migan/migra IZ

Large Format LED Display with Pulse Counter

User's Manual

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microSYST

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Table of Contents

1 General

This manual describes the „migan" and „migra" LED large format display with pulse counter. The following inputs are integrated:

- Two counting inputs or counting input and counting direction (pulse counter) or input for incremental position encoder (2 phase-delayed signals)
- Reset- and preset input
- Reset inputs for relay outputs

The configuration of the counter happens with the help of a PC software (communication with the PC via RS232 interface).

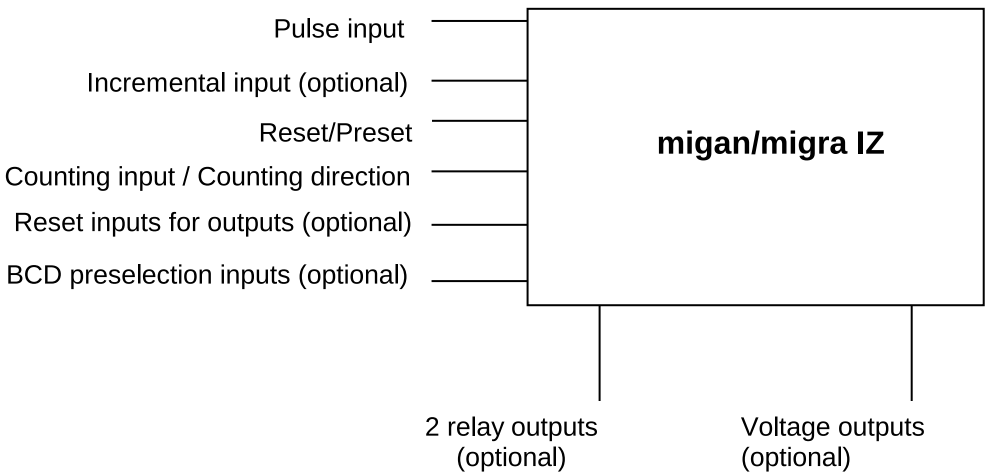
With the help of BCD coded inputs, settings like the preset value of the counter or overflow and underflow values can be changed within running operation.

It is possible to control external peripherals like LEDs, horns etc. with the two available relay outputs (optional).

Display options:

- Counting value
- Frequency
- Number of revolutions
- Cycle duration
- Time

2 System Overview



3 Technical Data

Display type:	7 segment LED (migan), LED dot matrix (migra)
Digits:	1 to 9
Decimal point:	configurable position
View:	single or double sided
Inputs:	Pulse input, input for counting direction, inputs for phase-delayed signals pulses (incremental inputs optional), reset and preset input, 2 reset inputs for relay outputs (optional) BCD preselection inputs (optional)
Outputs:	2 relay outputs (optional), voltage output, max. 0.5 A
Pulse repetition frequency:	up to 1 MHz (pulse counter, optionally 5 Hz) or up to 5 KHz with counting direction input, up to 1 MHz per input at incremental counter
Input level: (pulse input)	U_{low} 0 to 4 VDC U_{high} 15 to 30 VDC
Input level: (incremental input)	U_{low} 0 VDC U_{high} 5 VDC
Display options:	counting value, frequency (counting pulses per time unit), number of revolutions, cycle duration, time
Dimensional display:	upon request
Operation voltage:	230 V / 50 Hz, 110 V / 60 Hz or 24 VDC +/-20 %
Housing:	industrial version, powder coated aluminium
Mounting:	articulated arm, hanging with chain, angle brackets
Protection:	IP54 or IP65
Operating temperature:	0 to +50 °C (optional -20 to +50 °C)
Storage temperature:	-25 to +70 °C

3.1 Tips for the Start-up

- When putting on the power supply, the following sequence has to be observed:
    - Connect the power supply cable to the display.
    - Connect the power supply cable to the power supply.

- When disconnecting the power supply, the following sequence has to be observed:
    - Disconnect the power supply cable from the power supply.
    - Disconnect the power supply cable from the display.

3.2 Description of the Signals

Pulse input, UP / DOWN switching
The display counts at an increasing resp. decreasing flank (adjustable with PC software) at the pulse input

- with UP / DOWN switching = HIGH (+24 VDC): upwards (standard configuration)
- with UP / DOWN switching = LOW (0 V): downwards (standard configuration)

Incremental input
Differential inputs (5 V level) for two phase-delayed signals. The upwards or downwards counting happens according to the phase shift of the both signals.

Preset
At a HIGH level, the counting value is set to the value of the preselection inputs (BCD, optional) resp. to the default preselection value (configurated with the PC software). As long as a HIGH level is connected, no pulse counting happens.

Reset
The counting value is reset at a HIGH level to „0“ (resp. to the lower limit of the counting range, if “0” is not within the counting range). As long as a HIGH level is connected, no pulse counting happens.

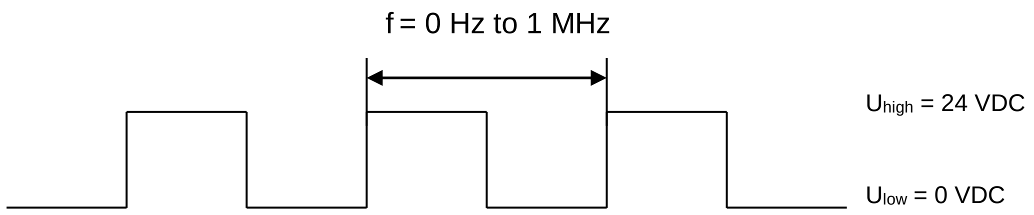
Reset Relays 1/2
If you have a display version with relay outputs (optional) and the obverse settings, at a HIGH pulse, the associating relay is set to the original condition after a transgression of the limit area.

2x Pulse input
The display counts at an increasing or decreasing flank (adjustable via PC software). Here, the counting direction input is used as a second counting input (up to 5 KHz).

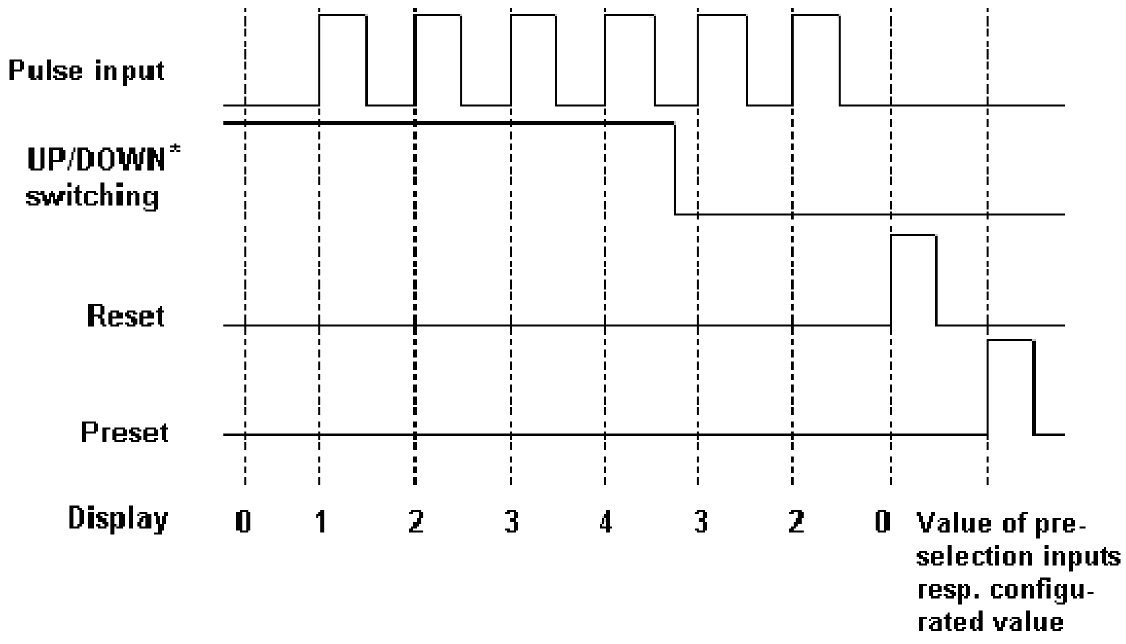
3.3 Pulse Diagrams

3.3.1 Pulse Input

Signal level and signal frequency:



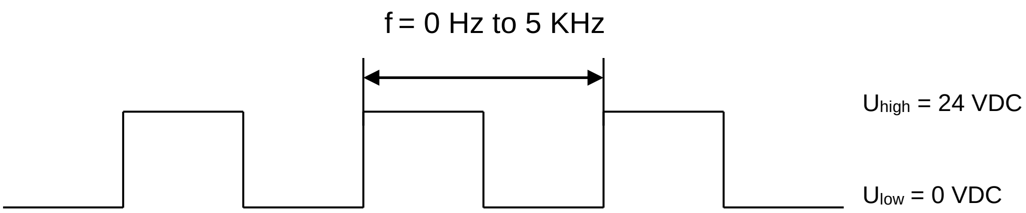
Counting behaviour:



*: The direction switching could possibly be executed a few milliseconds after changing the level.

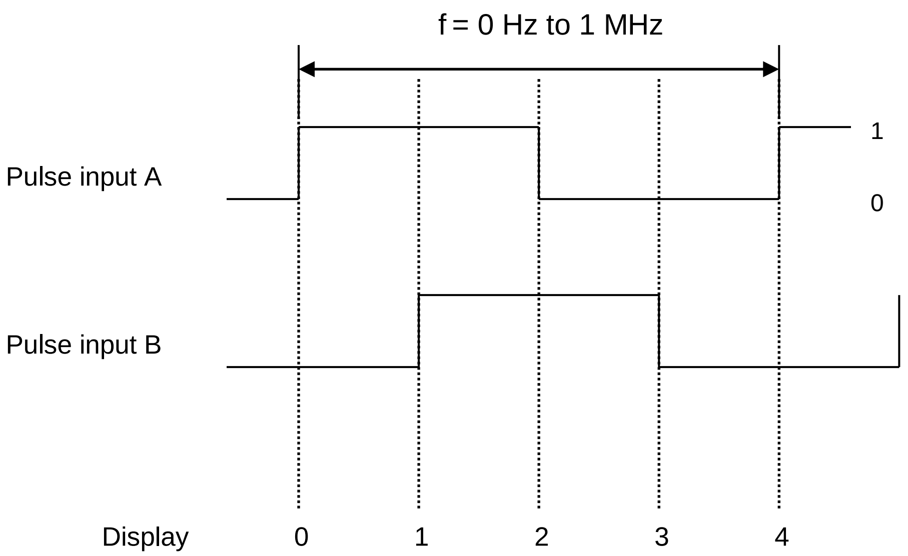
3.3.2 Counting Direction Input as Counting Input

Signal level and signal frequency:



3.3.3 Incremental Input

At the incremental inputp, the counting direction depends on the phase shift of the two signals. The maximum frequency of a single input is 1 MHz.



If pulse channel A hurries ahead the channel B by 90 degrees (like in the picture above), an UP-counting happens. If channel B hurries ahead the channel A by 90 degrees, a DOWN-counting happens.

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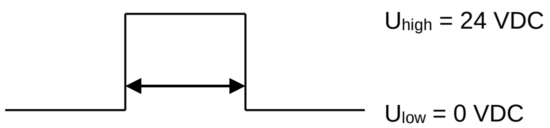
3.3.4 Control Inputs

Reset input, preset input, reset relay 1(optional), reset relay 2(optional):



t_i = pulse duration

The pulse duration t_i must take <u>100 ms</u> for each of these inputs <u>at least.</u>

3.4 Device Configuration migan

Character height:
☐ 60 mm ☐ 100 mm ☐ 150 mm ☐ 200 mm ☐ 250 mm ☐ 300 mm

Number of digits:

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Display colour:
☐ red ☐ green ☐ yellow ☐ white ☐ blue

Dimensional display:

____

View:
☐ single sided ☐ double sided

Operating voltage:
☐ 230 V / 50 Hz ☐ 110 V / 60 Hz ☐ 24 V DC

Protection:
☐ IP54 ☐ IP65

Operating temperature:
☐ 0 to +50 °C ☐ -20 to +50 °C ☐ _________°C

Housing dimension: _________x_________x_________mm

Housing colour: RAL _____________

Housing material:
☐ Aluminium profile
☐ High-grade steel
☐ Sheet steel

3.5 Device Configuration migra

Pixel resolution (horizontal x vertical): ________x________

Display colour:
☐ red ☐ green ☐ yellow ☐ white ☐ blue

View:
☐ single sided ☐ double sided

Operating voltage:
☐ 230 V / 50 Hz ☐ 110 V / 60 Hz ☐ 24 VDC

Protection:
☐ IP54 ☐ IP65

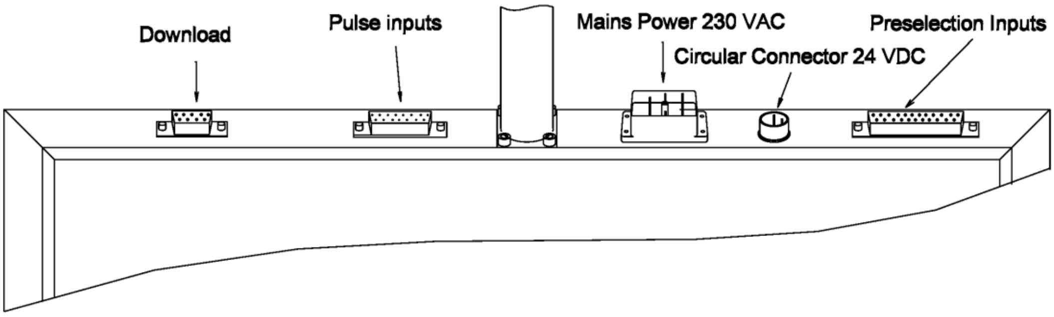
Operating temperature:
☐ 0 to +50 °C ☐ -20 to +50 °C

Housing dimension: _______x_______x_______mm

Housing colour: RAL _____________

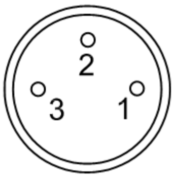
Housing material:
☐ Aluminium profile
☐ High-grade steel
☐ Sheet steel

4 Connector Pin Assignments



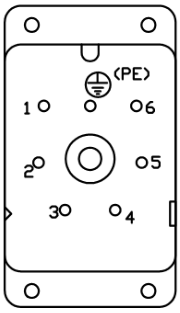
The power supply happens with the 3-pin circular connector (+24 VDC).
Optionally it's possible to supply with the 7-Pole mains plug (230 VAC).

Power Connector 24 VDC



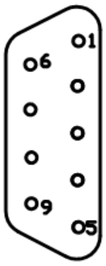
Pin	Assignment
1	GND
2	+24 VDC
3	PE

Power Connector 230 VAC (optional)



Pin	Assignment
1	L1
2	N
⏚ (PE)	PE

Pulse and Control Inputs (9-Pin Sub-D Plug Connector)



Pin	Assignment
1*	A+ (incremental input, 5 V)
2*	B+ (incremental input, 5 V)
3***	Output +15 VDC
4*	A- (incremental input, 5 V)
5**	Pulse input (24 V) resp. B- (incremental input, 5 V)
6	UP / DOWN switching for pulse input. At standard configuration: +24 V = UP 0 V = DOWN or second counting input (24 V)*
7	GND
8	Preset input (+24 V = 1, 0 V = 0) Display the data of the preselection inputs
9	Reset input (+24 V = 1, 0 V = 0)

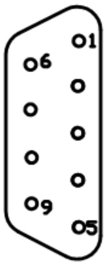
* = optional
** = at version with incremental inputs, this pin is used for the signal B- !
*** = This pin is only optionally connected! Depending on the display's version, the voltage at this output can also be +24 VDC! together with Pin 1, relay outputs (see next page), max. current 0.5 A

<u>Input Impedances</u>
Standard inputs: > 38 kΩ
Incremental inputs: > 5 kΩ

Note: If using the pulse input (Pin 5) without controlling the UP/DOWN switching (Pin 6), the display counts upwards (at standard configuration).

Signal A = 1, if A+ = +5 V and A- = 0 V
Signal A = 0, if A+ = 0 V and A- = +5 V
Signal B = 1, if B+ = +5 V and B- = 0 V
Signal B = 0, if B+ = 0 V and B- = +5 V

Relay Outputs (9-Pin Sub-D Plug Connector, optionally mounted)



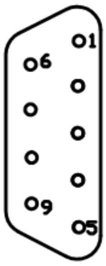
Pin	Assignment
1**	Output +15 VDC
2	GND
3*	Relay 1, make resp. break contact
4*	Relay 1, common contact
5*	Relay 2, make resp. break contact
6*	Relay 2, common contact
7	Relay 1 reset input (+24 V = 1, 0 V = 0)
8	Relay 2 reset input (+24 V = 1, 0 V = 0)
9	n. c.

n. c. = not connected

* = potential-free outputs, depending on mounting variation: make or break contact: **maximum switching voltage/current 24 VDC / 1 A**

** = This pin is only optionally connected!
Depending on the display's version, the voltage at this output can also be +24 VDC!
together with Pin 3, pulse inputs (previous page),
max. current 0,5 A

Download Interface for the PC (9-Pin Sub-D Plug Connector)



Pin	Assignment
1	
2	RS232 RxD
3	RS232 TxD
4	
5	RS232 GND
6	
7	
8	
9	

Preselection Inputs (25-Pin Sub-D Plug Connector, optionally mounted)

Depending on device type, the preselection inputs are operated in mode BCD parallel or BCD multiplex:

BCD parallel	
Pin	**Assignment**
1	GND
2	Output for preselection inputs (+15 or +24 VDC)
3	Data $2^0/10^3$
4	Data $2^1/10^3$
5	Data $2^2/10^3$
6	Data $2^3/10^3$
7	
8	Data $2^0/10^2$
9	Data $2^1/10^2$
10	Data $2^2/10^2$
11	Data $2^3/10^2$
12	
13	Data $2^0/10^1$
14	Data $2^1/10^1$
15	Data $2^2/10^1$
16	Data $2^3/10^1$
17	
18	Data $2^0/10^0$
19	Data $2^1/10^0$
20	Data $2^2/10^0$
21	Data $2^3/10^0$
22	LE (latch enable)
23	
24	
25	

BCD multiplex	
Pin	**Assignment**
1	GND
2	Output for preselection inputs (+15 or +24 VDC)
3	LE 10^5
4	
5	
6	LE 10^4
7	
8	
9	LE 10^3
10	
11	
12	LE 10^2
13	
14	
15	LE 10^1
16	
17	
18	LE 10^0
19	
20	
21	Data 2^0
22	Data 2^1
23	Data 2^2
24	Data 2^3
25	

The LE connections (latch enable) are LOW-active.

The ouput voltage of Pin 2 can be used for wiring the preselection inputs.
If the wiring shall happen with an external voltage, its GND must be connected to Pin 1.

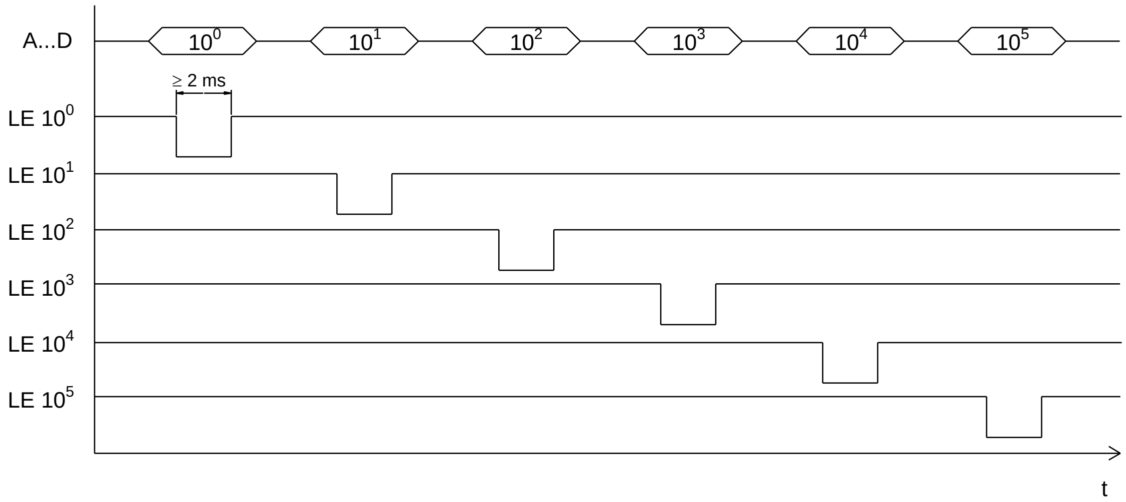
Procedure with BCD parallel:

- Switch data signals to the display digits (HIGH-active).
- Set preset input (HIGH-active).

The LE input must not be operated because it is automatically supplied with a LOW signal if it's not connected. In this case it is active.

Procedure with BCD multiplex:

- Set an HIGH-signal to the display digits you want to use.
- Set data signals for digit 10^0.
- Activate LE 10^0 (= interrupt HIGH-signal or connect LOW-signal).
- Repeat the last two steps for all display digits:



- Set preset input (HIGH-active).

5 Appendix

5.1 Declaration of Conformity

EU-Konformitätserklärung
EU Declaration of Conformity

Produktbezeichnung: migan/migra
Product name:

Typenreihe: migan/migra IZ
Type code:

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

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

Windischeschenbach, 20.11.2017

Manuel Raß

Manuel Raß

Geschäftsführer / *General Manager*

5.2 Maintenance and Care

Please observe the following instructions:

- Make sure that the housing can be opened for adjustment and maintenance even after the display has been installed. Allow for adequate clearance at the back, front and top of the display unit in order to allow for sufficient ventilation (if vent slots are included).
- Display quality is impaired by direct illumination with bright light sources and/or direct sunlight.
- The display must be switched off before cleaning.
- Protect the display from excessive humidity, extreme vibration, direct sunlight and extreme temperatures. Non-observance may lead to malfunctioning or destruction of the device. Under certain circumstances electrical shock, fire and explosion may occur as well. Information concerning allowable ambient conditions, including recommended temperature ranges, can be found in the chapter entitled “Technical Data”.
- The display may not be placed into service if the device and/or the power cable are known to be damaged.
- Do not attempt to repair the device yourself. The guarantee is rendered null and void if the device is tampered with by unauthorised persons.
- Observe all notes and instructions included in this user’s manual.

5.3 Warranty / Liability

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

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

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

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

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

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

5.4 Versions Overview

Version	Date	Remark, Description
1.00	03.11.03	Gold S.: Document created
1.01	08.12.03	Gold S.: Default voltage for voltage outputs changed
1.10	28.10.04	Kreuzer: Housing dimensions changed
1.20	22.11.04	Kreuzer: Complete revised
1.30	13.03.06	Kreuzer: Second counting input instead of counting direction is possible
1.40	15.12.00	Kreuzer: Optionally 5 Hz impulse input
1.50	02.09.08	Kreuzer: Max. output current limited to 0.5 A
1.60	24.09.09	Kreuzer: Impedances of the inputs
1.70	16.08.10	Technical Data updated
1.80	31.01.11	migan AW added
1.90	15.01.13	Description for preselection inputs changed
2.00	21.03.13	Company address, declaration of conformity, warranty changed
2.10	17.10.13	Logo
2.20	27.04.16	Declaration of conformity
2.30	20.11.17	Change of address

Certified per **DIN EN ISO 9001.**