

**LIGHTMACHINERY:** Hyperfine spectrometers; **SOUTHERN PHOTONICS:** New fiber laser; **SLM Solutions:** New SLM280 v2.0; **WHAT'S ON:** NMW/AUSTECH; **WHAT'S ON MY TV SCREEN:** 3D titanium implants

## LightMachinery

Excellence in Lasers and Optics

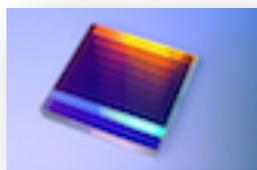
The HyperFine series of spectrometers are based on LightMachinery's renowned and patented VIPA technology. Designed for measuring hyperfine spectra and subtle spectral shifts, the HyperFine spectrometer from LightMachinery is a compact, low cost spectrometer capable of sub-picometer resolution. It is ideal for pulsed laser characterization and for measuring the small spectral shifts from Brillouin scattering. Simple PC based software allows the user to review spectra in real time and save or export for more analysis. LabView drivers enable the HyperFine spectrometer to be integrated into automated experimental setups.



### Features

- Simple to use
- Sub picometer resolution
- Fiber optic input
- Quick data acquisition and export
- Simple USB interface
- LabView Drivers
- No moving parts

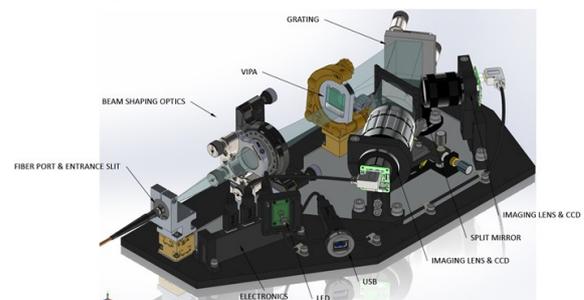
The engine of the HyperFine spectrometer is the patented LightMachinery VIPA etalon. Our fluid jet polishing technology allows us to create surfaces of unmatched parallelism and perfection. Just imagine a grating with 50x the dispersion!



### Applications

- Light sources characterization
  - Lasers of all types
  - Single shot pulsed laser spectrum
  - Super luminescent diodes
  - Gas discharge lamps, etc
- Spectroscopy
  - Plasma spectroscopy
  - High-precision gas spectroscopy
  - Brillouin spectroscopy
  - Femtosecond comb fingerprinting spectroscopy
  - Spectral-domain optical coherence tomography, etc
- Passive components characterization
  - Notch filters
  - Etalons
  - Fiber Bragg gratings, etc

### How does it work?



Light enters the HyperFine Spectrometer through a fiber or directly imaged onto the slit. A VIPA etalon, manufactured using LightMachinery's proprietary fluid jet polishing technology, is used to produce very high dispersion in the vertical axis with sub picometer resolution. This is followed by a conventional grating to disperse overlapping orders in the horizontal direction and produce a 2D spectrum of the input light. LightMachinery software unwraps the spectrum to produce an ultra high resolution wavelength spectrum of the input light. A secondary camera provides a wide wavelength range, lower resolution view of the spectrum.



Operating from Auckland, New Zealand, Southern Photonics specializes in optical systems design and manufacture, providing instruments and solutions for a wide range of test, measurement, lab and industrial needs.



The **FSL100** – a new self-starting fiber seed laser for applications like micro-machining where high reliability is a must!

*For more information on the new fiber laser and all other products offered by Southern Photonics as well as advice on manufacturing a special solution contact Raymax Applications on +61 2 9979 7646*



**NEW SLM280 v2.0**

**Flexible, safe and efficient. Up to 80% higher build-up rate.**



The Selective Laser Melting Machine SLM 280 2.0 provides a 280 x 280 x 365 mm<sup>3</sup> build envelope and a patented multi-beam technology. Available in several configurations, providing single optics (1x 400W or 1x 700W), dual optics (1x 700W and 1x 1000W) and twin optics (2x 400W or 2x 700W). Depending on how

the components are arranged, a 80% higher build rate can be achieved. In addition, the patented bidirectional powder coating helps to reduce the manufacturing time of individually manufactured metal build parts.

The use of a large powder tank (40l) with two bottles (each 5l) enables the execution of a complete production process in full height with a 1.6-way overdose. The size of the overflows has also been modified accordingly and to enable simple handling, the powder bottles of the overflows are easily accessible from outside.

A new inert gas flow is used for optimum process conditions, whereby an efficient removal of flue gas from the process chamber is achieved. In addition to the attainment of constant conditions on the work surface, the beam entry glasses are also effectively protected from contamination. The build parts can be cleaned of powder while still in an inert gas atmosphere. An extensive monitoring system enables a high level of process control and, as a result, a high level of quality for the build parts.

*For information on SLM280 upgrade contact Raymax Applications 02 9979 7646*



**NMW / AUSTECH**

**Melbourne Convention & Exhibition Centre 9 – 12 May 2017**

Visit Raymax and SLM Solutions on **Stand 740** in the Digital & Additive Manufacturing section

**WHAT'S ON MY TV SCREEN**

SBS aired Season 6 Episode 1, 27 February 2017 of the BBC's **Trust Me; I'm a Doctor**. Aside from exploring the benefits of red wine, Gabriel Weston, their presenting surgeon visited Birmingham Heartlands Hospital to witness a unique operation, the implant of a 3D printed titanium sternum produced by *Anatomics* in Melbourne. Having read about a similar implant in a cancer patient in the University Hospital in Salamanca, Spain, the cardiothoracic surgeon Ehab Bishay offered the 60 year old patient Edward Evans the opportunity of receiving a titanium implant. Evans previously had his sternum removed due to infection and building a replacement using the traditional construction from cement could be subject to further infection, so the titanium solution was a better option. Bishay sent scanned images of the patient to *Anatomics* in Victoria who used these to construct the implant. Bishay requested modifications to the 3D implant made for the patient in Spain, to better suit Evans' condition and avoid further possibilities of infection. Evans has now recovered from the operation and doing well, able to carry on life as normal.

The operation was a UK first and a landmark for an Australian 3D printing company. It demonstrates not just the value of 3D printing in metals for the medical sector, but how small companies can collaborate to produce great results.



Surgeon Gabriel Weston with the prototype