Coherent Laser Training Catalog
Customer Training Program
Description of Courses
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Technical Support

In the U.S.:

Should you experience any difficulties with your laser or need any technical information, please visit our Web site [www.Coherent.com](http://www.Coherent.com). Should you need further assistance, please contact Coherent Technical Support via e-mail Product.Support@Coherent.com or telephone, 1-800-367-7890 (1-408-764-4557 outside the U.S.). Please be ready to provide model and laser head serial number of your laser system as well as the description of the problem and any corrective steps attempted to the support engineer responding to your request.

Telephone coverage is available Monday through Friday (except U.S. holidays and company shutdowns). Inquiries received outside normal office hours will be documented by our automatic answering system and will be promptly returned the next business day.

Outside the U.S.:

If you are located outside the U.S., please visit [www.Coherent.com](http://www.Coherent.com) for technical assistance, or phone your local Service Representative. Service Representative phone numbers and addresses can be found on the Coherent web site.

Coherent provides telephone and web-based technical assistance as a service to its customers and assumes no liability thereby for any injury or damage that may occur contemporaneous with such services. Under no circumstances do these support services affect the terms of any warranty agreement between Coherent and the buyer. Operation of any Coherent laser with any of its interlocks defeated is always at the operator's own risk.
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Coherent Training Catalog - Description of Courses

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Coherent offers Advanced Customer and Original Equipment Manufacturer (OEM) training courses which have been designed specifically to help our customers operate and maintain their Coherent lasers. Participants who successfully complete this laser training course will gain a level of knowledge and skill that will allow them to effectively and efficiently operate, optimize, and maintain their laser system.

The customer must have purchased and received a Coherent laser system before attending a course. A pre-course questionnaire must be completed and returned to Coherent at least two weeks before the start of the course.

Instructors

Coherent instructors have extensive knowledge and experience in their areas of product specialty. They have gained their expertise through formal education and by working in various fields such as manufacturing, customer service and engineering. Each instructor creates a professional and comfortable environment that is ideal for learning.

Course Features

Our courses are unique and can be a powerful tool to increase your performance and effectiveness in the workplace. Key features and benefits of the Coherent laser training program include:

- Individually tailored courses, designed to meet the specific needs of our students.
- Small class sizes, ensuring a generous amount of individualized attention and hands-on experience with the laser system
- Emphasis on laser safety
- Professional, experienced instructors
- Official certification upon successful course completion

Registration

To register for a course, call the Coherent Laser Training Facility at (408) 764-4909, or fax the Training Course Inquiry Form on the last page of the preface to (408) 764-4806.

Did you find the course you wanted?

If you do not find a course you are looking for, call us at (408) 764-4909. There are some courses available that do not appear on the schedule. We can prepare special courses to meet specific laser training needs.

A minimum of 8 weeks prior notification is required to process requests for special courses. This includes requests to conduct standard laser training courses, courses listed in this catalog, and courses intended to take place away from Coherent’s laser training facility located in Santa Clara CA. Our training schedule is created based on the laser training course waiting list.
**TERMS AND CONDITIONS**

Terms of Certification

**PLEASE NOTE:** Certification for courses attended will apply only while you are under the employment of the company for which you trained. When/if you are no longer employed by that company, your certification will no longer be valid or recognized by Coherent, Inc.

Terms of Payment

The invoiced amount, or purchase order number, is due at registration.

Cancellations by Students

If you need to cancel your participation in a laser training course, the following fees will apply:

- **For cancellation notice received more than 20 working days before the scheduled course,** no fee is charged.
- **Between 10 and 20 working days before the scheduled course,** a 25% cancellation fee is charged.
- **Fewer than 10 working days before the scheduled course,** 100% of the fee is charged. We recommend you substitute another individual in your place. Participation substitution is acceptable anytime, without penalty.
- **Cancellation notice of a discounted course must be received 20 working days before the scheduled course,** or the discount will be forfeit and the standard training fee will be charged for the rescheduled course. Discounted training must be taken within 6 months of the purchase of the laser system.

Cancellations by Coherent

There is a minimum required number of students per class. Courses not meeting the attendance requirement are subject to cancellation. Coherent will notify students of a course cancellation no fewer than 15 days prior to course start date. At that time, alternative course dates or a priority position on the laser training course waiting list will be provided to the student.

In general, Coherent cannot guarantee that a course will proceed as scheduled. We strongly advise that you do not purchase airline tickets with tight restrictions or cancellation penalties. Coherent accepts no financial responsibility in the event that a training course is canceled.
Reading the Course Descriptions

1. Verdi V-Family Service Course

2. Schedule: Flex Course  Part #: 1060800  Course length: 5 days  Tuition: $6,000

3. Day(s): Monday – Friday

4. Key Topics: Laser and electrical safety; thermal management; power supply layout; circuit familiarization; head design; FAP diagnosis, replacement, and calibration; performing electrical measurements and calibrations; troubleshooting techniques; head-power supply swaps; RS-232 operation; fiber optic inspection; photocell calibrations; current calibrations; PCBA replacement; Servo-Loop analysis; software upgrades.

5. Prerequisites: Complete product knowledge requires a thorough understanding of various electronic devices and their role in the circuit. Students should be able to read schematics and block diagrams and relate them to the actual assembly of printed circuit boards and any other applied circuitry. An understanding of basic laser theory is also recommended.

<table>
<thead>
<tr>
<th>#</th>
<th>LABEL</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>—</td>
<td>Title of laser training course.</td>
</tr>
<tr>
<td>2</td>
<td>Schedule</td>
<td>General times during which the training course is offered.</td>
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<tr>
<td></td>
<td></td>
<td>Upon Request – All courses are scheduled upon a customer request.</td>
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<tr>
<td></td>
<td></td>
<td>Please contact the Training Coordinator to be put on the training course waiting list.</td>
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<td>Once we have enough students to conduct a course, one will be scheduled.</td>
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<tr>
<td>3</td>
<td>Day(s)</td>
<td>The courses are normally offered on weekdays. Students will be notified at time of registration of any changes.</td>
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<tr>
<td>4</td>
<td>Course Length</td>
<td>Number of full days for standard training course.</td>
</tr>
<tr>
<td>5</td>
<td>Begin – End</td>
<td>The course start and end time, standard pacific time. Students will be notified at time of registration of any changes.</td>
</tr>
<tr>
<td>6</td>
<td>Tuition</td>
<td>Cost of training course. Note that “Field Call” courses are performed at the customer site, using the customer’s equipment, and are billed as field service visits.</td>
</tr>
<tr>
<td>7</td>
<td>Course Description</td>
<td>Overview of educational objectives for the training course.</td>
</tr>
<tr>
<td>8</td>
<td>Key Topics &amp; Optional Topics</td>
<td>Specific topics addressed during the training course. Requests for training on any of the listed optional topics should be made at least 30 days prior to the scheduled course start date.</td>
</tr>
<tr>
<td>9</td>
<td>Prerequisites</td>
<td>Knowledge requirement list for the selected training course. Please contact the Coherent laser training facility if you have any questions or would like additional information.</td>
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</tbody>
</table>
TRAINING COURSE INQUIRY FORM

Please complete and return to the Coherent Training Coordinator by fax at (408) 764-4806. (Please indicate in the Preferred Schedule Date and Comments section, if multiple students will attend.)

Please Write Clearly

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Phone Number</th>
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<tr>
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<tr>
<th>E-mail Address</th>
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<table>
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<tr>
<th>Type of Laser System and/or Options</th>
<th>Sales Order Number</th>
<th>Number of Students</th>
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<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>PREFERRED SCHEDULE DATE AND COMMENTS¹</th>
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</table>

¹Schedule dates can be read from the course descriptions on the following pages. Once this inquiry form is received and processed, specific calendar dates for which class spaces are available will be provided. Please allow 24 hours for processing.
**CO₂ Diamond OEM Course**

**Schedule:** Upon request  
**Part #:** 1060892  
**Course length:** 1 day  
**Tuition:** Field Call  
**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** CO₂ Diamond OEM courses are designed for people who service, maintain, and/or integrate the CO₂ laser system. Students will be taught on their specific model of CO₂ laser system. The course covers theory of operation, installation and site requirements, and troubleshooting. Students will learn to identify proper operation and will be qualified to diagnose faults at the major component level. Beam delivery optics and integration will also be discussed.

**Key Topics:** Laser and electrical safety; daily operation; preventive maintenance; specifications; basic theory of operation; troubleshooting; laser mode evaluation; installation and site requirements.

**Optional Topics:** Instruction about remote control (external triggering) of the laser system, available upon advance request.

**Prerequisites:** Complete product knowledge requires a thorough understanding of various electronic devices and their role in the circuit. Students should be able to read schematics and relate them to the actual assembly of printed circuit boards and any other applied circuitry.
CONTINUOUS WAVE

Customer Courses

**MBD-200/266 Customer Course**

<table>
<thead>
<tr>
<th>Schedule:</th>
<th>Upon request</th>
<th>Part #: 1060879</th>
<th>Course length: 2 days</th>
<th>Tuition: Field Call</th>
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</thead>
<tbody>
<tr>
<td>Day(s):</td>
<td>Upon availability</td>
<td></td>
<td>Begin: 9:00 AM</td>
<td>End: 5:00 PM</td>
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**Course Description:** The MBD-200/266 Advanced Course is intended for end customers. The course covers all procedures needed to operate the MBD-200/266 family of second harmonic doubling units. This course is primarily a hands-on course, including extensive lab exercises.

**Key Topics:** Laser and electrical safety; brief description of laser theory; optical cavity and identification of components; specifications; full alignment techniques; crystal phase matching; control box setup; troubleshooting performance issues.

**Prerequisites:** A basic theoretical understanding of optics and nonlinear processes is ideal, as well as some exposure to ring laser systems and optically pumped laser systems. A background in frequency stabilization and locking techniques is also helpful.

**MBR-110 Customer Course**

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<tr>
<th>Schedule:</th>
<th>Upon request</th>
<th>Part #: 1060879</th>
<th>Course length: 2 days</th>
<th>Tuition: Field Call</th>
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<tbody>
<tr>
<td>Day(s):</td>
<td>Upon availability</td>
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<td>Begin: 9:00 AM</td>
<td>End: 5:00 PM</td>
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**Course Description:** The MBR-110 Advanced Course is intended for end customers. The course covers all procedures needed to operate the MBR-110 Ti:Sapphire ring laser system. This course is primarily a hands-on course, including extensive lab exercises.

**Key Topics:** Laser and electrical safety; brief description of laser theory; optical cavity and identification of components; specifications; full alignment procedures; frequency stabilization techniques; electronics setup; troubleshooting performance and electronic issues.

**Prerequisites:** A good theoretical understanding of optics and lasers is ideal. Some exposure to ring cavities, frequency-stabilized, and optically pumped laser systems is preferred, as well as some electronics background.
OEM Courses

Azure OEM Course

Schedule: Upon request   Part #: 1060875   Course length: 1 day   Tuition: Field Call
Day(s): Upon availability   Begin: 9:00 AM   End: 5:00 PM

Course Description: This Azure OEM Course is intended for end customers as well as OEMs. The course covers all procedures needed to operate and maintain the Azure laser system. This course is a lecture based course, but includes lab exercises and demonstrations.

Key Topics: Laser and electrical safety; basic theory of operation; optical cavity and identification of components; specifications; installation; operation and electronics troubleshooting; troubleshooting performance issues.

Prerequisites: Students must have an electronics troubleshooting background, basic theoretical understanding of optics, and nonlinear processes, as well as some exposure to ring laser systems and optically pumped laser systems.
**Avia OEM Course**

**Schedule:** Upon request  
**Part #:** 1060874  
**Course length:** 2 days  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** The Avia OEM Course prepares students to install, operate, and maintain the laser system. Students will also learn how to teach others to control and operate the system. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure they are capable of operating and maintaining the laser system.

**Key Topics:** Laser and electrical safety; thermal management; FAP diagnosis, replacement, and calibration; performance verification; ThermaTrack; SHG/THG/FHG temperature optimization; head-power supply swaps; RS-232 operation; software upgrades.

**Prerequisites:** Some experience with lasers and laser safety is ideal. An understanding of optics, and electronics is recommended.

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**Matrix OEM Course**

**Schedule:** Upon request  
**Part #:** 1172329  
**Course length:** 1 day  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** The Matrix OEM Course familiarizes students with the system components and optional accessories. It demonstrates installation, operation, and troubleshooting on a user level.

**Key Topics:** Determine whether the system behaves normally under nominal conditions, specifically verification of laser pulse parameters; most relevant interface functions; usage of RS232 commands and graphical interface; understand possible pitfalls and capture mandatory information to allow factory support assisting to solve configuration issues; head-power supply swaps; software upgrades.

**Prerequisites:** Students should have a general understanding of laser beam parameters, Q-switched laser principle, basic electronics knowledge, as well as hands-on experience in oscilloscope measurements.
Paladin OEM Course

Schedule: Upon request  Part #: 1060872  Course length: 2 days  Tuition: Field Call
Day(s): Upon availability

Course Description: The Paladin OEM Course prepares students to install, operate, perform limited troubleshooting, and maintain the laser. Course content includes basic theory of operation and basic troubleshooting. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of supporting the product in the field.

Key Topics: Laser and electrical safety; thermal management; laser head, power supply, and chiller layout; FAP assembly replacement; performing output power calibration; limited troubleshooting techniques; desiccant chamber(s) removal and replacement; Brewster window cleaning; head, power supply, and chiller swaps; RS-232 operation; modem programming.

Prerequisites: Complete product knowledge requires a general understanding of various optical and electronic devices and their role within the laser system. Students should be able to read block diagrams. Personal laptop for class participation is strongly suggested.

Talisker OEM Course

Schedule: Upon request  Part #: 1173112  Course length: 1-2 day  Tuition: Field Call
Day(s): Upon availability

Course Description: The Talisker OEM Course is designed to train students with a theoretical overview, installation with performance verification (pulse energy stability, beam profile, and power measurement), GUI operation, and basic maintenance and troubleshooting including the chiller.

Key Topics: Laser and electrical safety, theory of operation, proper installation and first-time setup; turn-on and off procedures; laser optimization; monitoring fast photo diode output; chiller fluid and filter replacement; fault troubleshooting.

Prerequisites: A basic theoretical understanding of optics and lasers is strongly recommended, but not required.

Verdi OEM Course

Schedule: Upon request  Part #: 1060800  Course length: 2 days  Tuition: Field Call
Day(s): Upon availability

Course Description: The Verdi OEM Course prepares students to install, operate, and maintain the laser system. Students will also learn how to teach others to control and operate the system. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating and maintaining the laser system.

Key Topics: Laser and electrical safety; thermal management; FAP diagnosis, replacement, and calibration; SHG temperature optimization; head-power supply swaps; RS-232 operation; software upgrades.

Prerequisites: Some experience with lasers and laser safety is ideal. An understanding of optics and electronics is recommended.
Vitesse OEM Course

Schedule: Upon request  Part #: 1060801  Course length: 2 days  Tuition: Field Call
Day(s): Upon availability  Begin: 9:00 AM  End: 5:00 PM

Course Description: The Vitesse OEM Course prepares students to install, operate, and maintain the laser system. Students will also learn how to teach others to control and operate the system. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating and maintaining the laser system.

Key Topics: Laser and electrical safety; thermal management; power supply layout; head design; FAP diagnosis, replacement, and calibration; RS-232 operation; software upgrades; re-centering PZTs.

Prerequisites: Some experience with lasers and laser safety is ideal. An understanding of optics and electronics is recommended.
Customer Courses

**Innova 70, 90, 300 Customer Course**

<table>
<thead>
<tr>
<th>Schedule:</th>
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<tr>
<td>Day(s):</td>
<td>Upon availability</td>
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<tr>
<td>Part #:</td>
<td>1060886</td>
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<tr>
<td>Course length:</td>
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<td>Tuition:</td>
<td>Field Call</td>
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<td>Begin:</td>
<td>9:00 AM</td>
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<td>End:</td>
<td>5:00 PM</td>
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</table>

**Course Description:** The Advanced Customer Training Course prepares students to operate, troubleshoot, repair common problems, and maintain the laser. Students will also learn how to teach others to control and operate the system. Course content ranges from basic theory of operation to basic optical troubleshooting. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of supporting the product in the field.

**Key Topics:** Laser and electrical safety; detailed optical alignment, head and power supply layout; electrical measurements and calibrations not requiring a service EPROM.

**Prerequisites:** Successful completion of the installation and on site training course, basic electronics, and familiarity with basic laser theory.

**Innova 90 or 300 FreD/MotoFreD Customer Course**

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<th>Schedule:</th>
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<tr>
<td>Day(s):</td>
<td>Upon availability</td>
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<tr>
<td>Part #:</td>
<td>1060887</td>
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<tr>
<td>Course length:</td>
<td>3 day</td>
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<td>Tuition:</td>
<td>Field Call</td>
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<td>Begin:</td>
<td>9:00 AM</td>
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<td>End:</td>
<td>5:00 PM</td>
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</table>

**Course Description:** The Advanced Customer Training Course prepares students to operate, troubleshoot, repair common problems, and maintain the laser. Students will also learn how to teach others to control and operate the system. Course content ranges from basic theory of operation to basic optical troubleshooting. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of supporting the product in the field.

**Key Topics:** Laser and electrical safety; detailed optical alignment; head and power supply layout; electrical measurements and calibrations not requiring a service EPROM.

**Prerequisites:** Successful completion of the installation and on site training course, basic electronics, and familiarity with basic laser theory.
**Innova Sabre Customer Course**

**Schedule:** Upon request  
**Part #:** 1060884  
**Course length:** 1 day  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** The Advanced Sabre Customer Training Course prepares students to operate, troubleshoot, repair common problems, and maintain the laser. Students will also learn how to teach others to control and operate the system. Course content ranges from basic theory of operation to optical troubleshooting. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of supporting the product in the field.

**Key Topics:** Laser and electrical safety; detailed optical alignment; head and power supply layout; electrical measurements and calibrations not requiring a service EPROM.

**Prerequisites:** Successful completion of the installation and on site training course, basic electronics, and familiarity with basic laser theory.

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**Innova Sabre FreD/MotoFreD Customer Course**

**Schedule:** Upon request  
**Part #:** 1060885  
**Course length:** 3 days  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** Instruction is provided on the proper techniques for aligning, operating, and maintaining the Innova Sabre FreD/MotoFreD laser system. Course lectures detail how specific undesirable characteristics in the laser system output can be traced to the misalignment or failure of specific assemblies and/or modules within the laser cavity. Extensive laboratory time is spent operating and optimizing the laser system in the SHG and the fundamental configurations.

**Key Topics:** Introduction to the theory of frequency doubling; system installation; doubling hardware; alignment; calibration and operation; crystal maintenance. Also included is an introduction to the Innova Sabre laser head, resonator, tube, and magnet assembly; optics and alignment; optics cleaning; walking and aligning the laser for best mode and power.

**Optional Topics:** Fault message troubleshooting to the major assembly level, including reintegration of the faulty assembly (head, power supply, heat exchanger, and remote), available upon advance request.

**Prerequisites:** Some prior working experience with lasers, laser theory, and general laboratory safety practices is ideal, but not required. A basic theoretical understanding of optics is also ideal.
Customer Courses

Laser Machining Center Applications Course

Schedule: Monthly – second week  Part #: 1191407  Course length: 3 days  Tuition: $3,600
Day(s): Tuesday – Thursday  Begin: 9:00 AM  End: 5:00 PM

Course Description: The Laser Machining Center Applications Course prepares students to understand the basics of materials processing using laser cutting and engraving as the primary medium. The primary focus of the course is based on metal processing, since applied knowledge of metals is the basis for cutting all organic materials using laser techniques. Students will learn the operation, troubleshooting, and preventive maintenance of a complex laser machining system. They will also learn a variety of techniques to clean cut metals, develop “machine ready” programs and conversions from CAD databases, move prototype jobs to high volume “step and repeat” production runs, and many other production ready techniques. Course content ranges from basic laser theory of operation to advanced LaserLink programming. Hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of efficient use of the product in the field.

Key Topics: Laser and electrical safety; CAD database program conversion; laser machining basics; materials and process parameter selection; LaserLink SW operation; Vision system set-up and control; system set-up, preventive maintenance, and calibration; troubleshooting and fault diagnosis techniques; laser machining center optimization techniques.

Prerequisites: Technically oriented vocational training or experience in sheet metal or material processing. Product operation requires basic computer skills and network infrastructure knowledge. Understanding of CAD based source files for the object that will be machined. Technical understanding of basic automation machine tools and the operator interface required to run the machine. Students should be able to read mechanical drawings and verify the machined result using appropriate measurement tools.
## PULSED

### Customer Courses

#### Evolution 15/30/45 Customer Course

<table>
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<tr>
<th>Schedule:</th>
<th>Upon request</th>
<th>Part #:</th>
<th>1054395</th>
<th>Course length:</th>
<th>2 days</th>
<th>Tuition:</th>
<th>Field Call</th>
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<tbody>
<tr>
<td>Day(s):</td>
<td>Upon availability</td>
<td></td>
<td></td>
<td>Begin:</td>
<td>9:00 AM</td>
<td>End:</td>
<td>5:00 PM</td>
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**Course Description:** This course is intended for OEMs as well as end customers. It is designed to train students on the proper techniques for maintaining an Evolution 15/30 laser system. Emphasis is placed on quick and efficient repairs in the field that minimize customer downtime. Students will learn the proper approach to the optical optimization, troubleshooting techniques, and performance verification of the laser system.

**Key Topics:** Laser and electrical safety; brief description of laser theory; installation procedures and facility requirements; daily operation; optical optimization; LBO temperature optimization; electronic and optical troubleshooting; head and power supply swaps; diode temperature optimization.

**Prerequisites:** Complete product knowledge requires a good understanding of various electronic and optical devices, optically pumped laser theory, and non-linear optical processes.

#### Evolution 75/90/HE Customer Course

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<th>Upon request</th>
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<td></td>
<td>Begin:</td>
<td>9:00 AM</td>
<td>End:</td>
<td>5:00 PM</td>
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**Course Description:** This course is intended for OEMs as well as end customers. It is designed to train students on the proper techniques for maintaining an Evolution 75/90/HE laser system. Emphasis is placed on quick and efficient repairs in the field that minimize customer downtime. Students will learn the proper approach to the optical optimization, troubleshooting techniques, and performance verification of the laser system.

**Key Topics:** Laser and electrical safety; brief description of laser theory; installation procedures and facility requirements; daily operation; optical optimization; LBO temperature optimization; electronic and optical troubleshooting; head and power supply swaps; diode temperature optimization.

**Prerequisites:** Complete product knowledge requires a good understanding of various electronic and optical devices, optically pumped laser theory, and non-linear optical processes.
Revolution Customer Course

Schedule: Upon request  
Part #: 1054395  
Course length: 2 days  
Tuition: Field Call  

Day(s): Upon availability  
Begin: 9:00 AM  
End: 5:00 PM  

Course Description: This course is intended for OEMs as well as end customers. It is designed to train students on the proper techniques for maintaining an Revolution laser system. Emphasis is placed on quick and efficient repairs in the field that minimize customer downtime. Students will learn the proper approach to the optical optimization, troubleshooting techniques, and performance verification of the laser system.

Key Topics: Laser and electrical safety; brief description of laser theory; installation procedures and facility requirements; daily operation; optical optimization; LBO temperature optimization; electronic and optical troubleshooting; head and power supply swaps; diode temperature optimization.

Prerequisites: Complete product knowledge requires a good understanding of various electronic and optical devices, optically pumped laser theory, and non-linear optical processes.
### ULTRAFAST

#### Customer Courses

**Chameleon Ultra/Ultra II/Vision/Vision-S Customer Course**

<table>
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<td>Day(s): Upon availability</td>
<td>Begin: 9:00 AM</td>
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**Course Description:** The Chameleon Customer Course for Ultra/Ultra II/Vision/Vision-S prepares students to install, operate, and maintain the laser system.

**Key Topics:** Laser and electrical safety; thermal and humidity management; re-centering PZT's; monitoring wavelength calibration with an optional Spectrometer; customer RS-232 operation.

**Prerequisites:** Some experience with lasers and laser safety is recommended.

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**Legend (Any Version) Customer Course**

<table>
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<th>Schedule</th>
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<th>Tuition</th>
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<td>1135442</td>
<td>3 days</td>
<td>Field Call</td>
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<td>Day(s): Upon availability</td>
<td>Begin: 9:00 AM</td>
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**Course Description:** The Legend Customer Training Course prepares students to better operate, maintain, and troubleshoot their laser. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the laser system. After the presentation the, instructor walks the students through the optical alignment of the stretcher, Regen cavity, and compressor. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not cover the Seed or Pump laser.

**Key Topics:** Laser and electrical safety; review of specifications and typical operating conditions; laser basics; theory of operation, including the concept of Chirped Pulse Amplification; review of optical beam paths; demonstration of alignment optimization; system optimization; maintenance procedures; optics cleaning; SDG timing; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

**Prerequisites:** Students must have attended the basic training courses for their Legend pump (Evolution) and seed (Mira, Micra, Chameleon or Vitesse) lasers. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
Libra Customer Course

Schedule: Upon request  Part #: 1135446  Course length: 3 days  Tuition: Field Call

Day(s): Upon availability  Begin: 9:00 AM  End: 5:00 PM

Course Description: The Libra Customer Training Course prepares students to better operate, maintain, and troubleshoot their laser. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the laser system which includes the integrated Pump and Seed laser. After the presentation the instructor, walks the students through the optical alignment of the stretcher, Regen cavity, and compressor. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; Verdi/Vitesse and Evolution presentation; laser basics; theory of operation, including the concept of Chirped Pulse Amplification; Review of optical beam paths; demonstration of alignment optimization; system optimization; software control and instructions; maintenance procedures; optics cleaning; SDG timing; diode calibration; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

Prerequisites: A basic theoretical understanding of optics and lasers is strongly recommended, but not required.

Mantis + CPC Customer Course

Schedule: Upon request  Part #: 1173434  Course length: 2 days  Tuition: Field Call

Day(s): Upon availability  Begin: 9:00 AM  End: 5:00 PM

Course Description: The Mantis + CPC course better prepares students to operate the Mantis ultrafast laser and the Compact Pulse Compressor (CPC) accessory. Course content ranges from basic theory to day-to-day operation. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating the laser.

Key Topics: Laser and electrical safety; theory of operation; modelocking; optical components and alignment; OPSL pump laser; bandwidth adjustment; pulse compression; negative dispersion mirrors.

Optional Topics: Instruction about advanced optimization of laser output characteristics can also be provided.

Prerequisites: A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
### Micra Customer Course

**Schedule:** Upon request  
**Part #:** 1135448  
**Course length:** 2 days  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** The Micra Customer Training course covers operation, maintenance, and alignment of either the Micra-5 or Micra-10 oscillator. The course focuses on the topics listed below, tailored to a level which is appropriate for the students. Hands-on experience with the system is heavily emphasized.

**Key Topics:** Laser and electrical safety; brief description of laser theory; modelocking; specifications; optical cavity and identification of components; daily operation and maintenance; center wavelength and bandwidth adjustments; troubleshooting techniques.

**Optional Topics:** Instruction about advanced optimization of laser output characteristics can also be provided.

**Prerequisites:** A basic theoretical understanding of optics and lasers is strongly recommended, but not required.

### Mira (F or P) Customer Course

**Schedule:** Upon request  
**Part #:** 1060878  
**Course length:** 2 days  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** The Mira Customer Training Course prepares students to better operate, maintain, and troubleshoot their laser. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the laser system. After the presentation, the instructor walks the students through the optical alignment of the oscillator cavity. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course typically does not include the pump laser.

**Key Topics:** Laser and electrical safety; review of specifications and typical operating conditions; laser basics; theory of operation including the concept of dispersion compensation and modelocking; review of optical beam paths; demonstration of alignment optimization in CW and main cavity; modelocking the laser; pulsewidth optimization; wavelength tuning; system optimization; using the Mira Optima control box; maintenance procedures; optics cleaning; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

**Prerequisites:** A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
Mira (Dual) Customer Course

Schedule: Upon request Part #: 1060878 Course length: 3 days Tuition: Field Call
Day(s): Upon availability Begin: 9:00 AM End: 5:00 PM

Course Description: The Mira Customer Training Course prepares students to better operate, maintain, and troubleshoot their laser. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the laser system. After the presentation, the instructor walks the students through the optical alignment of the oscillator cavity. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course typically does not include the pump laser.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; laser basics; theory of operation, including the concept of dispersion compensation and modelocking; review of optical beam paths; demonstration of alignment optimization in CW and main cavity; modelocking the laser; pulsewidth optimization; wavelength tuning; system optimization; using the Mira Optima control box; maintenance procedures; optics cleaning; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

Prerequisites: A basic theoretical understanding of optics and lasers is strongly recommended, but not required.

Mira Accessories (Pulse Picker, Synchrolock AP, Harmonic Generator or Pulseswitch) Customer Course

Schedule: Upon request Part #: 1135449 Course length: 1 days Tuition: Field Call
Day(s): Upon availability Begin: 9:00 AM End: 5:00 PM

Course Description: The Mira Accessory Customer Training Course prepares students to better operate, maintain, and troubleshoot their Mira Accessory. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation or discussion of the accessory. After the presentation, the instructor walks the students through the optical alignment of the accessory. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not include the Mira or its pump laser.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; theory of operation; review of optical beam paths; demonstration of alignment; system optimization; using the system's control box; maintenance procedures; optics cleaning; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

Prerequisites: The students must have attended the training course for their Mira lasers. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
Mira-OPO (Any Version) Customer Course

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<td>Day(s): Upon availability</td>
<td>Begin: 9:00 AM</td>
<td>End: 5:00 PM</td>
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</tbody>
</table>

Course Description: The Mira OPO Customer Training Course prepares students to better operate, maintain, and troubleshoot their Mira OPO. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the Mira OPO. After the presentation, the instructor walks the students through the optical alignment of OPO. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not include the Mira or its pump laser.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; laser and OPO basics; theory of operation; review of optical beam paths; demonstration of alignment optimization of both YAG and OPO cavities; pulsewidth optimization; wavelength tuning; system optimization; using the OPO control box and diagnostics; maintenance procedures; optics cleaning; turn on/off procedures; discussion of additional available/typical diagnostics; troubleshooting scenarios.

Prerequisites: The students must have attended the training course for their Mira laser. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.

OPerA Solo Customer Course

<table>
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<th>Schedule: Upon request</th>
<th>Part #: 1135450</th>
<th>Course length: 2 days</th>
<th>Tuition: Field Call</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>3 days with accessories</td>
<td></td>
</tr>
<tr>
<td>Day(s): Upon availability</td>
<td>Begin: 9:00 AM</td>
<td>End: 5:00 PM</td>
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</table>

Course Description: The OPerA Solo Customer Training Course prepares students to better operate, maintain and troubleshoot their OPerA Solo and accessories (if present). The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the OPA. After the presentation, the instructor walks the students through the optical alignment of OPA and accessories (if present). Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not include the KHz amplifier, its seed laser, or any pump lasers.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; laser and OPA basics; theory of operation; review of optical beam paths; demonstration of alignment optimization; wavelength tuning and calibration; system optimization; software control and instructions; maintenance procedures; optics cleaning; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

Prerequisites: Students must have attended the training course for their KHz amplifier and all of its prerequisites. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
RegA 9000 or 9050 Customer Course

Schedule: Upon request  Part #: 1060880  Course length: 2 days  Tuition: Field Call
Day(s): Upon availability  Begin: 9:00 AM  End: 5:00 PM

Course Description: The RegA Advanced Customer Training Course prepares students to better operate, maintain, and troubleshoot their laser. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the laser system. After the presentation, the instructor walks the students through the optical alignment of the stretcher (for 9050, not 9000), Regen cavity, and compressor. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not cover the Seed or Pump laser.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; laser basics; theory of operation, including the concept of chirped pulse amplification; review of optical beam paths; demonstration of alignment optimization; system optimization; maintenance procedures; optics cleaning; using the control box; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

Prerequisites: Students must have attended the basic training courses for their RegA seed (Mira, Micra or Vitesse) laser. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.

RegA OPA Customer Course

Schedule: Upon request  Part #: 1060880  Course length: 2 days  Tuition: Field Call
Day(s): Upon availability  Begin: 9:00 AM  End: 5:00 PM

Course Description: The RegA OPA Customer Training Course prepares students to better operate, maintain, and troubleshoot the RegA OPA. The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the OPA. After the presentation, the instructor walks the students through the optical alignment of OPA. Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not include the RegA, its seed laser or any pump lasers.

Key Topics: Laser and electrical safety; review of specifications and typical operating conditions; laser and OPA basics; theory of operation; review of optical beam paths; demonstration of alignment optimization; wavelength tuning; system optimization; maintenance procedures; optics cleaning; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

Prerequisites: Students must have attended the training course for their RegA laser and all of its prerequisites. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
**Topas C Customer Course**

**Schedule:** Upon request  
**Part #:** 1135450  
**Course length:** 2 days  
3 days with accessories  
**Tuition:** Field Call

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** The Topas C Customer Training Course prepares students to better operate, maintain, and troubleshoot their OPA and accessories (if present). The course content is flexible and often customized to the needs and interest of the students attending. A typical course covers the key topics listed below, tailored to a level which is appropriate for the students. The course begins with a presentation on laser safety followed by a presentation on the OPA. After the presentation, the instructor walks the students through the optical alignment of OPA and accessories (if present). Various troubleshooting techniques are discussed at this time. The optical hands-on is limited to a few basic adjustments in order to preserve the current operating condition of the installed laser system. If time permits, various troubleshooting scenarios will be staged by the instructor for the students to resolve. The course does not include the KHz amplifier, its seed laser, or any pump lasers.

**Key Topics:** Laser and electrical safety; review of specifications and typical operating conditions; laser and OPA basics; theory of operation; review of optical beam paths; demonstration of alignment optimization; wavelength tuning and calibration; system optimization; software control and instructions; maintenance procedures; optics cleaning; turn on/off procedures; discussion of available/typical diagnostics; troubleshooting scenarios.

**Prerequisites:** Students must have attended the training course for their KHz amplifier and all of its prerequisites. A basic theoretical understanding of optics and lasers is strongly recommended, but not required.
**Excimer**

Excimer training courses are conducted at our Coherent GmbH Göttingen/Germany facility.

## Operator Courses

### CompexPro/LPXPro Level-A Course (Operation)

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<th>Course length: 2 days</th>
<th>Tuition: $4,000.00 US 3,000.00 €</th>
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</table>

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM  

**Course Description:** Maximum 4 trainees. The CompexPro/LPXPro A-Level course prepares students to operate the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function to operation. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating the laser system safely.

**Key Topics:** Function of all main modules like laser tube, HV circuit, Thyratron, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check.

**Prerequisites:** Complete product knowledge requires a basic understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, some basic knowledge of how to read schematics and/or block diagrams would be very helpful.

### LEAP Level-A Course (Operation)

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</tbody>
</table>

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM  

**Course Description:** Max 4 trainees. The LEAP A-level training course prepares students to operate the laser system. Students will be also informed about safety aspects at the system, as well as main sources of hazard. Course content ranges from basic theory of laser function to operation. Extensive hands-on laboratory time allows students to test their knowledge and to develop skills to ensure that they are capable of operating the laser system safely.

**Key Topics:** Function of all main modules like laser tube, ASSP, gas handling, water cooling, energy monitor and internal and external communication; Safety aspect and source of hazard; Operation of the laser system in different work modes; Performance check.

**Prerequisites:** Complete product knowledge requires a thorough understanding of various electronic devices and their role in the circuit. You should be able to read schematics and block diagrams and relate them to actual assembly of printed circuit boards and any other applied circuitry. Student should be able to read and speak English or German.
Coherent Training Catalog

**Excistar S Ind./Indystar Level-A Course (Operation)**

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<th>Course length: 2 days</th>
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**Day(s):** Upon availability  
Begin: 9:00 AM  
End: 5:00 PM

**Course Description:** Maximum 4 trainees. The Excistar S Ind./Indystar A-Level course prepares students to operate the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function to operation. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating the laser system safely.

**Key Topics:** Function of all main modules like laser tube, HV circuit, Thyratron, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check.

**Prerequisites:** Complete product knowledge requires a basic understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, some basic knowledge of how to read schematics and/or block diagrams would be very helpful.

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**Excistar XS Level-A Course (Operation)**

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<th>Course length: 1 days</th>
<th>Tuition: $2,000.00 US 1,500,00 €</th>
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**Day(s):** Upon availability  
Begin: 9:00 AM  
End: 5:00 PM

**Course Description:** Maximum 4 trainees. The Excistar XS A-Level course prepares students to operate the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function to operation. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating the laser system safely.

**Key Topics:** Function of all main modules like laser tube, HV circuit, Thyratron, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check.

**Prerequisites:** Complete product knowledge requires a basic understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, some basic knowledge of how to read schematics and/or block diagrams would be very helpful.
LSX Level-A Course (Operation)

Schedule: Upon request  |  Part #: 1100634  |  Course length: 2 days  |  Tuition: $5,200.00 US  
|  |  |  | 4,000,00 €

Day(s): Upon availability  |  Begin: 9:00 AM  |  End: 5:00 PM

Course Description: Maximum 4 trainees. The LSX A-Level Course prepares students to operate the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function and operation. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating the laser system safely.

Key Topics: Function of all main modules like laser tube, ASSP, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles.

Prerequisites: Complete product knowledge requires a basic understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, some basic knowledge of how to read schematics and/or block diagrams would be very helpful.

Vyper Level-A Course (Operation)

Schedule: Upon request  |  Part #: 1100634  |  Course length: 2 days  |  Tuition: $5,200.00 US  
|  |  |  | 4,000,00 €

Day(s): Upon availability  |  Begin: 9:00 AM  |  End: 5:00 PM

Course Description: Maximum 4 trainees. The Vyper A-Level Course prepares students to operate the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function and operation. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating the laser system safely.

Key Topics: Function of all main modules like laser tube, ASSP, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles.

Prerequisites: Complete product knowledge requires a basic understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, some basic knowledge of how to read schematics and/or block diagrams would be very helpful.
Maintenance Courses

CompexPro/LPXPro Level-B Course (Maintenance)

Schedule: Upon request  Part #: 1100554/1100598  Course length: 4 days  Tuition: $8,000.00 US
6,000.00 €

Day(s): Monday-Thursday or Tuesday-Friday  Begin: 9:00 AM  End: 5:00 PM

Course Description: Maximum 4 trainees. The CompexPro/LPXPro B-Level course prepares students to
operate and maintain the laser. Students will also be informed about the safety aspect at the system, as well as all
main sources of hazard. Course content ranges from basic theory of laser function, laser operation to laser main-
tenance procedures. Extensive hands-on laboratory time allows students to test their knowledge and develop skills
to ensure that they are capable of operating and maintaining the laser system safely.

Key Topics: Function of all main modules like laser tube, HV circuit, Thyratron, gas handling, water cooling,
energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the
laser system in different working modes and duty cycles; performance check; laser maintenance procedures like
new fill, optic cleaning/exchange, alignment, calibration, and halogen filter exchange.

Prerequisites: Complete product knowledge requires a extended understanding of electronic and optical
systems. Students should be able to read and speak English or German. Also, knowledge of how to read sche-
matics and/or block diagrams would be very helpful.

LEAP Level-B Course (Maintenance)

Schedule: upon request  Part #: XXXXXXX  Course length: 4 days  Tuition: $8,000.00

Day(s): upon availability  Begin: 9:00 AM  End: 5:00 PM

Course Description: Max 4 trainees. The LEAP A-level training course prepares students to operate the laser
system. Students will be also informed about safety aspects at the system, as well as main sources of hazard.
Course content ranges from basic theory of laser function, laser operation to laser maintenance procedures. Exten-
sive hands-on laboratory time allows students to test their knowledge and to develop skills to ensure that they are
capable of operating and maintaining the laser system safely.

Key Topics: Function of all main modules like laser tube, ASSP, gas handling, water cooling, energy monitor and
internal and external communication; Safety aspect and source of hazard; Operation of the laser system in
different work modes; Performance check; laser maintenance procedures like New Fill, optic cleaning and
exchange, alignment, calibration, and halogen filter exchange.

Prerequisites: Complete product knowledge requires a thorough understanding of various electronic devices and
their role in the circuit. You should be able to read schematics and block diagrams and relate them to actual
assembly of printed circuit boards and any other applied circuitry. Student should be able to read and speak
English or German.
**Description of Courses**

**Excistar S Ind./Indystar Level-B Course (Maintenance)**

<table>
<thead>
<tr>
<th>Schedule:</th>
<th>Upon request</th>
<th>Part #: 1170394</th>
<th>Course length:</th>
<th>4 days</th>
<th>Tuition:</th>
<th>$8,000.00 US 6,000,00 €</th>
</tr>
</thead>
</table>

**Day(s):** Monday-Thursday or Tuesday-Friday  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** Maximum 4 trainees. The Excistar S Ind./Indystar B-Level course prepares students to operate and maintain the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function, laser operation to laser maintenance procedures. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating and maintaining the laser system safely.

**Key Topics:** Function of all main modules like laser tube, HV circuit, Thyatron, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check; laser maintenance procedures like new fill, optic cleaning/exchange, alignment, calibration, and halogen filter exchange.

**Prerequisites:** Complete product knowledge requires an extended understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, knowledge of how to read schematics and/or block diagrams would be very helpful.

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**Excistar XS Level-B Course (Maintenance)**

<table>
<thead>
<tr>
<th>Schedule:</th>
<th>Upon request</th>
<th>Part #: 1170393</th>
<th>Course length:</th>
<th>2 days</th>
<th>Tuition:</th>
<th>$5,200.00 US 4,000,00 €</th>
</tr>
</thead>
</table>

**Day(s):** Monday-Thursday or Tuesday-Friday  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** Maximum 4 trainees. The Excistar I Ind./Excistar XS B-Level course prepares students to operate and maintain the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function, laser operation to laser maintenance procedures. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating and maintaining the laser system safely.

**Key Topics:** Function of all main modules like laser tube, HV circuit, Thyatron, gas handling, water cooling, energy monitoring, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check; laser maintenance procedures like new fill, optic cleaning/exchange, alignment, calibration, and halogen filter exchange.

**Prerequisites:** Complete product knowledge requires an extended understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, knowledge of how to read schematics and/or block diagrams would be very helpful.
## LSX Level-B Course (Maintenance)

**Schedule:** Upon request  
**Part #:** 1100634  
**Course length:** 4 days  
**Tuition:** $10,400.00 US  
8,000.00 €

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** Maximum 4 trainees. The LSX B-Level course prepares students to operate and maintain the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function, laser operation to laser maintenance procedures. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating and maintaining the laser system safely.

**Key Topics:** Function of all main modules like laser tube, ASSP, gas handling, water cooling, energy monitoring, Cryo-function, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check; laser maintenance procedures like new fill, optic cleaning/exchange, alignment, calibration, and halogen filter exchange.

**Prerequisites:** Complete product knowledge requires an extended understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, knowledge of how to read schematics and/or block diagrams would be very helpful.

## Vyper Level-B Course (Maintenance)

**Schedule:** Upon request  
**Part #:** 1100634  
**Course length:** 5 days  
**Tuition:** $10,400.00 US  
8,000.00 €

**Day(s):** Upon availability  
**Begin:** 9:00 AM  
**End:** 5:00 PM

**Course Description:** Maximum 4 trainees. The Vyper B-Level course prepares students to operate and maintain the laser. Students will also be informed about the safety aspect at the system, as well as all main sources of hazard. Course content ranges from basic theory of laser function, laser operation to laser maintenance procedures. Extensive hands-on laboratory time allows students to test their knowledge and develop skills to ensure that they are capable of operating and maintaining the laser system safely.

**Key Topics:** Function of all main modules like laser tube, ASSP, gas handling, water cooling, energy monitoring, Cryo-function, and internal and external communication; safety aspect and sources of hazard; operation of the laser system in different working modes and duty cycles; performance check; laser maintenance procedures like new fill, optic cleaning/exchange, alignment, calibration, and halogen filter exchange.

**Prerequisites:** Complete product knowledge requires an extended understanding of electronic and optical systems. Students should be able to read and speak English or German. Also, knowledge of how to read schematics and/or block diagrams would be very helpful.