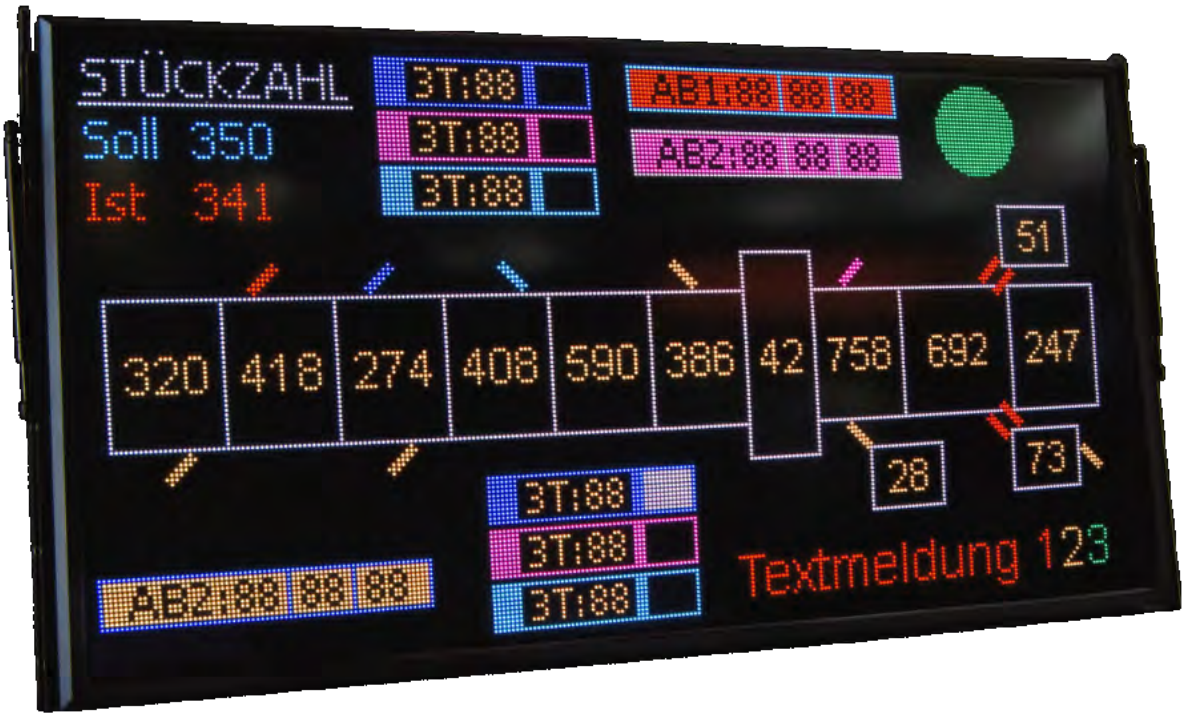
microSYST

migra S1X4

LED display

User manual



Contents

1 General information

The graphics-capable large format LED display (hereinafter called “device”) is universally applicable e.g. as production display or information board.

The modular structure enables cost-effective designs in different sizes.

Before operating the device, please read this user manual carefully. You will receive important information concerning the operation, safety and maintenance of the device. This will prevent the damage to the device and to yourself.

Important information whose inadequate observance or non-observance may result in personal injury or property damage is specially marked in the text.

This user manual is written for qualified electricians and those who are familiar with industrial electronics.

Please keep this user manual carefully.

The manufacturer shall not be liable for any damage caused by the failure to observe the standards mentioned in this user manual.

1.1 Legal information

1.2 Exclusion of liability

Despite careful control we do not assume any liability or guarantee for the accuracy, completeness or topicality of the provided information.

Errors and omissions excepted. Should you notice any mistake or wrong information, please inform us by mail (info@microsyst.de).

1.3 Safety instructions

For safety reasons, the repair and the exchange of components and assemblies may only be carried out by the manufacturer and the device may only be opened by an authorised electrician.

Applications which have not been included (special applications) have to be discussed with our “Service and Support” (support@microsyst.de).

As the devices have no power switch, they are immediately ready for operation after the operating voltage has been connected.

When installing and operating the device, please ensure the compliance with all applicable national and international installation, accident prevention and safety regulations. Failure to observe these standards may result in personal injury and property damage.

Before mounting or dismantling the device please make sure that it is voltage-free. Any work on the 230V mains supply may only be carried out by qualified electricians.

Please protect the LED display from excessive humidity, from strong vibrations, from direct sunlight and from extreme temperatures. Do not use the device if there is a possible danger of gas or dust explosions as it does not have any spark protection. Please observe the information concerning the supply system which can be find on the label of the relevant device.

Please note that direct radiation by bright light or direct sunlight may reduce the reading quality.

The device may not be used if there is any damage to the device and / or to the power cable.

1.4 Intended use

The intended use of the LED display is the industrial environment. A safe operation is only possible within the specified technical limits. With regard to project planning, installation, maintenance and testing of the device, the safety and accident prevention regulations which are required for the relevant application must abolutely be observed. Proper transport and appropriate storage, installation and mounting as well as careful operation and maintencance are assumed for a safe operation of the devices.

1.5 Warranty and liability

According to our General Terms and Conditions liability will be assumed for any other defects already existing upon delivery.

The customer is not entitled to claim the supply of a new product. The customer shall inspect the goods immediately upon receipt and inform the seller without any delay, at the latest within 24 hours about any errors occured. In the event that the obligation to inspect and give notice of defects is violated, the devices shall be deemed to have been approved. Defects which are not immeditately visible must also be reported immediately after their discovery.

Any defects and their symptoms have to be described in the best possible way so that their reproducibility - and their elimination - can be achieved. In addition to this, the purchaser shall provide all necessary and/or relevant information free of charge to remedy the defect, shall provide access to the devices and data in question and shall make all necessary data and machine times available free of charge.

Our warranty does not include any damage caused by failure to comply with the required conditions or by improper handling.

If the product has been provided for testing purposes and will then be purchased, the parties agree that the product has been delivered as “used” and has been taken over “as tested” within the legal sense. Any warranty claims are then excluded.

In addition to this, the current version of microSYST Systemelectronic’s general terms and conditions shall apply (https://www.microsyst.de/en/company/terms-and-conditions/terms-and-conditions.html).

We reserve the right of errors and technical changes.

1.6 Installation

The mounting options are made for a safe and reliable installation.

The user must ensure that the used mounting material, the device support and the fixing on the device support is made for a safe installation under the given local conditions.

1.7 Disposal

Please dispose the devices and parts of devices which are no longer required according to local provisions.

2 Initial operation

2.1 Connection cable

2.1.1 Grounding

The metal housing complies with the protection class I, therefore the devices need a protective conductor terminal. The connection cable for the operating voltage must contain a protective conductor with sufficient cross-section.

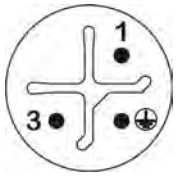
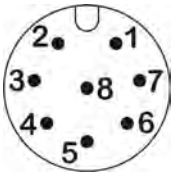
2.1.2 Data / supply cable

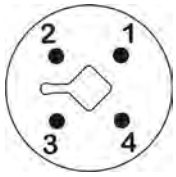
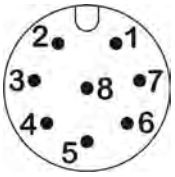
The devices comply with the current EU directive and are therefore interference-free. When connecting the operating voltage cables as well as the data cables, please observe the following instructions:

- Please use an appropriate data cable for the data connection.
- Please ensure that the cable cross-sections are sufficiently dimensioned.

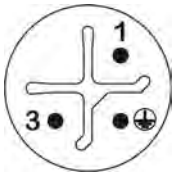
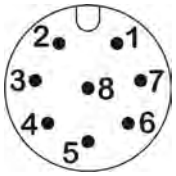
2.2 Pin assignment

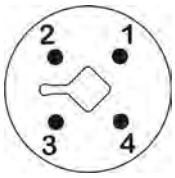
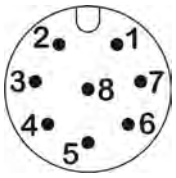
2.2.1 AD converter

AD Converter 230V AC			
Power plug 230V AC M12 / S-Coding		**Analog inputs M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L	1	Channel 1 + (voltage)
3	N	2	Channel 1 - (voltage)
⏚	PE	3	Channel 2 + (voltage)
		4	Channel 2 - (voltage)
		5	Channel 3 + (current)
		6	Channel 3 - (current)
		7	Channel 4 + (current)
		8	Channel 4 - (current)

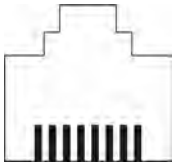
AD Converter 24V DC			
Power plug 24V DC M12 / T-Coding		**Analog inputs M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.	1	Channel 1 + (voltage)
2	+24 VDC	2	Channel 1 - (voltage)
3	PE	3	Channel 2 + (voltage)
4	GND	4	Channel 2 - (voltage)
		5	Channel 3 + (current)
		6	Channel 3 - (current)
		7	Channel 4 + (current)
		8	Channel 4 - (current)

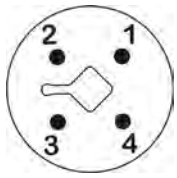
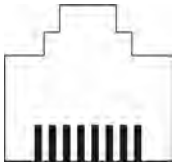
2.2.2 Clock

Clock 230V AC			
Power plug 230V AC M12 / S-Coding		**Digital IO M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L	1	IN 1
3	N	2	IN 2
⏚	PE	3	IN 3
		4	IN 4
		5	OUT 1
		6	OUT 2
		7	UDF
		8	GND

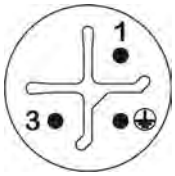
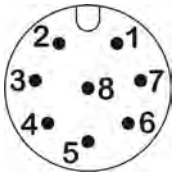
Clock 24V DC			
Power plug 24V DC M12 / T-Coding		**Digital IO M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.	1	IN 1
2	+24 VDC	2	IN 2
3	PE	3	IN 3
4	GND	4	IN 4
		5	OUT 1
		6	OUT 2
		7	UDF
		8	GND

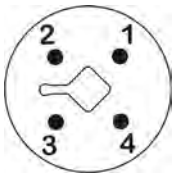
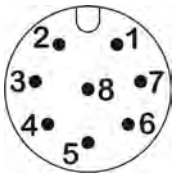
2.2.3 Ethernet

Ethernet 230V AC			
Power plug 230V AC M12 / S-Coding		**Ethernet RJ45**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L		
3	N		
⏚	PE		

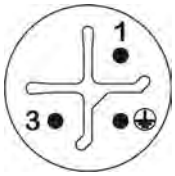
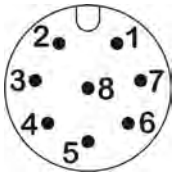
Ethernet 24V DC			
Power plug 24V DC M12 / T-Coding		**Ethernet RJ45**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.		
2	+24 VDC		
3	PE		
4	GND		

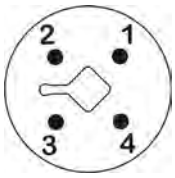
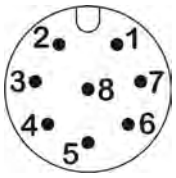
2.2.4 Digital inputs

Digital Inputs 230V AC			
Power plug 230V AC M12 / S-Coding		**Digital inputs M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L	1	Input 1 / Input 8
3	N	2	Input 2 / Input 9
⏚	PE	3	Input 3 / Input 10
		4	Input 4 / Input 11
		5	Input 5 / Input 12
		6	Input 6 / Input 13
		7	Input 7 / Input 14
		8	GND

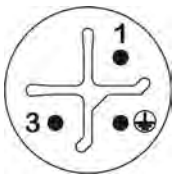
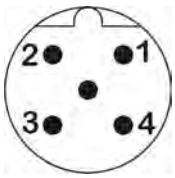
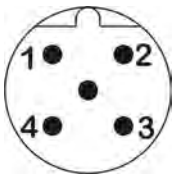
Digital Inputs 24V DC			
Power plug 24V DC M12 / T-Coding		**Digital inputs M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.	1	Input 1 / Input 8
2	+24 VDC	2	Input 2 / Input 9
3	PE	3	Input 3 / Input 10
4	GND	4	Input 4 / Input 11
		5	Input 5 / Input 12
		6	Input 6 / Input 13
		7	Input 7 / Input 14
		8	GND

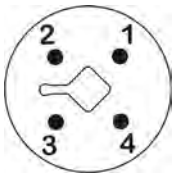
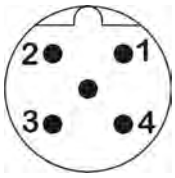
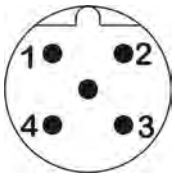
2.2.5 Pulse counter

Impuls counter 230V AC			
Power plug 230V AC M12 / S-Coding		**Impulse inputs M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L	1	Input 1
3	N	2	Input 2
⏚	PE	3	n.c.
		4	GND
		5	n.c.
		6	n.c.
		7	n.c.
		8	Preset / Reset

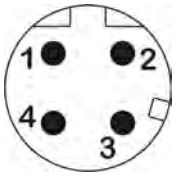
Impuls counter 24V DC			
Power plug 24V DC M12 / T-Coding		**Impulse input M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.	1	Input 1
2	+24 VDC	2	Input 2
3	PE	3	n.c.
4	GND	4	GND
		5	n.c.
		6	n.c.
		7	n.c.
		8	Preset / Reset

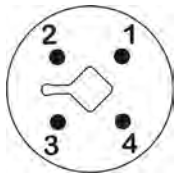
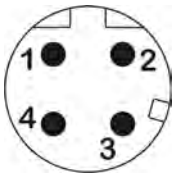
2.2.6 Profibus

Profibus 230V AC					
Power plug 230V AC M12 / S-Coding		**Profibus IN M12 Plug / B-Coding**		**Profibus OUT M12 Socket / B-Coding**	
					
PIN	**Signal**	**PIN**	**Signal**	**PIN**	**Signal**
1	L	1	+5 VDC	1	+5 VDC
3	N	2	Rx/Tx- (A)	2	Rx/Tx- (A)
⏚	PE	3	GND	3	GND
		4	Rx/Tx+ (B)	4	Rx/Tx+ (B)
		5	Shield	5	Shield

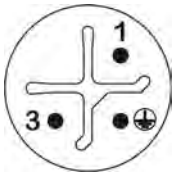
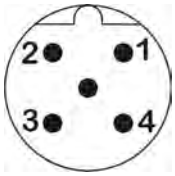
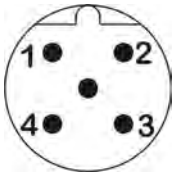
Profibus 24V DC					
Power plug 24V DC M12 / T-Coding		**Profibus IN M12 Plug / B-Coding**		**Profibus OUT M12 Socket / B-Coding**	
					
PIN	**Signal**	**PIN**	**Signal**	**PIN**	**Signal**
1	n.c.	1	+5 VDC	1	+5 VDC
2	+24 VDC	2	Rx/Tx- (A)	2	Rx/Tx- (A)
3	PE	3	GND	3	GND
4	GND	4	Rx/Tx+ (B)	4	Rx/Tx+ (B)
		5	Shield	5	Shield

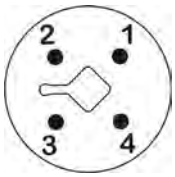
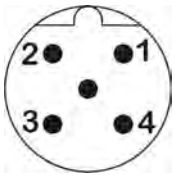
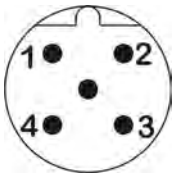
2.2.7 Profinet

Profinet 230V AC			
Power plug 230V AC M12 / S-Coding		**Profinet IN / OUT M12 Socket / D-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L	1	TD+
3	N	2	RD+
⏚	PE	3	TD-
		4	RD-

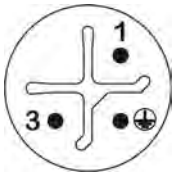
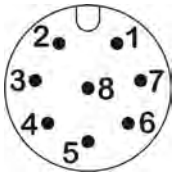
Profinet 24V DC			
Power plug 24V DC M12 / T-Coding		**Profinet IN / OUT M12 Socket / D-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.	1	TD+
2	+24 VDC	2	RD+
3	PE	3	TD-
4	GND	4	RD-

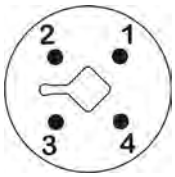
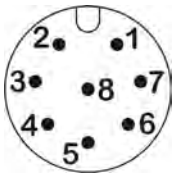
2.2.8 RS485

RS485 230V AC					
Power plug 230V AC M12 / S-Coding		**RS485 IN M12 Plug / B-Coding**		**RS485 OUT M12 Socket / B-Coding**	
					
PIN	**Signal**	**PIN**	**Signal**	**PIN**	**Signal**
1	L	1	+5 VDC	1	+5 VDC
3	N	2	Rx/Tx- (A)	2	Rx/Tx- (A)
⏚	PE	3	GND	3	GND
		4	Rx/Tx+ (B)	4	Rx/Tx+ (B)
		5	Shield	5	Shield

RS485 24V DC					
Power plug 24V DC M12 / T-Coding		**RS485 IN M12 Plug / B-Coding**		**RS485 OUT M12 Socket / B-Coding**	
					
PIN	**Signal**	**PIN**	**Signal**	**PIN**	**Signal**
1	n.c.	1	+5 VDC	1	+5 VDC
2	+24 VDC	2	Rx/Tx- (A)	2	Rx/Tx- (A)
3	PE	3	GND	3	GND
4	GND	4	Rx/Tx+ (B)	4	Rx/Tx+ (B)
		5	Shield	5	Shield

2.2.9 Timer

Timer 230V AC			
Power plug 230V AC M12 / S-Coding		**Digital IO M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	L	1	IN 1
3	N	2	IN 2
⏚	PE	3	IN 3
		4	IN 4
		5	OUT 1
		6	OUT 2
		7	UDF
		8	GND

Timer 24V DC			
Power plug 24V DC M12 / T-Coding		**Digital IO M12 / A-Coding**	
			
PIN	**Signal**	**PIN**	**Signal**
1	n.c.	1	IN 1
2	+24 VDC	2	IN 2
3	PE	3	IN 3
4	GND	4	IN 4
		5	OUT 1
		6	OUT 2
		7	UDF
		8	GND

2.3 Switching on / Switching off the device

- The device is switched on after the supply voltage has been supplied. When starting the device the switch-on screen depends on the configuration of the device.
- You can switch off the device if you disconnect it from the power supply.

3 Configuration

Please bear in mind that the devices may not work properly due to an incorrect configuration. We therefore recommend a backup using the microSYST configuration software 2.x (hereinafter called “MKS 2.x”) as described below.

3.1 Language settings

To adjust the current language settings, please click on **Extras | language** in the menu bar and choose the required language.

3.2 Backup of the factory settings

Should you want to change anything please save the current status as backup. Please proceed as follows:

1. Please connect the device and read-out the current project from the device. Click on the button **read-out** in the MKS 2.x.
2. Then please save the loaded project with **File** | **Save as...**

3.3 General information

The configuration of the visualisation as well as the used hardware components will solely be made via the MKS 2.x. The user interface of the microSYST configuration software consists of three parts:

Project structure, *Editor* as well as *Settings and properties*. (Picture 1).

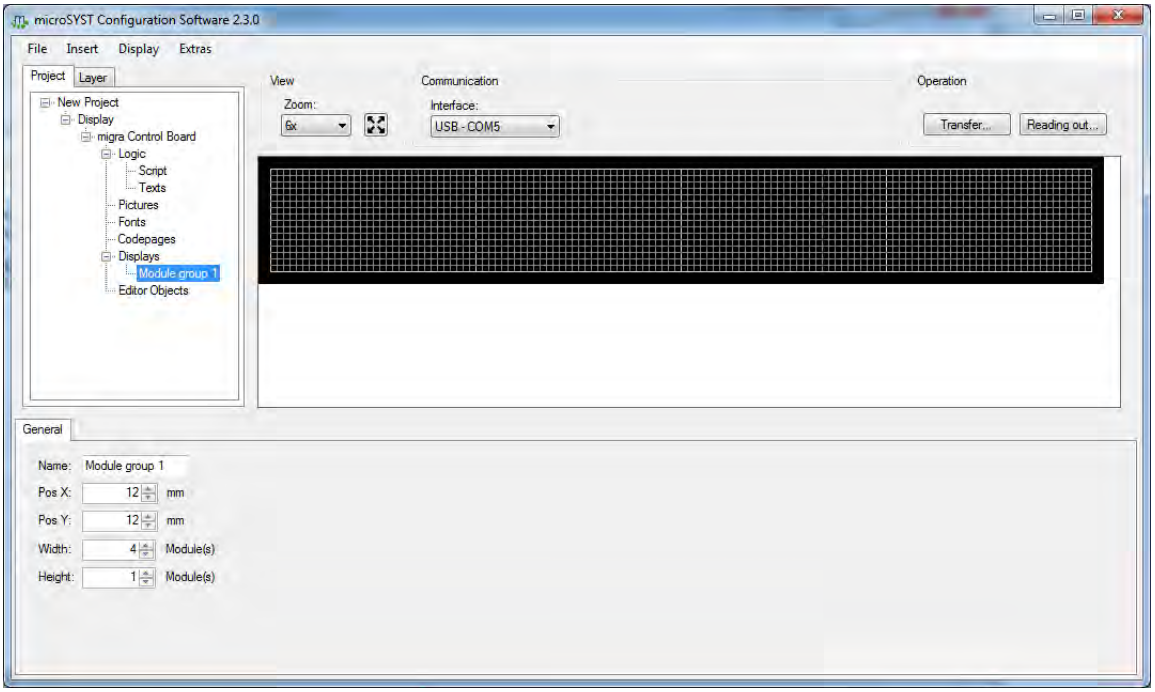


Figure 1: MKS 2.x interface

3.3.1 Project structure and layer view

The project structure can be seen in the upper left window of the user interface. There, the control board, additional boards, visualisation objects, elements of the editor as well as scripts and texts are accessible. With the tab *layer* you can switch to the layer view, there layers can be shown and hidden or renamed.

3.3.2 Settings and properties

In the lower part, the *Settings and properties* for the different elements of the project structure can be found. Each element has various properties. Therefore, click on one of the elements of the tree structure in order to see the possible settings and properties and to configure it.

3.3.3 Editor

On the right side of the user interface, in the *editor*, already selected editor elements and visualisation objects are displayed realistically.

3.4 Reading-out / transmitting / saving the configuration

3.4.1 Reading-out / transmitting

Under *Communication* you can select from the following interfaces for the performed *action*:

- Ethernet: Enter the IP address and the port (picture 2). Should you not know the IP address, please click on *searching device* and a new dialogue will appear, which shows all accessible Ethernet participants.

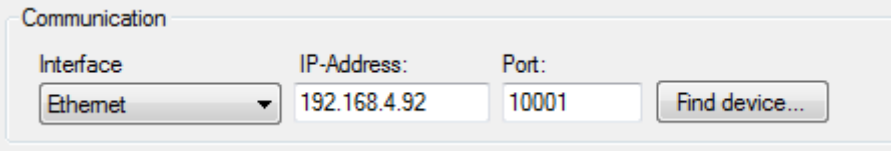


Figure 2: TCP/IP

- Serial interface (e.g. RS485): Choose the COM port, baud rate and parity for the device (picture 3). Please also specify the bus address (=address of the control board).

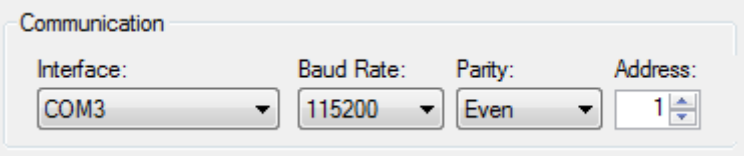


Figure 3: Serial interface

- USB: Please note that this interface only can be used if the device is connected with the PC via USB. The device will be logged on with a virtual COM port, then the COM port will be preselected. Should there be more devices connected , it is possible to choose between the virtual COM ports. (picture 4)

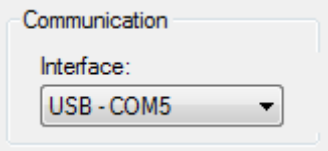


Figure 4: USB

3.4.2 Saving a project

To save a current project, click on **File | Save as** in the menu bar. Now, you can choose the path where you want to save the project. If the path is already preselected, you can also just click on *Save* in the menu bar.

3.5 Configuration of the IP address

In order to change the IP address of the display, the device has to be available via Ethernet. Please click on **Display** | **Configure interface...** in the menu bar in order to open the *configure*

interface dialogue (picture 5) and select the IP address to be changed from the list. Adjust the IP address under *configuration* | *IP address* accordingly and click on *Change* for the acceptation of the IP address. If you close the dialogue box with *Close and assign IP* the new IP address will be entered automatically under *communication*.

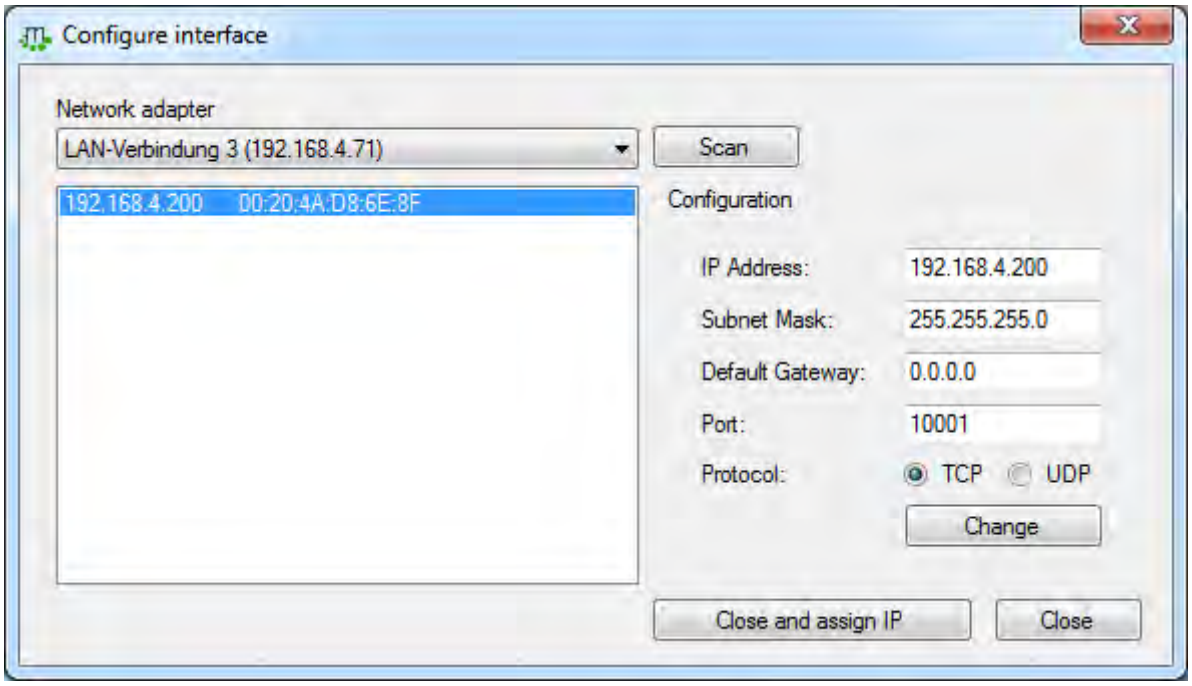


Figure 5: Configure interface

3.6 Configuration of the hardware components

Please note that each device has a basic configuration. Do you want to change it afterwards, please use the MKS 2.x. For more information please follow the instructions of each component.

Note: Please note that only the components used by microSYST can be configured.

Components / additional boards

The components / additional boards are forming the *microSYST Peripheral Bus System* (MPB) and can be combined or modified depending on cutomer's requirements. With the *MKS 2.x*, the *Control Board* and the individual components can be configured for displaying the desired data.

In the following, the features, options and possible settings of the control board and the components will be described in detail.

Note: For each of the components / additional boards you can find the *Name*, the *Address* and the *Poll cycle* under *Settings and Properties* and *General*.

3.6.1 Control board S1X4

The control board will be inserted automatically when creating a new project. By clicking on the control board in the project structure the *Settings and Properties* of this component will be displayed.

Under *Settings and Properties* and *General* (picture 6) you can change a component's name in the project. Please confirm it with the enter key. The new name will appear in the upper left corner of the project structure. You can adjust the maximum brightness of the display here as well.

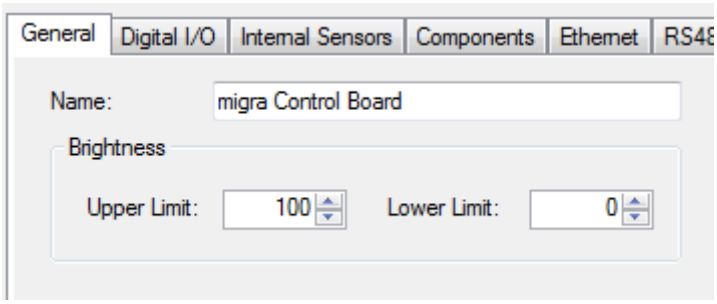


Figure 6: Tab General

The control board has four inputs in total (e.g. for using switch inputs). The tab *Digital I/O* (picture 7) is for adjusting the debouncing time for each input as well as the input level of all inputs.

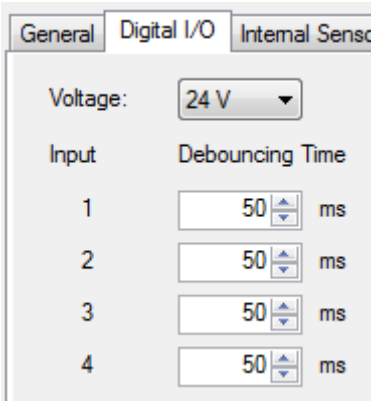


Figure 7: Tab Digital I/O

You can operate the control board in a *Master* or *Slave* mode under the tab *Internal Sensors* (picture 8) . This setting is important if multiple control boards are sharing one sensor (e.g. brightness, humidity sensor etc.). The tab *Internal Sensors* is preconfigured by default and must not be changed.

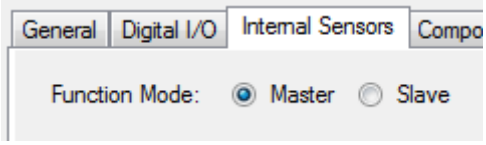


Figure 8: Tab internal sensor

You can configure the Ethernet interface under *Ethernet* (picture 9). The default protocol is *ASCII* and will be described in this manual.

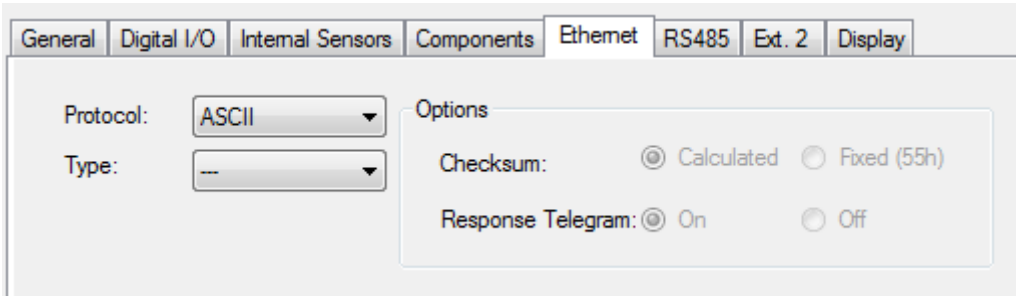


Figure 9: Tab Ethernet

The settings for the RS485 interface can be found under the tab *RS485* (picture 10). The default protocol is *ASCII* and will be described in this manual.

In addition to this you can set baud rate, parity and the RS485 bus address of the control board.

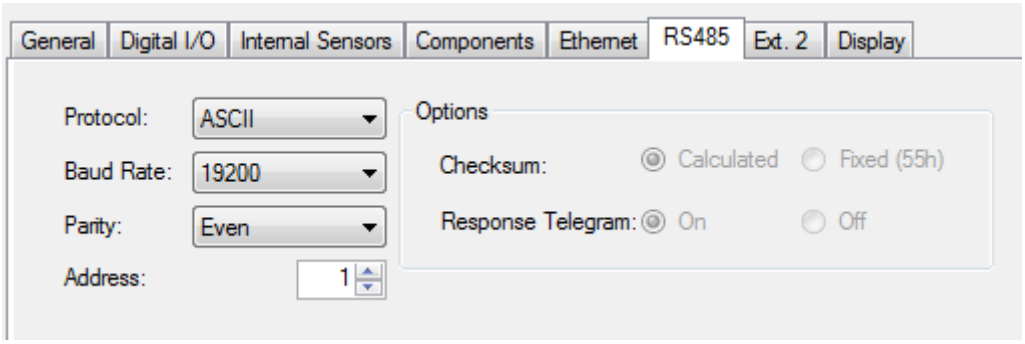


Figure 10: Tab RS485

Under the tab *Ext.2* (picture 11) you can configure the external interface 2. The default protocol is *ASCII* and will be described in this manual.

This interface can be configured and used under *Extern 2* as *RS232* or *RS485*. If set to RS485, the RS485 bus address refers to the address in tab *RS485*. In both settings you can configure the baud rate and parity of the interface.

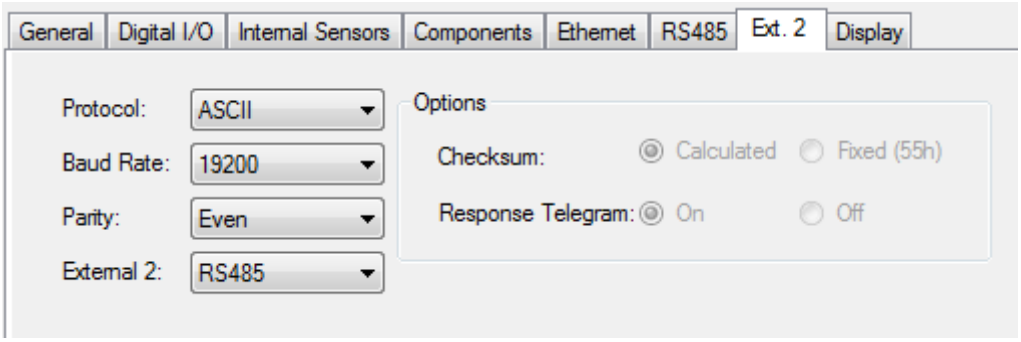


Figure 11: Tab Ext.2

The tab *Display* (picture 12) can be used to adjust the display specifications.

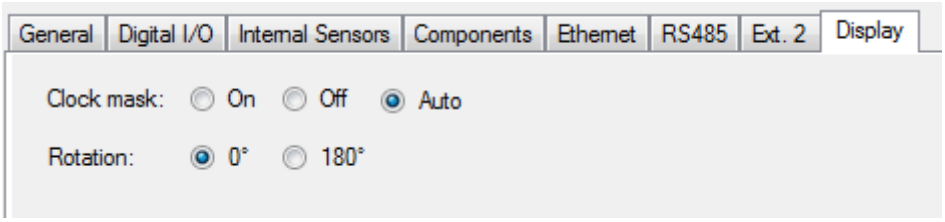


Figure 12: tab display

3.6.2 AD converter

The AD converter enables you to convert physical measuring units (length, mass, time) into digits. It has two channels for power and two channels for voltage.

Important: Please note that each of the four channels has to be activated before usage, so it can supply a value.

3.6.2.1 Channel 1 / Channel 2 - Voltage

Enable / disable the channel under *Use* (picture 13).

The accuracy of the AD converter can be determined with specifying the resolution and the average value under *Accuracy*. The resolution specifies the number of areas that are divided in sectors with a voltage ranging from -10 bis +10 V. With regard to the average value information on the last measured voltage level is gathered and thus the average value, which shall be used for stabilising the display values, is calculated.

The upper and the lower limit, which the display value refers to, can be specified with the *threshold value*. If then the device value has exceeded / fallen below the upper or lower limit, it is possible to react individually.

The *measuring straight* is defined by two points. The measuring straight determines which value is represented when a voltage is applied.

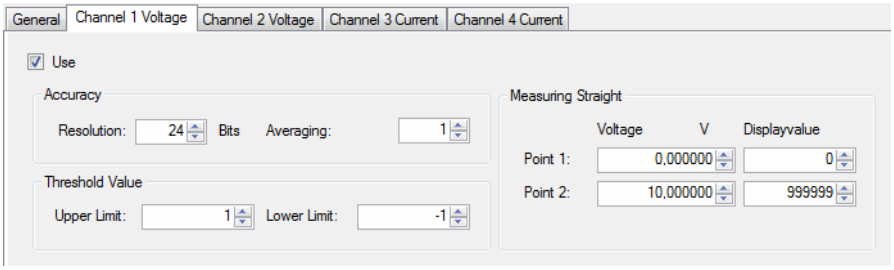


Figure 13: tab Channel 1/Channel 2

3.6.2.2 Channel 3 / Channel 4 - power

Enable / disable the channel under *Use* (picture 14).

The accuracy of the AD converter can be determined with specifying the resolution and the average value under *Accuracy*. The resolution specifies the number of areas that are divided in sectors with a current ranging from -20 mA bis +20 mA. With regard to the average value information on the last measured current is gathered and thus the average value, which shall be used for stabilising the display values, is calculated.

The upper and the lower limit, which the display value refers to, can be specified with the *threshold value*. If then the device value has exceeded / fallen below the upper or lower limit, it is possible to react individually.

The *measuring straight* is defined by two points.The measuring straight determines which value is represented when a current is applied.

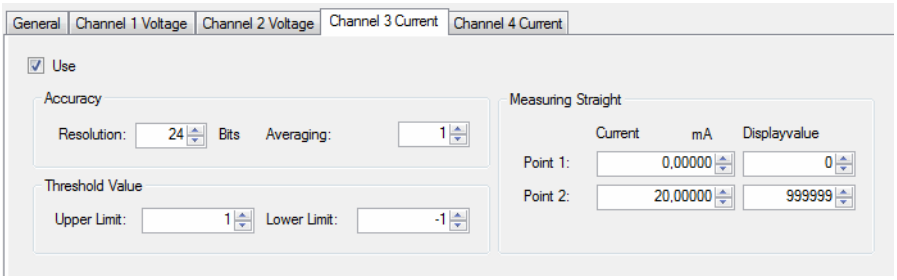


Figure 14: tab Channel 3/Channel 4

3.6.3 BCD / IO

The operating mode of this component can be adjusted under *Function* (picture 15). You can choose between different options:

- *Digital input:* delivers the current input level (depending on high/low mode). Additionally, high edge results will be reported once. In order to be able to evaluate the results meaningfully, the poll cycle time should be set to at least 100 ms.
- *BCD Parallel, BCD Multiplex*: the inputs are run in BCD mode(=method)

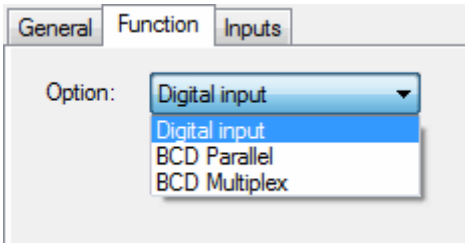


Figure 15: tab Function

When enabled, the *special characters* extend the numerics by the following alphabectical characters (picture 16): H, E, L, P, (space), -.

BCD parallel: You can select the number of decimal places from 1 to 4.

BCD Multiplex: You can select the number of decimal places from 1 to 6.

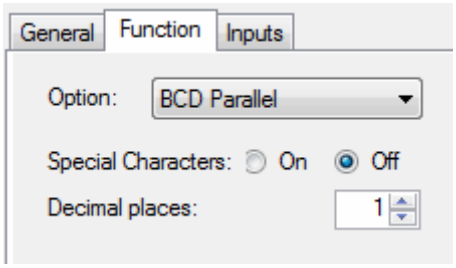


Figure 16: Special Characters

The inputs can be adjusted under *Inputs* (picture 17).

Name: shows the name of each input.

Logic: If *invert* is activated you can invert the high / low level at the input.

Pull up: Pull up is a resistor which will be applied to the internal supply voltage in order to read in a high signal at an open input.

Pull down: Pull down is a resistor which will be applied to the internal ground in order to read in a low signal at an open input.

Debouncing cycles: adjustable time for debouncing the inputs for precisely identifying (=bounce-free) any change of state.

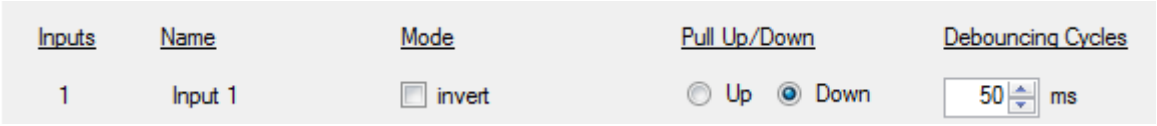


Figure 17: tab Inputs

3.6.4 Pulse counter

Under *operating mode* you can select from the following options:

- Pulse counter
- Pulse interval
- Impulses per time
- Interval counter
- Incremental Decoder
- Incremental Decoder IDX Reset
- Incremental Decoder Velocity

In the following, the above mentioned *operating modes* will be explained in detail.

Important: Please note that there are different *inputs* depending on the operating mode (4 inputs in total). Input 1, 2, Reset and Incremental Decoder Input (Inc.Dec.Input). You can adjust these inputs under the tab *Inputs* as soon as you have chosen the operating mode (please see *operating modes*-mode).

Note: The operating modes pulse counter, pulse interval, impulses per time and interval counter generate two values:

Pulse counter value 1: counter value Pulse counter value 2: Status value

The operating modes Incremental Decoder, Incremental Decoder IDX Reset, Incremental Decoder Velocity generate two values:

Pulse counter value 1 – Incremental counter value

Pulse counter value 2 – IDX counter value (rotations)

3.6.4.1 Operating mode - Pulse counter

The pulse counter counts pulses up and down at both inputs. Thereby the settings of input 2 can determine the counting direction of input 1 (picture 18).

Under *Options - min. / max.* you can find several options concerning the settings of your counter when reaching the minimum / maximum value:

- *Ignore*: Counter continues to count (32 bit)
- *Stop counter*: The counter stops counting after reaching the *minimum / maximum value*
- *Counter overflow through zero*: The counter restarts to count from zero after exceeding the *min. / max. value*
- *Overflow through minimum / maximum value*: The counter restarts to count from the max value after the min value has been reached. After exceeding the maximum value, the counter restarts from the minimum value.

As soon as you have chosen the required function you can specify the *upper and lower limit*, if needed. After reaching the upper / lower limit a bit in the status value will be set (please see list above).

Furthermore, you can determine the *maximum value* and the *minimum value* of the counter regarding the overflow and stopping options.

A bit will be set in the status value after the expiry of the adjusted *signal timeout period*. With each pulse the timeout counter will be set to 0.

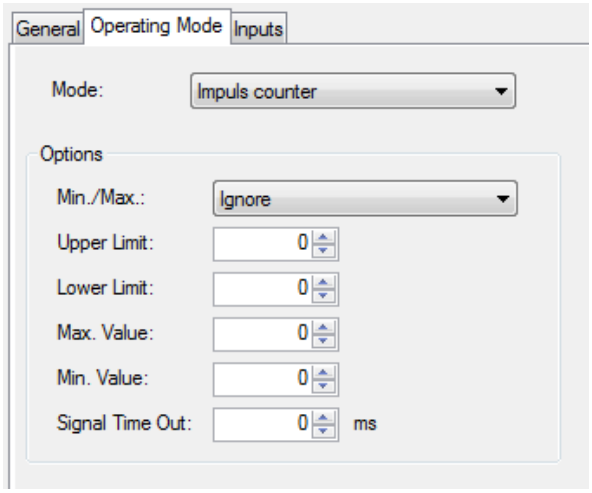


Figure 18: Pulse counter

Under *Inputs* (picture 19) you can adjust the *inputs 1* and *2* and under *Reset* you can adjust the level, cut-off frequency (= filter for bouncing signals) and counting direction as well as activation, debouncing filter and preset value (= start value of the counter after reset) via selection fields.

Note: If the *level* has been adjusted to *Pull up* a pull-up resistor will be switched to 5 V, the maximum pulse repetition frequency is 100 Hz (minimal pulse duration 5 ms).

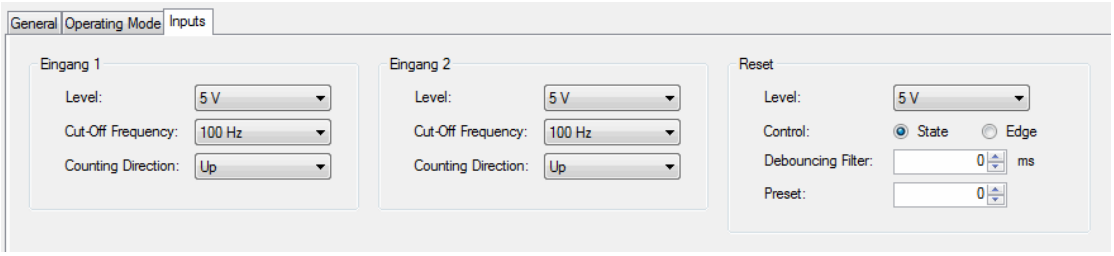


Figure 19: tab Inputs

3.6.4.2 Operating mode - Pulse interval

In that mode the time between two edges is measured.

Under *Options - min. / max.* (Abbildung 20) you can find several options concerning the settings of your counter when reaching the min. / max. value:

- *Ignore*: Counter continues to count (32 bit)
- *Stop counter*: The counter stops counting after reaching the *min. / max. value*.

As soon as you have chosen the required function, you can specify the *upper and lower limit*. After reaching the upper / lower limit a bit in the status value will be set (please see list above).

Furthermore, you determine the *maximum value* and the *minimum value* of the counter regarding the stopping options.

The average of up to 30 measured values can be calculated with the *average value*.

A bit will be set in the status value after expiry of the adjusted *signal timeout period*. With each pulse the timeout counter will be set to 0. The result will be multiplied with the *resolution* (unit per digit).

Under *inputs* you can adjust the *input 1* via selection fields:

Level, cut-off frequency (picture 21).

Note: If the *level* has been adjusted to *Pull up* a pull-up resistor will be switched to 5 V, the maximum pulse repetition frequency is 100 Hz (minimal pulse duration 5 ms).

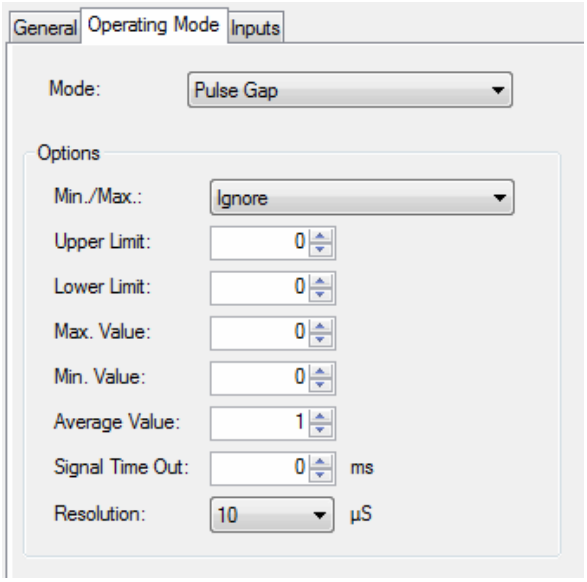


Figure 20: Pulse interval

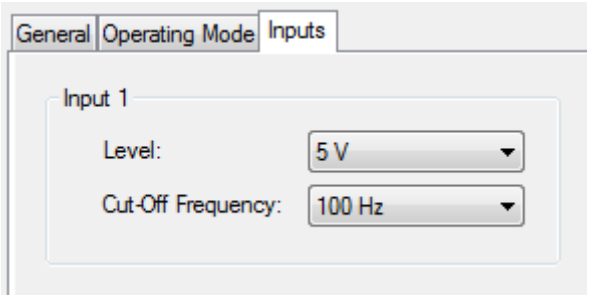


Figure 21: tab Inputs

3.6.4.3 Operating mode - Pulses per time

It is possible to display the number of pulses per selected time unit (picture 22).

Under *Options - min. / max.* you can find several options concerning the settings of your counter when reaching the min./max value:

- *Ignore*: Counter continues to count (32 bit)
- *Stop counter*: The counter stops counting after reaching the *min. / max. value*

As soon as you have chosen the required function, you can specify the *upper and lower limit*. After reaching the upper / lower limit a bit in the status value will be set (please see list above).

Furthermore, you determine the *maximum value* and the *minimum value* of the counter regarding the overflow and the stopping options.

The average of up to 30 measured values can be calculated with the *average value*.

A bit will be set in the status value after expiry of the adjusted *signal timeout period*. With each pulse the timeout counter will be set to 0.

Under *time unit* you can determine the time frame in ms in which the incoming pulses will be counted.

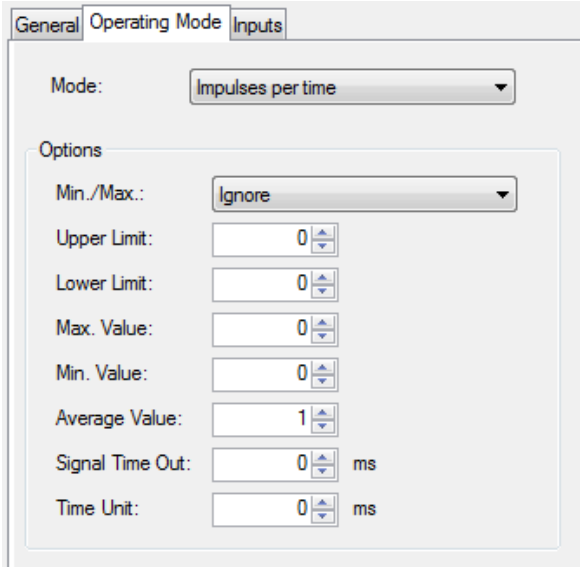


Figure 22: Impulses per time

Under *Inputs* you can adjust the *input 1* via selection fields: Level, cut-Off Frequency (picture 23).

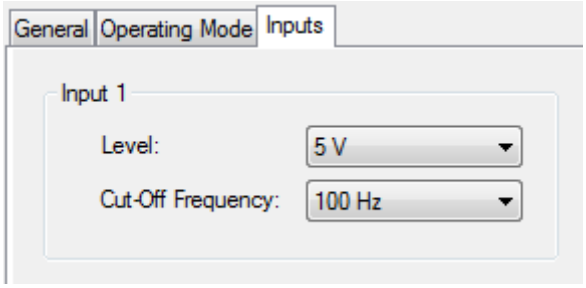


Figure 23: tab Inputs

Note: If the *level* has been adjusted to *Pull up* a pull-up resistor will be switched to 5 V, the maximum pulse repetition frequency is 100 Hz (minimal pulse duration 5 ms).

3.6.4.4 Operating mode - Interval counter

In that mode it is counted upwards and downwards in the interval of the time unit.

Under *Options - min. / max.* (picture 24) you can find several options concerning the settings of your counter when reaching the min. / max. value:

- *Ignore*: Counter continues to count (32 bit)
- *Stop counter*: The counter stops counting after reaching the *min. / max. value*
- *Counter overflow through zero*: The counter restarts to count from zero after exceeding the *min. / max. value*
- *Overflow through min. / max. value*: The counter restarts to count from the max value after the min value has been reached. After exceeding the max. value, the counter restarts from the min. value.

As soon as you have chosen the required function, you can specify the *upper and lower limit*. After reaching the upper / lower limit a bit in the status value will be set (please see list above).

Furthermore, you determine the *maximum value* and the *minimum value* of the counter regarding the overflow and the stopping options.

Under *time unit* you can adjust the interval in ms. Furthermore, please select the counting direction *up* or *down*.

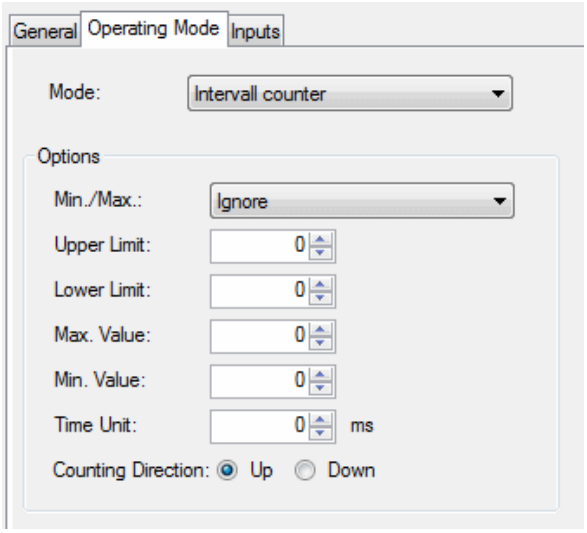


Figure 24: Interval counter

Under *inputs* you can adjust *Reset* via selection fields:

Level, control, debouncing filter and preset value (= start value of the counter after reset) (picture 25).

Note: If the *level* has been adjusted to *Pull up* a pull-up resistor will be switched to 5 V, the maximum pulse repetition frequency is 100 Hz (minimal pulse duration 5 ms).

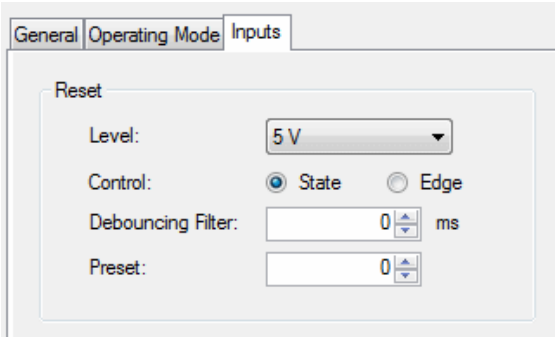


Figure 25: tab Inputs

3.6.4.5 Operating mode - Incremental Decoder

Incremental (quadrature) decoder, 32 Bit quadrature register. Additionally, 32 bit counter register of the Dx signal (complete rotation) both upwards and downwards (picture 26).

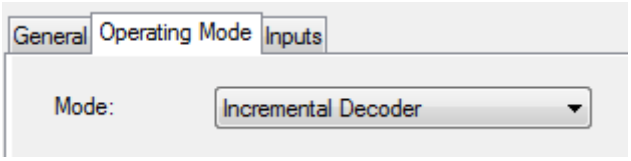


Figure 26: Incremental decoder

Under *inputs* and *Inc.Dec.input* you can adjust the filter (picture 27). For each incremental input Dx, phA, phB you have the possibility to choose between 1 to 63 (6 bit). The minimum pulse width is $\frac{value+1}{48} MHz$.

All incremental inputs can be inverted by marking:

- Invert Dx
- Invert phB
- Invert phA

Under *Reset* you can adjust level, control, debouncing filter and preset value (= start value of the counter after reset) via selection fields.

Note: If the *level* has been adjusted to *Pull up* a pull-up resistor will be switched to 5 V, the maximum pulse repetition frequency is 100 Hz (minimal pulse duration 5 ms).

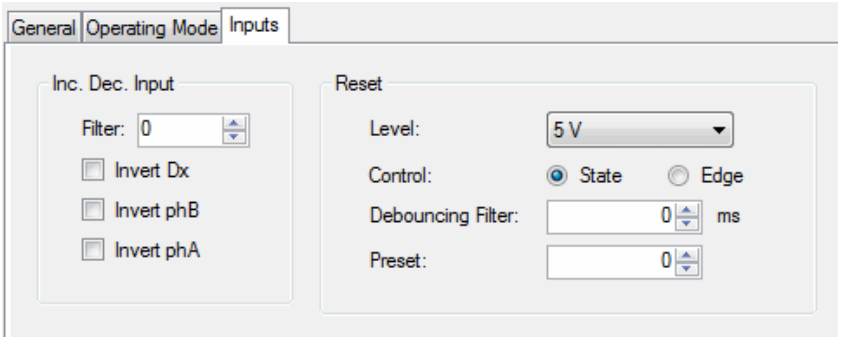


Figure 27: Inputs incremental decoder

3.6.4.6 Operating mode - Incremental Decoder IDX Reset

Incremental (quadrature) decoder, 16 Bit quadrature register. Additionally, 16 bit counter register of the Dx signal (complete rotation) both upwards and downwards (picture 28). The quadrature register will be deleted after each Dx pulse. So the quadrature register shows the position of the encoder in relation to Dx.

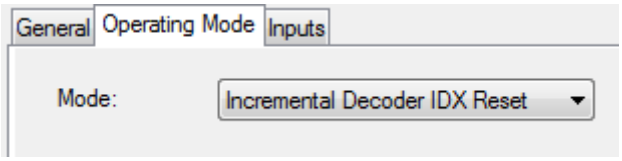


Figure 28: Incremental decoder IDX Reset

Under *inputs* and *Inc.Dec.input* you can adjust the filter (picture 29). For all Incremental inputs Dx, phA, phB you have the possibility to choose between 1 to 63 (6 bit). The minimum pulse width is $\frac{value+1}{48} MHz$.

All incremental inputs can be inverted by marking:

- Invert Dx
- Invert phB
- Invert phA

Under *Reset* you can adjust level, control, debouncing filter and preset value (= start value of the counter after reset) via selection fields.

Note: If the *level* has been adjusted to *Pull up* a pull-up resistor will be switched to 5 V, the maximum pulse repetition frequency is 100 Hz (minimal pulse duration 5 ms).

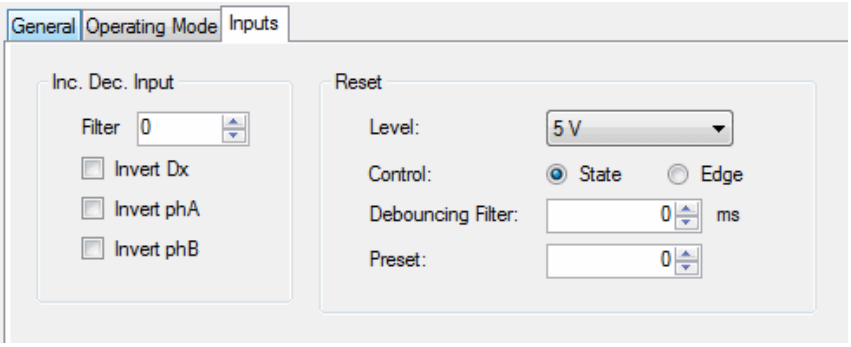


Figure 29: Inputs incremental decoder IDX Reset

3.6.4.7 Operating mode - Incremental Decoder velocity

In that operating mode you can see the number of increments per selected time unit (picture 30). Depending on the direction of rotation they can be positive or negative.

The average of up to 30 measured values can be calculated under *Options*. Under *Time unit* you can determine the timeframe in ms in which the incoming pulses will be counted.

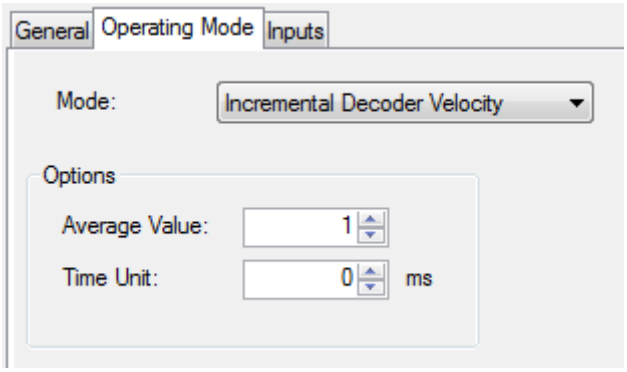


Figure 30: Incremental decoder velocity

Under *Inputs* and *Inc.Dec.input* you can adjust the filter (picture 31). For all Incremental inputs Dx, phA, phB you have the possibility to choose from 1 to 63 (6 bit). The minimum pulse width is $\frac{value+1}{48} MHz$.

All incremental inputs can be inverted by marking:

- Invert Dx
- Invert phB
- Invert phA

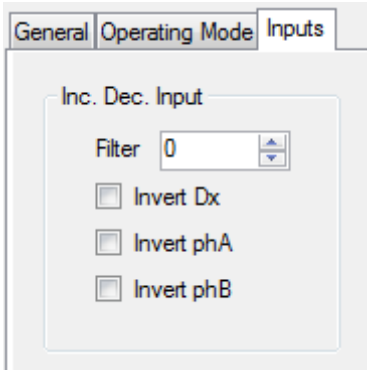


Figure 31: Inputs incremental decoder velocity

3.6.5 RS / RTC

With the RS/RTC component you can receive telegrams and adjust it to deliver and to display the required values.
Additionally, the exact time via Real Time Clock (RTC) can be displayed.

Time out, baud rate and parity can be adjusted under the tab *RS232 Settings* respectively *RS485 Settings* (picture 32).

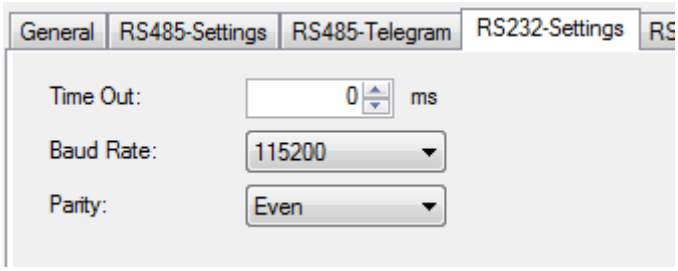


Figure 32: tab RS232 settings

Additionally, you can find stop bits, data bits and mode under *RS485 Settings* (picture 33). You can choose between RS485, RS422 and RS232. The bus termination can be en- or disabled.

You can configure the telegram parts you received from a connected device (e.g. from scales) and the telegram parts that need to be processed with the RS/RTC component under *RS485-Telegram* respectively *RS232-Telegram* (picture 34).

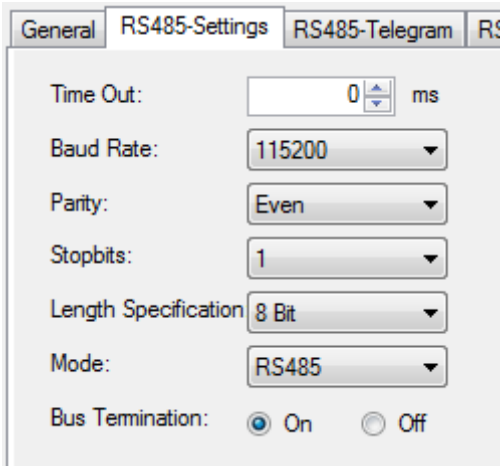


Figure 33: tab RS485 settings

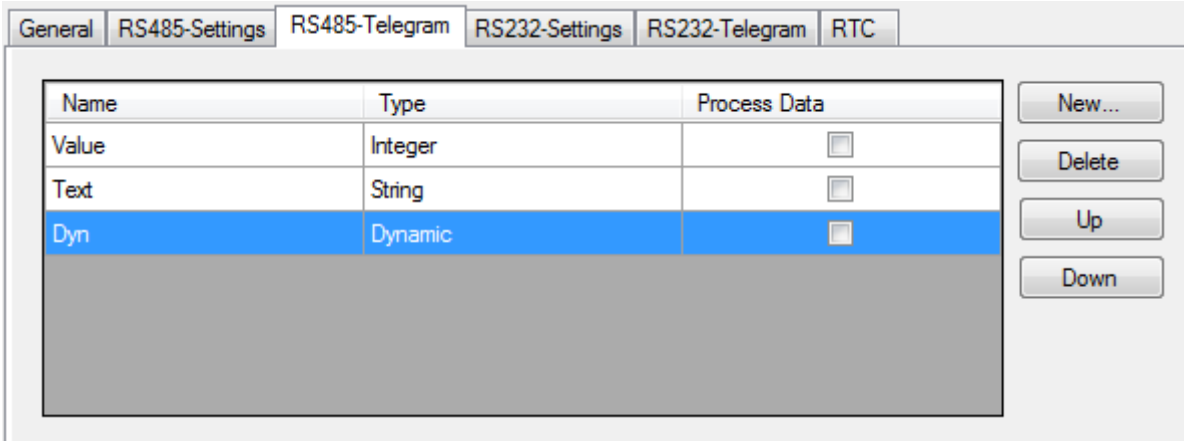


Figure 34: tab RS485 - Telegram

3.6.5.1 Inserting a telegram part

To insert a new telegram part, click on *New...* under the tab *RS485 / RS232 Telegram* (picture 34). A new dialogue appears (picture 35) where you can create a new telegram part. Now, you can define the name and the data type to be created.

Note:

- Integer: a whole-numbered value between 1 - 4 bytes which can be unsigned or signed.
- String: a string of characters which consists of a byte sequence which will be used in a different coding (e.g. UTF8, CP1252, etc. ...) It has a defined length.
- Dynamic: a string of characters which consists of a byte sequence which will be used in a different coding (e.g. UTF8, CP1252, etc. ...)
  It has an undefined length.

Please confirm your selection with the button *Create*. The different options regarding the individual

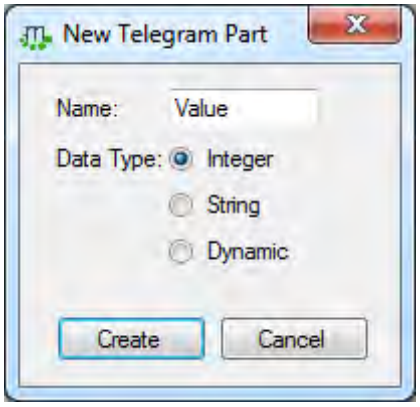


Figure 35: New Telegram Part

data types can be changed and adjusted in the detail view of each data type. By one click on the data type in the list the detail view appears on the right side (please see the following chapters *detail view integer, detail view string, detail view dynamic*).

3.6.5.2 Detail view integer

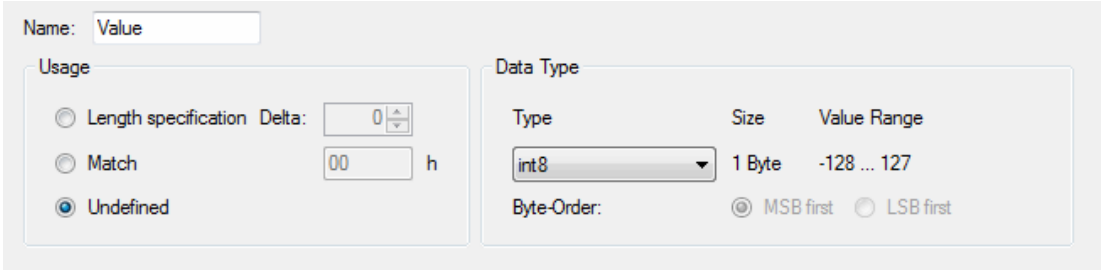


Figure 36: Integer settings

- Name:

  The telegram part's name.

- Usage:

  Length specifications: The stated length specifications bytes are used for specifying the length of the following bytes.

  Delta: The entered delta value will be added to the length specification.

  Conformity: A hexadecimal value can be specified here. This value has to be conform with the value in the data type position in the telegram. The hexadecimal value has to contain as many bytes as configured by the type.

  Undefined: The numeric value has no defined significance for the evaluation.

- Data type:

Type You can choose between different types. The data type determines the number of the following bytes. Unsigned data types are marked with uintX and signed data types are marked with intX, the X shows the number of bits.

Byte order As soon as the selection is bigger than 8 bits, the byte order option will be activated. This option is important for a correct interpretation of the decimal value. MSB – Higher-value byte first LSB – Lower-value byte first

3.6.5.3 Detail view string

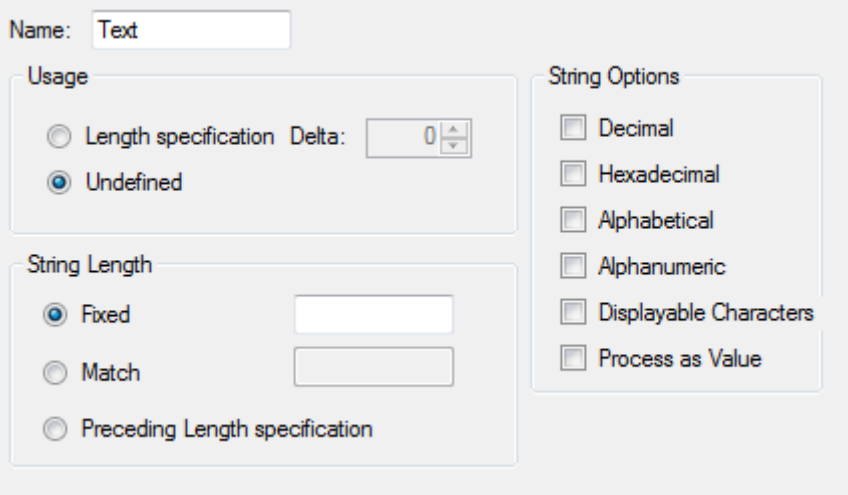


Figure 37: String settings

- Name:

  The telegram part's name.

- Usage:

  Length specifications: The following ASCII characters are used for the length specification of following telegram entries (bytes). Additionally, the string option has to be marked with "process as value". With this option, all existing decimal numbers will be converted into an integer value.

  Delta: The entered delta value will be added to the converted integer value which acts as a length specification.

  Undefined: The ASCII characters have no specific meaning for the evaluation.

- String length:

  Fixed: You can enter the number of following ASCII characters.

  Conformity: Here, you can enter an ASCII character string (10 characters max.) that has to be conform with the character string in the telegram.

  Preceding length specification: A preceding telegram entry has to be marked with "length specifications". Then the ASCII character string's length will be defined.

- String options

  Decimal: The ASCII character string may only contain the following characters: 0 1 2 3 4 5 6 7 8 9

  Hexadecimal: The ASCII character string may only contain the following characters: 0 1 2 3 4 5 6 7 8 9 a b c d e f A B C D E F

  Alphabetical: The ASCII character string may only contain the following characters: A – Z, a - z

  Alphanumeric: The ASCII character string may only contain the following characters: A – Z, a – z, 0 – 9

  Displayable characters: The ASCII character string may only contain the following characters: space, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ ] ^ _ ‘ { | } ~ A – Z, a – z, 0 – 9

  Process as value See *Application - Length specifications*

3.6.5.4 Dynamic detail view

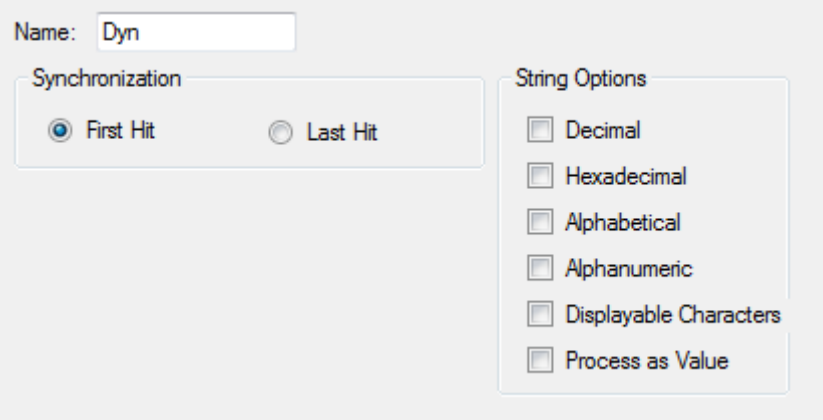


Figure 38: Dynamic settings

- Name:

  The telegram part’s name.

- Synchronisation

  The dynamic data type requires a preceding and a following telegram entry with the application “Conformity” as a fixed point. The option *last hit* can be set if the preceding fixed point should occur multiple times in the dynamic part. If the preceding fixed point is clearly defined and does not occur in the dynamic part, the option *first hit* is used.

- String options

  Decimal: The ASCII character string may only contain the following characters: 0 1 2 3 4 5 6 7 8 9

Hexadecimal: The ASCII character string may only contain the following characters: 0 1 2 3 4 5 6 7 8 9 a b c d e f A B C D E F

Alphabetical: The ASCII character string may only contain the following characters: A – Z, a - z

Alphanumeric: The ASCII character string may only contain the following characters: A – Z, a – z, 0 – 9

Displayable characters: The ASCII character string may only contain the following characters: space, ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ ] ^ _ ‘ { | } ~ A – Z, a – z, 0 – 9

Process as value See *Detail View for String - Application - Length specifications*

3.6.6 Deleting a telegram part

If you want to delete an existing telegram part in the telegram chart, select the relevant telegram part and click on *Delete*.

3.6.7 Moving a telegram part

If you want to move an existing telegram part in the telegram chart up or down, select it and click on *Up* or *Down*.

Important: Special features of the telegram structure:

1. The telegram structure may never contain a dynamic data type and a telegram entry with application *length specification* at the same time!
2. Two dynamic data types may never be inserted successively.

After having set up the telegram parts correctly, you can activate the corresponding line under *Process data* in order to use the data (picture 39).

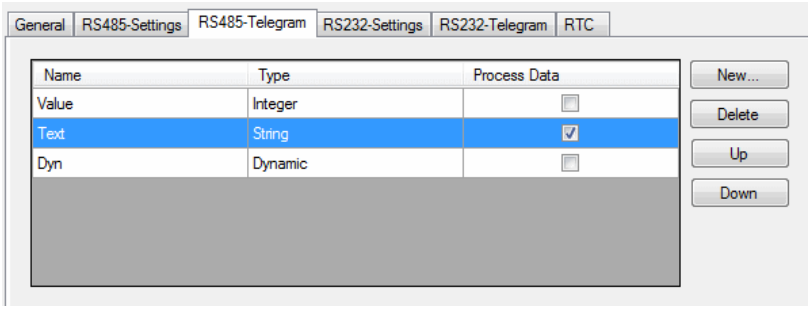


Figure 39: Telegrams

3.6.7.1 Real Time Clock

You can also use the Real Time Clock. This feature must be activated (picture 40).

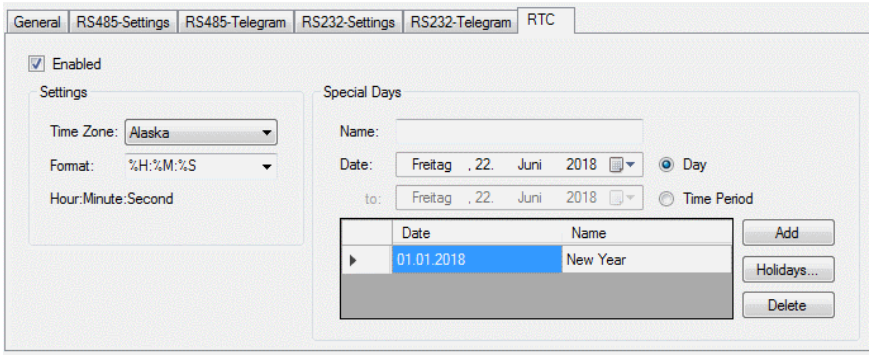


Figure 40: RTC tab

Under *settings* you can select your preferred time zone as well as the display format from already pre-selected format strings or you can also enter formats which you require.

Important: Please use the placeholders available in the formatting string under *settings* :

Placeholder	Description
%a	Short name of the weekday. Depending on the location
%A	Full name of the weekday. Depending on the location.
%b	Short name of the month. Depending on the location.
%B	Full name of the month. Depending on the location.
%c	The structure of date and time depends on the location.
%C	Indication of the century. Integer values from 00 to 99.
%d	Day of the month written with two digits from 01 to 31.
%D	as **%m/%d/%y**
%e	Day of the month written as decimal value. Single-digit values have a space character put in front. Values from ' 1' to '31'.
%g	as **%G**, but without century.
%G	The four-digit year complies with the ISO specification. (see **%V**). The same format and the same value as **%Y**. Specification: if the ISO week is the previous or the following year the current year will be used.
%h	as **%b**
%H	24-hour format from 00 to 23.
%I	12-hour format from 00 to 12.
%j	Day of the year as value from 001 to 366.
%K	If the current date is a special day the name of the special day will be displayed.
%m	The month as value from 01 to 12.
%M	Minute as decimal value.
%n	New line.
%p	Either 'am' or 'pm' depending on the location.
%r	Time in a.m. or p.m. format.
%R	Time in 24-hour format.
%S	Seconds as decimal value.
%t	Tabulator
%T	Current time as **%H:%M:%S**
%u	Day of the week as decimal value from 1 to 7. Monday starts with one.
%U	Number of the week of the current year as decimal value. Starting with the first sunday as first day of the first week.
%V	Calendar week according to ISO 8601:1988 of the current year. Written with the decimal value from 01 bis 53. The first week has at least four days in the current year. The week starts with monday. Use **%G** or **%g** for the year.
%w	Weekday as decimal value. Sunday is 0.
%W	Number of the week of the current year starting with the first monday as the first day of the first week.
%x	The diplayed date depends on the location.
%X	The displayed time depends on the location.
%y	The year as two-digit value from 00 to 99.
%Y	The year as four-digit value incl. century.
%Z	Name or short name of the time zone.
%%	% character.

With *special days* (picture 41) you can determine specific days which are not standard (e.g. company holidays, month-end, public holidays etc.) You can either indicate individual days or a specific period (from date_x to date_y) and enter an individual name. Please click on *add* in order to see this day or period in your list. With a click on *delete* you can remove the previously selected entry.

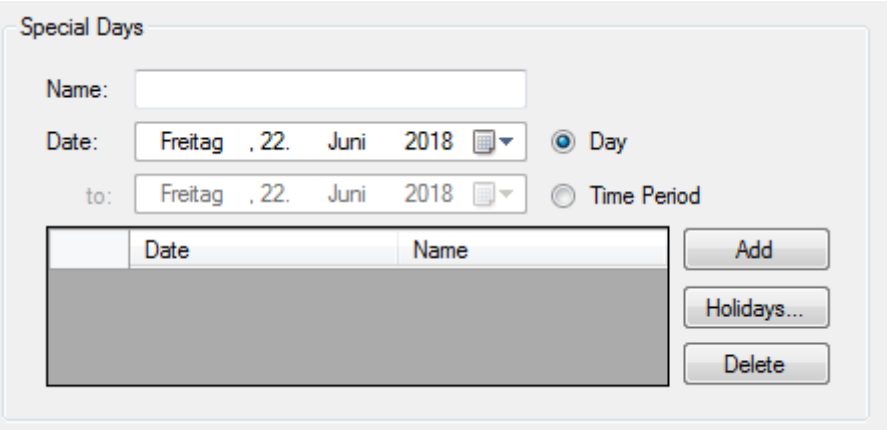


Figure 41: Special days

Public holidays can be displayed from year X - year Y (picture 42). To do so, please select the requested public holidays and add them with *OK* to the special day list. You have also the possibility to select a number of days. Click on one day and select the requested days by dragging with the mouse or press the Strg-key and select the requested days by a click on the required days.

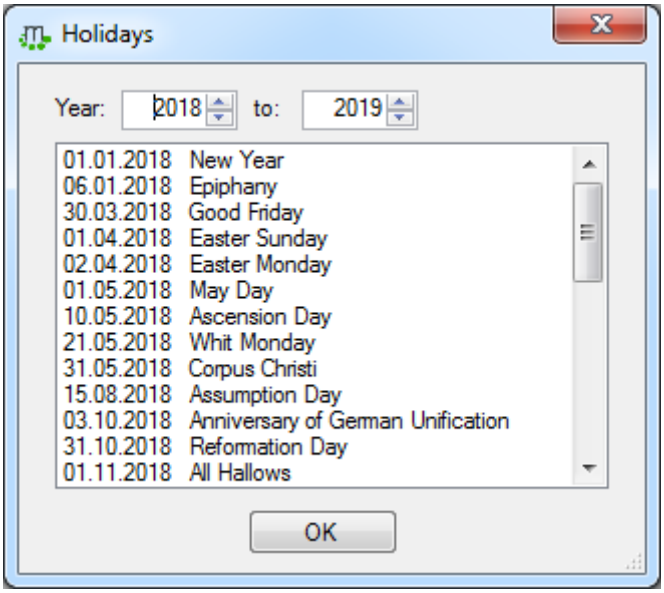


Figure 42: Selecting public holidays

3.6.8 Sound board

Under the tab *MP3's* you can add your required songs with the button *Add* (picture 43).

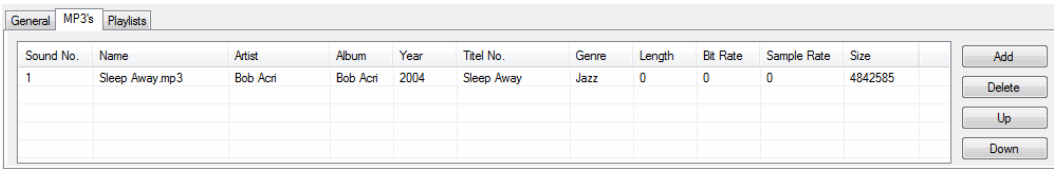


Figure 43: tab MP3's

Important: Please note that the memory of the sound board ist limited to 15,9 MB. It is useful to use only small MP3 files as the transfer will probably takes some time.

You can also *delete* the selected music tracks at any time or *move* them *up* or *down* by one position.

Under the tab *playlists* (picture 44) you can *add* a playlist or *delete* it.

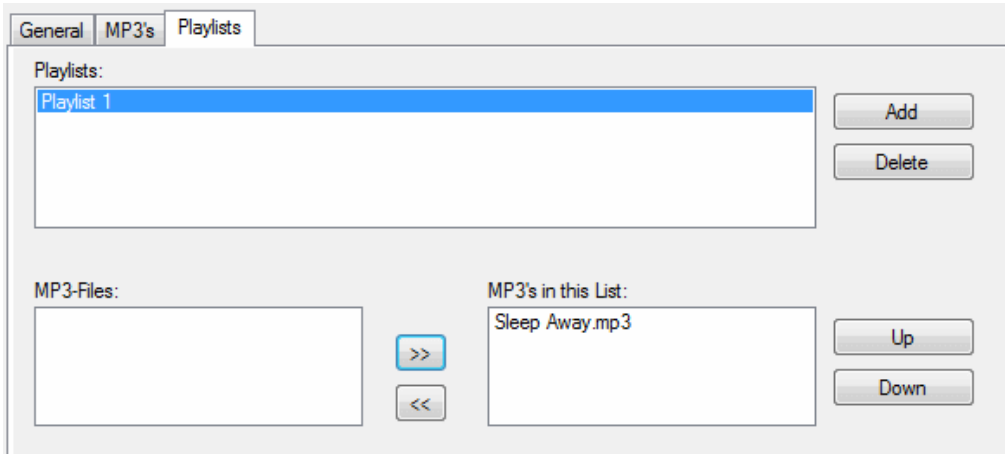


Figure 44: tab playlists

Important: Please note that the name of the playlist cannot be changed.

You can find all your uploaded music tracks under *MP3 files*. Every title may only exist once. You can add the tracks with >> to the previously selected playlist or you can remove them with <<. On the playlist you can *move up* or *down* the requested tracks.

3.6.9 Profibus

Under *Options* (picture 45) you can adjust the Profibus DP slave address in the range from 1 to 126. Please select *empty data* if you want all values to be set to 0 and the strings to be set to empty after a break in the Profibus DP communication.

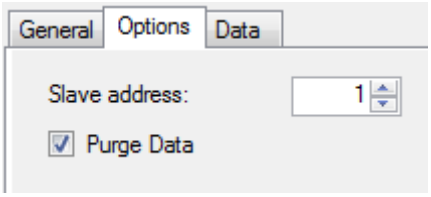


Figure 45: tab Option

Under the tab *Data* (picture 46) you can configure the received data and the data to be processed with the Profibus component. Under *Length* you can see the number of bytes of the added data part. The number of *output bytes* shows you how many bytes you have already assigned.

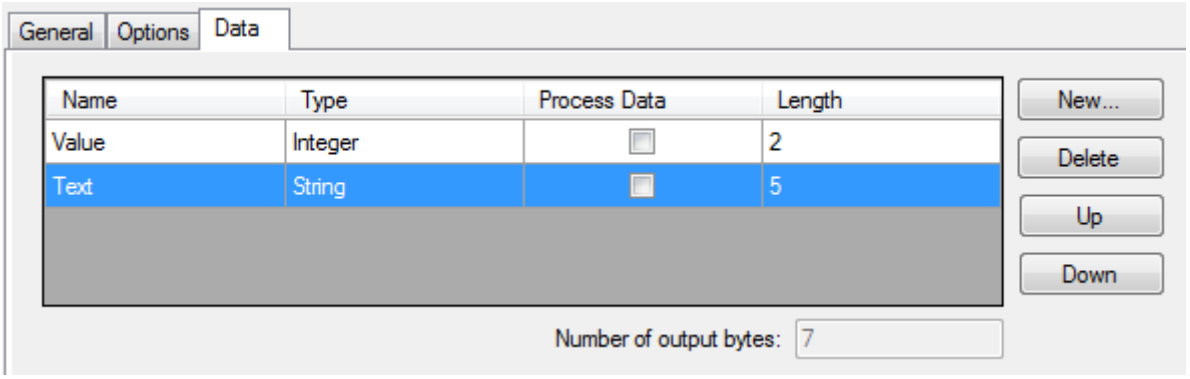


Figure 46: tab data

3.6.9.1 Inserting a data part

To insert a new data part, click on *New...* under the tab *data* (picture 46). A new dialogue appears (picture 47) where you can create a data part. You can select the name and the required data type.

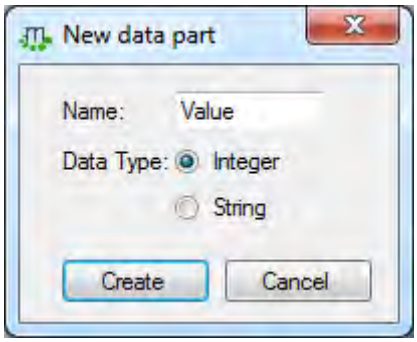


Figure 47: Inserting a data part

Note:

- Integer: an integer value between 1 - 4 byte, can be unsigned or signed.
- String: a string of characters which consists of a byte sequence which will be used in a different coding (e.g. UTF8, CP1252, etc. ...) It has a defined length.

Confirm the selected data type with the button *Create*.

The different options regarding the individual data types can be changed and adjusted in the detail view of each data type. By one click on the data type in the list the detail view appears on the right side (please see the following chapters *settings integer, settings string*).

3.6.9.2 Integer settings

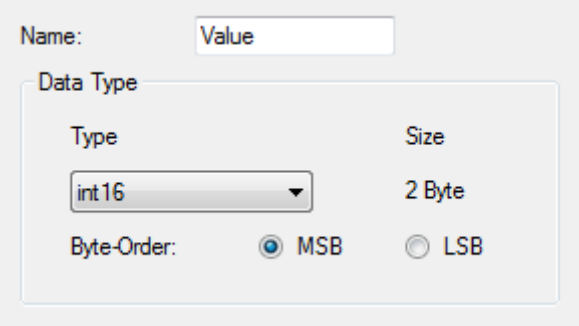


Figure 48: Integer settings

- Name:

  Name for the telegram part.

- Data type:

  Type You can choose different types. The data type defines the number of bytes. Unsigned data types are marked with uintX and signed data types with intX whereby the X describes the number of bits.

  Byte order As soon as the selection is higher than 8 bit the option for the byte order will be activated. This is important in order to correctly interpret the decimal value.

  MSB – Higher-value byte first LSB – Lower byte first

3.6.9.3 String settings

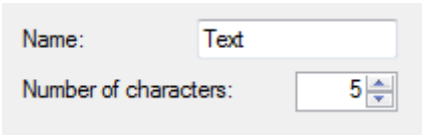


Figure 49: String settings

- Name:

  Name for the telegram part.

- Number of characters:

  Number of characters in the string.

3.6.9.4 Deleting a data part

If you want to delete an already existing data part in the data sheet, select the required data part and click on *delete*.

3.6.9.5 Moving a data part

If you want to move an already existing data part in the data sheet up or down, select the required data part and click on *Up* or *Down*.

By activating *Process data* (picture 50) you select the data wich shall be used. If you do not want to use several fields in the Profibus data, you can ignore them by creating the data part but by **not** activating *Process data*.

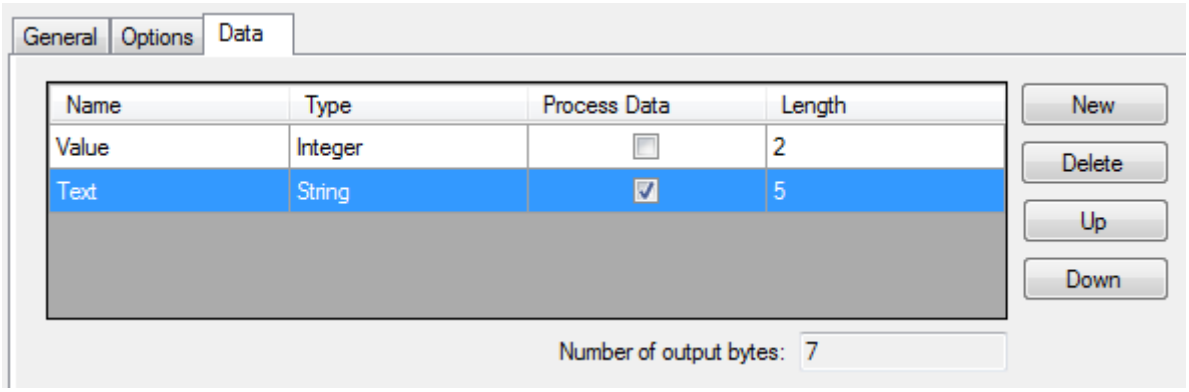


Figure 50: Data

3.6.10 Profinet

With regard to the Profinet component, the configuration of the received data and the data to be processed can be found in the previous chapter *Profibus|Inserting a data part*.

3.6.10.1 PROFIenergy

Under the tab PROFIenergy (picture 51) you can define several pause modes. Both the minimum pause time and the corresponding maximum electrical power consumption of the device have to be specified. (“OW” means that the power consumption is unkown)

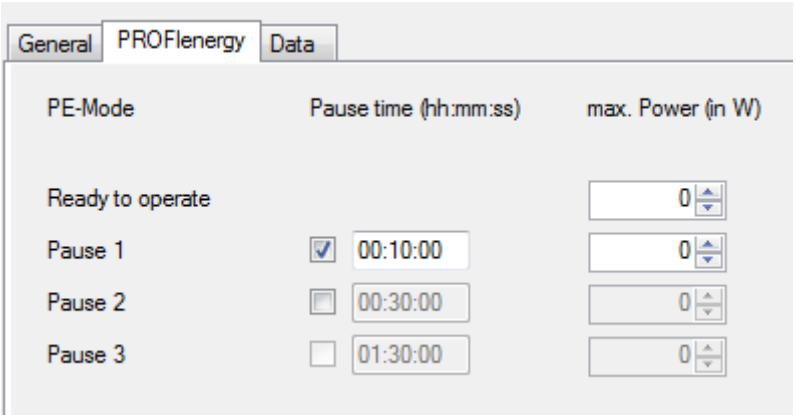


Figure 51: tab PROFIenergy

In the line *Ready to operate* the maximum power consumption for the normal operating mode *Ready-To-Operate* will be entered.

Important: These settings are device-specific and will normally be made by microSYST. The Profinet component provides the current PE mode. The reaction of the display to the different PE modes is made with scripting (e.g. darkening or switching-off the display).

3.6.10.2 Project engineering of the microSYST MPB Profinet interface in Siemens TIA portal (V14)

1. Create or open a TIA project which contains a PLC / controller with Profinet interface (PN-Controller).

   Note: Please check if the current GSD file for the device (GSDML-V2.xx-MICROSYST-MIFACEPNMPB-xxxxxxxx.XML) has been installed. You can find the file on www.microsyst.de and install it under the menu item *Options / Manage general station description files (GSD)* in the TIA portal.

2. Please double-click in the project tree on *Devices & networks* to open the Network view (picture 52)and select the entry *Other field devices/PROFINET IO/I/O/microSYST/Miface/PNIO-MPB/MifacePnMpb-DAP3* in the hardware catalog.

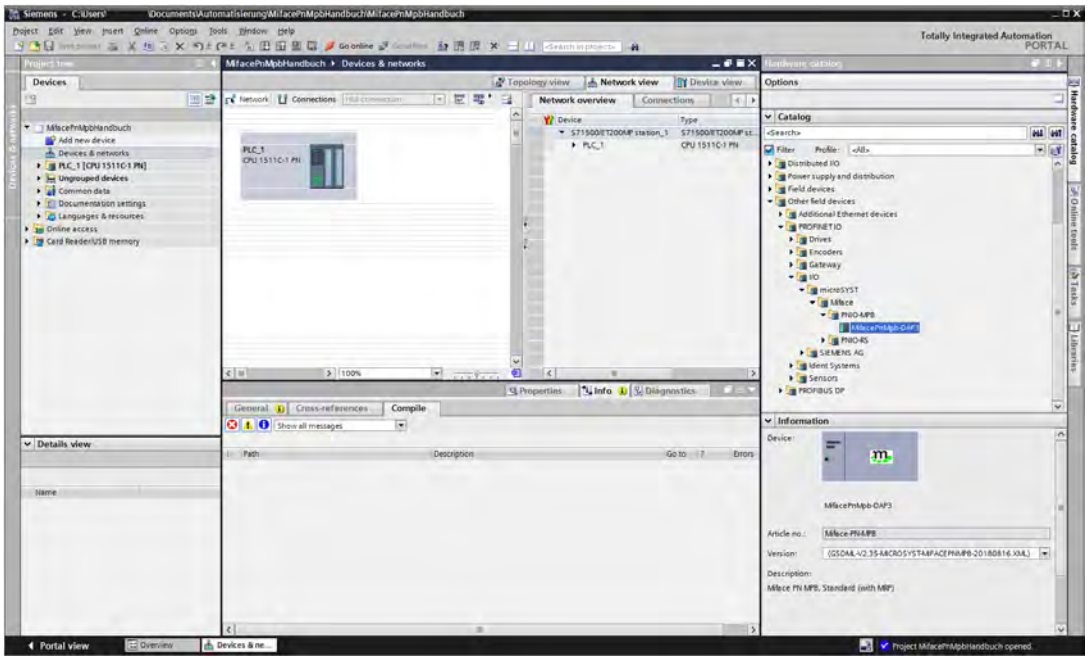


Figure 52: Network view and hardware catalog

3. Drag *MifacePnMpb-DAP3* into the network view (picture 53).

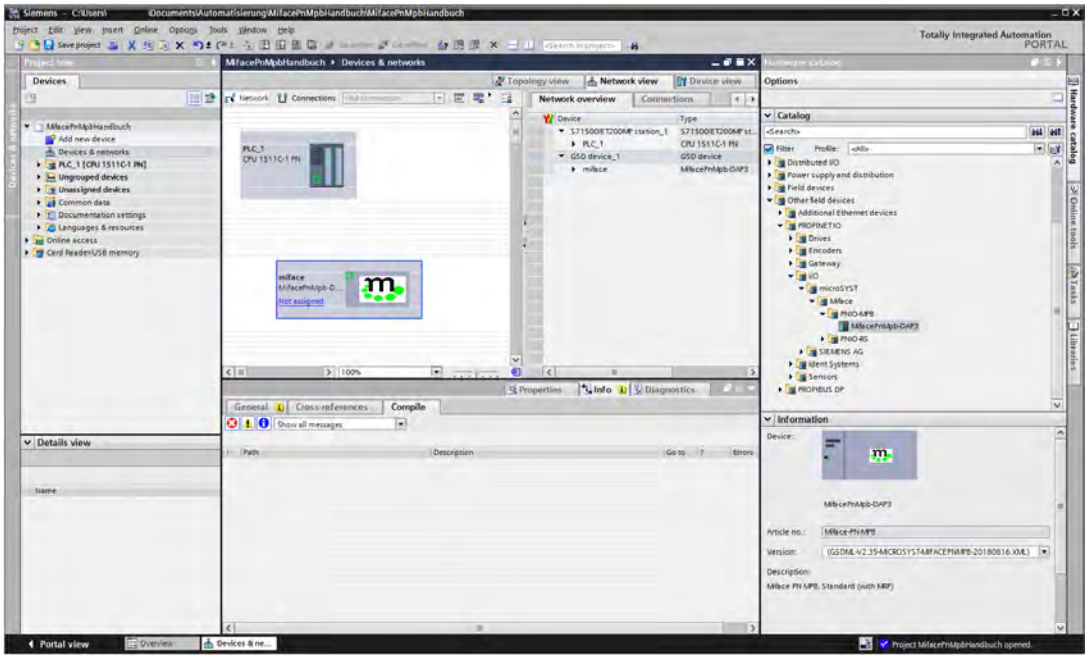


Figure 53: Inserting MifacePnMpb-DAP3

4. Connect *MifacePnMpb-DAP3* via *PROFINET IO-System* with the PLC (picture 54). First, please click on the green square of the *MifacePnMpb-DAP3*, drag with a pressed mouse

button a connection line to the green square of the PLC and release the mouse button there.

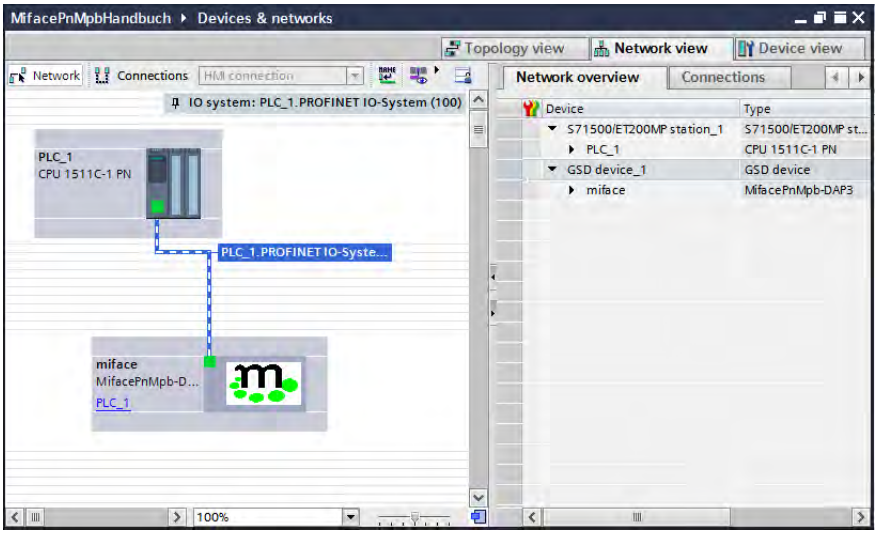


Figure 54: Connecting CPU with MifacePnMpb-DAP3

You can choose a different device name (picture 55) by clicking on the standard name *miface* and enter the new name (e.g. *miface1*).

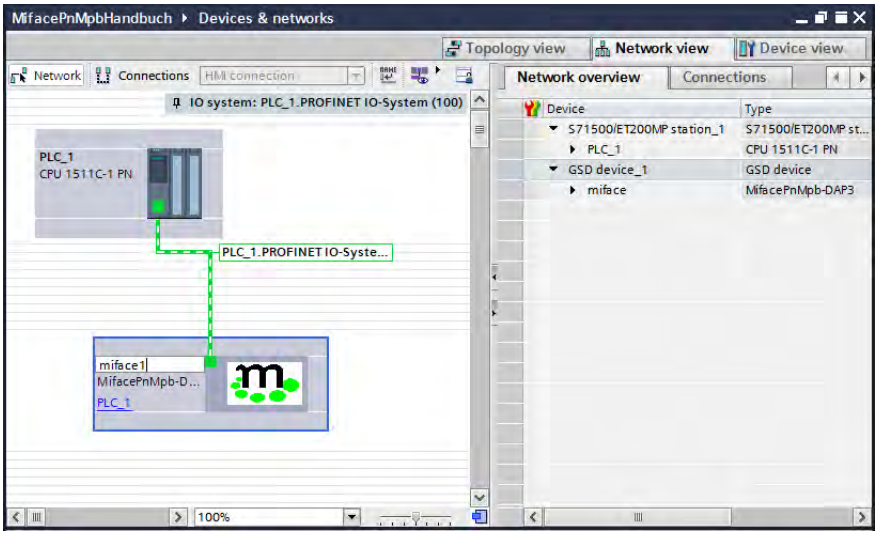


Figure 55: Assigning device name

5. Please set the desired update time (picture 56). Click on the microSYST symbol of the *MifacePnMpb-DAP3* and select under the tab *Properties* the item *General/PROFINET interface [X1]/Advanced options/Real time settings/IO cycle*.

The update time should be at least 8 ms, typically it is 32 ms. Depending on the application also higher values may be set (=> leading to a lower network load).

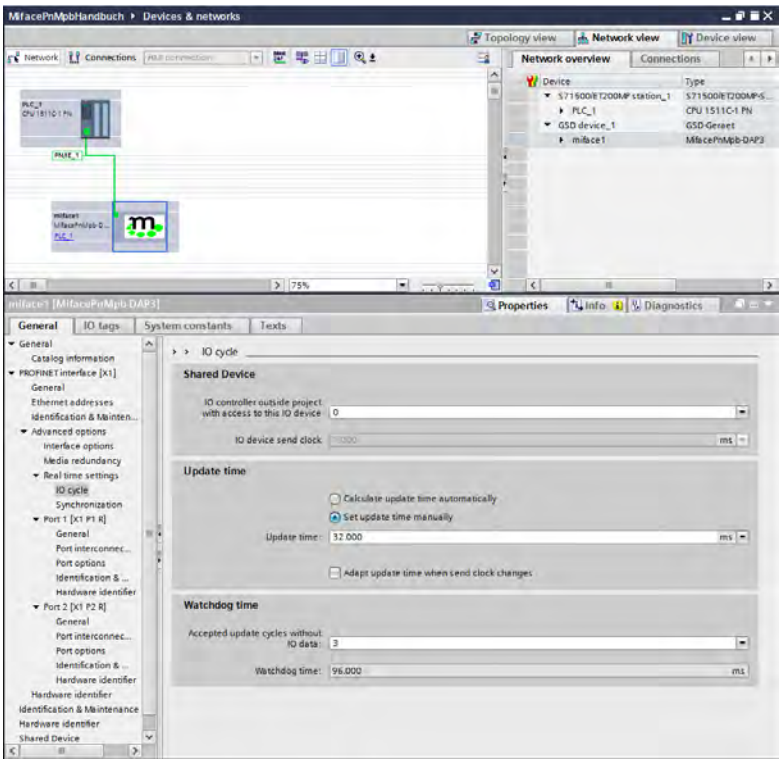


Figure 56: Setting update time

6. Please click on the microSYST symbol of the *MifacePnMpb-DAP3* and check the Ethernet settings (picture 57). Under the tab *properties* please select *General/PROFINET interface [X1]/Ethernet addresses*. Please ensure that the settings correspond to the picture.

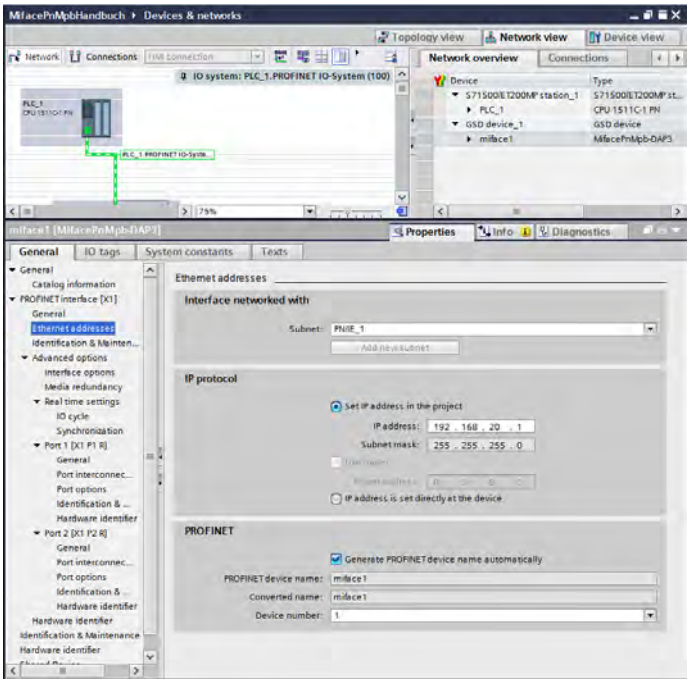


Figure 57: Checking Ethernet settings

Selecting and configuring IO module(s)

Click on the tab *Device view* (picture 58) and extend the folder *Module* of the hardware catalog.

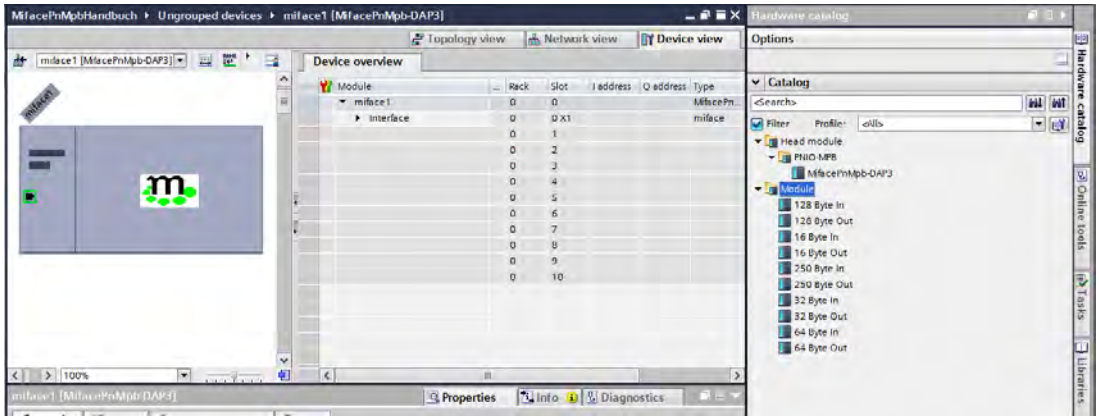


Figure 58: Device view

The type and number of the required *IO modules* depends on the data amount to be transferred cyclically. By any combination of different IO modules, at the moment data widths of up to 250 bytes in each direction are possible. The data of all IO modules are stringed together.

Note: The Profinet interface always includes only the first 250 bytes of all consecutive modules!

The data order depends on the slot index starting from the lowest up to the highest index. Within an IO module the data is transferred consistently.

Example: A maximum of 64 output bytes and a maximum of 64 input bytes have to be transferred cyclically between the PN controller (PLC) and the PN device (Miface PN MPB / display):

1. Select the module *64 Byte Out* (picture 59).

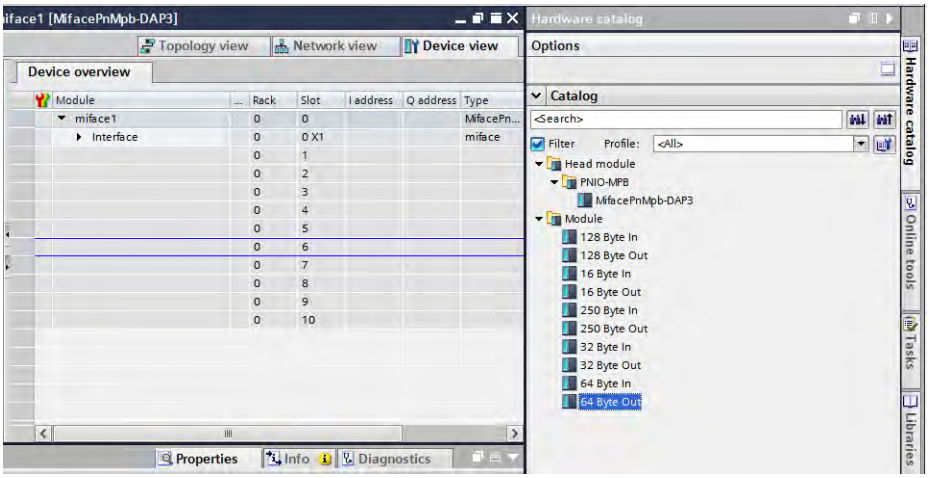


Figure 59: Selecting IO Module

2. Drag it into the marked line of the *Device view* (picture 60) and set the *Q-address* as required (first output-byte-address from which the data can be set by the PLC).

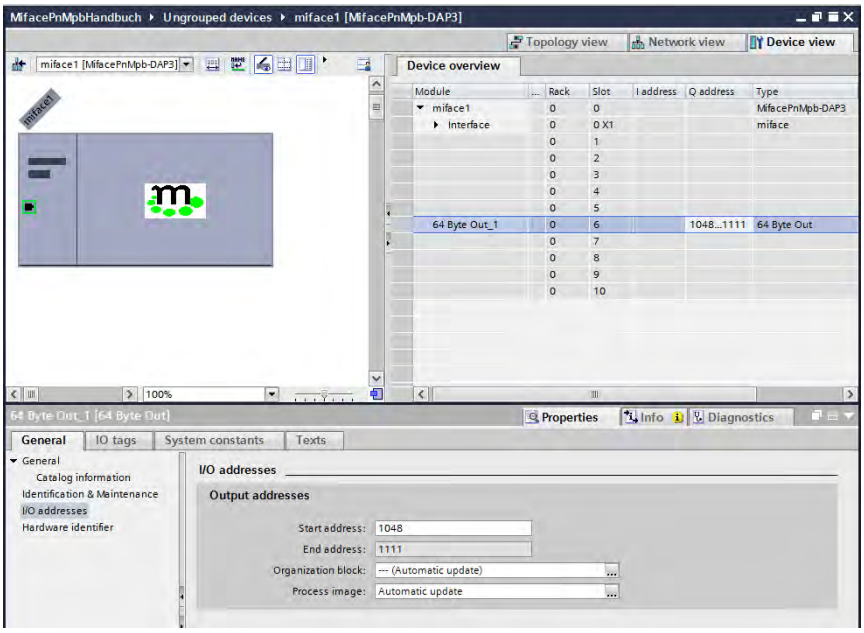


Figure 60: Setting "64 Byte Out" Q-address

3. Repeat this for the module *64 Byte In* (picture 61) and set the *I-address* as required (first input-byte-address from which the data can be read by the PLC).

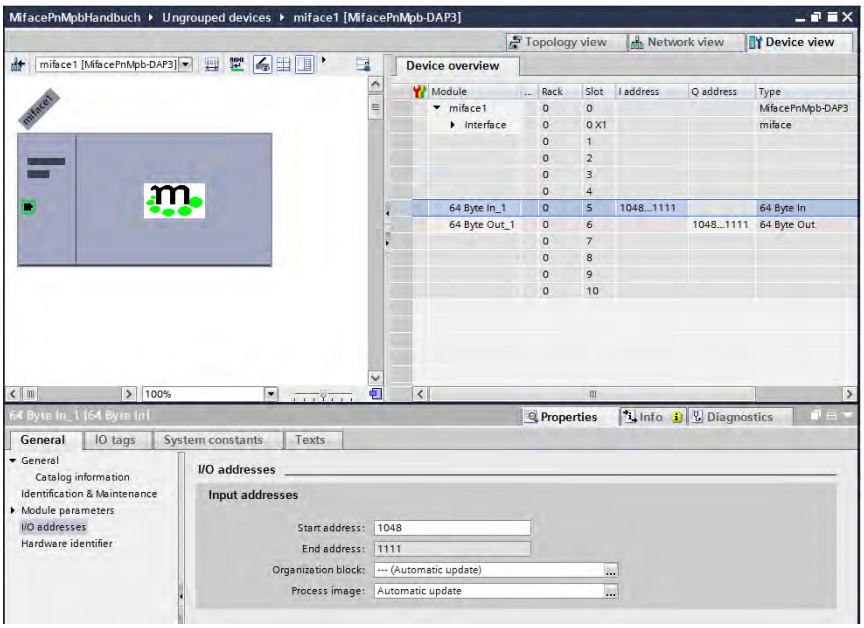


Figure 61: Setting "64 Byte In" I-address

Example: A maximum of 240 output bytes and a maximum of 240 input bytes have to be transferred cyclically between the PN controller (PLC) and the PN device (Miface PN MPB / display):

1. Select sequentially all output modules except the module *250 Byte Out* and drag them into the marked line of the device view (picture 62).
2. Set the Q-address as required (PLC-output-byte-address from which the data can be set).
3. Select sequentially all input modules except the module *250 Byte In* and drag them into the marked line of the device view.
4. Set the *I-address* as required (PLC-input-byte-address from which the data can be read).

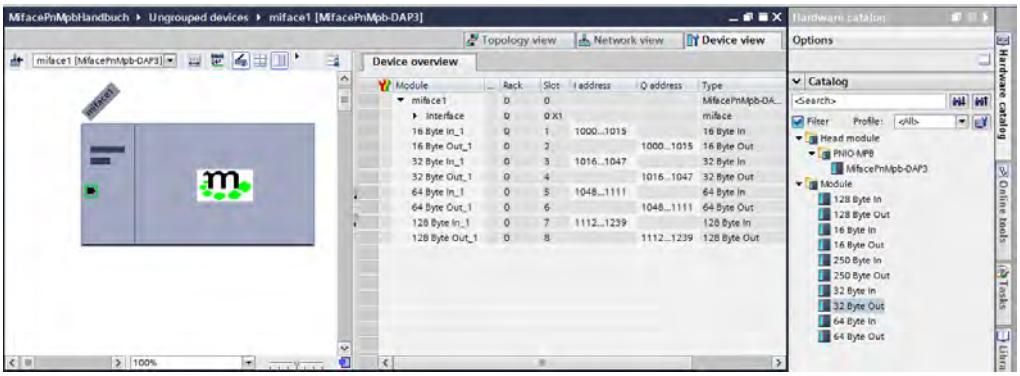


Figure 62: Device view - all modules used (except 250 Byte In/Out)

3.6.10.3 Assign a Profinet device name (using TIA V14)

To be able to find the configured PN device in the PN network by the PN controller it is necessary that the real PN device identifies itself with the appropriate device name (same as in the TIA project).

The real PN device has to be “named” once:

1. Connect the device to be named with the profinet network and set up the power supply.
2. By a click with the right mouse button on the microSYST symbol (picture 63) you can open the context menu and select *Assign device name*.

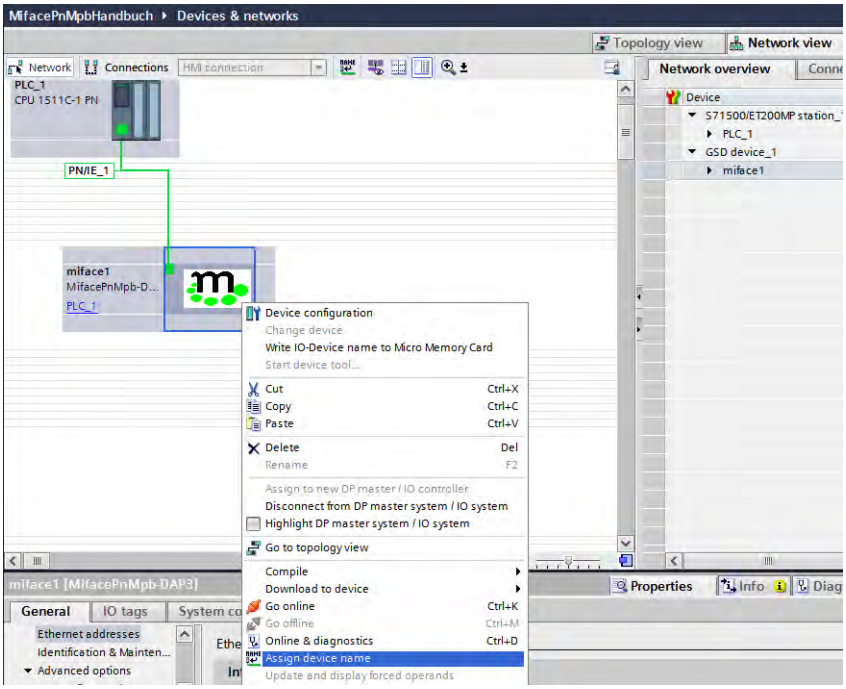


Figure 63: Assigning device name

3. A new dialog window appears (picture 64). Please check the settings under *Online access* and *device filter*.

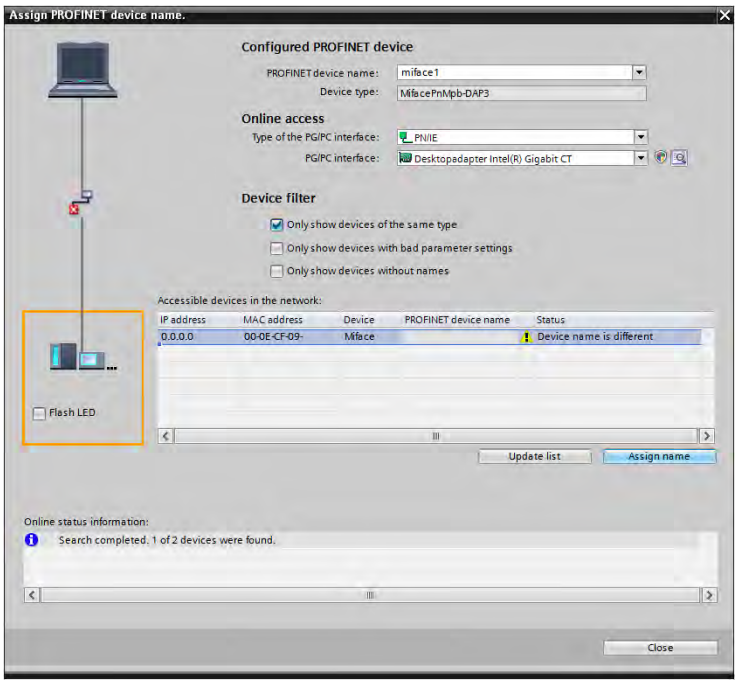


Figure 64: Assigning dialog for device name

4. Please click on *Update list* and select the device to be assigned which appears after a few seconds in the list and which can be clearly identified with the MAC address.
5. Pleasec click on *Assign name* and close the dialog window.

3.6.10.4 Technical Data

Name	Profinet IO Device (2 x RJ45 with integrated switch, 100 Mbit/s)
Standards	IEC 61158 / 61784
	PNIO-Version V2.35
	Conformance Class C (PNIO Device RT + IRT)
	Application Class "HighPerformance"
	Netload (Sec Level 1) Class III
	RT-Class 1+3
	PROFIenergy-Profile V1.1 (class 3 = energy saving + measurement device)
	FSU, Legacy
	MRP, MRPD (media redundancy)
Attributes	RT : Sendclock = 0.250...4 ms, clock divider = 1...512
	IRT : Sendclock = 0.125...4 ms, clock divider = 1...16
	Output data width = 0...250 bytes
	Input data width = 0...250 bytes
	Vendor-/Device-ID = 0x01CF/0x0002
	Hardware base: Siemens ERTEC200P-2
	Software base: Siemens-PN-Stack (EK45)
	Profinet certificate "Device": Z12313 (PNO-Test-Report PN522-1, Siemens-COMDEC)
	Profinet certificate "PROFIenergy": Z40253 (PNO-Test-Report PE059-1, Siemens-COMDEC)
	GSDML-V2.35-microSYST-MifacePnMpb-20180816.xml

3.7 Configuration of the visualisation

3.7.1 Visualisation objects

3.7.1.1 General information

You can display any information with different visualisation objects (e.g.texts, numbers, scrolling texts or simple basic forms such as rectangles, triangles, lines and circles etc.

In the *editor* all added objects can be easily moved / positioned by using the drag-and-drop function, changed in size with active points and changed in order using the context menu (right-click on the object).

In the *editor* you can group objects with the help of containers (folders and subfolders). With a right-click on *editor objects* in the project tree a context menu will be opened. In the menu under *new container* a new container will be created which can be moved / positioned by using the drag-and-drop function.

Every object has the tab *General* (Picture 65) and the tab *formatting* (picture 66) under *settings and properties*.

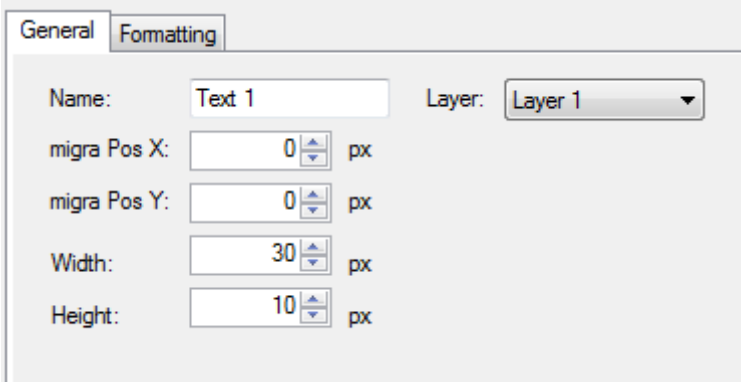


Figure 65: General information

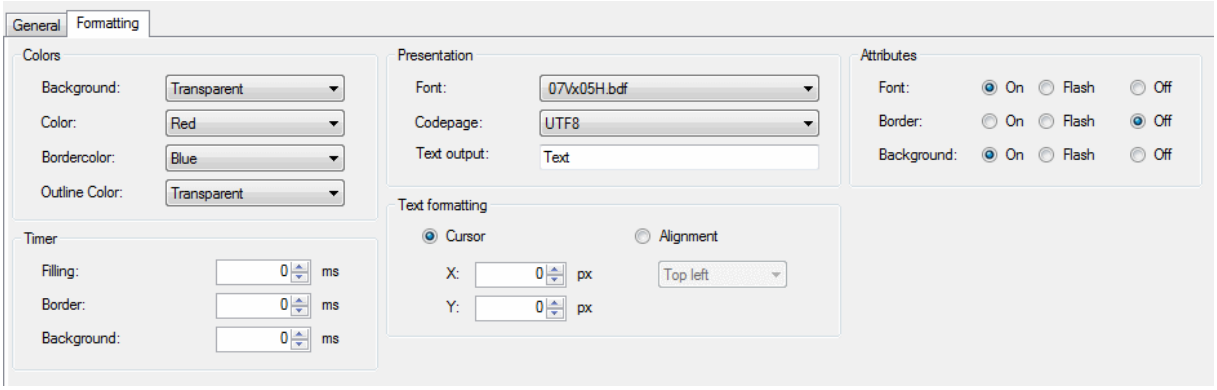


Figure 66: Formatting

Here you can find all relevant features for the object. Every modification which will be made here, can be seen live in the *editor*.

3.7.2 Layer

You can choose between 32 layers, which are assigned to the visualisation objects under *Settings and properties* under the tab *General*. If there are different visualistion objects on the same layer it is possible to put the different objects *to the foreground* or *to the background* by a right-click on the object. If objects are on different layers, the layer number determines the drawing order. For example, layer2-objects will be drawn after layer1-objects and will probably cover them.

Different layers can be shown or hidden with the tab *layer*.

3.7.3 Creating imgages

Please click on *images* (picture 67) under *migra control board* in the project structure in order to go to the image editor for the creation of simple drawings. With the button *Add...* you can upload externally created / existing images and change them according to your requirements. By clicking on *New* a new image with the name *New image* will be created. You can change the name of the image by clicking on the name *new image*.

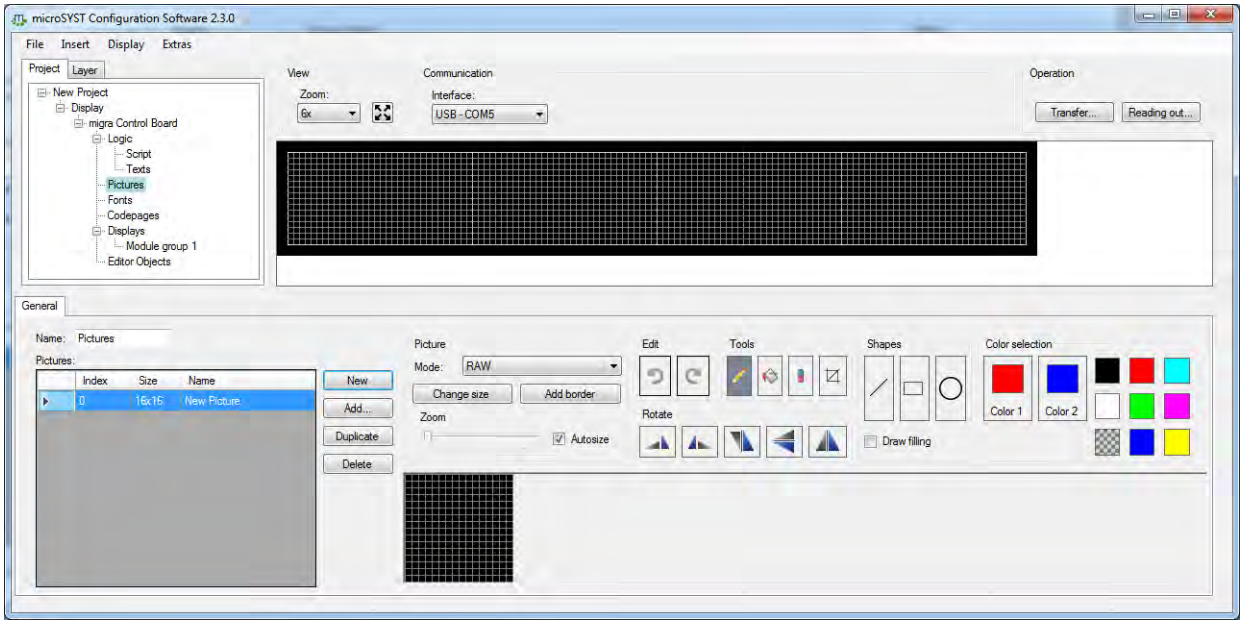


Figure 67: editor

Regarding images, you can choose between different modes, which influence the memory sizes in the control board. The default is *RAW* for a black background and *RAW_TRANSPARENT* for a transparent background. For editing, different tools, forms and colours are available. Furthermore, you can use *rotate* in order to bring the image in the desired direction.

Tool tips:

- You can select the *colour 1* by a left-click and *colour 2* by a right-click under the tab *colour selection*.
- With a left-click the colour under *colour 1* and with a right-click the colour under *colour 2* will be used when selecting the tools *pencil* and *fill with colour*.
- The *eraser* uses black in the *RAW* mode and transparent in the *RAW_TRANSPARENT* mode.
- If forms shall be filled, please activate the check box *drawing a filling* and add afterwards an rectangle or a circle.

3.7.4 Table of variables

In the project structure under *migra control board* by clicking on *logic|script* you will find the table of variables. Every component and every visualisation objects have values, which can be seen here. (picture 68).

Component	Value	Variable	Typ
Text 1	output_string	0	STRING
Text 1	temp_string	1	STRING
Script	sys_timer0	0	INT
Script	sys_timer1	1	INT
Script	sys_timer2	2	INT
Script	sys_timer3	3	INT
Script	sys_timer4	4	INT
Script	sys_timer5	5	INT
Script	sys_timer6	6	INT
Script	sys_brightness_...	7	INT
ext 1	foreg...	8	INT
Text 1	background_color	40	INT
Text 1	border_color	41	INT
Text 1	font	42	INT
Text 1	text_attribute	43	INT
Text 1	timer_value	44	INT
Text 1	timer_value2	45	INT

Figure 68: Table of variables

Please see the following chapter *Telegrams* for information on reading and changing values.

From the table of variables you can receive following information:

Component: Source of the variable

Value: Description of the variable

Variable: Number in the table of variable Integer and string, each have their own numbering

Type: Data type of the variable

Note

- Integer: a whole-numbered value between 1 - 4 bytes which can be unsigned or signed.
- String: a string of characters which consists of a byte sequence which will be used in a different coding (e.g. UTF8, CP1252, etc. ...) It has a maximum length of 200 bytes incl. a string end.

4 Telegrams

4.1 General information regarding telegrams

Telegrams are used for the activation of the displays. The structure of these telegram is based on ASCII characters. The content to be displayed is a byte sequence, which can have another coding regarding the data type String (e.g. UTF8, CP1252, usw. ...). A distinction is made between a reading and writing access as well as between the type of data, integer or string.

The following syntax diagram (picture 69) describes the general telegram structure. You will find specific examples below.

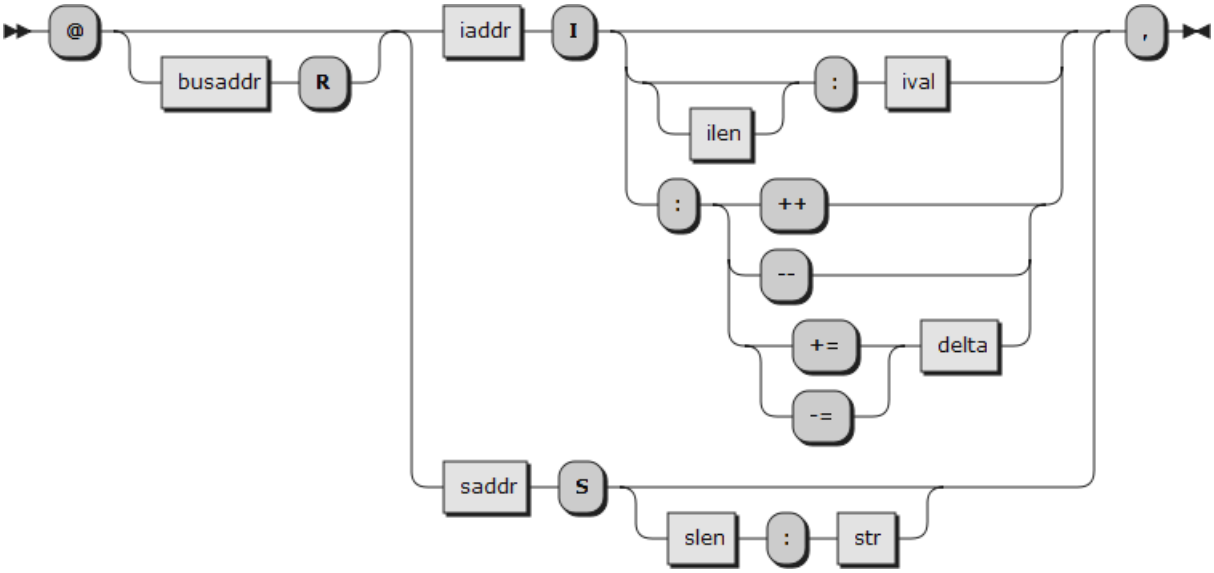


Figure 69: General structure of telegrams

Please find the explanation described below:

Field	Description
busaddr	RS485 bus address. Only necessary if the display is connectetd to a RS485 bus.
iaddr	The memory cell is located in the integer area of the display.
ilen	Number of the digits *ival*. The inidication is optionally.
ival	The integer value to be written to the *iaddr*.
delta	The current value in the memory cell will be increased or decreased by this value.
saddr	The memory cell is located in the string area of the display.
slen	Number of the digits *str*.
str	The string to be written to the *saddr*.

4.2 Integer telegrams

4.2.1 Reading integer values

In order to read-out an integer value, please use following telegram (picture 70):

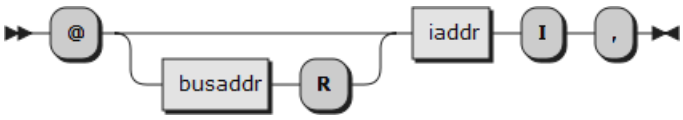


Figure 70: Reading integer values

The structure of the response telegram follows the general telegram structure (see chapter *General information regarding telegrams*) but always without any length information and without any bus address (picture 71):

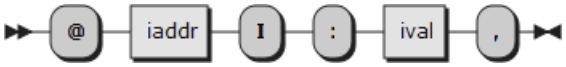


Figure 71: Response telegram

Example: If we assume that the value 516 is in the integer variable 8. The following table shows telegram examples for reading the variable 8:

Telegram	Description	Response
@8I,	This example reads the integer value 8	**@8I:516,**
@6R8I,	Example as before but the RS485-address 6 will be used	

4.2.2 Writing integer values

In order to write an integer value into the display, please use following telegram (picture 72):

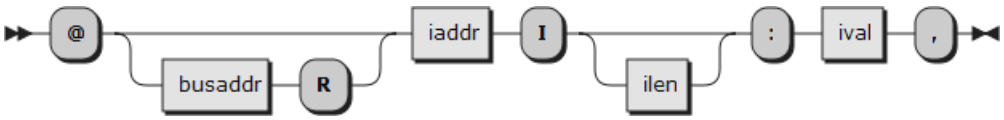


Figure 72: Writing integer values

Examples

Telegram	Description
Write **with** length specification.	
@12I4:1234,	On the integer value 12 these telegrams write the value **1234** or **-1234**.
@12I5:-1234,	
@6R12I4:1234,	Example as befor but the RS485-address 6 will be used.
@6R12I5:-1234,	
Write **without** length specification.	
@12I:1234,	Example as before.
@12I:-1234,	
@6R12I:1234,	
@6R12I:-1234,	

4.2.3 Incrementing / decrementing integer values

In order to increase (increment) or decrease (decrement) an integer value by one, please use following telegram (picture 73):

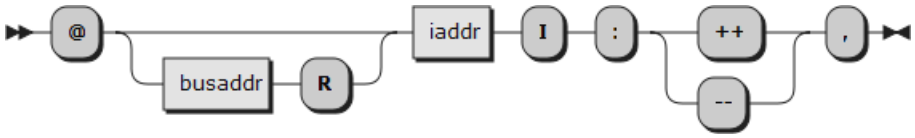


Figure 73: Incrementing / decrementing integer values

The integer value can also be modified by higher values (picture 74):

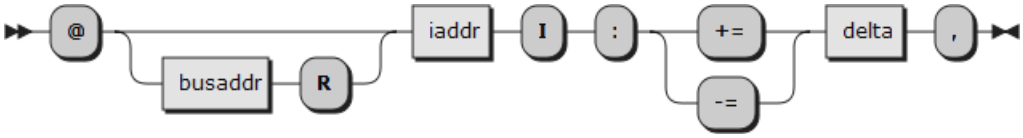


Figure 74: Incrementing / decrementing integer values 2

Examples

Telegram	Description
@42I:++,	This telegram increases (++) oder decreases (--) the integer value 42 by one
@42I:--,	
@6R42I:++,	Example as befor but the RS485-address 6 will be used.
@6R42I:--,	
Telegram with *delta*	
@42I:+=8,	This telegram increases (+=) oder decreases (-=) the integer value 42 by eight
@42I:-=8,	
@6R42I:+=8,	Example as befor but the RS485-address 6 will be used.
@6R42I:-=8,	
@42I:+=+8,	The value may have a negative or positive sign. The calculation of the memory content will be made mathematically correct.
@42I:-=+8,	
@42I:+=-8,	
@42I:-=-8,	
@6R42I:+=+8,	Example as befor but the RS485-address 6 will be used.
@6R42I:-=+8,	
@6R42I:+=-8,	
@6R42I:-=-8,	

4.3 String telegrams

4.3.1 Reading strings

In order to be able to read-out a string, please use following telegram (picture 75):

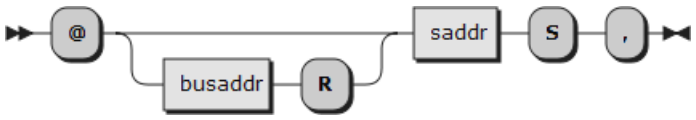


Figure 75: Reading strings

The structure of the response telegram follows the general telegram structure (see chapter *General information regarding telegrams*). The length of the string will always be returned in the response (picture 76):

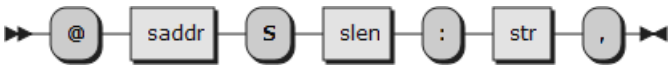


Figure 76: Response telegram strings

Example: If we assume that the string “Hello world” is in the string variable 4. The following table shows telegram examples for reading-out the variable 4:

Telegram	Description	Response
@4S,	This example reads the string on address 4	**@4S11:Hello world,**
@11R4S,	Example as before but the RS485-address 11 will be used	

4.3.2 Writing strings

In order to write a string, please use following telegram (picture 77):

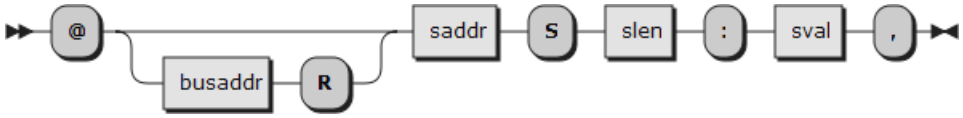


Figure 77: Writing strings

Examples

Telegram	Description
@4S11:Hello world,	This telegram writes on the string address 4 "Hello world"
@6R4S11:Hello world,	Example as before but the RS485-address 6 will be used

4.4 Display mode

In general, the display will be operated in standard mode. In order to check the display it has a display test. In that mode every basic colour and one pixel pattern will be displayed.

Telegrams for changing the modes are described below.

4.4.1 Standard

Please use following telegram in order to operate the display in standard mode (picture 78):

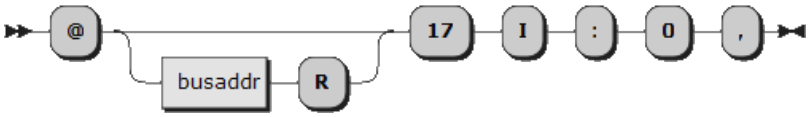


Figure 78: Standard mode

Example

Telegram	Description
@17I:0,	This telegram starts the standard operation of the display.
@1R17I:0,	Example as before but the RS485-address 1 will be used

4.4.2 Display test

Please use following telegram in order to activate the display test (picture 79):

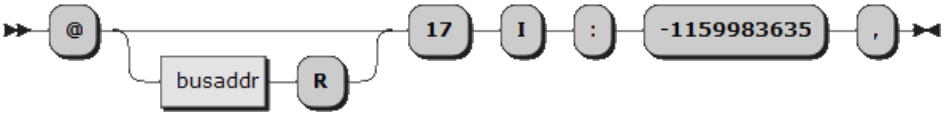


Figure 79: Display test

Example

Telegram	Description
@17I:-1159983635,	This telegram starts the display test
@1R17I:-1159983635,	Example as before but the RS485-address 1 will be used

5 Technical data

5.1 Display type

The display type can be found on the nameplate of the device.

DisplayID	Pixelgröße / Pixelabstand	Abstrahlwinkel	Auflösung / Modul	Displaygröße / Modul	max. Leistung / Modul
Innenanwendung					
I4RG	3mm / 4mm	150 / 150	64x16 Pixel	260mm x 65mm	14 Watt
I8RG	2,4mm / 7,62mm	150 / 150	64x16 Pixel	488mm x 122mm	23 Watt
I8RGB	2,4mm / 7,62mm	120 / 120	32x16 Pixel	244mm x 122mm	9,5 Watt
Außenanwendung					
O8RG	2,6mm / 7,62mm	60 / 60	32x16 Pixel	244mm x 122mm	25 Watt
O12RG	3,9mm / 3mm	110 / 60	16x16 Pixel	187mm x 187mm	35 Watt
O16RG	3,9mm / 3mm	110 / 60	16x16 Pixel	264mm x 264mm	35 Watt

5.2 Mounting types

5.2.1 Mounting frame

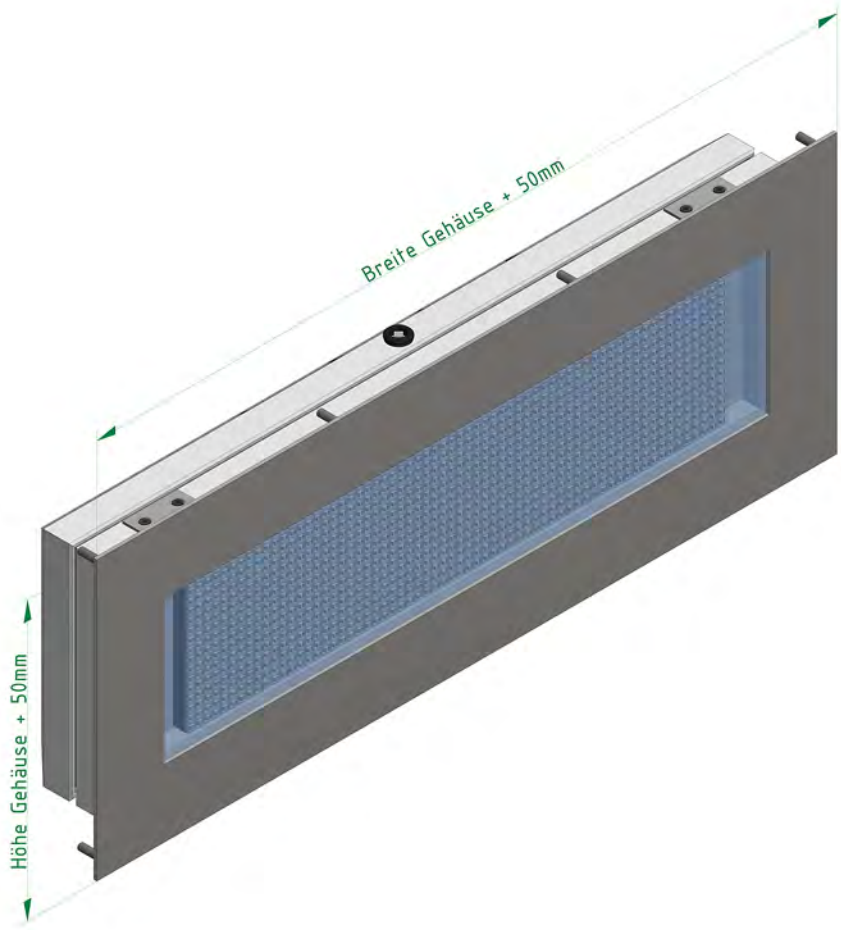


Figure 80:

5.2.2 Mast

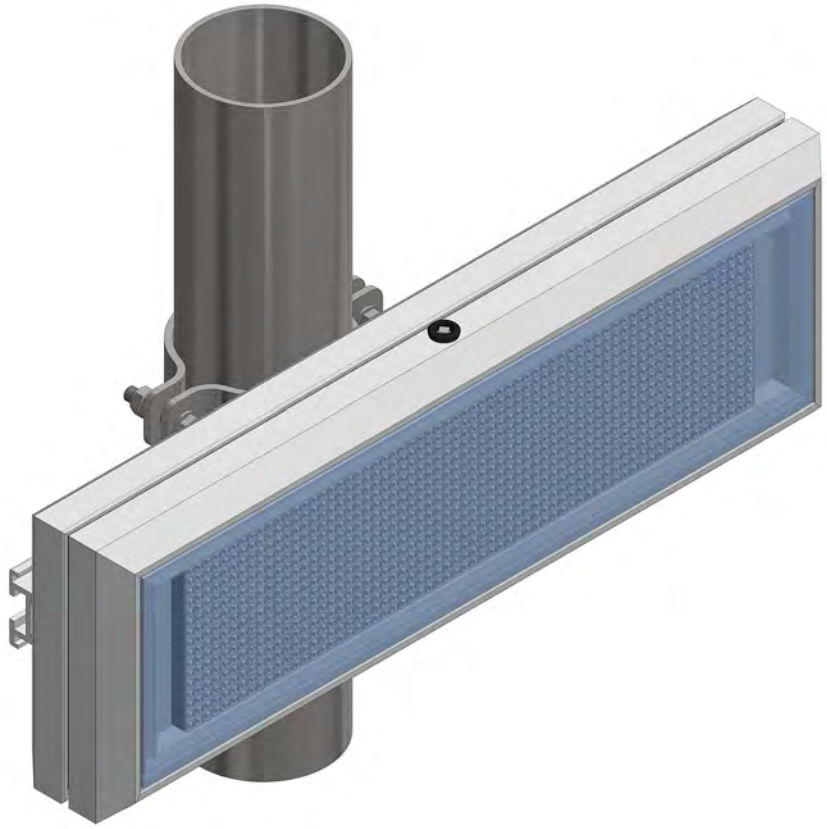


Figure 81:

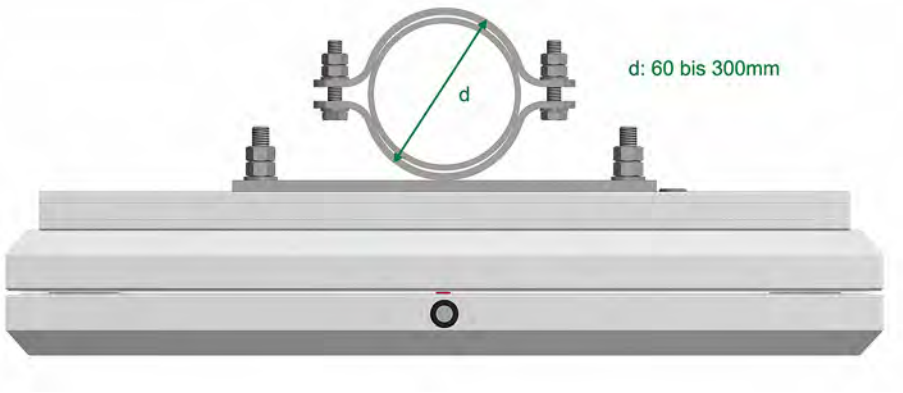


Figure 82:

5.2.3 Mounting brackets

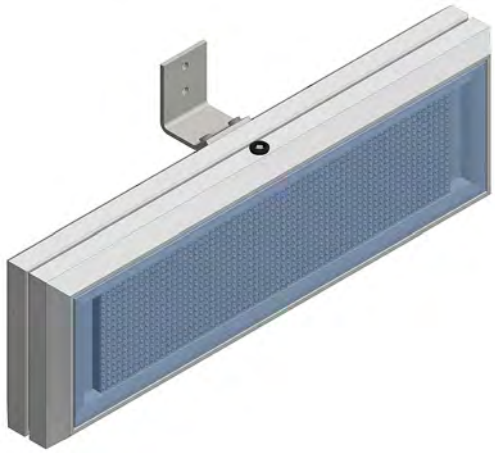


Figure 83:

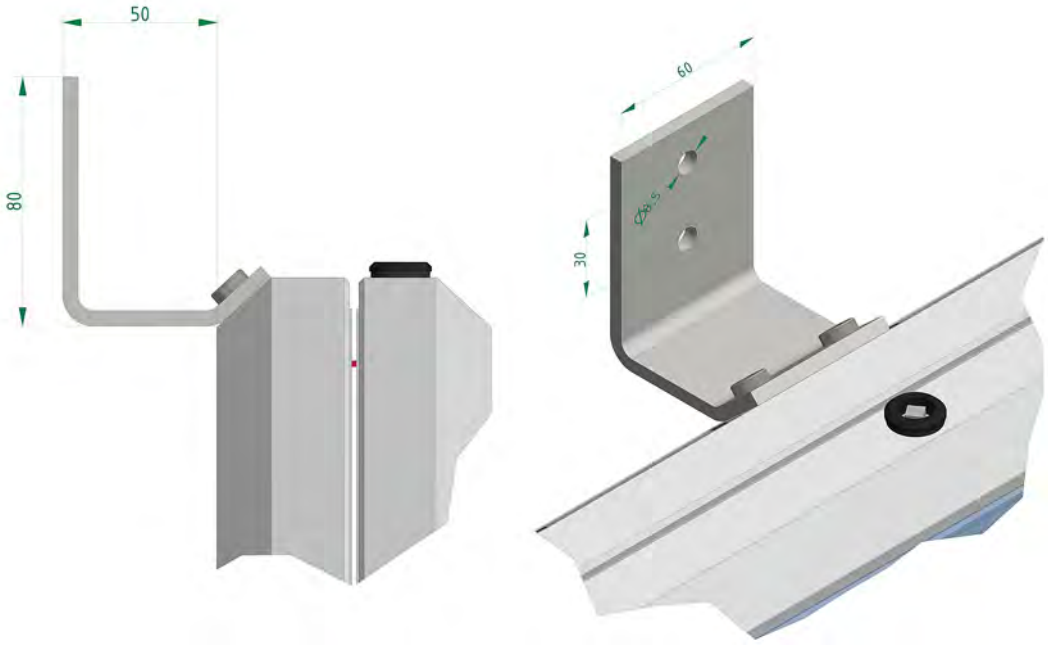


Figure 84:

5.2.4 Multi-articulated arm

Figure 85:

Figure 86:

5.2.5 Eyelets

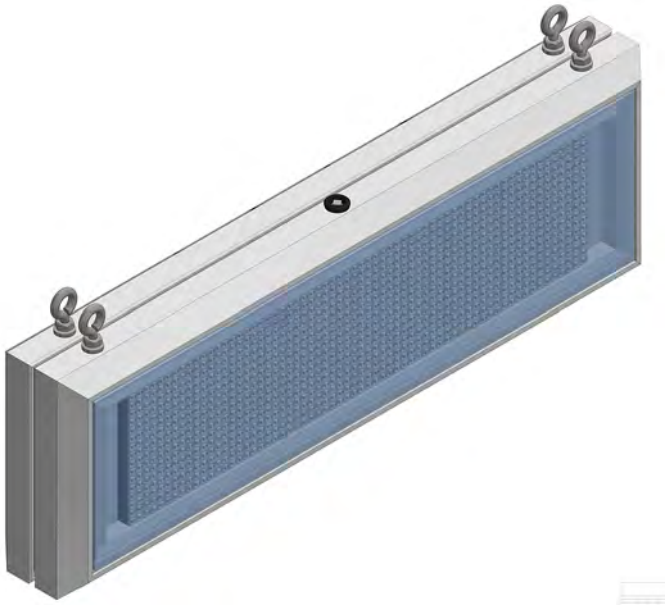


Figure 87:

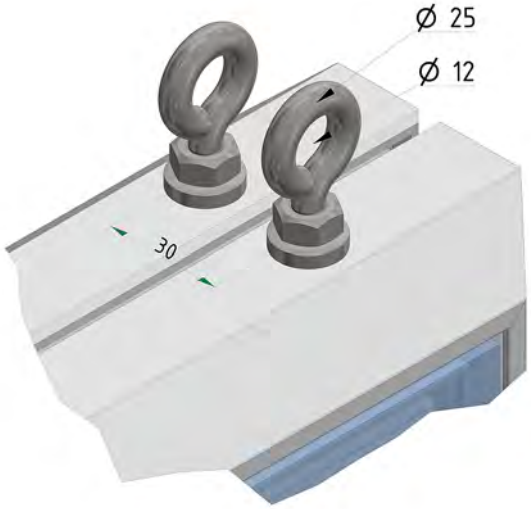


Figure 88:

5.2.6 Wire rope dampers

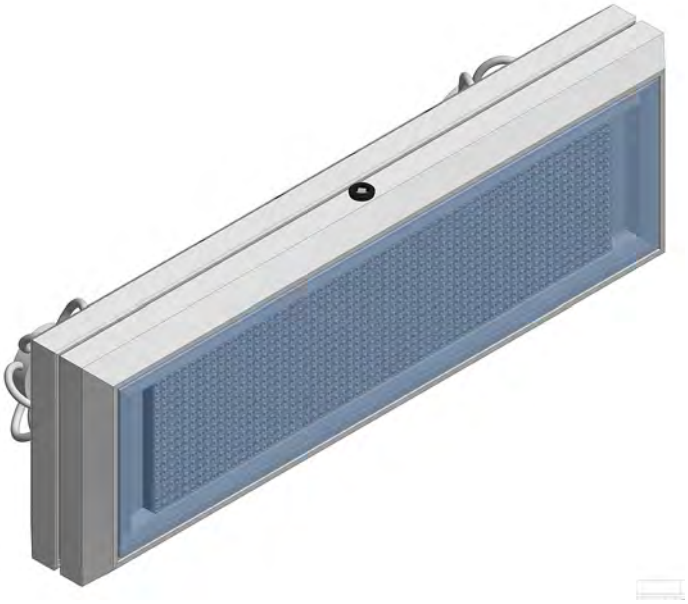


Figure 89:

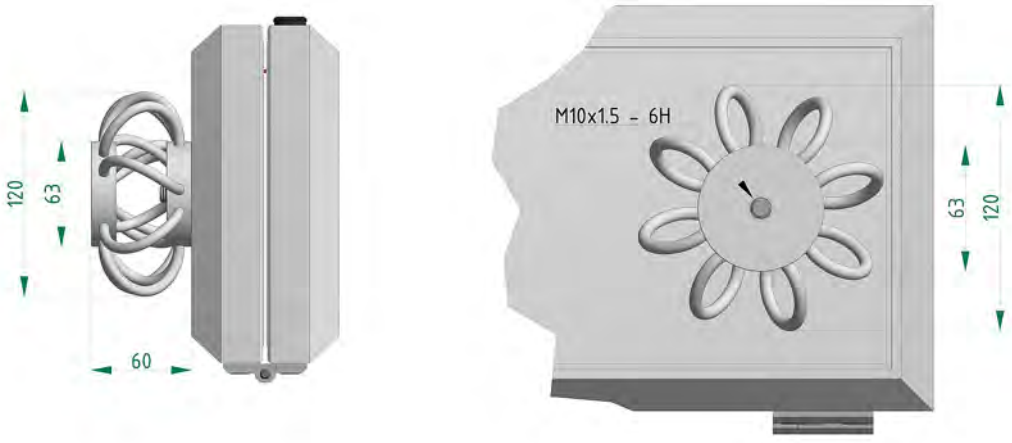


Figure 90:

5.2.7 Mounting bracket with vibration

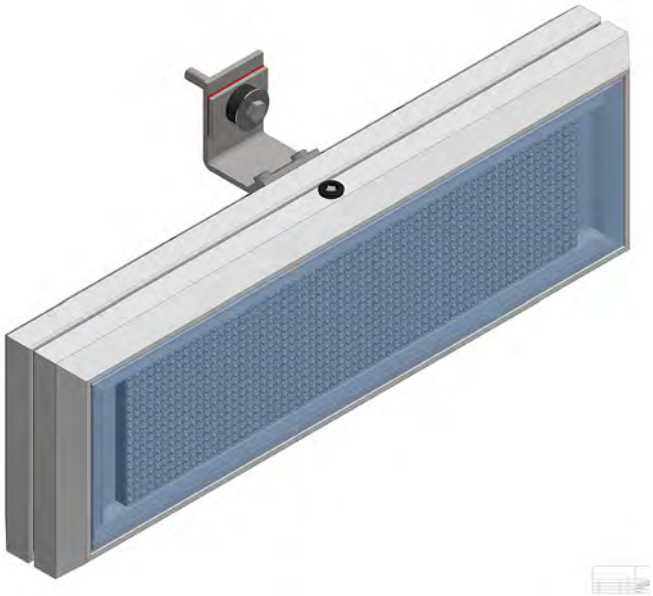


Figure 91:

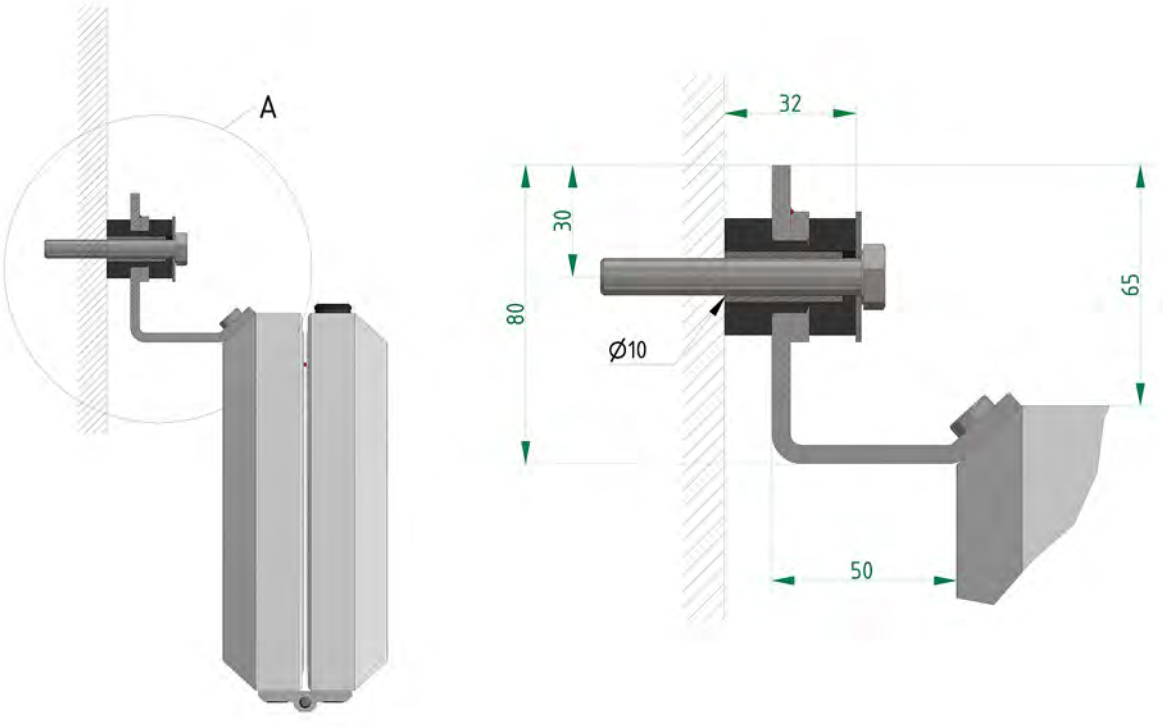
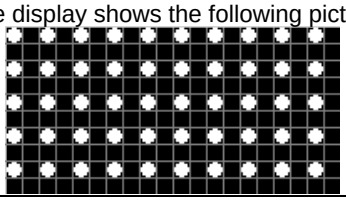


Figure 92:

6 Problems and solutions

Problem	Solutions
No display content	• Please check the power supply • Configure the device
The display shows the following picture 	• Configure the device using the MK-Software via USB
There is no connection to the device / no data can be sent	• Use the correct interface parameters IP address, RS485 (baud rate, parity, address),... • Configure the device using the MK-Software via USB
The device cannot be connected via USB / configured	• Reinstalli the USB driver • Starten Sie das Gerät neu • Restart the device

Should you have any other problem which is not mentioned here, please do not hesitate to contact our Service & Support by mail support@microsyst.de or by phone +49 9681/91960-0. Please keep the article number and the serial number of the relevant device ready for any queries.

7 EU declaration of conformity

microSYST

EU-Konformitätserklärung

EU Declaration of Conformity

Produktbezeichnung: migra
Product name:

Modelle: S1X4
Types:

Hersteller: microSYST Systemelectronic GmbH
Manufacturer: Am Gewerbepark 11
92670 Windischeschenbach

Das bezeichnete Produkt stimmt mit der folgenden Europäischen Richtlinie überein: *We herewith confirm that the above mentioned product meets the requirements of the following standard:*		**Die Übereinstimmung des bezeichneten Produktes mit den Vorschriften der angewandten Richtlinie(n) wird nachgewiesen durch die Einhaltung folgender Normen / Vorschriften:** *The conformity of the product described above with the provisions of the applied Directive(s) is demonstrated by compliance with the following standards / regulations:*
Richtlinien / *Directives*		**Europäische Norm /** *Standard*
EMV Richtlinie *EMC Directive*	**2014/30/EU**	EN61000-6-2:2005
		EN61000-6-4:2007 +A1:2011
Niederspannungs-Richtlinie *Low Voltage Directive*	**2014/35/EU**	EN60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013
RoHS Richtlinie *RoHS Directive*	**2011/65/EU**	EN50581:2012

Weiden, 19.03.2018

Manuel Raß

Geschäftsführer / *General Manager*

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8 Version history

Date	Creator	Discription
13 Dec 2018	hc	Document created, migra S1X4