

**LCL - Diode Laser and LASCON® Process Controller in one Box**

**Laser system with ultra fast, built in infrared pyrometer with 100µs sampling rate**

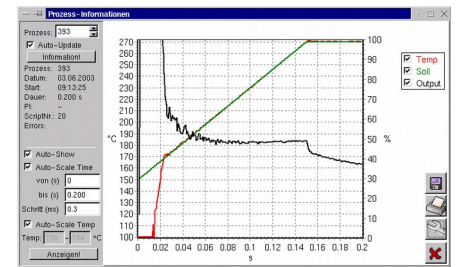
**Industrial I/O terminal with digital and analog I/O for connection to plc`s**

**Powerfull software package for**  
 - temperature measurement  
 - closed loop control  
 - data storage and visualization  
 - up to 255 different process scripts allow handling of complex tasks  
 - for OS Linux® and Windows®

**Ethernet connectivity**



**Built in power supply 90-260VAC**



**LCL Diode Laser with integrated LASCON® Laser Process Controller**

**Visible pilot laser beams**

**Integrated diode laser with up to 140W power into 200µm or 100µm fiber**

**Various optics with spots down to 200µm diameter and temperature ranges from 100°C - 2200°C**

**LCL** is a unique combination of infrared temperature measurement and control system and integrated high power diode laser, which provides powerful possibilities to handle complex laser processing in industry and science.

Integrated LASCON measurement and control system has been established as a kind of standard in laser industry. Over 1500 industrial installations worldwide speak for themselves.

### The main field of applications are :

- Compact integration into **laser soldering** robots for temperature controlled laser soldering. **Laser plastic welding**. Laser heating

### LCL offers a complete solution of :

- Built in, ultrafast, fiber coupled infrared pyrometers with sampling rates down to 100µs – blocked against laser light. Glas fiber coupling for high immunity against electromagnetic interference.
- Visible pilot laser beam for aiming.
- Various laser processing heads like LH102 ( ultra compact ) and LH103 ( with video camera and pyrometer port ) can be directly connected to LCL by glas fiber cables.
- Ultra fast adaptive closed loop temperature control for high speed laser soldering and welding in unmatched quality
- Rugged controller with realtime operating system and 4 GB flash disk to store data with a rate up to 10kHz
- Industrial I/O terminal (analog and digital ) for integration into machines and connection to plc. For example digital start/stop/error signals or analog temperature and control out
- The system can monitor and supervise laser processes and can create an error signal, if the laser process does not follow the predefined parameters. This parameters can be defined by a simple programming language in so called „laser scripts“.
- Up to 255 different scripts can be stored on the system and can be activated within milliseconds. In case of laser soldering, thus up to 255 individual laser joints can be processed and supervised.
- The flash disk can store up to 500.000 processes.
- A separate software task checks, whether the flash disk is full, gives a warning and starts deleting of old processes
- All features are supported by our powerful PROCESS MANAGER SOFTWARE ( LPM ). The software can run on the controller itself or can be installed on any Windows® pc, which is connected by ethernet with the controller
- Easy calibration of the pyrometer can be done with the LPM software. This allows, that the pyrometer can always be traced back to NIST standards.
- **Rugged diode laser system with power up to 140W integrated** with lifetime > 20.000h
- Fiber diameter 100µm or 200µm ( detachable fiber )
- System builders and integrators can use the programming handbook to develop and create own software

| Infrared pyrometer               |   |
|----------------------------------|---|
| Temperature ranges               | from 100°C * to 2200°C in different ranges, depending on response time and optics   |
| Subrange                         | Any subrange is selectable by changing parameters with LPM software   |
| Spectral range                   | 1.65 – 2µm (optional 1.65 – 2.5 µm )  |
| Accuracy ( e=1, t90=1s, T=25°C ) | Below 1500°C: 0.3% of measured value in °C or +2°C,   |
| Repeatability                    | 0.1% or +-1°C   |
| Resolution                       | 0.1°C   |
| Response time ( t90 )            | < 0.2ms   |
| Max. sampling rate               | 0.1ms ( 10kHz )   |
| Emissivity                       | Adjustable from 0.01 to 1 by LPM software   |
| Power supply                     | Wide range power supply 90-260VAC , 250W  |
| Sighting                         | Laser targeting light, coaxial with pyrometer   |
| Interfaces and bus control       | Digital and Analog I/O's<br>Ethernet , optional EtherCAT  |
| IO terminal                      | 6 analog IN, 2 analog OUT ( 0-10V , 12 Bit ) , 16 dig IN, 8 dig OUT ( 24V ), update rate : 10kHz  |
| Parameters and Software          | Powerfull software package for measurement, closed loop control, storage, visualization, calibration curves for different optics selectable, customer can calibrate |
| Glas fiber lenght                | 5m, 10m, other lenghts on request   |
| Ambient temperature              | Max. 40°C   |
| Dimensions                       | Controller 165 x 145 x 340mm  |

| Diode laser    |  |
|----------------|--|
| Power          | up to 140W                                   |
| Wavelength     | Typ. 980nm                                   |
| Rise time      | 0.1ms  |
| Fiber diameter | Detachable fiber 200 µm ( 100 µm pigtailed ) |
| Life time      | > 20.000h                                    |
| Cooling        | Aircooled by integrated fan                  |

*LASCON is a registered trademark of Dr.Mergenthaler GmbH&Co.KG, Germany. Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Linux is a registered trademark of Linus Torvalds*