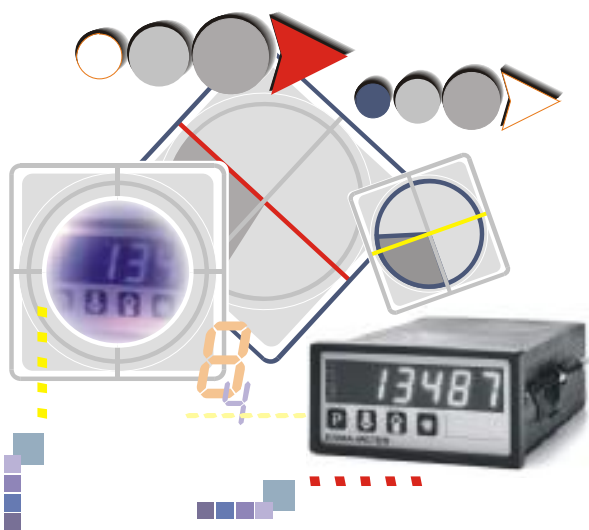


# Katalog

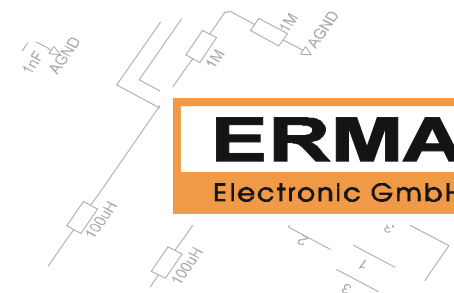
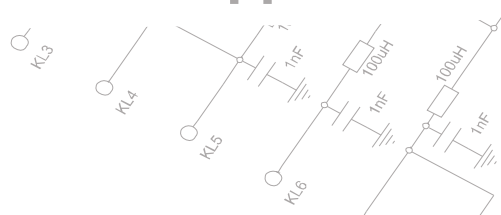
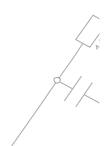
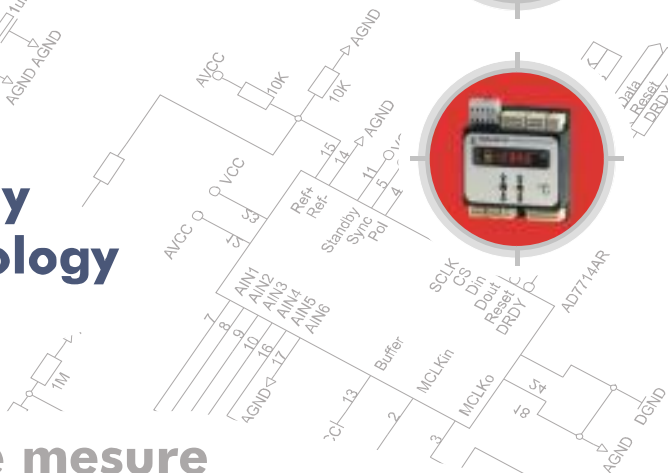
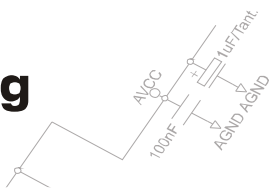
Catalogue Catalog



**Messtechnik**  
**PC-Messtechnik**  
**Encoder-Auswertung**  
**Entwicklungen**

**Measuring technology**  
**PC-measuring technology**  
**Encoder-evaluation**  
**Developments**

**Technique de mesure**  
**Technique de mesure d'ordinateur**  
**Évaluation des signaux des codeurs**  
**Développements**



# Panel Meters



**Panel mounting instruments /  
DIN cabinets mounting  
different standard housing sizes  
different supply voltages  
all usual measured variables  
Measuring instruments  
programmable  
industrial fair execution  
customized solutions**



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**List of Contents**

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**Group identifier A**

**Programmable Counter/Revolution Meter, Frequency Meter, Time Meter/Hour Meter**

CM 2510 . . . . .	LED, 5-decades, 8 mm. . . . .	48 x 24 mm
CM 2510M . . . . .	LED, 5-decades, 8 mm, Mauell-Mosaicsystems . . . . .	48 x 24 mm
CF 2610. . . . .	LED, 5-decades, 14 mm . . . . .	96 x 24 mm
CF 3011. . . . .	LED, 5-decades, 14 mm . . . . .	96 x 48 mm
CF 5010. . . . .	LED, 5-decades, 25 mm . . . . .	144 x 72 mm
CF 7000. . . . .	LED, 4-decades, 45 mm . . . . .	192 x 72 mm

**Programmable Universalcounter/Frequency Meter/Time Meter**

CM 3001 . . . . .	LED, 6-decades, 14 mm . . . . .	96 x 48 mm
CM 3101 . . . . .	LED, 6-decades, 14 mm, 1MHz . . . . .	96 x 48 mm

**Programmable Instruments for Absolute Encoder with SSI-Interface**

SSI 3025 . . . . .	LED, 6-decades, 14 mm . . . . .	96 x 48 mm
SSI 3005 . . . . .	LED, 6-decades, 14 mm . . . . .	96 x 48 mm

**Group identifier B**

**Programmable Instruments with RS 232-, RS 485- or TTY-Interface**

MT 2511, MT 2512, MT 2513. . . . .	LED, 5-decades, 8 mm. . . . .	48 x 24 mm
MT 2511M, MT 2512M, MT 2513M. . . . .	LED, 5-decades, 8 mm, Mauell-Mosaicsystems . . . . .	48 x 24 mm
MT 2611, MT 2612, MT 2613. . . . .	LED, 5-decades, 14 mm . . . . .	96 x 24 mm
MT 3011, MT 3012, MT 3013. . . . .	LED, 5-decades, 14 mm . . . . .	96 x 48 mm
MT 5011, MT 5012, MT 5013. . . . .	LED, 5-decades, 25 mm . . . . .	144 x 72 mm
MT 7001, MT 7002, MT 7003. . . . .	LED, 4-decades, 45 mm . . . . .	192 x 72 mm

**Programmable Instrument with Parallel Interface**

FA 2510. . . . .	LED, 5-decades, 8 mm. . . . .	48 x 24 mm
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**Panel Meter with Parallel Interface**

T 158 (not programmable) . . . . .	LED, 6-decades, 16 mm . . . . .	96 x 48 mm
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**Instrument with Synchron Serial Interface**

FA 2511. . . . .	LED, 5-decades, 8 mm, D 19 mm . . . . .	48 x 24 mm
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## Group identifier **C**

### LowCost Panel Meters

UM 2701 . . . . . LED, 3½-decades, 14 mm . . . . . 72 x 36 mm

### Programmable Instruments for 0-10 V, 0(4)-20 mA

UM 2500, UM 2510, UM 2550 . . . LED, 4-decades, 8 mm. . . . . 48 x 24 mm  
 UM 2550M . . . . . LED, 4-decades, 8 mm, Mauell-Mosaicsystems. . . 48 x 24 mm  
 UM 2600 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 24 mm  
 UM 2700 . . . . . LED, 4-decades, 14 mm . . . . . 72 x 36 mm  
 UM 3010 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm  
 UM 3011 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm  
 UM 3012 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm  
 UM 3020 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm  
 UM 3022 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm  
 UM 5000 . . . . . LED, 4-decades, 25 mm . . . . . 144 x 72 mm  
 UM 7000 . . . . . LED, 4-decades, 45 mm . . . . . 192 x 72 mm

### LowCost Panel Meters programmable

UM 3300 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm  
 UM 3301 . . . . . LED, 4-decades, 14 mm . . . . . 96 x 48 mm

### Programmable Instrument for Thermocouples and Pt100

TM 2500 . . . . . LED, 4-decades, 8 mm. . . . . 48 x 24 mm

### Programmable Instrument for ±10V, ±20mA, Thermocouples, Pt100

DM 2400 . . . . . LED, 4-decades, 8 mm. . . . . 48 x 48 mm  
 DM 3110 . . . . . LED, 6-decades, 14 mm . . . . . 96 x 48 mm  
 DM 3103 . . . . . LED, 6-decades, 14 mm, Integrator . . . . . 96 x 48 mm  
 DM 3105 . . . . . LED, 6-decades, 14 mm, Differenzmessung . . . . . 96 x 48 mm

### Programmable Instruments for DMS-Sensorics

DM 3002 . . . . . LED, 6-decades, 14 mm . . . . . 96 x 48 mm

### Programmable Instrument for AC-Voltage/AC-Current

DM 3202 . . . . . LED, 6-decades, 14 mm . . . . . 96 x 48 mm

### Power Indicator

UI 354 . . . . . LED, 3 3/4-decades, 16 mm . . . . . 96 x 48 mm  
 UI 357 . . . . . LED, 4-decades, 16 mm . . . . . 96 x 48 mm  
 UI 359 . . . . . LED, 4½-decades, 16 mm . . . . . 96 x 48 mm

## Quick list

		TM 2500	UM 2510	UM 2550 (M)	UM 2600	UM 2701	UM 3010	UM 3011	UM 3012	UM 5000	UM 7000	DM 2400	UM 3020	UM 3022	UM 3300	UM 3301	DM 3002	DM 3103	DM 3105	DM 3110	DM 3202	
<b>Dimensions</b>	48 x 24 mm	x	x	x																		
	48 x 24 mm (Mauell-Raster)			x																		
	48 x 48 mm											x										
	72 x 36 mm					x																
	96 x 24 mm				x																	
	96 x 48 mm						x	x	x				x	x	x	x	x	x	x	x	x	x
	144 x 72 mm									x												
	192 x 72 mm										x											
<b>Current input signal</b>	DC 0 .. 20 mA / 4 .. 20 mA		x	x	x	x	x	x		x	x	x	x	x	x	x		x	x	x		
	DC ± 20 mA											x						x		x		
	DC 0 .. 1 A																				x	
	AC 0 .. 1 A TRMS																					x
<b>Voltage input signal</b>	DC 0 .. 10 V		x	x	x	x	x	x		x	x	x	x	x	x	x		x	x	x		
	DC ± 10 V											x						x		x		
	DC 0 .. 60 mV																				x	
	DC 0 - 500 V																					x
	AC 0 .. 60 mV TRMS																					x
	AC 0 .. 500 V TRMS																					x
<b>DMS input signal</b>	1; 1,5; 2; 3 mV/V																x					
<b>Potentiometer</b>	1K .. 10K								x													
<b>Temperature</b>	Pt100	x						x				x						x		x		
	Thermoelemente	x										x						x		x		
<b>Display range</b>	-999 .. 9999	x		x	x		x	x	x	x	x	x	x	x	x	x						
	-9999 .. 99999		x																			
	-99999 .. 99999																	x	x	x	x	
<b>Numeral height (mm)</b>		8	8	8	14	14	14	14	14	25	45	8	14	14	14	14	14	14	14	14	14	
<b>Power supply</b>	AC 95 .. 250 V													x		x	x	x	x	x	x	
	DC 18 .. 36 V (1)	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	
<b>Sensor supply</b>	DC 9V (Reference voltage)																x					
	DC 24 V/125 mA (1)																	x	x	x		
<b>Standard functions</b>	MAX-value detection	x	x	x	x		x	x	x	x	x		x	x								
	MIN/MAX-value detection											x			x	x	x	x	x	x	x	
	User defined linearisation		x	x	x		x	x	x	x	x	x	x				x	x	x	x	x	
	Integral function																		x			
	Tare function															x	x	x	x	x	x	
	1 Optocouple output				x		x	x	x	x	x		x	x								
	2 Alarm output (relay)										x	x	x					x	x	x	x	
<b>Options</b>	Analog output 10V/20mA																x	x	x	x	x	
	RS 232-Interface (2)																x			x	x	
	RS 485-Interface																x			x	x	
	Current-Loop-Interface (2)																x			x	x	

(1) galvanic isolation

(2) in preparation

Technical Subjects To Change

## Quick list

		CM 2510 (M)	CF 2610	CF 3011	CF 5011	CF 7000	CM 3001	CM 3101	SSI 3005	SSI 3025	MT 251x (M)	MT 261x	MT 301x	MT 501x	MT 700x	FA 2510	FA 2511	T 158
<b>Dimensions</b>	48 x 24 mm	x									x					x	x	
	48 x 24 mm (Mauell-Raster)	x									x							
	72 x 36 mm																	
	96 x 24 mm		x									x						
	96 x 48 mm			x			x	x	x	x			x					x
	144 x 72 mm				x									x				
	192 x 72 mm					x									x			
<b>Input signal</b>	Frequency meter	x	x	x	x	x	x	x										
	Pulse counter	x	x	x	x	x	x	x										
	Time meter	x	x	x	x	x	x	x										
	Incremental A 90° B						x	x										
	Serial, RS 232										x	x	x	x	x			
	Serial, RS 485										x	x	x	x	x		x	
	Serial, Current Loop (TTY)										x	x	x	x	x			
	SSI-Interface								x	x								
	Parallel																x	x
<b>Display range</b>	4-decades					x									x			
	5-decades	x	x	x	x						x	x	x	x		x	x	
	6-decades						x	x	x	x								x
<b>Numeral height (mm)</b>		8	14	14	25	45	14	14	14	14	8	14	14	25	45	8	8	14
<b>Power supply</b>	AC 95 .. 250 V						x	x	x									
	DC 18 .. 36 V (1)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>Sensor supply</b>	DC 24 V/125 mA (1)						x	x	x									
<b>Standard functions</b>	Scaling factor	x	x	x	x	x	x	x	x	x							x	
	Data buffering	x					x	x										
	Offset value	x	x	x	x	x	x	x	x	x							x	
	MIN/MAX-value detection						x	x	x									
	addressable										x	x	x	x	x			
	Display test	x	x	x	x	x	x	x	x		x	x	x	x	x	x		
	Display hold						x	x	x									
	1 Alarm output (Opto.)		x	x								x	x					
	2 Alarm outputs (Relay)				x	x	x	x	x					x	x			
<b>Options</b>	Analog output 10V/20mA						x	x	x									
	RS 232-Interface						x	x	x									
	RS 485-Interface						x	x	x									
	Current-Loop-Interface						x	x	x									

(1) galvanic isolation

Technical Subjects To Change

## ■ Programmable Totalizing Counter Model CM 2510

### Highlights

- LED Display 8 mm, 5 decades
- DIN Housing 48 x 24 mm
- Switchboard- or Mosaic System Mounting
- Data Memory
- Isolated Power Supply
- Plug-In Screw Terminal

### Standard functions

#### Modes

- Time meter with start and stop input
- Puls counter with direction-input
- Cycle duration measurement
- Puls duration measurement
- Frequency measurement up to 10 kHz
- Revolutions per minute
- Hour meter
- Tachometer m/s or km/h

#### Software functions

- Scaling factor 0,001 .. 10,000
- Offset value for count mode
- Count frequency 25 Hz, 7 kHz programmable
- Programmable decimal point
- Autoranging
- Last digit: 1, 2, 5 or 10 steps
- Display test

#### Digital input channels

The instrument is provided with four digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test

#### Data memory

In addition to the modes pulse counter and hour meter a data memory is effective. When the power is switched off the actual display value will be stored and will be available after the power is switched on again.

#### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated



### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### Housing type

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### Colour of the front frame

- Black
- Grey coloured RAL 7037
- Grey coloured RAL 7032
- Grey coloured RAL 7035

#### Design of the front

- Without front foil
- Front foil ALU
- Front foil RAL 7032
- Front foil RAL 7035
- Unit overprint

#### Display colour

- Red
- Green

**Technical data**

Display : 5 decades, 8 mm, red (opt. green)  
 Display range : -9999 .. 99999

Measuring ranges:  
 Time meter : 10 ms .. 9999,9 s  
 Pulse counter  $f_{max}$  : 25 Hz, 7 kHz programmable  
 Period duration : 10 ms .. 9999,9 s  
 Pulse duration : 10 ms .. 9999,9 s  
 Frequency : 0,6 Hz .. 9,999 kHz  
 Revolution : 42 .. 9999 U/min  
 Hour meter : 0,02 h .. 9999,9 h  
 Tachometer:  
 Resolution : 0,01 m/s or 0,1 km/h  
 Distance : 1 m fix or variable prog.

Digital input channels:  
 Low level : < 0,4 V  
 High level : > 3,5 V, max. 30 V  
 Input resistance:  
 Input 1-4 : 10 k $\Omega$  to +5V  
 Input 5 : 10 k $\Omega$  to GND

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC,  $\pm$  10 %, isolated  
 optional : 5 V DC,  $\pm$  10 %, isolated

Power consumption : approx. 30 mA (red)  
 (18 .. 36 V DC) : approx. 40 mA (green)

Housing : switch board mounting DIN 43700  
 Dimensions : 48 x 24 x 60 mm  
 Depth : < 70 mm incl. screw terminal  
 Protection : front IP 40

EMV : EMV-conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C

**Ordering information**

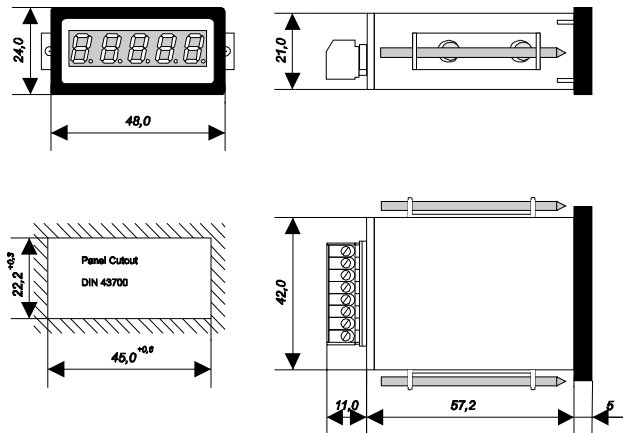
<b>CM 2510 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	1 Grey coloured RAL 7037
	2 Grey coloured RAL 7032
	3 Grey coloured RAL 7035
	<b>Front design</b>
	0 Without front foil
	1 Front foil ALU eloxiert
	2 Front foil RAL 7032
	3 Front foil RAL 7035
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm$ 10%, isolated
	1 12 V DC, $\pm$ 10 %, isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

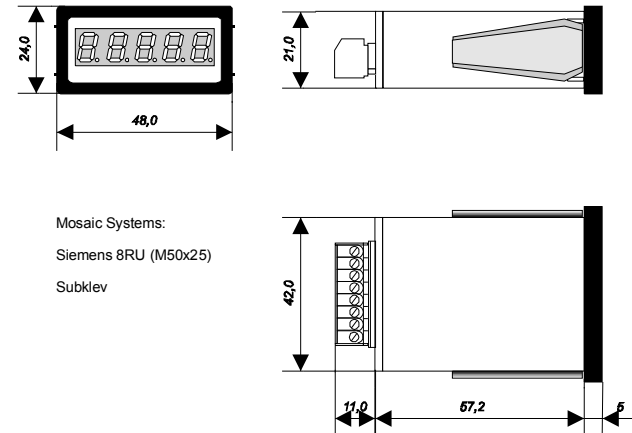
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**





## ■ Programmable Totalizing Counter Model CM 2510M

### Highlights

- LED Display 8 mm, 5 decades
- Housing for Mauell-Mosaic-Systems M 24 T, M 24 MK and MK 24x48
- Data Memory
- Isolated Power Supply
- Plug-In Screw Terminal

### Standard functions

#### Modes

- Time meter with start and stop input
- Puls counter with direction-input
- Cycle duration measurement
- Puls duration measurement
- Frequency measurement up to 10 kHz
- Revolutions per minute
- Hour meter
- Tachometer m/s or km/h

#### Software functions

- Scaling factor 0,001 .. 10,000
- Offset value for count mode
- Count frequency 25 Hz, 7 kHz programmable
- Programmable decimal point
- Autoranging
- Last digit: 1, 2, 5 or 10 steps
- Display test

#### Digital input channels

The instrument is provided with four digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test

#### Data memory

In addition to the modes pulse counter and hour meter a data memory is effective. When the power is switched off the actual display value will be stored and will be available after the power is switched on again.

#### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated



### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### Housing type

- Mauell-Mosaic-Systems M 24 T, M 24 MK and MK 24x48

#### Colour of the front frame

- Black
- Grey coloured RAL 7037
- Grey coloured RAL 7032
- Grey coloured RAL 7035

#### Design of the front

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

#### Display colour

- Red
- Green

## Technical data

Display : 5 decades, 8 mm, red (opt. green)  
 Display range : -9999 .. 99999

**Measuring ranges:**

Time meter : 10 ms .. 9999,9 s  
 Pulse counter  $f_{max}$  : 25 Hz, 7 kHz programmable  
 Period duration : 10 ms .. 9999,9 s  
 Pulse duration : 10 ms .. 9999,9 s  
 Frequency : 0,6 Hz .. 9,999 kHz  
 Revolution : 42 .. 9999 U/min  
 Hour meter : 0,02 h .. 9999,9 h  
 Tachometer:  
 Resolution : 0,01 m/s or 0,1 km/h  
 Distance : 1 m fix or variable prog.

**Digital input channels:**

Low level : < 0,4 V  
 High level : > 3,5 V, max. 30 V

**Input resistance:**

Input 1-4 : 10 k $\Omega$  to +5V  
 Input 5 : 10 k $\Omega$  to GND

**Power supply DC**

optional : 18 V to 36 V DC, isolated  
 optional : 12 V DC,  $\pm$  10 %, isolated  
 optional : 5 V DC,  $\pm$  10 %, isolated

**Power consumption**  
 (18 .. 36 V DC)

: approx. 30 mA (red)  
 : approx. 43 mA (green)

**Housing**

: Mauell-Mosaic-Systems  
 M 24 T, M 24 MK, MK 24x48

**Dimensions**

: 48 x 24 x 86,5 mm

**Depth**

: < 95 mm incl. screw terminal

**Protection**

: front IP 40

**EMV**

: EMV-conform with 89/336/EWG

**Operating temperature**

: 0 .. 50 °C

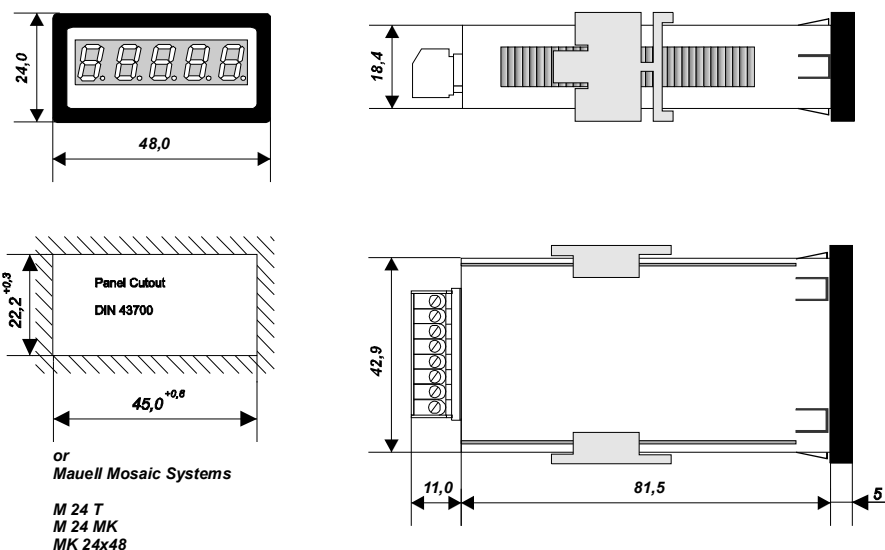
## Ordering information

<b>CM 2510M -</b>	
	<b>Housing</b>
	0 Mauell-Mosaic-Systems
	<b>Front frame colour</b>
	0 Black
	1 Grey coloured RAL 7037
	2 Grey coloured RAL 7032
	3 Grey coloured RAL 7035
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm$ 10%, isolated
	1 12 V DC, $\pm$ 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

Please specify in clear text at order !

## Dimensions



## ■ Programmable Totalizing Counter Model CF 2610

### Highlights

- LED Display 14 mm, 5 decades
- DIN Housing 96 x 24 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- Limit Value Output (Optocoupler)

### Standard functions

#### Modes

- Time meter with start and stop-input
- Pulse counter with direction-input
- Cycle duration measurement
- Pulse duration measurement
- Frequency measurement up to 10 kHz
- Revolution per minute
- Hour meter
- Tachometer in m/s or km/h

#### Software functions

- Scaling factor 0,001 .. 9,999
- Offset value for count mode
- Count frequency 25 Hz, 7 kHz programmable
- Programmable decimal point
- Autoranging
- Last digit in 1, 2, 5 or 10 steps
- Display test
- Limiting value functions

#### Digital input channels

The instrument is provided with four digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test

#### Limiting value output (optocouple)

The instrument is provided with a optocouple output for limiting value indication. Following functions can be programmed:

- Alarm point and hysteresis
- High or low alarm



#### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### Options

##### Housing

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

##### Colour of the front frame

- Black

##### Design of the front

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

##### Display colour

- Red
- Green

## Technical data

Display	: 5 decades, 14 mm, red (opt. green)
Display range	: -9999 .. 99999
Measuring ranges:	
Time meter	: 10 ms .. 9999,9 s
Pulse counter $f_{max}$	: 25 Hz, 7 kHz programmable
Cycle duration	: 10 ms .. 9999,9 s
Pulse duration	: 10 ms .. 9999,9 s
Frequency	: 0,6 Hz .. 9,999 kHz
Revolution	: 42 .. 9999 U/min
Hour meter	: 0,02 h .. 9999,9 h
Tochometer:	
Resolution	: 0,01 m/s or 0,1 km/h
Distance	: 1 m fix or variable
Digital input channels	
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Input resistance:	
Input 3-6	: 10 k $\Omega$ to +5V
Input 7	: 10 k $\Omega$ to GND
Limit value output	: optocoupler : max. 10 mA, 70 V, max. 150 mW
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, $\pm$ 10 %, isolated
optional	: 5 V DC, $\pm$ 10 %, isolated
Power consumption	: approx. 65 mA (red)
(18 .. 36 V DC)	: approx. 75 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 96 x 24 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

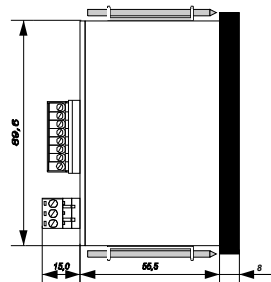
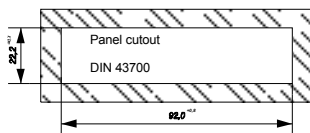
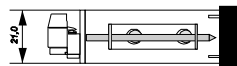
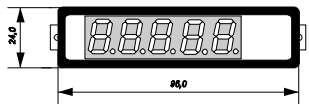
<b>CF 2610 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm$ 10%, isolated
	1 12 V DC, $\pm$ 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

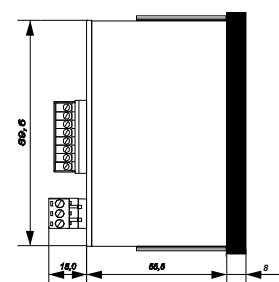
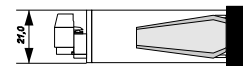
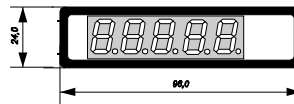
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subkleb

## ■ Programmable Totalizing Counter Model CF 3011

### Highlights

- LED Display 14 mm, 5 decades
- DIN Housing 96 x 48 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- Limit Value Output (Optocoupler)

### Standard functions

#### Modes

- Time meter with start and stop-input
- Pulse counter with direction-input
- Cycle duration measurement
- Pulse duration measurement
- Frequency measurement up to 10 kHz
- Revolution per minute
- Hour meter
- Tachometer in m/s or km/h

#### Software functions

- Scaling factor 0,001 .. 10,000
- Offset value for count mode
- Count frequency 25 Hz, 7 kHz programmable
- Programmable decimal point
- Autoranging
- Last digit in 1, 2, 5 or 10 steps
- Display test
- Limiting value functions

#### Digital input channels

The instrument is provided with four digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test

#### Limiting value output (optocouple)

The instrument is provided with a optocouple output for limiting value indication. Following functions can be programmed:

- Alarm point and hysteresis
- High or low alarm



#### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### Options

##### Housing

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

##### Colour of the front frame

- Black

##### Design of the front

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

##### Display colour

- Red
- Green

## Technical data

Display	: 5 decades, 14 mm, red (opt. green)
Display range	: -9999 .. 99999
Measuring ranges:	
Time meter	: 10 ms .. 9999,9 s
Pulse counter $f_{max}$	: 25 Hz, 7 kHz programmable
Cycle duration	: 10 ms .. 9999,9 s
Pulse duration	: 10 ms .. 9999,9 s
Frequency	: 0,6 Hz .. 9,999 kHz
Revolution	: 42 .. 9999 U/min
Hour meter	: 0,02 h .. 9999,9 h
Tochometer:	
Resolution	: 0,01 m/s or 0,1 km/h
Distance	: 1 m fix or variable
Digital input channels	
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Input resistance:	
Input 3-6	: 10 k $\Omega$ to +5V
Input 7	: 10 k $\Omega$ to GND
Limit value output	: optocoupler : max. 10 mA, 70 V, max. 150 mW
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, $\pm$ 10 %, isolated
optional	: 5 V DC, $\pm$ 10 %, isolated
Power consumption	: approx. 65 mA (red)
(18 .. 36 V DC)	: approx. 75 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 96 x 48 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

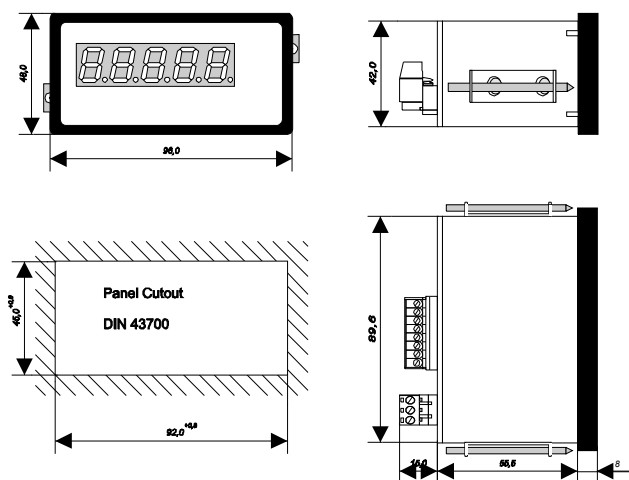
<b>CF 3011 -</b>	
	<b>Housing</b>
0	Switch board mount
1	Panel clip
	<b>Front frame colour</b>
0	Black
	<b>Front design</b>
0	Without front foil
1	Front foil ERMA-METER
2	Front foil NEUTRAL
	<b>Display colour</b>
0	Red
1	Green
	<b>Power supply</b>
0	5 V DC, $\pm$ 10%, isolated
1	12 V DC, $\pm$ 10 %, isolated
2	18 .. 36 V DC, isolated

## Unit overprint

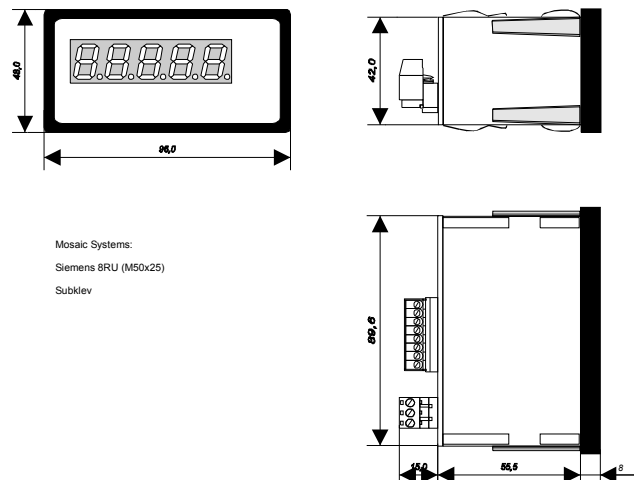
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens BRU (M50x25)  
Subkleb

## ■ Programmable Totalizing Counter Model CF 5010

### Highlights

- LED Display 25 mm, 5 decades
- DIN Housing 144 x 72 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- 2 Alarm Relay Outputs

### Standard functions

#### Modes

- Time meter with start and stop-input
- Pulse counter with direction-input
- Cycle duration measurement
- Pulse duration measurement
- Frequency measurement up to 10 kHz
- Revolution per minute
- Hour meter
- Tachometer in m/s or km/h

#### Software functions

- Scaling factor 0,001 .. 10,000
- Offset value for count mode
- Count frequency 25 Hz, 7 kHz programmable
- Programmable decimal point
- Autoranging
- Last digit in 1, 2, 5 or 10 steps
- Display test
- Limiting value functions

#### Digital input channels

The instrument is provided with four digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test

#### Alarm relay outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarm



#### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### Options

##### Housing

- Switch board mounting DIN 43700
- Mosaic system mounting (Siemens 8RU)

##### Colour of the front frame

- Black

##### Design of the front

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

##### Display colour

- Red
- Green

## Technical data

Display	: 5 decades, 25 mm, red (opt. green)
Display range	: -9999 .. 99999
Measuring ranges:	
Time meter	: 10 ms .. 9999,9 s
Pulse counter $f_{max}$	: 25 Hz, 7 kHz programmable
Cycle duration	: 10 ms .. 9999,9 s
Pulse duration	: 10 ms .. 9999,9 s
Frequency	: 0,6 Hz .. 9,999 kHz
Revolution	: 42 .. 9999 U/min
Hour meter	: 0,02 h .. 9999,9 h
Tochometer:	
Resolution	: 0,01 m/s or 0,1 km/h
Distance	: 1 m fix or variable
Digital input channels	
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Input resistance:	
Input 3-6	: 10 k $\Omega$ to +5V
Input 7	: 10 k $\Omega$ to GND
Limit value (relays)	: AC max. 5 A, max. 250 V, 1250 VA
	: DC max. 5 A, max. 250 V, 100 W
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, $\pm$ 10 %, isolated
optional	: 5 V DC, $\pm$ 10 %, isolated
Power consumption	: approx. 65 mA (red)
(18 .. 36 V DC)	: approx. 75 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 144 x 72 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

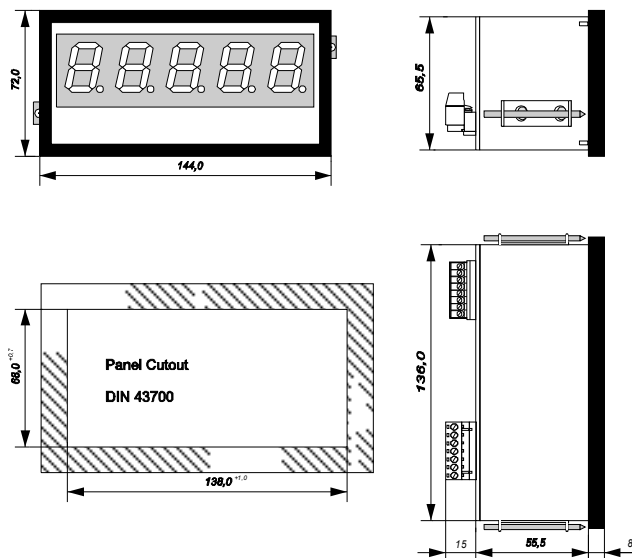
<b>CF 5010 -</b>					
				<b>Housing</b>	
				0	Switch board mount
				1	Panel clip
				<b>Front frame colour</b>	
				0	Black
				<b>Front design</b>	
				0	Without front foil
				1	Front foil ERMA-METER
				2	Front foil NEUTRAL
				<b>Display colour</b>	
				0	Red
				1	Green
				<b>Power supply</b>	
				0	5 V DC, $\pm$ 10%, isolated
				1	12 V DC, $\pm$ 10 %, isolated
				2	18 .. 36 V DC, isolated

## Unit overprint

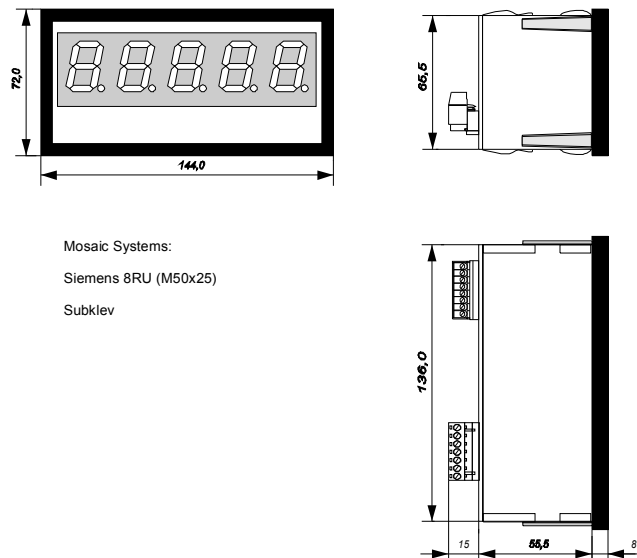
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subklev



## ■ Programmable Totalizing Counter Model CF 7000

### Highlights

- LED Display 45 mm, 4 decades
- DIN Housing 192 x 72 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- 2 Alarm Relay Outputs

### Standard functions

#### Modes

- Time meter with start and stop-input
- Pulse counter with direction-input
- Cycle duration measurement
- Pulse duration measurement
- Frequency measurement up to 10 kHz
- Revolution per minute
- Hour meter
- Tachometer in m/s or km/h

#### Software functions

- Scaling factor 0,001 .. 10,000
- Offset value for count mode
- Count frequency 25 Hz, 7 kHz programmable
- Programmable decimal point
- Autoranging
- Last digit in 1, 2, 5 or 10 steps
- Display test
- Limiting value functions

#### Digital input channels

The instrument is provided with four digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test

#### Alarm relay outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarm



#### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### Options

##### Housing

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev)

##### Colour of the front frame

- Black

##### Display colour

- Red

**Technical data**

Display : 4 decades, 45 mm, red  
 Display range :-999 .. 9999

Measuring ranges:  
 Time meter : 10 ms .. 999,9 s  
 Pulse counter f<sub>max</sub> : 25 Hz, 7 kHz programmable  
 Cycle duration : 10 ms .. 999,9 s  
 Pulse duration : 10 ms .. 999,9 s  
 Frequency : 0,6 Hz .. 9,999 kHz  
 Revolution : 42 .. 9999 U/min  
 Hour meter : 0,02 h .. 999,9 h  
 Tochometer:  
 Resolution : 0,01 m/s or 0,1 km/h  
 Distance : 1 m fix or variable

Digital input channels  
 Low level : < 0,4 V  
 High level : > 3,5 V, max. 30 V  
 Input resistance:  
 Input 3-6 : 10 kΩ to +5V  
 Input 7 : 10 kΩ to GND

Limit value (relays) : AC max. 5 A, max. 250 V, 1250 VA  
 : DC max. 5 A, max. 250 V, 100 W

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC, ± 10 %, isolated  
 optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 70 mA (red)  
 (18 .. 36 V DC)

Housing : switch board mounting DIN 43700  
 Dimensions : 192 x 72 x 63,5 mm  
 Depth : < 72 mm incl. screw terminal  
 Protection : front IP 40

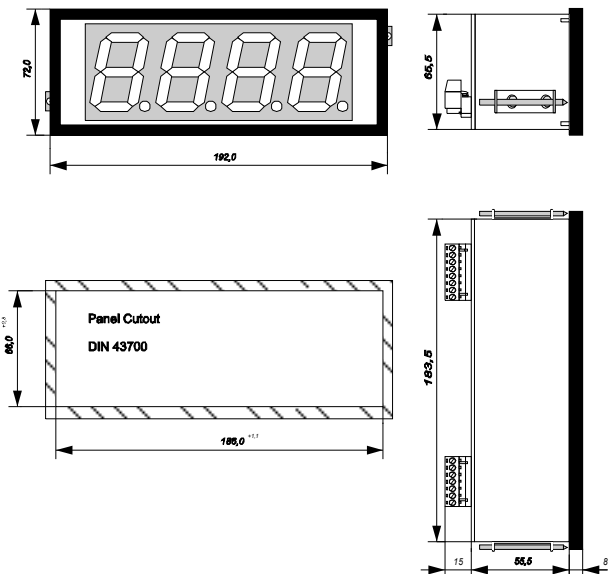
EMV : in conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C

**Ordering information**

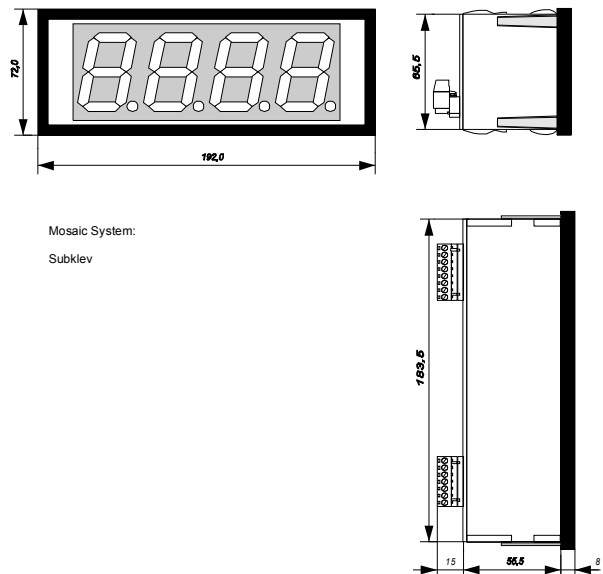
<b>CF 7000 -</b>	
	<b>Housing</b>
<b>0</b>	Switch board mount
<b>1</b>	Panel clip
<b>Front frame colour</b>	
<b>0</b>	Black
<b>Front design</b>	
<b>0</b>	Without front foil
<b>Display colour</b>	
<b>0</b>	Red
<b>Power supply</b>	
<b>0</b>	5 V DC, ± 10%, isolated
<b>1</b>	12 V DC, ± 10 %, isolated
<b>2</b>	18 .. 36 V DC, isolated

**Dimensions**

**Switch board mounting**



**Panel clip**



## ■ Programmable Universal Counter Model CM 3001

### **Characteristics**

- LED-Display, red, 6 decades, 14 mm
- Display range -99999 .. 999999
- DIN Housing 96 x 48 mm
- Operating mode programmable
- Data storage at power fail
- Accessory power supply for the encoder
- 2 alarm relay, analog output, interface
- Plug-In screw terminal

### **Modes**

- Incremental A 90° B x 1  
A 90° B x 2, A 90° B x 4
- UP/DOWN + Direction
- Puls counter A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Frequency-/Rotation speed measurement A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Cycle duration measurement
- Pulse duration measurement
- Time meter about Start/Stop

### **Software functions**

The universal counter is equipped with following functions:

- Scaling factor 0,00001 .. 9,99999
- programmable offset value
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Displaytest and displayhold
- Setting of alarm points during measurement

### **Signal inputs**

The signal inputs are programmable to several encoder output logic:

- PNP- or NPN-Logic
- 5 V (TTL), 12 V or 24 V signal level
- 25 Hz signal input filter

### **Push buttons at the front**

The three push buttons could be programmed to following functions:

- No function
- Resetting Measured value or MIN/MAX value
- Displaying Measured-, MIN- or MAX-Value
- Manual alarm point reset
- Displaying and setting of alarm points



### **Digital Input Channel**

These both input are low active and could be programmed to following functions:

- No function
- Resetting Measured- or MIN/MAX-value
- Displaying Measured-, MIN- or MAX-value
- Manual alarm point reset
- Displayhold or displaytest

### **Accessory power supply (only at AC-Version)**

Built-in power supply for encoders, 24 V DC/125 mA, isolated to the further electronic.

### **Alarm outputs**

Two (Four at option) programmable alarm outputs with free allocation allows the monitoring of production operation. Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm response time (Fall off and put on time)
- Data source (Measured-, Hold-, MIN- or MAX-value)

### **Option analog output**

The option analog output is provided with a current output and a voltage output. Both output are isolated from the further electronic.

- To scale (offset and final value)
- Output 0(2) - 10 V or 0(4) - 20 mA
- Data source (Measured-, Hold-, MIN- or MAX-value)

### **Optionen serial interfaces**

Addition to data communication or to a printer

- RS 485
- RS 232 (analog output not possible)
- Current-Loop, TTY (analog output not possible)

**Elektrical Datas**

Counter incremental	counter steps 24 Bit
Count frequency	max. 4,5 kHz
UP/DOWN-counter + direction	counter steps
24 Bit	
count frequency	max. 10 kHz
Puls counter	counter steps 24 Bit
Count frequency	max. 10 kHz
Frequency/rotation speed	
1-channel mode	max. 20 kHz
Resolution	0,01 Hz auto., 0,1 Hz, 1 Hz
2-channel mode	max. 10 kHz
Resolution	1 Hz
Cycle duration	0,0001 s .. 999999 s
Pulse duration	0,0001 s .. 999999 s
Time meter	0,0001 s .. 999999 s
or	00.00.00 h .. 99.59.59 h
Accuracy	
Frequency measurings	< 0,01 %
Time measurings	< 0,02 %
Update rate	
Counter modes	60 ms
Frequency-/Time meter	100 ms
Signal input filter	25 Hz programmable
Data storage	> 10 years (NOVRAM)
Signal inputs	4, input A, B, Reset, Tor
Logic	PNP-, NPN
Signal level	5 V (TTL), 12 V, 24 V
Digital user inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	2 (4) Relays (programmable as
	opened contacte or closed contact)
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Analog output	resolution 16 bit
Accuracy	± 0,2% of final valuet
Nonlinearity	± 0,012 %
Voltage	0(2) - 10 V, max. 10 mA
Current	0(4) - 20 mA; max. 500 Ω
Isolation voltage	3 kV / 1 min
Interfaces	RS 485, RS 232, TTY
Protocol	DIN 66 019 / ISO 1745
Isolation voltage	1,6 kV / 1 min
Power supply voltage AC	95 V to 250 V/AC
Isolation voltage	2,5 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	AC 9 VA, DC 70 mA
Accessory power supply	24 V DC / 125 mA (only at AC)
Isolation voltage	500 V / 1 min

**Mechanical Datas**

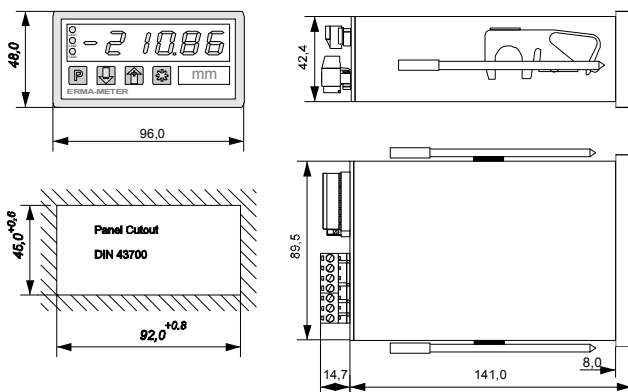
Display	6 decades, 14 mm, red
	Decimal point programmable
	preliminary zero suppression
	- sign at negative values
Operation, keyboard design	front membrane with push buttons
Case	switch board mounting DIN 43700
Dimensions (B x H x T)	96 x 48 x 141 mm
Depth	148 mm incl. screw terminal
Mounting	switch board mounting or
	mosaic-systems
Weight	ca. 400 g
Connection	Plug-In screw terminal
<b>Environmental conditions</b>	
Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 54
Field of application	class 2, overvoltage protection II
CE	in conform with 89/336/EWG
	NSR 73/23/EWG

**Ordering information**

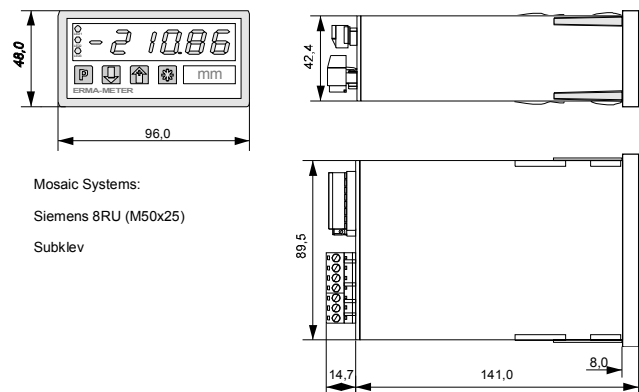
<b>CM 3001-</b>					
				<b>Housing type</b>	
				0 Switch board	
				1 Panel-Clip	
				<b>Front frame colour</b>	
				0 black	
				<b>Front design</b>	
				0 ERMA-Meter Logo	
				1 No Logo	
				2 Customer defined Logo	
				<b>Power supply</b>	
				0 95 .. 250 V/AC	
				1 18 .. 36 V/DC, isolated	
				<b>Option interface</b>	
				0 No interface	
				1 Interface RS 485	
				0 2 Interface RS 232	
				0 3 Interface Current-Loop, TTY	
				<b>Options</b>	
				0 No options	
				1 With analog output	
				4 in addition two alarm outputs	

**Dimensions and Mounting**

**Switch board mounting**



**Panel-Clip**



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subkleb

## ■ Programmable Universal Counter Model CM 3101 up to 1 MHz

### **Characteristics**

- LED-Display, red, 6 decades, 14 mm
- Display range -99999 .. 999999
- DIN Housing 96 x 48 mm
- Operating mode programmable
- Data storage at power fail
- Accessory power supply for the encoder
- 2 alarm relay, analog output, interface
- Plug-In screw terminal



### **Modes**

- Incremental A 90° B x 1  
A 90° B x 2, A 90° B x 4
- UP/DOWN + Direction
- Puls counter A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Frequency-/Rotation speed measurement A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Cycle duration measurement
- Pulse duration measurement
- Time meter about Start/Stop

### **Software functions**

The universal counter is equipped with following functions:

- Scaling factor 0,00001 .. 9,99999
- programmable offset value
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Displaytest and displayhold
- Setting of alarm points during measurement

### **Signal inputs**

The signal inputs are programmable to several encoder output logic:

- PNP- or NPN-Logic
- 5 V (TTL), 12 V or 24 V signal level
- 25 Hz signal input filter

### **Push buttons at the front**

The three push buttons could be programmed to following functions:

- No function
- Resetting Measured value or MIN/MAX value
- Displaying Measured-, MIN- or MAX-Value
- Manual alarm point reset
- Displaying and setting of alarm points

### **Digital Input Channel**

These both input are low active and could be programmed to following functions:

- No function
- Resetting Measured- or MIN/MAX-value
- Displaying Measured-, MIN- or MAX-value
- Manual alarm point reset
- Displayhold or displaytest

### **Accessory power supply (only at AC-Version)**

Build in power supply for encoders, 24 V DC/125 mA, isolated to the further electronic.

### **Alarm outputs**

Two (Four at option) programmable alarm outputs with free allocation allows the monitoring of production operation.

Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm response time (Fall off and put on time)
- Data source (Measured-, Hold-, MIN- or MAX-value)

### **Option analog output**

The option analog output is provided with a current output and a voltage output. Both output are isolated from the further electronic.

- To scale (offset and final value)
- Output 0(2) - 10 V or 0(4) - 20 mA
- Data source (Measured-, Hold-, MIN- or MAX-value)

### **Optionen serial interfaces**

Addition to data communication or to a printer

- RS 485
- RS 232 (analog output not possible)
- Current-Loop, TTY (analog output not possible)

## Elektrical Datas

Counter incremental	counter steps 24 Bit
Count frequency	max. 1 MHz
UP/DOWN-counter + direction	counter steps
24 Bit	
count frequency	max. 1 MHz
Puls counter	counter steps 24 Bit
Count frequency	max. 1 MHz
Frequency/rotation speed	
1-channel mode	max. 1 MHz
Resolution	0,01 Hz auto., 0,1 Hz, 1 Hz
2-channel mode	max. 1 MHz
Resolution	1 Hz
Cycle duration	0,0001 s .. 66 s
Pulse duration	0,0001 s .. 66 s
Time meter	0,0001 s .. 999999 s
or	00.00.00 h .. 99.59.59 h
Accuracy	
Frequency measurings	< 0,01 %
Time measurings	< 0,02 %
Update rate	
Counter modes	60 ms
Frequency-/Time meter	100 ms
Signal input filter	25 Hz programmable
Data storage	> 10 years (NOVRAM)
Signal inputs	4, input A, B, Reset, Tor
Logic	PNP-, NPN
Signal level	5 V (TTL), 12 V, 24 V
Digital user inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	2 (4) Relays (programmable as
	opened contacte or closed contact)
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Analog output	resolution 16 bit
Accuracy	± 0,2% of final valuet
Nonlinearity	± 0,012 %
Voltage	0(2) - 10 V, max. 10 mA
Current	0(4) - 20 mA; max. 500 Ω
Isolation voltage	3 kV / 1 min
Interfaces	RS 485, RS 232, TTY
Protocol	DIN 66 019 / ISO 1745
Isolation voltage	1,6 kV / 1 min
Power supply voltage AC	95 V to 250 V/AC
Isolation voltage	2,5 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	AC 9 VA, DC 70 mA
Accessory power supply	24 V DC / 125 mA (only at AC)
Isolation voltage	500 V / 1 min

## Mechanical Datas

Display	6 decades, 14 mm, red Decimal point programmable preliminary zero suppression - sign at negative values
Operation, keyboard design	front membrane with push buttons
Case	switch board mounting DIN 43700
Dimensions (B x H x T)	96 x 48 x 141 mm
Depth	148 mm incl. screw terminal
Mounting	switch board mounting or mosaic-systems
Weight	ca. 400 g
Connection	Plug-In screw terminal

## Environmental conditions

Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 54
Field of application	class 2, overvoltage protection II

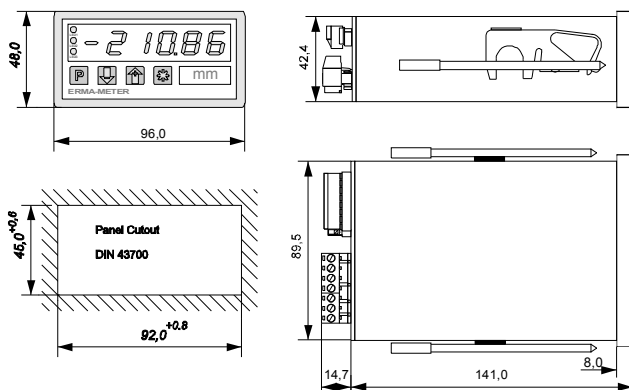
CE in conform with 89/336/EWG  
NSR 73/23/EWG

## Ordering information

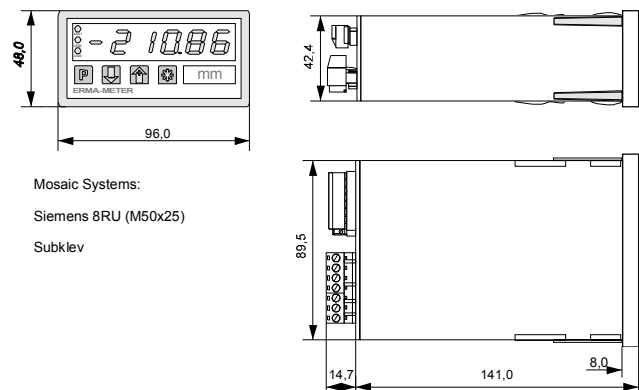
<b>CM 3101-</b>					
					<b>Housing type</b>
					0 Switch board
					1 Panel-Clip
					<b>Front frame colour</b>
					0 black
					<b>Front design</b>
					0 ERMA-Meter Logo
					1 No Logo
					2 Customer defined Logo
					<b>Power supply</b>
					0 95 .. 250 V/AC
					1 18 .. 36 V/DC, isolated
					<b>Option interface</b>
					0 No interface
					1 Interface RS 485
					0 2 Interface RS 232
					0 3 Interface Current-Loop, TTY
					<b>Options</b>
					0 No options
					1 With analog output
					4 in addition two alarm outputs

## Dimensions and Mounting

### Switch board mounting



### Panel-Clip



■ **SSI 3025 Digital display for SSI signals**

**Characteristics**

- Input Synchron Serial Interface SSI
- Up to 1 MHz clock frequency
- Master/Slave-Mode
- LED-Display, red, 6 decades, 14 mm
- Display range -99999 .. 999999
- Free scaling and zero definition
- DIN Standard Case 96 x 48 mm
- Small Depth (70 mm)

**Parameters of encoder**

- Binary or gray code
- Resolution of the encoder
- Singelturm/Multiturn
- Direction of rotation
- Master/Slave-Mode  
Master: clock is generated internally  
Slave: clock is generated by an external instrument

**SSI signal inputs**

- Data input, receiver RS 422/485
- Clock output, driver RS 422/485
- Clock input, receiver RS 422/485

**Software functions**

- Adjustable for encoder with 9-32 bits
- Bit programming for fir-tree data format
- Scalingfactor
- Zero point adjustment with or without sign
- Decimal point setting
- Offset value
- programmable push button:  
the \* -button can be programmed to zero-setting functions

**Ordering Informations**

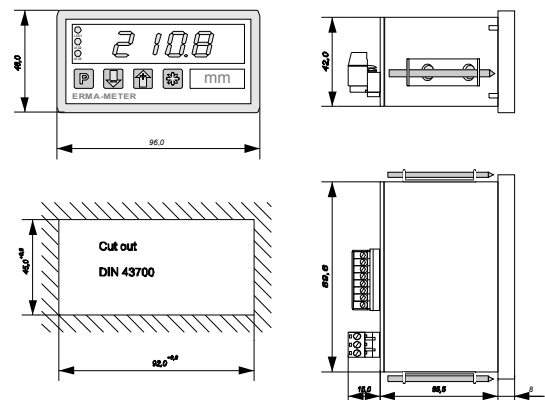
<b>SSI 3025 -</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Housing</b>			
	0	switch board mounting	
	1	panel-clip mounting	
<b>Reserved</b>			
<b>Front design</b>			
	0	reserved	
	1	ERMA-Meter Logo	
	2	no Logo	
	3	customer defined Logo	
<b>Reserved</b>			
<b>Power supply</b>			
	0	5 V DC, 10 % (isolated)	
	1	12 V DC, 10 % (isolated)	
	2	18 bis 36 V DC (isolated)	



**Specifications**

SSI signal input	: singleturn or multiturn
Resolution	: 9 .. 32 bit
Code	: binary or gray
Data input	: receiver RS 422/485
Clock input	: receiver RS 422/485
Clock output	: driver RS 422/485
Master mode	
Clock frequency	: 1 MHz, 500 kHz, 200 kHz, 100 kHz
Conversion rate	: approx. 80 values per sec
Slave mode	
Clock frequency	: extern, 500 kHz, 200 kHz, 100 kHz
Conversion rate	: approx. 80 values per sec
Pause	: 500 µs
Power supply voltage	: 18 .. 36 V DC, max 50 mA
optional	: 12 V DC, ± 10 %, max. 100 mA
optional	: 5 V DC, ± 10 %, max. 200 mA
Isolation voltage	: 500 V / 1 min
Display	: 6 decades, 14 mm, red Decimal point programm. preliminary zero suppress. - sign at negative values
Operation, keyboard design	: front membrane with push buttons
Case	: DIN 43700
Dimensions	: 96 x 48 x 65 mm
Depth	: 72 mm incl. screw terminal
Mounting	: panel mounting or mosaic-system
Weight	: ca. 200 g
Connection	: Plug-In screw terminal
Operating temperature	: 0 .. 50 °C
Storage temperature	: -20 .. 70 °C
Humidity	: < 80 %, not-condensing
Protection	: protective class II
Front protection	: IP 54
Field of application	: class 2, overvoltage protect.
CE	: in conform w. 89/336/EWG

**Dimensions**



## ■ SSI 3005 Display for encoders with SSI interface



### **Characteristics**

- Input Synchron Serial Interface SSI
- Master/Slave-Mode
- Up to 1 MHz clock frequency
- LED-Display, red, 6 decades, 14 mm
- Display range -99999 .. 999999
- DIN Standard Case 96 x 48 mm
- Free scaling and zero definition
- Sensor supply
- 2 Alarm relays
- Plug-In screw Terminals

### **Encoder control**

- Binary or gray code
- Singelturm/Multiturn
- Direction of rotation
- Master/Slave-Mode
  - Master: clock for reading data of the encoder is generated internal
  - Slave: clock for reading data of the encoder is generated by an external device

### **SSI signal inputs**

- Data input, receiver RS 422/485
- Clock output, driver RS 422/485
- Clock input, receiver RS 422/485

### **Software functions**

- Encoder adjustments
- Adjustable for encoder with 9-32 bits
- Bit programming for fir-tree data format
- Scaling factor
- Zero point adjustment
- Direction of rotation
- Offset value
- Incremental measurement
- Display test and display hold (Latch)
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Set point editing during normal measurement

### **Push button at the front**

The three push buttons could be programmed to following functions:

- No function
- Displaying Encoder data, MIN or MAX value
- Resetting the MIN/MAX value
- Zero adjustment
- Reset zero adjustment
- Manual alarm reset
- Display test and display hold



### **Digital input channels**

These both input are low active and could be programmed to following functions:

- No function
- Displaying Encoder data, MIN or MAX value
- Resetting the MIN/MAX value
- Zero adjustment
- Reset zero adjustment
- Manual alarm reset
- Change of the displayed value: encoder value -> Max. value -> Min. value
- Display test and display hold

### **Accessory power supply (only at AC version)**

Built-in power supply for encoders, 24 V DC/125 mA, isolated from the device electronic.

### **Alarm outputs**

Two (Four as option \*) free programmable relay alarm outputs. Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm response time (fall off and put on time)
- Data source: direct encoder, MIN or MAX value

### **Option analog output**

The option analog output provides a current and a voltage output. Both outputs are isolated from the device electronic.

- scalable (offset and final value)
- Outputs 0(2) - 10 V or 0(4) - 20 mA
- Programmable to different data sources: encoder value, MIN value or MAX value

### **Option serial interface**

For data communication or printing.

- RS 485
- RS 232 \*
- Current-Loop, TTY \*

\* with RS232, Current-Loop resp. TTY and four alarm outputs the analogue output option is not possible.



**Electrical Data**

SSI signal input	singleturn or multiturn
Resolution	9 .. 31 bit
Code	binary or gray
Data input	receiver RS 422/485
Clock input	receiver RS 422/485
Clock output	driver RS 422/485
Master mode	
Clock frequency	internal 1 MHz, 500 kHz, 200 kHz or 100 kHz
Conversion rate	approx. 28 values per sec
Slave mode	
Clock frequency	extern, max. 500 kHz
Conversion rate	approx. 28 values per sec
Digital inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	2 (4) Relays (programmable as normally opened or normally closed
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Analog output	resolution 16 bit
Accuracy	± 0,2% of final value
Voltage	0(2) - 10 V, max. 10 mA
Current	0(4) - 20 mA; max. 500 Ω
Isolation voltage	3 kV / 1 min
Interfaces	RS 485, RS 232, TTY
Protocol	DIN 66 019 / ISO 1745
Isolation voltage	1,6 kV / 1 min
Power supply voltage AC	95 V to 250 V/AC
Isolation voltage	2,5 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	AC 9 VA, DC 70 mA
Accessory power supply AC)	24 V DC / 125 mA (only at AC)
Isolation voltage	500 V / 1 min
Mechanical Datas	
Display	6 decades, 14 mm, red Decimal point programmable preliminary zero suppression - sign at negative values front membrane with push
Operation, keyboard design buttons	
Case	switch board mounting DIN
43700	
Dimensions (B x H x T)	96 x 48 x 141 mm
Depth	148 mm incl. screw terminal
Mounting	switch board mounting or mosaic-systems
Weight	ca. 400 g
Connection	Plug-In screw terminal

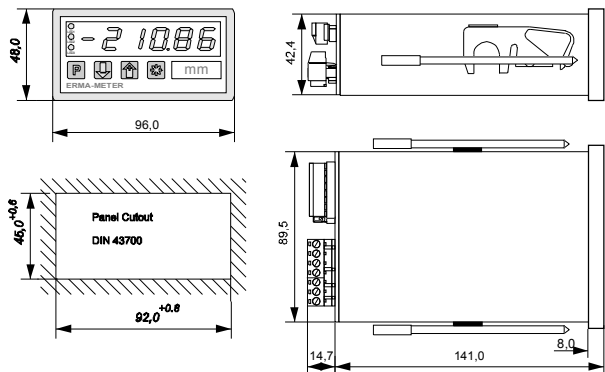
**Environmental conditions**

Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 54
Field of application	class 2, overvoltage protecti- on II
CE in conform with 89/336/EWG	NSR 73/23/EWG

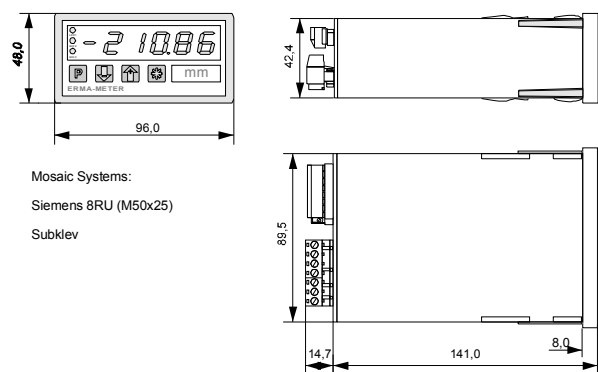
**Ordering information**

<b>SSI 3005 -</b>	
	<b>Housing</b>
<b>0</b>	Switch board
<b>1</b>	Panel clip
	<b>Front frame color</b>
<b>0</b>	Black
	<b>Front design</b>
<b>0</b>	ERMA-Meter logo
<b>1</b>	No logo
<b>2</b>	Customer defined logo
	<b>Power supply</b>
<b>0</b>	95 .. 250 V/AC
<b>1</b>	18 .. 36 V/DC, isolated
	<b>Option interface</b>
<b>0</b>	No interface
<b>1</b>	Interface RS 485
<b>2</b>	Interface RS 232
<b>3</b>	Interface TTY (Current-Loop)
	<b>Options</b>
<b>0</b>	No option
<b>1</b>	With analog output
<b>4</b>	Additional 2 alarm outputs

**Switchboard Mounting**



**Panel Clip**



## ■ Displays with Serial Interface MT 2511, MT 2512 and MT 2513

### Highlights

- Serial Input RS 232, RS 485 or TTY
- Addressing
- LED Display 8 mm, 5 decades
- DIN Housing 48 x 24 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal

### Comments

The instruments are available with several interfaces:

#### **MT 2511**

- RS 232 signal input

#### **MT 2512**

- RS 485 signal input

#### **MT 2511**

- TTY (Current-Loop, 20 mA) signal input

### Standard functions

#### **Addressing**

Several instruments can work on one interface. To this each instrument gets a own adress.

If the displayed signs of the data string is not start at the first position, it is possible to programm how much preceded signs are to ignore.

#### **Signs**

- -, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blank, decimal point
- "+" is shown as a blank

#### **Software functions**

- Programmable baud rate
- 3 selectable address signs
- To fade out max. 127 signs
- Display test

#### **Digital input channels**

The instruments are provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test



#### **Power supply**

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### **Options**

##### **Housing type**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

##### **Colour of the front frame**

- Black
- Grey coloured RAL 7037
- Grey coloured RAL 7032
- Grey coloured RAL 7035

##### **Design of the front**

- Without front foil
- Front foil ALU
- Front foil RAL 7032
- Front foil RAL 7035
- Unit overprint

##### **Display colour**

- Red
- Green

**Technical data**

Display : 5 decades, 8 mm, red (opt. green)

Signal input :  
 MT 2511 : RS 232  
 MT 2512 : RS 485  
 MT 2513 : TTY (Current-Loop, 20 mA)

Data form : 1 start bit, 8 data bits, 2 stop bits  
 Baud rate : 1200, 2400, 4800, 9600 prog.

Digital input channels : 10 kΩ to +5V  
 Low level : < 0,4 V  
 High level : > 3,5 V, max. 30 V

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC, ± 10 %, isolated  
 optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 30 mA (red)  
 (18 .. 36 V DC) : approx. 40 mA (green)

Housing : switch board mounting DIN 43700  
 Dimensions : 48 x 24 x 60 mm  
 Depth : < 70 mm incl. screw terminal  
 Protection : front IP 40

EMV : EMV-conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C

**Ordering information**

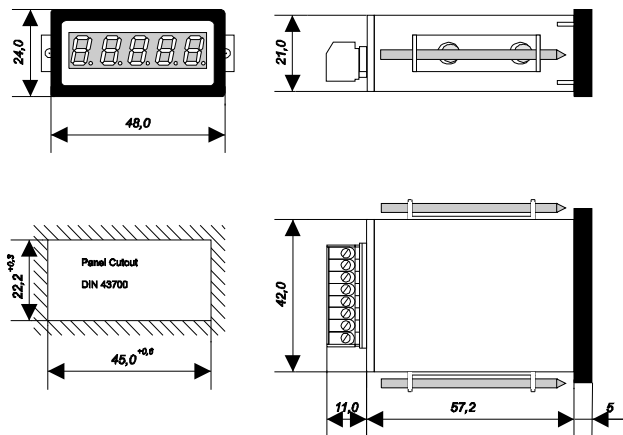
<b>MT 251x -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	1 Grey coloured RAL 7037
	2 Grey coloured RAL 7032
	3 Grey coloured RAL 7035
	<b>Front design</b>
	0 Without front foil
	1 Front foil ALU eloxiert
	2 Front foil RAL 7032
	3 Front foil RAL 7035
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

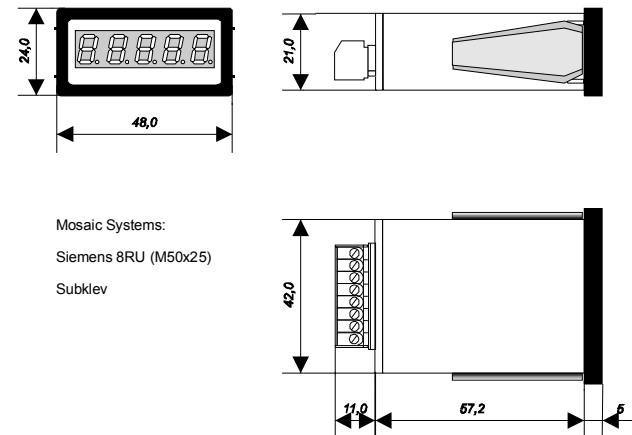
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
 Siemens 8RU (M50x25)  
 Subklef

## ■ Displays with Serial Interface MT 2511M, MT 2512M and MT 2513M

### Highlights

- Serial Input RS 232, RS 485 or TTY
- Addressing
- LED Display 8 mm, 5 decades
- Housing for Mauell-Mosaic-Systems M 24 T, M 24 MK and MK 24x48
- Isolated Power Supply
- Plug-In Screw Terminal

### Standard functions

The instruments are available with several interfaces:

#### **MT 2511M**

- RS 232 signal input

#### **MT 2512M**

- RS 485 signal input

#### **MT 2513M**

- TTY (Current-Loop, 20 mA) signal input

### Standard functions

#### **Addressing**

Several instruments can work on one interface. To this each instrument gets a own address.

If the displayed signs of the data string is not start at the first position, it is possible to programm how much preceded signs are to ignore.

#### **Signs**

- -, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blank, decimal point
- "+" is shown as a blank

#### **Software functions**

- Programmable baud rate
- 3 selectable address signs
- To fade out max. 127 signs
- Display test

#### **Digital input channels**

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test



### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### **Housing type**

- Mauell-Mosaic-Systems M 24 T, M 24 MK and MK 24x48

#### **Colour of the front frame**

- Black
- Grey coloured RAL 7037
- Grey coloured RAL 7032
- Grey coloured RAL 7035

#### **Design of the front**

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

#### **Display colour**

- Red
- Green

## Technical data

Display	: 5 decades, 8 mm, red (opt. green)
Signal input	
MT 2511M	: RS 232
MT 2512M	: RS 485
MT 2513M	: TTY (Current-Loop, 20 mA)
Data form	: 1 start bit, 8 data bits, 2 stop bits
Baud rate	: 1200, 2400, 4800, 9600 prog.
Digital input channels	: 10 k $\Omega$ to +5V
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, $\pm$ 10 %, isolated
optional	: 5 V DC, $\pm$ 10 %, isolated
Power consumption	: approx. 30 mA (red)
(18 .. 36 V DC)	: approx. 43 mA (green)
Housing	: Mauell-Mosaic-Systems M 24 T, M 24 MK, MK 24x48
Dimensions	: 48 x 24 x 86,5 mm
Depth	: < 95 mm incl. screw terminal
Protection	: front IP 40
EMV	: EMV-conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

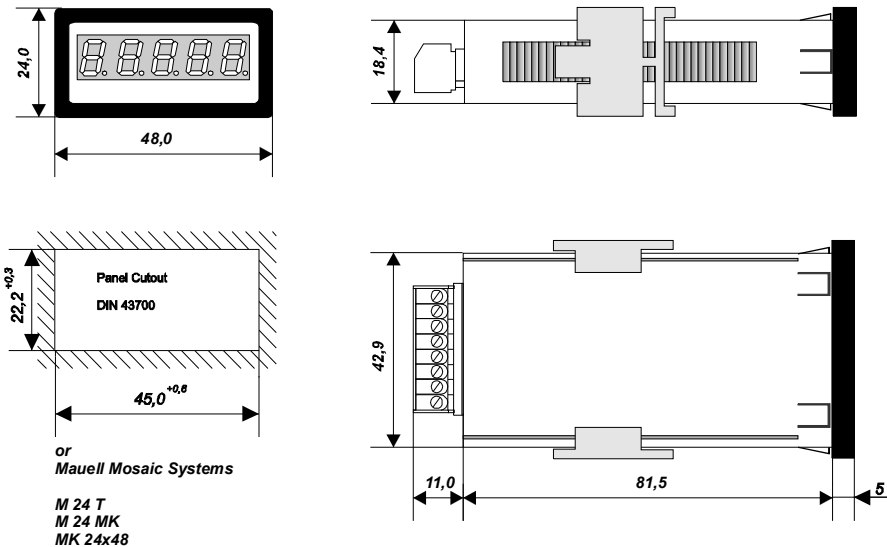
## Ordering information

<b>MT 251xM -</b>	
	<b>Housing</b>
	0 Mauell-Mosaic-Systems
	<b>Front frame colour</b>
	0 Black
	1 Grey coloured RAL 7037
	2 Grey coloured RAL 7032
	3 Grey coloured RAL 7035
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm$ 10%, isolated
	1 12 V DC, $\pm$ 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

Please specify in clear text at order !

## Dimensions



## ■ Displays with Serial Interface MT 2611, MT 2612 and MT 2613

### Highlights

k

- Serial Input RS 232, RS 485 or TTY
- Addressing
- LED Display 14 mm, 5 decades
- DIN Housing 96 x 24 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- Limit Value Output (Optocoupler)

### Comments

The instruments are available with several interfaces:

#### **MT 2611**

- RS 232 signal input

#### **MT 2612**

- RS 485 signal input

#### **MT 2613**

- TTY (Current-Loop, 20 mA) signal input

### Standard functions

#### **Addressing**

Several instruments can work on one interface. To this each instrument gets a own address.

If the displayed signs of the data string is not start at the first position, it is possible to programm how much preceded signs are to ignore.

#### **Signs**

- -, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blank, decimal point
- "+" is shown as a blank

#### **Software functions**

- Programmable baud rate
- 3 selectable address signs
- To fade out max. 127 signs
- Display test
- Limiting value functions

#### **Digital input channels**

The instruments are provided with three digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test



#### **Limiting value output (optocouple)**

The instruments are provided with a optocouple output for limiting value indication. Following functions can be programmed:

- Alarm point and hysteresis
- High or low alarm

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### **Options**

##### **Housing**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

##### **Colour of the front frame**

- Black

##### **Design of the front**

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

##### **Display colour**

- Red
- Green

**Technical data**

Display : 5 decades, 14 mm, red (opt. green)

Signal input  
 MT 2611 : RS 232  
 MT 2612 : RS 485  
 MT 2613 : TTY (Current-Loop, 20 mA)

Data form : 1 start bit, 8 data bits, 2 stop bits  
 Baud rate : 1200, 2400, 4800, 9600 prog.

Digital input channels : 10 kΩ to +5V  
 Low level : < 0,4 V  
 High level : > 3,5 V, max. 30 V

Limit value output : optocoupler  
 : max. 10 mA, 70 V, max. 150 mW

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC, ± 10 %, isolated  
 optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 65 mA (red)  
 (18 .. 36 V DC) : approx. 75 mA (green)

Housing : switch board mounting DIN 43700  
 Dimensions : 96 x 24 x 63,5 mm  
 Depth : < 72 mm incl. screw terminal  
 Protection : front IP 40

EMV : in conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C

**Ordering information**

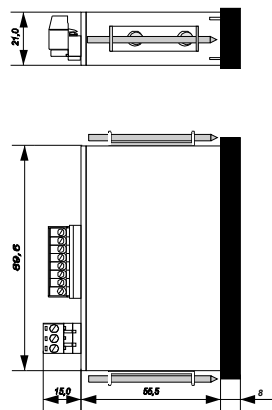
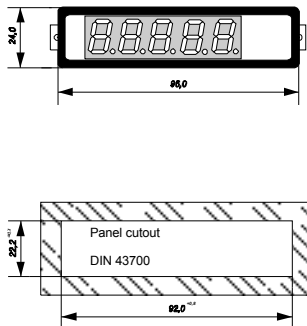
<b>MT 261x -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

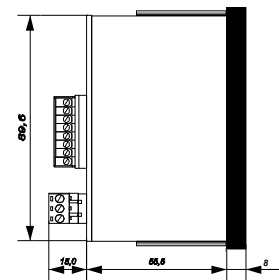
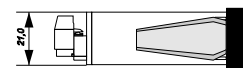
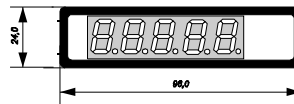
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
 Siemens 8RU (M50x25)  
 Subkleb

## ■ Displays with Serial Interface MT 3011, MT 3012 and MT 3013

### Highlights

- Serial Input RS 232, RS 485 or TTY
- Addressing
- LED Display 14 mm, 5 decades
- DIN Housing 96 x 48 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- Limit Value Output (Optocoupler)

### Comments

The instruments are available with several interfaces:

#### **MT 3011**

- RS 232 signal input

#### **MT 3012**

- RS 485 signal input

#### **MT 3013**

- TTY (Current-Loop, 20 mA) signal input

### Standard functions

#### **Addressing**

Several instruments can work on one interface. To this each instrument gets a own address.

If the displayed signs of the data string is not start at the first position, it is possible to programm how much preceded signs are to ignore.

#### **Signs**

- -, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blank, decimal point
- "+" is shown as a blank

#### **Software functions**

- Programmable baud rate
- 3 selectable address signs
- To fade out max. 127 signs
- Display test
- Limiting value functions

#### **Digital input channels**

The instruments are provided with three digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test



#### **Limiting value output (optocouple)**

The instruments are provided with a optocouple output for limiting value indication. Following functions can be programmed:

- Alarm point and hysteresis
- High or low alarm

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### **Housing**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Colour of the front frame**

- Black

#### **Design of the front**

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

#### **Display colour**

- Red
- Green



**Technical data**

Display : 5 decades, 14 mm, red (opt. green)

Signal input  
 MT 3011 : RS 232  
 MT 3012 : RS 485  
 MT 3013 : TTY (Current-Loop, 20 mA)

Data form : 1 start bit, 8 data bits, 2 stop bits  
 Baud rate : 1200, 2400, 4800, 9600 prog.

Digital input channels : 10 k $\Omega$  to +5V  
 Low level : < 0,4 V  
 High level : > 3,5 V, max. 30 V

Limit value output : optocoupler  
 : max. 10 mA, 70 V, max. 150 mW

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC,  $\pm$  10 %, isolated  
 optional : 5 V DC,  $\pm$  10 %, isolated

Power consumption : approx. 65 mA (red)  
 (18 .. 36 V DC) : approx. 75 mA (green)

Housing : switch board mounting DIN 43700  
 Dimensions : 96 x 48 x 63,5 mm  
 Depth : < 72 mm incl. screw terminal  
 Protection : front IP 40

EMV : in conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C

**Ordering information**

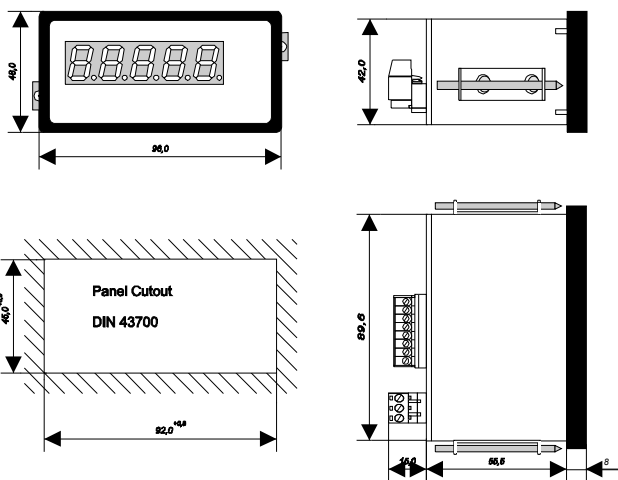
<b>MT 301x -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm$ 10%, isolated
	1 12 V DC, $\pm$ 10 %, isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

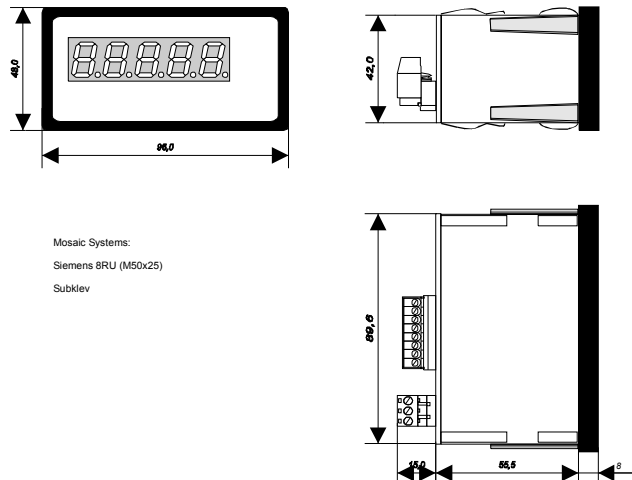
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
 Siemens BRU (M50x25)  
 Subkleb

## ■ Display with Serial Interface MT 5011, MT 5012 and MT 5013

### Highlights

- Serial Input RS 232, RS 485 or TTY
- Addressing
- LED Display 25 mm, 5 decades
- DIN Housing 144 x 72 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- 2 Alarm Relay Output

### Comments

The instruments are available with several interfaces:

#### **MT 5011**

- RS 232 signal input

#### **MT 5012**

- RS 485 signal input

#### **MT 5013**

- TTY (Current-Loop, 20 mA) signal input

### Standard functions

#### **Addressing**

Several instruments can work on one interface. To this each instrument gets a own address.

If the displayed signs of the data string is not start at the first position, it is possible to programm how much preceded signs are to ignore.

#### **Signs**

- -, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blank, decimal point
- "+" is shown as a blank

#### **Software functions**

- Programmable baud rate
- 3 selectable address signs
- To fade out max. 127 signs
- Display test
- Limiting value functions

#### **Digital input channels**

The instrument is provided with three digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test



#### **Alarm relay outputs**

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarm

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### **Options**

##### **Housing**

- Switch board mounting DIN 43700
- Mosaic system mounting (Siemens 8RU)

##### **Colour of the front frame**

- Black

##### **Design of the front**

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

##### **Display colour**

- Red
- Green

## Technical data

Display	: 5 decades, 25 mm, red (opt. green)
Signal input	
MT 5011	: RS 232
MT 5012	: RS 485
MT 5013	: TTY (Current-Loop, 20 mA)
Data form	: 1 start bit, 8 data bits, 2 stop bits
Baud rate	: 1200, 2400, 4800, 9600 prog.
Digital input channels	: 10 kΩ to +5V
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Limit value (relays)	: AC max. 5 A, max. 250 V, 1250 VA
VA	: DC max. 5 A, max. 250 V, 100 W
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, ± 10 %, isolated
optional	: 5 V DC, ± 10 %, isolated
Power consumption	: approx. 65 mA (red)
(18 .. 36 V DC)	: approx. 75 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 144 x 72 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

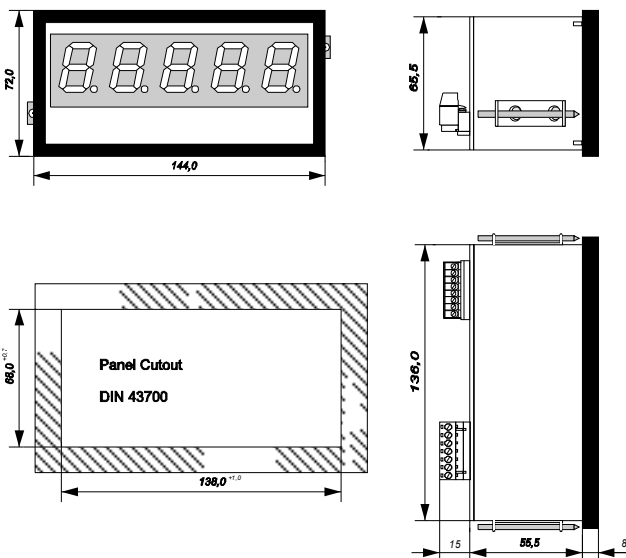
<b>MT 501x -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

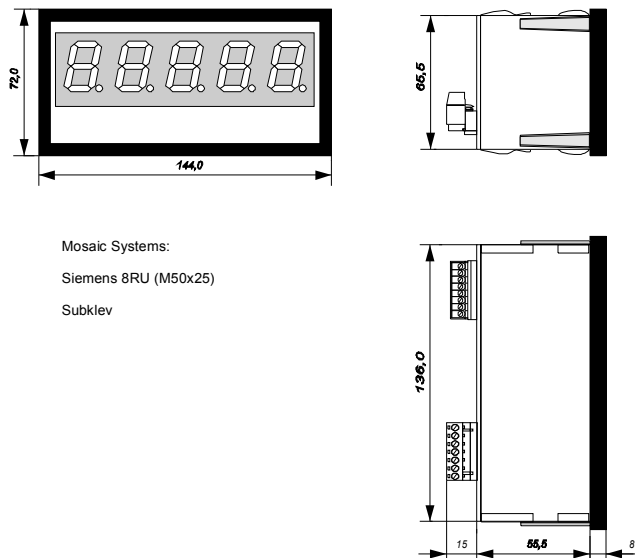
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subkleb

## ■ Display with Serial Interface MT 7001, MT 7002 and MT 7003

### Highlights

- Serial input RS 232, RS 485 or TTY
- Addressing
- LED Display 45 mm, 4 decades
- DIN Housing 192 x 72 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminal
- 2 Alarm Relay Output

### Comments

The instruments are available with several interfaces:

#### **MT 7001**

- RS 232 signal input

#### **MT 7002**

- RS 485 signal input

#### **MT 7003**

- TTY (Current-Loop, 20 mA) signal input

### Standard functions

#### **Addressing**

Several instruments can work on one interface. To this each instrument gets a own address.

If the displayed signs of the data string is not start at the first position, it is possible to programm how much preceded signs are to ignore.

#### **Signs**

- -, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Blank, decimal point
- "+" is shown as a blank

#### **Software functions**

- Programmable baud rate
- 3 selectable address signs
- To fade out max. 127 signs
- Display test
- Limiting value functions

#### **Digital input channels**

The instrument is provided with three digital input channels. The input channels are low active. The digital input channels are carried out following functions:

- Programming
- Display test



#### **Alarm relay outputs**

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarm

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

#### **Options**

##### **Housing**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev)

##### **Colour of the front frame**

- Black

##### **Display colour**

- Red

## Technical data

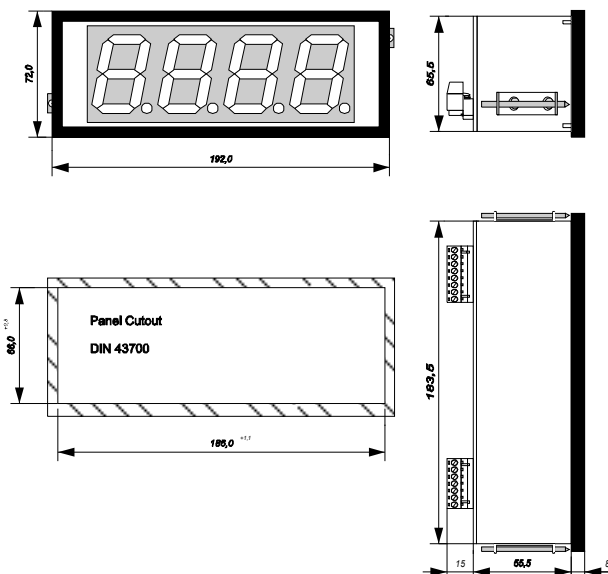
Display	: 4 decades, 45 mm, red
Signal input	
MT 7001	: RS 232
MT 7002	: RS 485
MT 7003	: TTY (Current-Loop, 20 mA)
Data form	: 1 start bit, 8 data bits, 2 stop bits
Baud rate	: 1200, 2400, 4800, 9600 prog.
Digital input channels	: 10 kΩ to +5V
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Limit value (relays)	: AC max. 5 A, max. 250 V, 1250 VA
VA	: DC max. 5 A, max. 250 V, 100 W
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, ± 10 %, isolated
optional	: 5 V DC, ± 10 %, isolated
Power consumption	: approx. 70 mA (red)
(18 .. 36 V DC)	
Housing	: switch board mounting DIN 43700
Dimensions	: 192 x 72 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

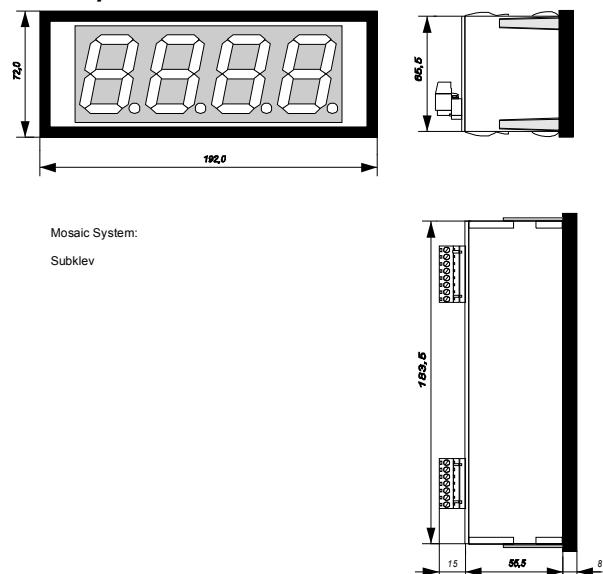
<b>MT 700x -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	<b>Display colour</b>
	0 Red
	<b>Power supply</b>
0	5 V DC, ± 10%, isolated
1	12 V DC, ± 10 %, isolated
2	18 .. 36 V DC, isolated

## Dimensions

### Switch board mounting



### Panel clip



## ■ Display with Parallel Interface Type FA 2510

### Highlights

- LED Display 8 mm, 5 decades
- Preliminary Zero Suppression
- Input Parallel, max. 16 bit
- For SPS-Interface or Absolute Encoders With Parallel Output
- BCD-, Gray- or Binäry-Code
- Switchboard- or Mosaic System Mounting
- 26-pole Flatcabel Connection DIN 41651
- Isolated Power Supply

### Standard functions

#### **Programmable software functions**

- BCD-, Binäry- or Gray-Code
- with/without sign
- Offset value -9999 .. 99999
- external/internal decimal point controlling
- Scaling factor 0.0001 .. 9.9999
- with/without strobe signal

#### **Digital inputs channels**

In addition the instrument is provided with four control inputs. These control inputs are carried out following functions:

- Programming
- Display test
- external decimal point controlling
- external strobe signal

#### **Input level**

All signal inputs are layed out as active high inputs and layed out for PNP-Input. The input level 5V, 12V or 24 V are necessary. Not conneted signal inputs are interpeted as low signal.

#### **Strobe input**

The user can select by programming between the mode with strobe signal and the mode without strobe signal. If selected the mode with strobe signal a impuls at the strobe input updates the display with the actualy datas at the data inputs. If selected the mode without strobe signal the display is updated coninuous with the datas at the data inputs.

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 5V or 12 V DC isolated



### Programming

The programming is easy and clearly arranged. By means of a programming menue the user is taken through this programming. The programming is carried out through the four control inputs.

### Options

#### **Housing type**

- switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Colour of the front frame**

- Black
- Grey coloured RAL 7037
- Grey coloured RAL 7032
- Grey coloured RAL 7037

#### **Design of the front**

- Without front foil
- Front foil ALU
- Front foil RAL 7032
- Front foil RAL 7035
- Unit overprint

#### **Display colour**

- Red
- Green

## Technical data

Display	: 5 decades, 8 mm, red (opt. green)
Display range	: -9999 .. 99999 preliminary zero suppression
Code	: programmable BCD, BINÄRY or GRAY
Digital inputs	: PNP logic
Input level	: 5V, 12V or 24V
Input resistance	: > 50 kΩ
Conversion rate	: approx. 300 ms
Strobe signal time	: >100us
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, ± 10 %, isolated
optional	: 5 V DC, ± 10 %, isolated
Power consumption (18 .. 36 V DC)	: approx. 25 mA (red) : approx. 35 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 48 x 24 x 107 mm
Depth	: < 125 mm incl. connector
Conection	: 26 pole flatcabel DIN 41651
Protection	: front IP 40
EMV	: EMV-conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

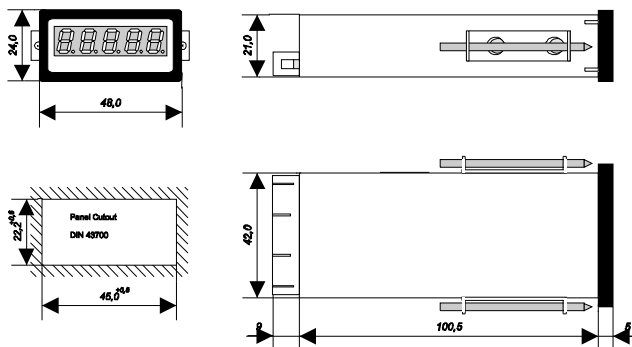
<b>FA 2510 -</b>	<b>Input level</b>
	0 5 V
	1 12 V
	2 24 V
	<b>Housing</b>
	0 Switch board mounting
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	1 Grey coloured RAL 7037
2 Grey coloured RAL 7032	
3 Grey coloured RAL 7035	
<b>Front design</b>	
0 Without front foil	
1 Front foil ALU	
2 Front foil RAL 7032	
3 Front foil RAL 7035	
<b>Display colour</b>	
0 Red	
1 Green	
<b>Power supply</b>	
0 5 V DC, ± 10%, isolated	
1 12 V DC, ± 10 %, isolated	
2 18 .. 36 V DC, isolated	

## Unit overprint

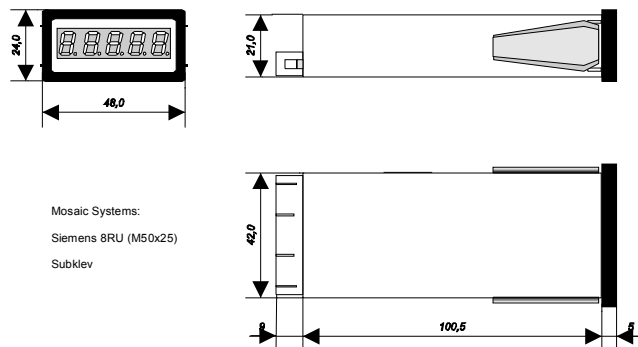
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subkleb

## ■ Display with Parallel Interface Type FA 2510

### Highlights

- LED Display 8 mm, 5 decades
- Preliminary Zero Suppression
- Input Parallel, max. 16 bit
- For SPS-Interface or Absolute Encoders With Parallel Output
- BCD-, Gray- or Binäry-Code
- Switchboard- or Mosaic System Mounting
- 26-pole Flatcabel Connection DIN 41651
- Isolated Power Supply

### Standard functions

#### **Programmable software functions**

- BCD-, Binäry- or Gray-Code
- with/without sign
- Offset value -9999 .. 99999
- external/internal decimal point controlling
- Scaling factor 0.0001 .. 9.9999
- with/without strobe signal

#### **Digital inputs channels**

In addition the instrument is provided with four control inputs. These control inputs are carried out following functions:

- Programming
- Display test
- external decimal point controlling
- external strobe signal

#### **Input level**

All signal inputs are layed out as active high inputs and layed out for PNP-Input. The input level 5V, 12V or 24 V are necessary. Not conneted signal inputs are interpreted as low signal.

#### **Strobe input**

The user can select by programming between the mode with strobe signal and the mode without strobe signal. If selected the mode with strobe signal a impuls at the strobe input updates the display with the actualy datas at the data inputs. If selected the mode without strobe signal the display is updated coninuous with the datas at the data inputs.

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 5V or 12 V DC isolated



### Programming

The programming is easy and clearly arranged. By means of a programming menue the user is taken through this programming. The programming is carried out through the four control inputs.

### Options

#### **Housing type**

- switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Colour of the front frame**

- Black
- Grey coloured RAL 7037

#### **Design of the front**

- Without front foil
- Front foil ERMA METER
- Front foil NEUTRAL

#### **Display colour**

- Red
- Green



## Technical data

Display	: 5 decades, 8 mm, play range -9999 .. 99999 preliminary zero suppression
Code	: programmable BCD, BINÄRY or GRAY
Digital inputs	: PNP logic
Input level	: 5V, 12V or 24V
Input resistance	: > 50 kΩ
Conversion rate	: approx. 300 ms
Strobe signal time	: >100us
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, ± 10 %, isolated
optional	: 5 V DC, ± 10 %, isolated
Power consumption (18 .. 36 V DC)	: approx. 25 mA (red) : approx. 35 mA (green)
Housing 43700	: switch board mounting DIN
Dimensions	: 48 x 24 x 107 mm
Depth	: < 125 mm incl. connector
Conection	: 26 pole flatcabel DIN 41651
Protection	: front IP 40
EMV	: EMV-conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

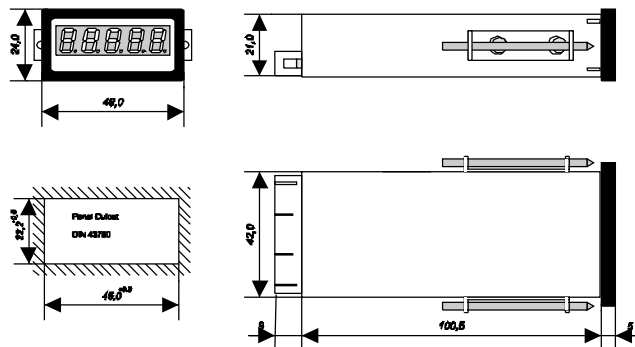
<b>FA 2510</b>	
	<b>Input level</b>
<b>0</b>	5 V
<b>1</b>	12 V
<b>2</b>	24 V
	<b>Housing</b>
<b>0</b>	Switch board mounting
<b>1</b>	Panel clip
	<b>Front frame colour</b>
<b>0</b>	Black
<b>1</b>	Grey coloured RAL 7037
	<b>Front design</b>
<b>0</b>	Without Front foil
<b>1</b>	Front foil ERMA METER
<b>2</b>	Front foil NEUTRAL
	<b>Display colour</b>
<b>0</b>	Red
<b>1</b>	Green
	<b>Power supply</b>
<b>0</b>	5 V DC, ± 10%, isolated
<b>1</b>	12 V DC, ± 10 %, isolated
<b>2</b>	18 .. 36 V DC, isolated

## Unit overprint

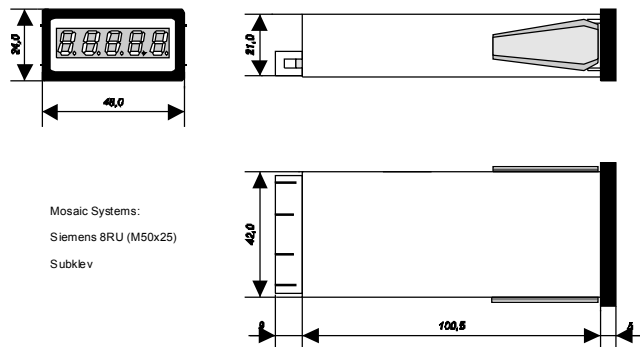
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subkev

■ **Display with Parallel Interface Type T 158**

**Highlights**

- Parallel Interface, 16 Bit Binary or Gray Code
- Parallel Interface, 20 Bit BCD Code
- LED Display, 4 or 6 Digit
- Display 14 mm in Height
- Input Channels PCL Compatible
- 37-pole Flatcabel Connection DIN 41651
- Wide Range Power Supply



**Standard functions**

**Programmable by Input Signals**

- BCD-, Binäry- oder Gray-Code
- Strobe
- Decimal point selection

**Inputs Channels**

The input channels are high activ and are available for different input voltage levels. Not connected signal inputs are interpeted as low signal. The following voltag- levels can be ordered:

- 24 V
- 12 V
- 5 V
- 48 V

**Strobe input**

High level at the strobe input will store the display. If a low signal is applied (or when strobe input is left open) the display is continuously updated with the actually datas at the data inputs.

**Decimal Point Selection**

There are 3 input channels provided for selecting the desired decimal point position.

**Power supply**

There is a wide range power supply built in. Power supply ground and signal common input are the same pin at the 37-pole connector.

**Options**

**Colour of the front frame**

- Black
- Grey coloured RAL 7037

**Design of the front**

- Without front foil
- Front foil ALU
- Front foil RAL 7032
- Front foil RAL 7035
- Unit overprint

**Display colour**

- Red
- Green

**Specifications**

Display	: 4 or 6 decades, 14 mm height
Colour	: red
Code	: BCD, BINÄRY or GRAY
Digital inputs	: PNP logic
Input level	: 5V, 12V, 24V or 48V
Input resistance	: > 10 kΩ
Conversion rate	: approx. 300 ms
Strobe signal time	: >100us
Power supply	: 15 V to 30 V DC, not isolated
Power consumption	: approx. 80 mA, 24 VDC
Housing	: panel mounting DIN 43700
Dimensions	: 96 x 48 x 107 mm
Depth	: < 125 mm incl. connector
Conection	: 37-pole D-Sub connector
Protection	: front IP 40
EMV	: EMV-conform with 89/336/EWG
Operating temperature	: 0 ... 55 °C

**Ordering Information**

<b>T 158 -</b>	
	<b>Input Voltage Level</b>
	0 24 V
	1 12 V
	2 5 V
	3 48 V
	<b>Power supply</b>
	0 15...30 V DC

t158\_datas\_en.vp/05.08

## ■ Programmable digital panelmeter UM 2550 and UM 2510

### **Highlights**

- LED Display 8 mm
- DIN Housing 48 x 24 mm
- Switchboard- or Mosaic System Mounting
- Isolated Power Supply
- Plug-In Screw Terminals

### **Versions**

#### **UM 2550**

- Voltage measuring 0 - 10 V
- Current measuring 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Accuracy 0,1% ±1 digit
- Resolution max. 4000 digits

#### **UM 2510 \* (see text below)**

- Voltage measuring 0 - 10 V
- Current measuring 0 - 20 mA resp. 4 - 20 mA
- Display range -9999 .. 99999
- Accuracy 0,01% ±1 digit
- Resolution max. 24 Bits

#### **Software functions**

- Scaling factor
- Averaging (Adjustable digital filter)
- MAX storage function
- Userdefined linearization up to 9 points
- Programmable decimal point
- Rounding the least digit in 1, 2, 5 or 10 steps
- Display test

#### **Digital input channels**

The instruments are provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test
- Reset of MAX storage

#### **Power supply**

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

Figure shows UM 2510.  
UM 2550 has 4 decades



### **Options**

#### **Housing type**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Colour of the front frame**

- Black
- Grey tone RAL 7037
- Grey tone RAL 7032
- Grey tone RAL 7035

#### **Design of the front**

- Without front foil
- Front ALU
- Front foil ERMA-Meter
- Front foil neutral
- Printed label with the unit (e.g. [V] )

#### **Display colour**

- Red
- Green

\* The **UM 2510** is no longer a standard product. Please contact for price, delivery time and minimum lot size

## Technical data

Measuring ranges	0 .. 10 V
Voltage	> 1 MΩ
Input impedance	0(4) .. 20 mA
Current	ca. 0,2 V
voltage drop	5 Measurings/sec
Measuring rate	10 kΩ to +5V
Digital inputs	< 0,4 V
Signal level low	> 3,5 V, max. 30 V
Signal level high	18 V .. 36 V DC
Power supply DC	500 V / 1 min
Isolated voltage	12 V DC, ± 10 %, isolated
optional	5 V DC, ± 10 %, isolated
optional	ca. 30 mA (18 .. 36 V DC)
Power consumption	8 mm, red (opt. green)
Mechanical data	Decimal point programmable
Display	suppressing of leading zeros
	- sign with negative values
Housing	
Dimensions(B x H x T)	48 x 24 x 60 mm
Depth	70 mm screw term. incl.
	Montageart
Mounting	Switchboard mounting
	or panel clip
Weight	ca. 200 g
Connectors	Screw terminals
Environment condition	
Operation temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Relative humidity	< 80 %, not condensing
Protection class	Protection class II
Protection	Front IP 40
CE	conform w. 89/336/EWG
	NSR 73/23/EWG

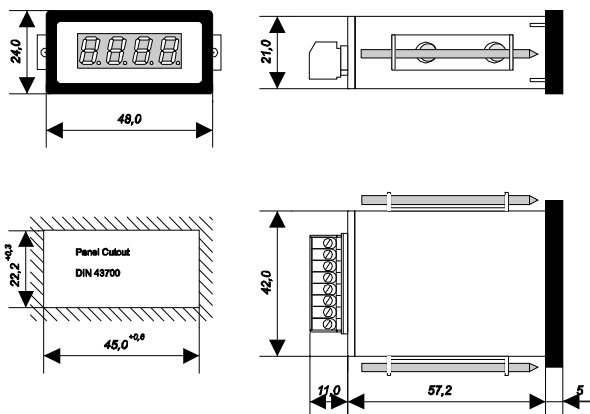
## Order Key

<b>UM 25x0 -</b>	
	<b>Housing</b>
0	Switch board
1	Panel clip
	<b>Front frame colour</b>
0	Black
1	Grey tone RAL 7037
2	Grey tone RAL 7032
3	Grey tone RAL 7035
	<b>Front design</b>
0	No front foil
1	Front ALU
2	Front foil ERMA-Meter
3	Front foil neutral
	<b>Display colour</b>
0	Red
1	Green
	<b>Power supply</b>
0	5 V DC, ± 10%, isolated
1	12 V DC, ± 10 %, isolated
2	18 .. 36 V DC, isolated

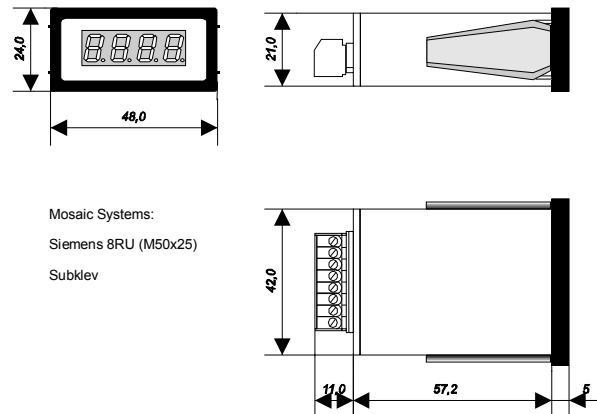
## Printed label with the unit (e.g. [V])

Please specify in clear text at order !

## Switch board mounting



## Panel clip



## ■ Programmable Digital Panel Meters UM 2550M

### Highlights

- Signal Input 0 - 10 V and 0/4 - 20 mA
- Housing for Mauell-Mosaic-Systems M 24 T, M 24 MK and MK 24x48
- LED Display 8 mm
- Plug-In Screw Terminal
- Isolated Power Supply

### UM 2550M

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 digit

### Software functions

- Scaling factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Programmable decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

### Digital input channels

The instruments are provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test
- Reset of peak detection

### Power supply

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.



### Options

#### Housing type

- Mauell-Mosaic-Systems M 24 T, M 24 MK and MK 24x48

#### Colour of the front frame

- Black
- Grey tone RAL 7037
- Grey tone RAL 7032
- Grey tone RAL 7035

#### Design of the front

- Without front foil
- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint

#### Display colour

- Red
- Green

## Technical data

Display green)	: 4 decades, 8 mm, red (opt. green)
Input impedance	: at voltage > 1 MΩ : at current approx. 10 Ω
Conversion rate sec	: approx. 5 per
Digital inputs	: 10 kΩ to +5 V : low level < 0,4 V : low level > 3,5 V, max. 30 V
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, ± 10 %, isolated
optional	: 5 V DC, ± 10 %, isolated
Power consumption (18 .. 36 V DC)	: approx. 25 mA (red) : approx. 40 mA (green)
Housing	: Mauell-Mosaic-Systems : M 24 T, M 24 MK, MK 24x48
Dimensions	: 48 x 24 x 86,5 mm
Depth	: < 95 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

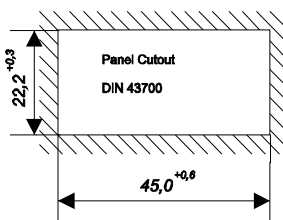
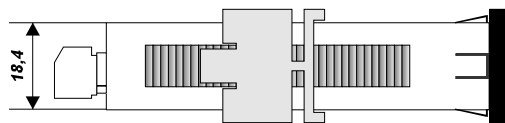
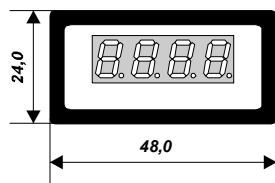
## Ordering information

<b>UM 2550M -</b>	
	<b>Housing</b>
	0 Mauell-Mosaic-Systems
	<b>Front frame colour</b>
	0 Black
	1 Grey tone RAL 7037
	2 Grey tone RAL 7032
	3 Grey tone RAL 7035
	<b>Front design</b>
	0 No front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

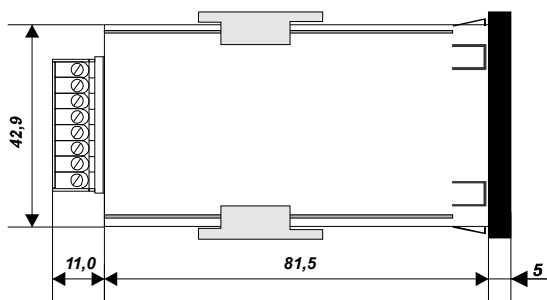
Please specify in clear text at order !

## Dimensions



or  
Mauell-Mosaic-Systems

M 24 T  
M 24 MK  
MK 24x48



## ■ Programmable Digital Panel Meter Model UM 2600

### Highlights

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 96 x 24 mm
- LED Display 14 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- Optocouple Output

### Comments

#### UM 2600

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 digit

#### Software functions

##### Standard functions

- Scaling factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

#### Digital input channels

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test
- Reset of peak detection
- Display of limiting value

#### Optocouple output

The instrument is provided with a optocouple output. Alternatively the optocouple output can be programmed for following functions:

##### 1. Serial output

Continually measured value transmitting at ASCII-Code with following data format:

- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 Bd, 1 start bit, 8 data bits, 1 stop bit



##### 2. Limiting value

The instrument is provided with a optocouple output for limiting value function. Following function can be programmed:

- Alarm point and hysteresis
- High or low alarm

##### Power supply

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### Housing type

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### Colour of the front frame

- Black

#### Design of the front

- Without front foil
- Front foil ERMA-METER or NEUTRAL
- Unit overprint

#### Display colour

- Red
- Green

## Technical data

Display	: 4 decades, 14 mm, rot (opt. green)
Input impedance	: at voltage > 1 M $\Omega$ : at voltage approx. 10 $\Omega$
Conversion rate sec	: approx. 5 per
Digital inputs	: 10 k $\Omega$ to +5 V : low level < 0,4 V : high level > 3,5, max. 30 V
Optocouple output	
Limit value	: max. 10 mA, 70 V, max. 150 mW
Serial data	: 9600 baud, 1, 8, N, 1
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, $\pm$ 10 %, isolated
optional	: 5 V DC, $\pm$ 10 %, isolated
Power consumption (18 .. 36 V DC)	: approx. 65 mA (red) : ca. 75 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 96 x 24 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

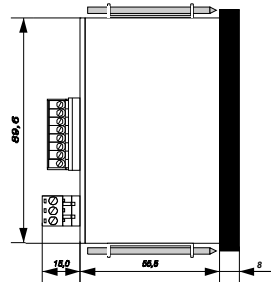
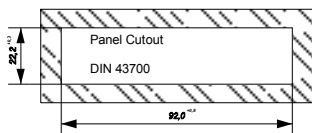
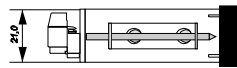
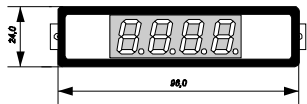
<b>UM 2600 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm$ 10%, isolated
	1 12 V DC, $\pm$ 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

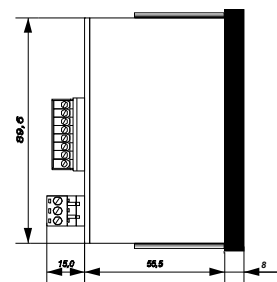
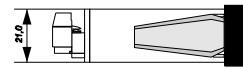
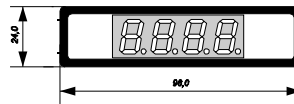
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subkleb



■ **Low-Cost-Panel Meter UM 2701**

**Highlights**

- High Quality Low-Cost-Meter
- LED-Display, red, 14 mm
- Display Range -1999 ... 1999
- Fronta 72 x 36 mm
- Plug In Screw Terminal Connector



**Available Ranges**

- Voltage: -199,9...199,9 mV
- Voltage: -1.999...1,999 V
- Voltage: -19,99...19,99 V
- Voltage: -199,9...199,9 V
- Voltage: -500...500 V
- Current: 0...20 mA

**Technical Datas**

- Accuracy 0,1 % ± 1 Digit
- Resolution 4000 Digit

**Options**

**Housing**

- Panel mounting DIN 43700
- Mosaic system mounting (Siemens 8RU)

**Colour of the front frame**

- Black
- Grey RAL 7037

**Front design**

- Without front foil
- Front foil ERMA-METER
- Front foil without label
- Unit label

**Specifications**

Ranges	
Voltage	
Input resistance	> 1 MΩ
Current	0 .. 20 mA, ± 0,1 %
Voltage drop	200 mV
Rate	3 samples per second
Supply voltage DC	18 V .. 36 V DC
Isolation voltage	500 V / 1 min
optional	12 V DC, ± 10 %, isolated
optional	5 V DC, ± 10 %, not isolated
Power consumption	max. 0,7 W

**Supply Voltage**

The UM 2701 is available for different supply voltages:

- 18 .. 36 V DC isolated
- 12 V DC isolated
- 5 V DC not isolated

**Ordering Information**

<b>UM 2701</b>					
				<b>Housing</b>	
				0 Panel meter	
				1 Panel-Clip	
				<b>Bezel</b>	
				0 black	
				1 RAL 7037	
				<b>Front</b>	
				0 without front foil	
				1 Front foil ERMA-METER	
				2 front foil NEUTRAL	
				<b>Ranges</b>	
				0 200 mV	
				1 2 V	
				2 20 V	
				3 200 V	
				4 500 V	
				5 20 mA	
				<b>Supply voltages</b>	
				0 5 V DC, ± 10%, isolated	
				1 12 V DC, ± 10 %, isolated	
				2 18 .. 36 V DC, not isolated	

**Unit Label**

Please specify in text at order !

## Mechanical Datas

Display	4-digit, 14 mm, red ) Decimal point programmable Sign at negative values
Case	According DIN 43700
Dimensions (B x H x T)	72 x 36 x 63,5 mm
Depth	72 mm including terminal connector
Mounting	Panel mounting or mosaic mounting
Weight	ca. 350 g
Connection	Plug in terminal connector

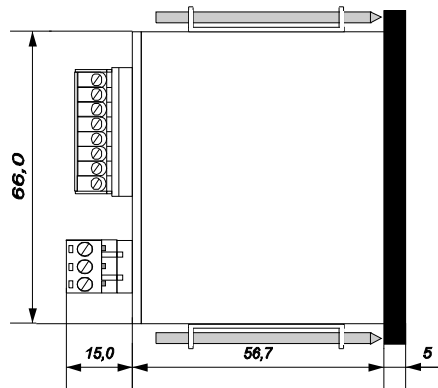
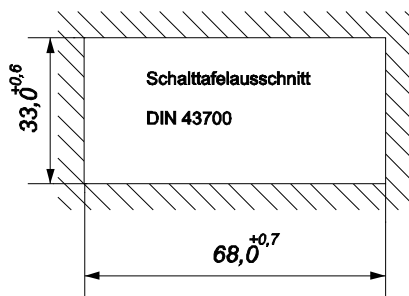
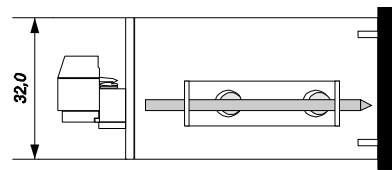
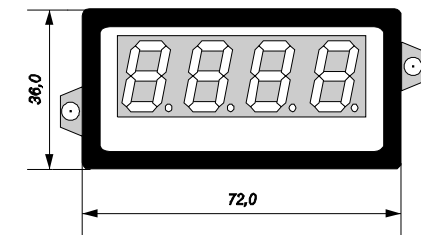
## Environmental Conditions

Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	Protection class II
Front protection	IP 40
Fields of application	class 2 overvoltage protection II
CE	in conform with 89/336/EWG NSR 73/23/EWG

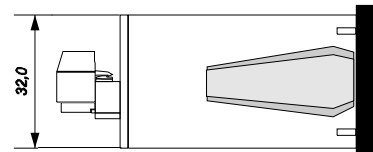
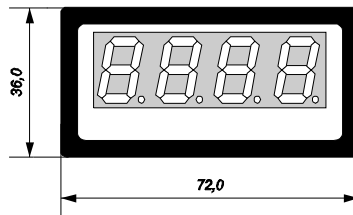
## Connections

Input channel (+)	Terminal 1
Input channel GND (-)	Terminal 2
Power supply (-)	Terminal 3
Power supply (+)	Terminal 4

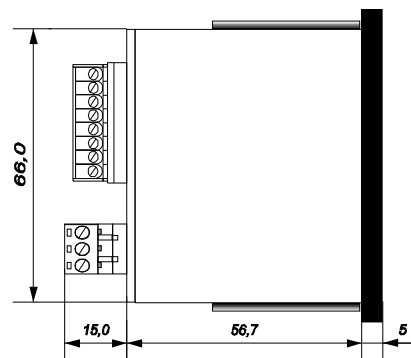
**Panel Meter**



**Panel Clip**



Mosaiksystem:  
Siemens 8RU (M50x25)



## ■ Programmable Digital Panel Meter Model UM 3010

### **Highlights**

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 96 x 48 mm
- LED Display 14 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- Optocouple Output

### **UM 3010**

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 digit

### **Software functions**

- Scaling-factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

### **Digital input channels**

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are used for the following functions:

- Programming
- Display test
- Reset of peak detection
- Display of limiting value

### **Optocouple output**

The instrument is provided with a optocouple output. Alternatively the optocouple output can be programmed for the following functions:

#### **1. Serial output**

Continually measured value transmitting at ASCII-Code with the following data format:

- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 Bd, 1 start bit, 8 data bits, 1 stop bit

#### **2. Limiting value**

The instrument is provided with a optocouple output for limiting value function. Following function can be programmed:



- Alarm point and hysteresis
- High or low alarm

### **Power supply**

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### **Options**

#### **Housing type**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Colour of the front frame**

- Black

#### **Design of the front**

- Without front foil
- Front foil ERMA-METER or NEUTRAL
- Unit overprint

#### **Display colour**

- Red
- Green

**Technical data**

Ranges  
 Voltage : 0 ...10 V,  $\pm 0,1\%$   
 Current : 0(4)...20 mA,  $\pm 0,1\%$   
 Input resistance : at voltage > 1 M $\Omega$   
 : at current approx. 10  $\Omega$

Conversion rate : approx. 5 per sec

Digital inputs : 10 k $\Omega$  to +5 V  
 : low level < 0,4 V  
 : high level > 3,5, max. 30 V

Optocouple output  
 Limit value : max. 10 mA, 70 V, max. 150 mW  
 Serial data : 9600 baud, 1, 8, N, 1

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC,  $\pm 10\%$ , isolated  
 optional : 5 V DC,  $\pm 10\%$ , isolated

Power consumption : approx. 65 mA (red display)  
 (18 .. 36 V DC) : ca. 75 mA (green display)

Display : 4 decades, 14 mm, red  
 (opt. green)  
 : Decimal point programmable  
 : leading zero blanking

Housing : switch board mounting DIN 43700  
 Dimensions : 96 x 48 x 63,5 mm  
 Depth : < 72 mm incl. screw terminal

**Environmental**

Operating temperature : 0 .. 50 °C  
 Storage temperatur : -20...70 °C  
 Humidity : < 80% non-condensing  
 Protection : front IP 40

EMC : in conform with 89/336/EWG

**Ordering information**

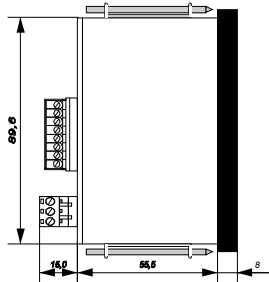
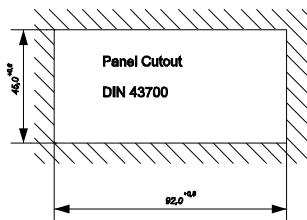
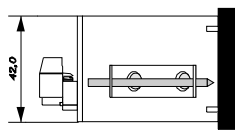
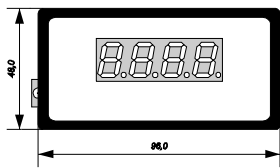
<b>UM 3010 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, $\pm 10\%$ , isolated
	1 12 V DC, $\pm 10\%$ , isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

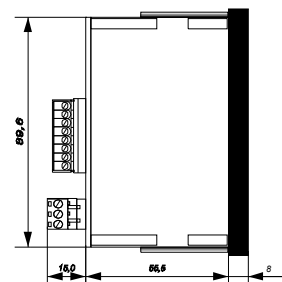
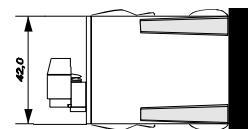
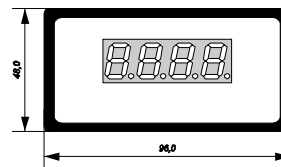
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
 Siemens 8RU (M50x25)  
 Subkleb

## ■ Programmable Digital Panel Meter Model UM 3011

### Highlights

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 96 x 48 mm
- LED Display 14 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- Optocouple Output

### UM 3011

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Temperature Pt100, -100...800°C
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 digit

### Software functions

- Scaling-factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

### Digital input channels

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are used for the following functions:

- Programming
- Display test
- Reset of peak detection
- Display of limiting value

### Optocouple output

The instrument is provided with a optocouple output. Alternatively the optocouple output can be programmed for the following functions:

#### 1. Serial output

Continually measured value transmitting at ASCII-Code with the following data format:

- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 Bd, 1 start bit, 8 data bits, 1 stop bit

#### 2. Limiting value

The instrument is provided with a optocouple output for limiting value function. Following function can be programmed:



- Alarm point and hysteresis
- High or low alarm

### Power supply

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### Housing type

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### Colour of the front frame

- Black

#### Design of the front

- Without front foil
- Front foil ERMA-METER or NEUTRAL
- Unit overprint

#### Display colour

- Red
- Green

**Technical data**

Ranges  
 Voltage : 0 ...10 V, ± 0,1%  
 Current : 0(4)...20 mA, ± 0,1%  
 Temperature : -100...800 °C, ±0,1% ±1 °C  
 Input resistance : at voltage > 1 MΩ  
 : at current approx. 10 Ω

Conversion rate : approx. 5 per sec

Digital inputs : 10 kΩ to +5 V  
 : low level < 0,4 V  
 : high level > 3,5, max. 30 V

Optocouple output  
 Limit value : max. 10 mA, 70 V, max. 150 mW  
 Serial data : 9600 baud, 1, 8, N, 1

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC, ± 10 %, isolated  
 optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 65 mA (red display)  
 (18 .. 36 V DC) : ca. 75 mA (green display)

Display : 4 decades, 14 mm, red  
 (opt. green)  
 : Decimal point programmable  
 : leading zero blanking  
 : switch board mounting DIN

Housing 43700  
 Dimensions : 96 x 48 x 63,5 mm  
 Depth : < 72 mm incl. screw terminal

**Environmental**

Operating temperature : 0 .. 50 °C  
 Storage temperature : -20...70 °C  
 Humidity : < 80% non-condensing  
 Protection : front IP 40

EMC : in conform with 89/336/EWG

**Ordering information**

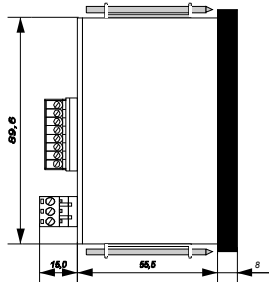
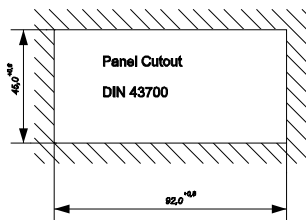
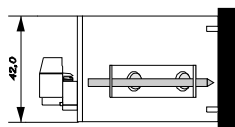
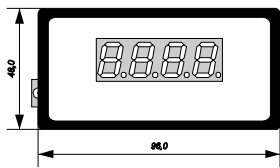
<b>UM 3011 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

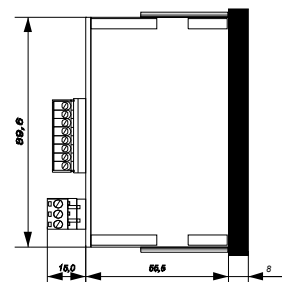
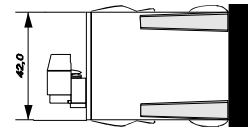
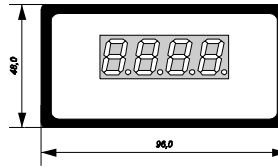
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
 Siemens BRU (M50x25)  
 Subkleb

## ■ Programmable Digital Panel Meter Model UM 3012

### **Highlights**

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 96 x 48 mm
- LED Display 14 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- Optocouple Output

### **UM 3012**

- Potentiometer 1k...10k
- Accuracy 0,1% ±1 digit
- max. resolution 4000 digit

### **Software functions**

- Scaling-factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

### **Digital input channels**

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are used for the following functions:

- Programming
- Display test
- Reset of peak detection
- Display of limiting value

### **Optocouple output**

The instrument is provided with a optocouple output. Alternatively the optocouple output can be programmed for the following functions:

#### **1. Serial output**

Continually measured value transmitting at ASCII-Code with the following data format:

- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 Bd, 1 start bit, 8 data bits, 1 stop bit

#### **2. Limiting value**

The instrument is provided with a optocouple output for limiting value function. Following function can be programmed:

- Alarm point and hysteresis
- High or low alarm



### **Power supply**

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### **Options**

#### **Housing type**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Colour of the front frame**

- Black

#### **Design of the front**

- Without front foil
- Front foil ERMA-METER or NEUTRAL
- Unit overprint

#### **Display colour**

- Red
- Green

**Technical data**

Ranges  
 Potentiometer : 1k...10k  
 Input resistance : >1 M Ω  
 Accuracy : 0,1% ± 1 digit  
 Conversion rate : approx. 5 per sec

Digital inputs : 10 kΩ to +5 V  
 : low level < 0,4 V  
 : high level > 3,5, max. 30 V

Optocouple output  
 Limit value : max. 10 mA, 70 V, max. 150 mW  
 Serial data : 9600 baud, 1, 8, N, 1

Power supply DC : 18 V to 36 V DC, isolated  
 optional : 12 V DC, ± 10 %, isolated  
 optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 65 mA (red display)  
 (18 .. 36 V DC) : ca. 75 mA (green display)

Display : 4 decades, 14 mm, red  
 (opt. green)  
 : Decimal point programmable  
 : leading zero blanking

Housing : switch board mounting DIN 43700  
 Dimensions : 96 x 48 x 63,5 mm  
 Depth : < 72 mm incl. screw terminal

**Environmental**

Operating temperature : 0 .. 50 °C  
 Storage temperatur : -20...70 °C  
 Humidity : < 80% non-condensing  
 Protection : front IP 40  
 EMC : in conform with 89/336/EWG

**Ordering information**

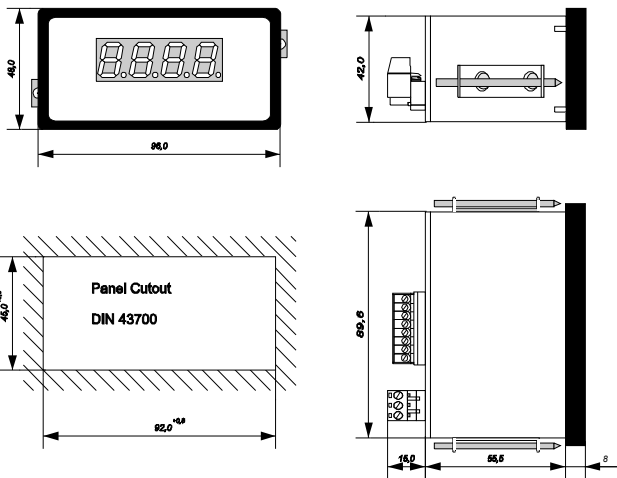
<b>UM 3012 -</b>	
<b>Housing</b>	
0	Switch board mount
1	Panel clip
<b>Front frame colour</b>	
0	Black
<b>Front design</b>	
0	Without front foil
1	Front foil ERMA-METER
2	Front foil NEUTRAL
<b>Display colour</b>	
0	Red
1	Green
<b>Power supply</b>	
0	5 V DC, ± 10%, isolated
1	12 V DC, ± 10 %, isolated
2	18 .. 36 V DC, isolated

**Unit overprint**

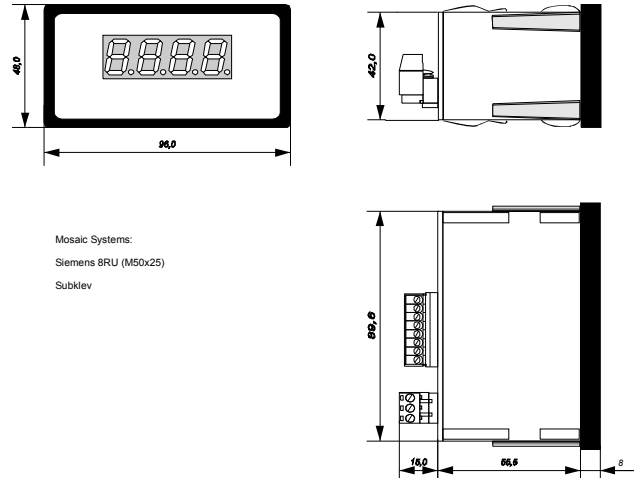
Please specify in clear text at order !

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
 Siemens BRU (M50x25)  
 Subkleb



## ■ Programmable Digital Panel Meter Model UM 3020

### **Highlights**

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 96 x 48 mm
- LED Display 14 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- Optocouple Output

### **UM 3020**

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 digit

### **Software Functions**

- Scaling-factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

### **Functions Of Push Buttons And Digital Input Channels**

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test
- Reset of peak detection
- Display of limiting value

### **Optocoupler Output**

The instrument is provided with a optocouple output. Alternatively the optocouple output can be programmed for following functions:

#### **1. Serial Output**

Continually measured value transmitting at ASCII-Code with following data format

- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 Bd, 1 start bit, 8 data bits, 1 stop bit

#### **2. Limiting Value**

The instrument is provided with a optocoupler output for limiting value function. Following function can be programmed:

- Alarm point and hysteresis



- High or low alarm
- During normal measurement the alarm value can be programmed by the push buttons "+" and "-".

### **Power Supply**

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### **Options**

#### **Housing**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### **Color Of The Front Frame**

- Black

#### **Design Of The Front**

- Without front foil
- Front foil ERMA-METER or NEUTRAL
- Unit overprint

#### **Display Color**

- Red
- Green

**Technical data**

Display : 4 decades, 14 mm, rot (opt. green)

Input impedance : at voltage > 1 MΩ  
: at voltage approx. 10 Ω

Conversion rate : approx. 5 per sec

Digital inputs : 10 kΩ to +5 V  
: low level < 0,4 V  
: high level > 3,5, max. 30 V

Optocouple output  
Limit value : max. 10 mA, 70 V, max. 150 mW  
Serial data : 9600 baud, 1, 8, N, 1

Power supply DC : 18 V to 36 V DC, isolated  
optional : 12 V DC, ± 10 %, isolated  
optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 65 mA (red)  
(18 .. 36 V DC) : ca. 75 mA (green)

Housing : switch board mounting DIN 43700  
Dimensions : 96 x 48 x 72 mm  
Depth : < 63 mm incl. screw terminal  
Protection : front IP 54

EMV : in conform with 89/336/EWG  
Operating temperature : 0 .. 50 °C

**Ordering information**

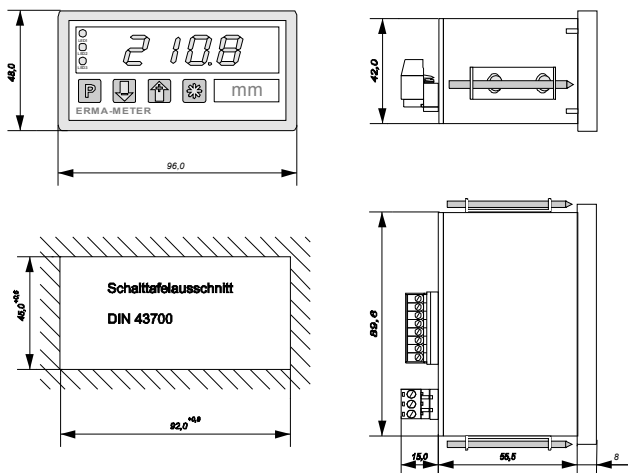
<b>UM 3020 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front Frame Color</b>
	0 Black
	<b>Front Design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display Color</b>
	0 Red
	1 Green
	<b>Power Supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

**Unit overprint**

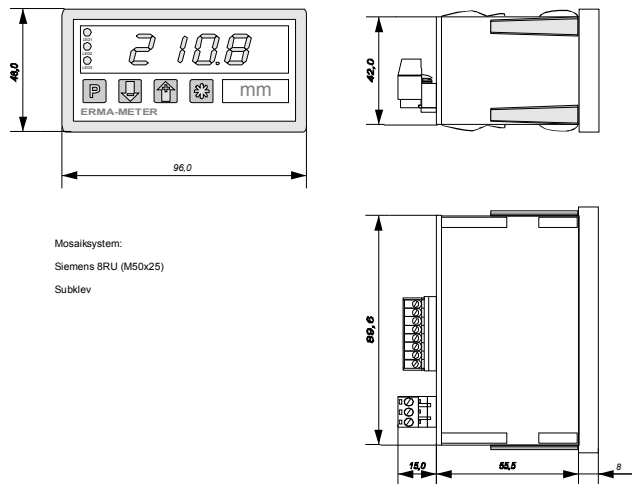
Please specify in clear text at order !

**Dimensions**

**Panel Mounting**



**Panel Clip**



Mosaiksystem:  
Siemens 8RU (M50x25)  
Subkleb

## ■ Programmable Digital Panel Meter UM 3022

### Highlights

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 96 x 48 mm
- LED Display 14 mm
- Panel or Mosaic System Mounting
- Screw Terminal
- Alarm or Serial Output
- Analog Output 0/4...20 mA
- Linearization
- Sensor Supply (24 VDC/100 mA)
- Power Supply 95...240 VAC

### UM 3022

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 64000 digits
- Accuracy 0,1% ±1 digit
- Analog Output 0/4 ... 20 mA
- Sensor Supply 24 VDC/100 mA

### Software Functions

- Scaling-factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test

### Functions Of Push Buttons And Digital Input Channels

The instrument is provided with four push buttons at the front and three digital input channels at the rear. Following functions can be carried out:

- Programming
- Display test
- Reset of peak detection
- Display of limiting value

### Optocouple Output Channel

The instrument is provided with a optocoupler output. This output can be programmed for two functions.

#### 1. Serial Output

Continually measured value transmitting at ASCII-Code with following data format



- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 Bd, 1 start bit, 8 data bits, 1 stop bit

#### 2. Alarm Output

Following function can be programmed:

- Alarm point and hysteresis
- High or low alarm
- During normal measurement the limit value can be programmed by the push buttons "+" and "-".

### Analog Output

- Programmable between 4...20 mA or 0... 20 mA

### Sensor Supply

- A sensor power supply 24 VDC/100 mA is available

### Power Supply

- 95 ... 250 VAC

### Programming

By means of a programming menu the user is taken through the programming of the unit. The programming can be carried out by the push buttons at the front.

### Options

#### Housing

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### Front Design

- Front foil ERMA-METER
- Front foil NEUTRAL
- Unit overprint
-

**Technical data**

Ranges  
 Voltage : 0...10 VDC  
 Input impedance : at voltage > 1 MΩ  
 Current : 0...20 mA, 4...20 mA  
 Input impedance : 10 Ω  
 Resolution : 16 Bit

Display : 4 decades, 14 mm, red  
 Conversion rate : approx. 2 per sec

Isolated analog output : 0/4...20 mA  
 Max. load resistance : 500 Ω  
 Resolution : 16 Bit

Digital inputs : 10 kΩ to +5 V  
 : low level < 0,4 V  
 : high level > 3,5, max. 30 V

Optocouple output  
 Limit value : max. 10 mA, 70 V, max. 150 mW  
 Serial data : 9600 baud, 1, 8, N, 1

Power supply : 95 ... 240 VAC  
 Power consumption : 2,5 VA  
 Housing : panel mounting DIN 43700  
 Dimensions : 96 x 48 x 72 mm  
 Depth : 65 mm

Protection : front IP 54

EMV : in conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C

**Ordering information**

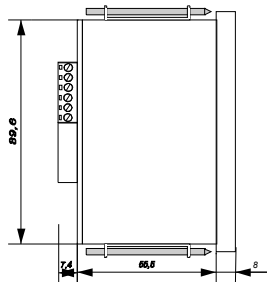
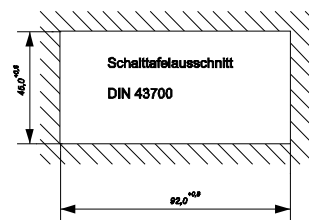
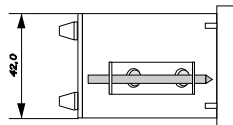
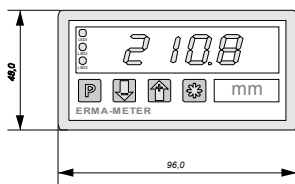
<b>UM 3022 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front Frame Color</b>
	0 Black
	<b>Front Design</b>
	0 Reserve
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display Color</b>
	0 Red
	<b>Power Supply</b>
	0 95 ... 240 VAC

**Unit overprint**

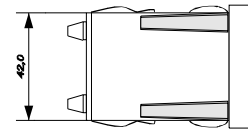
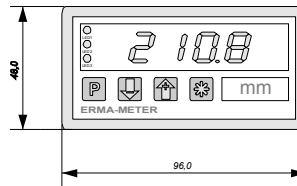
Please specify in clear text at order !

**Dimensions**

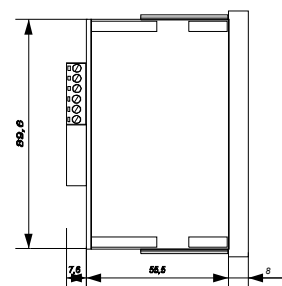
**Panel Mounting**



**Panel Clip**



Mosaiksystem:  
 Siemens 8RU (M50x25)  
 Subklev



**■ Programmable Low Cost Digital Panel Meter UM 3300**

**Characteristics**

- Input for standard signals 0-10V and 0/4-20 mA
- LED Display, red, 4 decades, 14 mm
- Display Range -999 - 9999
- DIN Housing 96 x 48 mm
- free scaling
- Isolated Power Supply
- Power supply 5 VDC - 36 VDC
- Plug-In Screw Terminal
- Programmable front buttons



**Measuring Ranges**

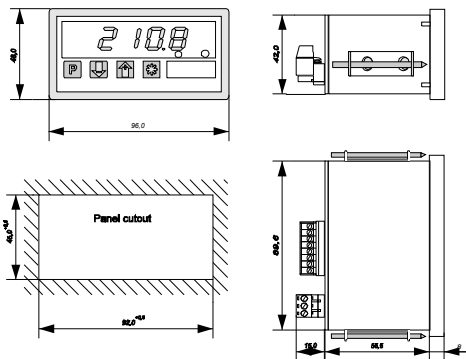
- Input Voltage Range 0 - 10 V
- Input Current Range 0 - 20 mA
- Input Current Range 4 - 20 mA
- Resolution 12 bit

**Software Functions**

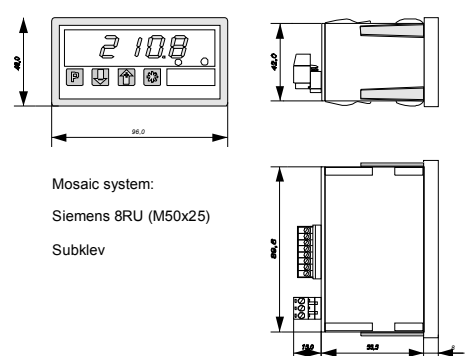
- Scaling-factor
- Digital filtering
- Taring
- Min/Max detection
- Decimal point
- Functions of three push buttons at the front
- Display test

**Dimensions**

**Switch board**



**Panel Clip**



**Specifications**

Ranges	
Voltage	: 0..10 V, ±0,05%, ± 1digit
Input impedance	: > 50 kΩ
Current	: 0(4)..20mA, ±0,05%, ±1digit
Input impedance	: 10 Ω
Resolution	: 12 Bit
Conversion rate	: approx. 5 per sec
Display	: 4 decades, 14.2 mm, red programmable decimal point, leading zero suppression minus sign
Display range	: -999 .. 9999
Operation, keyboard design	: front membrane w/ push buttons
Power supply DC	: 5 V to 36 V DC, isolated
Power consumption	: max. 65 mA
Case	: 96 x 48 x 63.5 mm
Depth	: <72 mm incl. screw terminal
Protection case at front	: IP 54
Protection case connection	: IP 20
EMV	: conform to 89/336/EWG
Operating temperature	: 0 .. 50 °C
Storage temperature	: -25 .. 80 °C
Humidity	: < 80 %, not-condensing
Field of application	: class 2 overvoltage protection II
Weight	: approx. 200 g

**Ordering Information**

UM3300-	0	0	x	0	x	
						<b>Housing</b>
						0 Switchboard mounting
						1 Panel clip
						<b>Reserved</b>
						<b>Front design</b>
						0 Reserved
						1 ERMA-Meter logo
						2 No logo

**■ Programmable Low Cost Digital Panel Meter UM 3301**

**Characteristics**

- Input for standard signals 0-10V and 0/4-20 mA
- LED Display, red, 4 decades, 14 mm
- Display Range -999 - 9999
- DIN Housing 96 x 48 mm
- free scaling
- Isolated Power Supply
- Power supply 6 VDC - 36 VDC or 230 VAC
- Plug-In Screw Terminal
- Programmable front buttons



**Measuring Ranges**

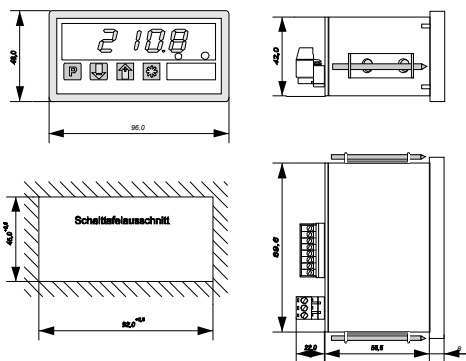
- Input Voltage Range 0 - 10 V
- Input Current Range 0 - 20 mA
- Input Current Range 4 - 20 mA
- Resolution 12 bit

**Software Functions**

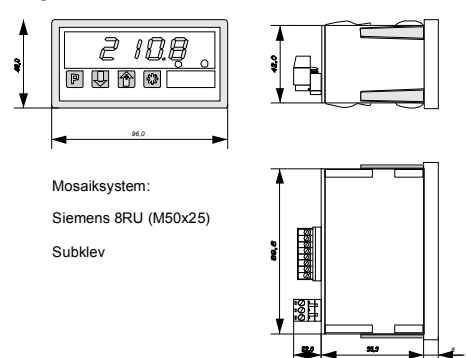
- Scaling-factor
- Digital filtering
- Taring
- Min/Max detection
- Decimal point
- Functions of three push buttons at the front
- Display test

**Dimensions**

**Switch board**



**Panel Clip**



Mosaiksystem:  
Siemens 8RU (M50x25)  
Subklev

**Specifications**

Ranges	
Voltage	: 0..10 V, ±0,05%, ± 1digit
Input impedance	: > 50 kΩ
Current	: 0(4)..20mA, ±0,05%, ±1digit
Input impedance	: 10 Ω
Resolution	: 12 Bit
Conversion rate	: approx. 5 per sec
Display	: 4 decades, 14.2 mm, red programmable decimal point, leading zero suppression minus sign
Display range	: -999 .. 9999
Operation, keyboard design	: front membrane w/ push buttons
Power supply DC	: 6 V to 36 V DC, isolated
Power consumption	: max. 120 mA
Power supply AC	: 230 VAC ±10 % 50/60 Hz 1,5VA
Case	: 96 x 48 x 63.5 mm
Depth	: <78 mm incl. screw terminal
Protection case at front	: IP 54
Protection case connection	: IP 20
EMV	: conform to 89/336/EWG
Operating temperature	: 0 .. 50 °C
Storage temperature	: -25 .. 80 °C
Humidity	: < 80 %, not-condensing
Field of application	: class 2 overvoltage protection II
Weight	: approx. 200 g

**Ordering Information**

UM3301-	0	0	x	0	x	
						<b>Housing</b>
						0 Switchboard mounting
						1 Panel clip
						<b>Reserved</b>
						<b>Front design</b>
						0 Reserved
						1 ERMA-Meter logo
						2 No logo

## ■ Programmable Digital Panel Meter Model UM 5000

### Highlights

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 144 x 72 mm
- LED Display 25 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- 2 Alarm Relay Outputs
- Serial Output

### UM 5000

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 Digit

### Software functions

- Scaling factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2, 5 or 10 steps
- Display test
- Limiting value functions

### Digital input channels

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test
- Reset of peak detection

### Serial Output

Continually measured value transmitting at ASCII-Code with following data format:

- Sign or X, X, X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 baud, 1 start bit, 8 data bits, 1 stop bit

### Alarm relay outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms



### Power supply

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### Programming

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### Housing

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### Design of the front

- Without front foil
- Front foil ERMA-METER or NEUTRAL
- Unit overprint

#### Colour of the front frame

- Black

#### Display colour

- Red
- Green

## Technical data

Display	: 4 decades, 25 mm, red (opt. gren)
Input impedance	: at voltage > 1 MΩ : at current approx. 10 Ω
Conversion rate sec	: approx. 5 per
Digital inputs	: 10 kΩ to +5 V : low level < 0,4 V : high level > 3,5 V, max. 30 V
Serial output	: Optocoupler : max. 10 mA, 70 V, max. 150 mW : 9600 baud, 1, 8, N, 1
Limit value (relays)	: AC max. 5 A, max. 250 V, 1250 VA : DC max. 5 A, max. 250 V, 100 W
Indication of limit value	: two LEDs at the front
Power supply DC optional optional	: 18 V to 36 V DC, isolated : 12 V DC, ± 10 %, isolated : 5 V DC, ± 10 %, isolated
Power consumption (18 .. 36 V DC)	: approx. 65 mA (red) : approx. 75 mA (green)
Housing	: switch board mounting DIN 43700
Dimensions	: 144 x 72 x 63,5 mm
Depth	: < 72 mm incl. screw terminal
Protection	: front IP 40
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

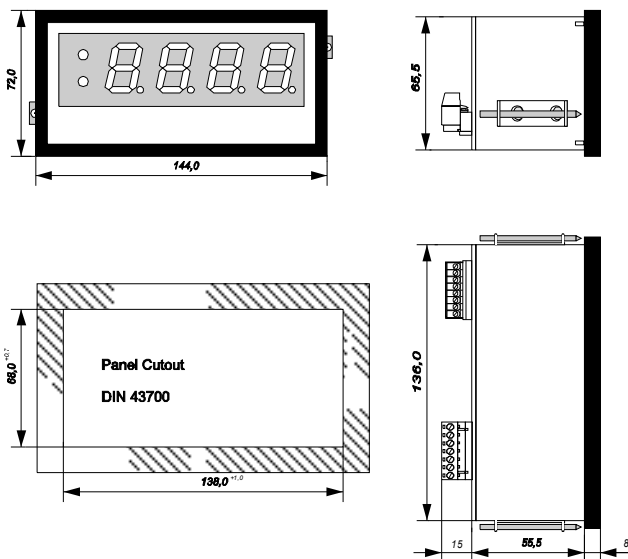
<b>UM 5000 -</b>	
	<b>Housing</b>
	0 Switch board mount
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	<b>Front design</b>
	0 Without front foil
	1 Front foil ERMA-METER
	2 Front foil NEUTRAL
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

## Unit overprint

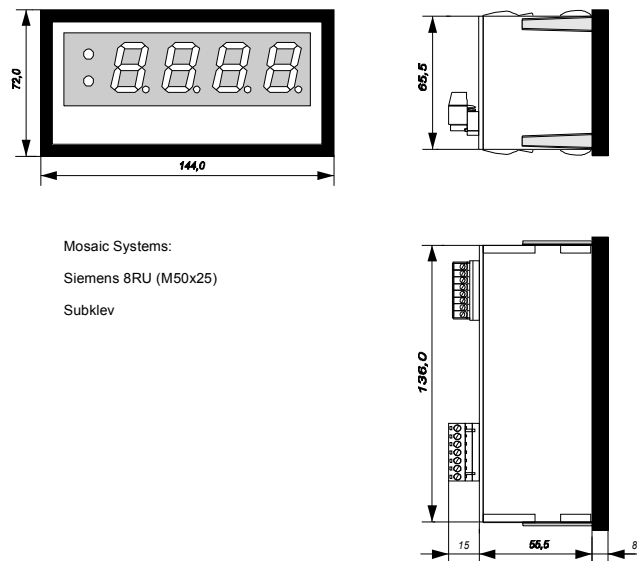
Please specify in clear text at order !

## Dimensions

### Switch board mounting



### Panel clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subklev



## ■ Programmable Digital Panel Meter Model UM 7000

### **Highlights**

- Signal Input 0 - 10 V and 0/4 - 20 mA
- DIN Housing 192 x 72 mm
- LED Display 45 mm
- Switchboard- or Mosaic System Mounting
- Plug-In Screw Terminal
- Isolated Power Supply
- 2 Alarm Relay Outputs
- Serial Output

### **UM 7000**

- Voltage 0 - 10 V
- Current 0 - 20 mA resp. 4 - 20 mA
- Display range -999 .. 9999
- Resolution max. 4000 digits
- Accuracy 0,1% ±1 Digit

### **Software functions**

- Scaling-factor
- Userdefined linearization up to 9 points
- Adjustable digital filter
- Peak detection
- Decimal point
- Last digit in 1, 2 , 5 or 10 steps
- Display test
- Limiting value functions

### **Digital input channels**

The instrument is provided with three digital input channels. The digital input channels are low active. The digital inputs are carried out following functions:

- Programming
- Display test
- Reset of peak detection

### **Serial Output**

Continually measured value transmitting at ASCII-Code with following data format:

- Sign or X, X , X, (dp), X, 0D<sub>H</sub>, 0A<sub>H</sub>
- 9600 baud, 1 start bit, 8 data bits, 1 stop bit

### **Alarm relay outputs**

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms



### **Power supply**

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- Optional 5 V DC isolated

### **Programming**

The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### **Options**

#### **Housing**

- Switch board mounting DIN 43700
- Mosaic system mounting (Subklev)

#### **Colour of the front frame**

- Black

#### **Display colour**

- Red

**Technical data**

Display : 4 decades, 45 mm, red

Input impedance : at voltage > 1 MΩ  
: at current approx. 10 Ω

Conversion rate : approx. 5 per sec

Digital inputs : 10 kΩ to +5 V  
: low level < 0,4 V  
: high level > 3,5 V, max. 30 V

Serial output : Optocoupler  
: max. 10 mA, 70 V, max. 150 mW  
: 9600 baud, 1, 8, N, 1

Limit value (relays) : AC max. 5 A, max. 250 V,  
1250 VA  
: DC max. 5 A, max. 250 V, 100 W

Indication of limit value : two LEDs at the front

Power supply DC : 18 V to 36 V DC, isolated  
optional : 12 V DC, ± 10 %, isolated  
optional : 5 V DC, ± 10 %, isolated

Power consumption : approx. 70 mA (18 .. 36 V DC)

Housing : switch board mounting DIN 43700

Dimensions : 192 x 72 x 63,5 mm

Depth : < 72 mm incl. screw terminal

Protection : front IP 40

EMV : in conform with 89/336/EWG

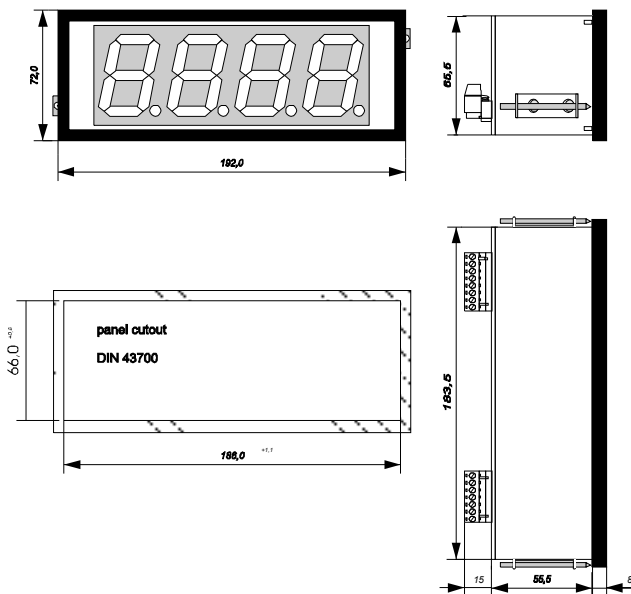
Operating temperature : 0 .. 50 °C

**Ordering information**

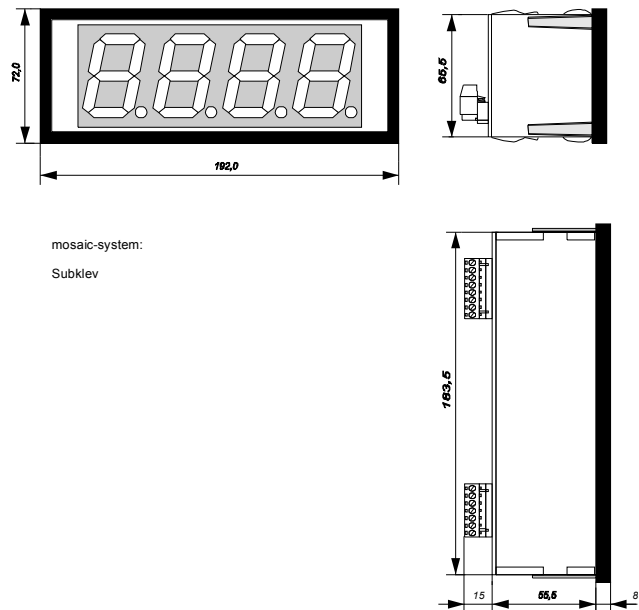
UM 7000 -	
<b>Housing</b>	
0	Switch board mount
1	Panel clip
<b>Front frame colour</b>	
0	Black
<b>Front design</b>	
0	Without front foil
<b>Display colour</b>	
0	Red
<b>Power supply</b>	
0	5 V DC, ± 10%, isolated
1	12 V DC, ± 10 %, isolated
2	18 .. 36 V DC, isolated

**Dimensions**

**Switch board mounting**



**Panel clip**



## ■ Programmable Meter for Temperatures Model TM 2500

### Highlights

- THERMOCOUPLE
- RTD
- VOLTAGES
- DIN HOUSING 48 x 24 mm
- ISOLATED POWER SUPPLY
- PLUG\_IN SCREW TERMINALS

### Standard functions

#### Modes

- Thermocouple Type K, J, S, L, and R
- RTD (2-wire/3-wire modes)
- Voltages 0 - 200 mV and 0 - 2 V

#### Software functions

- Scaling for voltage input channels
- Digital filtering
- Max value detection
- Programmable decimal point
- Last digit steps: 1, 2, 5 or 10
- Display test

#### Digital input channels

The instrument is provided with 3 digital input channels at the rear. These digital input channels are low active. With the aid of the digital inputs are carried out following functions:

- Programming
- Display test
- Reset of max. value

#### Power supply

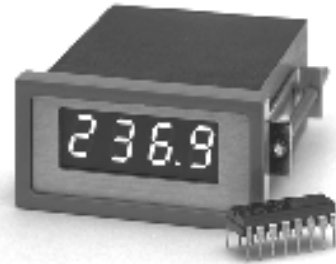
The TM 2500 is provided for DC supply voltages. Using DC/DC converters the power supply is isolated from internal electronic and from all input channels.

The TM 2500 can be delivered supplied with the following supply voltages:

- 18 .. 36 V DC isolated
- optional 12 V DC isolated
- optional 5 V DC isolated

#### Construction

The meter TM 2500 has a 4 digit resolution. Digits are 8 mm in height. The meter is presented in standard 1/32 DIN format with short depth (68.2 mm). The meter fit a 45mm x 22.2mm standard 1/32 DIN cut-out.



**We have special conditions for this device!  
Availability and prices only on demand.**

The front of the instrument is drip proof and is dust tight.

The meter comes complete with brackets and plug in screw terminal connectors.

### Programming

The meter is user programmable via external push buttons connected to the screw terminal at the rear. The programming is easy and clearly arranged. By means of a programming menu the user is taken through this programming. The programming is carried out through the digital input channels.

### Options

#### Housing type

- Panel mounting DIN 43700
- Mosaic system mounting (Subklev, Siemens 8RU)

#### Colour of the front frame

- Black
- Grey coloured RAL 7037
- Grey coloured RAL 7032
- Grey coloured RAL 7035

#### Design of the front

- Without front foil
- Front foil ALU
- Front foil RAL 7032
- Front foil RAL 7035
- Unit label

#### Display colour

- Red
- Green

## Technical data

Display	: 4 decades, 8 mm, red (opt. green)
Display range	: -999 .. 9999
Display Rate	: 5 /s
Measuring ranges:	
Thermocouple	
Ni-CrNi (K)	: -100 to +1370 °C
Accuracy	: ± 1°C, ± 1 Digit (>200°C)
Fe-CuNi (J)	: -100 to 1000°C
Accuracy	: ± 1°C, ± 1 Digit
PtRh90/10%-Pt (S)	: 0 to 1750°C
Accuracy	: ± 1°C, ± 1 Digit (>250°C)
Fe-CuNi (L)	: -100 to +900°C
Accuracy	: ± 1°C, ± 1 Digit
PtRh87/13%-Pt (R)	: 0 to 1590°C
Accuracy	: ± 1°C, ± 1 Digit (>200°C)
Ice Point Compensation	
Accuracy	: internal 0 to 50°C
RTD	
Modes	: 2-wire / 3-wire
Resolution	: 0.1°C or 1 °C
Accuracy	: ± 1°C
Voltages	
Range 1	: 0 to 200 mV, ± 0.1%, ± 1 Digit
Range 2	: 0 to 2 V, ± 0.01%, ± 1 Digit
Digital input channels:	
Low level	: < 0,4 V
High level	: > 3,5 V, max. 30 V
Input resistance:	
Input 1-4	: 10 kΩ to +5V
Input 5	: 10 kΩ to GND
Power supply DC	: 18 V to 36 V DC, isolated
optional	: 12 V DC, ± 10 %, isolated
optional	: 5 V DC, ± 10 %, isolated
Power consumption	: approx. 25 mA (red), 24 VDC
	: approx. 40 mA (green), 24VDC
Housing	: panel mounting DIN 43700
Dimensions	: 48 x 24 x 60 mm
Depth	: < 70 mm incl. screw terminal
Protection	: front IP 40
EMV	: EMV-conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C

## Ordering information

<b>TM 2500 -</b>	
	<b>Housing</b>
	0 Panel mounting
	1 Panel clip
	<b>Front frame colour</b>
	0 Black
	1 Grey coloured RAL 7037
	2 Grey coloured RAL 7032
	3 Grey coloured RAL 7035
	<b>Front design</b>
	0 Without front foil
	1 Front foil ALU eloxiert
	2 Front foil RAL 7032
	3 Front foil RAL 7035
	<b>Display colour</b>
	0 Red
	1 Green
	<b>Power supply</b>
	0 5 V DC, ± 10%, isolated
	1 12 V DC, ± 10 %, isolated
	2 18 .. 36 V DC, isolated

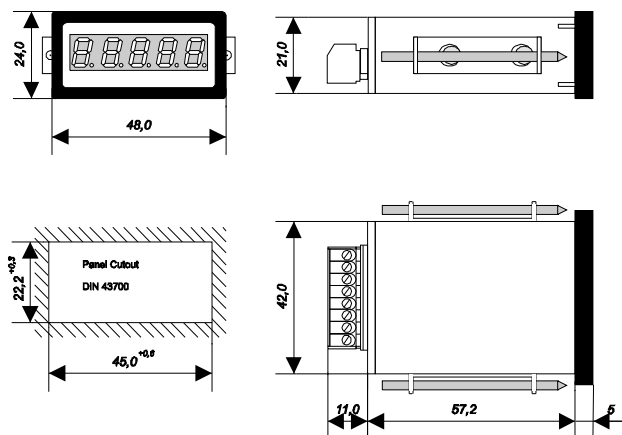
## Unit label

Please specify in clear text at order !

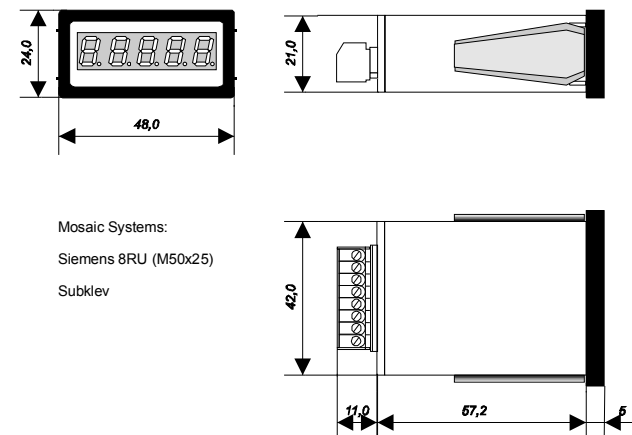
**We have special conditions for this device!**  
**Availability and prices only on demand.**

## Dimensions

### Panel Mounting



### Panel Clip



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subklev

## ■ Programmable Digital Panel Meter Model DM 2400

### Highlights

- LED Display, Red, 4 Decades, 8 mm
- DIN Housing 48 x 48 mm
- Voltage, Current, Thermocouples, Pt100
- User Configurable
- High Accuracy
- Userdefined Linearization
- 2 Alarm Relay Outputs
- Plug-In Screw Terminal
- Many Integrated Functions

### Standard functions

#### Input ranges

- Voltage  $\pm 10$  V
- Current  $\pm 20$  mA
- Current 4 - 20 mA
- Thermocouple Type K, J, L, S, T, U, R
- Pt100 2-/4-Wire

#### Software functions

- Scaling-factor
- Adjustable digital filter of 1th order
- Peak and valley detection
- Automatic reset of peak and valley detection
- Userdefined linearization up to 10 points
- Display of temperature in °C or °F
- Taring
- Display test
- Display hold
- Setting of alarm points during measurement

#### Display

- Display range +9999 to -999
- Points programmable
- Data source: direct input, peak-, valley-, mean- or hold value
- Last digit: in 1, 2, 5 or 10 steps

#### Push buttons at the front

The two push buttons at the front can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring
- Manual alarm reset
- Setting of alarm point



- Showing one of following data source by pressing push button: peak-, valley- or mean value
- Display test
- Display hold

#### Alarm outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms
- Alarm response time
- Data source: direct input, peak-, valley, mean- or hold value

#### Power supply

- 18 .. 36 V DC isolated
- Optional 12 V DC isolated
- optional 5 V DC isolated

**Technical data**

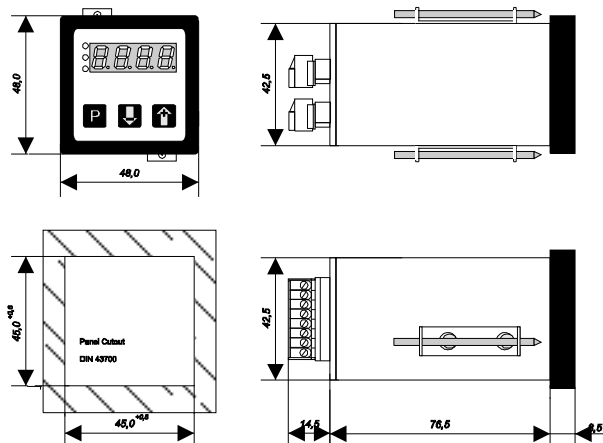
Input range  
 Voltage :  $\pm 10 \text{ V}$ ,  $\pm 0,01 \%$   
 Current :  $\pm 20 \text{ mA}$ ,  $\pm 0,01 \%$   
 Thermocouple  
 Ni-CrNi (K) : -100 to +1300 °C,  $\pm 1 \text{ }^\circ\text{C}$   
 Fe-CuNi (J) : -100 to +1000 °C,  $\pm 1 \text{ }^\circ\text{C}$   
 Fe-CuNi (L) : -100 to +900 °C,  $\pm 1 \text{ }^\circ\text{C}$   
 PtRh90/10%-Pt (S) : 0 to +1750 °C,  $\pm 5 \text{ }^\circ\text{C}$   
 Cu-CuNi (T) : -100 to +400 °C,  $\pm 1 \text{ }^\circ\text{C}$   
 Cu-CuNi (U) : -80 to +400 °C,  $\pm 1 \text{ }^\circ\text{C}$   
 PtRh87/13%-Pt (R) : 0 to +1400 °C,  $\pm 2 \text{ }^\circ\text{C}$   
 Temp. compensation : internal  
 Pt100 : 2-/4-Wire  
 : -99,9 to +600,0 °C,  $\pm 0,5 \text{ }^\circ\text{C}$   
 Conversion rate : 10 per sec  
 Display : 4 decades, 8 mm, rot  
 Power supply : 18 .. 36 V DC isolated  
 Power consumption : approx. 80 mA  
 Housing : switch board mounting DIN 43700  
 Dimensions : 48 x 48 x 85 mm  
 Depth : 100 mm incl. screw terminal  
 Protection : front IP 54  
 EMV : in conform with 89/336/EWG  
 Operating temperature : 0 .. 50 °C  
 Alarm outputs : Relay outputs  
 : AC max. 250 V, 5 A, 1250 VA  
 : DC max. 250 V, 5 A, 100 W  
 Indication : two LEDs at the front

**Ordering information**

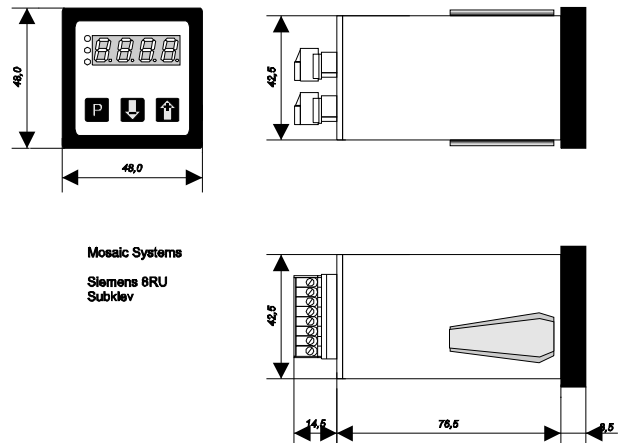
<b>DM 2400-</b>	0	0				
<b>Housing</b>						
0 Switch board mount						
1 Panel clip						
<b>Front frame colour</b>						
0 Black						
<b>Front design</b>						
1 No logo						
<b>Reserve</b>						
<b>Power supply</b>						
0 5 V DC, $\pm 10 \%$ , isolated						
1 12 V DC, $\pm 10 \%$ , isolated						
2 18 .. 36 V DC isolated						
<b>Reserve</b>						

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems  
 Siemens 8RU  
 Subklev

## ■ Programmable Digital Panel Meter Model DM 3110

### Highlights

- LED Display, Red, 6 Decades, 14 mm
- DIN Housing 96 x 48 mm
- Voltage, Current, Thermocouples, Pt100
- User Configurable
- High Accuracy
- Userdefined Linearization
- Power Supply For Remote External Sensor
- 2 Alarm Relay, Analog Output, Interface
- Plug-In Screw Terminal
- Many Integrated Functions

### Standard functions

#### Input ranges

- Voltage  $\pm 10$  V
- Current  $\pm 20$  mA
- Current 4 - 20 mA
- Thermocouple Type K, J, L, S, T, U, R
- Pt100 2-/3-/4-Wire

#### Software functions

- Scaling-factor
- Adjustable digital filter of 1th order
- Peak and valley detection
- Automatic reset of peak and valley detection
- Userdefined linearization up to 10 points
- Display of temperature in °C or °F
- Taring
- Display test
- Display hold
- Setting of alarm points during measurement

#### Display

- Display range +99999 to -99999
- Points programmable
- Data source: direct input, peak-, valley-, mean- or hold value
- Last digit: in 1, 2, 5 or 10 steps

#### Digital input channels

The instrument is provided with two digital input channels. The digital input channels are low active. Each input can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring
- Manual alarm reset



- Display hold
- Display test
- Display of direct input signal
- Display of peak value
- Display of valley value

#### Push buttons at the front

The three push buttons at the front can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring
- Manual alarm reset
- Setting of alarm point
- Showing one of following data source by pressing push button: peak-, valley- or mean value

#### Accessory sensor supply

At AC model the instrument is provided with a power supply (24V/50mA DC) for external sensors. This power supply is isolated of the signal inputs and the main power supply.

#### Alarm outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms
- Alarm response time
- Data source: direct input, peak-, valley, mean- or hold value

#### Analog output

**Options**

- Isolated
- Configurable range
- Voltage: 0 - 10 V, 2 - 10 V, max. 10 mA
- Current: 0 - 20 mA, 4 - 20 mA, 500 Ohm
- Data source: direct input, peak-, valley-, mean- or hold value
- Indication of sensor break: >22 mA, >11 V

**Serial interface**

- RS 485-interface, isolated
- Up to 19200 baud

Input range  
Voltage : ± 10 V, ± 0,01 %

**Technical data**

Current : ± 20 mA, ± 0,01 %  
 Thermocouple  
 Ni-CrNi (K) : -100 to +1300 °C, ±1 °C  
 Fe-CuNi (J) : -100 to +1000 °C, ±1 °C  
 Fe-CuNi (L) : -100 to +900 °C, ±1 °C  
 PtRh90/10%-Pt (S) : 0 to +1750 °C, ±5 °C  
 Cu-CuNi (T) : -100 to +400 °C, ±1 °C  
 Cu-CuNi (U) : -80 to +400 °C, ±1 °C  
 PtRh87/13%-Pt (R) : 0 to +1400 °C, ±2 °C  
 Temp. compensation : internal/constant  
 Pt100 : 2-/3-/4-Wire : -200,0 to +600,0 °C, ±0,5 °C

Conversion rate  
 Voltage, Current : 10 per sec  
 Temperature : 5 per sec  
 Display : 6 decades, 14 mm, rot  
 Digital input channels : 10 kΩ to +5 V  
 Power supply : 95 V to 250 V/AC  
 Power consumption : approx. 5 VA  
 Housing : switch board mounting DIN 43700  
 Dimensions : 96 x 48 x 141 mm  
 Depth : 148 mm incl. screw terminal  
 Protection : front IP 54  
 EMV : in conform with 89/336/EWG

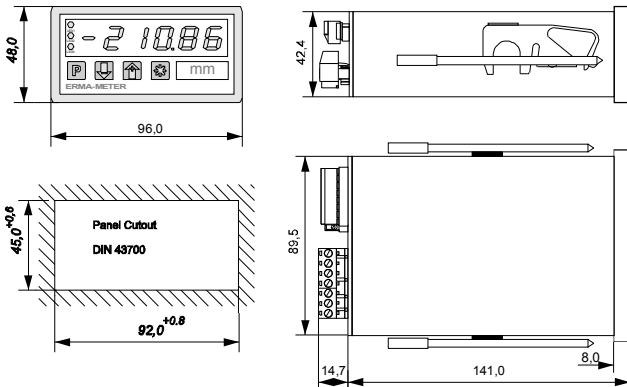
Operating temperature : 0 .. 50 °C  
 Analog output : resolution 16 Bit  
 : accuracy 0,2% of FS  
 0 - 10 V, max. 10 mA  
 0/4 - 20 mA, max. 500 Ω  
 Alarm outputs : relay output (closed contact)  
 : AC max. 250 V, 5 A, 1250 VA  
 : DC max. 250 V, 5 A, 100 W  
 Indication : two LEDs at the front

**Ordering information**

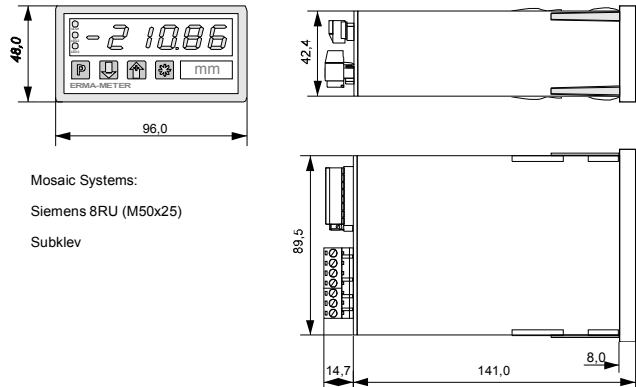
<b>DM 3110-</b>									
									<b>Housing</b>
									0 Switch board mount
									1 Panel clip
									<b>Front frame colour</b>
									0 Black
									<b>Front design</b>
									0 ERMA-Meter logo
									1 No logo
									2 Customer defined logo
									<b>Power supply</b>
									0 95 .. 250 V/AC
									1 18 .. 36 V/DC, isolated
									<b>Option interface</b>
									0 No interface
									1 Interface RS 485
									2 Interface RS 232
									3 Interface Current-Loop, TTY
									<b>Option analog output</b>
									0 No analog output
									1 With analog output

**Dimensions**

**Switch board mounting**



**Panel clip**





## ■ Programmable Digital Panel Meter Model DM 3103 with Integrator

### Highlights

- LED Display, Red, 6 Decades, 14 mm
- DIN Housing 96 x 48 mm
- Voltage, Current, Thermocouples, Pt100
- User Configurable
- High Accuracy
- Integral Function 1/s, 1/min or 1/h
- Summary Memory
- Userdefined Linearization
- Power Supply For Remote External Sensor
- 2 Alarm Relay, Analog Output
- Plug-In Screw Terminal

### Standard functions

#### Input ranges

- Voltage  $\pm 10$  V
- Current  $\pm 20$  mA
- Current 4 - 20 mA
- Thermocouple Typ K, J, L, S, T, U, R
- Pt100 2-/3-/4-wire

#### Software functions

- Scaling-factor
- Adjustable digital filter of 1th order
- Peak and valley detection
- Automatic reset of peak and valley detection
- Userdefined linearization up to 10 points
- Display of temperature in °C or °F
- Taring
- Display test
- Display hold
- Setting of alarm points during measurement
- Integral function 1/s, 1/min or 1/h
- Summary memory
- Masked quantity suppression

#### Display

- Display range -99999 to 99999
- Programmable decimal point
- Data source: direct input, peak-, valley-, mean-, hold- or summary memory value
- Last digit: 1, 2, 5 or 10 steps

#### Digital input channels

The instrument is provided with two digital input channels. The digital input channels are low active. Each input can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring



- Manual alarm reset
- Display hold
- Display test
- Display of direct input signal
- Display of peak value
- Display of valley value

#### Push buttons at the front

The three push buttons at the front can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring
- Manual alarm reset
- Display of summary memory
- Reset of summary memory
- Setting of alarm point
- Showing one of following data source by pressing push button: peak-, valley- or mean value

#### Accessory sensor supply

At AC model the instrument is provided with a power supply (24V/125mA DC) for external sensors. This power supply is isolated of the signal inputs and the main power supply.

#### Alarm outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms
- Alarm response time
- Data source: direct input, peak-, valley-, mean- or hold value

**Options**

**Analog output**

- Isolated
- Configurable range
- Voltage: 0 - 10 V, 2 - 10 V, max. 10 mA
- Current: 0 - 20 mA, 4 - 20 mA, 500 Ohm
- Data source: direct input, peak-, valley-, mean- or hold value
- Indication of sensor break: >22 mA, >11 V

- Analog output : resolution 16 Bit  
: accuracy 0,2% of FS  
0 - 10 V, max. 10 mA  
0/4 - 20 mA, max. 500 Ω
- Alarm outputs : relay output (closed contact)  
: AC max. 250 V, 5 A, 1250 VA  
: DC max. 250 V, 5 A, 100 W
- Indication : two LEDs at the front

**Technical data**

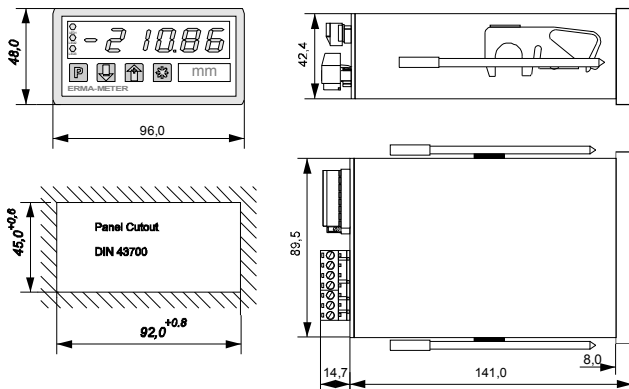
- Input range  
Voltage : ± 10 V, ± 0,01 %  
Current : ± 20 mA, ± 0,01 %
- Thermocouple  
Ni-CrNi (K) : -100 to +1300 °C, ±1 °C  
Fe-CuNi (J) : -100 to +1000 °C, ±1 °C  
Fe-CuNi (L) : -100 to +900 °C, ±1 °C  
PtRh90/10%-Pt (S) : 0 to +1750 °C, ±5 °C  
Cu-CuNi (T) : -100 to +400 °C, ±1 °C  
Cu-CuNi (U) : 0 to +400 °C, ±1 °C  
PtRh87/13%-Pt (R) : 0 to +1400 °C, ±2 °C  
Temp. compensation : internal/constant  
Pt100 : 2-/3-/4-Wire : -200,0 to +600,0 °C, ±0,3 °C
- Conversion rate  
Voltage, Current : 10 per sec  
Temperature : 5 per sec
- Display : 6 decades, 14 mm, red
- Digital input channels : 10 kΩ to +5 V
- Power supply : 95 V to 250 V/AC
- Power consumption : approx. 5 VA
- Housing : switch board mounting DIN 43700
- Dimensions : 96 x 48 x 141 mm
- Depth behind the panel : 148 mm incl. screw terminal
- Protection : front IP 54
- EMV : in conform with 89/336/EWG
- Operating temperature : 0 .. 50 °C

**Ordering information**

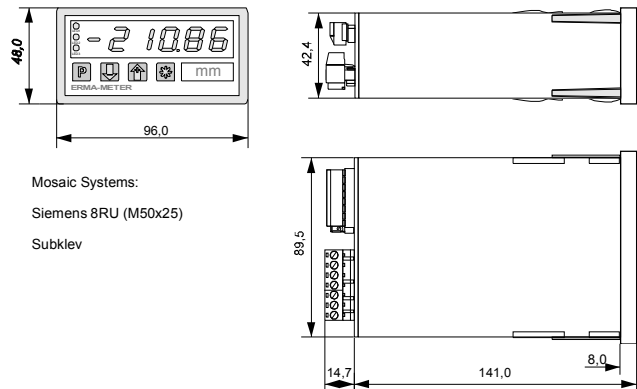
DM 3103-	0				
<b>Housing</b>					
0 Switch board mount					
1 Panel clip					
<b>Front frame colour</b>					
0 Black					
<b>Front design</b>					
0 ERMA-Meter logo					
1 No Logo					
2 Customer defined logo					
<b>Power supply</b>					
0 95 .. 250 V/AC					
1 18 .. 36 V/DC, isolated					
<b>Option analog output</b>					
0 No analog output					
1 With analog output					

**Dimensions**

**Switch board mounting**



**Panel clip**



## ■ Programmable Digital Panel Meter Model DM 3105

### Highlights

- 2 Analog Input Channels
- LED Display, Red, 6 Decades, 14 mm
- DIN Housing 96 x 48 mm
- User Configurable
- High Accuracy
- Userdefined Linearization
- Power Supply For Remote External Sensor
- 2 Alarm Relay, Analog Output, Interface
- Plug-In Screw Terminal
- Many Integrated Functions

### Standard functions

#### Input Ranges

- Voltage 0 - 10 V
- Current 0 - 20 mA

#### Software Functions

- Display for channel A, B, (A - B), (A - B) / B
- Scaling-factor
- Adjustable digital filter of 1th order
- Peak and valley detection
- Automatic reset of peak and valley detection
- Userdefined linearization up to 10 points
- Taring
- Display test
- Display hold
- Setting of alarm points during measurement

#### Display

- Display range +99999 to -99999
- Points programmable
- Data source: direct input, peak-, valley-, mean- or hold value
- Last digit: in 1, 2, 5 or 10 steps

#### Digital Input Channels

The instrument is provided with two digital input channels. The digital input channels are low active. Each input can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring, peak, and valley values
- Manual alarm reset
- Display hold and display test
- Display of direct input, peak, or valley value



#### Push Buttons At The Front

The three push buttons at the front can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring and reset of taring
- Manual alarm reset
- Setting of alarm point
- Showing one of following data source by pressing push button: peak-, valley- or mean value

#### Accessory Sensor Supply

At AC model the instrument is provided with a power supply (24V/50mA DC) for external sensors. This power supply is isolated of the signal inputs and the main power supply.

#### Alarm outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms
- Alarm response time
- Data source: direct input, peak-, valley, mean- or hold value

#### Analog output

- Isolated
- Configurable range
- Voltage: 0 - 10 V, 2 - 10 V, max. 10 mA
- Current: 0 - 20 mA, 4 - 20 mA, 500 Ohm
- Data source: Input, peak-, valley-, mean- or hold value

## Technical data

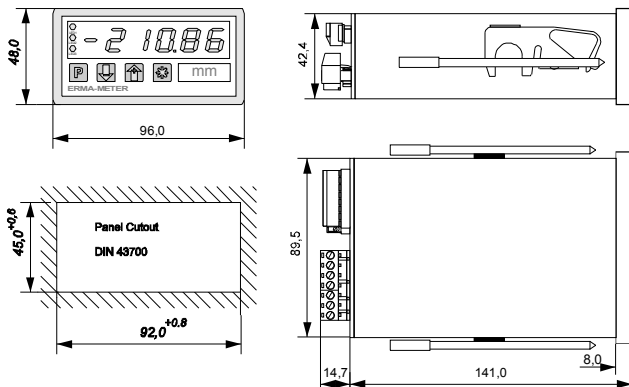
<b>Input ranges</b>	
Voltage	: 0 - 10 V, ± 0,01 %
Input resistance	: 1 MΩ
Current	: 0 - 20 mA, ± 0,01 %
Input resistance	: 10 Ω
<b>AD converter</b>	
Resolution	: 16 Bit
<b>Conversion rate</b>	
Voltage, Current	: 5 per sec
<b>Display</b>	
	: 6 decades, 14 mm, rot
<b>Digital input channels</b>	
	: Programmable
Input Voltage	: max. 30 V
Threshold level	: Low-level < 0.4 V : High-level > 3.5 V
<b>Power supply</b>	
	: 95 V to 250 V/AC
Power consumption	: approx. 5 VA
Optional	: 18 ... 36 VDC
<b>Housing</b>	
	: switch board mounting DIN 43700
<b>Dimensions</b>	
	: 96 x 48 x 141 mm
Depth	: 148 mm incl. screw terminal
Protection	: front IP 54
EMV	: in conform with 89/336/EWG
Operating temperature	: 0 .. 50 °C
<b>Analog output</b>	
	: resolution 16 Bit
	: accuracy 0,2% of FS
	0 - 10 V, max. 10 mA
	0/4 - 20 mA, max. 500 Ω
<b>Alarm outputs</b>	
	: relay output (closed contact)
	: AC max. 250 V, 5 A, 1250 VA
	: DC max. 250 V, 5 A, 100 W
<b>Indication</b>	
	: two LEDs at the front

## Ordering information

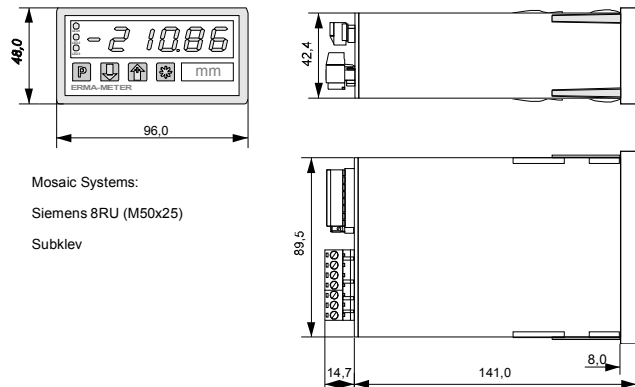
<b>DM 3105 -</b>	
	Analog Input
0	0 - 10 V
1	0 - 20 mA
<b>Housing</b>	
0	Switch board mount
1	Panel-Clip
<b>Front frame colour</b>	
0	Black
<b>Front design</b>	
0	ERMA-Meter Logo
1	no Logo
2	Customer defined logo
<b>Power supply</b>	
0	95 .. 250 V AC
1	18 .. 36 V DC, isolated
<b>Option analog output</b>	
0	no analog output
1	with analog output

## Dimensions

### Switch board mounting



### Panel clip



## ■ Programmable Digital Panel Meter Model DM 3002

### Highlights

- LED Display, Red, 6 Decades, 14 mm
- DIN Housing 96 x 48 mm
- Strain Gauge (DMS) Input
- User Configurable
- High Accuracy
- Userdefined Linearization
- Reference Voltage Source for DMS-Sensor
- Additional 24V DC Sensor Supply
- 2 Alarm Relay, Analog Output, Interface
- Plug-In Screw Terminal
- Many Integrated Functions

### Standard functions

#### Input ranges

- DMS 1 mV/V
- DMS 1,5 mV/V
- DMS 2 mV/V
- DMS 3 mV/V

#### Software functions

- Scaling-factor
- Adjustable digital filter of 1th order
- Peak and valley detection
- Automatic reset of peak and valley detection
- Userdefined linearization up to 10 points
- Taring
- Display test
- Display hold
- Setting of alarm points during measurement

#### Display

- Display range +99999 to -99999
- Programmable decimal point
- Data source: direct input, peak-, valley-, mean- or hold value
- Last digit: 1, 2, 5 or 10 steps

#### Digital input channels

The instrument is provided with two digital input channels. The digital input channels are low active. Each input can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring
- Manual alarm reset
- Display hold



- Display test
- Display of direct input signal
- Display of peak value
- Display of valley value

#### Push button at the front

The three push buttons at the front can be programmed for performing the following functions:

- No function
- Reset of peak and valley detection
- Taring
- Reset of taring
- Manual alarm reset
- Setting of alarm point
- Showing one of following data source by pressing push button: peak-, valley- or mean value

#### DMS-sensor supply

The instrument is provided with a reference voltage source 9 V/DC for the DMS-sensor.

At AC model the instrument is provided with a additional sensor supply (24V/50mA DC) for external sensors. This sensor supply is isolated of the signal inputs and the main power supply.

#### Alarm outputs

The instrument is provided with two alarms with relay output. For each alarm point there can be programmed following functions:

- Alarm point and hysteresis
- High or low alarms
- Alarm response time
- Data source: direct input, peak-, valley-, mean- or hold value

**Options**

**Analog output**

- Isolated
- Configurable range
- Voltage: 0 - 10 V, 2 - 10 V, max. 10 mA
- Current: 0 - 20 mA, 4 - 20 mA, 500 Ohm
- Data source: direct input, peak-, valley-, mean- or hold value
- Indication of sensor break: >22 mA, >11 V

**Serial interface**

- RS 485-interface, isolated
- Up to 19200 baud

**Technical data**

Input range : 1 / 1,5 / 2 / 3 mV/V  
DMS : 4-wire, bipolar

Sensor supply : 9 V/DC ± 2 %, 40 mA  
Conversion rate : 5 per sec

Display : 6 decades, 14 mm, red  
Digital input channel : 10 kΩ to +5 V  
Power supply : 95 V to 250 V/AC  
Power consumption : approx. 5 VA  
Housing : switch board mouting DIN 43700  
Dimensions : 96 x 48 x 141 mm  
Depth behind the panel : 148 mm incl screw terminal  
Protection : front IP 54

EMV : in conform with 89/336/EWG  
Operating temperature : 0 .. 50 °C  
Analog output : resolution 16 Bit  
: accuracy 0,2% of FSt  
0 - 10 V, max. 10 mA  
0/4 - 20 mA, max. 500 Ω

Alarm outputs : relay output (closed contact)  
: AC max. 250 V, 5 A, 1250 VA  
: DC max. 250 V, 5 A, 100 W

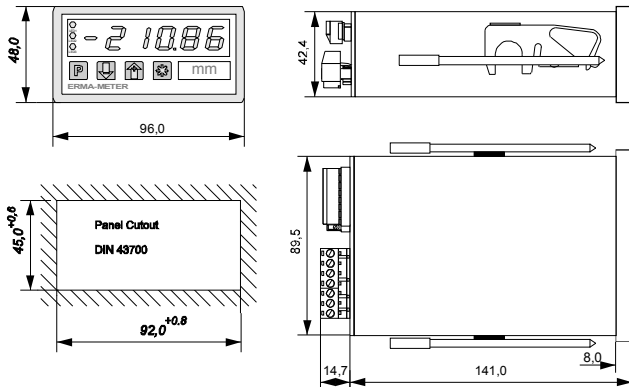
Indication : two LEDs at the front

**Ordering information**

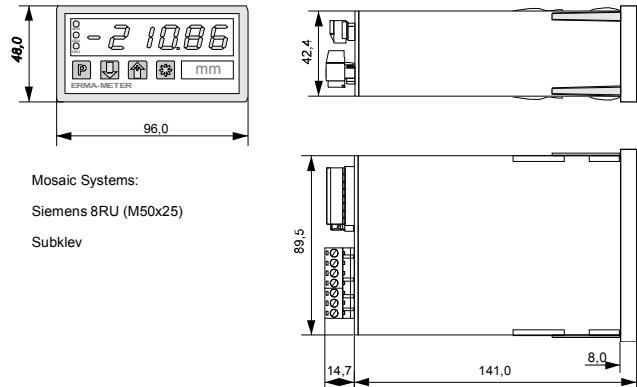
<b>DM 3002-</b>									
<b>Housing</b>									
0 Switch board mount									
1 Panel clip									
<b>Front frame colour</b>									
0 Black									
<b>Front design</b>									
0 ERMA-Meter logo									
1 No logo									
2 Customer defined logo									
<b>Power supply</b>									
0 95 .. 250 V/AC									
1 18 .. 36 V/DC, isolated									
<b>Option interface</b>									
0 No interface									
1 Interface RS 485									
0 2 Interface RS 232									
0 3 Interface Current-Loop, TTY									
<b>Options</b>									
0 No options									
1 With analog output									

**Dimensions**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subklev

## ■ Instrument for AC-Voltage/AC-Current Model DM 3202

### **Characteristics**

- LED Display, red, 6 decades, 14 mm
- Display range -99999 .. 99999
- DIN housing 96 x 48 mm
- User configurable
- Userdefined linearization
- Power supply for remote external sensor
- 2 Alarm relay, analog output, interface
- Plug-in screw terminal

### **Input ranges**

- Voltage, TRMS 0 .. 500 V
- Voltage, TRMS 0 .. 60 mV
- Current, TRMS 0 .. 1 A

### **Input signal**

- DC .. 400 Hz, independent of signal form

### **Software functions**

- Scaling factor
- Adjustable digital filter of 1th order
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Userdefined linearization up to 10 points
- Taring
- Displaytest and displayhold
- Setting of alarm points during measurement

### **Push buttons at the front**

The three push buttons at the front are programmable to following functions:

- No function
- Displaying measured, mean or MIN/MAX value
- Reset MIN/MAX value
- Taring and reset of tare value
- Displayhold
- Displaying and setting of alarm point value
- Manual alarm reset

### **Digital input channels**

These both inputs are low active and they are programmable to following functions:

- No function
- Displaying measured, mean or MIN/MAX value
- Resetting MIN/MAX value
- Taring and reset of tare value
- Displaytest and displayhold
- Manual alarm reset



### **Accessory power supply (only at AC-Version)**

Builtin power supply for sensors, 24 V DC/125 mA, isolated to the further electronic.

### **Alarm outputs**

Two programmable alarm outputs with free allocation allows the monitoring of production operation.

Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm release delay time and operate delay time
- Data source (measured, hold, mean and MIN/MAX value)

### **Option analog output**

The option analog output is provided with a current output and a voltage output. Both output are isolated from the further electronic.

- To scale (offset and final value)
- Output 0(2) - 10 V or 0(4) - 20 mA
- Data source (measured, hold, mean and MIN/MAX value)

### **Option serial interfaces**

Addition to data communication or to a host.

- RS 485

**Elektrical Datas**

Input ranges	
Voltage I	0 .. 500 V
Input resistance	> 10 MΩ
Voltage II	0 .. 60 mV
Input resistance	> 1 kΩ
Current	0 - 1 A
Voltage	< 60 mV
Frequency range	DC .. 400 Hz
Accuracy	
DC	< 0,1 % of input range
TRMS 40 .. 400 Hz	< 0,2 % of input range
Crestfactor	max. 5 (accuracy < 0,6% of i.r.)
Resolution of A/D-Converter	max. 15 bit
Setting time	< 2 s at changing
Conversion rate	5 measurings per sec
Digital inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	2 Relays (programmable as
	opened contact or closed contact)
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Analog ouput	resolution 16 bit
Accuracy	± 0,2% of final valuet
Voltage	0(2) - 10 V, max. 10 mA
Current	0(4) - 20 mA; max. 500 Ω
Isolation voltage	3 kV / 1 min
Interfaces	RS 485
Protocol	DIN 66 019 / ISO 1745
Isolation voltage	1,6 kV / 1 min
Power supply voltage AC	95 V to 250 V/AC
Isolation voltage	2,5 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	AC 9 VA, DC 70 mA
Accessory power supply	24 V DC / 125 mA (only at AC)
Isolation voltage	500 V / 1 min

**Mechanical Datas**

Display	6 decades, 14 mm, red Decimal point programmable preliminary zero suppression - sign at negative values
Operation, keyboard design	front membrane with push buttons
Case	switch board mounting DIN 43700
Dimensions (B x H x T)	96 x 48 x 141 mm
Depth	148 mm incl. screw terminal
Mounting	switch board mounting or mosaic-systems
Weight	ca. 400 g
Connection	Plug-In screw terminal

**Environmental conditions**

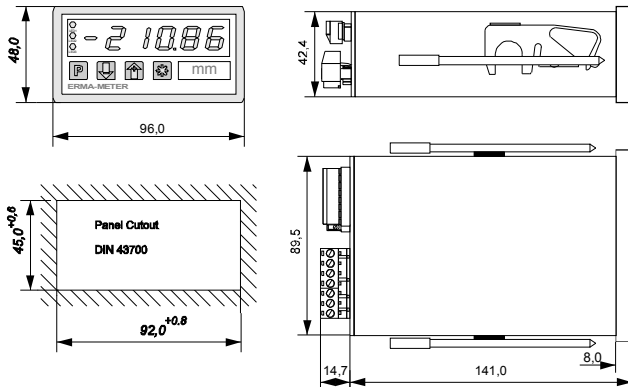
Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 54
Field of application	class 2, overvoltage protection II
CE	in conform with 89/336/EWG NSR 73/23/EWG

**Ordering information**

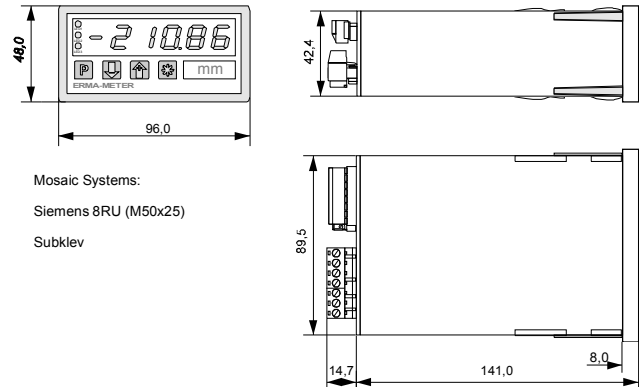
<b>DM 3202-</b>	
	<b>Housing type</b>
	0 Switch board
	1 Panel-Clip
	<b>Front frame colour</b>
	0 black
	<b>Front design</b>
	0 ERMA-Meter Logo
	1 No Logo
	2 Customer defined logo
	<b>Power supply</b>
	0 95 .. 250 V/AC
	1 18 .. 36 V/DC, isolated
	<b>Option interface</b>
	0 No interface
	1 Interface RS 485
	<b>Options</b>
	0 No options
	1 With analog output

**Dimensions and Mounting**

**Switch board mounting**



**Panel clip**



Mosaic Systems:  
Siemens 8RU (M50x25)  
Subklev



## ■ Effectice Power Panel Meter UI 354 / UI 357 and UI 359

### **Deliverable Types**

- **Effective power panel meter Type UI 354**  
Display range **3999**
- **Effective power panel meter Type UI 357**  
Display range **9999**
- **Effective power panel meter Type UI 359**  
Display range **19999**

### **General**

The digital panel meters of serie UI 354, UI 357 and UI 369 are effective power panel meter for industrial area. Depents of the type of panel meter the display range to extend over 3999 to 19999. The overflow will be indicated at the display "- - -".

### **Input ranges**

The maximal voltage to connected at the effective power panel meter is 400 V.

The maximal current to connected at the effective power panel meter is 1 A (Higher currents are realisable with an external shunt or current transformer).

Please specify the maximal power, the maximal voltage and the maximal current at order.

For example type UI 354:

Voltage	max. 400 V
Current	max. 20 A (Current transformer)
Power	max. 3999 kW

### **Function**

The current input and the voltage input have a common ground point. This version is specify expecially at DC power measurement or by using of an external current transformer.

### **Construction**

The panel meters have a very liminous intensity display. The numeral are 16 mm, so the display is still very good legible even from a distance of 10 m. The colour of the display is red (optional green). To improve the contrast the panel meters have a red (optional green) filter plate on the display.

The panel meters are placed in a high-impact DIN standard case 96 x 48 x 107 mm. To connect the input and output signals there are screw terminals ath the rear. The front frame colour is black. (Optional grey RAL 7037, grey RAL 7032 or grey RAL 7035). The installation depth inclusive the srew terminals is 118 mm. To mount the instrument in the panel a clamping frame is available.

### **Decimal point**

If a decimal point is used please specify it at the order (f.e. 1 A/ 400 V = 399.9 W).

### **Power supply**

The panel meters contains an integrated power supply. The power supply is interpreted for 230 V AC. Optional the panel meters are deliverable for the power supply 115 V AC, 24 V AC or 18 .. 36 V DC. The power supply is isolated from the further electronic.

### **Adjustment**

The panel meters are precalibrated. When deliverd no adjustment is necessary. If a new adjustment is requi- red ther are two potentiometers P1 and P2 at the rear. It is possible to vary the input offset at P1 and the scale factor at P2.

### **Service Instruction**

At power supply 230 V AC resp. 115 V AC or 24 V AC The power must be connected to screw terminal 7 (L1) and screw terminal 8 (N), ground to screw terminal 9 (PE). At power supply 18 to 36 V DC the power supply must be connected to screw terminal 8 (+) and 7 (-). Attention must be paid that the power supply will agree with the voltage noticed at the name plate.

The voltage input signal must be connected to screw terminal 5 and 6. Screw terminal 6 must be the zero conductor. The current input signal must be connected to screw terminal 4 and 6. 6 (U<sub>E</sub> resp. I<sub>E</sub>) and screw terminal 6 (Analog-Gnd). Screw terminal 6 must be the zero conductor, too.

**Electrical Data**

Voltage input	max. 400 V
Input resistance	> 1 MΩ
Current input	max. 1 A
Input voltage	max. 200 mV
Accuracy	< 0,5 % f.s. ± 1 Digit
Conversion rate	approx. 2-3 measurings per sec
Temperature coefficient	< 30 ppm/K
Offset adjustment	P1, approx. ± 20 Digit
Full scal adjustment	P2, approx. ± 5% v. Mb.
Decimal point	at factory
Power supply voltage AC	230 V, +6%/-10%, 50/60 Hz
optional	115 V, +6%/-10%, 50/60 Hz
	24 V, +6%/-10%, 50/60 Hz
Isolation voltage	2,5 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	AC 4,6 VA, DC 70 mA

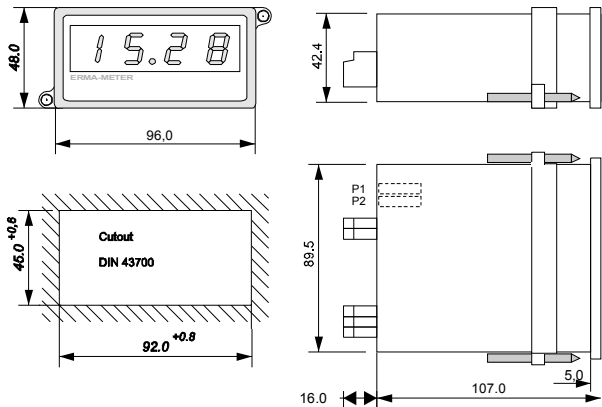
**Mechanical Data**

Display	16 mm, red (optional green)
Display range	
UI 354	max. 3999
UI 357	max. 9999
UI 359	max. 19999
Decimal point	setting at factory
Case	switch board mounting DIN 43700
Dimension (B x H x T)	96 x 48 x 107 mm
Depth	118 mm incl. screw terminal
Mounting	switch board mounting
Weight	approx 300 g
Connections	screw terminal

**Environment conditions**

Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 40
Field of application	class 2
	overvoltage protection II
CE	in conform with 89/336/EWG
	NSR 73/23/EWG

**Dimensions amd Mounting**



**Ordering Information**

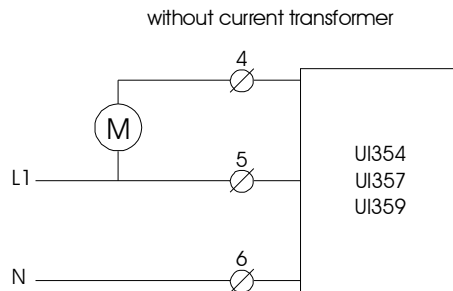
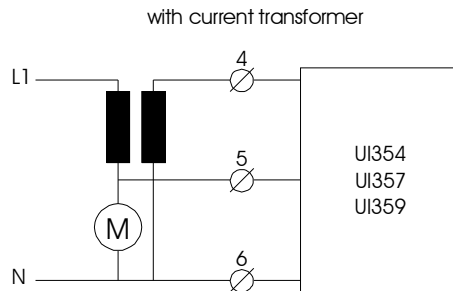
UI 35x-	0				
<b>Housing</b>					
0 Switch board					
<b>Front frame colour</b>					
0 black					
1 grey RAL 7037					
2 grey RAL 7032					
3 grey RAL 7035					
<b>Front design</b>					
0 ERMA-Meter Logo					
1 No Logo					
<b>Power supply</b>					
0 230 V/AC					
1 115 V/AC					
2 24 V/AC					
3 18 .. 36 V/DC, isolated					
<b>Display colour</b>					
0 red					
1 green					
<b>Reserve</b>					

**Unit overprint**

Please specify in clear text at order !

**Screw termianl indication**

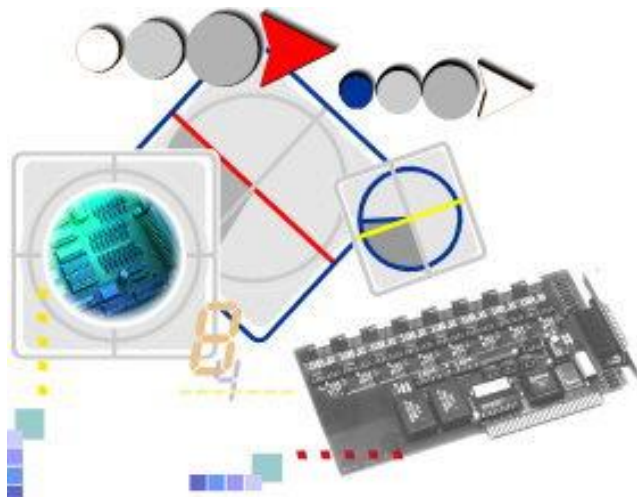
screw terminal 9	ground PE
screw terminal 8	power supply N
	or power supply (+)
screw terminal 7	power supply L1
	or power supply (-)
screw terminal 6	signal-GND
screw terminal 5	voltage signal input U <sub>E</sub>
screw terminal 4	current signal input I <sub>E</sub>





**PCI- ISA-Cards**  
**Digital I/O - Cards**  
**Relay - Cards**  
**A/D - Cards, D/A - Cards**  
**Encoder - Evaluation**  
**Timer/Counter - Cards**  
**industrial fair execution**  
**customized solutions**

**PCI**



**ISA**

**Digital Input and Output Boards**

				<b>Page Marker A</b>		
Model	optoisolated Inputs	optoisolated Outputs	Input Voltage	max. Output Voltage	maxi. Output Current	Interrupts
IO 1388 (PCI)	16 / 32	16 / 32	5 V, 24 V	30 V	1 A, short circuit protected	1

**Up/Down Counter Boards**

							<b>Page Marker D</b>		
Model	Counter	Counter Input Voltage	Additional Inputs	Modes	Direction Detection	Reset	Digital Inputs	Digital Outputs	Inputs/Outputs optoisolated
PCI 1389-S01 (PCI)	2 x 32 Bit Counter	RS 422 (5 V)	1 x 16 Bit Reference Counter	1-fold / 2-fold 4-fold / Event Time	automatic	by soft- or hardware	4	4	Yes
PCI 1389-S02 (PCI)	2 x 32 Bit Counter	RS 422 (5 V)	1 x 16 Bit Reference Counter	1-fold / 2-fold 4-fold / Event Time	automatic	by soft- or hardware	4	4	Yes

**Special-Boards**

					<b>Page Marker G</b>	
Model	Description	Inputs	Interrupts	Digital Inputs	Digital Outputs	optoisolated
SSI 1417 (PCI)	Interface-Board directly connect to encoder with SSI-interface	2	1	2 Inputs for zeroing 2 Inputs for triggering	-	optional

■ **Isolated digital PCI-Input-Output-Card IO 1388**

**Features of the card**

- 16 / 32 Isolated Digital Poweroutputs, 8 - 30 V, 1 A, Short Circuit Protected
- 16 / 32 Isolated Digital Inputs, 5 V, 24 V or Custom Input Voltage
- Programmable Timer
- Programmable Watchdog
- PCI 2.2

**Outputs**

- 16 / 32 isolated Outputs
- 8 - 30 V each 1 A, short circuit protected

**Inputs**

- 16 / 32 isolated Inputs
- 5V, 24 V or custom input voltage
- Input Resistance > 10 k Ω

**Interrupts**

- For each input separately programmable to rising and/or falling edge

**Timer**

- Timing driven recording of inputs
- Interval programable 1 μs to > 3 sekonds

**Watchdog**

- Outputs will be set to programmable value on system or program crashes
- Watchtime programable 1 ms to > 65 seconds

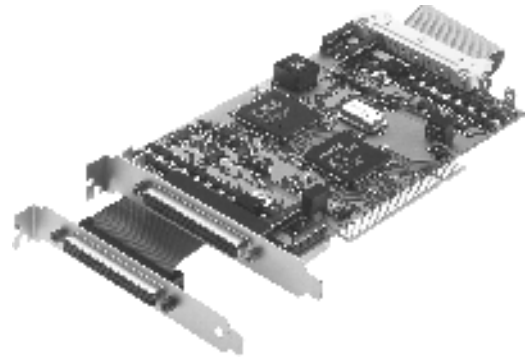
**Software**

- Driver and DLL for Windows 9x/ME
- Driver and DLL for Windows NT4.0/2000/XP
- Example-program for Delphi
- Example-program for VisualBasic
- Example-program for VisualC++

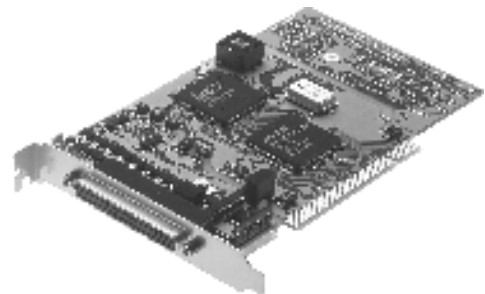
**Ordering Information**

IO1388/	x/	xx
		<b>Input Voltage</b>
		05 Input Voltage 5 V
		24 Input Voltage 24 V
		<b>Number of ports</b>
	0	16 Inputs / 16 Outputs
	1	32 Inputs / 32 Outputs (flat-cable included)

**Example:** IO 1388/1/05 = 32 Inputs / 32 Outputs  
5 V input voltage



**IO 1388/1/xx**



**IO 1388/0/xx**

**Technical Specifications**

Inputs	: 16 / 32 Inputs isolated
Input voltage	: 5 V , 24 V or custom specific
Input resistance	: > 10 kΩ
Outputs	: 16 / 32 Outputs isolated, high-side
Output current	: max. 1 A
Output voltage	: 8 - 30 V DC
Connector	: 1 / 2 37-pol. DB37-female
EMV	: EMV-conform with 89/336/EWG
Operating temperature	: 0 - 50 °C
Dimensions	: 190x107 mm

**Accessories**

- **KIO 1388-1**  
For IO 1388/0/xx if overall current (for 16 outputs) exceeds 10 A.  
For IO 1388/1/xx if overall current (for 16 outputs) of the flat-cable exceeds 2 A.
- **KIO 1388-2**  
For IO 1388/1/xx if overall current exceeds 2 A for the flat-cable and 10 A for the D-type connector.

## ■ Incremental Counter Card PCI 1389-S01

### Highlights

- Two 32-Bit Incremental Up/Down Counter
- One 16-Bit Reference Counter
- 1-, 2- and 4-fold Mode or Event Counting
- Evaluation of the Counter Values by Timer Intervals with 5- or 10 MHz Resolution
- Optical Isolation
- PCI 2.2 compatible



### General

The counter card PCI 1389-S01 has two 32-Bit incremental up/down counter. The input channels of these counters are provided with isolated RS422 interfaces. In addition there is one 16-Bit reference counter with a RS422 interface which is also isolated.

For controlling tasks there are 4 isolated digital input channels and 4 isolated digital output channels.

The two up/down counter can be programmed for 1-, 2-, or 4-fold mode counting. It is also possible to use the counters as event counters.

Alternatively there is the possibility to measure the time event of each increment with a resolution of 5 MHz or 10 MHz.

The reference counter is able to trigger the two up/down counters. With the aid of the reference counter it is also possible to generate constant time intervals for measurements.

The digital input and output channels can be used for controlling tasks. In addition the digital input channel 1 can be used for triggering one of the two up/down counters either with the raising edge or the falling edge of the input signal.

### Output Channels

- 4 digital output channels
- 7 - 30 VDC, max. 1 A, short circuit protected
- Isolation Voltage 500 VDC

### Input Channels

- 4 digital Input Channels, high-aktiv
- 5V Input Voltage
- Impedance > 100 k $\Omega$
- Isolation Voltage 500 VDC

### Reference Counter

- Timer controlled measuring of the counter values
- Position controlled measuring of the counter values

### Software

- Driver and DLL for Windows 9x/ME
- Driver and DLL for Windows NT4.0/2000/XP
- Programm Samples VisualC++

### Orderin Informations

### PCI 1389-S01

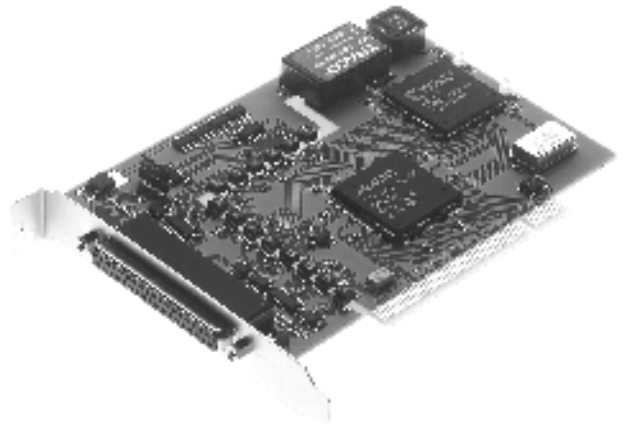
### Specifications

RS422-Ports	: 4 bidirectional : 8 unidirectional
Isolation Voltage	: 500 VDC
Output Channels	: 4
Function	: Source
Voltage Range	: 7 - 30 VDC
Max. Current	: 1 A, short circuit protected
Isolation Voltage	: 500 VDC
Input Channels	: 4
	high-aktiv
Input Voltage	: 5 V
Impedance	: > 100 K
Isolation Voltage	: 500 VDC
Supply Voltage	: +5 V, max. 1 A
External Connector	: 37-pol. SUB-D-Connector
EMV	: EMV-according to EG-Direction
89/336/EWG	
Operating Temperature	: 0 - 50 °C
Storage Temperature	: - 25 to +85 °C
Dimensions	: 160 x 113 mm

## ■ Incremental Counter Card PCI 1389-S02

### Highlights

- Two 32-Bit Incremental Up/Down Counter
- One 16-Bit Reference Counter
- 1-, 2- and 4-fold Mode or Event Counting
- Evaluation of the Counter Values by Timer Intervals with 5- or 10 MHz Resolution
- Trigger Generation by Changing Counting Direction for Angle Measuring
- Optical Isolation
- PCI 2.2 compatible



### General

The counter card PCI 1389-S02 has two 32-Bit incremental up/down counter. The input channels of these counters are provided with isolated RS422 interfaces. In addition there is one 16-Bit reference counter with a RS422 interface which is also isolated.

For controlling tasks there are 4 isolated digital input channels and 4 isolated digital output channels.

The two up/down counter can be programmed for 1-, 2-, or 4-fold mode counting. It is also possible to use the counters as event counters.

Alternatively there is the possibility to measure the time event of each increment with a resolution of 5 MHz or 10 MHz. For measuring of angles the counter can be triggered when changing the counting direction.

The reference counter is able to trigger the two up/down counters. With the aid of the reference counter it is also possible to generate constant time intervals for measurements.

The digital input and output channels can be used for controlling tasks. In addition the digital input channel 1 can be used for triggering one of the two up/down counters either with the raising edge or the falling edge of the input signal.

### Output Channels

- 4 digital output channels
- 7 - 30 VDC, max. 1 A, short circuit protected
- Isolation Voltage 500 VDC

### Input Channels

- 4 digital Input Channels, high-aktiv
- 5V Input Voltage
- Impedance > 100 kΩ
- Isolation Voltage 500 VDC

### Reference Counter

- Timer controlled measuring of the counter values
- Position controlled measuring of the counter values

### Software

- Driver and DLL for Windows 9x/ME
- Driver and DLL for Windows NT4.0/2000/XP
- Programm Samples VisualC++

### Orderin Informations

#### PCI 1389-S02

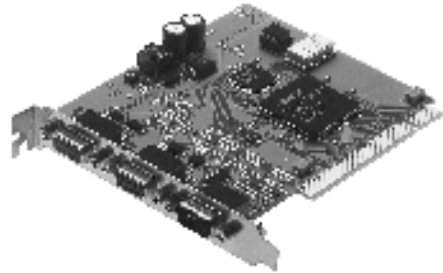
### Specifications

RS422-Ports	: 4 bidirectional : 8 unidirectional
Isolation Voltage	: 500 VDC
Output Channels	: 4
Function	: Source
Voltage Range	: 7 - 30 VDC
Max. Current	: 1 A, short circuit protected
Isolation Voltage	: 500 VDC
Input Channels	: 4 high-aktiv
Input Voltage	: 5 V
Impedance	: > 100 K
Isolation Voltage	: 500 VDC
Supply Voltage	: +5 V, max. 1 A
External Connector	: 37-pol. SUB-D-Connector
EMV	: EMV-according to EG-Direction
89/336/EWG	
Operating Temperature	: 0 - 50 °C
Storage Temperature	: - 25 to +85 °C
Dimensions	: 160 x 113 mm

■ **Synchron-Serial-Interface SSI 1417**

**Highlights**

- 2 Synchron-Serial-Interfaces, max. 44 Bit, 5 MHz, Master- / Slave-Mode
- Timed Data Recording
- Trigger And Zero Setting Input Channels
- Option: Optical Isolated Inputs
- Option: Encoder Supply Voltages  
5 V / 300 mA, 12 V / 125 mA or  
24 V / 60 mA for each Encoder
- Option: Buffer Battery For Encoders 3,6 V
- PCI 2.2



**SSI-Interfaces**

- 2 SSI-Interfaces
- max. 44 Bit
- Option: Isolated Input Channels

**Input Channels**

- 2 zero setting input channels (channels can be assigned separately to each encoder)
- 2 trigger input channels (channels can be assigned separately to each encoder)
- RS 422-, PNP- or NPN- input configuration
- Option: Isolated input channels

**Timer**

- Timer controlled recording of the encoder values
- Programmable interval: 6 µs to > 200 ms

**Software**

- Driver and DLL for Windows 9x / ME
- Driver and DLL for Windows NT4.0 / 2000 / XP
- Examples for Delphi, VisualBasic, VisualC++

**Ordering Informations**

SSI 1417 /	x/	x/	xx
<b>Encoder Supply</b>			
			00 Without Supply
			05 Supply Voltage 5 V
			12 Supply Voltage 12 V
			24 Supply Voltage 24 V
<b>Buffer Battery</b>			
			0 Without Battery
			1 With Battery
<b>Input Channel Isolation</b>			
			0 Without Isolation
			1 With Isolation

**Ordering Example: SSI 1417/0/0/05**

SSI-Board without isolation, without battery, and with encoder supply voltage of 5 V

**Technical Specifications**

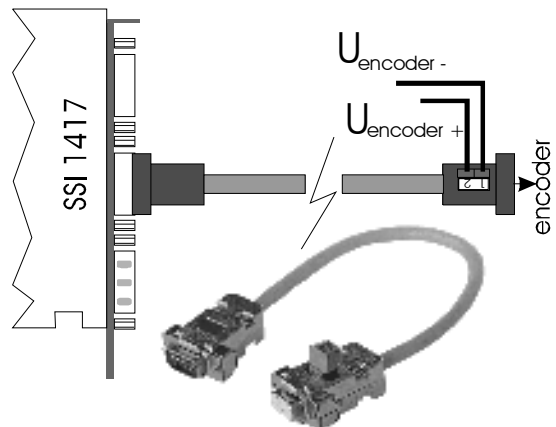
SSI-Interfaces	: 2 x SSI-Interfaces
Resolution	: max. 44 Bit
Clock Output	: max. 5 MHz
Modes	: Master- and Slave-Mode
Input Resistance	: > 10 kΩ
Input Channels	: 2 x Trigger 2 x Zero Setting Input Channels
Configuration	: RS 422, PNP, NPN
Input Level	: 5 V
Encoder Supply	: optional 5 V / 2 x 300 mA, 12 V / 2 x 125 mA or 24 V / 2 x 60 mA
Connectors	: 2 x 9 pol. SUB-D-Connector 1 x 9 pol. SUB-D-Connector
EMV	: EMV-conform to 89/336/EWG
Operating Temperature	: 0 - 50 °C
Storage Temperature	: - 25 to +85 °C
Dimensions	: 107 x 127 mm

**Accessory**

To provide an external power supply for the connected encoder(s) a special adapter is available.

**Ordering Information**

KA 1417

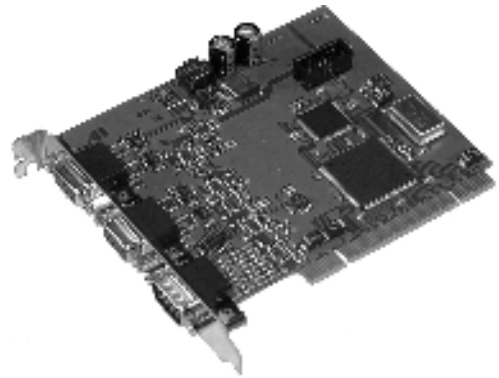




■ **Synchron-Serial-Interface SSI 1417**

**Highlights**

- 2 Synchron-Serial-Interfaces, max. 44 Bit, 5 MHz, Master- / Slave-Mode
- Timed Data Recording
- Trigger And Zero Setting Input Channels
- Option: Optical Isolated Inputs
- Option: Encoder Supply Voltages  
5 V / 300 mA, 12 V / 125 mA or  
24 V / 60 mA for each Encoder
- PCI 2.2



**SSI-Interfaces**

- 2 SSI-Interfaces
- max. 44 Bit
- Option: Isolated Input Channels

**Input Channels**

- 2 zero setting input channels (channels can be assigned separately to each encoder)
- 2 trigger input channels (channels can be assigned separately to each encoder)
- RS 422-, PNP- or NPN- input configuration
- Option: Isolated input channels

**Timer**

- Timer controlled recording of the encoder values
- Programmable interval: 6  $\mu$ s to > 200 ms

**Software**

- Driver and DLL for Windows 9x / ME
- Driver and DLL for Windows NT4.0 / 2000 / XP
- Driver and DLL for Windows Vista/7/8/10
- Examples for Delphi, VisualBasic, VisualC++, LabView

**Ordering Informations**

SSI 1417 /	x/	0/	xx	
				<b>Encoder Supply</b>
		0	00	Without Supply
		0	05	Supply Voltage 5 V
		0	12	Supply Voltage 12 V
		0	24	Supply Voltage 24 V
				<b>Input Channel Isolation</b>
		0		Without Isolation
		1		With Isolation

**Ordering Example: SSI 1417/0/0/05**

SSI-Board without isolation and with encoder supply voltage of 5 V

**Technical Specifications**

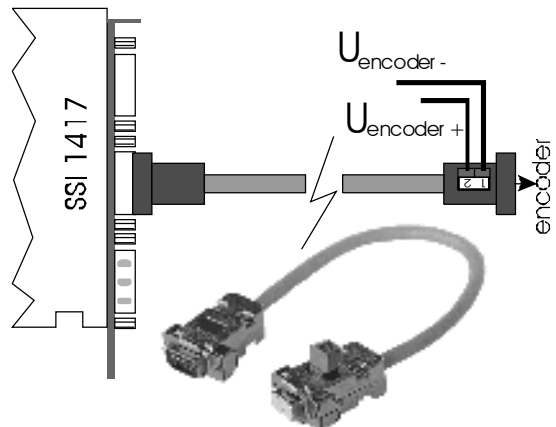
SSI-Interfaces	: 2 x SSI-Interfaces
Resolution	: max. 44 Bit
Clock Output	: max. 5 MHz
Modes	: Master- and Slave-Mode
Input Resistance	: > 10 k $\Omega$
Input Channels	: 2 x Trigger 2 x Zero Setting Input Channels
Configuration	: RS 422, PNP, NPN
Input Level	: 5 V
Encoder Supply	: optional 5 V / 2 x 300 mA, 12 V / 2 x 125 mA or 24 V / 2 x 60 mA
Connectors	: 2 x 9 pol. SUB-D-Connector 1 x 9 pol. SUB-D-Connector
EMV	: EMV-conform to 2014/30/EU
Operating Temperature	: 0 - 50 $^{\circ}$ C
Storage Temperature	: - 25 to +85 $^{\circ}$ C
Dimensions	: 107 x 127 mm

**Accessory**

To provide an external power supply for the connected encoder(s) a special adapter is available.

**Ordering Information**

KA 1417



■ **Converter CNV 9101 for Absolute Encoders with SSI-Interface**



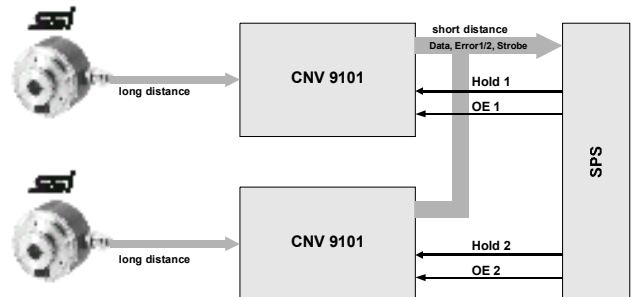
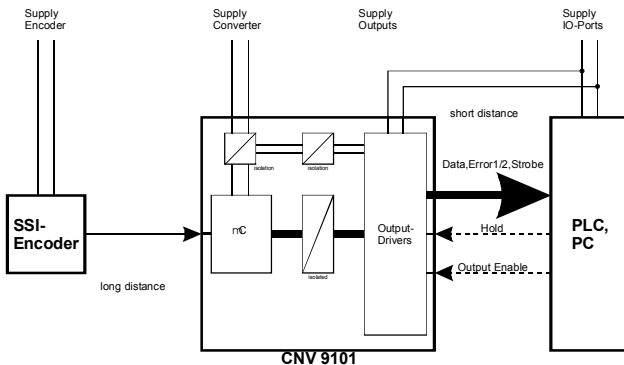
**Characteristics**

- Input: Synchron Serial Interface
- Output: Parallel, max. 26 Bit, max. 30 V, max. 100 mA, short circuit protected, usable for bus applications
- Master/Slave mode
- Input-Code Gray/ Binary
- Output-Code Gray/Binary/BCD
- Hold- and OE-Inputs
- Strobe-Output
- Housing for DIN rail mounting EN 50 022
- Connector: Plug-in-screw Terminals and DB37M



**Applications**

- SSI-Connection with high immunity against EMI instead of parallel EMI-prone connections.



- Replacement for parallel absolute encoders.

**SSI-Input**

- Binary or Gray Code selectable
- Resolution 10, 12, 13, 24, 25, 26 Bit, selectable (other resolutions up to 28 Bit on enquiry)
- Singelturm/Multiturn
- Direction of rotation selectable
- Master/Slave-mode selectable  
Master: Clock generation by CNV 9101  
Slave: Clock generation by an external unit
- Clock frequency max. 125 kHz (slave-mode) resp. max. 100 kHz (master-mode)
- Data input: RS 422/485
- Clock output: RS 422/485
- Clock input: RS 422/485

**Parallel Output**

- Number Channels: Max. 26 Bit (other number of channels up to max. 28 Bit on enquiry)
- Outputs max. 30 V / 100 mA, short circuit protected
- Bus-Mode: Controllable by OE-input
- Strobe-Signal: Indication of data transfer (pulse duration 10 ms, other on enquiry)
- Output code: Binary, Gray, or BCD selectable (other on enquiry)
- Output and LED for error on SSI input (with Bus-Mode)
- Output and LED for error on output channels (with Bus-Mode)
- Operation without control signals possible for single device applications

## Electrical Datas

SSI-Input	Singelturm or Multiturn
Resolution	10 .. 26 Bit
Input-Code	Binary or Gray Code
Input-Signals	Receiver RS422/RS485
Clock-Input	Receiver RS422/RS485
Clock-Output	Transmitter RS422/RS485
Master-Mode	
Clock-Frequency	internal, 100 kHz
Data-Transfer	approx. 30 values per sec
Slave-Mode	
Clock-Frequency	external, max. 125 kHz
Interval Time	min. 500 µs
Data Transfer	approx. 30 values per sec
Parallel Outputs	
Logic	high side, max. 30 V 100 mA, short circuit protected
Isolation Voltage	3 kV / 1 min
Power Supply DC Voltage	18 .. 36 V DC 5 V DC ±10 % optional 12 V DC ±10 % optional
Isolation Voltage	500 V / 1 min
Power Consumption	DC 70 mA (18 .. 36 V DC) DC 250 mA (5 V DC) DC 110 mA (12 V DC)

## Environmental Conditions

Operating Temperaturer	0 .. 50 °C
Storage Temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	Protection Class II
Field of Application	Class 2 Overvoltage Protection II
CE	in conform with 89/336/EWG NSR 73/23/EWG

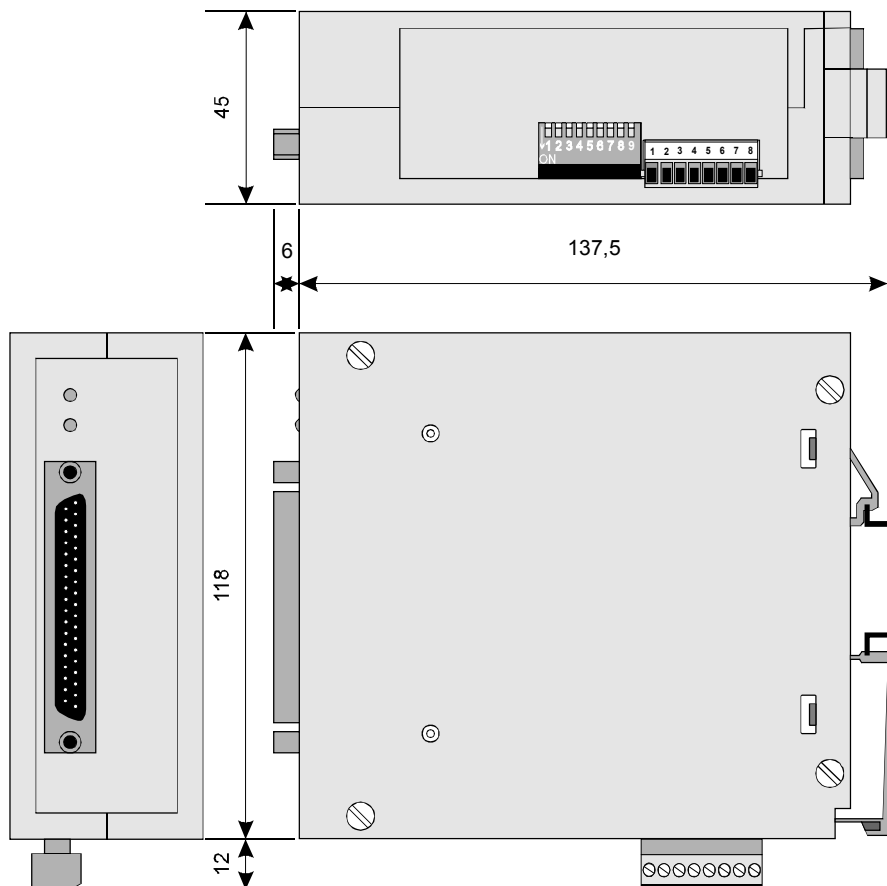
## Ordering Information

CNV 9101 -	0	0	0
			Reserve
			Reserve
			<b>Versorgung (Nennspannung)</b>
	0		5 V DC, ±10%, isolated
	1		12 V DC, ±10, isolated
	2		18.. 36 V DC, isolated
			Reserve

## Mechanical Datas

Case	Rail Mounting EN 50 022
Dimensions (B x H x T)	45 x 118 x 137,5 mm
Weight	ca. 300 g
Connections	Plug-in-screw terminals and DB37M

## Dimensions



# Signal Converter



**DIN Rail Mounting**  
**Several Supply Voltages**  
**Galvanic Isolation**  
**Industrialfair Execution**  
**Customized Solutions**



## ■ Converter SSI 9005 / 9006 for encoder with SSI interface

### ***Characteristics***

- SSI 9005, 2 alarm relays and analog output optional RS 485 interface
- SSI 9006, 4 alarm relays optional RS 485 interface
- Up to 1 MHz clock frequency
- Input Synchron Serial Interface SSI
- Output 0(2) - 10V or 0(4) - 20mA (SSI 9005)
- Programmable slave mode
- Housing for DIN rail mounting EN 50 022
- Plug-In screw terminals
- Removing of MSBs and LSBs possible

### ***Parameters of encoder***

- Binary or gray code
- Singelturn/Multiturn
- Direction of rotation
- Master/Slave-Mode  
Master: clock for reading data of encoder is generated internal by the SSI 9005-9006  
Slave: clock for reading data of encoder is generated by an external instrument

### ***SSI signal inputs***

- Data input, receiver RS 422/485
- Clock output, driver RS 422/485
- Clock input, receiver RS 422/485

### ***Software functions***

- Encoder adjustments
- Adjustable for encoder with 9-32 bits
- Removing of MSBs and/or LSBs possible
- Scaling factor
- Zero point adjustment
- Direction of rotation
- Offset value
- Incremental measurement
- Display test and display hold (Latch)
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Set point editing during normal measurement

### ***Push button functions***

The three push buttons at the front could be programmed for performing the following functions:

- No function
- Displaying encoder data, MIN or MAX value
- Resetting the MIN/MAX value
- Zero adjustment
- Reset zero adjustment
- Manual alarm reset
- Display test and display hold



### ***Digital input channels***

The both digital input channels are low active and can be programmed to following functions:

- No function
- Displaying encoder data, MIN or MAX value
- Zero adjustment
- Reset zero adjustment
- Manual alarm reset
- Display test and display hold

### ***Alarm outputs***

Two alarm outputs (SSI 9005) or four alarm outputs (SSI 9006) with free allocation allows the monitoring of production operation.

Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm response time (fall off and put on time)
- Data source: encoder, MIN or MAX value

### ***Analog output (SSI 9005)***

The analog output is provided with a current output and a voltage output. Both outputs are isolated from the further electronic.

- Scaleable (zero/offset and final value)
- Output 0(2) - 10 V or 0(4) - 20 mA

Data source: direct encoder, MIN or MAX value

### ***Option Serial Interface***

The unit can be provided with an serial interface for data communication.

- RS 485

## Electrical Data

SSI signal input	singleturn or multiturn
Resolution	9 .. 32 bit
Code	binary or gray
Data input	receiver RS 422/485
Clock input	receiver RS 422/485
Clock output	driver RS 422/485
Master mode	
Clock frequency	internal 1 MHz, 500 kHz, 200 kHz or 100 kHz
Conversion rate	approx. 28 values per sec
Slave mode	
Clock frequency	extern, max. 500 kHz
Conversion rate	approx. 28 values per sec
Digital inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	2 (4) Relays program. as n.o. contact or n.c.contact
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Analog output	resolution 16 bit
Accuracy	± 0,2% of final value
Voltage	0(2) - 10 V, max. 10 mA
Current	0(4) - 20 mA; max. 500 Ω
Isolation voltage	3 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	DC 200 mA

## Mechanical Data

Display	6 decades, 8 mm, red Decimal point programmable preliminary zero suppression - sign at negative values
Operation, keyboard design	front membrane with push buttons
Case	Rail mounting EN 50 022
Dimensions (B x H x T)	67,5 x 75 x 105 mm
Weight	ca. 300 g
Connection	Plug-In screw terminal

## Environmental conditions

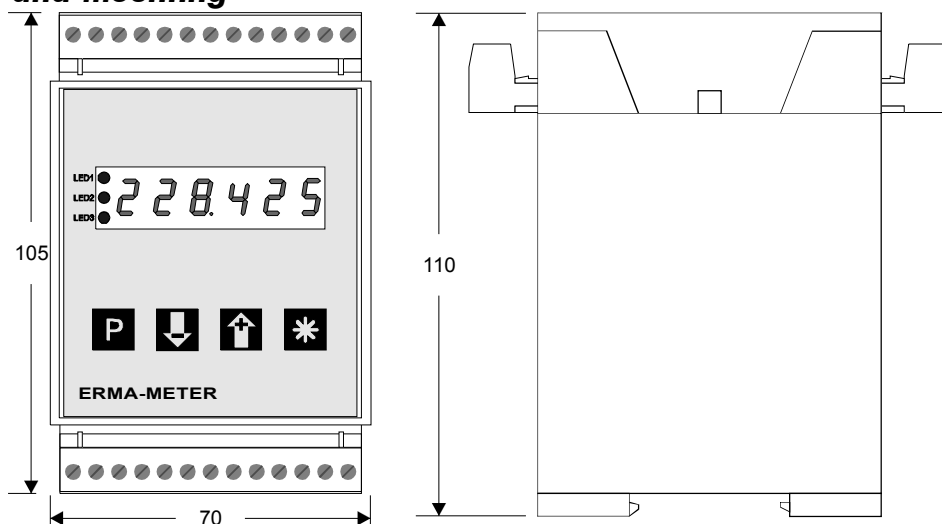
Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Field of application	class 2, overvoltage protection II CE in conform with 89/336/EWG NSR 73/23/EWG

## Ordering Information

<b>SSI 9005 -</b>	<b>0</b>	<b>0</b>
		<b>Reserve</b>
		<b>Front design</b>
	<b>0</b>	No logo
		<b>Power supply</b>
	<b>0</b>	5 V DC, ±10%, isolated
	<b>1</b>	12 V DC, ±10, isolated
	<b>2</b>	18.. 36 V DC, isolated
		<b>Option RS 485 Interface</b>
	<b>0</b>	Without Serial Interface RS 485
	<b>1</b>	With Serial Interface RS 485

<b>SSI 9006 -</b>	<b>0</b>	<b>0</b>
		<b>Reserve</b>
		<b>Front design</b>
	<b>0</b>	No logo
		<b>Power supply</b>
	<b>0</b>	5 V DC, ±10%, isolated
	<b>1</b>	12 V DC, ±10, isolated
	<b>2</b>	18.. 36 V DC, isolated
		<b>Option RS 485 Interface</b>
	<b>0</b>	Without Serial Interface RS 485
	<b>1</b>	With Serial Interface RS 485

## Dimensions and mounting



## ■ Signal Converter CM 9001 for incremental encoder signals

### Characteristics

- LED-Display, red, 6 decades, 8 mm
- Display range -99999 .. 999999
- DIN Rail Mounted
- Operating mode programmable
- Data storage at power fail
- Analog output 0(2) - 10 V oder 0(4) - 20 mA
- 2 alarm relay
- Plug-In screw terminal

### Modes

- Incremental A 90° B x 1  
A 90° B x 2, A 90° B x 4
- UP/DOWN + Direction
- Puls counter A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Frequency-/Rotation speed measurement A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Cycle duration measurement
- Pulse duration measurement
- Time meter about Start/Stop

### Software functions

The universal counter is equipped with following functions:

- Scaling factor 0,00001 .. 9,99999
- programmable offset value
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Displaytest and displayhold
- Setting of alarm points during measurement

### Signal inputs

The signal inputs are programmable to several encoder output logic:

- PNP- or NPN-Logic
- 5 V (TTL), 12 V or 24 V signal level
- 25 Hz signal input filter

### Push buttons at the front

Three of the push buttons could be programmed to following functions:

- No function
- Resetting Measured value or MIN/MAX value
- Displaying Measured-, MIN- or MAX-Value
- Manual alarm point reset
- Displaying and setting of alarm points



### Digital Input Channel

These both input are low active and could be programmed to following functions:

- No function
- Resetting Measured- or MIN/MAX-value
- Displaying Measured-, MIN- or MAX-value
- Manual alarm point reset
- Displayhold or displaytest

### Alarm outputs

Two programmable alarm outputs with free allocation allows the monitoring of production operation.

Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm response time (Fall off and put on time)
- Data source (Measured-, Hold-, MIN- or MAX-value)

### Analog output

The analog output is provided with a current output and a voltage output. Both output are isolated from the further electronic.

- To scale (offset and final value)
- Output 0(2) - 10 V or 0(4) - 20 mA
- Data source (Measured-, Hold-, MIN- or MAX-value)

### Optionen serial interfaces

Addition to data communication or to a printer

- RS 485

## Elektrical Datas

Counter incremental	counter steps 24 Bit
Count frequency	max. 4,5 kHz
UP/DOWN-counter + direction	counter steps
24 Bit	
count frequency	max. 10 kHz
Puls counter	counter steps 24 Bit
Count frequency	max. 10 kHz
Frequency/rotation speed	
1-channel mode	max. 20 kHz
Resolution	0,01 Hz auto., 0,1 Hz, 1 Hz
2-channel mode	max. 10 kHz
Resolution	1 Hz
Cycle duration	0,0001 s .. 999999 s
Pulse duration	0,0001 s .. 999999 s
Time meter	0,0001 s .. 999999 s
or	00.00.00 h .. 99.59.59 h
Accuracy	
Frequency measurings	< 0,01 %
Time measurings	< 0,02 %
Update rate	
Counter modes	60 ms
Frequency-/Time meter	100 ms
Signal input filter	25 Hz programmable
Data storage	> 10 years (NOVRAM)
Signal inputs	4, input A, B, Reset, Tor
Logic	PNP-, NPN
Signal level	5 V (TTL), 12 V, 24 V
Digital user inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	2 Relays (programmable as
	opened contacte or closed contact)
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Analog ouput	resolution 16 bit
Accuracy	± 0,2% of final valuet
Nonlinearity	± 0,012 %
Voltage	0(2) - 10 V, max. 10 mA
Current	0(4) - 20 mA; max. 500 Ω
Isolation voltage	3 kV / 1 min
Interfaces	RS 485
Protocol	DIN 66 019 / ISO 1745
Isolation voltage	1,6 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	70 mA

## Mechanical Datas

Display	6 decades, 8 mm, red
	Decimal point programmable
	preliminary zero suppression
	- sign at negative values
Operation, keyboard design	front membrane with push buttons
Case	DIN rail mounted
Dimensions (B x H x T)	67,5 x 75 x 105 mm
Weight	ca. 300 g
Connection	Plug-In screw terminal

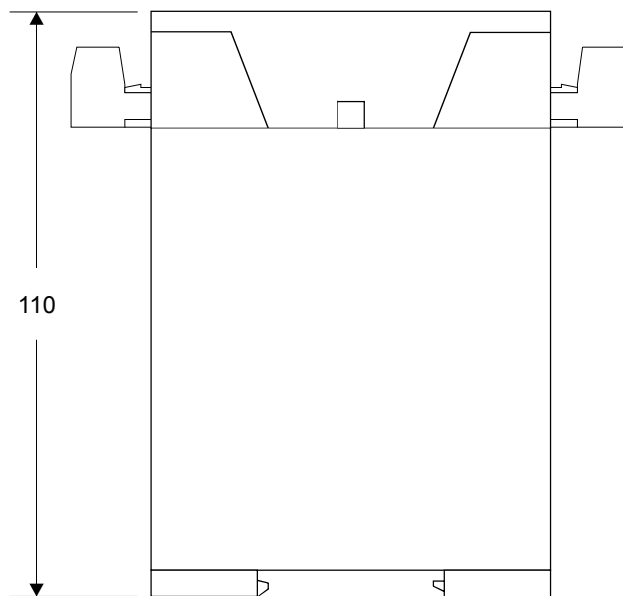
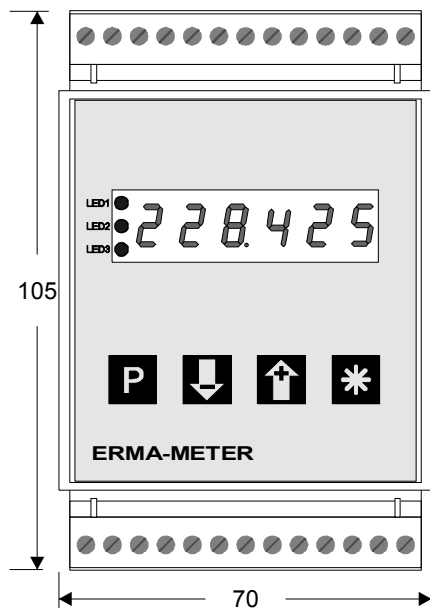
## Environmental conditions

Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 40; connections IP 20
Field of application	class 2, overvoltage protection II

CE in conform with 89/336/EWG  
NSR 73/23/EWG

## Ordering information

<b>CM 9001 -</b>			
			<b>Reserve</b>
			<b>Front design</b>
		<b>0</b>	No logo
			<b>Power supply</b>
	<b>0</b>	5 V DC, +/- 10 %, isolated	
	<b>1</b>	12 V DC, +/- 10 %, isolated	
	<b>2</b>	18 .. 36 V DC, isolated	
			<b>Option interface RS 485</b>
	<b>0</b>	No interface	
	<b>1</b>	RS 485	





## ■ Signal converter CM 9002 for incremental encoder signals

### Characteristics

- LED-Display, red, 6 decades, 8 mm
- Display range -99999 .. 999999
- DIN Rail Mounted
- Operating mode programmable
- Data storage at power fail
- 4 alarm relays
- Plug-In screw terminal

### Modes

- Incremental A 90° B x 1  
A 90° B x 2, A 90° B x 4
- UP/DOWN + Direction
- Puls counter A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Frequency-/Rotation speed measurement A  
A-B, A+B, A/B, (A-B)/A, (B-A)/A
- Cycle duration measurement
- Pulse duration measurement
- Time meter about Start/Stop

### Software functions

The universal counter is equipped with following functions:

- Scaling factor 0,00001 .. 9,99999
- programmable offset value
- MIN/MAX value detection
- Auto-Reset for MIN/MAX value
- Displaytest and displayhold
- Setting of alarm points during measurement

### Signal inputs

The signal inputs are programmable to several encoder output logic:

- PNP- or NPN-Logic
- 5 V (TTL), 12 V or 24 V signal level
- 25 Hz signal input filter

### Push buttons at the front

Three of the push buttons could be programmed to following functions:

- No function
- Resetting Measured value or MIN/MAX value
- Displaying Measured-, MIN- or MAX-Value
- Manual alarm point reset
- Displaying and setting of alarm points



### Digital Input Channel

These both input are low active and could be programmed to following functions:

- No function
- Resetting Measured- or MIN/MAX-value
- Displaying Measured-, MIN- or MAX-value
- Manual alarm point reset
- Displayhold or displaytest

### Alarm outputs

Four programmable alarm outputs with free allocation allows the monitoring of production operation.

Programmable parameters:

- Alarm point and hysteresis
- Relay function (high or low alarm)
- Alarm response time (Fall off and put on time)
- Data source (Measured-, Hold-, MIN- or MAX-value)

### Optionen serial interfaces

Addition to data communication or to a printer

- RS 485

**Elektrical Datas**

Counter incremental	counter steps 24 Bit
Count frequency	max. 4,5 kHz
UP/DOWN-counter + direction	counter steps
24 Bit	
count frequency	max. 10 kHz
Puls counter	counter steps 24 Bit
Count frequency	max. 10 kHz
Frequency/rotation speed	
1-channel mode	max. 20 kHz
Resolution	0,01 Hz auto., 0,1 Hz, 1 Hz
2-channel mode	max. 10 kHz
Resolution	1 Hz
Cycle duration	0,0001 s .. 999999 s
Pulse duration	0,0001 s .. 999999 s
Time meter	0,0001 s .. 999999 s
or	00.00.00 h .. 99.59.59 h
Accuracy	
Frequency measurings	< 0,01 %
Time measurings	< 0,02 %
Update rate	
Counter modes	60 ms
Frequency-/Time meter	100 ms
Signal input filter	25 Hz programmable
Data storage	> 10 years (NOVRAM)
Signal inputs	4, input A, B, Reset, Tor
Logic	PNP-, NPN
Signal level	5 V (TTL), 12 V, 24 V
Digital user inputs	2, programmable function
Logic	NPN, max. 30 V
Alarm outputs	4 Relays (programmable as
	opened contacte or closed contact)
Signaling	2 LEDs at the front
Switch voltage	250 V AC / 250 V DC
Switch current	5 A AC / 5 A DC
Switch power	750 VA / 100 W
Interfaces	RS 485
Protocol	DIN 66 019 / ISO 1745
Isolation voltage	1,6 kV / 1 min
Power supply voltage DC	18 .. 36 V DC
Isolation voltage	500 V / 1 min
Power consumption	70 mA

**Mechanical Datas**

Display	6 decades, 8 mm, red
	Decimal point programmable
	preliminary zero suppression
	- sign at negative values
Operation, keyboard design	front membrane with push buttons
Case	DIN rail mounted
Dimensions (B x H x T)	67,5 x 75 x 105 mm
Weight	ca. 300 g
Connection	Plug-In screw terminal

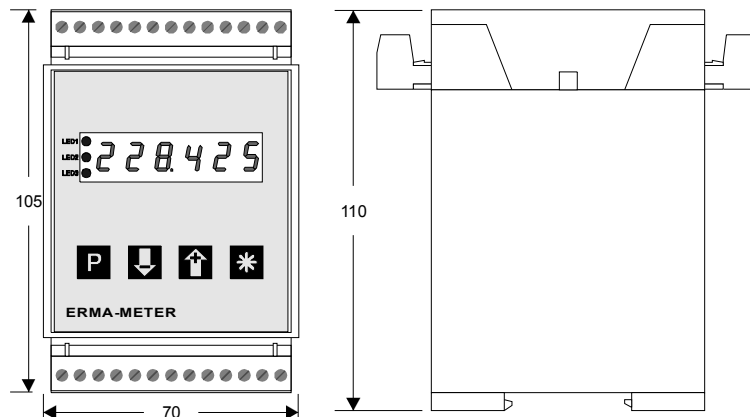
**Environmental conditions**

Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Humidity	< 80 %, not-condensing
Protection	protective class II
Front protection	IP 40; connections IP 20
Field of application	class 2, overvoltage protection II

CE in conform with 89/336/EWG  
NSR 73/23/EWG

**Ordering information**

<b>CM 9002 -</b>			
			<b>Reserve</b>
			<b>Front design</b>
		<b>0</b>	No logo
			<b>Power supply</b>
	<b>0</b>	5 V DC, +/- 10 %, isolated	
	<b>1</b>	12 V DC, +/- 10 %, isolated	
	<b>2</b>	18 .. 36 V DC, isolated	
			<b>Option interface RS 485</b>
	<b>0</b>	No interface	
	<b>1</b>	RS 485	



■ **Programmable Process Instrument Model PM 9000**

**Highlights**

- DIN rail mounting
- Especially qualified for installation in flat wall case and terminal box
- At standard a lot of measuring ranges for different sensors
- Varied connections at digital IO's from SPS (also Mini-SPS)
- 10 parameter sets for a quickly configuration
- Measuring during parameter setup
- Application as a nominal value transmitter

**Standard functions**

**Measuring ranges**

**Analoge input ranges**

(16 bit, 5 measurements per sec, user configurable)

- Voltage : +/-20.00 V, +/-2.000 V, +/-200.0 mV, +/-20.00 mV
- Current : +/-20.00 mA, 0/4.00 to 20.00 mA
- Angle potentiometer : 0 to 100.0%
- Resistance : 0 to 1.000k $\Omega$
- DMS : 1,5/2/2,5/3/3,3 mV/V +/-100.0 % (4-wire)

(fixed measuring ranges)

- Pt100 : -200.0 to +800.0 °C (2-, 4- wire)
- FeCuNi (J) : -100 to +800 °C
- NiCrNi (K) : -100 to 1300 °C
- PtRhPt (S) : 0 to 1750 °C
- Temperature compensation: internal, constant or without

**Digital input ranges**

(input voltage 24 - 60 V, isolated)

**Counter** (24 bit, to scale)

(display range +99999 to -9999)

- Incremental : 1-, 2-, 4- fold to 2 kHz
- Impulse : max. 2 kHz alternatively gate, direction, re-set

**Time measuring**

- Frequency : 0.01 Hz to 10 kHz
- Time : to 9999.9 s
- Cycle : to 9999.9 s
- Pulse duration : to 9999.9 s
- Impulse/min : 0 to 99999



- Impulse/h : 0 to 99999

**Special function**

- Nominal value transmitter

**Alarm outputs**

- 2 alarms with solid-state relays (24 VDC, 200 mA, short-proof) supplying about the main power supply
- Programmable functions: alarm point, hysteresis, switching characteristics, rise time - and fall time delay data source: direct input -, mean -, peak -, valley value
- Direct connection to SPS

**Analog output**

- Free scaling, isolated, 14 Bit
- Voltage : 0 to 10 V, max. 10 mA
- Current : 0/4 to 20 mA, 500  $\Omega$  burden
- Data source : direct input -, mean -, peak -, valley value
- Error indication at current output  
Sensor break : > 22 mA  
Error : < 2 mA

**Synchron serial interface**

- Isolated
- Connection of separate displays with serial input
- Connection to SPS resp. IO-cards
- Measured value transmitting
- Control of transfer rate via SPS
- Minimum IO-expense at the SPS

**Parameter sets**

The PM 9000 is provided with 10 parameter sets. Each parameter sets contains all adjustments incl. 10 point linearisation. So the PM 9000 can be lay on the stock

for 10 several fields of applications. If required the wished parameter set is be adjust and the instruments gets in the operation mode.

**External button connection**

- Isolated
- Supplying about the main power supply
- Connection to SPS for parameter setup

**Display**

- 5 decades, 7 segment, 7,6 mm
- Display range +99999 to -9999
- Programmable decimal point
- Data source: direct input -, mean -, peak -, valley value
- Last digit: in 1, 2, 5 or 10 steps

**Software functions**

- User scaling
- Adjustable digital filter of 1th order
- Peak and valley detection
- Userdefined linearization up to 10 points
- Taring
- Automatic reset of peak and valley detection
- Display of temperature in °C, °F or K
- Setting of parameters during measurement

**General datas**

Power supply : 18 .. 36 VDC,  
 Power consumption : max. 3 W\*  
 Mounting : DIN rail 35 mm  
 DIN EN 50022 - 35 x 7,5  
 DIN EN 50022 - 35 x 15  
 32 mm G-rail

DIN EN 50035 - G - 32  
 EMV : in conform with 89/336/EWG  
 Operating temperature  
 standard : 0 to + 50 °C  
 optional : -25 to + 75 °C  
 Storage temperature : -25 to +85 °C

**Options**

- Extended temperature range -20 to +75 °C
- RS485-interface isolated, to 19200 baud
- Data memory

**Accessories**

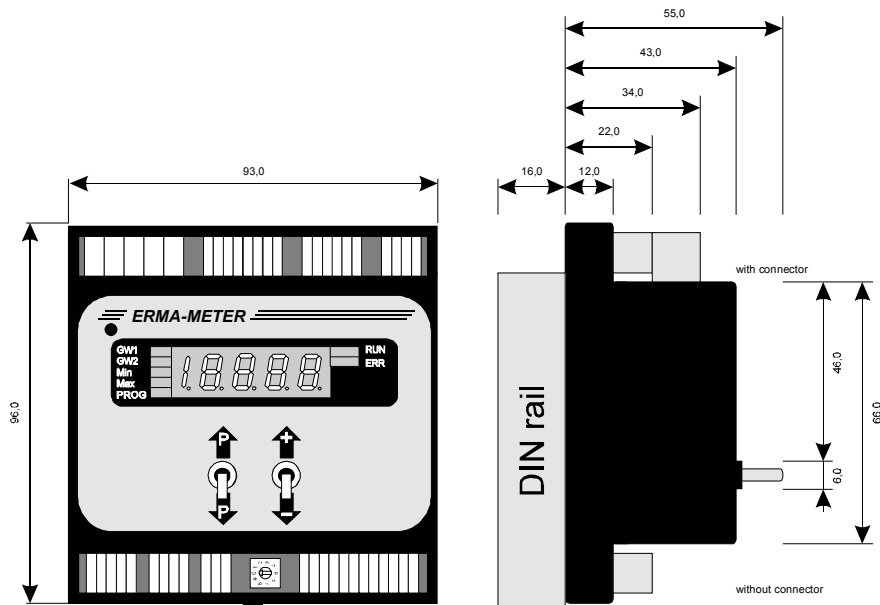
- Power relay for 1 or 2 limit indications
- Seperate synchron serial display (several colours)

**Ordering informations**

- PM 9000/0 Operating temperature 0 to 50 °C
- PM 9000/1 Operating temperature -20 to +70 °C

\*All components and options active.

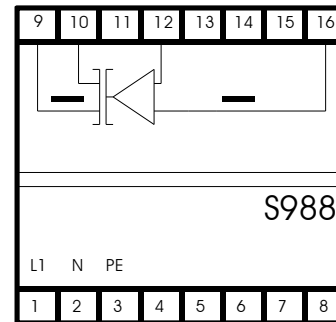
**Dimensions**



■ **Signal Conditioner Typ S 988**

**Highlights**

- Isolated Signal Conditioner
- Customer Defined Voltage or Current Ranges
- Standard Outputs
- ± 0.1% Typical Accuracy
- Short Response Time
- 1000 V rms of CMV Isolation
- Low Power Consumption
- Standard Power Supply 230 or 115 VAC
- Power Supply Optional 24 V



**General**

The signal conditioner S 988 is a rail mount DC voltage input module. Standard input voltage ranges from 30 mV up to 300 V .

For complete safety, an internal isolation amplifier is used. Avoiding digital conversions a fast frequency response is achieved. The input to output isolation provides high output signal-to-noise ratio which makes these signal conditioners highly immune to ground loop signals and RFI.

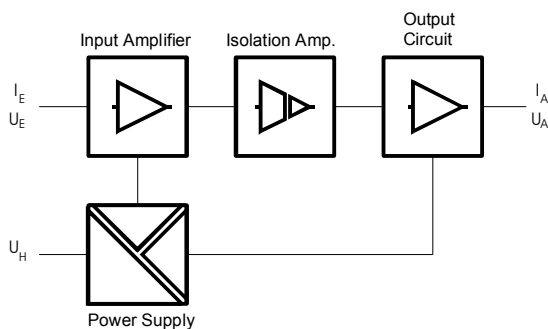
The output is linear to the input and can be delivered either with 0-10 V, 0-20 mA, or 4-20 mA.

**Construction**

- Compact plastic housing, rugged design for harsh locations.
- 16 screw terminals safe to come in contact with according to VDE 0100 part 750 and VGB 4.
- DIN rail mounting according to DIN 46 277 and DIN EN 50 022.

**Electrical Design**

The blockdiagramm is shown in figure 1. The input voltage is amplified by the amplifier A1. The output of the amplifier A1 is connected to the isolation amplifier. The output signal of the isolation amplifier is controlling the output circuit.

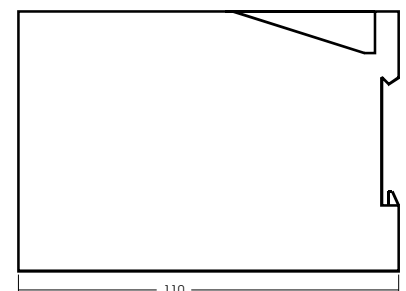
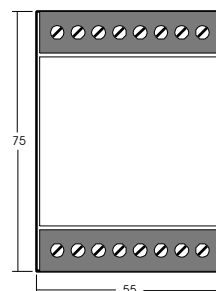


**Power Supply**

- Supply voltage 230 VAC or 115 VAC
- Optional 24 VDC

**Specifications**

Input Channel	: Voltage or current
Voltage	: 0...30 mV to 0...300 V
Impedance	: >100k to 10 MΩ
Current	: 0...1 mA to 0...100 mA
Voltage drop	: max. 150 mV
Transfer	:
Accuracy	: typ. 0,1% v. E.
Isolation voltage	: 1 kV
CMR	: 130 dB from 0 to 60 Hz
Output channel	:
Voltage	: 0 ... 10 V / 10 mA
Current	: 0/4...20 mA / max. 500Ω
Supply voltage	: 230 VAC or 115 VAC (4,2 VA)
Optional	: 18 V...36 V DC
Current consumption	: max 50 mA
environmental conditions	
EMV	: accord. ENV 50121-3-2
Protection	: IP40
Screw terminals	: IP 20
Mounting	: EN 50022
Operating temperature	: 5 bis +50 °C
Dimensions	: 75 x 55 x 110 mm
Weight	: 100 g



s988\_datas\_en.vp/05.08

■ **Frequency To Analog Converter Typ FA 9002**

**Highlights**

- Frequency to Current Conversion (0/4...20 mA)
- Selectable Input Voltage Levels
- Adjustable Frequency Divider
- Suitable for incremental encoders
- Low Power consumption
- High Reliability
- Compact housing



**General**

The unit **FA 9002** is a frequency to analog converter for converting a frequency into a proportional output current of either 0 to 20 mA or 4 to 20 mA.

**Function**

The input frequency is processed by a frequency divider, a microprocessor and a digital to analog converter. The value of frequency dividing (1-256) can be set by a 8-pin DIP switch. The output current is proportional to the input frequency.

**Isolated Digital Input Channel**

There are 2 input channels available for the A and B channel of a incremental encoder.

- With the aid of jumpers the input threshold level can be chosen by the user. Input levels of 5, 12, or 24V are selectable.
- The max. input frequency is 50 kHz when using only one input channel otherwise 25 kHz.
- The source current for each input must be > 5mA.

**Isolated Output**

The analog output channel is opto-isolated and the range of the output current can be selected by a jumper (0-20 mA or 4-20 mA) . The maximum output current is 21 mA and the maximum burden is 1 kΩ.

**Microprocessor controlled**

Because of the microprocessor-based signal processing it is relatively easy to build customized solutions; even signals with very slow frequencies (below 1 Hz) can be processed.

**Construction**

The unit **FA 9002** is provided for DIN-rail mounting according to EN 50022.

**Power Supply**

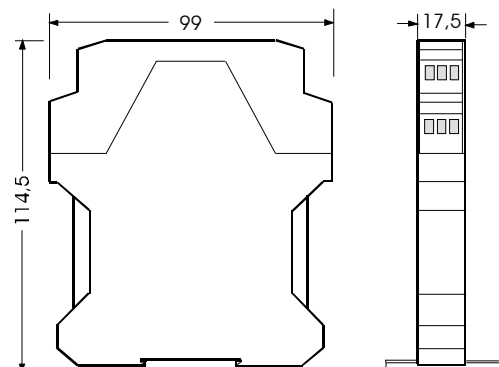
The unit is provided with an isolated power supply and deliverable for voltages of 5, 12, 24V or 48 VDC.

**Specifications**

Input voltage level	: 5 V, 12 V, 24 V selectable
Input current per channel	: 5 mA source current
max. input frequency	: 50 kHz one channel
max. input frequency	: 25 kHz two channel
Analog output	: 0/4...20 mA, isolated
External impedance	: max. 1 k
Response time	: 200ms + period time
Ripple	: max. 20 µA
Power supply	: isolated (500V)
Supply voltage	: see ordering information
Current consumption	: max. 40 mA (24 VDC)
EMV	: Accord. ENV 50121-3-2
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
Dimensions	: 99 x 114,5 x 17,5

**Ordering Information**

<b>FA 9002-</b>		
		<b>Range (divider = 1)</b>
	<b>0</b>	500 Hz = 20 mA (one channel)
	<b>1</b>	reserved
		<b>max. input frequency</b>
	<b>0</b>	50 kHz (A or B), 25 kHz (A + B)
	<b>1</b>	reserved
	<b>2</b>	reserved
	<b>3</b>	reserved
		<b>Power supply</b>
	<b>0</b>	18...36V DC, (standard)
	<b>1</b>	4,5...9V DC, (option)
	<b>2</b>	9...18V DC, (option)
	<b>3</b>	36...48V DC, (option)



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■ **Analog to Frequency Converter Type AF 9001**

**Highlights**

- Voltage/Current to Frequency Converter
- Adjustable Output Frequency
- Isolated Input/Output Channels
- High Reliability
- Small Dimensions
- Low Power Consumption



**General**

The unit **AF 9001** is an analog to frequency converter for converting an analog input into a proportional and adjustable output frequency.

**Function**

The input signal (either voltage or current) is processed by a converter into a frequency. The actual frequency at the output can be adjusted by an internal adjustable frequency divider. An input signal of 20 mA resp. 10 V and a divider value of "1" results in an output frequency of 25 kHz. The wished dividing value (1...4080) is set by a internal 8-pin DIP switch and 5 jumper. The output frequency is proportional to the input frequency and the puls/pause ratio is 1:1.

**Analog Input**

The following input configurations are available:

- 0...10 V
- 0...20 mA
- 4...20 mA

The input range has to be specified by the ordering information key.

**Isolated Output**

The frequency output channel is opto-isolated. The output transistor is able to switch up to 30 V and 25 mA.

**Customized solutions possible**

The standard output frequency of 25 kHz at the final value of the input can be adjusted in a wide range to customer requirements.

**Construction**

The unit **AF 9001** is provided for DIN-rail mounting according to EN 50022.

**Power Supply**

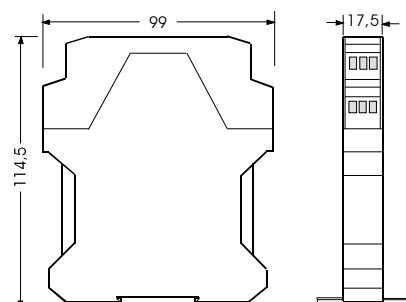
The unit is deliverable for power supply voltages of 5, 12 or 24V DC (see ordering information).

**Specifications**

<b>Input channel</b>	
Input voltage range	: 0...10 V
Impedance	: 100 kΩ
Input current range	: 0...20 mA
Impedance	: 100 Ω
<b>Output channel</b>	
Output frequency	: max. 25 kHz
Accuracy	: 0,1% of full scale
Divider	: 8-pole DIP switch 5 jumper
Voltage	: max. 30 V
Current	: max. 25 mA
<b>Power supply</b>	: 18 V...36 V
Current consumption	: max. 27 mA (24 VDC)
<b>Construction</b>	
EMV	: Accord. ENV 50121-3-2
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
Dimensions	: 99 x 114,5 x 17,5

**Ordering Information**

<b>AF 9001-</b>			
		<b>Output range</b>	
		0 max 25 kHz	
		1 reserved	
		<b>Input signal</b>	
		0 0...10 V	
		1 0...20 mA	
		2 4...20 mA	
		3 reserved	
		<b>Power supply</b>	
		0 18...36 V DC, (standard)	
		1 4,5...9 V DC, (option)	
		2 9...18 V DC, (option)	
		3 36...48 V DC, (option)	

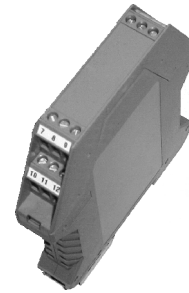


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## ■ FREQUENCY DIVIDER MODEL FT 9002

### Highlights

- Adjustable Divider from 1 to 255
- Additional Divider 1, 2, 4, 8 and 16
- Different Input Voltage Levels Selecttable
- Isolated Output
- Low Power Consumption
- Small Dimensions



### General

The unit **FT 9002** is used for dividing input frequencies by a user adjustable frequency divider. There are one respectively two input channels provided. These input channels are optically isolated from the internal circuitry. By this way disturbances by a noisy environment are reduced.

One or both input channels can be used. If both input channels are applied, they must be 90 degrees out of phase. So incremental encoders can be connected to the two input channels.

One output channel is provided. The output channel has an open collector configuration.

### Isolated Digital Inputs

Configuration of the input channels:

- Input voltage: 5V, 12V, 24V and (optional) 48V (adjustable)
- Tolerance: a logical "0" will be recognized up to 20 % max. of the nominal input level. (e.g. up to 4,8V at an input level of 24V )  
A logical "1" will be recognized at +/- 20% of the nominal input level. (e.g. from 19,2V min. to 28,8V max. at an input level of 24V )
- Input current: 5 mA
- Input frequency: max.25 kHz respectively 50 kHz (other frequencies on request)

### Isolated Output

As output channel there is a collector-emitter path of an opto-coupler provided. The transistor can switch up to 30 V and 25 mA. The output channel is protected against overvoltage and spikes.

### Construction

The unit **FT 9002** is provided for DIN-rail mounting according to EN 50022.

### Power Supply

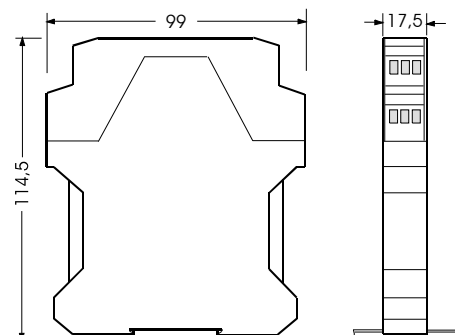
The unit is designed for power supply voltages of 5, 12 or 24V DC. The power supply input is isolated from all input and output channels. For details see ordering information.

### Specifications

<b>Input channels</b>	
Input voltage level	: 5V, 12V, 24V selectable : optional 48V
Input current per channel	: 5 mA source current
Input Frequency	: max. 50 kHz, one input : max. 25 kHz, both inputs
Tolerances of input level	: +/-20% of the nominal input
<b>Divider</b>	: 8-pole DIP, dividing by 1...255 : 5 Jumper, dividing by 1/2/4/8/16
<b>Output channel</b>	: isolated
Voltage	: max. 30 V
Current	: max. 25 mA
Frequency	: max. 25 kHz
<b>Power supply</b>	: see ordering information
Current	: max. 25 mA (24 VDC)
<b>Construction</b>	
CE	: 2014/30/EU, 2014/35/EU, 2011/65/EU+2015/863
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
<b>Dimensions</b>	: 99 x 114,5 x 17,5

### Ordering Information

<b>FT 9002-</b>		
		<b>Special model</b>
	<b>0</b>	standard
	<b>1</b>	reserved
		<b>Input voltage</b>
	<b>0</b>	standard
	<b>1</b>	48 V
		<b>Power supply</b>
	<b>0</b>	18 ... 36 V DC, (standard)
	<b>1</b>	4,5 ... 9 V DC, (option)
	<b>2</b>	9V ... 18 V DC, (option)
	<b>3</b>	36 ... 48 V DC, (option)





■ **Frequency Divider FT 9003**

**Highlights**

- Input Frequency up to 2 MHz
- Adjustable Divider from 2 to 510
- Additional Divider 1, 2, 4, 8 and 16
- Different Input Voltage Levels adjustable
- Isolated Output
- Low Power Consumption

**General**

The unit **FT 9003** is used for dividing input frequencies up to 2 Mhz by a user adjustable frequency divider. The maximum output frequency is 25 kHz. There is one input channels provided. The input channel is optically isolated from the internal circuitry. By this way disturbances by a noisy environment are reduced. One output channel is provided. The output channel has an open collector configuration.

**Isolated Digital Input**

Configuration of the input channel:

- Input voltage: 5V, 12V, 24V and (optional) 48V (adjustable)
- Tolerance: a logical "0" will be recognized up to 20 % max. of the nominal input level. (e.g. up to 4,8V at an input level of 24V )  
A logical "1" will be recognized at +/- 20% of the nominal input level. (e.g. from 19,2V min. to 28,8V max. at an input level of 24V )
- Input current: 5 mA
- Input frequency: max. 2 MHz

**Isolated Output**

As output channel there is a collector-emitter path of an opto-coupler provided. The transistor can switch up to 30 V/ 50 mA. The output channel is protected against overvoltage and spikes. The maximum output frequency is 25 kHz.



**Construction**

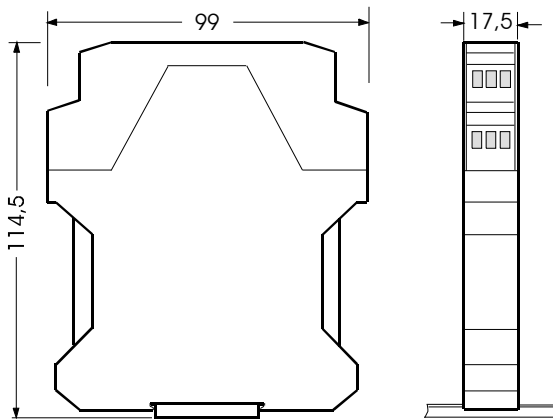
The unit **FT 9003** is provided for DIN-rail mounting according to EN 50022.

**Power Supply**

The unit is designed for a power supply from 18 to 36VDC (standard design).

**Specifications**

<b>Input channel</b>	
Input voltage level	: 5V,12V,24V &(optional)48V
Input current per channel	: 5 mA source current
Input Frequency	: max. 2 MHz
Tolerances of the input channel	: +/-20% of the nominal input
<b>Divider 1</b>	
	: 8-pole DIP switch
	: adjustable divisor 2 ... 510
<b>Divider 2</b>	
	: 5 Jumper,
	: adjustable divisor 1/2/4/8/16
<b>Output channel</b>	
Voltage	: isolated
Current	: max. 30 V
Frequency	: max. 50 mA
<b>Power supply</b>	: max. 25 kHz
Current	: 18 V...32 V DC
	: max. 25 mA (24 VDC)
<b>Construction</b>	
EMV	: Accord. ENV 50121-3-2
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
<b>Dimensions</b>	
	: 99 x 114,5 x 17,5



**Dimensions**

**Ordering Information**

<b>FT 9003-</b>		
		<b>Special model</b>
		0 standard
		1 reserved
		<b>Input voltage</b>
		0 standard
		1 48 V
		2 reserved
		3 reserved
		<b>Power supply</b>
	0	18 ... 36 V DC, (Standard)
	1	4,5 ... 9 V DC, (Option)
	2	9 ... 18 V DC, (Option)
	3	36 ... 48 V DC, (Option)

## ■ Frequency Divider FT 9003

### Highlights

- Input Frequency up to 2 MHz
- Adjustable Divider from 2 to 510
- Additional Divider 1, 2, 4, 8 and 16
- Different Input Voltage Levels adjustable
- Isolated Output
- Low Power Consumption

### General

The unit **FT 9003** is used for dividing input frequencies up to 2 Mhz by a user adjustable frequency divider. The maximum output frequency is 25 kHz. There is one input channels provided. The input channel is optically isolated from the internal circuitry. By this way disturbances by a noisy environment are reduced. One output channel is provided. The output channel has an open collector configuration.

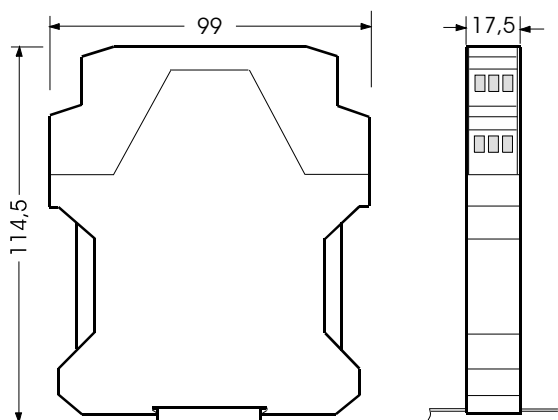
### Isolated Digital Input

Configuration of the input channel:

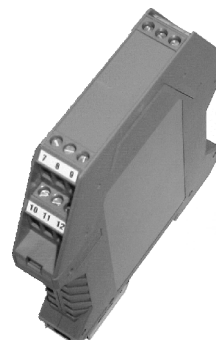
- Input voltage: 5V, 12V, 24V and (optional) 48V (adjustable)
- Tolerance: a logical "0" will be recognized up to 20 % max. of the nominal input level. (e.g. up to 4,8V at an input level of 24V )  
A logical "1" will be recognized at +/- 20% of the nominal input level. (e.g. from 19,2V min. to 28,8V max. at an input level of 24V )
- Input current: 5 mA
- Input frequency: max. 2 MHz

### Isolated Output

As output channel there is a collector-emitter path of an opto-coupler provided. The transistor can switch up to 30 V/ 50 mA. The output channel is protected against overvoltage and spikes. The maximum output frequency is 25 kHz.



Dimensions



### Construction

The unit **FT 9003** is provided for DIN-rail mounting according to EN 50022.

### Power Supply

The unit is designed for a power supply from 18 to 36VDC (standard design).

### Specifications

<b>Input channel</b>	
Input voltage level	: 5V, 12V, 24V & (optional) 48V
Input current per channel	: 5 mA source current
Input Frequency	: max. 2 MHz
Tolerances of the input channel	: +/-20% of the nominal input
<b>Divider 1</b>	: 8-pole DIP switch
	: adjustable divisor 2 ... 510
<b>Divider 2</b>	: 5 Jumper,
	: adjustable divisor 1/2/4/8/16
<b>Output channel</b>	: isolated
Voltage	: max. 30 V
Current	: max. 50 mA
Frequency	: max. 25 kHz
<b>Power supply</b>	: 18 V...32 V DC
Current	: max. 80 mA (18 VDC)
<b>Construction</b>	
CE	: 2014/30/EU, 2014/35/EU, 2011/65/EU+2015/863
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
<b>Dimensions</b>	: 99 x 114,5 x 17,5

### Ordering Information

FT 9003-			
			<b>Special model</b>
			0 standard
			1 reserved
			<b>Input voltage</b>
			0 standard
			1 48 V
			2 reserved
			3 reserved
			<b>Power supply</b>
			0 18 ... 36 V DC, (Standard)
			1 4,5 ... 9 V DC, (Option)
			2 9 ... 18 V DC, (Option)
			3 36 ... 48 V DC, (Option)

## ■ FT 9004 Frequency divider for quadrature encoders

### Highlights

- Divider for incremental encoder
- A/B IN, A/B out
- Dividing factor from 2 to 999
- Divider adjustment by DIP-Switches
- Input level adjustable: 5, 12 or 24 V
- Low power consumption
- High reliability
- Standard housing for DIN rail mounting



### General

The FT 9004 is an easy to handle frequency divider. The unit is designed for dividing frequencies respectively pulse chains of incremental encoders. Two input pulse chains 90° out of phase are divided by an user adjustable value and are outputted as two pulse chains 90° out of phase. It is understood that Up-down counting is possible without loss of pulses.

A second function can be selected by an internal DIP-switch. Using this function input A is used as input for a pulse chain, input B is used for controlling the direction of the pulse chain. As described above the output signals of the output channels A and B are two pulse chains 90° out of phase. Using uneven dividing factors <10 may result in a phase shift which differs from 90°

### Input channels

All input channels are optically isolated. Applied sensors must have pnp or push-pull output circuits (source currents  $\geq 5$  mA). The input frequency for the two input channels A and B may not exceed 90 kHz.

### Output channels

There are two output channels A and B. They are performed as open-collector transistor outputs and are able to switch currents up to 50 mA and voltages up to 30 V. For correct operating external pull-up-resistors are necessary.

### Digital adjustment

There are two internal 8-pol DIP-switches for adjustments provided. For adjusting the case must be opened. Following adjustments are available:

- A 3-decade divider value can be selected using BCD-code. Divider values from 2 to 999 are allowed.
- One DIP-switch is provided selecting the desired input function, two pulse chains, 90° out of phase or one pulse chain and a direction input signal.

**Attention!** Changes of DIP-switch settings become active only after a power up.

### Power supply

The FT 9004 is designed for a power supply voltage of nominal 24 VDC. Voltages from 18 to 36 VDC are allowed. The power supply input is isolated from all input and output channels.

### Housing

The FT 9004 is provided for DIN-rail mounting according to EN 50022. The case is of Polyamid PA 6.6. For connecting inputs, outputs and power supply there are 12 screw terminals provided.

### Technical specifications

#### Input channels

Input voltage level	: 24 V, 12 V, 5 V selectable
Tolerance	: +/-20% of selected level
Isolation	: 500 V
Input current	: $\geq 5$ mA, pnp or push-pull
Frequency channel A and B	: 0... 90000 Hz
Input channel C	: reserve

#### Divider value adjustment

3-decade	: 2...999
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#### Outputs

Open-collector current	: max. 50 mA
Open collector voltage	: max. 30 VDC

#### Power supply

Voltage	: 18...36 VDC
Current	: max. 15 mA (24 V DC)

#### Case

Dimensions	: 99 x 114,5 x 17,5 mm
Screw terminals	: 12
Protection	: IP40
Mounting	: EN 50022 (DIN-rail mounting)

#### Environmental

EMV	: EG-direction 89/336/EWG
Operating temperature	: -5 to +55 °C

### Ordering Information

FT 9004 -	0		
			Reserve
		0	reserved
		1	reserved
		Frequency inputs	
		0	Standard
		1	48 V
		Powersupply	
	0	18 ... 36 V DC, (standard)	
	1	4,5 ... 9 V DC, (option)	
	2	9 ... 18 V DC, (option)	
	3	36 ... 48 V DC, (option)	

■ **Rotational Direction Detection Unit Type DS 9000**

**Highlights**

- Direction detection of incremental encoders
- Relay output
- One electronic output channel
- High reliability
- Small dimensions
- Low power consumption



**General**

The new unit **DS 9000** is used to find out the rotational direction of incremental encoders. There are two input channels provided. These input channels are optically isolated from the internal circuitry. By this way disturbances by a noisy environment are reduced. The input pulses of the two channels must have 90 degrees out of phase. When using incremental encoders together with this unit the output signals at the output channels are indicating the rotational direction of the encoder. When the power supply is applied to the unit, the relay is not excited and the optocoupler output is non conducting. Input channels, output channels, and power supply are isolated from one another.

**Digital Inputs**

These input channels can be used to connect an incremental encoder. Functions:

- Input voltage: 5V, 12V and 24V (adjustable by DIP switches)
- Tolerance: a logical "0" will be recognized up to 20 % max. of the nominal input level. (e.g. up to 4,8V at an input level of 24V )  
A logical "1" will be recognized at +/- 20% of the nominal input level. (e.g. from 19,2V min. to 28,8V max. at an input level of 24V )
- Input current: 5 mA
- Input frequency: max.25 kHz (other frequencies on inquiry)
- optoisolated

**Relay Output / Optocoupler Output**

For switching high currents respectively high voltages there is a contact output available. For fast switching requirements there is a optocoupler output provided ("Open Collector").

**Construction**

The unit **DS 9000** is provided for DIN-rail mounting according to EN 50022. The case is of Polyamid PA 6.6 (color green).

**Power Supply**

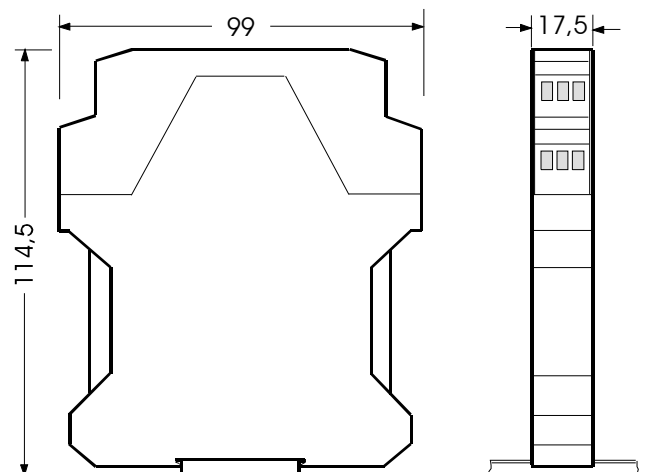
The unit is designed for a power supply from 12 to 32 VDC. The power supply is isolated from the input and output channels.

**Specifications**

Input channels	: 5V, 12V and 24V (adjustable)
Input current per channel	: 5 mA source current
Input Frequency	: max. 25 kHz
Tolerances of input level	: +/-20% of nominal input level
	: for a logical "1".
	: Max. 20% of the nominal input
	: level for a logical "0".
Optocoupler output	: isolated
Voltage	: max. 30 V
Current	: max. 10 mA
Relay	
Contact ratings	: 3A/250 VAC
Power supply	: 12 V...32 V
Current	: max. 33 mA
Construction	
EMV	: Accord. ENV 50121-3-2
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
Dimensions	: 99 x 114,5 x 17,5

**Ordering Information**

<b>DS 9000</b>					
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ds9000\_data\_en\_vp/05,08

## ■ FC 9001 - Monitoring the difference of two speeds

### Highlights

- Monitoring of gear ratios
- Integrated frequency divider
- Adjustable threshold and hysteresis
- High reliability and small dimensions

### General

The unit **FC 9001** is used for monitoring the deviation of two frequencies. There are two frequency input channels A and B provided. The higher frequency has to be applied to input channel A. This frequency can be divided by a value between 1 and 255. The value of the divider is selectable by an internal DIP-switch.

The permissible difference of the two frequencies and a hysteresis can be adjusted by internal DIP-switches. The permissible difference is selectable from 1 to 15 % in referring to the frequency of input channel B. The adjustable range of the hysteresis is +/- 0...3%. Attention must be paid that the value of the adjusted hysteresis is lower than the value of the selected threshold.

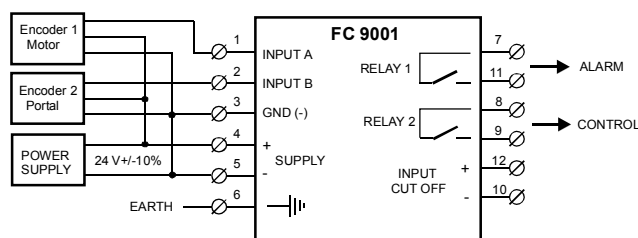
If the deviation of the two input frequencies exceeds the selected threshold, the output contact of relay 1 will close. For special applications the relay 1 output can be set inactiv by the "CUT OFF" input.

### Digital Inputs

All input channels are optically isolated from the internal circuitry. By this way disturbances by a noisy environment are reduced. Two incremental encoders with push-pull outputs can be connected to the input channels (see figure 1).

The device can also process signals from sensors with 3-wire pnp outputs. The input frequency has to be between 0,5 kHz and 60 kHz. Input voltage levels of 24, 12, or 5 V are selectable by internal jumpers. The nominal input current is about 5 mA.

### Block Diagram



### Relay Output

There are two relay outputs provided. The contact ratings are 250 VAC / 3 A.

### Housing

The unit **FC 9001** is provided for DIN-rail mounting according to EN 50022. The case is of Polyamid PA 6.6 (color green).

### Power Supply

The unit is designed for different power supplies (see ordering information). The power supply input is isolated from all input and output channels.

### Specifications

Input channels, voltage level	: 24 V, 12V, 5 V, optoisolated
Input current per channel	: > 5 mA source current
Channel A, frequency range	: 0,5... 60 kHz
Channel B, frequency range	: 0,5... 60 kHz
Tolerances of the inputs	: +/-20% of the nominal input level for a logical "1". : Max. 20% of the nom. input level for a logical "0".
Frequency divider	: 1...255 (channel A only)
Threshold adjustment	: 1...15 % (ref. to channel B)
Hysteresis adjustment	: 0... 3% (ref. to channel B)
Relais contact ratings	: 3A / 250 VAC
Power supply	: see ordering Information
Current consumption	: max. 32 mA, (24 VDC)
Construction	
EMV	: conform with 89/336/EWG
Protection	: IP40
Mounting	: EN 50022
Operating temperature	: -5 to +55 °C
Dimensions	: 99 x 114,5 x 17,5

### Ordering Information

FC 9001	-	X	0	0	
					Reserved
					Reserved
<b>Power supply</b>					
0	4,5 ... 9 V DC, (option)				
1	9 ... 18 V DC, (option)				
2	18 ... 36 V DC, (standard)				
3	36 ... 48 V DC, (option)				

**■ FD 9000 ROTATIONAL AND ZERO SPEED MONITOR**

**Highlights**

- Rotation speed monitor
- Zero speed detection
- Input for start-up inhibit
- Simple adjustments by DIP-Switches
- 2 Relay outputs
- Low power consumption
- High reliability
- Standard housing for DIN rail mounting



**General**

The FD 9000 can be used to detect over speed, under speed or for zero speed detection. To achieve fast response times the FD 9000 operates on a pulse-width measurement. At slow frequency the digital system measures the time between two consecutive pulses and at high frequency the shortest measurement time is 16 ms.

**Input channels**

There are 3 optically isolated input channels A, B, and C provided. Their threshold voltage can be selected between 5, 12, or 24 V. Applied sensors must have pnp or push-pull output circuits (source currents  $\geq 5$  mA). Max. input frequency for input channel A is 50 kHz. Input channel C can be used for start-up inhibit. Input B is not used.

**Relay outputs**

Two relays are provided. Relay output contact 1 is used to signal overspeed or underspeed. The selection between the signaling of overspeed or underspeed is made by an internal jumper setting. Relay output contact 2 is used to signal a zero speed. The contact rating for both relays is 250 VAC / 3 A.

**Digital adjustment**

There are two internal 8-pol DIP-switches provided for the digital adjustments. Possible adjustments:

- A 3-decade value for speed level adjustment (BCD-code)
- Four speed level multipliers can be set with 2 additional DIP-switches (x0,1/x1/x10/x100)
- The zero speed detection works with four selectable measuring times at input A. A detected zero speed will close relay output 2.

**Power supply**

The FD 9000 is designed for power supplies voltages of 5, 12, or 24V DC. See ordering key for details. The power supply input is isolated from all input and output channels.

**Housing**

The FD 9000 is provided for DIN-rail mounting according to EN 50022. The case is of Polyamid PA 6.6. For connecting inputs, outputs and power supply there are 12 screw terminals provided.

**Technical specifications**

**Input channels**

- Input voltage level : 24 V, 12 V, 5 V selectable
- Tolerance : +/-20% of selected level
- Isolation : opto isolated 500 V
- Input current :  $\geq 5$  mA, pnp or push-pull
- Input channel A, frequency : 0,1... 50.000 Hz
- Input channel B : reserve
- Input channel C : start-up inhibit

**Limit adjustment**

- 3-decade : 1...999
- Range : 0,1, 1, 10, 100, selectable
- Hysteresis, fixed : 3% of selected setpoint

**Zero speed detection**

- Time for no pulses at input A : 0.1/ 1/ 2/ 10 sec, selectable

**Relay outputs**

- Speed monitoring : contact of relay 1
- Relay function : selectable by jumper
- Zero speed detection : contact of relay 2
- Contact ratings : 3 A / 250 VAC

**Power supply**

- Voltage : see ordering information
- Current : max. 40 mA (24VDC)

**Case**

- Dimensions : 99 x 114,5 x 17,5 mm
- Screw terminals : 12
- Protection : IP40
- Mounting : EN 50022 (DIN-rail mount.)

**Environmental**

- EMV : EG-direction 89/336/EWG
- Operating temperature : -5 to +55 °C

**Ordering Information**

FD 9000	-	X	0	0	
					Reserved
					Reserved
					<b>Power supply</b>
			0		4.5 ... 9 V DC, (option)
			1		9 ... 18 V DC, (option)
			2		18 ... 36 V DC, (standard)
			3		36 ... 48 V DC, (option)

## ■ CO 9000 RTD-Thermostat Model

### Highlights

- 4 progr. temperature threshold values
- 4 separate solid state output channels
- High reliability
- Low power consumption
- Compact housing

### General

The thermostat **CO 9000** is a microprocessor controlled measuring device especially developed for locomotive applications. For instance it is possible of controlling four different oil-temperatures of a circular course.

The thermostat is provided with 4 threshold values. The threshold values and the corresponding hysteresis can be programmed according to the specifications of customers.

The temperature is measured by a sensor of the type Pt 100. When running the measured value is monitored. Passing over or falling short of the programmed threshold values will be indicated by a corresponding isolated contact.

### Measuring Range of RTD

-40°C ... +100°C

### Temperature Sensor

- Pt 100
- Optional Pt 1000

### Functions

- Two-wire measurement
- Measuring current 2 mA
- Averaging with a digital first order filter
- 4 programmable limiting values
- 4 semiconductor relays outputs
- power supply 24 VDC

### Housing

- DIN-rail Mounting according to EN 50022
- Polyamid PA 6.6 case
- 12 Screw terminals for wiring
- Construction width only 17,5 mm

The CO 9000 has a snap-in case for 35 mm DIN-rail mounting.

For connexions there are 12 screw terminals provided. The screw terminals can be used for rigid or flexible cables with a cross-section from 0,2 to 2,5 mm<sup>2</sup>. The nominal load for the screw terminals is 250V / 24A.



### Technical Data

Pt100-Input	
Measuring current	: 2 mA
Threshold value A, B, C, D	: programmable
Tolerance	: < 1°C
Output	: 4 SPST
max. switching voltage	: 33 V
max. switching current	: 100 mA
Power supply	: 16,8 V...31,2 V DC
Current consumption	: max 31 mA
General	
EMC	: acc. ENV 50121-3-2
Protection	: IP40
pcb	: varnish coating
Inflammability	: VO (UL94)
Mounting	: EN 50022
Operating Temperature	: -25 to +70 °C
Shock resistance	: acc. VDE 0115/part 200/ page 52/10.2.11
Dimensions	: 99 x 114,5 x 17,5 mm
Weight	: 100 g

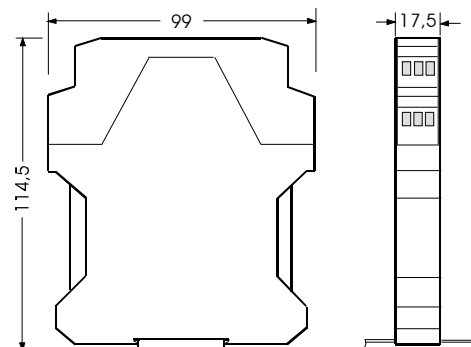
### Example of Configuration:

Order Information	Contact	on	off
CO 9000-00402	A	5°C	7°C
	B	45°C	35°C
	C	50°C	40°C
	D	65°C	55°C

The requested on set points has to be specified when ordering.

### Power Supply Voltages

CO 9000-	X	XXXXX
		Configuration
		Power supply
	0	18...36 V DC (Standard)
	1	4,5...9 V DC (Option)
	2	9...18 V DC (Option)
	3	36...48 V DC (Option)



## ■ CO 9001 Thermostat

### Highlights

- 4 RTD input channels
- 1 programmable limit value
- Low power consumption
- 2 solid state outputs

### General Discription

The **CO 9001** thermostat is a microprocessor controlled measuring device. The thermostat can be used for monitoring up to four RTD input channels. The temperatures are measured by RTDs of type Pt100. The measured values are monitored for exceeding respectively fall short of a predetermined limit value. The exceeding of this limit value will be indicated by the potential free contacts of a relay. The limiting value must be specified when ordering. The value will be customized at factory.

### Design

The CO 9001 is designed DIN-Rail-Mounting according to EN 50022. The unit width is 45 mm. The case consists of Polyamid PA 6.6 (color green) and is allowed for a temperature range from -40 °C to +100 °C. The unit is provided with 32 screw terminals. The screw terminals can be used for rigid or flexible cables with cross-sections from 0,2 to 2,5 mm<sup>2</sup>

### Function

The temperatures are measured by 4 separate RTD sensors of the type Pt100. For avoiding additional the currents through the sensors are less than 2 mA. By this way a heating by the sensor currents is avoided. Failures caused by cable resistances to the sensors are avoided by using 4-wire connection. When operating, the drop-out voltages of the sensors are measured. By the values of drop-out voltages the temperature of each RTD sensors can be calculated. The calculated temperatures are monitored. When exceeding the programmed limit value the the output contacts are activated. The limit value will be programmed according the requirements of the customer.

### Relays

By using solid state relays failures by vibration are avoided. In addition the advantages are long life as well as extremely high off-resistance, an lack of contact bounce. Lifetime is infinite if the rated datas of max. currents and voltages are not exceeded. The contact ratings are max. 100 mA and max. 33V. The Rds(on) is typical 10Ω. Using an other type of solid state relays (option!) it is possible to



switch higher currents.

To avoid destruction by high voltage spikes the output contacts are protected by suppressor diodes with a rated voltage of 33V.

### Technical Specifications

Pt100-Eingang	
Measuring current	: 2 mA
Measuring range	: -40...100 °C
Accuracy	: < 1°C
Threshold *	: close contact = 70°C open contact = 66°C
Relay outputs	: 1 N.O. 1 N.C.
max. switching voltage	: 33 V
max. switching current	: 100 mA
Power supply	: 16 V...32 V DC
Current	: max 40 mA
Design	
EMV	: ENV 50121-3-2
Protection class	: IP40
Combustible class	: VO (UL94)
Mounting	: EN 50022
environmental temperature	: -25 bis +70 °C
shock resistance	: VDE 0115/Teil : 200/ page 52/10.2.11
Dimensions	: 99 x 114,5 x 45 mm

### Order key (Example)

CO 9001-	X	X	X	X	X	Performance	
						Threshold	ON
		0	0	0	0	70°C	66°C
<b>Power Supply</b>							
		0	18 ...	36 V DC	(standard)		
		1	4,5 ...	9 V DC	(option)		
		2	9 ...	18 V DC	(option)		
		3	36 ...	48 V DC	(option)		

\* The switching performance and the switching thresholds had to be specified by the customer. The data in the technical specifications and in the order key are only examples.



## ■ LUW 1398/3-S02 Lamp Monitoring Unit

### Highlights

- Monitoring the current of 3 lines
- 6 solid state output relays
- High reliability
- Low power consumption
- Small case

### General

The unit **LUW 1398/3** was developed especially for locomotive applications. Capable of monitoring DC-currents of 3 lamps, the unit **LUW 1398/3** provide multiple solid state relay outputs for indicating the area in which a lamp has failed.

The solid state outputs can be used to drive an audible signaling device, a centrally located computer, or signaling LEDs.

The unit is measuring the currents which are supplying the lamps. Each measured current is monitored. If one of the 3 currents exceeds the adjusted limit, the internal solid state relays are switched on. For each input channel there are two separate solid state output contacts provided. These contacts are isolated from each other and can be used for different tasks.

### Functions

The currents of the lamps are measured by the voltage drop of built-in resistances. To reduce the generation of heat the values of the resistances are very low. Resistances of only 40 mΩ are used.

The voltage drop of the resistances are measured and evaluated. If one of the 3 currents fall short of the adjusted limit, the internal solid state relay will be switched off.

Two output contacts belong to each input channel. These contacts are protected against overvoltage and spikes by suppressor diodes. That's why the contacts may switch voltages up to 33V.

The max current for each output contact is 100 mA.

### Supply Voltage

The built-in electronic circuit must be supplied by 24VDC.

The negativ terminal of the supply voltage is connected via internal diodes to the negativ terminals of the 3 current input channels. By this way the 3 negativ terminals of the current input channels are allowed to accept different voltages.

For the positiv supply voltage there is a separate terminal provided.

### Housing

The **LUW 1398/3** is built in a snap-in case for 35 mm DIN-rail mounting.



### Specifications

Current input channel	
Input resistance	: 40 mΩ
Max.input current	: 4,5 A
Nominal current threshold	: approx. 0,85 A, other on request
Outputs	: 2 separate SPST for each lamp
Contact rating -Voltage	: max. 33V
Contac rating - Current	: max. 100 mA
Supply Voltage	: 16,8 VDC...31,2 VDC
Current Consumption	: max. 31 mA
Environmental Conditions	
EMV	: according ENV 50121-3-2
Protection	: IP40
Mounting	: EN 50022
Inflammability	: VO (UL94), DIN 5510-5
Resistance to shock	: according. VDE 0115/Teil 200/page 52/10.2.11
Printed board	: varnisd on both sides
Operating Temperature	: -25 bis +70 °C
Dimensions	: 99 x 114,5 x 35
Weight	: 200 g

### Ordering Information

**LUW 1398/3-S02**

