



*YOUR LASER
UNDER CONTROL*



A close-up of a cat's green eye with a black pupil, set against a background of a city skyline at night. The cat's fur is visible around the eye. The city skyline is at the bottom of the page, with various buildings and lights. The overall image has a soft, ethereal quality.

*What are you
focusing on?*

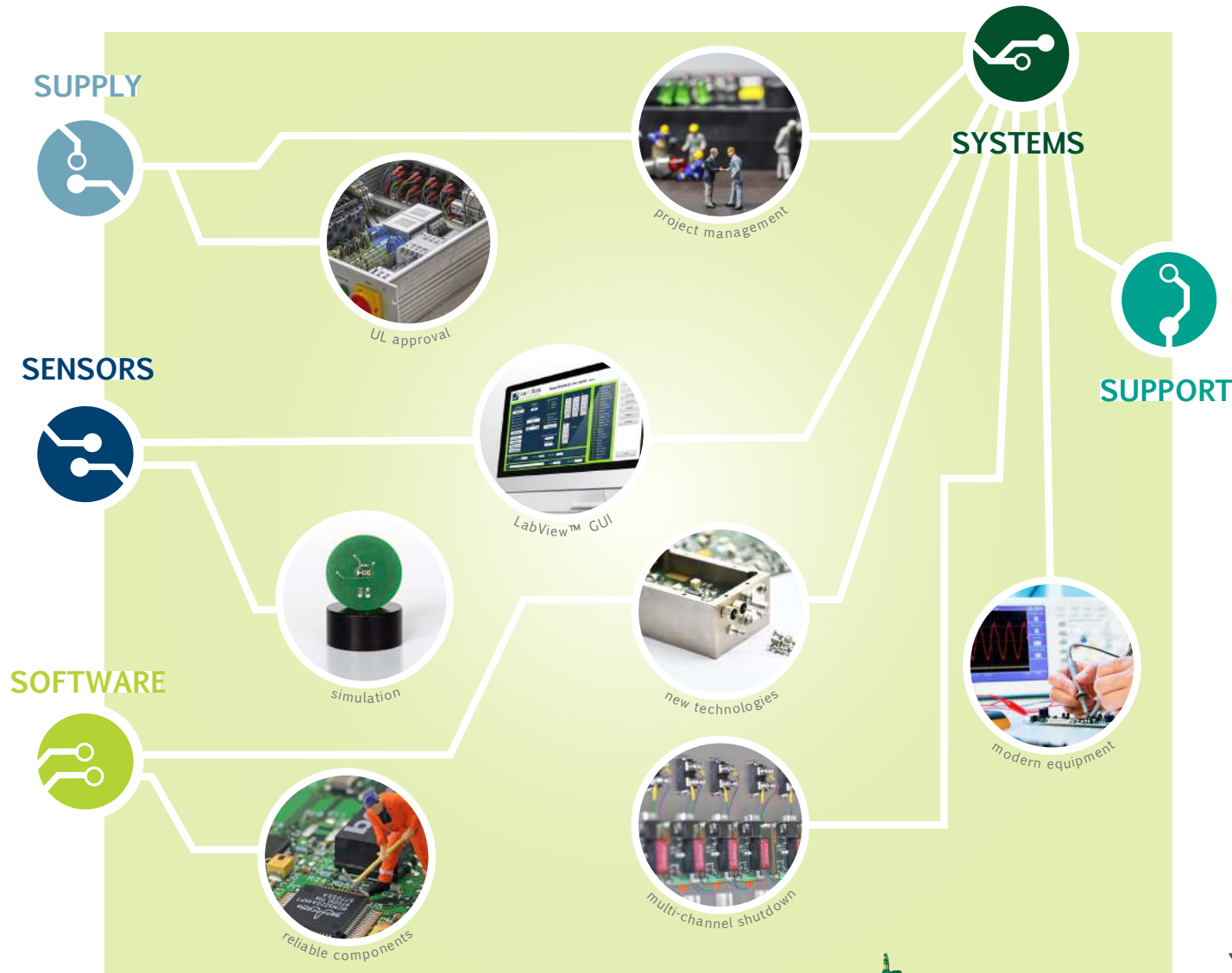
LaCoSys focuses on the production and development of optoelectronic laser components and systems.

With us by your side you can concentrate on the important things.

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FIELDS OF ACTIVITY



LaCoSys ...

- is a manufacturer and developer of optoelectronic components, power supplies and control systems for fiber, diode direct and multichannel lasers.
- is based in Jena and a competence center for laser and optoelectronics in Germany.
- combines many years of experience and know-how about laser systems in various application areas in research and industry.
- offers a unique spectrum of optoelectronic developments and services, in addition to innovative products.
- products guarantee highest flexibility with constant high manufacturing quality due to in-house development and production.
- unites performance, maximum precision and safety to create attractive brand products.

Benefit from our experience in the fields of optoelectronic systems and lasers.

... our competencies are



your success...

ELECTRONICS DEVELOPMENT

- Circuit design and layouts
- Circuit simulation
- Sensors
- Laser drivers and control systems
- Safety-related assemblies
- Measurement and test systems
- Optoelectronic prototypes

PRODUCTION

- PCB & tabletop units
- Power & laser burn-in racks
- Optoelectronic prototypes
- Test systems
- In-house production
- Small series manufacture

SOFTWARE

- Tailor-made firmware & human-machine-interfaces
- Combine our devices with your requirements
- Database access
- Test & logging software

SUPPLY

Each photon is an energy carrier and we carry the energy to the photons. Laser power supplies are among the most sophisticated power supply systems of our time. We develop power sources for different current intensities and ensure laser safety and laser standards.



SENSORS

Our laser sensors range from fast photodiodes with and without amplifiers, low noise power and peak detectors to high-speed PMT amplifiers. For our systems we offer the acquisition of all relevant physical quantities such as temperature, flow, pressure,...



SYSTEMS

This is where it all comes together, power supplies, sensor technology, control engineering, software paired with experience in industrial laser systems and innovations directly from the Photonics Campus in Jena. Combining complex systems with critical components in one device is our challenge.



SOFTWARE

We develop the appropriate software to adapt our innovative products to your application or plant. Our focus is on system security and reliability. Expandable and intuitive interfaces in LabView complete our components in the system environment.



SUPPORT

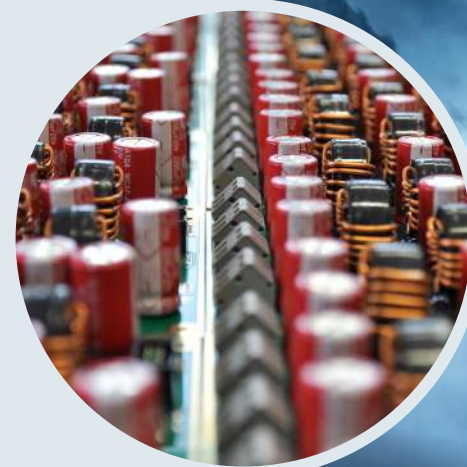
Support is important in all areas, especially when you leave your comfort zone. We support you with our products, in your projects and systems. You can count on us. We look forward to your inquiry.



LASER POWER SUPPLIES

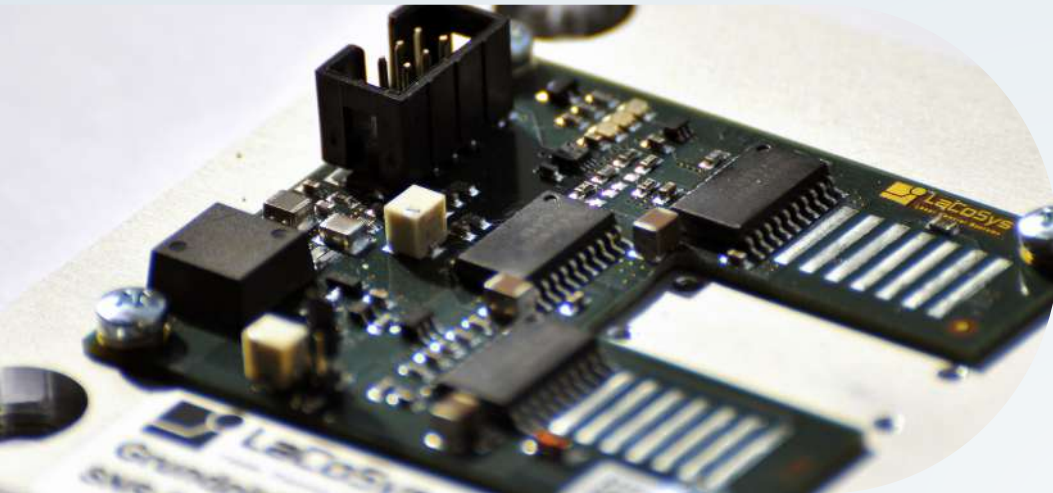


- From small power up to several kW in different voltage-current combinations
- From PCB version to high-end current driver
- Fast and easy integration into existing safety systems
- User-friendly, simple application, with or without external PC



XS – series	page 8
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SmartPower XS-Series



- **HIGH STABILITY LASER CURRENT SOURCE** •
 - **SEED LASER/PUMP LASER** •
 - **PILOT/MEASUREMENT LASER** •
- **FIBER COUPLED LASER FOR BIOPHOTONIC/MICROSCOPY** •

The SmartPower XS laser diode driver with temperature controller is a high precision, safe and cost effective solution for driving 10 & 14 pin butterfly package diode lasers in CW mode.

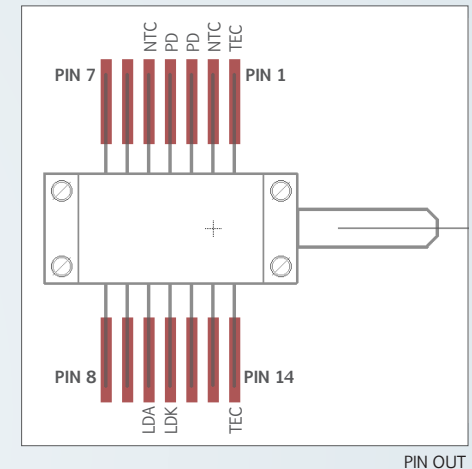
You can set current up to 2A and monitor the temperature and current.

The OEM-board comes with a built-in temperature and transient protection.

Every device has passed our test lab to ensure high quality and reliability.

FEATURES

- Laser driver for butterfly 10 & 14 pin packages
- TEC control
- Wide input voltage range
- Very low power dissipation
- Transient protection
- Over temperature protection for driver
- Analog set point control
- Enable/disable for laser current
- Slow start laser diode protection
- Single power supply for complete diode
- Easy to mount and user friendly



SPECIFICATIONS

LASER	
Voltage range:	0...4V
Current range:	0...2A
Current resolution:	analog
Current accuracy:	±0.5%
Current stability:	< 0.1%
Current noise:	< 5mA rms
Rise time:	< 150µs
Fall time:	< 150µs
Current limit:	2.1A
Enable input:	TTL (Fail safe - low active)
Analog input:	1V/1A

TE-cooler DRIVER	
Current:	max. ±2A
Voltage:	max. ±2.5V
Sensor typ:	NTC10k
Accuracy:	±0.5K

COMMON	
Supply:	7...25Vdc 25W
Size (HxWxD):	20x56x62 mm
Mass:	16g

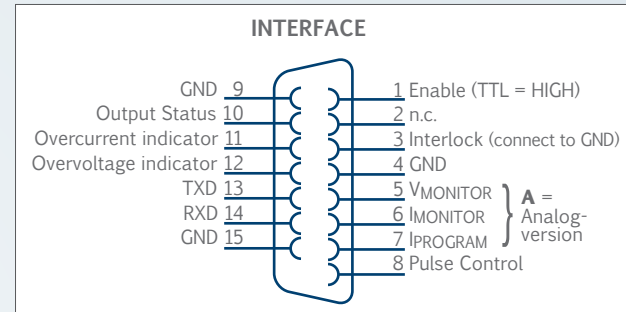
PIN OUT

SmartPower S-Series



FEATURES

- Configurable voltage and current versions
- Digital and analogue interface galvanic isolated
- Overload protection
- Temperature-controlled fan
- RS232 Interface
- Pulse control pin



SPECIFICATIONS

	600W	1200W
Power:	600W	1200W
Current:	up to 100A	200A
Voltage:	up to 50V	
Input voltage:	90-265Vac (Derating < 120Vac)	
Efficiency:	> 83%	
Current ripple:	< 0,5%rms @ Full Load (BW=20MHz)	
Trigger rise / fall time:	250µs	
Control accuracy:	< 0,5%	
Stability:	< 0,1%	
Protection circuits:	Overcurrent / Overvoltage / Overtemperature	



Fig.: 600W type



Fig.: 600W type

- CW LASER APPLICATION UP TO 200A @ 1200W ·
- ANALOG OR DIGITAL VERSION ·

The compact SmartPower laser diode drivers were designed for safe CW operation of diode lasers in industrial environments.

An analogue or digital interface allows the use as a stable laser power source in machines and complex laser systems. The compact housing is easy to cool and mount.

Microprocessor-controlled signal processing and safety shutdowns ensure reliable operation in the field.

A control software perfectly adapted to the power supply is available.

SmartPower M-Series



- **LASER DIODE DRIVER UP TO 200A – 600W/1200W** •
- **LOW NOISE UP TO 50A AVAILABLE** •

The SmartPower M laser diode drivers were developed for safe operation of diode lasers.

An intuitive touch screen control combined with modern microprocessor technology make them the first choice for laboratory and research applications.

SmartPower M drivers can be quickly and easily integrated into existing safety concepts using key switches and interlock.

These laser diode drivers can be controlled via an optional Ethernet connection with the PC and switched in pulse mode by an external TTL signal.

A control software perfectly adapted to the power supply is available.

FEATURES

- Low noise version available
- Configurable voltage and current versions
- 7" Touch screen control
- Overload protection
- Remote interlock prepared
- Key switch
- Temperature-controlled fan
- Optional Ethernet interface / RS232 / USB
- Customized solutions possible
- Global on / off trigger

SPECIFICATIONS

	600W	1200W
Current	up to 100A up to 60A low noise version	200A
Voltage:	up to 50V	
Input voltage:	90-265V (Derating < 120V)	
Efficiency:	> 83%	
Current ripple:	< 0,5%rms @ Full Load (BW=20MHz) < 0,03%rms @ Full Load (BW=20MHz) low noise version	
Trigger rise time:	< 500µs < 5ms (low noise version)	
Trigger fall time:	< 500µs < 5ms (low noise version)	
Control accuracy:	< 0,5%	
Stability:	< 0,1%	
Power limit:	Overcurrent / Overvoltage / Overtemperature	



SmartPower L-Series

19" RACK MOUNT DEVICES



- **CW LOW NOISE LASER APPLICATION UP TO 4.8KW ·**
- **SAFETY CIRCUIT ACCORDING EN ISO 13849-1 AND SIL CL 3 ACCORDING TO IEC 62061 ·**

The low-noise laser diode drivers were developed for safe operation of diode lasers.

Intuitive touch screen control combined with modern microprocessor technology make them to the first choice for laboratory and research applications.

SmartPower L drivers can be quickly and easily integrated into existing safety concepts using key switches and interlock. The 19" design guarantees simple system integration.

An optional RS232 or Ethernet interface ensures reliable connection to machine or PC.

A control software perfectly adapted to the power source is available.

FEATURES

- Low noise
- Configurable voltage and current versions
- Interlock prepared for maximum safety, up to performance level e according EN ISO 13849-1 and SIL CL 3 according to IEC 62061
- Overload protections
- Emission control
- Key switch
- Optional Ethernet interface
- Customized solutions possible
- Ideal for burn-in systems
- UL-prepared

SPECIFICATIONS

Standard configurations:	4 channels	8 channels
Power:	2.4kW	4.8kW
Input voltage:	85-264Vac (derating for less than 120Vac)	
Current per channel:	up to 100A	
Voltage:	up to 50V	
Channels:	up to 32 channels on request	
Efficiency:	> 86-89% (depends on configuration)	
Current ripple:	< 0,03%rms @ Full Load (BW=20MHz)	
Control accuracy:	< 0,5%	
Stability:	< 0,1% (over 8 hours)	
Output protection:	Overcurrent / Overvoltage / Overtemperature	
Dimension [mm]:	19" (132 x 483 x 602)	
Weight:	30kg	35kg
Cooling:	Water or air cooling	Water cooling



Fig.: 8 channel type

SmartPower XL-Series

19" RACK MOUNT DEVICES



FEATURES

- Configurable voltage and current versions
- Overload protections
- Ethernet interface
- Customized solutions possible
- Ideal for burn-in and test systems
- UL-prepared
- available with up to 500A
- pulsable in the QCW range

SPECIFICATIONS

Typ:	XL3000-30CW100	XL12000-30CW400
Standard configurations:	1 channel	1 channel
Power:	3kW	12kW
Current per channel:	100A	400A
Input voltage:	400Vac (derating for less than 120Vac)	
Voltage:	up to 50V	
Channels:	up to 4 channels on request	
Output protection:	Overcurrent / Overvoltage / Overtemperature	
Dimension [mm]:	19" (178 x 483 x 602)	
Control:	Direct via the PC or optionally via control unit	
Cooling:	Air cooling	

- CW LASER APPLICATION UP TO 15KW ·
- OPTIONAL SAFETY CIRCUIT ACCORDING EN ISO 13849-1 ·
- MODULARLY EXPANDABLE IN 100A-STEPS ·
- UP TO 500A PER UNIT ·

The XL series is the most powerful stand-alone laser driver from LaCoSys.

With its enormous power, the driver is the first choice for diode direct applications, laser tests and burn-in systems.

The automatic working point algorithm ensure safe operation in CW and long pulse mode.



Fig.: 1 channel type

CUSTOMIZED LASER POWER SUPPLIES

ACCESSORIES

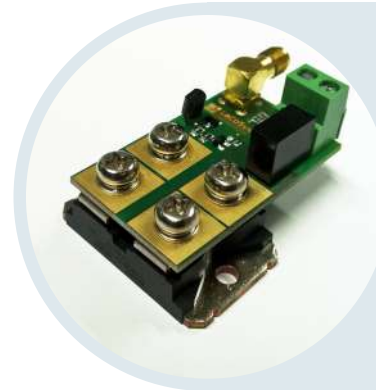


LaCoSys offers individually adapted laser supplies for your laser or laser system.

- Ready for integration in safety systems
- User friendly
- High quality and safety standards, such as (ISOs and ENs ...)
- Can be used with or without external PC
- Modular design with different number of channels and in different performance classes

*... adapted to
your environment ...*

*... you need it,
we build it ...*



Crowbar for laser diodes

- Small and easy mountable
- TTL-compatible turn on time $<1\mu s$
- Switching current up to 100A
- Galvanic isolated interface
- Special design to protect multi stage laser systems

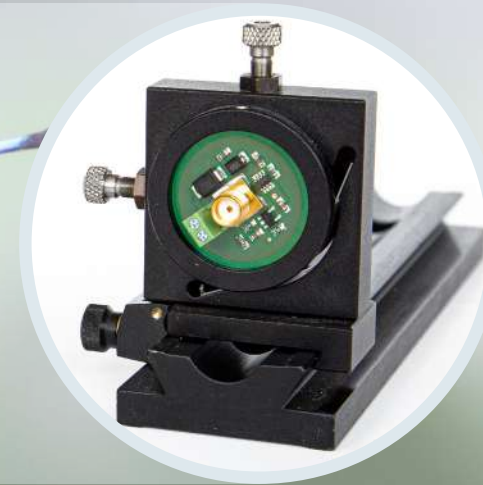


We manufacture suitable accessories for you. For example:

- Connection cable between the laser driver and your laser
- Emission light
- Laser stop box

LASER RELEVANT SENSORS

- Sensor technology for monitoring and optimizing your process
- Creation of sensor systems from different sensor types, specifically adapted to your process
- Realization of more traceability of your process by software based sensor data acquisition
- Combination of process relevant sensor data with your safety system



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SmartPicker Series - AOM



- PULSE PICKING IN ULTRA-SHORT-PULSE LASER SYSTEMS •
- BURST GENERATION •
- FAST REAL TIME PULSE CHECK •
- HIGH PRECISION PULSE PICKING •

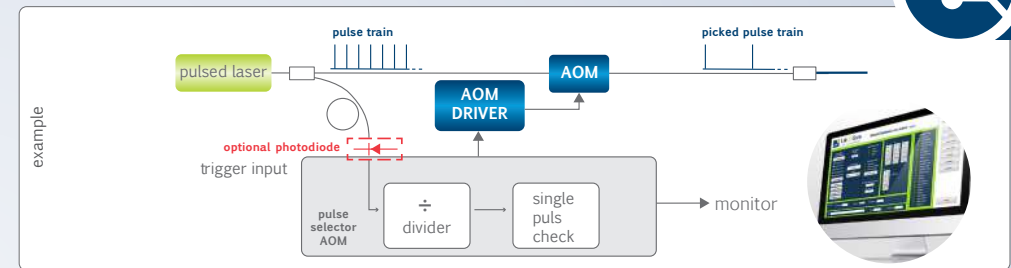
The pulse selector AOM of SmartPicker series is an ideal, easy to use signal generator with high stability and sensitivity.

The pulse selector generates a low-jitter synchronous control signal for acousto-optical modulators.

A perfectly tuned software in combination with state-of-the-art microprocessors allows easy adjustment of delay, pulse width and control parameters. The pulse selector is able to process signals up to 200MHz. The monitor function allows an easy control of the signal path. The available divider ranges allow a wide adjustment range for the output repetition rate.

FEATURES

- Optimized for ultra-short-pulse laser systems
- Variable trigger level
- SMA or built-in photodiode
- Pulse integrity check
- Wide range for delay and pulse width
- Standard DSUB-15 interface for AOM Driver
- Input frequencies up to 200MHz
- Output frequencies up to 40MHz
- Gate function
- Full software control (USB)
- Low power consumption
- Single pulse check
- Fully configurable PID and fuzzy controller
- 2-Stage drift compensation
- Easy-to-use software interface
- X-Series with high speed and high resolution



SPECIFICATIONS

	STANDARD	X-SERIES
Trigger input:	InGaAs Si SMA	InGaAs Si SMA
Min. trigger level:	10mV@20MHz	10mV@20MHz
Divider:	1 ... 2047	1 ... 16383
Max. pulse input frequency:	200MHz	200MHz
Max. pulse output frequency:	40MHz	100MHz
Output rise time/fall time:	< 1.5ns	< 1.5ns
Output level:	TTL	TTL
Pulse width range:	4ns ... 1ms (0,25ns resolution)	3,8ns ... 14ns (0,01ns resolution)
Delay range:	12ns ..1ms	3,8ns ... 14ns
Supply voltage:	24VDC	24VDC



SENSORS

SmartPicker Series - EOM



- PULSE SELECTION •
- PULSE GENERATION •
- PHASE CONTROL •
- LASER POWER CONTROL •
- LASER STABILIZATION •

The pulse selector EOM of SmartPicker series is an ideal, easy to use signal generator with high stability and sensitivity.

The pulse selector generates a low-jitter synchronous control signal for electro-optical modulators.

A perfectly tuned software in combination with state-of-the-art microprocessors allows easy adjustment of delay, pulse width and control parameters.

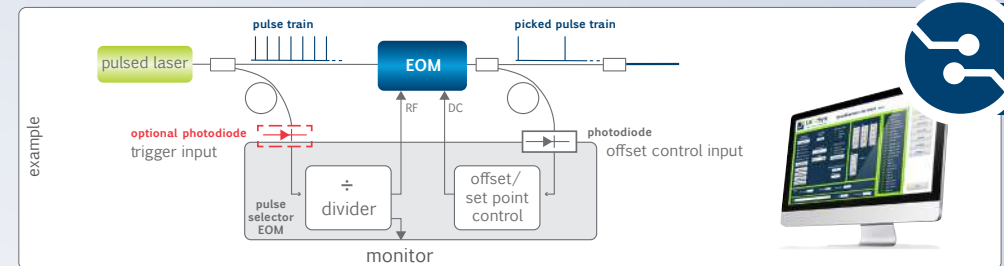
The pulse selector is able to process signals up to 200MHz. The monitor function allows an easy control of the signal path.

The available divider ranges allow a wide adjustment range for the output repetition rate.

FEATURES

- Automatic working point stabilization
- SMA or built-in photodiode
- EOM-RF up to 5Vpp
- EOM-DC out $\pm 10V$
- Input frequency up to 200MHz
- Full software control (USB)
- Variable trigger level (10mV ... TTL)
- Trigger / gate function
- PCB – version on request
- Easy-to-use software interface
- Fully configurable PID and fuzzy controller
- 2-Stage drift compensation
- X-Series with high speed and high resolution

NEW



SPECIFICATIONS

	STANDARD	X-SERIES
Offset control input:	Photodiode	Photodiode
Sensitivity range:	20nW ... 10mW	20nW ... 10mW
Divider:	1 ... 2047	1 ... 16383
Max. trigger frequency:	200MHz	200MHz
Max. output frequency:	40MHz	100MHz
Trigger input:	SMA (50 Ω) (optional PD)	SMA (50 Ω) (optional PD)
RF fall / rise time:	< 5ns	< 3ns
RF output:	7,5Vpp (50 Ω)	7,5Vpp (50 Ω)
Pulse width range:	4ns ... 1ms (0,25ns resolution)	3,8ns ... 14ns (0,01ns resolution)
Delay range:	12ns .. 1ms	3,8ns ... 14ns
DC output:	+/- 10V	+/- 10V
DC output impedance:	1k Ω	1k Ω
Monitor output:	TTL (100mA@50Ohm)	TTL (100mA@50Ohm)
Input voltage:	24VDC	24VDC



SENSORS

SmartDetect Series



- **ULTRA FAST PULSE DETECTION SYSTEMS** •
 - **POWER SUPERVISOR** •
 - **PEAK LEVEL DETECTION** •

The 1" SmartDetector photodetectors are easy useable in lab or industrial environment. The detectors can be implemented in difficult mounting positions. The photodiode and the amplification stage is specially designed for the target application.

A high signal stability and quality are ensured. The sensors with the various amplifier topologies can be used for pulsed and cw applications. The sensors are available with wavelengths from 200 nm to 2600 nm.

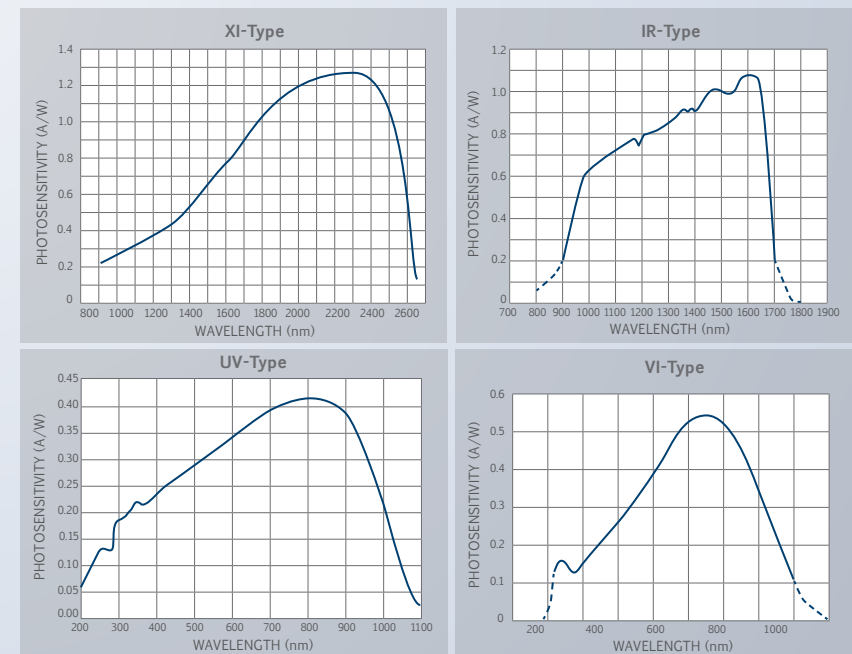
FEATURES

- Small footprint 1" standard
- Low-cost PCB-design
- 12-24Vdc wide input range
- 0-10Vdc extended output range (except T-Type)
- Variable threshold (T-Type only)
- Free beam (FB-Type) or fiber coupled (FC-Type)
- Available wavelengths:
 - ~ UV: ultra-violett 200-400nm
 - ~ VI: visible 320-1000nm
 - ~ IR: infrared 800-1700nm
 - ~ XI: extended infrared 1µm-2.6µm

MODEL DIFFERENTIATION

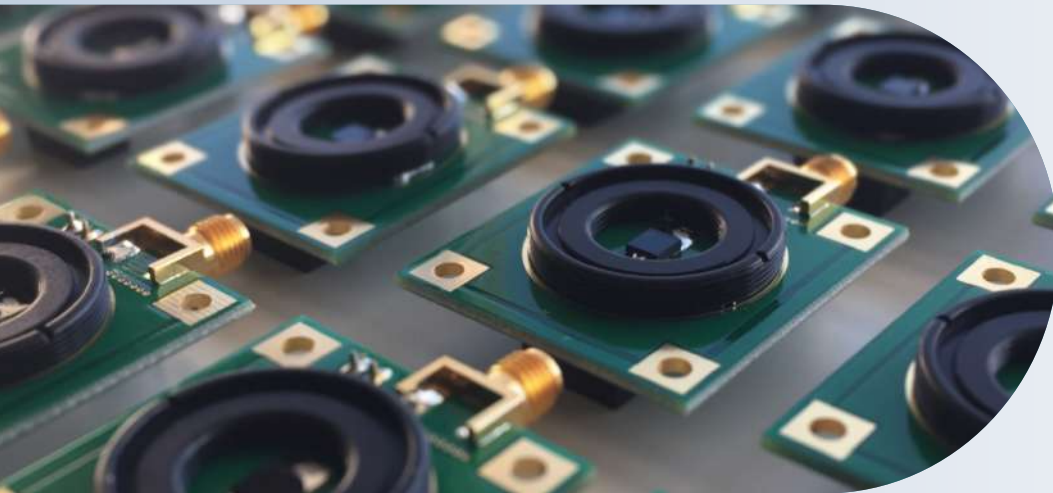
	OUTPUT	OUTPUT BANDWIDTH	APPLICATION
T-Type	TTL-OUT	250MHz	Pulse detection
C-Type	20kV/A	200MHz	TIA
A-Type	100kV/A	10kHz	Powermeter

Examples: SD-T-UV-FB = SmartDetect - TTL - ultra violett - free beam
 SD-A-XI-FC = SmartDetect - AVG - extended infrared - fiber coupled



Illustrations similar

CUSTOMIZED SENSORS



LaCoSys ...

- offers customized sensors and monitoring systems to optimize your process.
- combines process-relevant sensor data with your safety systems.
- creates specially matched sensor systems from different sensor types.

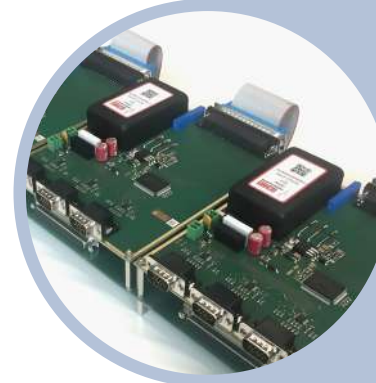
*... adapted to
your surroundings ...*

ACCESSORIES



SmartGain Series

- Low noise fast transimpedance converter for photomultiplier
- Tuned amplifier
- Variable gain amplifiers
- Low noise power amplifier for AOM



High voltage/mems multi array driver

- Signal acquisition, evaluation and reaction for any sensors and actuators
- Sensor-related piezo control
- Hänsch-Couillaud sensor evaluation and phase stabilization



Accessories for the Smart Detect series

- Housing solutions
- Customized housings connect sensors to your environment
- 1" SmartDetect series holders
- SMA cable connectors
- Power supplies

SYSTEMS

LaCoSys systems ...

- offer latest innovative optoelectronics and control systems.
- are customized in hard- and software for systems according to your requirements.
- are equipped with modular laser drivers to allow more flexibility for your future development.
- have a user-friendly operation and a high level of safety for your system and especially for the operator.
- are available from small bundles up to powerful burn-in and test systems.



Individually adapted
burn-in systems



*... we create
your individual
optoelectronic system ...*

BURN-IN & TEST SYSTEMS



- Innovation, state-of-the-art technology, design and modularity combined
- Reduction of application errors
- Optimization of power grid and space utilization
- Maximum flexibility
- Increase in productivity and traceability
- Fulfillment of various criteria such as laser safety, ISO, EMC

*... they not only
look good ...*

The modern **LaCoSys** systems offer:

- A simple and fast adaptability to your requirements due to their modular design
- A comfortable operation via touch display
- Pre-configurable profiles for your standard products
- Automatic transfer of product-specific parameters via profile selection or e.g. barcodes
- Fully automated burn-in and test processes to qualify your laser or laser systems
- Process monitoring and automatic error detection with integrated log function
- A space-saving design for optimal use of space
- An Internet connection, which enables remote maintenance and monitoring of the systems
- Cross-system networking via IOT, e.g. database
- Automated allocation of the burn-in or test station
- A monitoring of power consumption and power network utilization for an increase in productivity



SOFTWARE

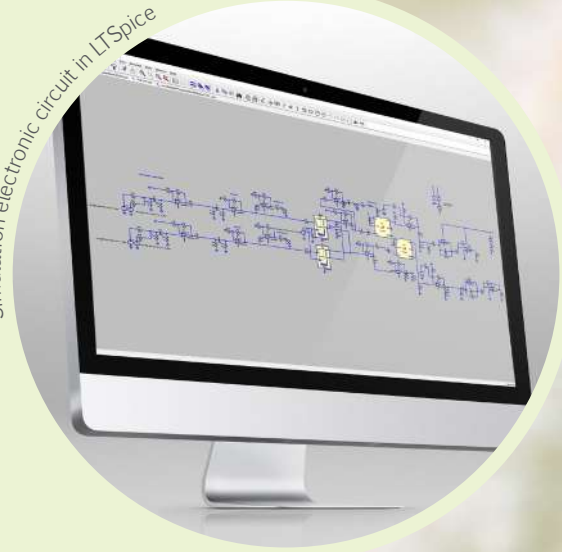
*... benefit from
intuitive user interfaces ...*

LaCoSys is the right partner for you if you need to control complex laser systems.

The highly qualified LaCoSys team develops the appropriate individual software for your laser system in a wide range of services.

- Programming in C++, LabVIEW and Python
- Solution of time critical problems by FPGA
- Circuit simulation
- Integration of motors, laser drivers, waveshapers, EOM / AOM, power meters, cameras, beam combining or laser stabilization systems and many other devices

Simulation electronic circuit in LTSpice



*... customized software solutions
to control your laser system ...*



Customer
interfaces



SUPPORT

The **LaCoSys** team is perfectly qualified to ...

- simulate your electronic systems with LTSpice and carry out feasibility studies.
- support your quality process up to the CE conformity declaration.
- advise you on technical questions in the field of EMC and laser safety.
- optimize your printed circuit board or convert your circuit into a design.
- test your highly sensitive laboratory equipment according to DIN VDE 0701-0702, DGUV V3 maintain and check electronic components of your laser systems.
- be your developing partner for new innovative optoelectronics and control systems.
- develop hardware and software for systems based on your requirements.



... we support you ...





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