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FEMTO®

LOCK-IN AMPLIFIERS

Easy-to-Use High-Performance Lock-In Amplifiers For Cost-Sensitive Applications

LIA-MV-150 Series Lock-In Amplifier Modules

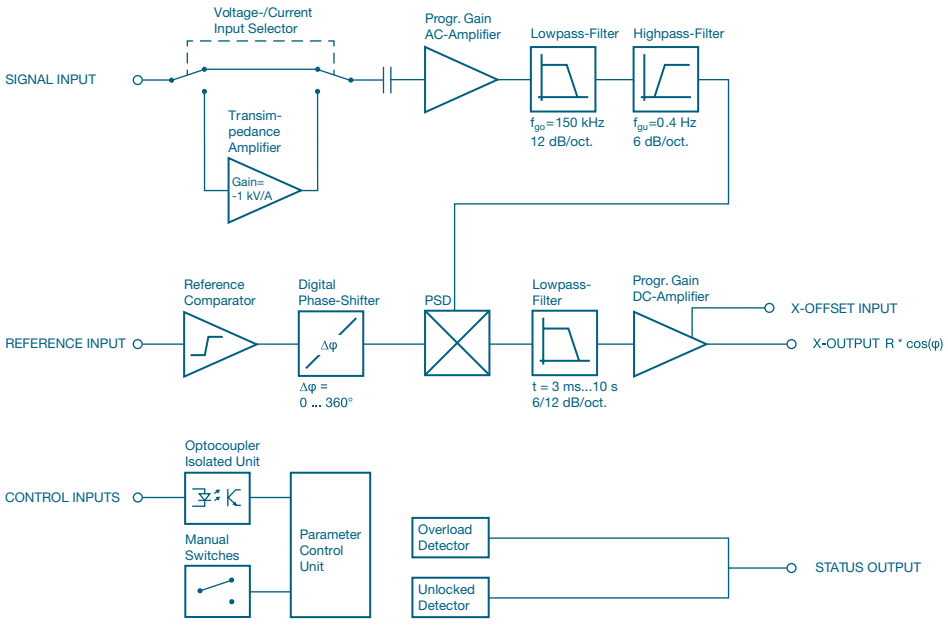
- Current and voltage input
- Working frequency up to 45 kHz
- Adjustable sensitivity, time constant and phase
- Local and remote control
- Compact and EMI-shielded case

Model	**LIA-MV-150-S** Standard	**LIA-MV-150-D** True-Differential Input
Voltage Input	BNC connector Single-ended Instrumentation amplifier Noise 12 nV/√Hz	Lemo® connector True-differential Instrumentation amplifier Noise 12 nV/√Hz
Current Input	BNC connector Transimpedance amplifier, gain 1 kV/A Noise 13 pA/√Hz	Lemo® connector Transimpedance amplifier, gain 1 kV/A Noise 13 pA/√Hz
Sensitivity (Full Scale)	Voltage: 3 µV to 100 mV, switchable in 1-3-10 steps Current: 3 nA to 100 µA, switchable in 1-3-10 steps	
Working Frequency	10 Hz - 45 kHz	
Reference Input	±100 mV to ±5 V, switchable to TTL	
Phase	Adjustable 0° - 360° (8-bit resolution), Temperature drift <0.01°/K	
Demodulator Dynamic Reserve	35 dB @ low drift setting, 55 dB @ high dynamic setting	
Time Constants	3 ms to 10 s, switchable in 1-3-10 steps, slope switchable 6 dB or 12 dB/octave	
Signal Filter	Highpass 0.4 Hz (6 dB/oct.), Lowpass 150 kHz (12 dB/oct.)	
Output	X = in phase, ±10 V full scale, short-circuit protected	
Digital Control	16 TTL, CMOS, opto-isolated 8-bit phase, 4-bit time constant, 4-bit sensitivity	
Power Supply	±15 V, 100 mA typ.	
Dimensions	170 x 60 x 30 mm (L x W x H), weight 370 g (0.82 lbs)	

Power supply via 3-pin Lemo® socket. A mating connector is provided with the device. Optional power supply PS-15 available. For further information please view the datasheet.

APPLICATIONS

Spectroscopy | Laser stabilization | Luminescence, fluorescence, phosphorescence measurements | Light scattering measurements | Opto-electronical quality control | Integration in industrial and scientific measurement systems | OEM systems



Block diagram LIA-MVD-150

LIA-MV(D)-200 Series Lock-In Amplifiers

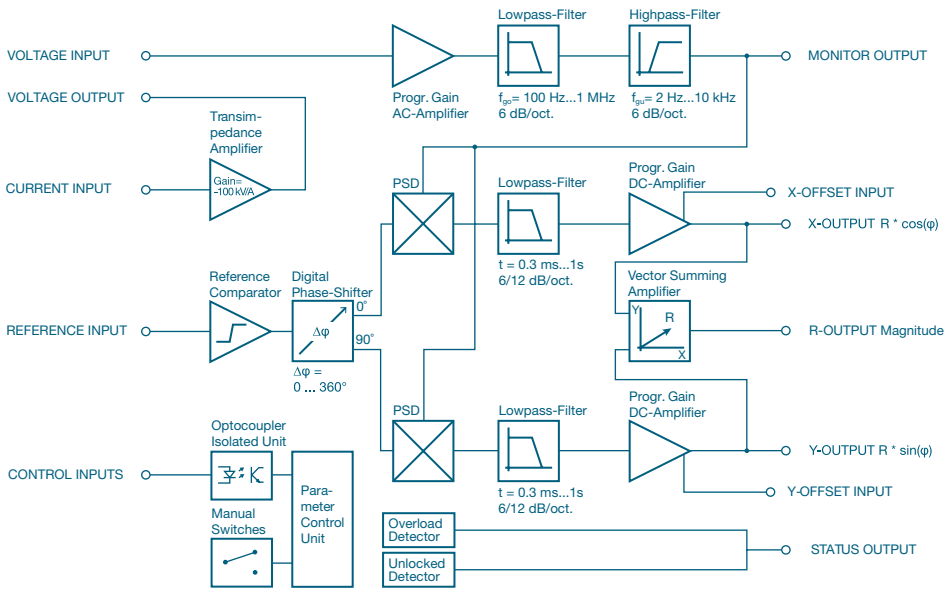
- Single and dual phase
- Rugged aluminum housing
- BNC connectors for input and output signals
- Working frequency 5 Hz up to 120 kHz
- Phase shifter 0° - 360°
- Current and voltage input
- Optional reference oscillator module SOM-1 available

Model	LIA-MV-200-L Single Phase	LIA-MV-200-H Single Phase	LIA-MVD-200-L Dual Phase	LIA-MVD-200-H Dual Phase
Working Frequency	5 Hz - 10 kHz	50 Hz - 120 kHz	5 Hz - 10 kHz	50 Hz - 120 kHz
Time Constants	3 ms - 10 s 6 or 12 dB/oct.	300 µs - 1 s 6 or 12 dB/oct.	3 ms - 10 s 6 or 12 dB/oct.	300 µs - 1 s 6 or 12 dB/oct.
Adjustable Signal Filter (6 dB/oct.)	Highpass 0.2 Hz - 1 kHz Lowpass 100 Hz - 1 MHz	Highpass 2 Hz - 10 kHz Lowpass 100 Hz - 1 MHz	Highpass 0.2 Hz - 1 kHz Lowpass 100 Hz - 1 MHz	Highpass 2 Hz - 10 kHz Lowpass 100 Hz - 1 MHz
Outputs (BNC)	X = in phase, ±10 V full scale, short-circuit protected, Signal monitor output		X = in phase, Y = quadrature, R = magnitude, ±10 V full scale, short-circuit protected, Signal monitor output	
Sensitivity (Full Scale)	Voltage: 3 µV - 1 V in 1-3-10 steps Current: 30 pA - 10 µA in 1-3-10 steps			
Voltage Input (BNC)	Instrumentation amplifier, noise 12 nV/√Hz			
Current Input (BNC)	Transimpedance amplifier, gain 100 kV/A, noise 0.4 pA/√Hz			
Reference Input (BNC)	±100 mV to ±5 V, switchable to TTL			
Phase	Adjustable 0° - 360°; resolution: 8-bit @ f ≤ 60 kHz, 7-bit @ f > 60 kHz Temperature drift <0.01°/K			
Max. Dyn. Reserve	80 dB			
Digital Control	16 TTL/CMOS inputs: 8-bit phase, 4-bit time constant, 4-bit sensitivity			
Power Supply	±15 V, +120 mA / –60 mA			
Dimensions	223 x 105 x 65 mm (L x W x H), weight 1,000 g (2.2 lbs)			

The optional Reference Oscillator SOM-1 can be connected by an extension connector inside the module. Power supply via 3-pin Lemo® socket. A mating connector is provided with the device. Optional power supply PS-15 available. For further information please view the datasheet.

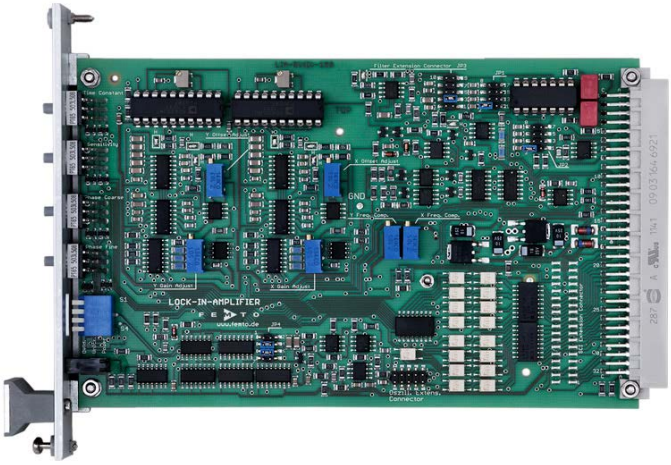
APPLICATIONS

Spectroscopy | Luminescence, fluorescence, phosphorescence measurements | Light scattering measurements | Laser stabilization | Opto-electronical quality control | Integration into industrial and scientific measurement-systems | Alternative to expensive desktop lock-in amplifiers for general lab use



Block diagram LIA-MVD-200-H

LIA-BV(D)-150 Series Single-Board Lock-In Amplifiers



- Single and dual phase 19" boards
- Working frequency 5 Hz up to 120 kHz
- Phase shifter 0° - 360°
- Current and voltage input
- Parameter control by local switches and opto-isolated digital inputs
- Mounting kit MK-LIA-2 and reference oscillator module SOM-1 available

Model	LIA-BV-150-L Single Phase	LIA-BV-150-H Single Phase	LIA-BVD-150-L Dual Phase	LIA-BVD-150-H Dual Phase
Working Frequency	5 Hz - 10 kHz	50 Hz - 120 kHz	5 Hz - 10 kHz	50 Hz - 120 kHz
Time Constants	3 ms - 10 s 6 or 12 dB/oct.	300 µs - 1 s 6 or 12 dB/oct.	3 ms - 10 s 6 or 12 dB/oct.	300 µs - 1 s 6 or 12 dB/oct.
Signal Filter	Highpass 0.2 Hz - 1 kHz Lowpass 100 Hz - 1 MHz	Highpass 2 Hz - 10 kHz lowpass 100 Hz - 1 MHz	Highpass 0.2 Hz - 1 kHz Lowpass 100 Hz - 1 MHz	Highpass 2 Hz - 10 kHz lowpass 100 Hz - 1 MHz
Outputs	X = in phase, ±10 V full scale, short-circuit protected, Signal monitor output		X = in phase, Y = quadrature, R = magnitude ±10 V full scale, short-circuit protected, Signal monitor output	
Sensitivity (Full Scale)	Voltage: 3 µV - 1 V in 1-3-10 steps Current: 30 pA - 10 µA in 1-3-10 steps			
Voltage Input	True-differential instrumentation amplifier, noise 12 nV/√Hz			
Current Input	Transimpedance amplifier, gain 100 kV/A, noise 0.4 pA/√Hz			
Reference Input	±100 mV to ±5 V, switchable to TTL			
Phase	Adjustable 0° - 360°; resolution: 8-bit @ f ≤ 60 kHz, 7-bit @ f > 60 kHz Temperature drift <0.01°/K			
Max. Dyn. Reserve	80 dB			
Digital Control	16 TTL/CMOS inputs: 8-bit phase, 4-bit time constant, 4-bit sensitivity			
Power Supply	±15 V, +120 mA / –60 mA			
Dimensions	160 x 100 x 20 mm (L x W x H), weight 100 g (0.22 lbs)			

APPLICATIONS

Spectroscopy | Luminescence, fluorescence, phosphorescence measurements | Light scattering measurements | Opto-electronical quality control | Integration in industrial and scientific measurement-systems | Multichannel systems at an attractive price