mipan FI

Numeric Panel-Mount LED Display with Profibus-DP Interface

User's Manual

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

Table of Contents

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

1 General

There's no doubt that Profibus is becoming more and more significant with the ever growing number of devices which are equipped with a Profibus interface.

The numeric panel mount LED display with Profibus interface is a high performance product which has been especially designed for industrial use.

The metal housing and rugged design of the numeric panel mount LED display with Profibus interface make it ideal for all type of applications, even under adverse ambient conditions.

1.1 Special Features

The display has been designed for use as a data converter between a Profibus DP master and a 6 digit, 7 segment display. It functions as a slave module at the Profibus DP, and allows for the display of data. Various functions are made available depending upon configuration (2 bytes output data for operating mode 1, 4 bytes output data for operating mode 2, 10 bytes output data for operating mode 3). For example, display brightness can be adjusted by means of control data, and/or individual characters can be caused to blink independent of one another.

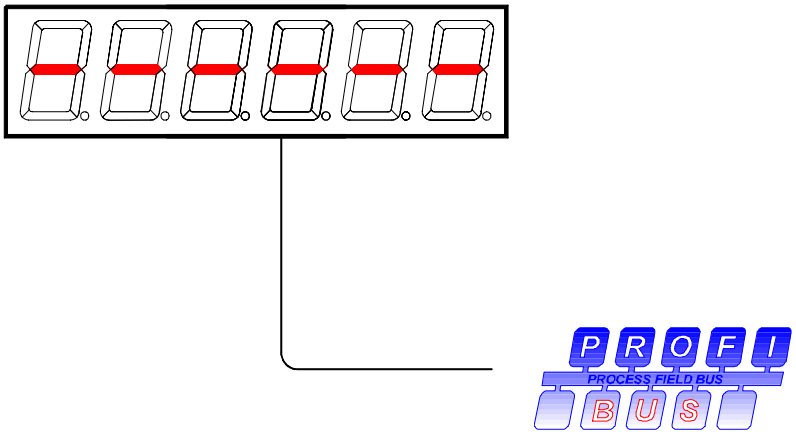
The device is equipped with the following important functional features:

- Profibus DP configuration with three different operating modes
- Brightness can be set to 4 different levels
- Blinker function for each of the 6 display digits at approx. 1 Hz
- Conversion of integer values with preceding plus or minus sign
- Individual display digits can be driven directly
- Self-test function via control bit from Profibus DP data, or with DIP switches
- Self-test function with DIP switches
- LED test with 24 VDC external
- Error message indicates interruption of communications via the Profibus DP.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

2 System Overview

The display is connected to a Profibus DP master via the Profibus DP.



microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3 Technical Data

General Specifications

Display type:	7 segment LED
Character height:	13 mm
Digits:	6 digits
Display colour:	red, green
Operating voltage:	24 VDC ±20 %
Power consumption	
Red displays:	approx. 75 mA at 24 VDC operating voltage
Green displays:	approx. 100 mA at 24 VDC operating voltage
Addresses:	0 to 126
Interface:	Profibus-DP
Display:	0 to 9 and H, E, L, P, -, Blank
Baud rate:	9.6 KBaud to 12 MBaud
Housing:	DIN panel-mount housing, metal with special surface finish
Housing dimensions:	see chapter 5
Mounting:	screw clamps
Protection:	front panel IP 65
Weight:	approx. 270 grams
Operating temperature:	0 to +50° C
Storage temperature:	-25 to +70° C

3.1 Operating Modes

Three different operating modes with various functions are available for the display. The operating mode is selected with the configuration data.

3.2 Operating Mode 1

Two bytes of output data are used in operating mode 1, which are selected with Profibus configuration identifier 0x21. These 2 bytes can be used to transmit a numeric value as a signed integer from the Profibus DP master. The panel mount display calculates the appropriate decimal value from the transmitted data, which lies within a range of -32768 and 32767. The calculated value is then displayed.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.3 Operating Mode 2

Four bytes of output data are used in operating mode 2, which are selected with Profibus configuration identifiers 0x21, 0x21. Brightness and blinking are controlled by the Profibus DP master with these 4 bytes, the software self-test is initialized and a numeric value is transmitted as a signed integer. The panel mount display calculates the appropriate decimal value from the transmitted data, which lies within a range of -32768 and 32767. The calculated value is then displayed.

3.4 Operating Mode 3

Ten bytes of output data are used in operating mode 3, which are selected with Profibus configuration identifiers 0x21, 0x21, 0x25. Brightness and blinking are controlled by the Profibus DP master with these 10 bytes, the software self-test is initialized and a numeric value is transmitted as a signed integer, and a display value is transmitted for each of the six digits.

3.5 Brightness Control

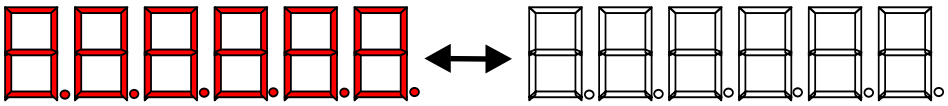
Brightness is controlled via device control data, and is only available in operating modes 2 and 3. Four different brightness levels are available including 100%, 80%, 50% and 20%.

3.6 Blinker Function

The blinker function is controlled via device control data, and is only available in operating modes 2 and 3. The characters displayed at each of the six digits can be caused to blink independent of one another. The blinking frequency is approximately 1 Hz.

3.7 Hardware Self-Test

The hardware self-test can be activated with the DIP switches. All of the segments at all six digits are switched on, and then back off again, during the hardware self-test. The display blinks at a rate of approx. 2 Hz at full brightness.



microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.8 Software Self-Test and Start-Up Performance

The following displays appear during the software self-test and device start-up:

1st Second

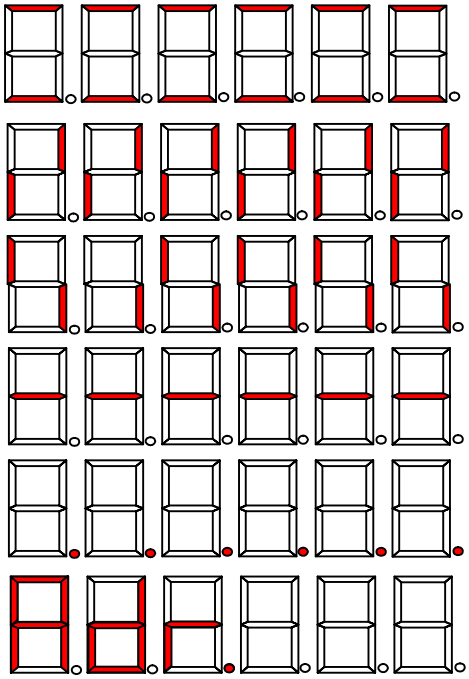
2nd Second

3rd Second

4th Second

5th Second

6th Second



Displaying the address

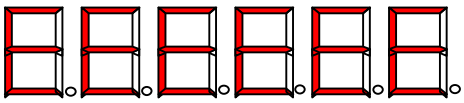
The software self-test is performed automatically each time operating power is switched on, or can be run continuously in operating modes 2 and 3 in which case it is initialized via device control data by setting the corresponding bits at the Profibus DP master.

During the software self-test immediately after start-up, the display is illuminated at full brightness (100%). The brightness level selected with the control data is taken into consideration during the software self-test which is initialized by the Profibus DP master.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.9 Monitoring the Profibus DP Interface

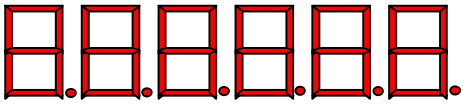
The Profibus DP interface is monitored by the panel mount LED display if the watchdog for the slave has been activated by the Profibus DP master. If no Profibus DP connection can be established, or if the connection to the master is interrupted, the following sequence appears at the display.



The status of the Profibus DP interface is also indicated at the LED monitor.

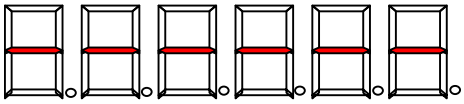
3.10 LED Test

The LED test function can be activated at pin 2 of the 3-pole terminal connector. As soon as +24 VDC are applied to this terminal, all display segments are illuminated at full brightness.



3.11 Hardware Malfunction Display

If a hardware error is detected during start-up, six static hyphens appear at the display. As a rule, this indicates that the blinker function is inactive for the RUN LED.



microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.12 Profibus DP Characteristic Data

ID Number:	0x04D0
Maximum Output Data:	2 bytes DP output data: operating mode 1 4 bytes DP output data: operating mode 2 10 bytes DP output data: operating mode 3
Default Configuration:	0x21, 0x21, 0x25
Parameter Data:	7 bytes, default
User PRM:	none
Diagnosis:	6 bytes, default
External Diagnosis:	none
Baud Rate:	9.6 KBaud / 19.2 KBaud / 93.75 KBaud / 187.5 KBaud / 500 KBaud / 1.5 MBaud / 3 MBaud / 6 MBaud / 12 MBaud
Protocol:	Profibus DP, DIN 19245, Part 3
Device Database File:	MIPN04D0.GSD

Configuration of the display is performed with 1, 2 or 3 bytes of configuration data. The display's operating mode is also selected by means of configuration data. The interface receives and examines the transmitted configuration data, which must conform to one of the possibilities shown in the tables below. If incorrect configuration data are transmitted to the interface as regards number of bytes or identifier, Profibus initialization is disabled and the slave's parameters must be reconfigured.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.13 Config_Data - Operating Mode 1

2 bytes of DP output data and 0 bytes input data are used for operating mode 1.

Byte No.	Data (Identifier)	Output Data	Function / Description
0	0x21	2	output data: display data as signed integer

3.14 Config_Data - Operating Mode 2

4 bytes of DP output data and 0 bytes input data are used for operating mode 2.

Byte No.	Data (Identifier)	Output Data	Function / Description
0	0x21	2	output data: device control data
1	0x21	2	output data: display data as signed integer

3.15 Config_Data - Operating Mode 3

10 bytes of DP output data and 0 bytes input data are used for operating mode 3.

Byte No.	Data (Identifier)	Output Data	Function / Description
0	0x21	2	output data: global control data (reserved)
1	0x21	2	output data: device control data
2	0x25	6	output data: display data as display value

3.16 User Parameter Data - User_Prm_Data

The user parameter data are not used by the display. However, a test is run to make sure that no user parameter data have been configured by the Profibus master. If parameter data have been configured, Profibus initialization is disabled and the slave's parameters must be reconfigured.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.17 Output_Data - Operating Mode 1

2 bytes of output data are used in operating mode 1. The individual data bytes are assigned to the following functions:

Byte No.	Designation	Length in Bytes	Function / Description
0 - 1	Data	2	display data as signed integer

The numeric value to be displayed is transmitted as a signed integer via 2 bytes of output data.

Display Value Coding:

Output_Data		Display					
Byte 0 (HEX)	Byte 1 (HEX)						
00	00						**0**
00	01						**1**
00	02						**2**
00	03						**3**
↓	↓						
7F	FD		**3**	**2**	**7**	**6**	**5**
7F	FE		**3**	**2**	**7**	**6**	**6**
7F	FF		**3**	**2**	**7**	**6**	**7**
80	00	**-**	**3**	**2**	**7**	**6**	**8**
80	01	**-**	**3**	**2**	**7**	**6**	**7**
80	02	**-**	**3**	**2**	**7**	**6**	**6**
↓	↓						
FF	FD	**-**					**3**
FF	FE	**-**					**2**
FF	FF	**-**					**1**

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

3.18 Output_Data - Operating Mode 2

4 bytes of output data are used in operating mode 2. The individual data bytes are assigned to the following functions:

Byte No.	Designation	Length in Bytes	Function / Description
0 - 1	Strb	2	device control data
2 - 3	Data	2	display data as signed integer

Device control data are transmitted as bytes 0 and 1 of the output data from the DP master to the display, and are used to control display brightness and blinking of individual digits, as well as triggering of the self-test.

Device Control Data Assignments

Byte No.	Designation	Bit No.	Function / Description	
0	Strb	0 - 1	brightness control	00_B = 100% brightness 01_B = 80% brightness 10_B = 50% brightness 11_B = 20% brightness
		2	software self-test	0_B = OFF, 1_B = ON
		3 - 7	no function	
1	Strb	0	digit 1 blinks	0_B = OFF, 1_B = ON
		1	digit 2 blinks	0_B = OFF, 1_B = ON
		2	digit 3 blinks	0_B = OFF, 1_B = ON
		3	digit 4 blinks	0_B = OFF, 1_B = ON
		4	digit 5 blinks	0_B = OFF, 1_B = ON
		5	digit 6 blinks	0_B = OFF, 1_B = ON
		6 - 7	no function	

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

Display Value Coding:

Output_Data		Display					
Byte 0 (HEX)	Byte 1 (HEX)						
00	00						**0**
00	01						**1**
00	02						**2**
00	03						**3**
↓	↓						
7F	FD		**3**	**2**	**7**	**6**	**5**
7F	FE		**3**	**2**	**7**	**6**	**6**
7F	FF		**3**	**2**	**7**	**6**	**7**
80	00	**-**	**3**	**2**	**7**	**6**	**8**
80	01	**-**	**3**	**2**	**7**	**6**	**7**
80	02	**-**	**3**	**2**	**7**	**6**	**6**
↓	↓						
FF	FD	**-**					**3**
FF	FE	**-**					**2**
FF	FF	**-**					**1**

3.19 Output_Data - Operating Mode 3

10 bytes of output data are used in operating mode 3. The individual data bytes are assigned to the following functions:

Byte No.	Designation	Length in Bytes	Function / Description
0 - 1	Header	2	global control data (reserved)
2 - 3	Strb	2	device control data
4 - 9	Data	6	display data (coded)

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

Device control data are transmitted as bytes 2 and 3 of the output data from the DP master to the display, and are used to control display brightness and blinking of individual digits, as well as triggering of the self-test. Bit coding for these 2 bytes is shown in the following table:

Device Control Data Assignments

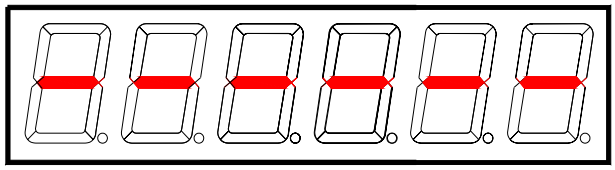
Byte No.	Designation	Bit No.	Function / Description	
2	Strb	0 - 1	brightness control	00_B = 100% brightness 01_B = 80% brightness 10_B = 50% brightness 11_B = 20% brightness
		2	software self-test	0_B = OFF, 1_B = ON
		3 - 7	no function	
3	Strb	0	digit 1 blinks	0_B = OFF, 1_B = ON
		1	digit 2 blinks	0_B = OFF, 1_B = ON
		2	digit 3 blinks	0_B = OFF, 1_B = ON
		3	digit 4 blinks	0_B = OFF, 1_B = ON
		4	digit 5 blinks	0_B = OFF, 1_B = ON
		5	digit 6 blinks	0_B = OFF, 1_B = ON
		6 - 7	no function	

Global Control Data - Operating Mode 3

Global control data are transmitted as bytes 0 and 1 of the output data from the DP master to the display, although they are not evaluated by the display. These two bytes are reserved and must be set to zero by the user.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

Display Data - Operating Mode 3



Digit:	6	5	4	3	2	1
Output Data, Byte No.:	4	5	6	7	8	9

List of Displayable Characters

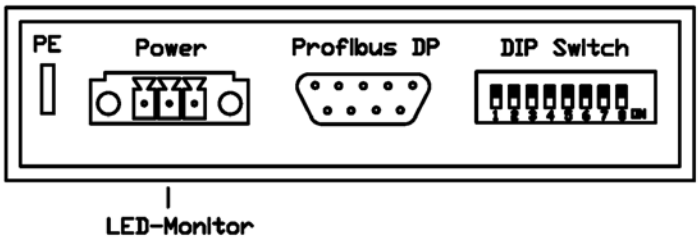
Code in HEX	Binary Code Bit No.:								Displayed Character
	7	6	5	4	3	2	1	0	
0x00	0	x	x	x	0	0	0	0	0
0x01	0	x	x	x	0	0	0	1	1
0x02	0	x	x	x	0	0	1	0	2
0x03	0	x	x	x	0	0	1	1	3
0x04	0	x	x	x	0	1	0	0	4
0x05	0	x	x	x	0	1	0	1	5
0x06	0	x	x	x	0	1	1	0	6
0x07	0	x	x	x	0	1	1	1	7
0x08	0	x	x	x	1	0	0	0	8
0x09	0	x	x	x	1	0	0	1	9
0x0A	0	x	x	x	1	0	1	0	-
0x0B	0	x	x	x	1	0	1	1	E
0x0C	0	x	x	x	1	1	0	0	H
0x0D	0	x	x	x	1	1	0	1	L
0x0E	0	x	x	x	1	1	1	0	P
0x0F	0	x	x	x	1	1	1	1	"blank"

x = is not evaluated

A decimal point is entered after the corresponding character by setting bit number 7. However, this function is only available in operating mode 3.

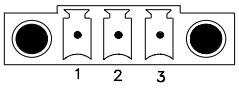
microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

4 Connector Pin Assignments



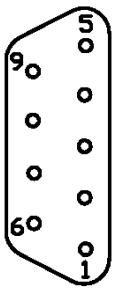
Flat Connector (PE)
Earth connection.

3 Pin Connector Terminal



Pin	Assignment
1	+24 VDC
2	LED test
3	GND

9 Pin Sub-D Plug Connector (Profibus DP)



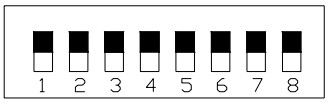
Pin	Assignment
1	Shield
2	free
3	Rx+
4	RTS signal
5	GND
6	+5 VDC
7	n.c.
8	Rx-
9	n.c.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

LED Monitor (Bottom of Housing)

LED	Colour	Function	
RUN	Green	Start-Up: Normal Operation: Error:	Off blinks at approx. 2 Hz lit continuously, off
INTERNAL	Red	Start-Up: Normal Operation: Error:	On On blinks at approx. 1 Hz, off
BUS	Yellow	Start-Up: Normal Operation: Profibus DP active Profibus DP inactive	Off On Off

DIP Switch



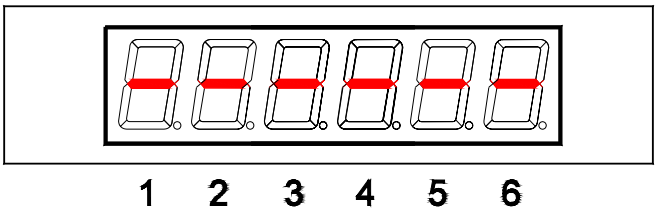
DIP Switches, DIP1	Profibus DP Address / Operating Mode		
Profibus DP Address		**ON**	**OFF**
DIP 8	ID No.: 2^0	1_D	0
DIP 7	ID No.: 2^1	2_D	0
DIP 6	ID No.: 2^2	4_D	0
DIP 5	ID No.: 2^3	8_D	0
DIP 4	ID No.: 2^4	16_D	0
DIP 3	ID No.: 2^5	32_D	0
DIP 2	ID No.: 2^6	64_D	0
Operating Mode		**ON**	**OFF**
DIP 1	Normal Operation / Self-Test	Self-Test	Normal Operation

Bus Termination (Bottom of Housing)

The bus termination of the Profibus-DP interface is activated by switching on both DIP switches (position ON).

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

4.1 Display Elements

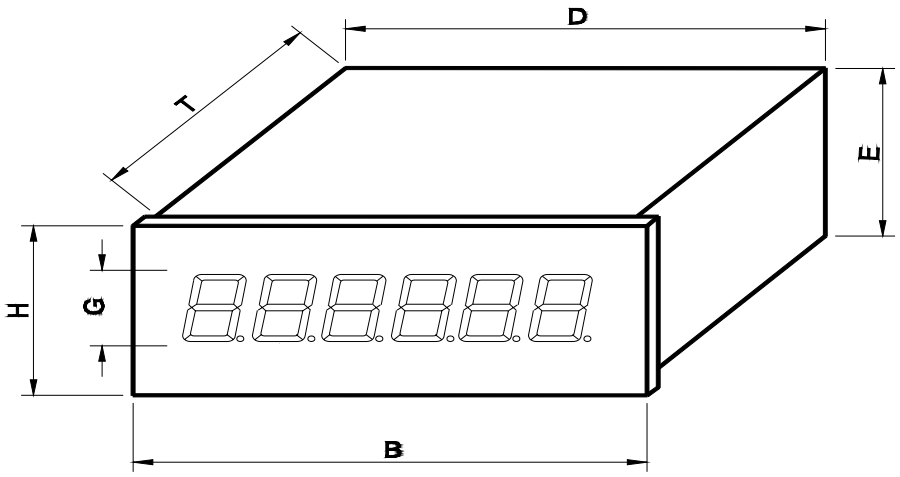


The digits are designated from left to right as shown above.

Component	Function / Description
6 Digit 7 Segment Display	
Number of lines:	1
Characters per line:	6
Character height:	13 mm
Display colour:	red or green illuminated
Brightness:	4 levels (20%, 50%, 80%, 100%)
Display type:	7 segment

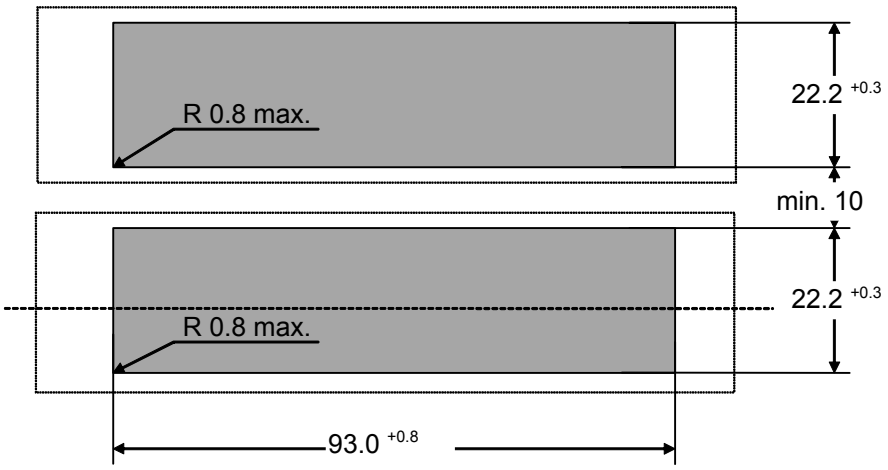
microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

5 Housing Dimensions



Dimension	B	H	T	D	E	G
Measurement (mm)	96	24	60	92	20	13

5.1 Panel Cutout



microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

6 Appendix

6.1 Standard Equipment

- Display with current software and hardware versions
- Mounting materials
- Mating plug for power supply
- User's manual
- Floppy disc with GSD file for original purchaser.

6.2 Maintenance and Care

Observe the following instructions in order to assure best possible performance of the display unit:

- 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 panel mount LED 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 are known to be damaged.

- Do not attempt to open or repair the device yourself. The guarantee is rendered null and void if the device is tampered with by unauthorized persons.

- Observe all of the instructions and requirements which are included in this user's manual.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

6.3 Troubleshooting, General Problems

Problem	Cause	Solution
LED RUN does not blink after start-up.	No power or incorrect supply voltage	Use only the specified supply voltage.
	Defective device	Return device for repair.
LED INTERNAL blinks.	Error during RAM test, or internal error	Switch supply power off and then back on. If the problem persists, return device for repair.

Troubleshooting, Display Problems

Problem	Cause	Solution
Only hyphens appear at the display.	Internal error	Switch supply power off and then back on. If the problem persists, return device for repair.
All display segments blink.	Hardware test is activated	Set DIP switches to normal operation.
Display is barely legible.	Incorrect brightness setting	Select a different brightness setting via the Profibus DP.
Only "Es" appear at the display.	No communication via the Profibus DP	Check the Profibus.
Interface does not respond.	Configuration and/or parameters are incorrect	Correct configuration and/or parameters.

Troubleshooting, Profibus DP Problems

Problem	Cause	Solution
Interface does not respond.	Pin assignments at Profibus connector are incorrect (data strands are reversed)	Correct the pin assignments at the Profibus connector.
	No bus termination, or bus termination is incorrect	Correct the bus termination.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

6.4 Declaration of Conformity

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, 92637 Weiden, Germany

does hereby declare
that the product described in this user's manual,

“mipan FI DP”

to which this declaration makes due reference,
is in compliance with the following standards or normative documents:

Interference emission: generic standard EN 61000-6-4

Interference immunity: generic standard EN 61000-6-2

In accordance with regulations specified by guideline 89/336/ EWG (and EMVG).

Weiden, 23 August 2004 microSYST Systemelectronic GmbH

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

6.5 Guarantee

The display is guaranteed for the duration of the legally specified period against defects which existed at the time the device was delivered to the buyer.

The device is subject to technical change without notice. Errors and omissions are accepted. No claims can be honoured for the shipment of a new product. The buyer is required to make notification of defects within 2 weeks after identification of such. Non-observance of notification requirements is equated with acceptance of the defect.

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 all required and/or useful information regarding defects at no charge, as well as to the affected devices, 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" regarding manufactured products and services rendered for the electrical industry apply as well.

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de

6.6 Versions Overview

Version	Date	Comments, Description
1.00	26.11.04	Kreuzer: Document created
1.10	24.02.05	Kreuzer: Output_Data - Operating Mode 3 changed
1.20	28.02.05	Kreuzer: Power consumption; differences between red / green
1.30	21.05.08	Kreuzer: Housing depth changed to 60 mm

Certified per **DIN EN ISO 9001:2000**

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10, D-92637 Weiden, Germany
Tel. (+49-961) 3 91 66-0, Fax (+49-961) 3 91 66-10, www.microsyst.de, info@microsyst.de