



4-Channel Measuring Amplifier GSV-1A4

Manual

Updated:	12.09.2018
Version	gsv-1a4_en-v2.0
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4-channel strain gauge measuring amplifier GSV-1A4



- Input sensitivity: 2mV/V;
- 4mV/V, 2 mV/V, 1mV/V, 0.5mV/V configurable via jumpers
- Output signals $\pm 10V$ AND 12mA+8mA on 15 pin Sub-D
- Integrated half and quarter bridge completion for 350 ohm strain gauge
- Tare function individually via control cables and together via control cables and switches

Description

The measuring amplifier GSV-1A4 is a measuring amplifier with 4 independent channels for sensors with strain gauges such as force sensors, torque sensors, acceleration sensors or extension sensors.

This measuring amplifier is also suitable for connecting strain gauge full and half bridges from 87.5 ohm to 5000 ohm and strain gauge quarter bridges with 350 ohm.

The measuring amplifier GSV-1A4 is supplied with a plug-in 18V power supply and SUB-D mating plugs.

The voltage and current outputs are at the 15-pin Sub-D socket and one ground for each analogue output. Both outputs have been calibrated and can be used at the same time.

The sensor inputs, bridge completions and the inputs for automatic zero adjustment of the individual channels are at the 37-pin Sub-D socket.

The bridge completion resistance with 0.1% tolerance for 350 ohm strain gauge is maintained. The quarter or half bridge mode can be set by the customer at the 37-pin Sub-D socket (see wiring diagram for 37-pin Sub-D socket).

As an option, it is possible to use the 6-wire technology of GSV-1L. The use of 6-wire technology must be configured to the circuit board.

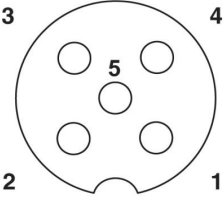
GSV-1A4 M12 socket variant

The GSV-1A4 is optionally equipped with round connectors for the sensor connection.

The mating plugs must be ordered separately or are a component of the sensor.



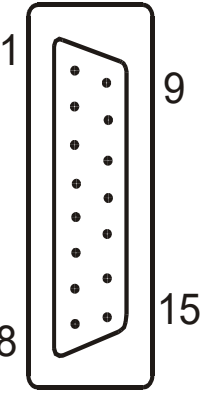
Wiring diagram for 5-pin socket M12x1, type 763

	5-pin	Description	Colour code for cable	
	2	-U _s negative bridge power supply	white	white
	1	+U _s positive bridge power supply	brown	brown
	3	+U _D positive differential input	green	blue
	4	-U _D negative differential input	yellow	black
View of socket side	5	AUX connected to quarter bridge 350 ohm (QB)	grey	grey

Six-wire technology is not possible for M12 socket variant.

In quarter bridge and half bridge mode, the internal half bridge completion must be activated via the solder bridge on the circuit board (also possible in the factory as a free order option).

Wiring diagram for output socket 15-pin Sub-D socket

Socket Spring contacts	GSV-1A4 assignment	15-pin SUB-D (PIN No.)			
	GNDio	1 black			
	Zero-point adjustment (joint)	8 purple			
	Supply voltage	9 gray			
		Channel 1	Channel 2	Channel 3	Channel 4
	Output voltage	2 brown	5 yellow	15 red-white	12 light green
	Output current	3 red	6 green	14 brown-white	11 pink
	Ground	4 orange	7 blue	13 black-white	10 white

The colors correspond to the core colors of the supplied 3 m cable with 15-pin connector SubD15.

Automatic Zero Adjustment

Automatic Zero-adjustment is operated via push button or via digital input. Advice: the GNDio PIN 1 for digital input with PIN 8 is isolated from analog Ground PIN4.

Analog grounds PIN4, PIN7, PIN13, PIN10 are connected.

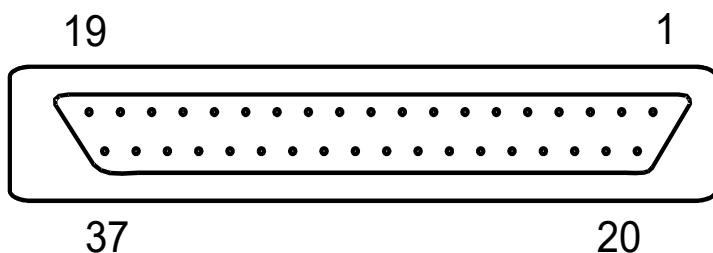
Connect GNDio (PIN1) permanently with Ground (PIN4) and connect Supply Voltage (PIN9) via Relais or button with PIN8 for remote-controlled zero adjustment.

GNDio for digital input	black, 1
Zero-adjustment input	purple, 8
Supply Voltage output	grey, 9

The colors correspond to the core colors of the supplied 3 m cable with 15-pin connector SubD15.

Wiring diagram for 37-pin Sub-D socket

37-pin Sub D, female



Terminal assignment 37 pin Sub D, female

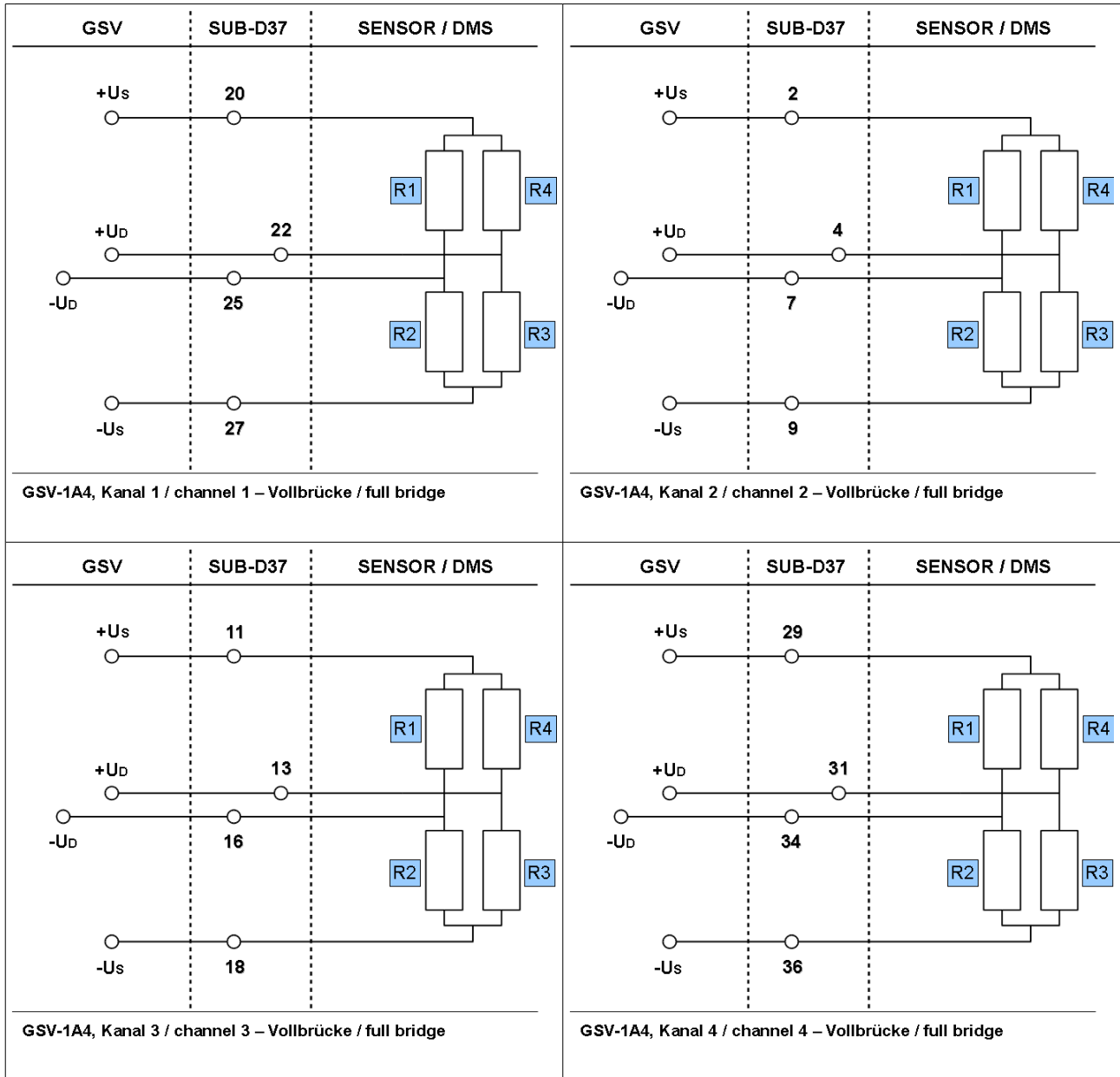
	GSV-1A4 assignment	37-pin SUB-D (PIN No.)			
GND	Ground/shield	1			
		Channel 1	Channel 2	Channel 3	Channel 4
+Us	positive sensor power supply	20	2	11	29
+UF	positive sensor input	21	3	12	30
+UD	positive differential input	22	4	13	31
QB350	quarter bridge completion 350Ω 1)	23	5	14	32
HB	half bridge completion 2)	24	6	15	33
-UD	negative differential input 2)	25	7	16	34
-UF	negative sensor input	26	8	17	35
-Us	negative sensor power supply	27	9	18	36
Tare	automatic zero-point adjustment	28	10	19	37

1) Half bridge completion must be activated at the same time.

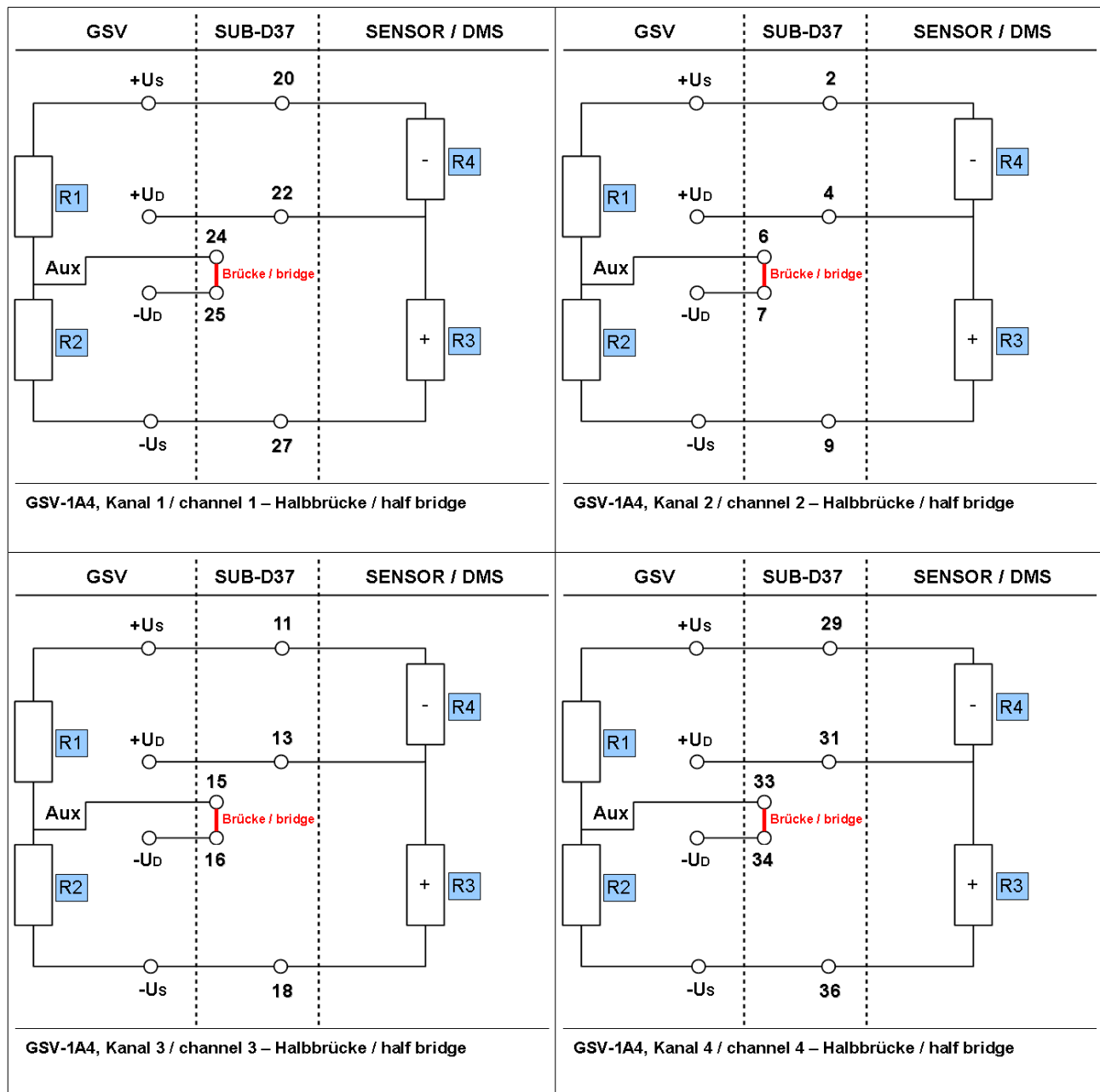
2) The negative differential input (25, 7,16, 34) must be connected to the corresponding half bridge completion (24, 6,15, 33).

The automatic zero point setting is done via push buttons or via the digital input. PIN 28 or 10 or 19 or 37. Note: The GNDio PINs for the automatic zero adjustment are separated from the analog ground. Permanently connect GNDio (PIN1) to the ground of the supply voltage and connect the supply voltage, but at least 3.5V with PIN 28 or 10 or 19 or 37 for remote zero setting.

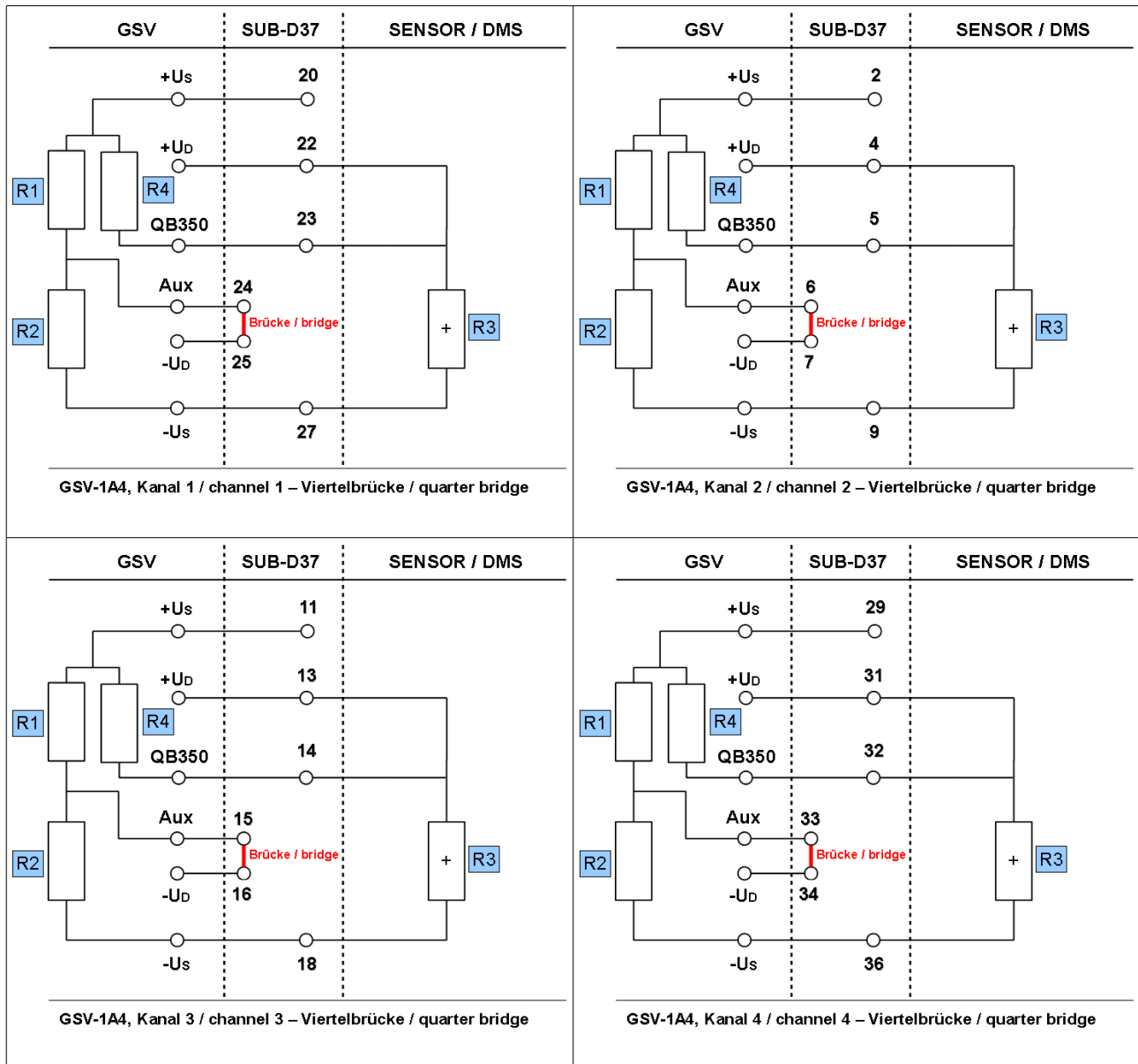
Wiring diagram of a full bridge to Sub-D-37, channel 1-4



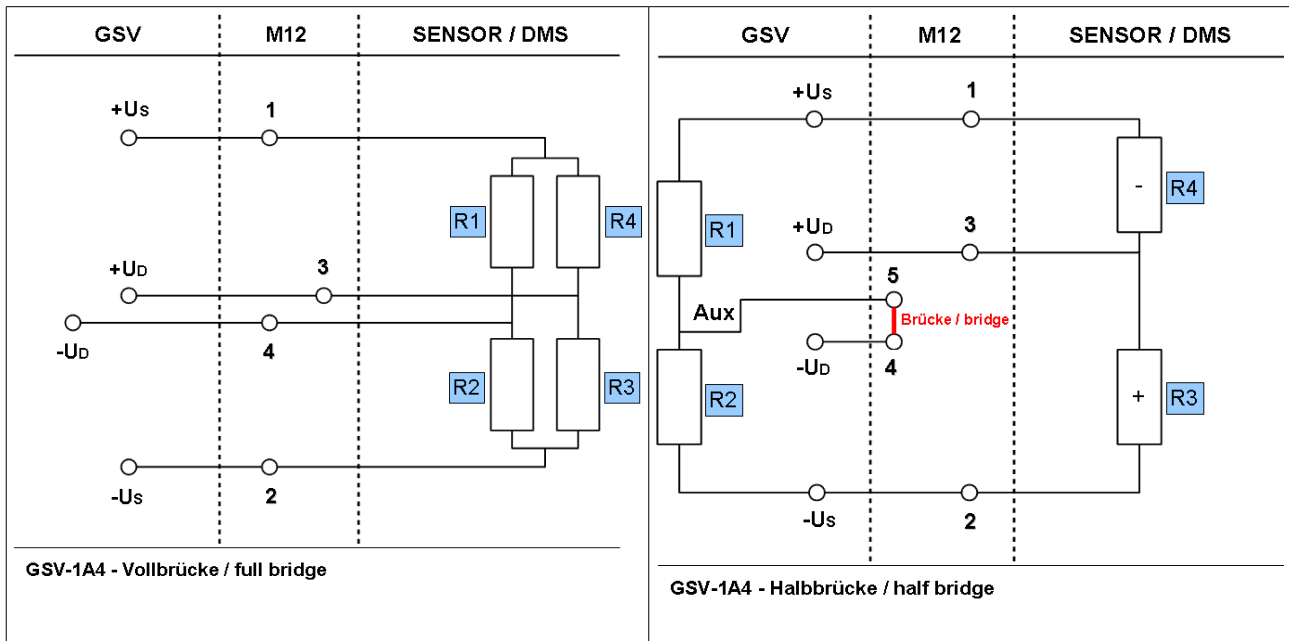
Wiring diagram of a half bridge to Sub-D-37, channel 1-4



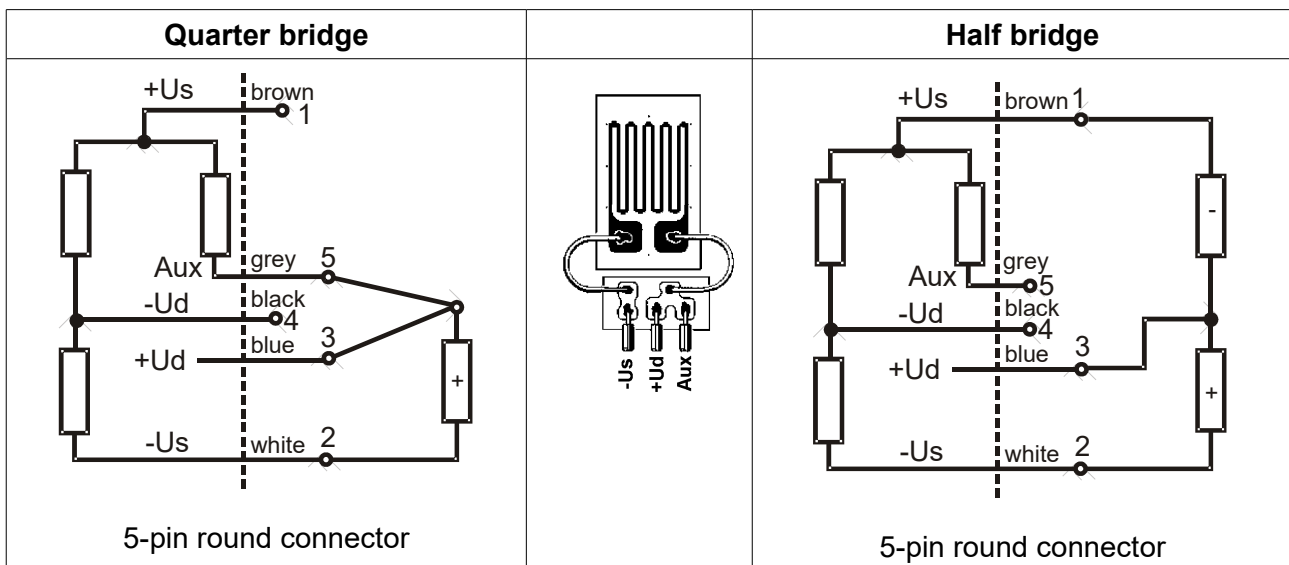
Wiring diagram of a quarter bridge to Sub-D-37, channel 1-4



Wiring diagram for a full bridge M12 variant

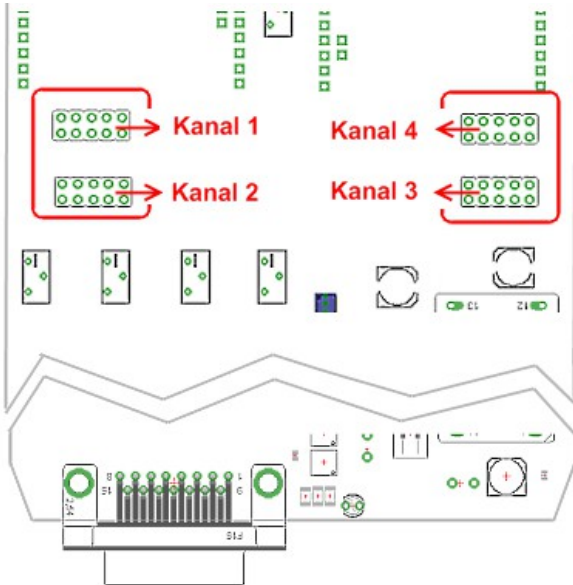
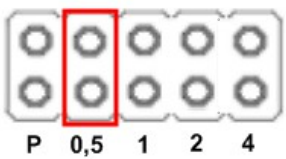
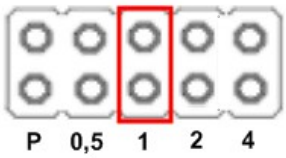
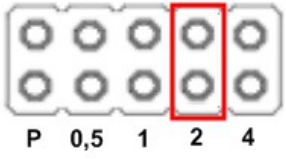
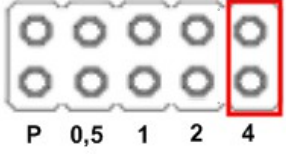


Wiring diagram for quarter bridges and half bridges M12 variant



Adjusting the sensitivity

The sensitivity of channels 1 to 4 can be adjusted. On the circuit board of the GSV-1A4, each channel has a jumper post field with 4 plug options in total.

	Sensitivity	Jumper position
	0.5 mV/V	 <p>P 0,5 1 2 4</p>
	1 mV/V	 <p>P 0,5 1 2 4</p>
	2 mV/V	 <p>P 0,5 1 2 4</p>
	4 mV/V	 <p>P 0,5 1 2 4</p>

Opening the device

1. All 4 screw covers and the fastening screws on each end cover should be removed.
2. The cover with the (37-pin Sub-D socket) must be loosened using the two hexagonal bolts.
3. The circuit board is unplugged from the side of the 15-pin Sub-D socket.
4. In the M12 socket version, the cover is pushed through the housing slightly slanted.

Technical data

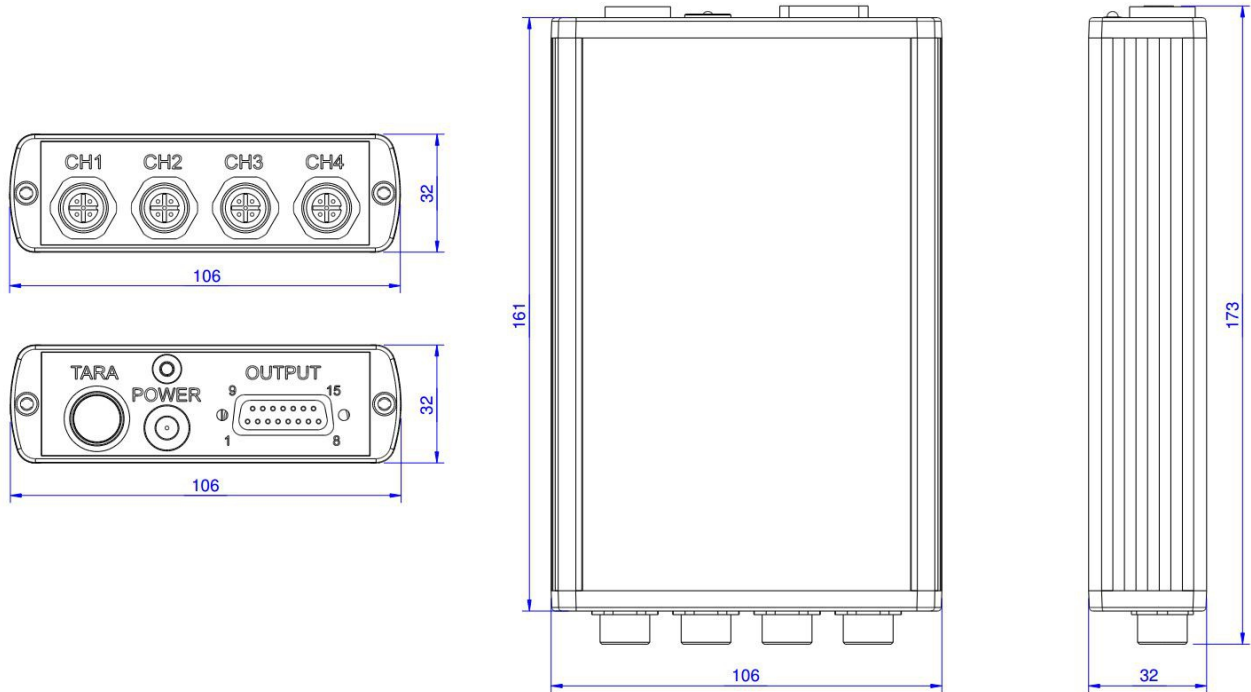
Version	GSV-1A4	Unit
Accuracy class	0.1	%
Measurement range configurable by jumper	± 2 ± 4 ; ± 1.0 ; ± 0.5	mV/V mV/V
Connectible full bridge	87..5000 Note limit!*	ohm
Bridge supply voltage	5	V
Input impedance	>20 / 300pF	Mohm
Linearity deviation	<0.02	% of unit
Influence of temperature on the zero point per 10K in relation to the measuring range (of unit)	< 0.2 type 0.05	% of unit % of unit
Influence of temperature on the measurement sensitivity per 10K referring to the measured value (RD)	< 0.1 type 0.05	% RD % RD
Output filter analogue output 3dB analogue cut-off frequency, Bessel, 2nd order	250	Hz
Resolution	>20000 parts	
Analogue output voltage		
Nominal range	± 10	V
Operating range	± 10.5	V
Output resistance	35	ohm
Analogue output current		
Nominal range	12 \pm 8 (alternatively 4-20)	mA
Operating range	12 \pm 8 (alternatively 4-20)	mA
Output resistance	35	ohm
Supply voltage		
Nominal range	12 ... 24	V
Operating range	10.5 ... 32	V
Power input max.	6	W
Zero adjustment		
Tolerance	<5, type <2.5	mV
Duration	<90	ms
Resolution on falling edge after at least 4ms high level (3.5V ... 30V or supply voltage)		
Memory	Last zero position	
Nominal temperature range	-10...+65	°C
Storage temperature range	-40...+85	°C

* Max. 2 channels can be operated with minimum sensor load of 87 ohm. The other 2 channels can be loaded with minimum 350 ohm. If the current outputs cannot be used, all

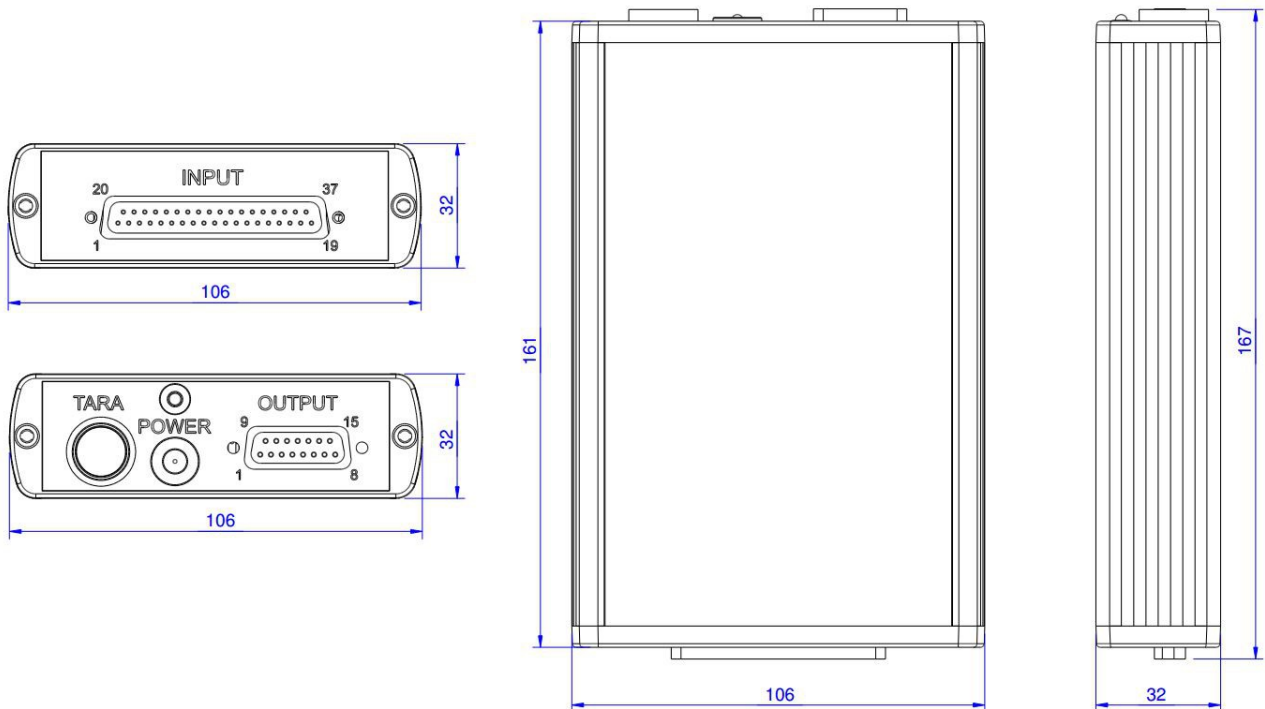


channels with a minimum sensor load of 120 ohm can be operated. This limit is necessary for reasons of thermal stability.

Dimensions GSV-1A4 M12



Dimensions GSV-1A4 SubD37



Changelog

Version	Datum	Änderungen
gsv-1a4_en.odt	26.08.15	Erste Version
gsv-1a4_en-v1.0	17.08.18	Formate Überarbeitet



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