



## 4 channel full bridge amplifier, for static and dynamic measurements, or for monitoring tasks with cloud connection.

- **A40W with WLAN Interface**
- **A40U with USB Interface**
- **A40WD – WLAN and Device Cloud connection**
- **A40UMRD – USB with 3G /4G LTE Modul, integrated Real Time Clock and Device Cloud connection**



The measuring amplifier has four identically constructed input channels, with high common mode rejection (CMRR). The low-noise 24-bit sigma-delta ( $\Sigma\Delta$ ) AD converter, with low offset and gain drift ( $5nV/^{\circ}C$ ,  $1ppm/^{\circ}C$ ), 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 ( $A_{in+} - A_{in-} + V_{offset}$  and  $-(A_{in-} - A_{in+} + V_{offset})$ ) 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.

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

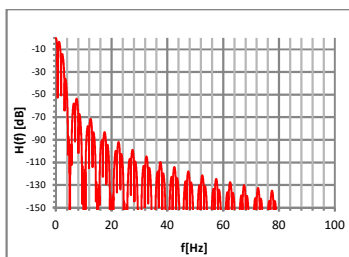
The measuring amplifier series uses 8pcs. Output channels that can be activated and assigned as required. These are output at the selected measuring rate between 0.00625...1200Hz. (Limit values in the measured value status). Selectable are :

- ✓ (CH1 ... CH4) Gross, net, tare channel (user scaled)
- ✓ (CH1 ... CH4) Bridge deviation [mV/V]
- ✓ (CH1 ... CH4) Positive / negative peak value memory (user scaled)
- ✓ Sum channel (user scaled, or the bridge deviation in [mV/V])
- ✓ Average channel (user scaled, or the bridge deviation in [mV/V])
- ✓ (CH1 ... CH4) AD converter raw count
- ✓ Unit temperature in  $^{\circ}C$

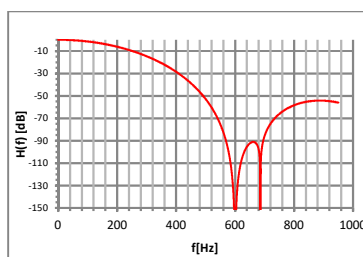
### Multipoint Acclation and Approximation of Sensor - Nonlinearities :

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.

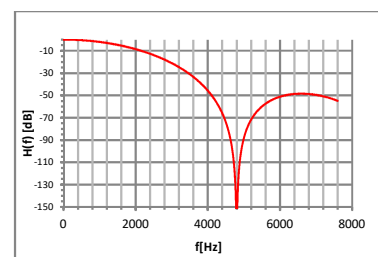
### Measurement rate-dependent notch - filters : allow for high noise reduction and bandwidth.



Measuring rate 1.25Hz, bandwidth -3dB = 0.3Hz  
 Noise reduction at 50Hz, -139dB



Measuring rate 600Hz, bandwidth -3dB = 140Hz



Measuring rate 4800Hz, bandwidth -3dB = 1200Hz



## Technical data :

Device Type		A40U	A40UMRD	A40W	A40WD
Interface		USB	USB / Mobile 4G Real Time Clock Cloud Connection	WLAN	WLAN Cloud Connection
Accuracy class		0.02			
Bridge supply voltage DC	V	5			
Connectable sensors : Strain Gauges full bridge 6-wire technology Maximum cable length Sensor connection	Ohm  m	120...1000  20 RJ12 6p6c, shielded			
Measuring / bridge adjustment range	mV/V	± 7mV/V			
AD converter type		Sigma-Delta ( $\Sigma$ - $\Delta$ )			
Internal resolution	bit	24			
User - scales per channel		2 ... 11 Points, or polynomial function of 3rd degree with 4 constants			
Filter Converter Digitalfilter		50Hz / 60Hz suppression selectable Notch - Filter (depending on measuring frequency)			
Internal measuring frequency range	Hz	2 channels synchronous 0.625 ... 4800			
Scaled data transmission	Hz	Measured values /s per channel with 4pcs. enabled output channels 0.625 ... 1200			
* Linearity deviation	%	<0.004			
* Temperature influence per K [CH1] to zero on the measuring range	%	After 15 min operating time <0.005 <0.0025			
Peak value memory		2 pcs. per output channel (user-scaled)			
Limit values (in measured value status)		2 pcs. per output channel can be defined			
Nominal temperature range	°C	0 ... +40			
Supply voltage DC Ripple max.		6.5 ... 13.5V ± 200mV			
Current consumption at 12VDC: switched on automatically switched off		< 180mA ---	180 ... 500mA < 500nA	250 ... 350mA ---	250 ... 350mA < 500nA
Interface Encryption		USB 2.0		IEEE 802.11b, g, und n open, WPA (TKIP), WPA2 (AES), WEP	
Cloud Connection		(3G / 4G LTE) SSL / Password protected		Password protected	
Protection class		IP 50			
Dimensions [D * W * H]	mm	80 * 64 * 30			
Weight	g	180			

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