



## 2 channel full bridge / incremental measuring amplifier A212U in desktop housing, with 3.2" TFT touch display and USB 2.0 interface, for static and dynamic measurements



**The strain gauge full bridge** input channel has a high common mode rejection ratio (CMRR). The low-noise 24-bit sigma-delta ( $\Sigma$ - $\Delta$ ) AD converter, with low offset and gain drift (5nV/°C, 1ppm/°C), is synchronised by a frequency-stable clock ( $\pm 0.2\%$ ), with low frequency tolerance ( $\pm 0.1\%$ )

In order to eliminate offset voltage errors, such as temperature-dependent thermoelectric voltages in soldered connections and plug contacts, charge injection through the conversion process, or EMI coupling, the  $\Sigma$ - $\Delta$  converter uses CHOPPING. The differential input to the modulator is alternately exchanged (CHOPPING) at the modulator output, and the measured value is inverted accordingly before the input to the digital filter. Both raw values (Ain+ - Ain-) + Voffset and -((Ain- - Ain+) + Voffset) are averaged, whereby the offset voltage is mathematically omitted. The resulting 4-fold (with 50Hz suppression), or 3 times (with 60Hz suppression) lower measuring rate is negligible for some applications.

**The incremental input** (quadrature encoder input TTL) can be used with linear or rotary sensors. It is also possible to connect a reverberation or reflection sensor. The power supply is provided at the 9pin DSUB.

In linear or rotary mode, in addition to the distance / number of revolutions, the speed / rotation speed and acceleration are also determined. In reflection mode, the speed and the state (Hall or light barrier active) are also measured.

### up to 8pcs. Output channels and limit value pairs selectable :

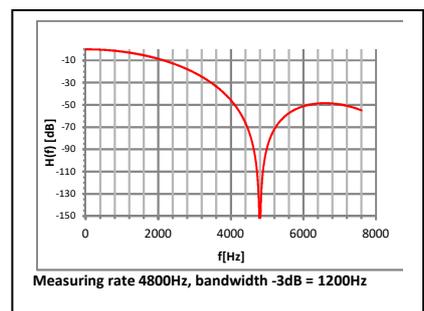
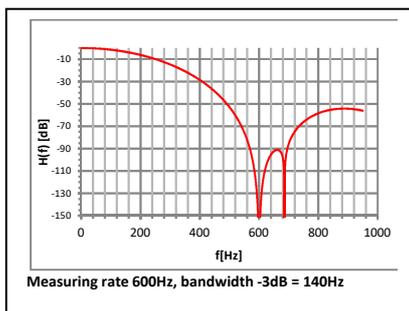
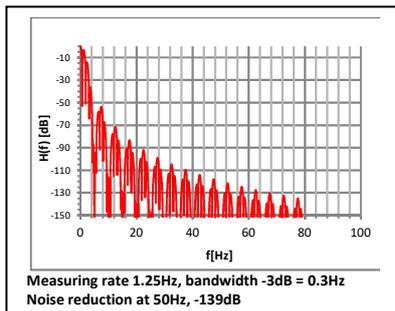
The measuring amplifier series uses 8pcs. Output channels that can be activated and assigned as required. These are output at the selected measuring rate between 0.00625...1200Hz. (Limit values in the measured value status). Selectable are :

CH1 [DMS - Channel]	CH2 [Incremental input]		
	in linear mode :	in rotary mode :	in reflection mode :
<ul style="list-style-type: none"> <li>✓ Gross, net, tare channel (user scaled)</li> <li>✓ Bridge detuning [mV/V]</li> <li>✓ Measured value [User scaled]</li> <li>✓ AD - Wandler Raw count</li> </ul>	<ul style="list-style-type: none"> <li>✓ Path</li> <li>✓ Speed [mm/s], or [mm/min]</li> <li>✓ Acceleration [mm/s<sup>2</sup>], oder [mm/min<sup>2</sup>]</li> <li>✓ Positive / negative peak value memory (user scaled)</li> <li>✓ Unit temperature in °C</li> </ul>	<ul style="list-style-type: none"> <li>✓ Number of revolutions</li> <li>✓ Rotational Speed [s<sup>-1</sup>], or [min<sup>-1</sup>]</li> <li>✓ Acceleration</li> <li>✓ Incremental counter reading</li> </ul>	<ul style="list-style-type: none"> <li>✓ Rotational Speed [min<sup>-1</sup>]</li> <li>✓ State</li> <li>-</li> <li>-</li> </ul>

### Multipoint acclimatisation and approximation of sensor - non-linearities :

The use of a multi-point user scaling (2 points to 11 points), or a 3rd degree polynomial function with 4 constants allows the approximation of a force-weight transducer, so that the relative deviation in [%] in the lower load range of the sensor is significantly improved. Nominal transducer values can be entered directly in [mV/V] in the setup programme.

### Measurement rate-dependent notch - filters : allow for high noise reduction and bandwidth.



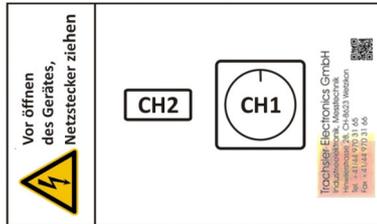
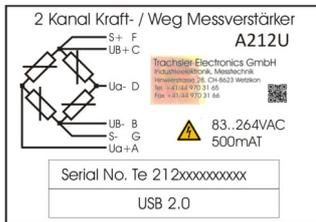
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## Sensor connection :

Strain gauge full bridges are connected via a shielded **MS3102A 7-pole plug**.  
 The connection is made in 6-wire technology, with shielding via the connector housing.



## Supply voltage :

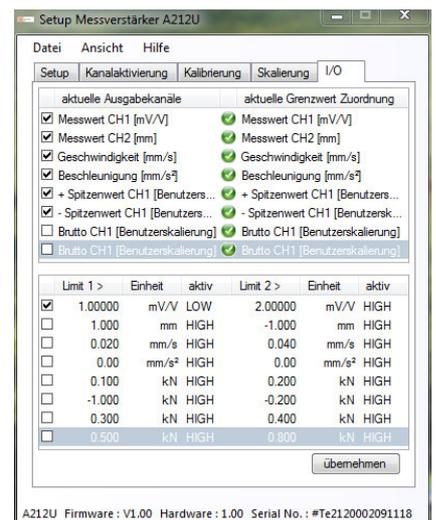
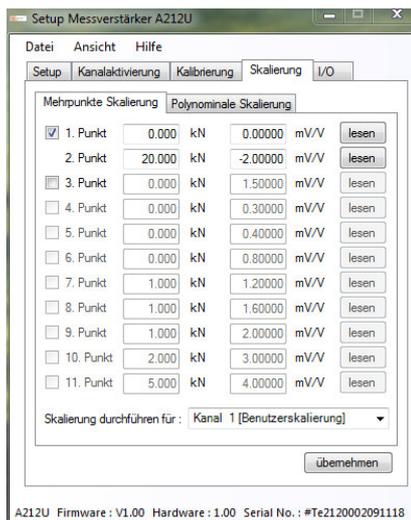
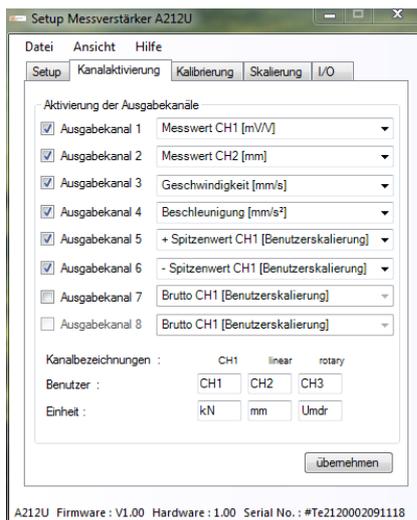
- 83...264VAC, 50/60Hz, via Euro - device plug, with integrated mains filter.

## Interface :

- USB 2.0, via USB A device socket

## Software :

The measuring amplifier is parameterised via a setup programme supplied (can be run under Windows 7 / 8.x and 10).



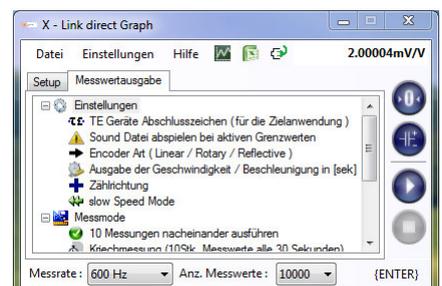
## Measurement data acquisition:

So that you can use your own test protocols and templates, the software **X – Link direct Graph** inserts the active measured values at the current cursor position.

To perform dynamic measurements, an X / t or X / Y graph is available in the software. The measurement data is saved in CSV format so that it can be imported into Excel and processed later.

In addition, there are other possibilities in X - Link direct Graph such as :

- Creep measurement (10 readings every 30 seconds)
- Play sound files with active limit values
- Perform measurements cyclically one after the other
- Slow Speed Mode or speed measurements with slow moving objects
- Easy switching of the measuring amplifier settings
- Operation via Hot - Keys





## Technical data :

		<b>A212U</b>
Accuracy class		0.02
Bridge supply voltage DC	V	5
Connectable sensors : CH1 DMS full bridge 6-wire technology Maximum cable length Sensor connection	Ohm  m	120...1000  20 MS 3102A 7pin sockets, shielded
CH2 TTL inkremental - Eingang Sensor Anschluss Encoder Versorgungsspannung		A, A\, B, B\, RM, RM\, RM = referenzmark, or home - signal DSUB 9pol female (Newall standard) 5VDC and supply voltage
Measuring range / bridge adjustment range [CH1]	mV/V	+/-7mV/V
AD converter type		Sigma-Delta ( $\Sigma\text{-}\Delta$ )
Internal resolution	bit	24
Measuring range [CH2] linear mode rotary mode reflective mode	Bit Bit Revs.	2 <sup>24</sup> 24 <sup>2</sup> 0 ... 20'000min <sup>-1</sup>
User - Scales / Channel	CH1 / CH2 CH1	2 ... 11 Points, or polynomial function of 3rd degree with 4 constants
Digitalfilter		Notch - Filter (depending on measuring frequency)
Internal measuring frequency range	Hz	4 channels synchronous 0.625 ... 4800
Scaled data transmission	Hz	Measured values /s per channel with 4pcs. enabled output channels 0.625 ... 1200
* Linearity deviation [CH1] :	%	<0.004
* Temperature influence per K [CH1] to zero on the measuring range	%	After 30 min operating time <0.005 <0.0025
Peak value memory		2 Stk. pro Ausgabekanal (Benutzerskaliert)
Limit values (in measured value status)		16 pcs. definable
Nominal temperature range	°C	0 ... +40
Supply voltage AC	V	83...264VAC, 50 / 60Hz
Display		3.2" TFT display with resistiv touch
Interface		USB 2.0
Protection class		IP 50
Dimensions [D * W * H]	mm	140 * 172 * 96
Weight	kg	≈1.5

\* 2mV/V calibrated, 50Hz filter, chop on, 2.5Hz measuring rate