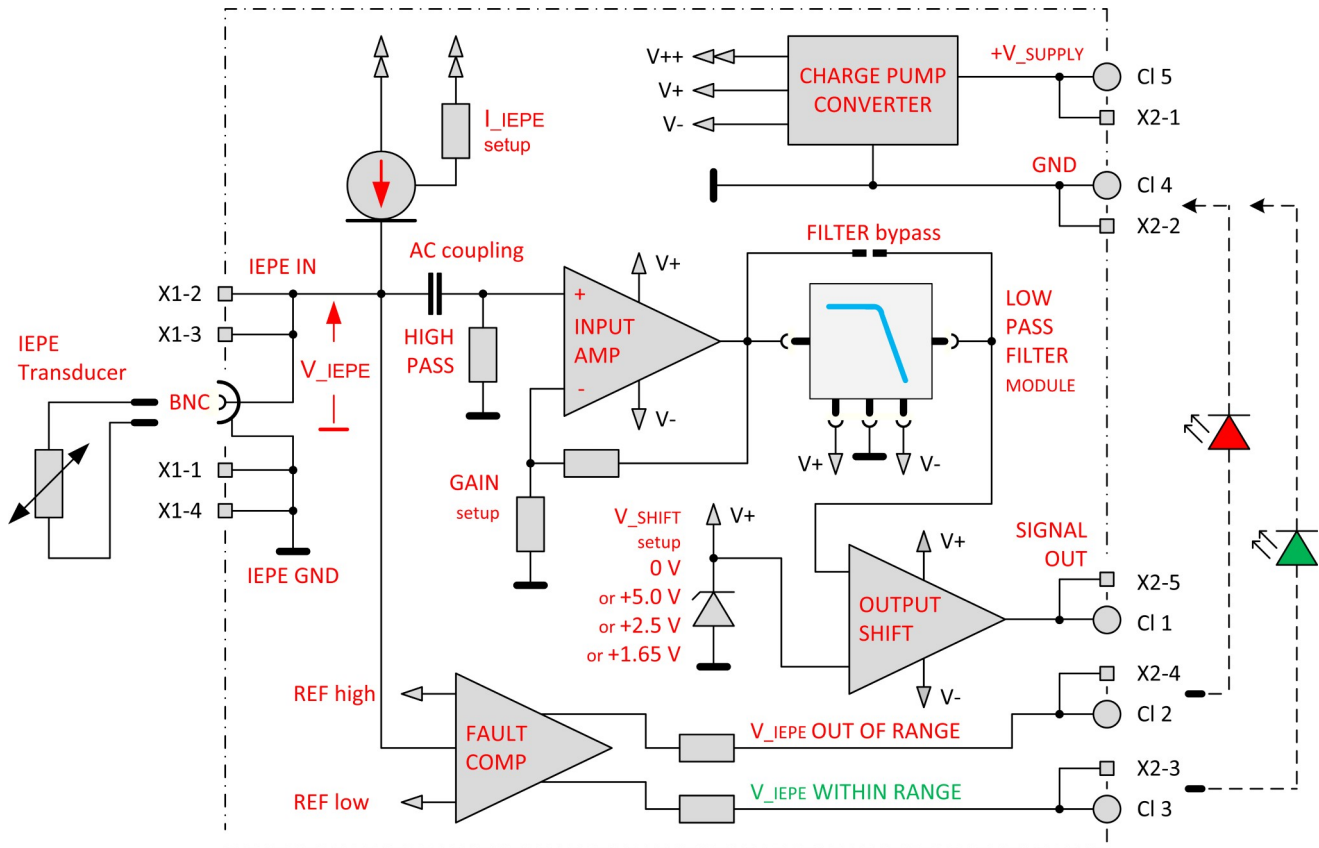


## IPE-FM6 - Configurable IEPE Signal conditioning amplifier

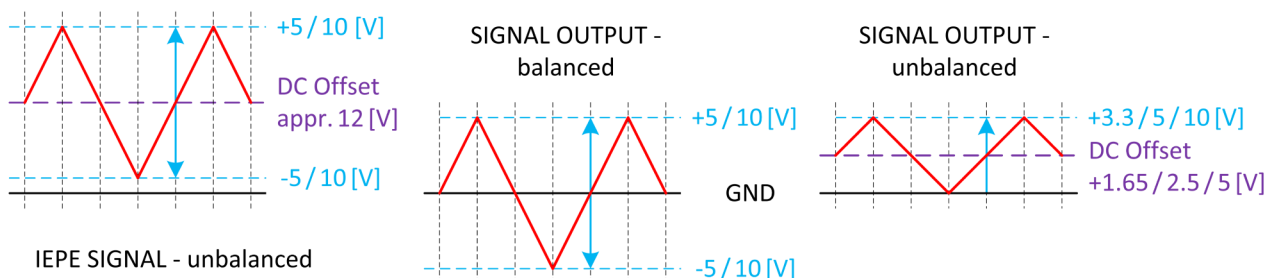
- Special features:**
- Application-specific configurable signal input to signal output range.
  - Unbalanced IEPE signals converted to balanced or unbalanced signal outputs with offset shift if required.
  - Clip-on active filter for bandwidth limitation (e.g. as an anti-aliasing filter).
  - IEPE input control: indication of errors in the IEPE input and also IEPE input OK



### Function diagram with the function groups:

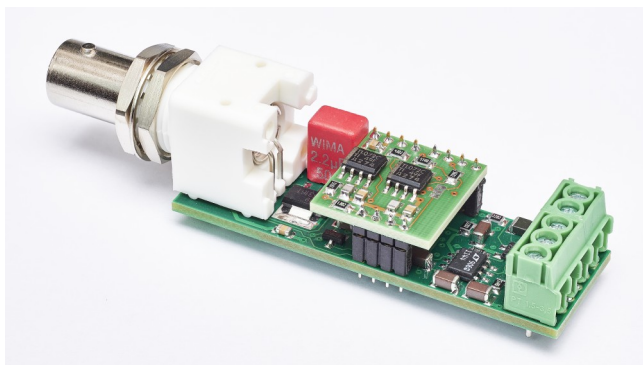
- Constant current source ( $I_{IEPE}$ ) to supply the IEPE sensor
- AC coupling (HIGH PASS) of the input amplifier (INPUT AMP)
- Active filter (LOW PASS FILTER plug-in module Piggyback) of your choice or filter bypass jumper
- Signal output shift (OUTPUT SHIFT) from balanced to unbalanced with output offset (of your choice)
- Error indicator for open or short-circuited signal input (red LED) and also signal OK detection (green LED)

### Example of conversion of the IEPE signal into the module output signal suitable for various analog to digital converters:

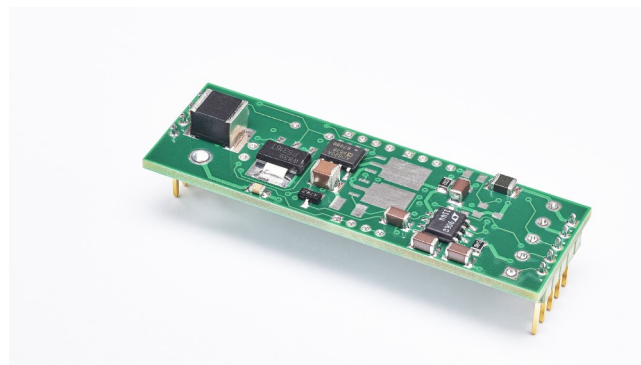


## IPE-FM6 - Configurable IEPE Signal conditioning amplifier

- Variants:
- Assembled with BNC socket and terminals or plug pins
  - Assembled for supply with 12 or 24 VDC
  - Assembled with amplification or attenuation of the signal
  - Assembled for balanced or unbalanced signal output



Version A - for front panel mounting  
Fig. Full configuration with filter piggyback



Version B - for mainboard mounting  
Fig. Partial assembly for 12 V, without filter

**Table 1: Configuration from IEPE SIGNAL INPUT to SIGNAL OUTPUT**

Order No.	IEPE Signal	Signal Output	Gain	Attenuation	Output Offset
IPE-FM6	[V <sub>peak-peak</sub> ] **	[V <sub>peak-peak</sub> ] ***	Factor	Factor	[VDC]
Balanced output signal					
_1-1_P_V *	±10	0 – ±10	1	1	0
_1-2_P_V	±10	0 – ±5	1	1 / 2	0
_1-3_P_V	±5	0 – ±10	2	1	0
_1-4_P_V	±2	0 – ±10	5	1	0
_1-5_P_V	±2	0 – ±5	2.5	1	0
_1-6_P_V	±1	0 – ±10	10	1	0
Unbalanced output signal					
_2-1_P_V	±10	0 – +10	1	1 / 2	+5.0
_2-2_P_V	±5	0 – +10	1	1	+5.0
_2-3_P_V	±10	0 – +5	1	1 / 4	+2.5
_2-4_P_V	±5	0 – +5	1	1 / 2	+2.5
_2-5_P_V	±10	0 – +3.3	1	200 / 33	+1.65
_2-6_P_V	±5	0 – +3.3	1	100 / 33	+1.65
_2-7_P_V	±2	0 – +3.3	1	40 / 33	+1.65
_2-8_P_V	±1	0 – +3.3	20 / 33	1	+1.65

\* \_P: supply voltage \_12 = 12VDC, \_24 = 24VDC

\_V: version \_A = front panel mounting (BNC, screw terminals), Version \_B = mainboard mounting (pins)

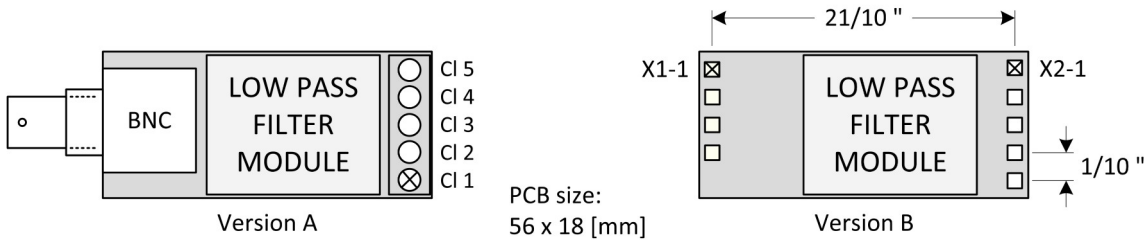
V<sub>peak-peak</sub> means

\*\* signal input: ±V<sub>IEPE-IN</sub>

\*\*\* signal output: ±V<sub>OUT</sub> or 0 to +V<sub>OUT</sub>

## IPE-FM6 - Configurable IEPE Signal conditioning amplifier

**Table 2: Connectors / screw terminals**



X1: IEPE input

X2: power supply, LED, signal output

X1 - 1	GND	X2 - 1	CI 5	Power supply 12 / 24VDC
X1 - 2	+ IEPE	X2 - 2	CI 4	GND
X1 - 3	+ IEPE	X2 - 3	CI 3	OK LED, 3mA low-current type (green)
X1 - 4	GND	X2 - 4	CI 2	Fault LED, 3mA low-current type (red)
		X2 - 5	CI 1	Signal output

**Table 3: Technical data**

Power supply:	12 VDC (12 to 15 max.), 24 VDC (22 to 26 max.) (please specify when ordering)
Current consumpt. @ I <sub>IEPE</sub> 4 mA:	approx. 45 mA without, approx. 55 mA with filter module
Signal input:	Power supply 12 V: ±5 VAC (±8 VAC max.) Power supply 15 or 24 VDC: ±10 VAC max.
IEPE current:	Default constant current: 4 mA (alternative please specify when ordering)
Bandwidth:	0.5 Hz – 25 kHz (-3 dB) without filters
Amplification:	See table 1 (please specify when ordering)
Signal output:	See table 1 (please specify when ordering)
Output shift:	See table 1 (please specify when ordering)
Fault indication:	<ul style="list-style-type: none"> <li>Input in the nominal range (green LED recommended)</li> <li>Input short-circuited or input open without IEPE sensor (red LED recommended)</li> </ul>
Versions:	<ul style="list-style-type: none"> <li>Version A with BNC and terminals for front panel mounting Depth behind front panel approx. 60mm, height including BNC 20 mm, width 18 mm</li> <li>Version B with pins for PCB assembly, height (PCB to PCB) 10.5 mm (please specify when ordering)</li> </ul>
Active filters:	<ul style="list-style-type: none"> <li>IPE-FM6.3_BU_4: Butterworth 4th order (= 24 dB/octave)</li> <li>IPE-FM6.3_BE_4: Bessel 4th order (= 24 dB/octave)</li> <li>IPE-FM6.3_BU_8: Butterworth 8th order (= 48 dB/octave)</li> <li>IPE-FM6.3_BE_8: Bessel 8th order (= 48 dB/octave)</li> </ul> (Type and cutoff frequency please specify when ordering)  The choice of filter characteristics (BU / BE) and order depends on the application: Time behavior of the measurement task and sampling rate of the digitization system: <ul style="list-style-type: none"> <li>Butterworth = steeper drop in the stopband compared to Bessel</li> <li>Bessel = constant group delay in the passband</li> <li>4th order = shallow drop in the stopband, therefore less effort and therefore cheaper than 8th order filters</li> <li>8th order = steeper drop in the stopband enables a better ratio cutoff frequency (-3 dB point) to sampling frequency (Nyquist criterion).</li> </ul>
Environment:	Storage temperature -40 to +100 degree C, operating temperature -10 to +85 degree C