# MotionFlex

## High-Performance Laser Doppler Vibrometer

### Product Introduction

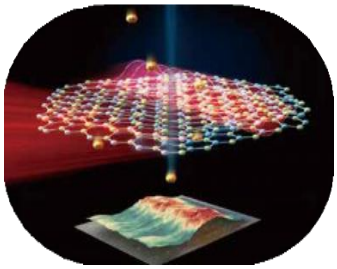
MotionFlex is a micro high-performance laser Doppler vibrometer with a built-in data processing unit and computing unit. It can output both digital and analog results simultaneously, with a maximum data sampling rate of 50Msps. MotionFlex comes with a complete lens system, allowing users to replace lenses according to specific situations. All these lenses support manual focusing for easy adjustment to the appropriate measurement distance. Thanks to its patented algorithms and excellent quality control, MotionFlex also exhibits outstanding static measurement characteristics and can be used as a large-range displacement sensor.

MotionFlex has specifically optimized the noise performance in the high-frequency band for high-frequency testing. It uses a low-noise, high-performance, high-power laser and supports testing up to 100 meters away. In the high-frequency band, it has a better noise floor than MotionGo. It can measure vibration signals below the nanometer level in the time domain (fixed bandwidth) and accurately test vibration signals from DC to 25MHz in the frequency domain. In summary, MotionFlex can be widely used in aerospace material testing, structural mechanics testing, semiconductor MEMS testing, ultrasonic material testing, new energy processing, and other fields.

### Product Features

- 1310nm measurement light + 655nm red light indication
- Replaceable and adjustable focus lenses, suitable for measurements from 0.2 to 100 meters
- Maximum 50M sampling rate
- Specially optimized high-frequency testing capabilities
- Intelligent sensor with built-in signal operation and processing capabilities
- Simultaneous digital and analog signal output
- Based on highly integrated silicon photonic chips
- Supports multi-channel synchronous measurement and large-scale networking
- Provides user SDK for secondary development
- Supports autofocus

## Application Fields



Ultrasonic acousto-optic effect testing

High-frequency ultrasonic material testing

Medical ultrasonic testing

Long-distance vibration testing

## Performance Parameters

| MotionFlex | | | |
|---|---|---|---|
| Parameter (Unit) | Value | Parameter (Unit) | Value |
| Measurement Distance (m) | 0.025 - 100 | Measurement Frequency Range (MHz) | DC - 25 |
| Displacement Noise Density (pm/√Hz) | Minimum 0.02 | Velocity Range (m/s) | Maximum 30 |
| Displacement Resolution (nm) | 0.001 | Displacement Repeatability (nm) (>1kHz) | Minimum 0.01 |
| Laser (nm) | 1310 measurement light, 655 indication light | Measurement Laser Output Power (mW) | <5 |
| Measurement Laser Safety Class | CLASS I | Indication Laser Output Power | Adjustable |
| Ambient Light Interference (lux) | >60000 | Protection Class | IP64 |
| Operating Temperature Range (° C) | 0 - 50 | Housing Material | Aluminum alloy |
| Supply Voltage (V) | DC12 | Power Consumption (W) | <6.5 |
| Digital Output Signal Interface | Ethernet 1000BaseT | Signal Generator Function | Supported |
| Signal Generator Rate (DA)* | <5M sps | Analog Output Signal Level (V) | +/-5 |
| Analog Peripheral Input | ICP/IEPE | Analog Peripheral AD Conversion | 24bit, <1M sps |
| Trigger Signal | Rising Edge | Network Synchronization Signal | Square Wave (1Hz) |
| Trigger/Synchronization Interface Selection | Input and Output | Synchronization Accuracy (μs) | 0.02 |
| Dimensions (mm) (Length × Width × Height) | 124.9x62x32 | Weight (g) | 285 |
| Dimensions (with Heat Sink Adapter Plate) (mm) (Length × Width × Height) | 124.9x65.5x72 | Weight (with Heat Sink Adapter Plate) (g) | 590 |

*Can reach 16M sps

## Vibrometer Selection Table

| Model | Lens | Additional functions | Maximum vibration amplitude | Displacement repeatability | Laser | Working distance |
|---|---|---|---|---|---|---|
| MF-SW-TR-F | Optional | Standard | 15 m/s | 0.1 nm | Standard | Interchangeable lens |
| MF-SW-TR-C | Optional | Standard | 30 m/s | 0.01 nm | High power and low noise | Interchangeable lens Optimized for laser ultrasonics |
| MF-AF-TR-C | Automatic zoom | Standard, | 30 m/s | 0.01 nm | High power and low noise | 0.18~10m |
| MF-AF-TR-M | Automatic zoom | Supports signal generator function Supports ICP/IEPE peripherals | 30 m/s | 0.01 nm | High power and low noise | 0.18~10m |

## Product Accessories

MotionFlex is equipped with two types of heat sink adapter plates :

When MotionFlex is placed vertically, a horizontally toothed heat sink adapter plate can be selected.

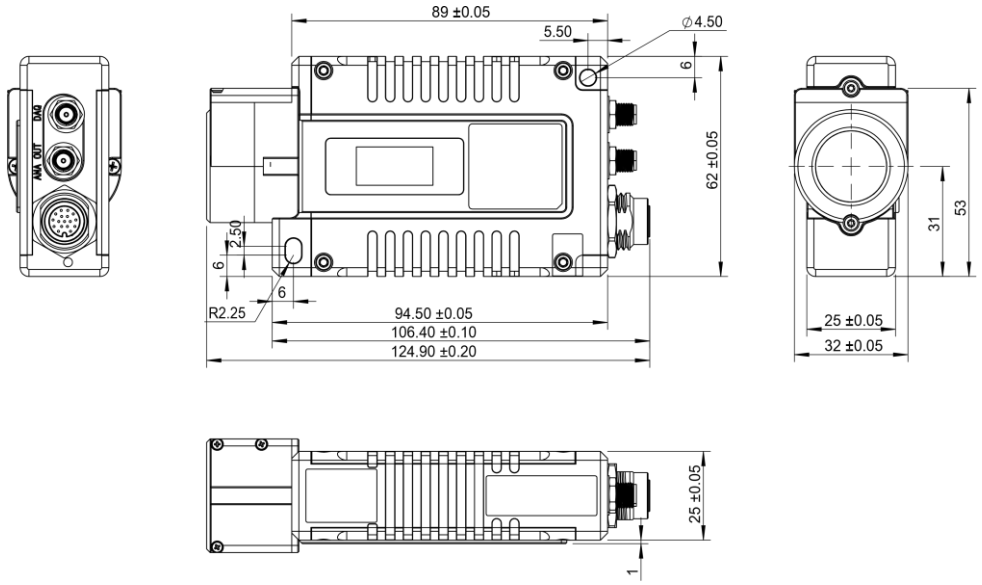
When MotionFlex is placed horizontally, a vertically toothed heat sink adapter plate can be selected.

MotionFlex with horizontally toothed heat sink adapter plate

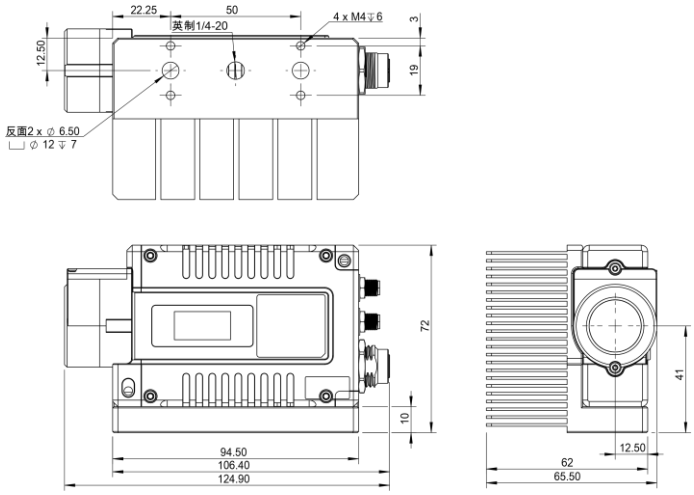
MotionFlex with vertically toothed heat sink adapter plate

## Product Outline and Dimensions

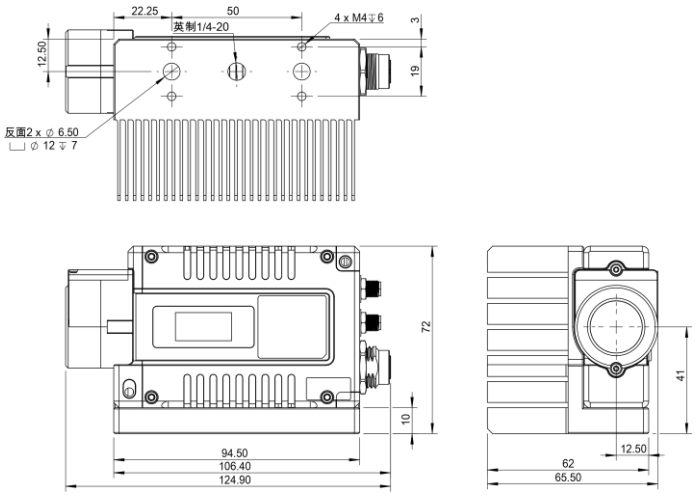
(Unit: mm)




MotionFlex




MotionFlex with horizontally toothed heat sink adapter plate




MotionFlex with vertically toothed heat sink adapter plate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