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Numeric Panel-Mount LED Display with Profinet IO RT Interface

Manual



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1 General

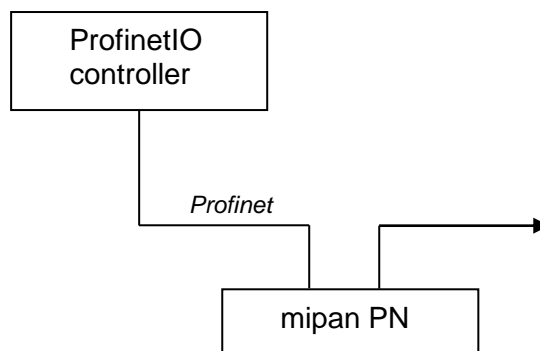
The numeric panel mount LED display mipan PN is designed for industrial use.

With a DIN installation size of 96 x 24 mm, a powerful display has been realized in smallest space.

A large operating voltage range ensures reliable operation even when voltage fluctuates. The integrated switch functionality simplifies cabling to further Profinet stations significantly.

2 System Overview

Systematic presentation of the display at the interface



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3 Technical Data

Display type:	7 segment LED
Character height:	13 mm
Digits:	6
Display colour:	red
Operating voltage:	24 VDC +/-20 %
Character set:	see corresponding chapter
Housing:	DIN panel-mount housing, metal with special surface finish
Housing dimensions:	96 x 24 x 61 mm (W x H x D)
Mounting:	screw clamps
Protection:	front panel IP65
Operating temp.:	0...+50 °C
Storage temp.:	-25...+70 °C

Interface Parameters

Interface:	2 x Profinet IO (with integrated switch)
Baud rate:	100 Mbit/s
Standards:	IEC 61158 / 61784 Profinet IO device RT (conformance class B) Profinet IO device IRT (conformance class C)
Features:	<ul style="list-style-type: none"> - Base: Siemens ERTEC200 - Real-time classes 1, 2 and 3 - RTA, LLDP, SNMP, MIB-II, LLDP-MIB - MRP (media redundancy) - DCP - Fast Startup - Send clock = 0.25, 0.5, 1, 2, 4 ms - Clock divider = 1...512 (RT), 1...16 (IRT) - Output data width = 0...250 bytes - Input data width = 0...250 bytes - Vendor-/Device-ID = 01CF_h / 0001_h

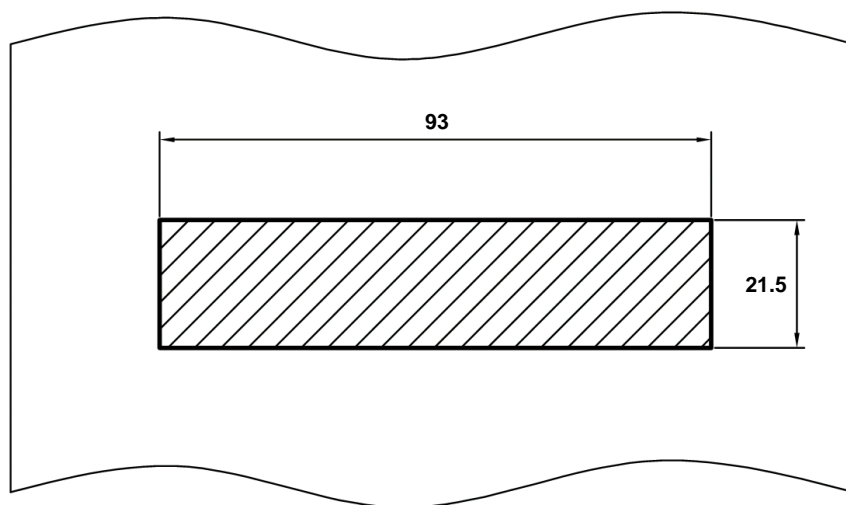
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4 Mounting

The display has been designed for mounting to a panel.
A rubber gasket seals the device's front panel against the panel.

Dimensions of panel cutout:



Mounting procedure:

- Push the display through the cut-out.
- Fasten the four countersink screws for the clamps.
- Snap in the clamps and fix the display.

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5 Profinet

5.1 System and Device Start-Up

A display test is performed after start-up.

After this, the connection between the Profinet controller and the Profinet device is established automatically (this can last up to approximately 10 seconds). To let this happen, the PN controller must be correctly configured and the PN device must have the matching name.

As long as no connection is established, the display shows “----- “ and it’s red LED is on.

After successful connection, the display is deleted and the red LED goes out.

The display is ready for data reception now.

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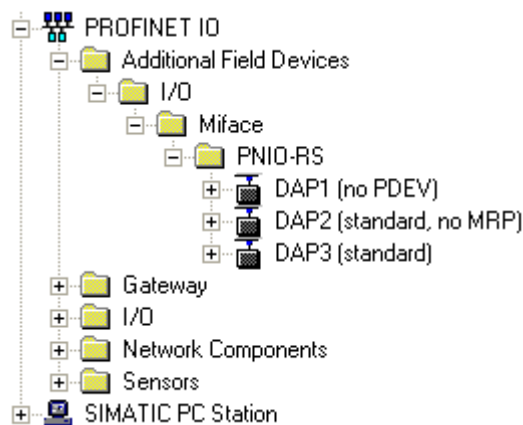
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5.2 Configuration of the Profinet Controller

The Profinet controller must be configured properly in order to communicate with the Profinet device.

The following descriptions refer to the "HW Config" tool from Siemens and are intended to represent the principle. This works of course with the tools of other manufacturers.

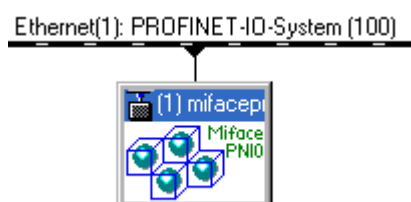
First, the GSDML file ("GSDML-V2.2-microSYST-01CF-MifacePNIO-....xml") has to be added to the „device catalogue“ of the configuration tool (menu item „Options/Install GSD File...“). Then, the device is shown in the catalogue view as follows:



Now you can choose between 3 different „Device Access Points“:

- DAP1 (no PDEV),
if your Profinet controller does not know a „physical device“
(usually only with older Profinet controllers)
- DAP2 (standard, no MRP),
if the MRP ability of the device shall not be activated.
- **DAP3 (standard)**,
if the MRP ability of the device shall be activated.

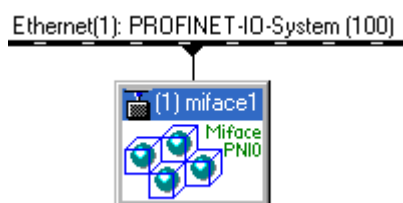
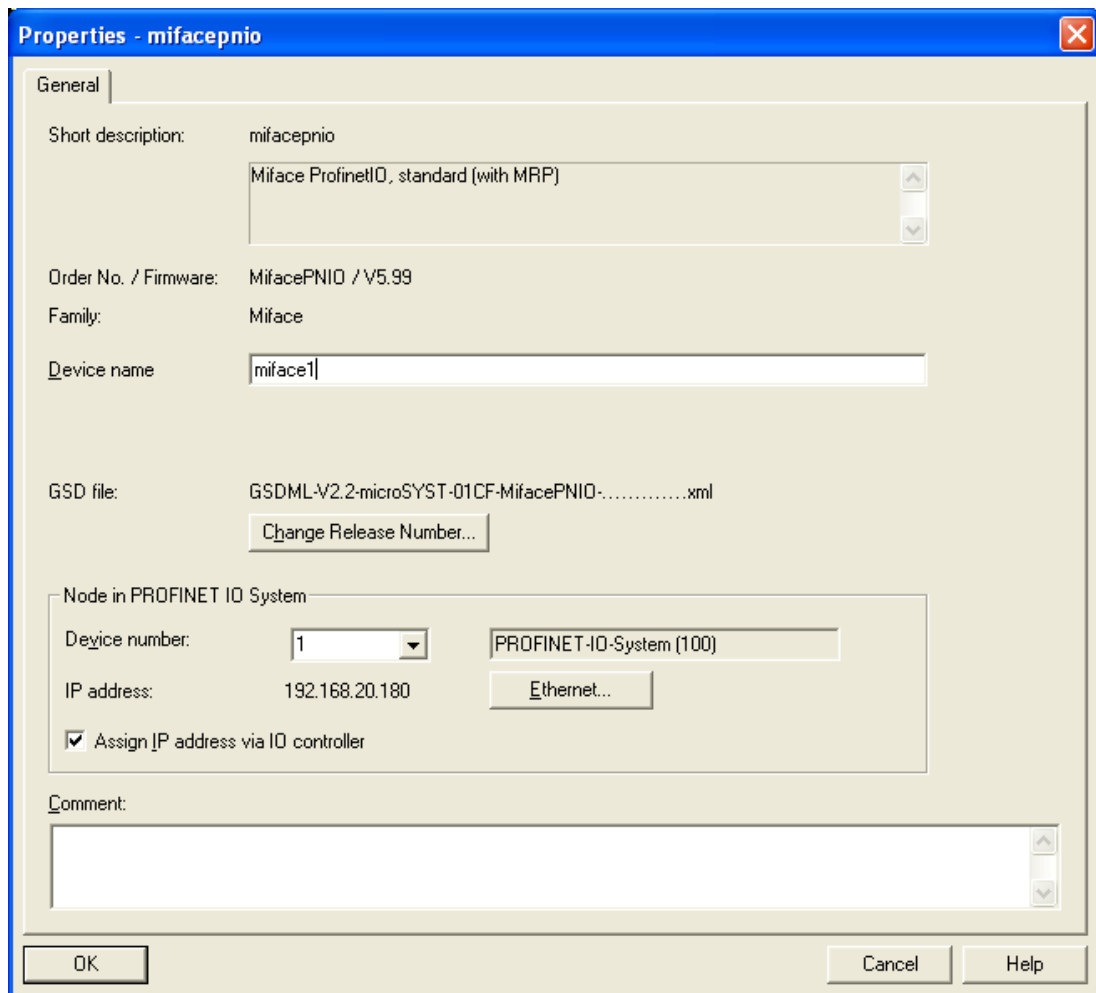
„Drag“ the needed „DAP“ to your Profinet system:



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Consider a meaningful device name and rename the display (here “**miface1**”) accordingly:

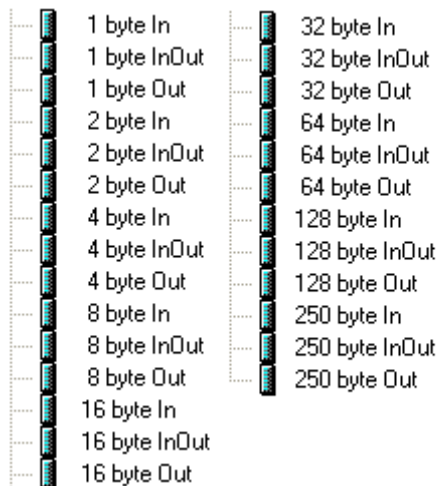


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In the next step the I/O data width of the cyclic Profinet communication must be defined.

There are Profinet IO modules with a data width of 1...250 bytes available:



Use the module “16 byte Out“:

Slot	Module	Order number	I Address	Q address
0	<i>milace1</i>	<i>MilacePNIO</i>		
X1	<i>Interface</i>			
X1 P1	<i>Port 1</i>			
X1 P2	<i>Port 2</i>			
1	16 byte Out			0...15

The setting “Slot X1 / IO Cycle / Update time” should be 8 ms at least (avoid unnecessary network load)!

After finishing the Profinet configuration, it must still be loaded into the Profinet controller:

- „Station/Save and Compile“
- „PLC/Download...“

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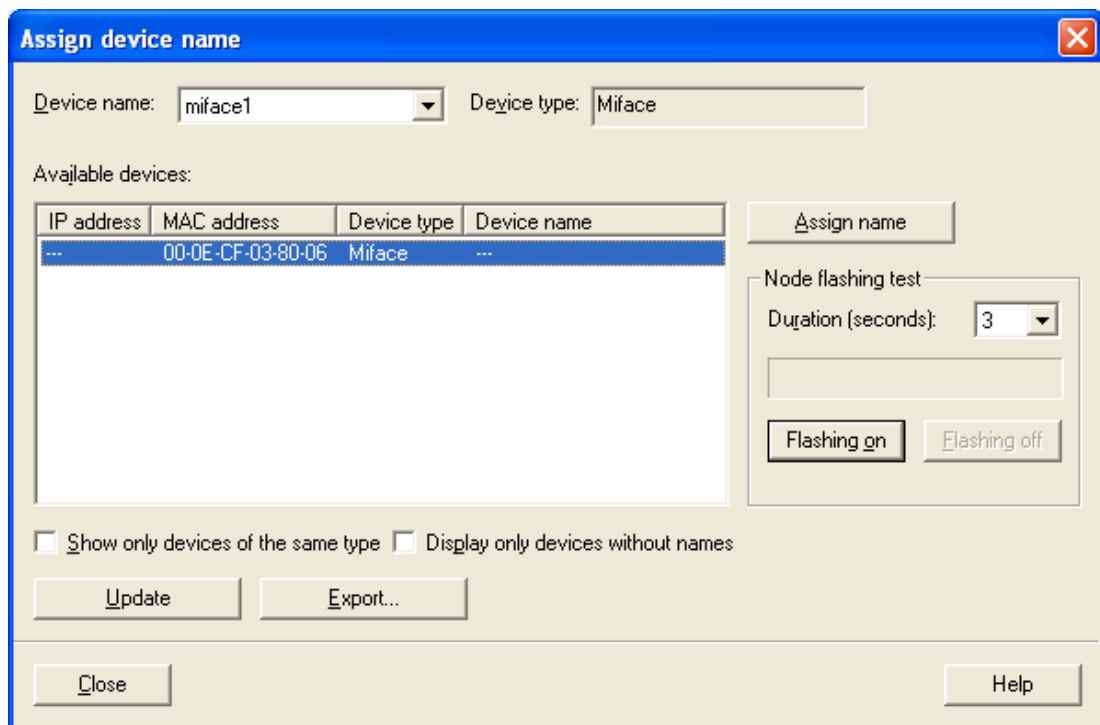
5.3 Profinet Device: Assign Name

The Profinet device must be assigned (one time) the device name, which also was chosen in the Profinet controller configuration ("miface1" in the example above).

For this, connect the device to the Profinet network and establish its power supply.

Start the tool for setting the device name:

- Mark (click) the concerned device in the bus overview
- Select the menu item „PLC/Ethernet/Assign Device Name...“
- Mark (click) the line with the corresponding device (see MAC-address)
- Click „Assign name“
- Close window



Tip: If you want to find the device of the marked line, you can click on „Flashing on“. The LED 1 (green) of the corresponding device starts to blink then.

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5.4 Display Control

If you want to transmit a frame to the display, the individual bytes must be entered at the Profinet side in output bytes 1 through n. After the bit for enabling is set (byte 1, bit 7), the following data is evaluated by the display.

Profinet Output Data				
Byte 1	Byte 2	Byte 3	Byte 4	Bytes 5...n
Enabling, brightness	Output format	Decimal points	Blinking	Data bytes
Bit 7 = 0: Display off = 1: evaluate following data Bit 6 = 0 (fixed) Bits 5...4: <u>Brightness:</u> 00 = 100% 01 = 80% 10 = 60% 11 = 40% Bits 3...0 = 0000 (fixed)	Bits 7...4 = 0110 (fixed) Bit 3: <u>Mode</u> 0 = LSB first 1 = MSB first Bits 2...0: <u>Data type</u> <u>Range</u> 000 = unsigned CHAR 0...255 001 = unsigned INT 0...65535 010 = unsigned LONG 0...999999 011 = signed CHAR -128...127 100 = signed INT -32768...32767 101 = signed LONG -99999...999999 110 = ASCII representation	Bit 7: Point at digit 1 Bit 6: Point at digit 2 Bit 5: Point at digit 3 Bit 4: Point at digit 4 Bit 3: Point at digit 5 Bit 2: Point at digit 6 Bits 1...0 = 00 (fixed)	Bits 7...1 = 0000000 (fixed) Bit 0 = 1: Display blinks	<u>at value representation (right-aligned):</u> CHAR value: 1 byte INT value: 2 bytes LONG value: 4 bytes <u>at ASCII representation (left-aligned, max. 12 bytes):</u> 1 byte per character, max. 6 digits, if Bit 7 = 1, respective digit blinks The decimal point has character code 2EH and is always set at the previous digit.

Example frame for brightness: 100%, data type: unsigned INT, value: 100 (hexadecimal representation of the single output bytes:

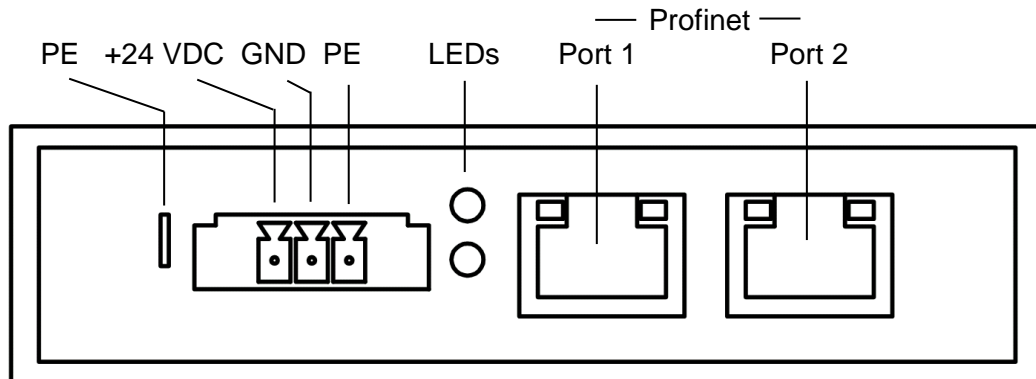
80 61 00 00 64 00

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6 Pin Assignment

Back Side:



LEDs

LED green	Normal:	On
	Normal with DCP signaling:	Blinking
	Hardware error:	Off
LED red	No Profinet connection:	On
	Cyclic Profinet communication is running:	Off

Profinet (Port 1, Port 2)

Pin	Assignment
1	Tx +
2	Tx -
3	Rx +
4	
5	
6	Rx -
7	
8	

DIP Switches

-> Standard settings: DIP1...4 = OFF

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7 Appendix

7.1 Displayable Characters

The data bytes are ASCII coded.

<i>Lower</i> ↓	<i>Higher</i> ↓	0	1	2	3	4	5	6	7
0				"Blank"	0		P		P
1					1	A	9	A	9
2					2	6	7	6	7
3					3	e	S	e	S
4					4	d	F	d	F
5					5	F	L	F	L
6					6	F		F	
7					7	G		G	
8			[8	H			H	
9]	9	I	Y		I	Y
A						J		J	
B									
C						L		L	
D				-					
E				.		n		n	
F						o	-	o	

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7.2 Maintenance and Care

- The display must be switched off before cleaning. Only solvent-free cleaners may be used, as the surface of the housing may otherwise be damaged. Under no circumstances may moisture be allowed to enter the interior of the device during cleaning.
- Protect the display from excessive humidity, extreme vibration, direct sunlight and extreme temperatures. Non-observance may lead to malfunctioning or destruction of the device. Under certain circumstances electrical shock, fire and explosion may occur as well. Information concerning allowable ambient conditions, including recommended temperature and atmospheric humidity ranges, can be found in the chapter entitled "Technical Data".
- The display may not be placed into service if the device and/or the power cable is damaged.
- Do not attempt to open or repair the device yourself. The guarantee is rendered null and void if unauthorised persons tamper with the device.
- Observe all of the instructions and requirements, which are included in this user's manual.

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7.3 Declaration of Conformity

EU-Konformitätserklärung

EU Declaration of Conformity

Produktbezeichnung: mipan
Product name:

Typenreihe: mipan PN
Type code:

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

Das bezeichnete Produkt stimmt mit der folgenden Europäischen Richtlinie überein: <i>We herewith confirm that the above mentioned product meets the requirements of the following standard:</i>		Die Übereinstimmung des bezeichneten Produktes mit den Vorschriften der angewandten Richtlinie(n) wird nachgewiesen durch die Einhaltung folgender Normen / Vorschriften: <i>The conformity of the product described above with the provisions of the applied Directive(s) is demonstrated by compliance with the following standards / regulations:</i>
Richtlinien / Directives		Europäische Norm / Standard
EMV Richtlinie <i>EMC Directive</i>	2014/30/EU	EN61000-6-2:2005
		EN61000-6-3:2007 +A1:2011
RoHS Richtlinie <i>RoHS Directive</i>	2011/65/EU	EN50581:2012

Windischeschenbach, 11.12.2017



Manuel Raß

Geschäftsführer / General Manager

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7.4 Warranty / Liability

For the product, liability is assumed for defects, which existed at the delivery date according to our General Terms and Conditions.

Technically changes as well as errors are accepted. A claim for delivery of a new product does not exist. The buyer has to check the received product immediately and indicate evident defects at the latest 24 hours after detection. Non-observance of notification requirements is equated with acceptance of the defect. Not immediately visible defects have to be indicated immediately after their perception too.

Generally, defects and their symptoms must be described as accurately as possible in order to allow for reproducibility and elimination. The buyer must provide for access to the relevant device and all required and/or useful information at no charge and must make all of the required data and machine time available free of charge.

The guarantee does not cover defects, which result from non-observance of the prescribed conditions of use, or from improper handling.

If the device has been placed at the disposal of the buyer for test purposes and has been purchased subsequent to such testing, both parties agree that the product is to be considered "used" and that it has been purchased "as is". No guarantee claims may be made in such cases.

The General Terms and Conditions of microSYST Systemelectronic GmbH in current version apply as well.

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7.5 Versions Overview

Version	Date	Comments
1.00	10.12.12	Document created
1.10	18.03.13	Declaration of conformity, warranty / liability changed
1.20	22.10.13	Logo
1.30	29.04.16	Declaration of conformity
1.40	11.12.17	Change of address

Certified per **DIN EN ISO 9001**.