

Lock-In Amplifiers

SE1311\SE1351 Modulation Lock-In

Signal Channel

| | |
|------------------------|--|
| Voltage input Mode | Single-ended or Differential |
| Full-scale Sensitivity | 1nV to 5 V in a 1-2-5 sequence |
| Current input | 10 ⁶ V/A |
| Impedance | |
| Voltage | 10 MΩ // 10 pF, AC or DC coupled |
| Current | 1kΩ to virtual ground |
| C.M.R.R | >70 dB to 10 KHz, decreasing by 6 dB/oct |
| Dynamic reserve | >120 dB |
| Gain accuracy | 0.2% typ, 1% max |
| Noise | 5nV/√Hz at 997Hz |

Reference Channel

| | |
|----------------------|--|
| Input | |
| Frequency range | DC to 100kHz/500kHz/1MHz |
| Reference input | TTL or sine |
| Input impedance | 10 MΩ |
| Phase | |
| Resolution | 1u° increments |
| Absolute phase error | <1° |
| Relative phase error | <0.01° |
| Orthogonality | 90°±0.001° |
| Phase noise | |
| Internal ref. | Synthesized, <0.0001°rms at 1kHz |
| External ref. | 0.005°rms at 1 kHz (100 ms time constant, 12 dB/oct) |
| Drift | <0.01° /°C below 10 kHz <0.1° /°C above 10 kHz |
| Harmonic detection | 2F, 3F, ...nF to 1MHz (n<65,535) |
| Acquisition time | |
| Internal Ref. | Instantaneous acquisition |
| External Ref. | (3 cycles + 5 ms) or 40 ms, whichever is larger |

Demodulator

| | |
|---------------------|--|
| Quantity | 8 |
| Stability | |
| Digital outputs | no zero drift on all setting |
| Display | no zero drift on all setting |
| Analog outputs | <5 ppm/°C for all dynamic reserve settings |
| Harmonic rejection | -75 dB |
| Time constants | 1μs to 3ks (6, 12, 18, 24, 30, 36, 42, 48dB/oct rolloff) |
| Synchronous filters | Available below 1k Hz and greater than 18 dB/oct rolloff |

Internal Oscillator

| | |
|------------|--|
| Frequency | |
| Range | DC to 100kHz/500 kHz/1MHz |
| Accuracy | 2 ppm + 10 μHz |
| Resolution | 1 uHz |
| Distortion | -80 dBc (f<10 kHz), -70 dBc (f>10 kHz) |
| Amplitude | 100nVrms to 5 Vrms 10nVrms Resolution |
| Accuracy | 1% |
| Stability | 100 ppm/°C |
| Outputs | Sine, 50 Ω output impedance TTL, 200 Ω output impedance |

Outputs

| | |
|---------------------|------------------|
| CH1 and CH2 Outputs | |
| Function | X, Y, R, θ |
| Amplitude | ±10 V |
| Impedance | 100 Ω |
| AUX Inputs | |
| Function | 2 BNC A/D inputs |
| Amplitude | ±10 V |
| Impedance | 1MΩ |

Interfaces

RS-232 and Ethernet.

General

| | |
|--------------------|----------|
| Power requirements | |
| Voltage | 12VDC±5% |
| Power | 15 W |
| Dimensions | |
| Width | 180 mm |
| Depth | 106 mm |
| Height | 44 mm |