M40113.V01/4/24/D 4 channel measuring unit
for rail mounting
with Profibus interface; power supply 24 V DC

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The unit M40113.V01/4/24/D reads the measuring values from max. 4 inputs.
The values MAX, MIN and Xq= (MAX+MIN)/2 are sampled for each input channel, including controlling of upper and lower limits. The function AUTOZERO allows to eliminate offset values. A programmable filter is used to smooth the measuring values. Different sensors can be used by selecting the measuring range .
The measured values may be read out through the profibus interface in binary coding.

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1. Control elements

front view

1 - 4 measuring inputs
1 DMS sensor
2 inductive tracer
3-4 voltage input +/-10 volt

X1 Input power supply

X2 RS 232 interface 9pol. female Sub D
Pin3: Output ; Pin7: Signal Ground
RS-232: 9600 Baud, 8 Bit, 1 Stopbit, no parity

X3 Profibus interface

-12V - Indicator -12V supply

+12V - Indicator +12V supply

+ 5V - Indicator + 5V supply

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2. Technical data
BxHxD: 105mm x 105mm x 215mm
weight: ca. 1700g
4x measuring input (1x DMS, 1x inductive tracer, 2x +/-10 volt) (2)
Profibus interface.

3. Power Supply X1
Power supply (3)+24V,+/-5% (X1).
current ca. 130mA.
To aviod influence of temperature the measuring equipment should be turned on ten minutes before the first measurement.

4. PROFIBUS-Interface X3

9pol. female Sub D

Term.: switchable terminal resistor for the busline

Diag: LED-Status display
Left- Green ON = Unit Ready
Center- Green ON = PROFIBUS Aktive
Right- Red ON = PROFIBUS Passive

Adr.: Adress switch (Range 00-99) hidden elements
x1 = low decimal
x10 = high decimal

5. RS-232 Serial port X2
9pol. female Sub D
Pin3: Output ; Pin7: Signal Ground
RS-232: 9600 Baud, 8 Bit, 1 Stopbit, no parity

The input values of the 4 channels can be read out through the serial port for dagnostics. The input of a single character starts the continous output of the incoming values of channel 1-4 until another single character is put in.
The range of these values is +/- 2000 for channel 2-4 and
+/- 1000 für channel 1 (torque-/force sensors full range with 2mV/V sensitivity).
The first output line contains the number of the software release.

ATTENTION: When reading out these values the number of the software release will be put out to the Profibus as measuring value. The normal measuring and programming is blocked!

6. Gain adjustment of measuring inputs
The fine calibration of channel 1 and 2 is possible with the hidden adjuster (1).
Default calibration is done for 2mV/V torque-/force sensors and +/-1mm inductive tracers (Voß, Tesa).

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7. Programming (s. schematic drawing 40113_3b1, page 7)

7.1 Measuring range

Selectable with 3 bit binary value (The input bits must be set permanently!)

binary val.	range	decimal point output	output value	measuring value
0	+/- 2	X , XXX	+/- 2000	+/- 2,000
1	+/- 5	XX , XX	+/- 500	+/- 05,00
2	+/- 10	XX , XX	+/- 1000	+/- 10,00
3	+/- 20	XX , XX	+/- 2000	+/- 20,00
4	+/- 50	XXX , X	+/- 500	+/- 050,0
5	+/- 100	XXX , X	+/- 1000	+/- 100,0
6	+/- 100	XXX , X	+/- 1000	+/- 100,0
7	+/- 100	XXX , X	+/- 1000	+/- 100,0

All bits for the measuring range will be written to output word 1 continously.

7.2 Filter

Selectable with 2 bit binary value (The input bits must be set permanently!)

binary val.	Filter
0	OFF
1	10ms
2	50ms
3	100 ms

All bits for the filter range will be written to output word 1 continously.

7.3 Measuring channel

Selectable with 5 bit binary value

binary val.	measuring channel
0	not used
1	Measuring input 1
2	Measuring input 2
3	Measuring input 3
4	Measuring input 4
5-8	not used
9	MAX-Wert Measuring input 1
10	MAX-Wert Measuring input 2
11	MAX-Wert Measuring input 3
12	MAX-Wert Measuring input 4
13-16	not used
17	MIN-Wert Measuring input 1
18	MIN-Wert Measuring input 2
19	MIN-Wert Measuring input 3
20	MIN-Wert Measuring input 4
21-24	not used
25	Mittelwert (MAX+MIN)/2 Measuring input 1
26	Mittelwert (MAX+MIN)/2 Measuring input 2
27	Mittelwert (MAX+MIN)/2 Measuring input 3
28	Mittelwert (MAX+MIN)/2 Measuring input 4
29-31	not used

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7.4 Setting of lower limits

This limit has to be set as binary value with its decimal bit for each input 1-4.
It is used for controlling the actual value, MAX, MIN and Xq=(MAX+MIN)/2 of its measuring input. The setting will be done by activating bit 5 of input word 0.
A receiption signal will be set to bit 5 of output word 1 as long as the input is set.

Example:	input limit	decimal point	limit value
	+ 550	XX , XX	+ 5,50

When reading the measured value later, bit 5, output word 1 "value < lower limit" will be set if measured value < 5,50.

7.5 Setting of upper limits

This limit has to be set as binary value with its decimal bit for each input 1-4.
It is used for controlling the actual value, MAX, MIN and Xq=(MAX+MIN)/2 of its measuring input. The setting will be done by activating bit 6 of input word 0.
A receiption signal will be set to bit 6 of output word 1 as long as the input is set.

Example:	input limit	decimal point	limit value
	+ 850	XX , XX	+ 8,50

When reading the measured value later, bit 6, output word 1 "value > upper limit" will be set if measured value > 8,50.

All limits will be preserved even when the power supply is switched off.

7.6 AUTOZERO

When setting bit 9, input word 0 before running a measuring sequence, an automatic Zero-point correction will be done. The average value (MAX+MIN)/2 will be taken as offset correction for all following measuring cycles.
The autozero-memory does not store its values without power supply.
After POWER ON these values are set to zero.

8. Measuring

If bit 8 of input word 0 is set, all 4 measuring inputs will be read continously until bit 8 is reset. The values MAX, MIN and Xq=(MAX+MIN)/2 will be calculated parallel. After measuring these values and the limit control bits are available after selecting the measuring channel number and setting the bit 15 of input word 0 ("Meßwert ANFORDERN").

Additional functions (All bits mean input word 0)

bit15	channel	bit 9	bit7	output
ON	1-4	OFF	ON	actual values
ON	1-4	ON	OFF	software release number
ON	0,9-31	ON	OFF	AUTOZERO values

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9. Connection schematics

Input measuring amplifier

5pin female, Fabr. Binder Series 680
Supply: 3V, 9,8kHz AC

Pin	description
1	Output Supply A
2	Ground
3	Signal input
4	torque-/force: Signal input; inductive: not used
5	Output Supply B

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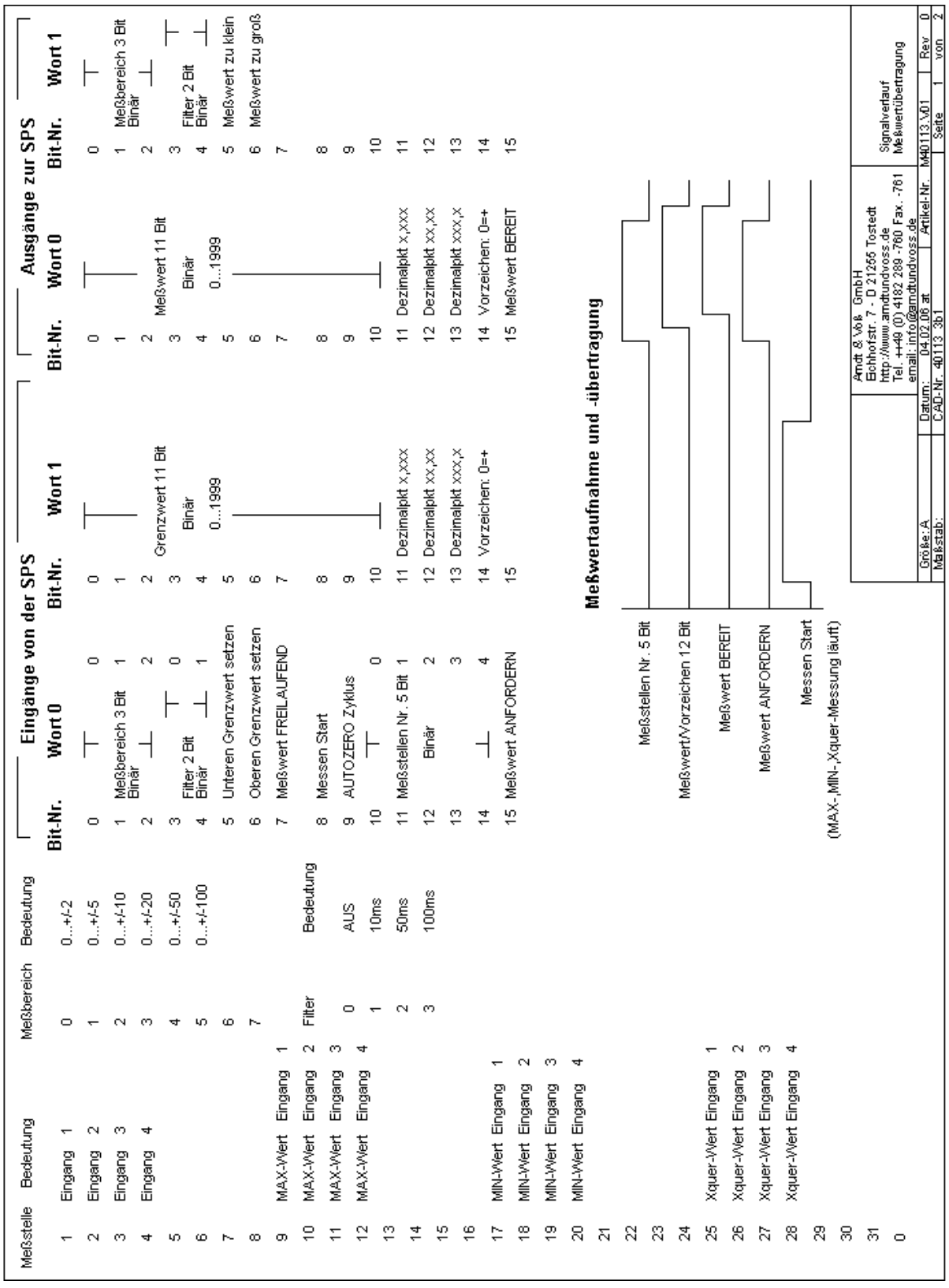

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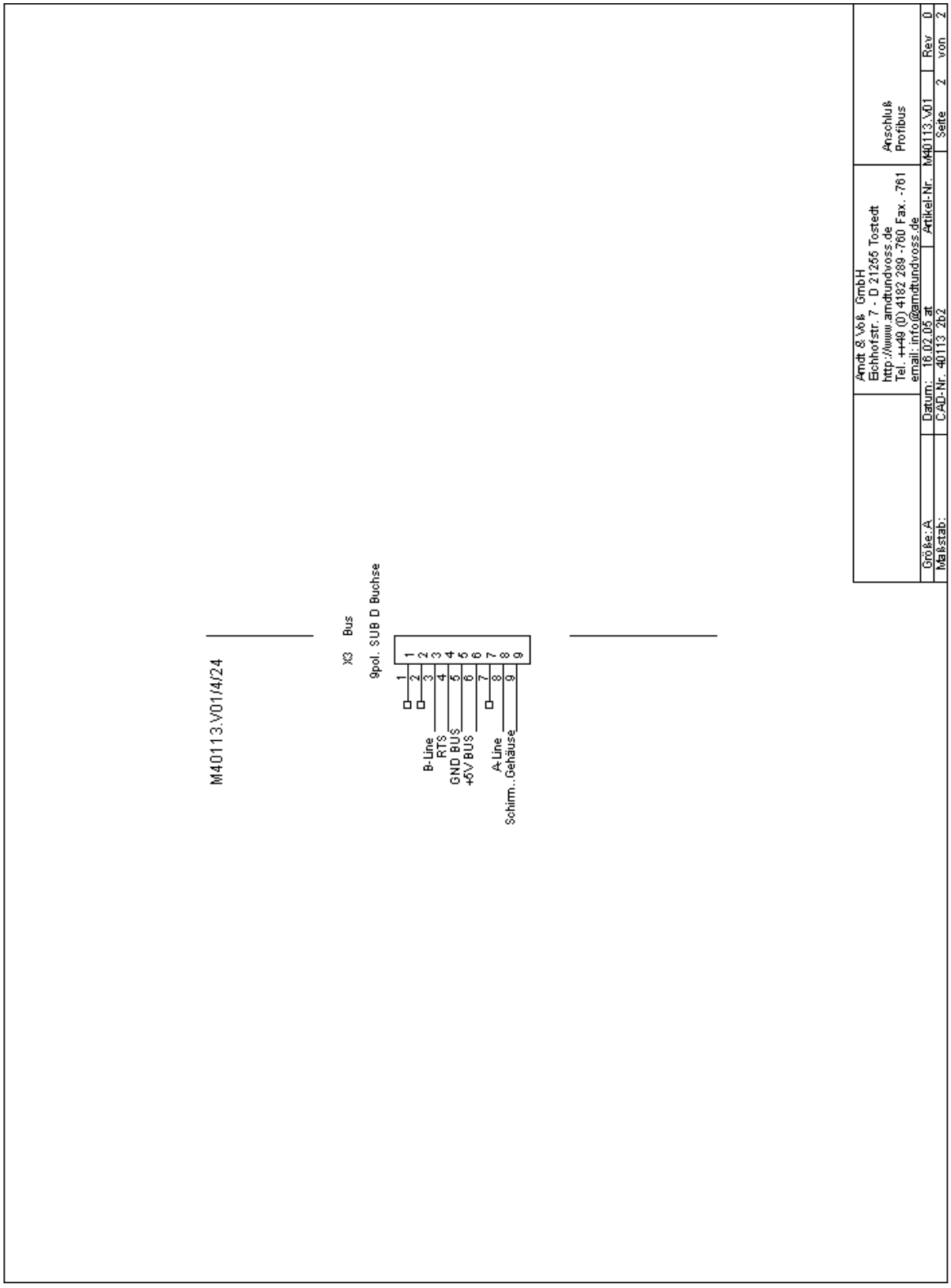

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