

TUNABLE MID IR LASER SYSTEM – LS-03-D

The Cascade Scientific LS 03 D is an affordable Quantum Cascade Laser Driver capable of operating at high power and duty cycle. Variable pulse lengths from 10ns up to 5µs allow the laser to be operated in true pulsed mode and high efficiency peltier cooling enables laser temperatures down to -30° C to be attained. Two units, the laser module and the control module, combine to provide unparalleled levels of performance in a compact and robust package suitable for both laboratory and OEM applications.

Applications

- High resolution laser spectroscopy
- Gas monitoring
- Combustion diagnostics
- Bio-marker detection



Aesthetic design subject to change without prior notice

Features

- High resolution (0.01 cm⁻¹)
- High power output (up to 100mW)
- User-swappable QCL's for increased flexibility and spectral coverage
- Pulsed operation with up to 8 cm⁻¹ continuous wavelength tuning¹.
- Electronic driver providing low noise voltage supply and stable thermoelectric control
- USB connectivity for 'plug and play' with stand alone Windows based control software
- Labview drivers provided for easy integration into experiments
- Integrated TEC control facilities for optional detector module

Characteristics

| Parameter | Ratings |
|----------------------------|----------------|
| Laser Current (I) | 0 - 20 A |
| Pulse Width | <1µS |
| Rise / fall time | 5-10nS |
| Pulse Repetition Frequency | <5MHz |
| Duty Cycle standard | 5% @ 20 A |
| Laser Temperature Range | -30°C to +50°C |

Laser Wavelengths availability

| Wavelength (µm) | Wavenumber (cm ⁻¹) | Gases Detectable |
|-----------------|--------------------------------|------------------|
| 4.48 | 2230 | CO2, CO |
| 5.25 | 1904 | NO, H2O |
| 6.13 | 1631 | NO2 |
| 7.43 | 1345 | SO2, H2S, CH4 |

Please note that our stock of laser continues to evolve. Please do not hesitate to contact us with inquiries for different wavelengths

Options

- High speed Digitiser

¹ Depends on each Quantum Cascade Laser.

MID IR LASER MODULE – LM-03-D

The Cascade Laser Module houses the hermetically sealed laser package. The module can be supplied with either a forced air or water cooled heat sink, which ensures excellent cooling performance from the inbuilt peltier element. Design features, such as integrated pulse circuitry and enhanced RF screening, allow unprecedented levels of performance in terms of pulse stability, pulse amplitude, duty cycle and repetition rate. As an option, interchangeable Anti-Reflection coated ZnSe micro optics can be selected, giving a low aberration 4mm diameter collimated output beam.



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Features

- Fast and simple laser exchange
- On board EPROM storage of individual laser characteristics
- Integrated pulse circuitry to minimise mismatch and enhance rise/fall time
- Low noise high bandwidth current monitor
- Optional water cooled heat sink for enhanced cooling performance
- Interchangeable ZnSe micro-optics modules for beam circularisation and beam expansion

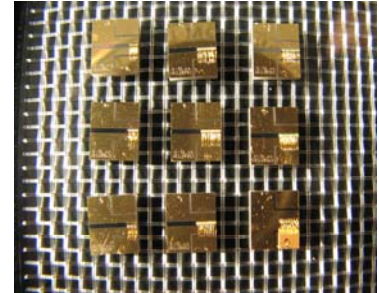
Characteristics

| Parameter | Ratings | | Units | Comment |
|------------------------------|--|---|-------|----------------------------|
| Laser Current (I) | 0 - 20 | | A | |
| Pulse Width | 20 - 10,000 | | ns | |
| Rise / fall time | < 10 | | ns | |
| Pulse Repetition Frequency | < 5 | | MHz | |
| Duty Cycle Standard | 5 @ 20 A 25 @ 5 A | | % | DC = 2000mA |
| Duty Cycle High Power | 10 @ 20 A 50 @ 5 A | | % | DC = 2000mA |
| Laser Temperature Range | -30 ... +50 -45 ... +50 | | ° C | Air Cooled Water Cooled |
| Peltier | 25 Watt / Delta 60° C 16 Watt / Delta 80° C | | | 1 stage 2 stage |
| Weight | 300 | 800 with forced air heatsink | g | |
| Dimensions | 65 x 30 x 65 | 65 x 65 x 65 with forced air heatsink | mm | L x W x H |
| Housing Material | Anodised Al | | | |
| Laser Submount compatibility | Compact (6 x 5 x 2) Standard (19 x 7 x 2) | | mm | L x W x H |

MID IR QUANTUM CASCADE LASERS – QC-02-XXXX

Features

- **Beam divergence at emitting facet of the Product:** Mean optical output power (P_m) guaranteed in a full solid angle of 60° .
- **Single mode suppression ratio:** SMSR of the Product over the laser gain spectrum of the Product: $\geq 25\text{dB}$
- **Mean optical output power:**
 Optical output power (P_m) during $t_{\text{pulse}} \geq 100 \text{ mW}$
 Optical output power decay (P_{decay}) from start to end of t_{pulse} : $\leq 50\%$



Operating Parameters:

- **Current and Voltage:**
 Max Pulse current (I_c): up to 4 Amps
 Typical Pulse voltage (V_c): up to 16 Volts
 Typical Current threshold (I_{th}): up to 2 Amps
- **Duty cycle, pulse repetition frequency and reciprocal wavelength scan:**
 Operating duty cycle (DC_c): up to 5%
 Pulse duration (t_{pulse}): up to 800ns
 Pulse repetition frequency (PRF): up to 100KHz
 Wavenumber scan during t_{pulse} ($\tilde{\nu}_s$): over 2cm^{-1}
- **Operating and environmental temperature:**
 Product sub-mount temperature (T): $-30^\circ\text{C} \leq T \leq 35^\circ\text{C}$

Note that the typical parameters listed here are for information only. Exact specifications may vary depending on the laser of choice. Please ask our team for more details.

Wavelengths and associated measurable gases with strong absorption bands in these regions

| Wavelength (μm) | Wavenumber (cm^{-1}) | Gases Detectable |
|------------------------------|---------------------------------|---|
| 4.48 | 2230 | CO ₂ , CO |
| 5.25 | 1904 | NO, H ₂ O |
| 6.13 | 1631 | NO ₂ |
| 7.43 | 1345 | SO ₂ , H ₂ S, CH ₄ |

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DIGITISER AV1500 – SINGLE CHANNEL 8-BIT 1 GSPS



Front



Back

The AV1500 high-speed digitizer/averager is a plug-and-play A/D converter designed with hassle-free instrument-to-PC interfacing. The AV1500 can digitise one channel with 8-bit precision over voltage ranges from ± 10 mV to ± 1.5 V. The card is capable of sampling 650 MHz bandwidth signals. In addition, the device is capable of co-adding data up to 65 655 times 2048 points giving an effective precision of 16Bit using onboard FPGA averaging.

Applications

- High speed instrumentation
- Automotive testing
- Mixed signal test
- Radar
- Metrology
- Medical
- Biotechnology
- Defence & Security
- Life sciences
- Semiconductor testing

Characteristics

| Parameter | Ratings | Units | Comment |
|----------------------|------------|---------|----------------------------|
| Sampling rate | 1 | GS/s | |
| Input Bandwidth | 650 | MHz | @3db |
| Signal Input | 50 | Ohm | SMA Gold plated |
| Signal Input Range | 10 to 1500 | mV | |
| Gain Setting | -10 to 35 | dB | Adjustable |
| Offset | 5 | V | FS 16bit adjustable |
| Max. Input Voltage | 1.5 | V | DC |
| Power | +12 | V | |
| Power Consumption | 5 | W | @12V |
| Acquisition memories | 2 | Kpoints | Upt to 64KHz averager mode |

| Trigger | | |
|------------------|---------------|-----------------|
| Internal trigger | TTL | DC to 600MHz |
| Trigger Input | 50Ohm | SMA Gold plated |
| Mode | Edge positive | |

| PC requirements | |
|-----------------|------------|
| Processor | 500MHz |
| Memory | 256MB |
| O/S | Win XP SP2 |
| Software | Labview |