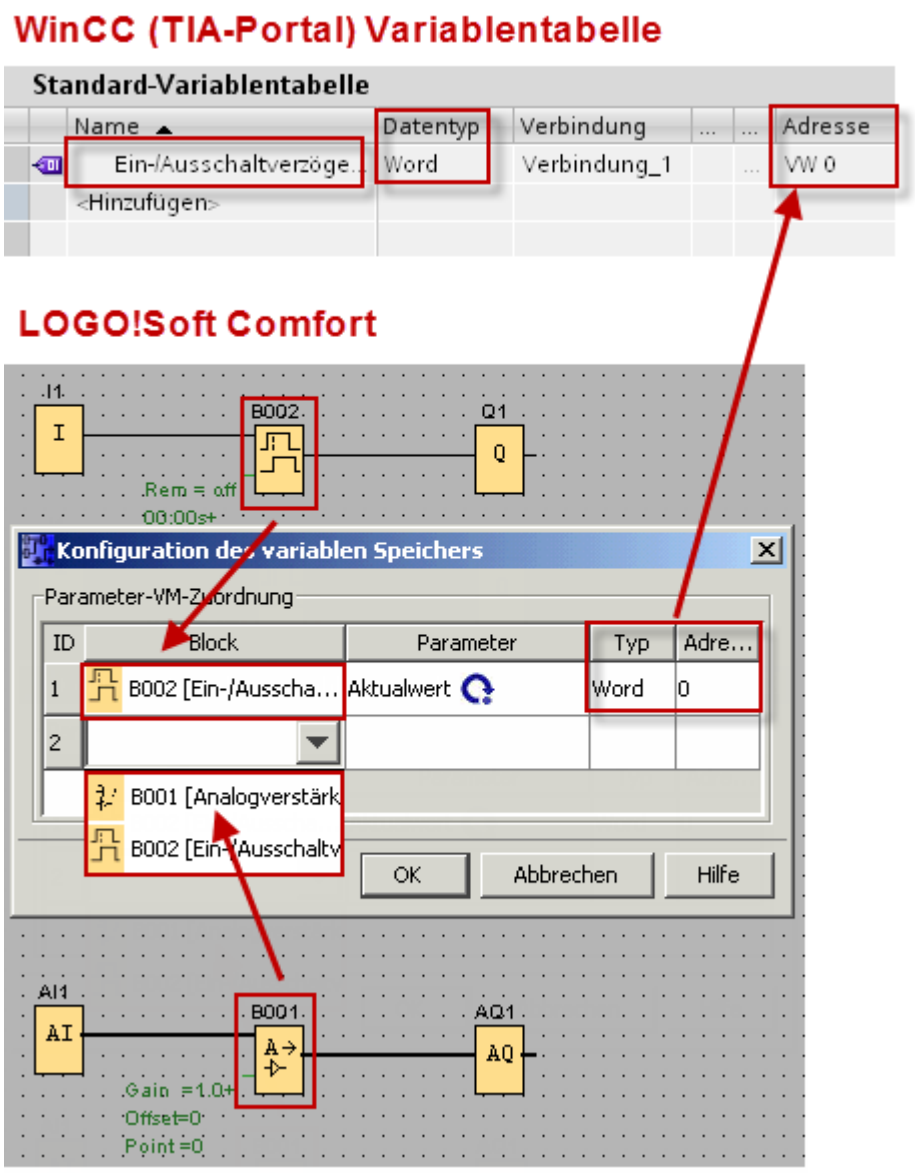
3. Double-click on the newly created connection to access the properties.



Select:

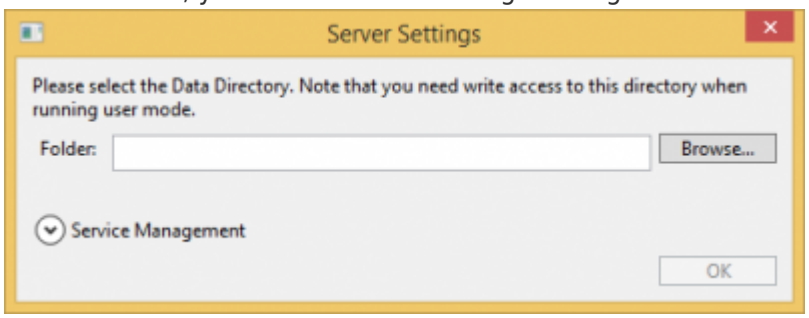
1. Server Connection
2. Local TSAP: 02:00 - 02:00 decentralized TSAP
3. accept all connections.

You can access DB1, inputs , outputs, flags , counters and timers with IP -S7 -LINK . Now put on “ Tools- > VM parameter map ” the variables that are to be transferred to the DB1.



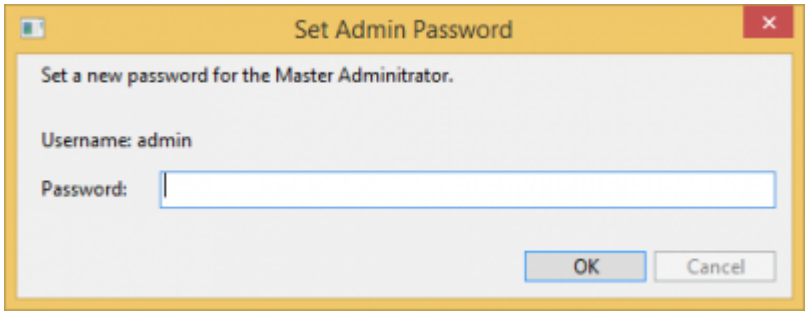
First Start

After the start, you receive the following message:



Select the location for the server data and click OK.

You are then prompted to set the admin password:



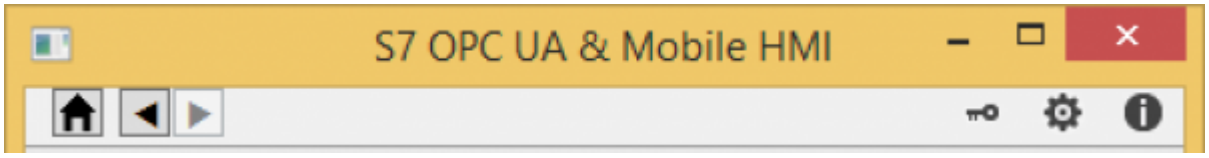
In the following start window, log in as admin and your chosen password:



The application

The application is divided into the menu and display area.

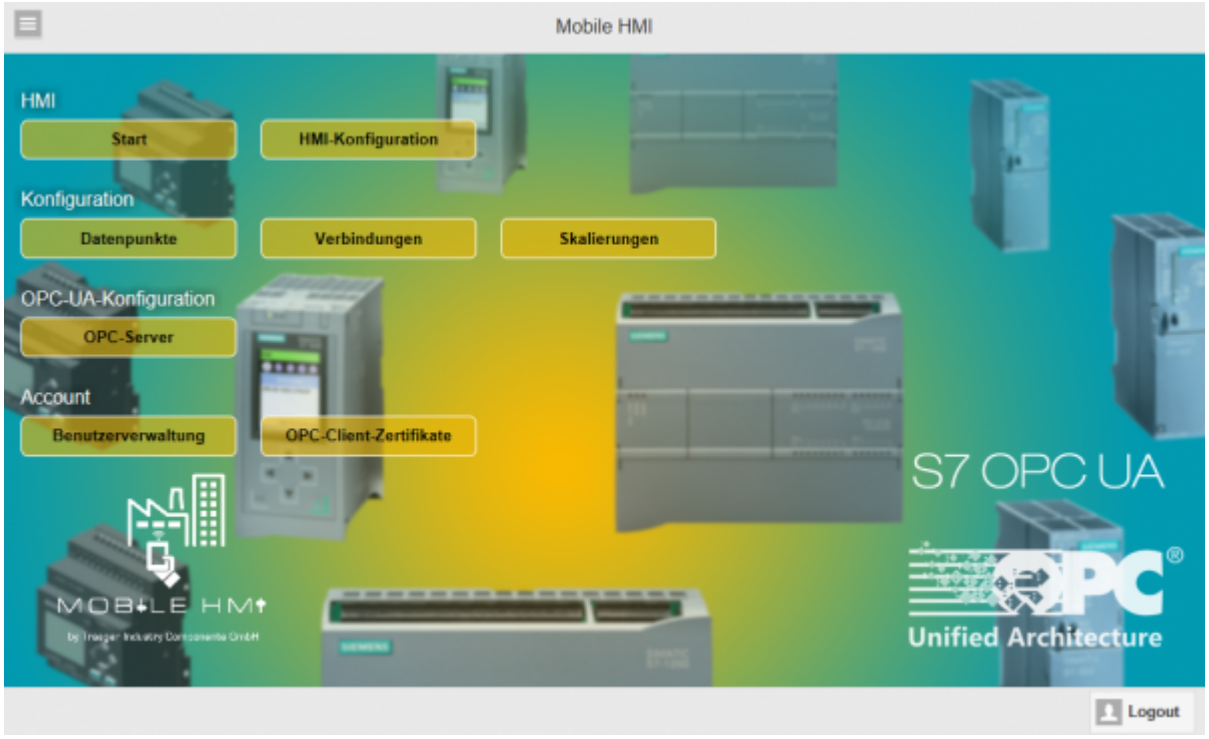
Area of the menu



Name	Description
	call Start page
◄	one page backward
►	one page forward
	Generate Machine Code, enter license key

Name	Description
	Call the server settings
	Information about the product and licensing

Display area

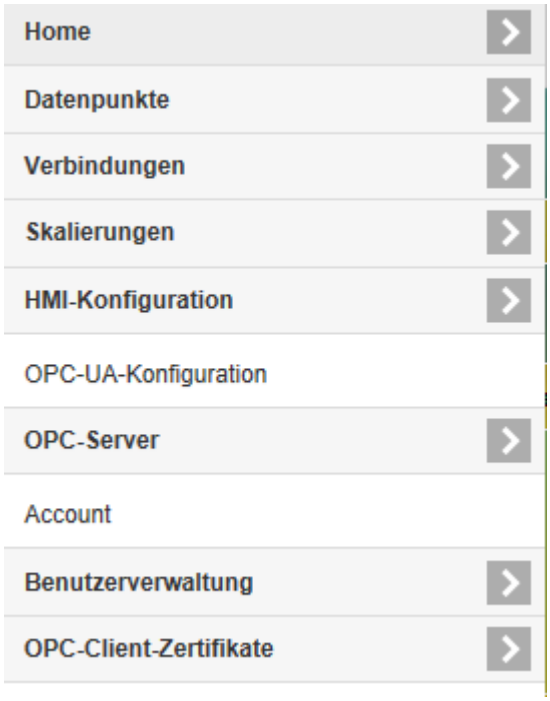


Displays the currently selected page with the available data and options.
Im obigen Bild sehen Sie z.B. die Startseite.

Fields marked with * are required.

Configuration menu

You can access all available pages by clicking on . The following menu items are available:

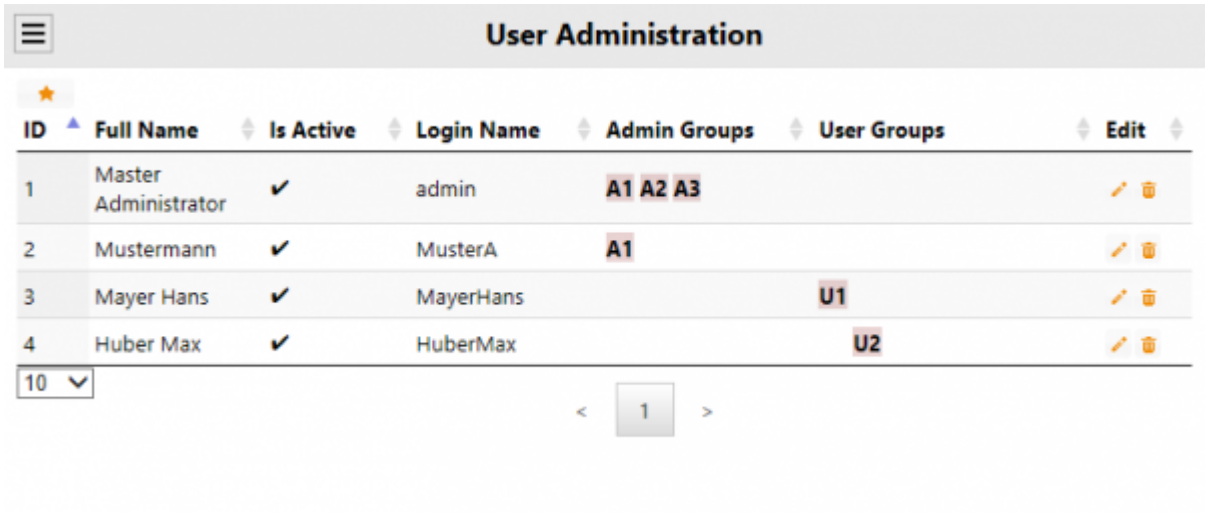


Menu	Description / task
Home	Call start page
Benutzerverwaltung	Manage your users and set permissible access to the data
Verbindungen	Establish the connections to your Siemens PLCs
Datenpunkte	Link the connections with the desired data addresses in the PLC. The tree structure allows you to pre-sort your data immediately
Skalierungen	Here you have the possibility to define various control and input elements for the view
HMI-Config	Design the desired view with main and sub-pages and add the desired data points to the respective data groups
OPC-Konfiguration	Sammelmenü für OPC-Einstellungen
OPC-Server	Create and manage OPC UA Server
OPC-Client Zertifikate	Certificates from OPC UA clients for the authenticated connection to the OPC UA server. You also assign the rights granted to the user

Standard functions in the menu item:

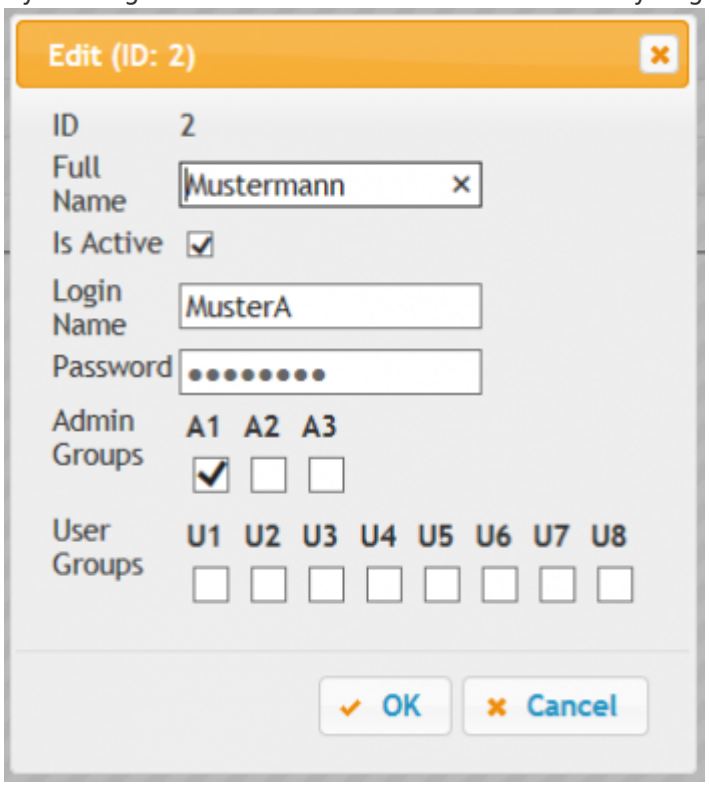
Funktion	Task
	Add new settings
	Edit settings
	Delete settings

User administration



Overview of existing users.

By clicking on a new user will be added and you get the following dialog:

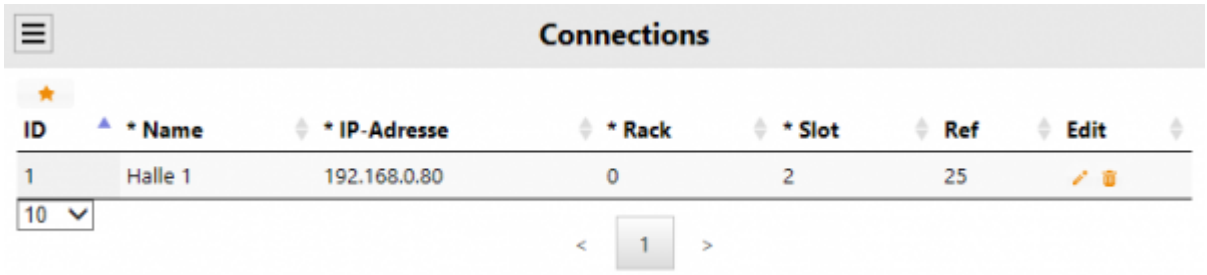


Name	Function
ID	User-assigned ID
Full Name	Username is displayed
Is Active	User can log on
Login Name	Name zur Identifikation des Benutzers
Password	Password for login
Admin Groups	Assign to the desired admin group (s). See user group table
User Groups	Assignment to the desired user group (s). See user group table

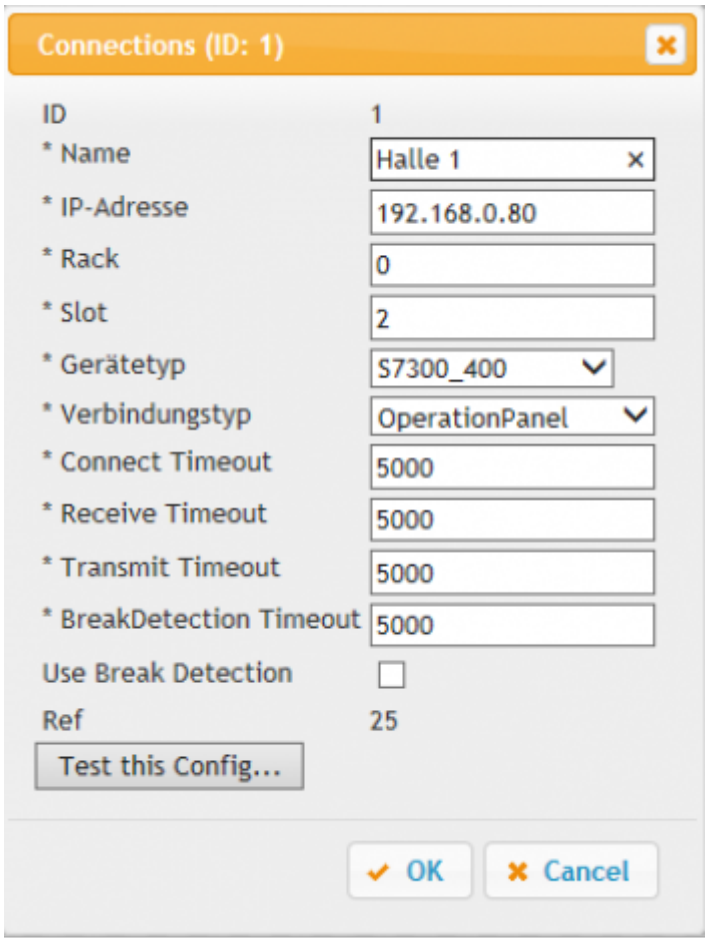
User group	Function
A1	Admin without restriction
A2	OPC-Admin, Data points and OPC relevant data
A3	HMI-Admin, Manage data points and HMI pages

User group	Function
U1 - U8	User groups 1 to 8. User groups can be used to group multiple users. You can then assign different data points to this group, adapted to your requirements. For example: user group U1 = all layer leaders (sees all machines and can control them), U2 = machine operator H2 (only sees the machines in its task area)

PLC-Connections



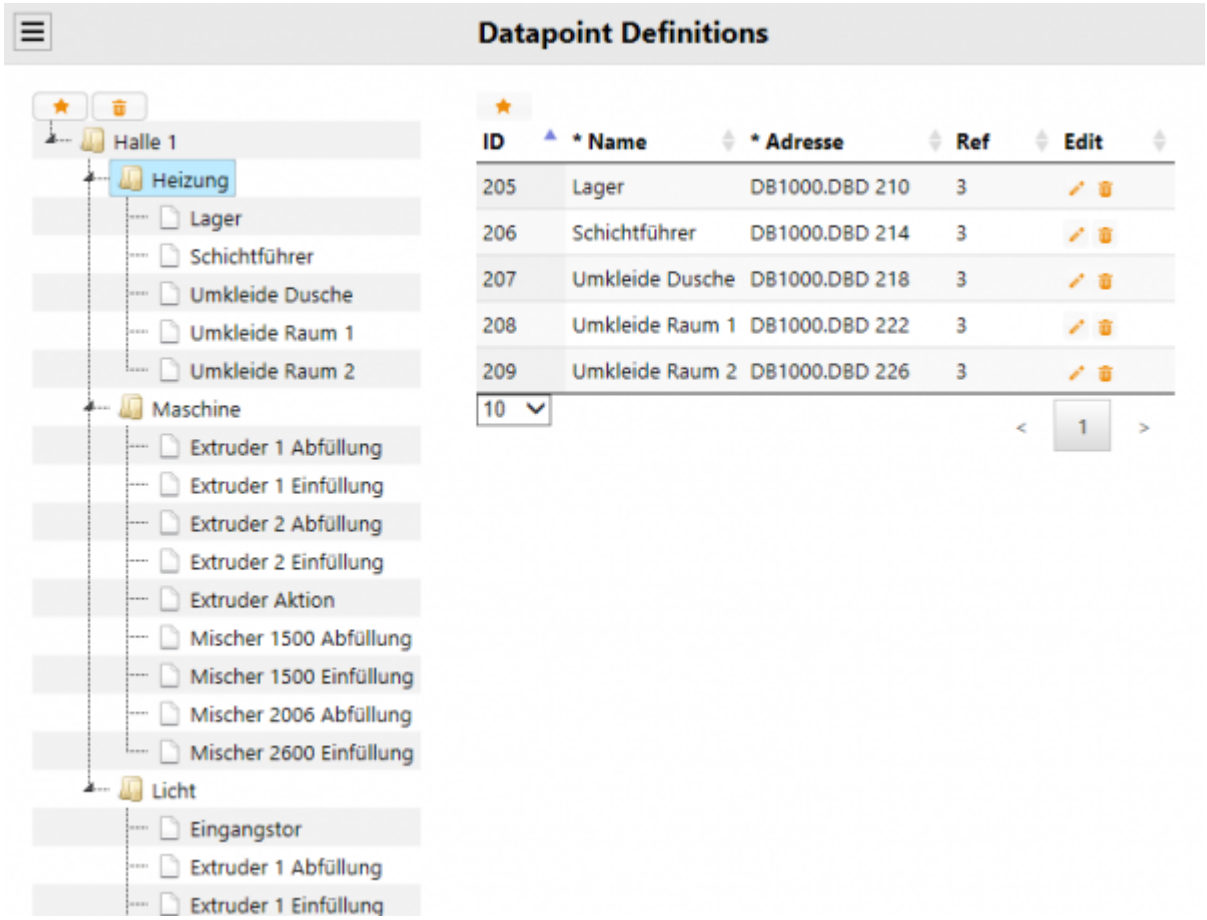
Overview of configured Siemens PLC connections.



Name	Function
ID	System-assigned ID
Name	Name of the connection in the display
IP-Adresse	IP address under which the PLC can be reached
Rack	Rack number of the CPU
Slot	Slot of the CPU

Name	Function
Gerätetyp	Type designation of the PLC. Available types: Logo S7200 S7300_400 S71200 S71500
Connection type	Default: Standard connection to the PLC (OperationPanel) OperationPanel: Connection via the OP channel ProgrammerDevice: Connection via the PG channel Other: Connection via the Other channel
Connect Timeout	Timeout in ms for connection setup
Recieve Timeout	Timeout in ms for receiving the data from the PLC
Transmit Timeout	Timeout in ms for sending to the PLC
BreakDetection Timeout	Keep Alive-Time for monitoring the TCP / IP connection (interesting at large intervals)
User Break Detection	Set Break Detection Timeout is used
Ref	Number of data points that point to this connection

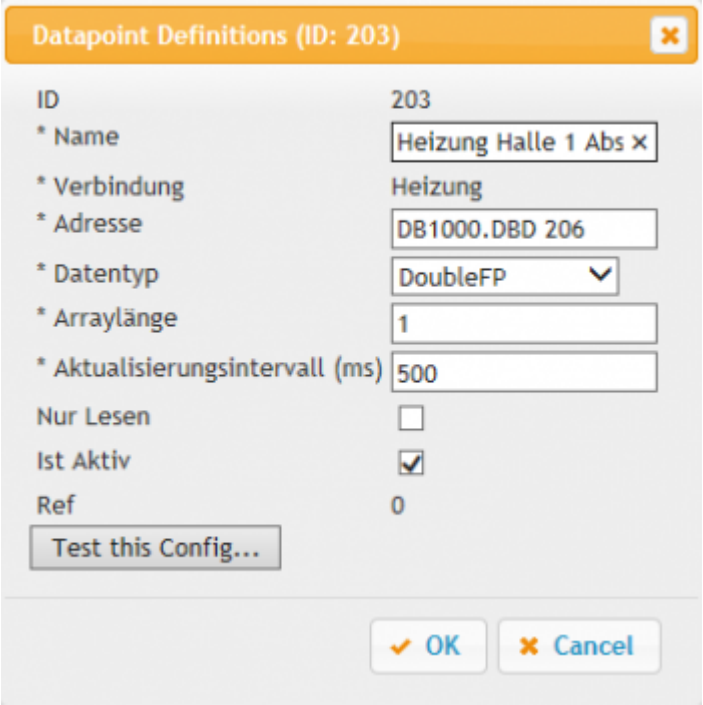
Data point definition



The addresses of the data points, which serve as data sources, are defined here.
The first node is always the connection. One connection can be added one

- New node
- New datapoint

Name	Description
Left	Adds a new node under the selected node
Right	Add a datapoint
	Rename the selected point
	Delete the selected point



Name	Description
ID	System-assigned ID
Name	Display name of the data point. If empty, the Data address (without spaces) is used as name.
Verbindung	Is added to this connection (the connection must already have been created)
Adresse	Data address to be processed in the PLC. DB1.DBB 0 for data block 1, data byte 0
Datentyp	Specifies the data type that the software driver reads from the PLC Please select... Bool Byte UInt16 Int16 UInt32 Int32 UInt64 Int64 SingleFP DoubleFP String
Arraylänge	Length of the array to be read

Name	Description
Anzahl der zu erstellenden, konsekutive DPs	Several consecutive data points can be created automatically. If the number is greater than 1, the end address of a data point is calculated and the address is entered as the next data point. Example: Name: Temperature, Address: **DBW100.DBD10** , Type: **Int16** , Number: **3** Generated: Name: Temperature_1 Address: DBW100.DBD10 Name: Temperature_2 Address: DBW100.DBD12 Name: Temperature_3 Address: DBW100.DBD14
Aktualisierungsintervall (ms)	Time grid of data updating
Nur lesen	Data can only be read. Even if this is entered as a setpoint in the GUI, this DP can not be written anymore
Ist Aktiv	Data point can be used
Ref	Number of references used

Move sample data points:
beispiel_datenpunkt_verschieben.mp4

PLC address variables:

Operand

Name	Abbreviation (Siemens, DE)	Abbreviation(IEC)
Input	E	I
Output	A	Q
Flag	M	M
Peripherals	P	P
Counter	Z	C
Data Block	DB	DB
Timer	T	16

Data types

Name	Abbreviation	Bit size	Range	Description	Array
BOOL	X	1	0 to 1	single bit representing true (1) or false (0)	x
BYTE	B	8	0 to 255	unsigned 8-bit	x
WORD	W	16	0 to 65.535	unsigned 16-bit (Word)	x
DWORD	D	32	0 to 2^{32} -1	unsigned 32-bit (Double Word)	x
CHAR	B	8	A+00 to A+ff	ASCII-Code unsigned 8-bit character	x
INT	W	16	-32.768 to 32.767	signed 16-bit integer	x
DINT	D	32	-2^{31} to 2^{31}-1	signed 32-bit integer (Double Word)	x
REAL	D	32	+-1.5e-45 to +-3.4e38	IEEE754 32-bit single precision floating point number	x
S5TIME	W	16	00.00:00:00.100 to 00.02:46:30.000	binary coded decimal (BCD) number representing a time span	

Name	Abbreviation	Bit size	Range	Description	Array
TIME	D	32	00.00:00:00.000 to 24.20:31:23.647	signed 16-bit integer representing a time span in milliseconds	
TIME_OF_DAY	D	32	00.00:00:00.000 to 00.23:59:59.999	unsigned 16-bit integer representing a time span in milliseconds	
DATE	W	16	01.01.1990 to 31.12.2168	unsigned 16-bit integer representing a date in days	
DATE_AND_TIME	D	64	00:00:00.000 01.01.1990 to 23:59:59.999 31.12.2089	binary coded decimal (BCD) number representing a date and time	
S7String	B	any	A+00 to A+ff	ASCII-Code, max. 254 Bytes	

The variables are composed of operand and data type. Examples:

Examples	Data type	Example Siemens	Example IEC
Input Byte 1, Bit 0	BOOL	E 1.0	I 1.0
Output Byte 1, Bit 7	BOOL	A 1.7	Q 1.7
Flag Byte 10, Bit 1	BOOL	M 10.1	M 10.1
Data Block 1, Byte 1, Bit 0	BOOL	DB1.DBX 1.0	DB1.DBX 1.0
Input Byte 1	BYTE	EB 1	IB 1
Output Byte 10	BYTE	AB 10	QB 10
Flag Byte 100	BYTE	MB 100	MB 100
Peripherals Input Byte 0	BYTE	PEB 0	PIB 0
Peripherals Output Byte 1	BYTE	PAB 1	PQB 1
Data Block 1, Byte 1	BYTE	DB1.DBB 1	DB1.DBB 1

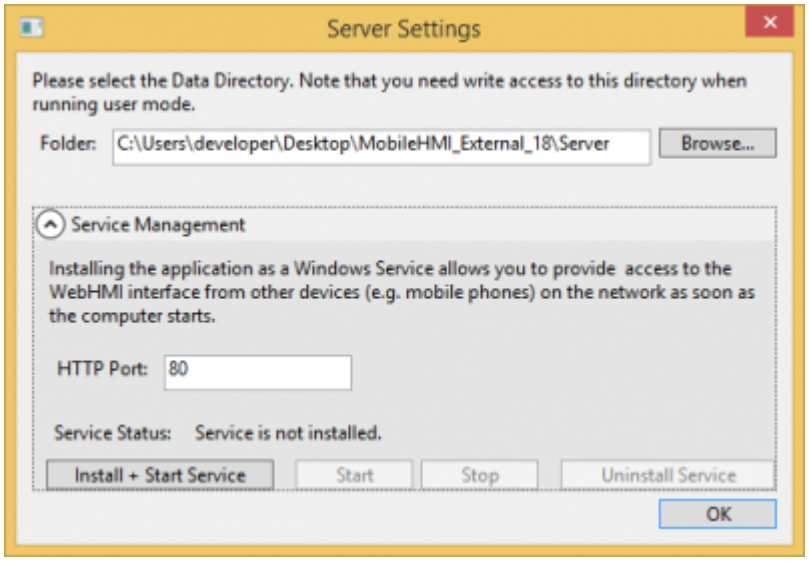
Data Block 1, Data Block 1 Typ bool, Address 1.0 → DB1.DBX 1.0
Data Block 1, Data Block Typ Byte, Address 1 → DB1.DBB 1
Peripherals Input, Typ DWORD, Address 0 → PED 0

Help:
DB#.DBB # = Data Block#.Data Block Byte #
DB#.DBW # = Data Block#.Data Block Word #
DB#.DBD # = Data Block#.Data Block Doubleword #
= Address

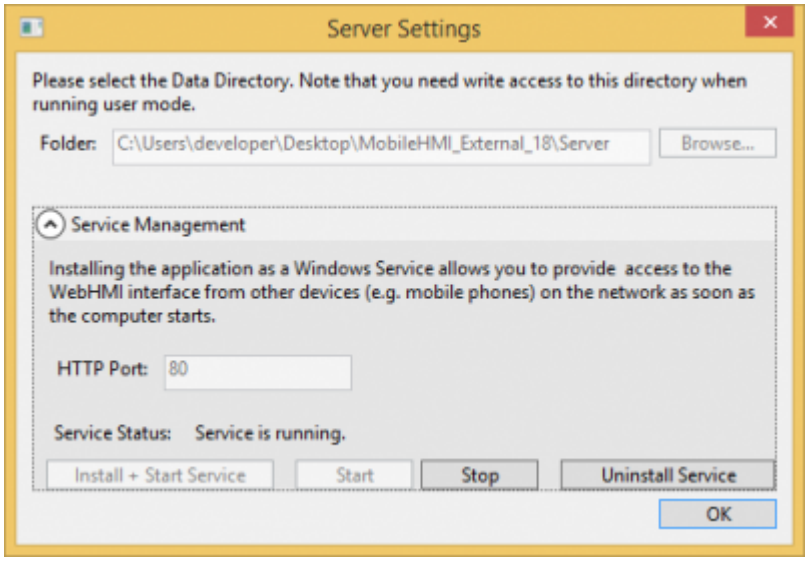
Service settings

- Among  You will find the settings for the service.

Service not installed:



Service installed:



Name	Description
HTTP Port	Port for the web interface of the configuration / display
Install + Start Service	Installs the application as a service and starts it automatically
Start	manual start teh service
Stop	Stop the service, e.g. for changes
Uninstall Service	Remove the installed service

If you want to change the port, stop the service and make the desired change and restart it.

For external users to access the application, the following firewall rules must be added:

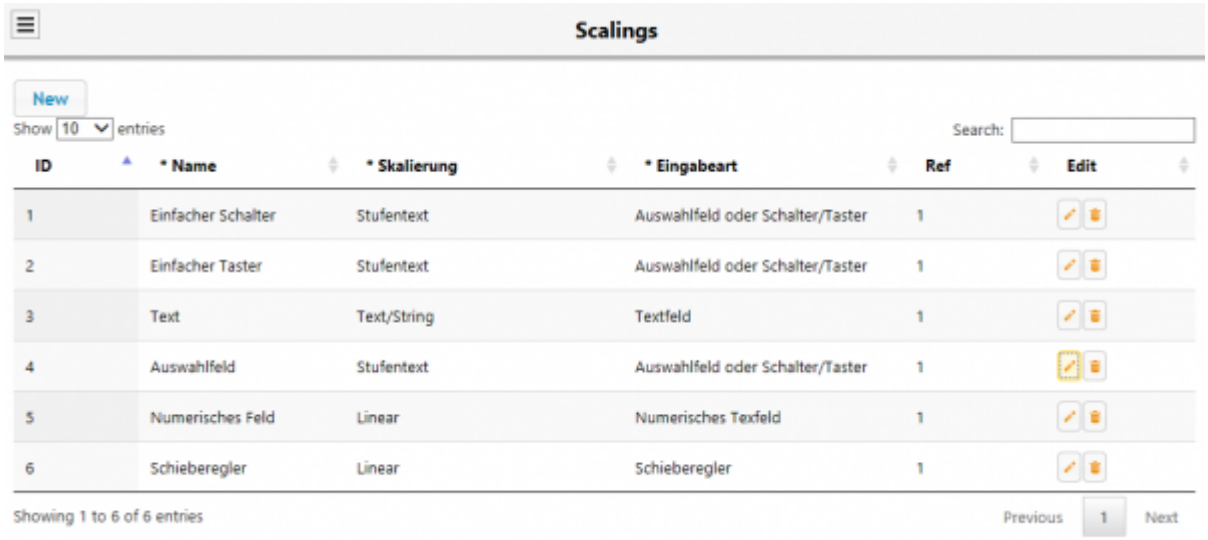
- Under Service set port
- If necessary, set OPC Server Ports

Home

Visualization start

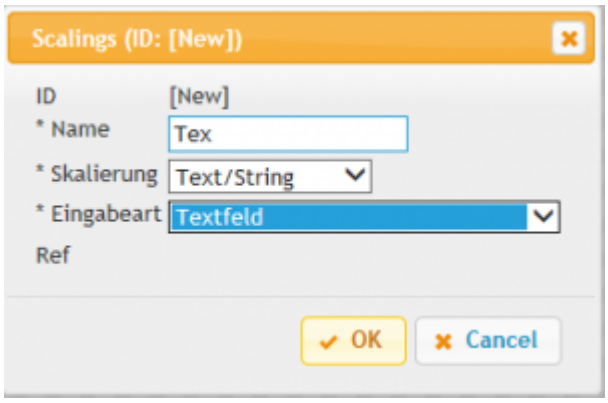
On the start page, you have the option to view the configured data. General information is also displayed.

Scaling



A scaling indicates how a “raw” data value (for example, number from the PLC) is converted into a representation (step text, numerical scaling, etc.). A combination of DP definition and normalization can then be used in the GUI as a set or actual value in a line. If no scaling is selected, a standard scaling is automatically used.

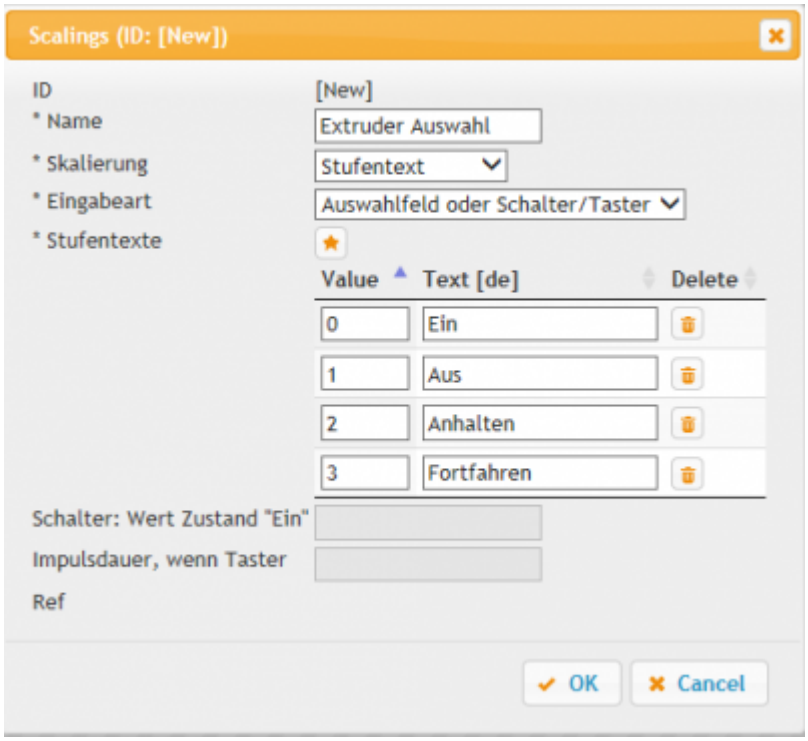
During the initial installation, a switch and a button are automatically created.



Name	Importance	
Name	Display name of scaling	
Scaling	Select the type of display	
	Text/String	Display of a string data block as text
	Level text	Allows the assignment of texts to values
	Linear	Value is scaled metric

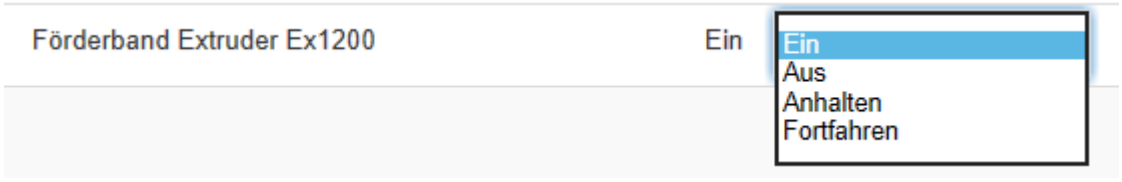
Name	Importance	
Input type	Specifies the type of control that is used for input. The following settings depend on the type of scaling	
	Text field	Is used with text / string. The data is provided in an input field
	Selection field or switch / button	If two step texts have been entered, it is possible to create a switch / push button. To create a switch, initialize the value for the “On” state
		A push button is a switch with extended function. As soon as this is pressed, the following actions are carried out: * The “On” value is written to the PLC. * Waiting as long as the pulse duration has been specified. * The “Off value” is written to the PLC
		If more than 2 texts are entered, a selection field is automatically created
	Numeric text field	Only numbers can be displayed and entered
	Slider	A slider with the defined definitions is created in the display
Ref	This field is used to determine how often this data point is used in GUI lines	

Create selection field

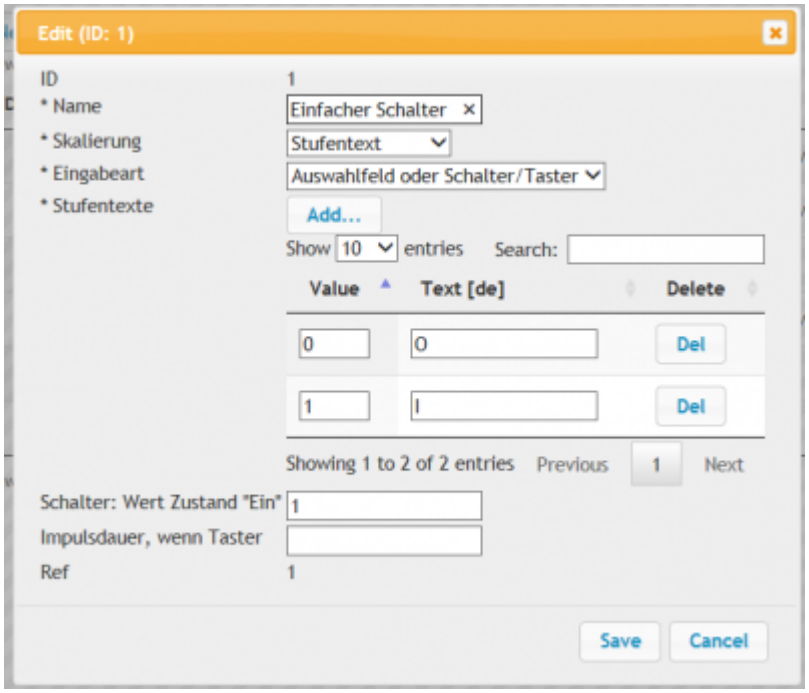


- Enter a name
- Under Scale, select “Stufentext”
- Select Entry Type “Auswahlfeld oder Schalter/Taster”
- Add a new selection by clicking on *
  The text is displayed in the visualization and the entered value is set in the PLC

Example view:



Create Switch

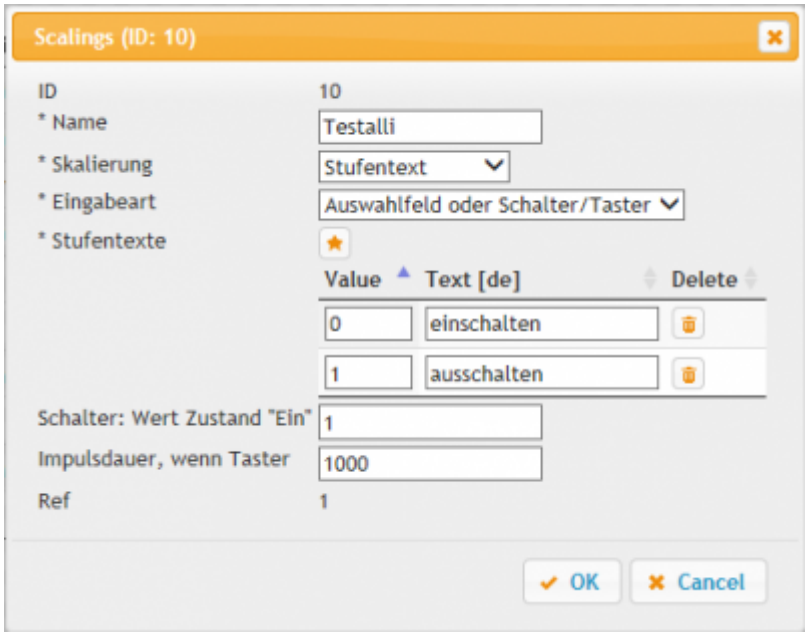


- Enter a name
- Under Scale, select “Stufentext”
- Select Entry Type “Auswahlfeld oder Schalter/Taster”
- You add two texts with values to the lower-level text
- Under “Schalter: Value state “On” enter the desired value

Example view:



Create Button

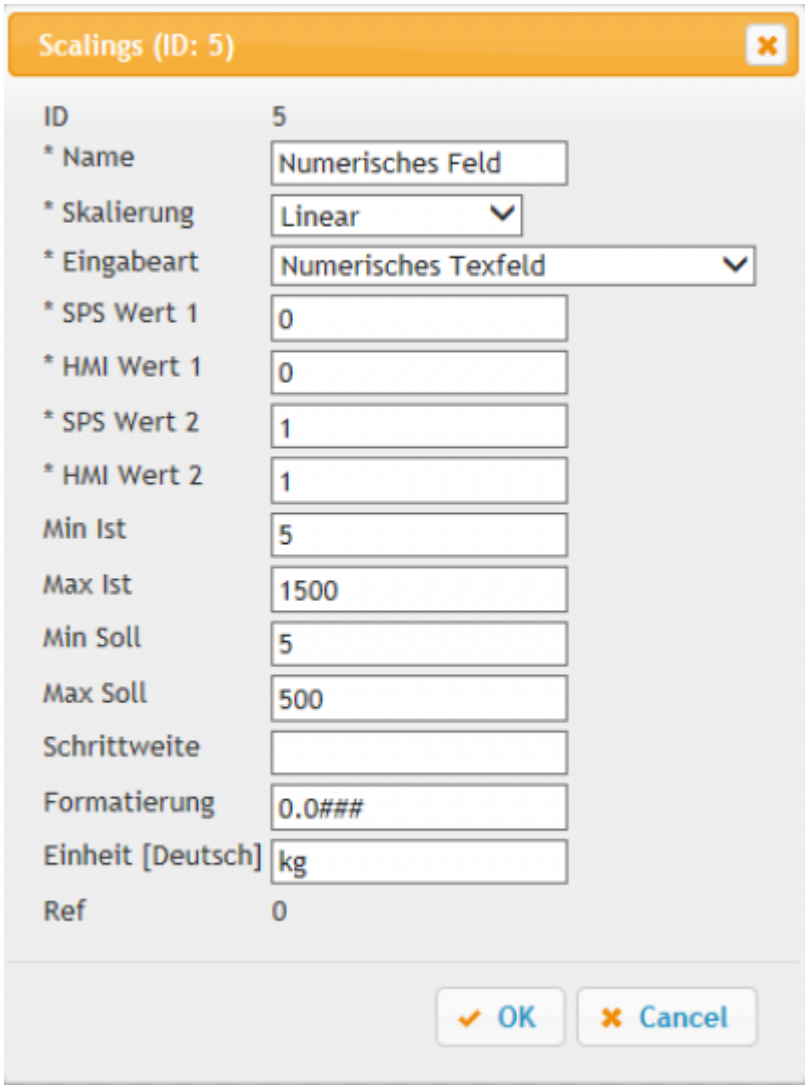


- Proceed as for the switch
- Under “Impulsdauer ...” enter the time in ms, which the button should wait until the action is inverted

Example view:

Licht Eingangstor	ausschalten	ausschalten
Licht Eingangstor	einschalten	einschalten

Create a numeric field



- Enter a name
- Under Scale, select “Linear”
- Select Input type “Numerisches Textfeld”
- SPS Wert 1/HMI Wert 1 - A value that is in the PLC and is to be converted to the actual value Example: PLC 5 ≈ HMI Value 9
- SPS Wert 2/HMI Wert 2 - A further value that is in the PLC and is to be converted. PLC / HMI value 1/2 must not have the same values Example: PLC 200 ≈ HMI value 90

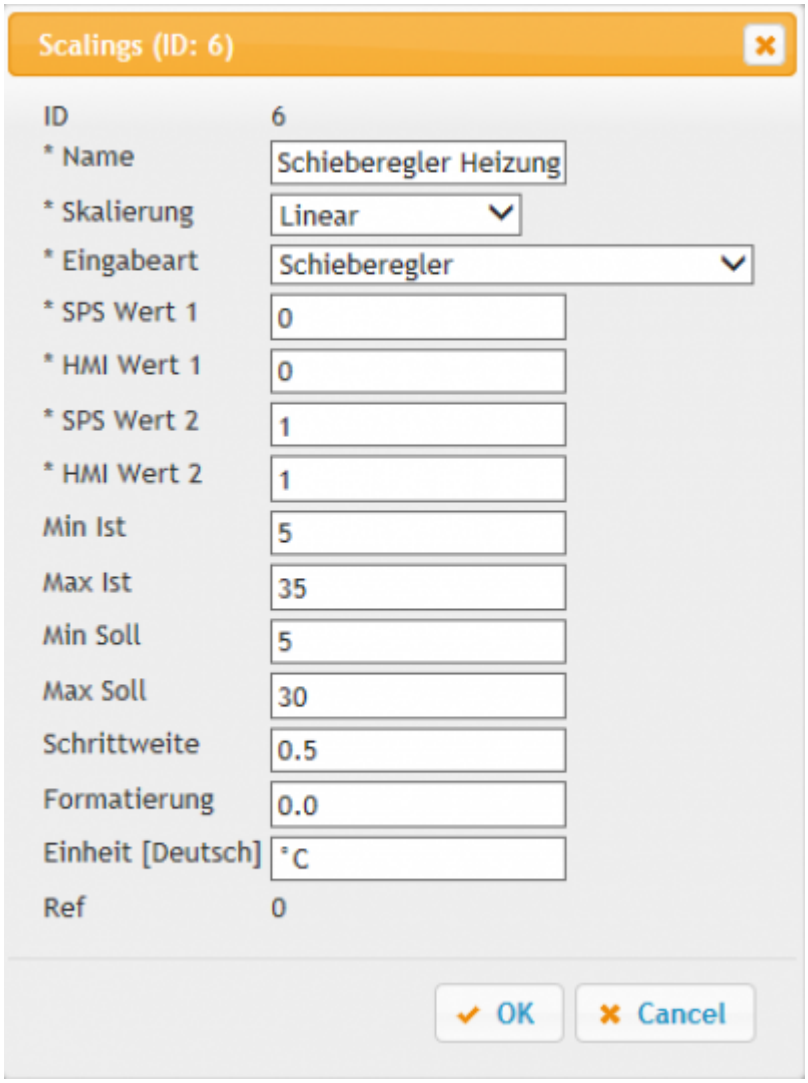
The following information is optional:

Name	Description
Min Ist	The indicator will turn red if the value is out of range
Max Ist	The indicator will turn red if the value is out of range
Min Soll	Smallest value that can be entered
Max Soll	Greatest value that can be entered
Schrittweite	If specified, it is checked whether the value is not only in the predetermined value range but is also a desired permissible value. In these example settings, e.g. The values 1, 2, 3, 4 and values> 500 are not allowed
Formatierung	Formate the readout value according to predefined patterns. Example: “0.00 ##” (**Important:** Always specify a **point** , no comma as decimal separator!) “0” = digit which is always displayed (0 if it does not occur) ”#“ = number which is only displayed if it actually occurs For “0.0 #”, the value 1 is displayed as “1.0” and 1.2345 is displayed as “1.23”
Einheit [Deutsch]	Characters added to the value. “° C”. In ”[]“ is the display language

Example view:



Create slider



- Enter a name
- Under Scale, select “Linear”
- Select Input type “Schieberegler”
- SPS Wert 1/HMI Wert 1 - A value that is in the PLC and is to be converted to the actual value
- SPS Wert 2/HMI Wert 2 - A further value that is in the PLC stands and is to be converted. PLC / HMI value 1/2 must not have the same values
- Enter the Min Set and Max Setpoint

Name	Description
Min Ist	The indicator will turn red if the value is out of range
Max Ist	The indicator will turn red if the value is out of range
Min Soll	Smallest value that can be selected
Max Soll	Greatest value that can be selected
Schrittweite	Automatically calculates the next permitted value. In these example settings, e.g. Only select values 5, 5.5 to 30 in increments of 0.5
Formatierung	Form the value read out according to predefined patterns. Example: “0.00 ##” (**Important:** Always specify a **point** , no comma as decimal separator!) “0” = digit, which is always displayed (0 if it does not occur) ”#“ = number that is only displayed if it actually occurs) For “0.0 #”, the value 1 is displayed as “1.0” and 1.2345 “is displayed as “1.23”
Einheit [Deutsch]	Characters added to the value. “° C” In ”[]” is the display language

Example view:



HMI-Config



Here you configure the view of your application.

Name/Symbol	Description	
	Opens the menu	
	Back to the start page	
	Edit the page. Here, for example, Change the title	
	Automatic generation of the HMI view	
	Create new page	
	Create data point group. Here you enter the title of the group and have the following options:	
	Apply setpoint changes immediately	Data is immediately transferred to the PLC
	Frameless group	Changes are accepted immediately and data points are displayed directly on the main page. The group heading is omitted
	Selected data group(s), page(s) and data point(s) in the respective direction	
Start page	Title of the current page	
Online	Online = Data is read and written live from the data source. Offline = Data is simulated	
Logout	Log out user	

For each page / group, a toolbar is displayed. In this bar you can edit the settings and the position.

There is a special display area for the push-button. The selected data point is used for the display.

Example :

- A light button is pressed
- The light is switched on
- The state of the light is stored in a flag

If the state data point is selected for the display, this address is displayed and not the defined action texts.

beispielanzeigetext.mp4

Seite erstellen

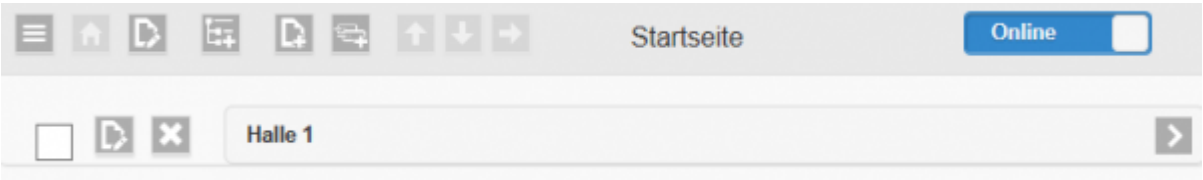
Example video:
beispiel_seiten_anlegen.mp4

beispiel_seiten_anlegen2.mp4

Click . The following dialog opens:



Enter the desired title. After confirmation, the toolbar appears next to the page.



Symbol	Description
	Select page for move
	Edit page properties eg Edit title
	Deletes the page with all subpages and data groups
Halle 1	Title of the page. Click to open it

One page is used to optically delimit groups of data points. With a frameless group it is also possible to display data points without a heading in the page.

Example :
View frameless group in configuration

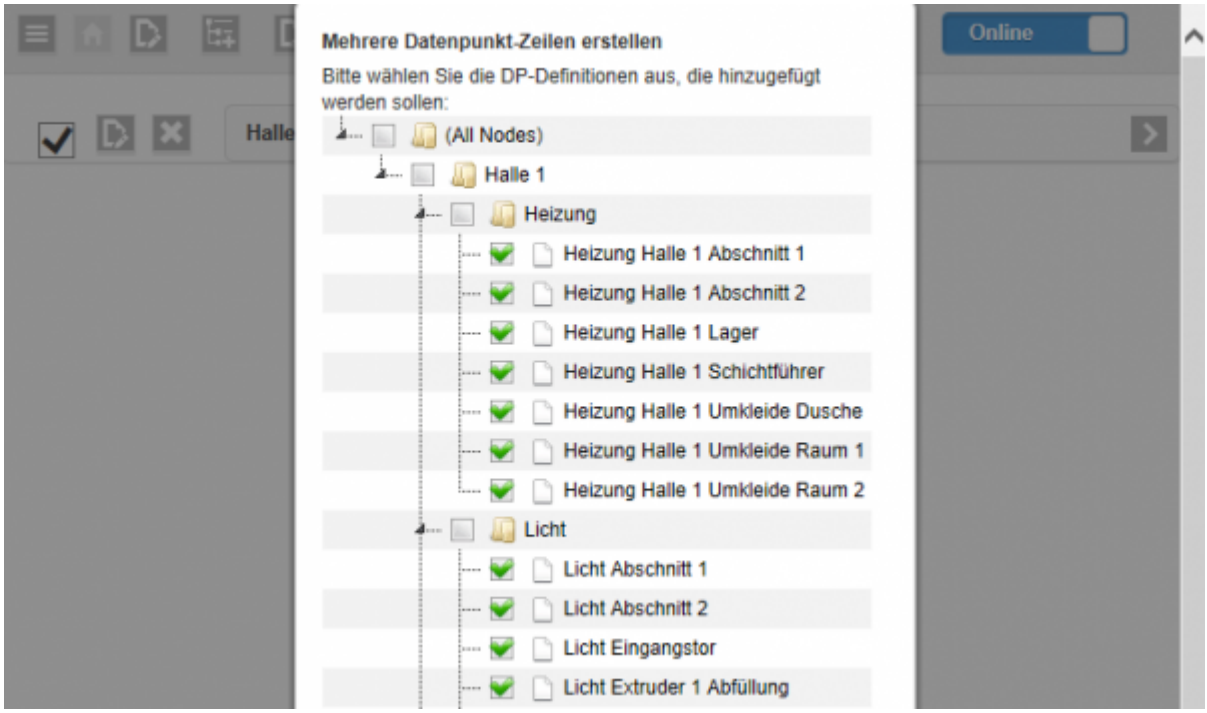
User view

View normal data group in the configuration

User view

Create automatically

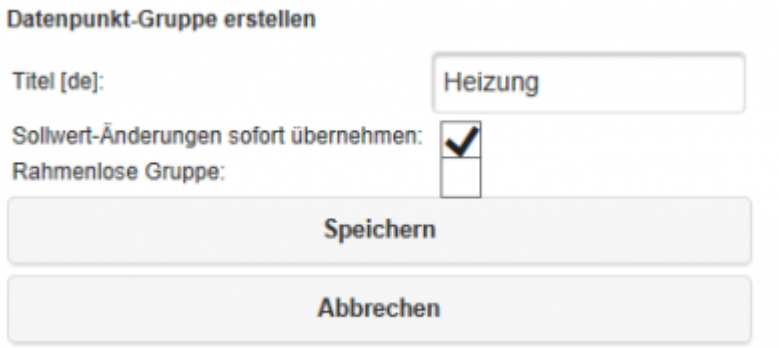
You have the possibility to automatically generate the view by clicking on on the basis of all created data points.



All unused data points are automatically marked. When the interfaces are selected, a page or data group with the data points is automatically created when you create it.

Assign data point

To add data points, you need a data point group. With  you can generate a new group:



Option	Function
Titel	Title
Sollwert-Änderungen sofort übernehmen	Changes are written directly to the PLC
Rahmenlose Gruppe	Data points are displayed directly on the page

You should see the following:



With  you can create a new data point:

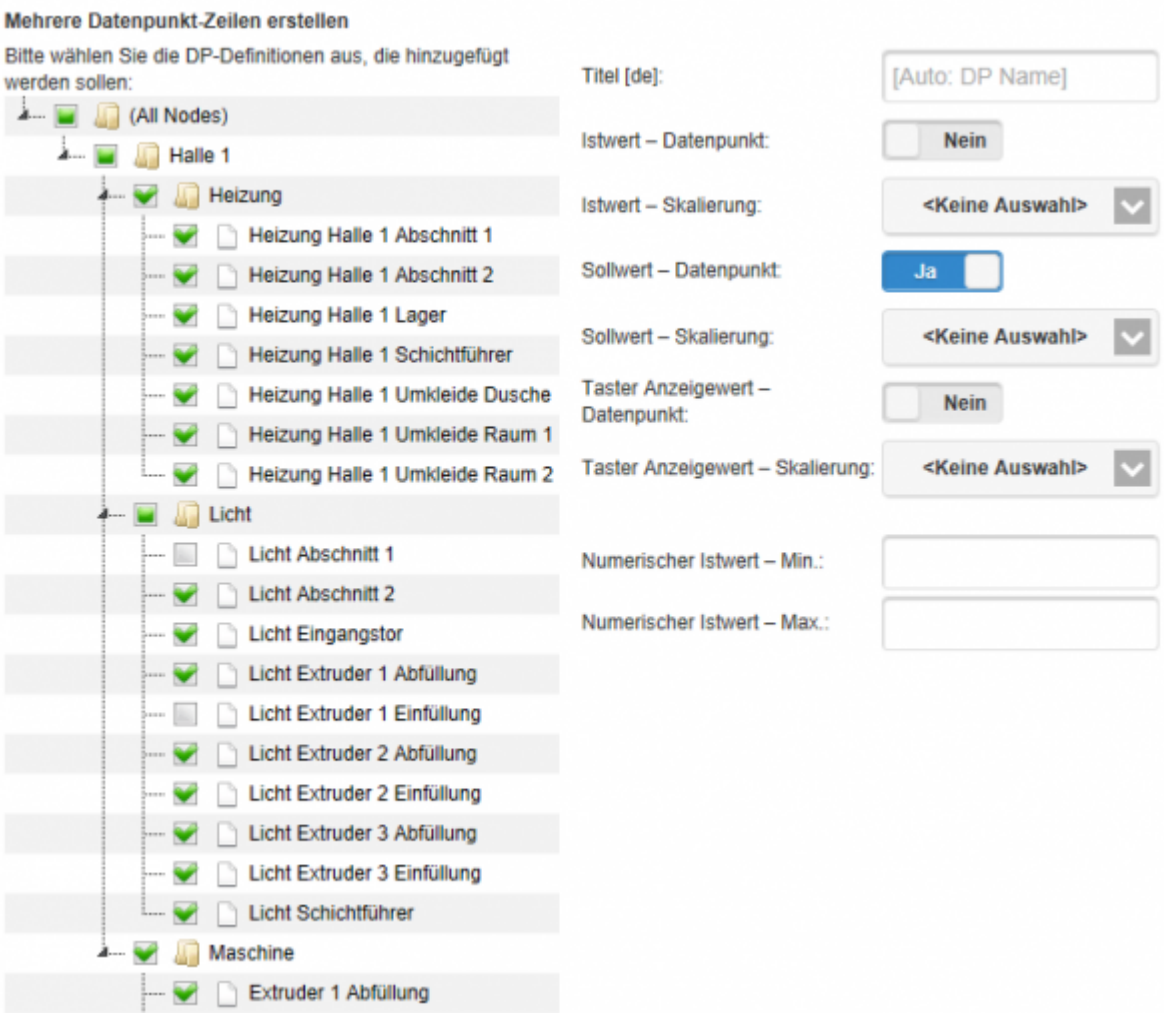
- Enter the name for the data point
- Select the previously defined data point for the desired range
- Select the previously defined scale
- Confirm with “Save” the settings and see immediately the result

You can also define a Min and Max value for the display. As soon as one of these limits is exceeded, the display shows this value red.

If you have defined a data array as a data point, you must specify the desired array index.

Assign multiple data points

In order not to have to create all data areas individually, it is possible to generate them automatically.
Click on .
Folowing dialog is been shown:



All previously unused data points are selected automatically.

Option	Description
Titel[de]	The entered data point name is not used automatically. If something is entered and several data points are automatically appended “_ #” (# = incremented number)
Istwert-Datenpunkt	Yes = Data point Actual value is displayed before the input field
Istwert-Skalierung	Value is displayed using the previously defined scale, if nothing is selected, the field is given a default format
Sollwert-Datenpunkt	Yes = Data point Setpoint is displayed before the input field

Option	Description
Sollwert-Skalierung	Value is displayed using the previously defined scale, if nothing is selected, the field is given a default format
Taster Anzeigewert-Datenpunkt	Data point to be displayed
Taster Anzeigewert-Skalierung	Applied scaling on the button

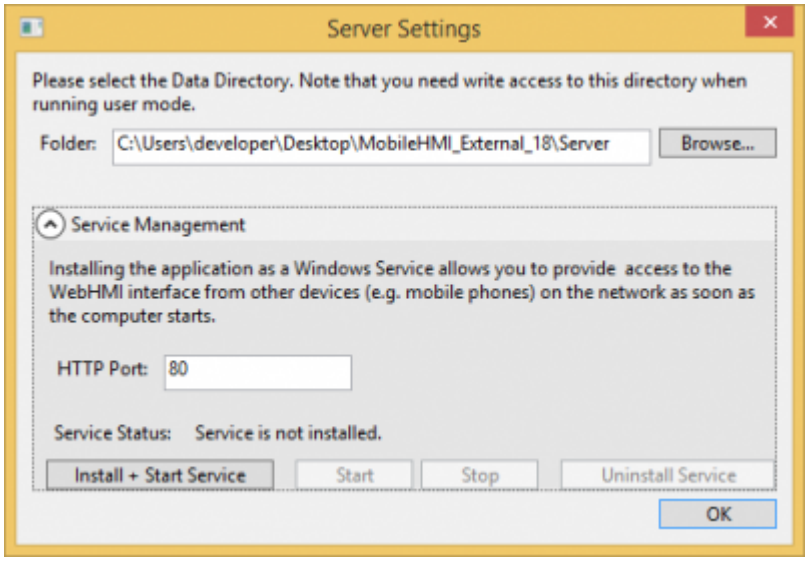
After saving, you will see the created data points and can modify them.

Examples:
Data point Example

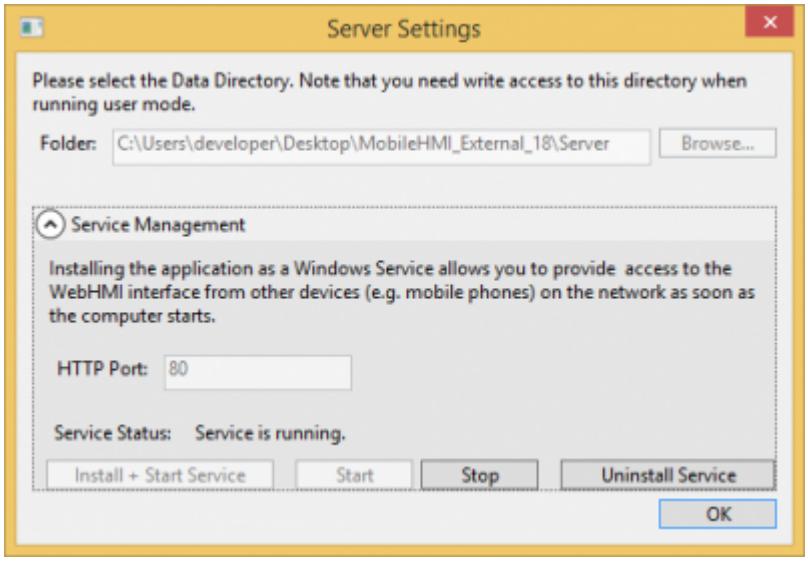
Service settings

- Among  You will find the settings for the service.

Service not installed:



Service installed:



Name	Description
HTTP Port	Port for the web interface of the configuration / display
Install + Start Service	Installs the application as a service and starts it automatically
Start	manual start teh service

Name	Description
Stop	Stop the service, e.g. for changes
Uninstall Service	Remove the installed service

If you want to change the port, stop the service and make the desired change and restart it.

For external users to access the application, the following firewall rules must be added:

- Under Service set port
- If necessary, set OPC Server Ports

Change MobileHMI Theme

With the Jquery Mobile Theme Roller.
MobileHMI use Theme “A”. Proceed as follows:

- Edit Theme “A”
- Then click on “Download theme zip file”
- As name **jquery.mobile.theme.custom** (important for the file name of the created CSS file to be correct)
- Unzipped downloaded zip file
- Copy the contents of this folder “themes” to the “<HMI-Directory> \ custom-theme” folder

Edit Icons

Proceed as follows:

- In the “<HMI Directory> \ custom-theme” folder, create the “main.custom.css” file
- Create folders for image files, e.g. “Img”
- Change desired icons via script

To change an icon, add the following lines to main.custom.css:

```
.hmi-button-<Iconname>:after {
    background-image: url("/img/<Name-der-Icon-Datei>");
    background-size: 90%;
}
```

Beispiel:

```
/* Icon Home-Button ändern */
.hmi-button-home:after {
    background-image: url("/img/Mein-Bild.png");
    background-size: 90%;
}
```

You can specify your own image files for the following icon names:

Name	Changes Control
loginlogout	Logout at the bottom left
home	Show Home
back	Page back (bottom left)
forward	Page forward (bottom left)
autogenerate-hmi	Automatic generation of data points and pages
new-page	Create page
edit-page	edit page
delete-page	Delete the page with all subpages and data points
new-group	Add data group
edit-group	Edit data group
delete-group	Delete data group with many data points
move-pageelement-up	Page(s), move data group(s) up
move-pageelement-down	Page(s), move data group(s) down
move-pageelement-parent	Page(s), data groups) to the desired page / group

Name	Changes Control
new-datapoint	Create data point
newmultiple-datapoint	Several data points
edit-datapoint	Edit the data point
delete-datapoint	Delete the data point
move-datapoint-up	move data point(s) up
move-datapoint-down	move data point(s) down
move-datapoint-parent	move data point(s) into the desired group
dp-submit-changes	Transfer changes to the PLC
dp-revert-changes	Discard changes in the page
dp-pushbutton-set	Press the button of view
dp-pushbutton-unset	Button of view on release

S7 OPC UA & MobileHMI

- Home
    - Visualisierung start
- Benutzerverwaltung
    - Name
    - Login Name
    - Passwort
    - Benutzergruppe
        - Admingruppen A1-A3
        - Benutzergruppen U1-U8
- Verbindungen
    - Name
    - IP-Adresse
    - Rack
    - Slot
    - Gerätetyp
        - Logo
        - S7200
        - S7300_400
        - S71200
        - S71500
    - Verbindungstyp
        - Default
        - Operation Panel
        - Programmer Device
        - Other
    - Timeouts
        - Connect
        - Recieve
        - Transmit
        - BreakDetection
- Datenpunkte
    - Verbindung(en)
        - Datenpunkt(e)
        - Knoten
            - Datenpunkt(e)

        - Unterknoten
            - Datenpunkt(e)
    - Name
    - Adresse
    - Datentyp
        - Bool
        - Byte
        - UInt16
        - Int16
        - UInt32
        - Int32
        - UInt64
        - Int64
        - SingleFP (23 bit Mantisse, 8 bit Exponent, 1 bit Vorzeichen)
        - DoubleFP (52 bit Mantisse, 11 bit Exponent, 1 bit Vorzeichen)
        - String
    - Arraylänge
    - Anzahl der zu erstellenden, konsekutiven Datenpunkte
    - Aktualisierungsintervall
    - Nur lesen
- Skalierungen
    - Name
    - Skalierung
        - Text/String
        - Stufentext
        - Linear
    - Eingabeart
        - Textfeld
        - Numerisches Textfeld
        - Schieberegler
        - Auswahlfeld oder Schalter/Taster
- HMI-Config
    - Seite(n)
        - Datenpunktgruppe(n)
            - Datenpunkt(e)
        - Unterseite
            - Datenpunktgruppe(n)
                - Datenpunkt(e)
    - Seite anlegen
        - Titel
    - Datenpunktgruppe anlegen
        - Titel
    - Datenpunkt zuweisen
        - Titel
        - Istwert-DP
        - Istwert-Skalierung
        - Sollwert-DP
        - Sollwert-Skalierung
        - Taster-Anzeigewert

        - Taster-Skalierung
        - Numerischer Istwert-Min
        - Numerischer Istwert-Max
- OPC Server
    - Alle Server neustarten
    - Neuen Server anlegen
        - Server Name
        - Transport
            - TCP
            - HTTP
        - Hostname
        - Port
        - URI Path
        - Automatically create rejected user certificates
        - Server Certificate
        - User Access
        - Everyone Acces
        - URI
    - Server starten
    - Server stoppen
    - Server neustarten
- OPC Client Zertifikate
    - Name
    - Is active
    - Certificate File
    - Admingruppe festlegen
    - Benutzergruppe festlegen
- Recipe Manager
    - Clear Selection
    - Product
    - Commission
    - Recipe
    - Rezept laden
    - Recept speichern

Table of Contents

SPS-Types 2
Operating systems 2
Functions overview 2
Areas of application 2
Installation 2
Deinstallation 3
PLC - Settings 3
S7-1200/1500 3
LOGO! 4
First Start 6
The application 7
Area of the menu 7
Display area 8
Configuration menu 8
User administration 9
PLC-Connections 11
Data point definition 12
Operand 14
Data types 14
Service settings 15
Home 16
Visualization start 16
Scaling 17
Create selection field 18
Create Switch 19
Create Button 19
Create a numeric field 20
Create slider 21
HMI-Config 23
Seite erstellen 23
Create automatically 24
Assign data point 25
Assign multiple data points 26
Service settings 27
Change MobileHMI Theme 29
Edit Icons 29