



- 1 8-channel lock-in assembly module.
- 2 Front panel of the 19" lock-in amplifier's rack with five 8-channel assembly modules.
- 3 Test measurements performed to compare Fraunhofer multichannel lock-in and commercially available single-channel Stanford Research SR 830.

MULTICHANNEL LOCK-IN AMPLIFIER FOR OPTOELECTRONIC MEASUREMENT SYSTEMS

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Multichannel detection

The measurement of weak signals in a noisy environment is a typical task for optical metrology. This task can be accomplished by synchronous detection using the lock-in technology. Due to the rapid development in optoelectronics, multichannel systems are common in a wide range of the application fields. This leads to an increasing demand for scalable multichannel amplification systems. Commercially available lock-in amplifiers offer a broad spectrum of applications, but most of them have a limited number of detection channels.

System Implementation

The Fraunhofer IOF offers a cost-efficient modular multichannel lock-in amplifier with a scalable number of detection channels. Up to 16 multichannel modules (with 8 detection channels each) can be connected to the parallel bus system. Measurement parameters are set up on the front panel and transferred from the control module to the 8-channel assembly modules.

System Parameters

- Sensitivity: 5 mV – 500 mV
- Time constant: 3 ms – 200 ms
- SNR: > 40 dB
- Linearity: 0.1 %
- Dynamic reserve: 60 dB
- Chopper input range: 1 kHz – 5 kHz
- Number of channels: scalable up to 128 channels (16 8 – channel modules)
- Housing size: 19 inch