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# MPS-AN502

## Analogue Input

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Rugged display  
2 Channels  
4-20mA / 0-10V / 0-20mA



Customized unit. Yes:  No:

Notes:

# Introduction

This manual covers the standard version of MPS-AN502.  
(Any customization noted on the front page may override/add some functionality.)



## **Technical overview:**

### **Analogue Inputs:**

An1 16bit: 4-20mA

An2 16bit: 0-10V (Ch2 can be configured with jumpers to be used as 4-20mA)

20Hz sampling rate. 1000X hardware oversampling enabling very low signal-to-noise ratio.

### **Noise reduction**

The unit uses a combination of Dead band + Smoothing band + Weighted average

### **Decals:**

A standard sheet with self adhesive text decals is included in the package. (st, kg, ton, %, °C, pcs)

Decals can be attached on the front glass.

### **Measurement range:**

The measurement range is adjustable via the digital inputs (or via the on-board buttons)

### **Power supply:**

24V AC/DC. (non polarized).

If a Microbus 24VAC power supply is included it provides galvanic separation.

### **Working temperature:**

-30°C – +55°C. In very cold temperatures its recommended to let the unit be powered on for 15 minutes before use.

### **Serial Port:**

The serial output can be used to mirror the values on other displays.

### **IP-class:**

IP51

IP68 (sealed front, optional)

# Connections

If the display is sealed to IP68 class, A standard display with one analogue input channel will have preinstalled 3 cables.

## CABLE A:

### Power input

2 core cable.  
0,75mm2  
Colour code:

Wire colour:	Description:
White 0,75mm2	Input Power 24V ~/=
Brown 0,75mm2	Input Power 24V ~/=

## CABLE B:

### Analogue input

2 core + shield  
Colour: Black + Red

Wire colour:	Description:
Red	An1 (Analogue input 4-20mA)
Black	GND

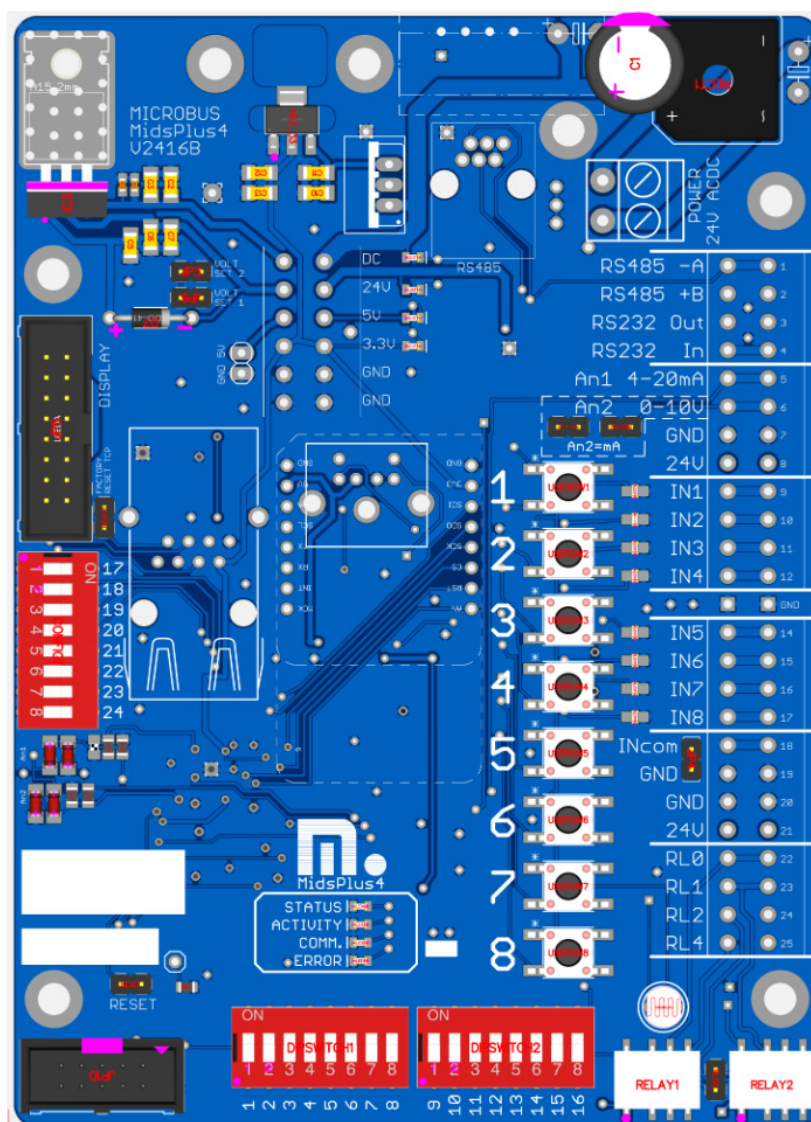
## CABLE C:

### 24V+Digital inputs

8 core cable.  
0,25mm2  
Colour code: DIN47100  
(unshielded)

Wire colour:	Description:	Normal Operation:	SetMode:
(White)	IN1	(Hold 2s) ---> SetMode	
Brown	IN2	AN1 Tara	RangeTop+
Green	IN3	AN1 Brutto	RangeTop-
Yellow	IN4	AN2 Tara	RangeLow+
Grey	IN5	AN2 Brutto	RangeLow-
Pink	IN6	Shift 1	Adj x10
Blue	IN7	Shift 2	Adj x100
(No wire)	IN8	Save Tara	Show Current signal value
Red	24V out		

Communication and power to LED digits.



Power 24VACDC

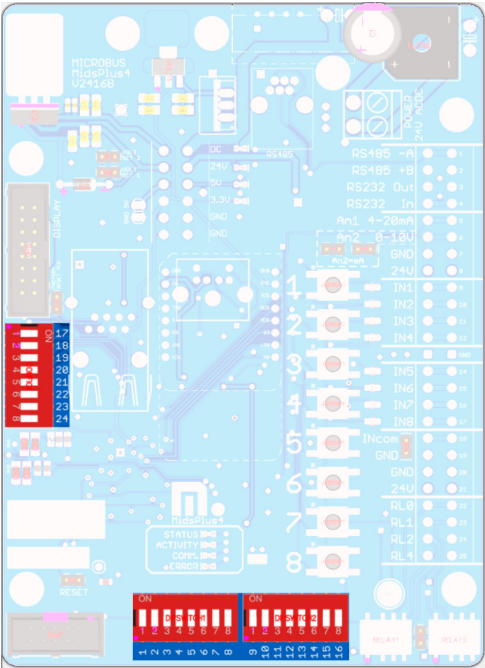
Analogue inputs (An1, An2)

Digital inputs (IN1-IN8)  
(= Buttons 1-8)

24V out and GND

# Configurations

DIP 17-24

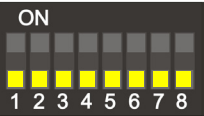
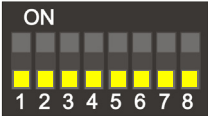


DIP 1-8    DIP 9-16

Please locate the three DIP blocks.  
 A total of 24 switches are numbered in 3 groups: 1-8, 9-16, 17-24  
 Changes will take effect immediately.

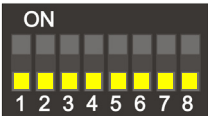
DIP 1-8

DIP 9-16



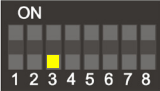

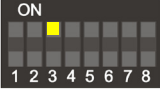

Default settings

DIP 17-24

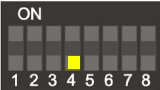

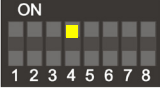



Settings for standard 4 digits display

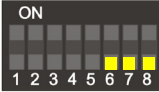

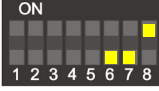

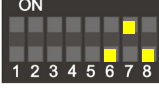

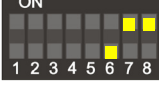

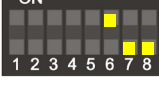

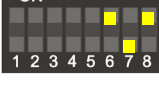

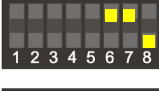

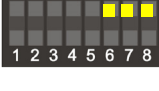

# Out of range errors

1-8	9-16	
		<p>On (Default)</p> <p>A) If the analogue signal is below 0,3mA: "Err" is shown on display.                      B) If the value exceeds the number of digits, the display will flash "9999..".</p>
		<p>Off.</p> <p>A) If the analogue signal is below 0,3mA: IGNORED                      B) If the value exceeds the number of digits, the display will flash the visible digits.</p>

# Show degree symbol. °

1-8	9-16	
		Disabled (Default)
		Enabled. (Both channels).

# Average window + Noise Reduction

1-8	9-16	
		0ms average + Low NR (default)
		0ms average + High NR
		250ms average + Low NR
		250ms average + Medium NR
		2s average + Low NR
		1min average + Low NR
		10min average + Low NR
		0ms average + No NR (DIRECT signal)

# Show Decimal point

1-8	9-16	An1
		" 1"
		" 0,1"
		" 0,01"
		"0,001"

1-8	9-16	An2
		" 1"
		" 0,1"
		" 0,01"
		"0,001"

# Measurement range

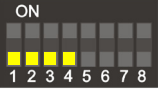
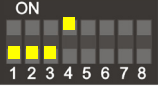
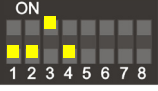
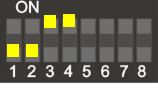
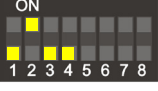
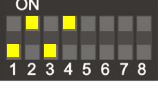
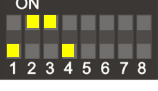
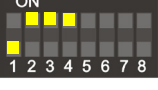
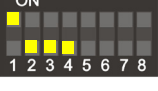

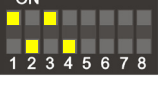
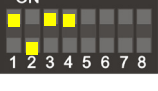
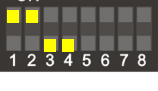
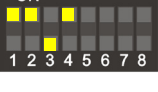
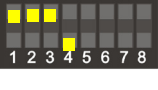
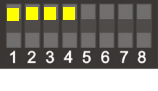
1-8	9-16	An1
		User setting (page 9)
		4mA = -50 20mA = +50
		4mA = 0 20mA = +50
		4mA = 400 20mA = 2000

1-8	9-16	An2
		User setting (page 9)
		0V / 0mA = -75 2V / 4mA = -50 10V / 20mA = +50
		0V / 0mA = -12,5 2V / 4mA = 0 10V / 20mA = +50
		0V / 0mA = 0 2V / 4mA = 400 10V / 20mA = 2000

# Digit layout

The number of physical digit boards installed in the unit for each channel.

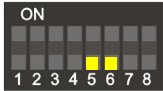
This is also necessary for the display to be able to visualize if the signal value exceeds the number of physical digits.

17-24	An1	An2
	1234	1234
	12345	12345
	123456	123456
	1234567	1234567
	12345678	12345678
	12345	1234
	1234	123
	123	123
	-	12
	-	123
	-	1234
	-	12345
	-	123456
	12	1234
	123	1234
	Custom	Custom

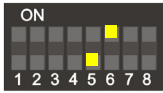
# Trailing fixed zeroes

17-24

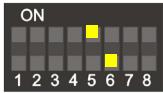
An1 & An2



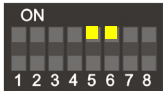
Default (No change)



...0



...00

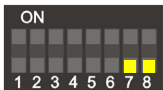


...000

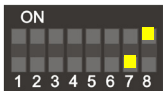
# Multiplicator

17-24

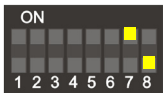
An1 & An2



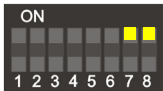
Value x1 (No change)



Value x 10



Value / 10



Value / 100



# Tara function

You can set and delete TARA via the buttons/digital inputs.

Use **IN2** for setting TARA on An1 (Display will show " T A R ")

Use **IN3** for deleting TARA on An1 (Display will show " D E L ")

Use **IN4** for setting TARA on An2 (Display will show " T A R ")

Use **IN5** for deleting TARA on An2 (Display will show " D E L ")

*TIPS: Use IN8 to save the current TARA offset to memory in case of power loss.*

*NOTE: The display will always load the saved TARA offsets at power on.*

## Adjust measurement range for An1

*NOTE: The Measurement range must be set to "User setting". (Page 6)*

### 1. Enter SetMode for AN1:

Press and hold **IN1** for 2s. --> The digits for AN1 will start flashing.

#### 1A. Adjust RangeMax (20mA)

Adjust the RangeMax value via the digital inputs:

**IN2**                 RangeMax +1

**IN3**                 RangeMax -1

#### 1B. Adjust RangeMin (4mA)

Adjust the RangeMin value via the digital inputs:

**IN4**                 RangeMin +1

**IN5**                 RangeMin -1

*TIP: For quicker adjusting,  
hold Shift1 or Shift2 while adjusting:*

Shift1	x10
Shift2	x100

### 2. Save and exit SetMode

Press and hold **IN1** for 2s

--> Display exits SetMode and shows " S A F E ", indicating the settings have been saved to memory.

#### NOTE:

If you are using 0-10V (or 0-20mA) please observe that the

**RangeMin** corresponds to the value given at **2V (or 4mA)**

You can use this formula:  $\text{RangeMin} = \text{Totalrange}/5 + 0V\text{value}$

Example scenario: 0-10V should be equal to 0kg to 400kg

Set RangeMax = 400

Set RangeMin = 80

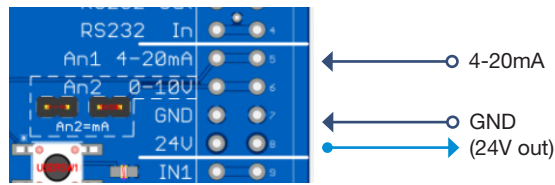
## Adjust measurement range for An2

### 1. Enter SetMode for An2

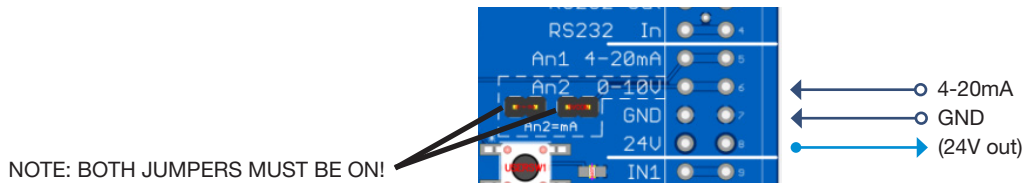
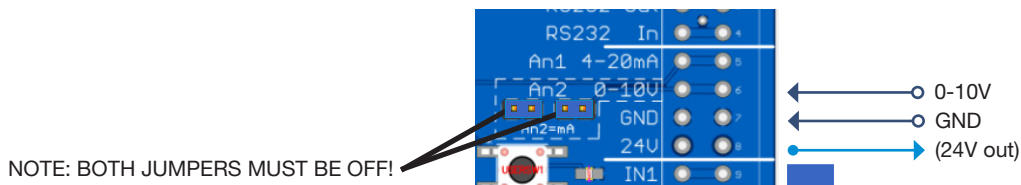
Press and hold **IN7** while pressing **IN1** for 2s. --> The digits for An2 will start flashing.

Follow the same procedure as An1.

# Analogue input (An1)

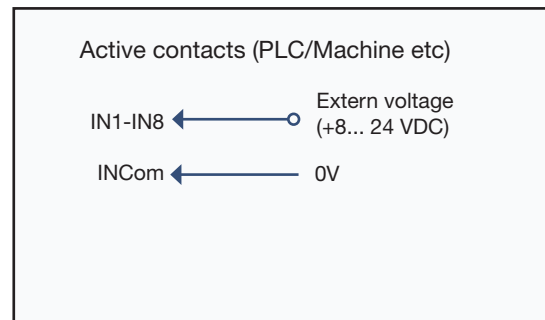
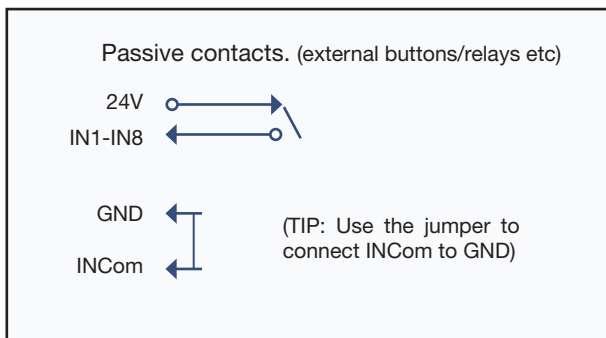


# Analogue input (An2)

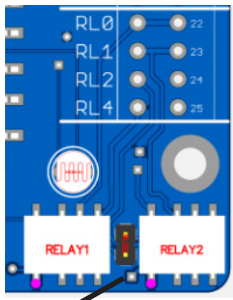


# Digital inputs (IN1 - IN8)

The corresponding LED indicator 1-8 will light up when the input is high or when the button is pressed.



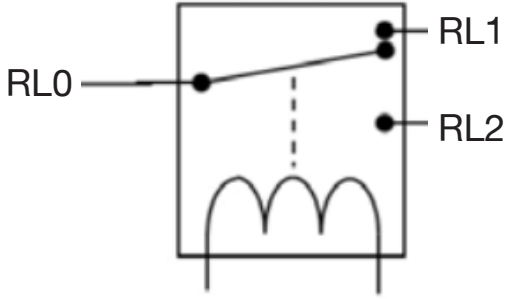
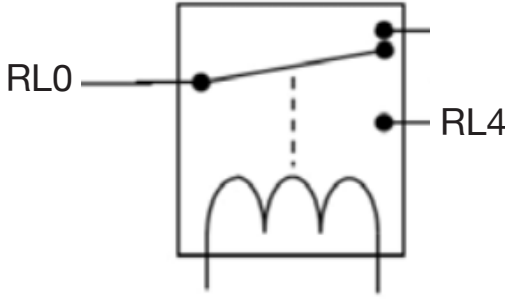
# Relay output (RL)



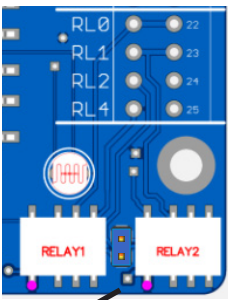
RL0  
RL1  
RL2  
RL4

RELAY1 RELAY2

Jumper = On

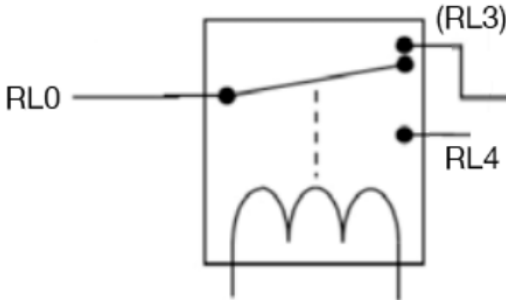
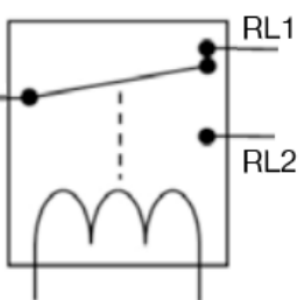
	pos1	pos2	pos3	pos4
<b>RL1</b>	1	0	1	0
<b>RL2</b>	0	1	0	1
<b>RL4</b>	0	0	1	1



RL0  
RL1  
RL2  
RL4

RELAY1 RELAY2

Jumper = Off

	pos1	pos2	pos3
<b>RL1</b>	1	0	0
<b>RL2</b>	0	1	0
<b>RL4</b>	0	0	1

# Accessories

## Outdoor sensor serie AGS54

Closed allround outdoor sensor with external sensory.  
To be mounted outdoor in the shadow, in freezing storages,  
etc

**MPS-AGS54-TRA1** Range: -50°C till +50°C

**MPS-AGS54-TRA2** Range: -10°C till +120°C

**MPS-AGS54-TRA3** Range: 0°C till +50°C

**MPS-AGS54-TRA4** Range: 0°C till +160°C

**MPS-KT-AF25-TRA5** Range: 0°C till +250°C



## Strap on sensors serie AF25

With heatplate for mount on pipes etc.

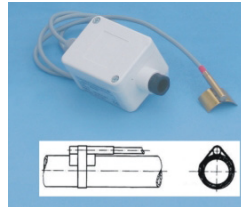
**MPS-AF25-TRA1** Range: -50°C till +50°C

**MPS-AF25-TRA2** Range: -10°C till +120°C

**MPS-AF25-TRA3** Range: 0°C till +50°C

**MPS-AF25-TRA4** Range: 0°C till +160°C

**MPS-AF25-TRA5** Range: 0°C till +250°C



## Cablesensors serie TF25

For measurement of gases or fluids.

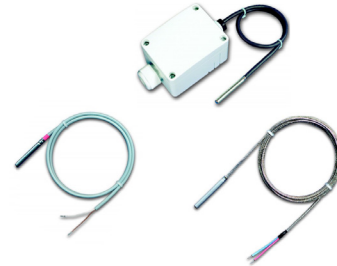
**MPS-TF25-TRA1** Range: -50°C till +50°C

**MPS-TF25-TRA2** Range: -10°C till +120°C

**MPS-TF25-TRA3** Range: 0°C till +50°C

**MPS-TF25-TRA4** Range: 0°C till +160°C

**MPS-TF25-TRA5** Range: 0°C till +250°C



## Wireless

**SR65** Range: -50°C till +50°C

## STC65-RS485

Wireless receiver



## Decals and logos.

Please notify when ordering  
if special logos or decals  
is needed.

## Logos & Decals

## Transformator 24VAC

**80-300-11**

For 230VAC.



## Buttonbox

**MPS-AN4P**

For manual setup of  
measurement range



## COM-displays

For connection as doublesided  
systems or for distance visu-  
alisations.



## Connection of slavedisplays.

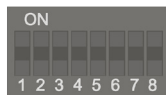
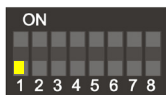
Both TCP/IP and RS485 up to 1000m can be used.

# HW CAL - Hardware Calibration

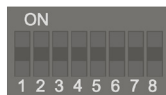
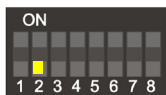
NOTE: The hardware is tested and calibrated individually before delivery and it is normally not necessary to redo this procedure.

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DIP1 are used for Factory hardware calibration An1.  
This DIP should normally always be in the OFF state.



DIP2 are used for Factory hardware calibration An2.  
This DIP should normally always be in the OFF state.

The hardware calibration procedure requires a dedicated analogue source to output the min, middle and max signal. ( 4mA, 12mA, 20mA. )

An2 can also be calibrated using voltage. Eg. 2V, 6V, 10V

1. To start calibration procedure for An1 switch on DIP1 --> The display field for An1 starts flashing.
2. Input Max and press IN 2
3. Input Middle and press IN 3
4. Input Min and press IN 4
5. Hold IN 1 for 2 to save to memory.
6. Switch off DIP1 to exit calibration mode.

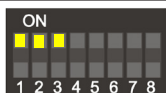
1. To start calibration procedure for An2 switch on DIP2 --> The display field for An2 starts flashing.
2. Input Max and press IN 2
3. Input Middle and press IN 3
4. Input Min and press IN 4
5. Hold IN 1 for 2 to save to memory.
6. Switch off DIP2 to exit calibration mode.

If the calibration values used is unreasonable, the display will show "CAL".  
If thats the case you can recalibrate the unit, or try a factory reset.

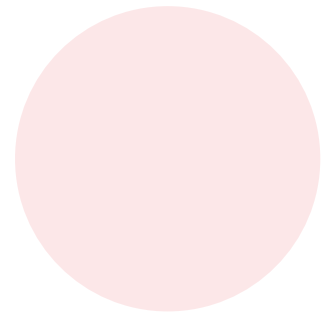
## Factory Reset

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If the device is restarted with DIP 1-3 ON the device will load default settings and load its factory calibration and then save it to flash.



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