



# USER GUIDE

## UV LASER MARKING MODULE SERIES



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## PREFACE

Ensure you read and understand this guide in its entirety and familiarize yourself with the operating and maintenance instructions before you use the product. IPG strongly recommends that all operators of the product read and pay particular attention to all safety information contained herein prior to operating the product.

This guide should stay with the product to provide you and all future operators, users, and owners of the product with important operating, safety, and other information.

For technical assistance concerning the product, contact IPG Customer Service in Oxford, Massachusetts, USA at 508-373-1157.

### Audience

The audience for this guide is system integrators and technicians responsible for installing and operating the product in industrial and non-industrial installations.

### Intended Use

The product represents a new generation of diode-pumped CW fiber lasers in world leading small form factor, with a unique combination of high power, ideal beam quality, fiber delivery and high wall-plug efficiency. The product is offered as a cost effective, adaptable solution for a clean room system or for integration into a production line.

### Note

The language of the original instructions is English.

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## OVERVIEW

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- **1.1 Introduction**
  - Additional Documentation
  - Applications: Industrial and General Manufacturing
  - Key Terms
- **1.2 Certification**
  - Recommended Requirements

## 1.1 INTRODUCTION

The UV Laser Marking Module consists of a new generation pulsed fiber laser, which is fully integrated with a 2-axis scanning system.

The UV Laser Marking Module also includes control electronics and scanning optics. This complete module comes fully optimized, pre-calibrated, and designed to help integrators enhance their laser marking products.

The UV Laser Marking Module also lets you use industry standard command inputs for use with your own scan controller and marking software.

There are two versions of the UV Laser Marking Module covered in this guide:

- Laser Marking Module XY2-100
- Laser Marking Module with Integrated Scan Controller

### 1.1.1 ADDITIONAL DOCUMENTATION

Refer to the following documentation included with the product:

- Specification Ytterbium Pulsed Fiber Laser - UV sources

### 1.1.2 APPLICATIONS

Industrial and General Manufacturing – Varieties of Materials: Stainless Steel, Aluminum, Brass, Nickel Alloy, Silver, and polymers such as Polycarbonate, HDPE, and Silicone.

### 1.1.3 KEY TERMS

Laser Source – responsible for generating the laser beam.

Scan Head – deflects a laser beam using galvo-controlled mirrors through a scanning lens.

Laser Marking – delivers and focuses a laser beam on a target surface.

## 1.2 CERTIFICATION

IPG certifies that the Laser Marking Module is thoroughly tested and inspected, and meets published specifications prior to shipping.

Upon receiving your shipment, check the packaging for any possible damage that could have occurred in transit. If damage is apparent, contact IPG immediately.

This product does not comply with IEC 60825, 21 CFR 1040.10 and/or 1040.11. For use as a system component only. It is the responsibility of the purchaser/end-user to bring the end system into full compliance with all applicable regulations.

### 1.2.1 RECOMMENDED REQUIREMENTS

IPG recommends the following additional requirements for your product:

- Safety Switch
- Z Stage Positioner to hold Optical Scanner Head
- Fume Extraction System to remove gases and particles released during the laser marking process.
- Protective Enclosure

## SAFETY INFORMATION

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- **2.1 Safety Conventions**
- **2.2 Safety Requirements and Features**
  - EMC Compliance
  - Laser Classification: Class IV Laser Product
  - Laser Safety Eyewear
  - Device Safety Labels
- **2.3 General Safety Instructions**
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- **2.4 Electrical Safety**
- **2.5 Environmental Safety**
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  - Process By-Product
- **2.6 Additional Safety Resources**





## 2.1 SAFETY CONVENTIONS

To ensure the safe operation and optimal performance of the product, follow all warnings in this guide. Safety precautions must be observed during all phases of operation, maintenance, and service.

Operators must adhere to these recommendations and to apply sound laser safety practices at all times. Never open the device module. There are no user-serviceable parts, equipment or assemblies associated with this product. All internal service and maintenance should only be performed by qualified IPG personnel.

IPG Photonics uses various words and symbols in this User Guide. They are designed to call to your attention to any hazards or important information.

**Table 2-1. Safety Symbols**

ELECTRICAL WARNING	LASER WARNING	CAUTION	IMPORTANT
 <p>Electrical Warning refers to a <u>potential personal hazard</u>. It requires a procedure that, if not correctly followed, can result in bodily harm to you or others.</p> <p>Do not proceed beyond the Electrical Warning symbol until you completely understand and meet the required conditions.</p>	 <p>Laser Warning refers to a <u>potential personal hazard</u>. It requires a procedure that, if not correctly followed, can result in bodily harm to you or others.</p> <p>Do not proceed beyond the Laser Warning symbol until you completely understand and meet the required conditions.</p>	 <p>Caution refers to a <u>potential product hazard</u>. It requires a procedure that, if not correctly followed, can result in damage or destruction to the product or components.</p> <p>Do not proceed beyond the Caution symbol until you completely understand and meet the required conditions.</p>	 <p>Important refers to <u>pertinent information</u> regarding the operation of the product. Ensure you do not overlook this information.</p>



## 2.2 SAFETY REQUIREMENTS AND FEATURES

### 2.2.1 EMC COMPLIANCE

The lasers are components and should be integrated into finished system. The EMC (CE mark relevant) standards are not applicable to the laser modules, however are applicable to the complete systems. The system integrator is responsible to comply with all applicable standards to the final laser system.

### 2.2.2 LASER CLASSIFICATION: CLASS IV LASER PRODUCT

Governmental standards and requirements specify that laser products must be classified according to their accessible emissions accounting for power, energy, temporal, and wavelength characteristics. The products are marked with the classifications that apply only to it as a standalone component. The product is a Class 4 laser source; therefore, all precautions associated with Class 4 laser products should be taken.

This product is classified as a high power Class IV laser instrument under 21 CFR, Subchapter J, Part II, 1040.10(d).

This product emits visible and invisible laser radiation at or around a wavelength of 355 nm. The total light energy radiated from the optical output is greater than 3.0W average at 300kHz and >10kW peak, depending on the model. Under normal operating conditions, the UV laser output will emit secondary wavelengths (510-540nm and 1020-1080nm) from the aperture. Therefore, PPE determination should be based on the information listed on the label(s).

**Table 2-2. Laser Classification**

Classification	Average Power	Peak Power	Wavelength
Class IV	3 W	10 kW	355 nm

#### LASER WARNING



Class IV laser beams are also a potential fire hazard and skin hazard as well. Take precautions to prevent accidental exposure to both direct and reflected beams.

Diffuse and specular beam reflections can inflict severe retina and/or cornea injuries leading to permanent eye damage or blindness.

When operating the device, all personnel must wear appropriate eye protection. For information on laser safety eyewear, see [Section 2.2.3](#).

Use of controls, adjustments or performance of procedures other than those set forth in this User Guide may result in exposure to hazardous radiation.

### 2.2.3 LASER SAFETY EYEWEAR

#### LASER WARNING



Use appropriate laser safety eyewear when operating this device. The selection of appropriate laser safety eyewear requires the end-user to accurately identify the range of wavelengths emitted from this product.


If the device is a tunable laser or Raman product, it emits light over a range of wavelengths. The end-user should confirm that the laser safety eyewear being used protects against the light that is emitted by the device over its entire range of wavelengths.

Please review the safety labeling on the product and verify that the personal protective equipment (i.e. enclosures, viewing windows, or viewports, eyewear, etc.) being utilized is adequate for the output power and wavelength ranges.

Whether the laser marking module is used in a new installation or to retrofit an existing system, the end-user is solely responsible for determining the suitability of all personal protective equipment.

There are several laser safety equipment suppliers that offer materials or equipment. Some of them include LaserVision USA, Kentek Corporation, and Rockwell Laser Industries. There are other laser personal protective equipment providers.

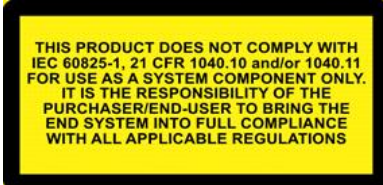
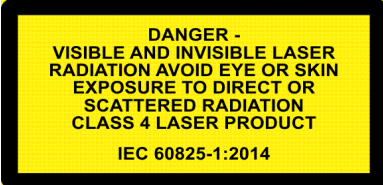
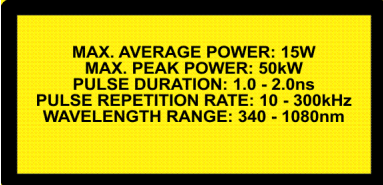



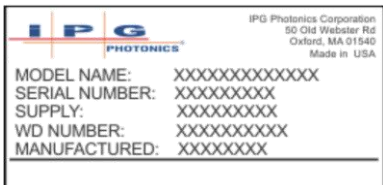


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IMPORTANT	
	<p>Laser safety eyewear must conform to US and international safety standards, including ANSI Z136.1 (US) and EN207/EN208/EN60825 (Europe). The regulations in force will depend on the location of the installation.</p>

### 2.2.4 DEVICE SAFETY LABELS

The product has the required safety labels located on the outside of the chassis in various locations. These include warning labels indicating removable or displaceable protective housings, apertures through which laser radiation is emitted and labels of certification, and identification.

**Table 2-3. Safety Label Description**

<b>1. Certification Label:</b>	<b>2. Class 4 Laser Product:</b>	<b>3. Warning Label</b> (identifies the laser classification, power, pulse duration, repetition rate, and wavelength):
		
<b>4. Aperture Label</b> (located near output aperture):	<b>5. Laser Radiation Hazard Label</b> (located near output aperture or exit point from the enclosure):	<b>6. Caution Label</b> (consult accompanying documentation):
		
<b>7. Product Identification Label</b> (example only):	<b>8. Warranty Void Sticker:</b>	<b>9. Functional Earth Grounding</b> (this is placed at the device earthing point and is mandatory for all grounded equipment):
		

## 2.3 GENERAL SAFETY INSTRUCTIONS

### IMPORTANT



If this instrument is used in a manner not specified in this document, the protection provided by the instrument may be impaired and the warranty will be voided.

### 2.3.1 SPECULAR REFLECTIONS

#### LASER WARNING



Exercise caution to avoid/minimize specular reflections. This product emits visible and invisible laser radiation.

### 2.3.2 EQUIPMENT AND SOLVENTS

Light-sensitive elements in equipment, such as video cameras, photomultipliers, and photo diodes may be damaged from exposure to the laser light.

#### LASER WARNING



Laser light is strong enough to cut or weld metal, burn skin, clothing, and paint. Laser light can ignite volatile substances such as alcohol, gasoline, ether, and other solvents.

Exposure to solvents or other flammable materials and gases must be avoided and must be relocated away from the device.

### 2.3.3 OPTICAL SAFETY

#### CAUTION



- NEVER look directly into a laser or scanner head when the power is ON.
- Always make sure that you wear appropriate laser safety eyewear at all times while operating the product.
- Do not stare into the beam or view directly with optical instruments.
- If the output of the device is delivered through a lens with an anti-reflection coating, ensure that the lens is of good quality and clean.
- Hot or molten pieces of metal can be present when using this laser. Exercise caution if debris is being generated in your application.
- Ensure all electrical and optical connections are connected to the correct locations.
- Proper enclosures must be used to secure a laser safe work area. This includes but is not limited to laser safety signs, interlocks, appropriate warning devices and training/safety procedures. In addition, it is important to install the output assembly away from eye level.

The interaction between the laser and the material being processed can also generate high intensity UV and visible radiation. Ensure that all laser enclosures are in place to prevent eye and skin exposure to visible and invisible collateral radiation.

## 2.4 ELECTRICAL SAFETY

To ensure electrical safety:

1. Always use your device in conjunction with properly grounded power source.
2. Before supplying the power to the product, make sure that the correct voltage of the DC power source is used. Failure to use the correct voltage could cause damage to the product.
3. Before switching the power on, ensure the voltage corresponds to the specified level.
4. There are no operator serviceable parts inside. Do not attempt replacement of any parts. Refer all servicing to qualified IPG personnel. Do not remove covers. Any tampering with the product might void the warranty.
5. Connections to external circuits except for Mains connections: the external connections between this product and other external devices are PELV (Protected Extra-Low Voltage) as defined by IEC 61140. Non-Mains outputs of other devices connected to this product should also be PELV or SELV (Safety Extra-Low Voltage).
6. Keep away from sources of shock or vibrations.

## 2.5 ENVIRONMENTAL SAFETY

### LASER WARNING



Ensure that all personal protective equipment (PPE) is suitable for the output power and wavelength range listed on the laser safety labels that are affixed to the Laser Marking Module.

### CAUTION



Damage to the laser is possible, unless caution is employed when operating the device.

### 2.5.1 HUMIDITY

In order to enhance the longevity of the product, IPG recommends that the device is not exposed to a high-moisture environment (>95% humidity).

### 2.5.2 PROCESS BY-PRODUCT

Ensure that the work surface is properly vented. When a laser beam reacts with any material, it can generate vapors, fumes, sparks, and particulate debris. By-products from the laser process are often toxic and can pose additional safety hazards. These fumes must be evacuated from the work area by means of an extraction system.

### IMPORTANT



It is the responsibility of the end-user to ensure proper disposal of waste debris and other by-products. Any extraction system must comply with local and health and safety regulations.

## 2.6 ADDITIONAL SAFETY RESOURCES

For additional information regarding Laser Safety, please refer the following list:

### **Laser Institute of America (LIA)**

13501 Ingenuity Drive, Suite 128  
Orlando, Florida 32826  
Phone: 407.380.1553, Fax: 407.380.5588  
Toll Free: 1.800.34.LASER  
Email: [lia@laserinstitute.org](mailto:lia@laserinstitute.org)

### **American National Standards Institute**

ANSI Z136.1 – 2014, American National Standard for the Safe Use of Lasers  
(Available through LIA)

### **International Electro-technical Commission**

IEC 60825-1, Edition 3, 2014  
Safety of laser products – Part 1: Equipment classification, requirements and user's guide  
(Available through LIA)

### **Center for Devices and Radiological Health**

21 CFR 1040.10 – Performance Standards for Light-Emitting Products

### **US Department of Labor – OSHA**

Publication 8-1.7 – Guidelines for Laser Safety and Hazard Assessment.  
<http://www.osha.gov/>

### **Laser Safety Equipment**

Laurin Publishing  
Laser Safety Equipment and Buyer's Guides  
<http://www.photonics.com/Directory>

## IMPORTANT



If this instrument is used in a manner not specified in this document, the protection provided by the instrument may be impaired and the warranty will be voided.

## USING THE LASER MARKING MODULE

- **3.1 Overview**
  - Laser Marking Module Architecture
    - Laser Marking Module XY2-100
    - Laser Marking Module with Integrated Scan Controller
- **3.2 Specifications**
  - Laser Specifications
  - Marking Unit Specifications
- **3.3 Unpacking Instructions**
  - Unpacking a Unit from the Shipping Carton
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    - Laser Marking Module with Integrated Scan Controller
  - Calibration Files
    - Laser Marking Module XY2-100
- **3.5 Laser Marking Module XY2-100: Rear Panel**
  - Power Supply Pinouts
  - Power Requirements
  - Sockets
    - Miscellaneous Signal Sockets
  - RS-232 DB-9 Pinouts
- **3.6 Laser Marking Module with Integrated Scan Controller: Rear Panel**
  - Power Supply Pinouts
  - Power Configuration Options
  - 37-Pin I/O Pinouts
  - RS-232 DB-9 Pin Sockets

### 3.1 OVERVIEW

The product consists of a laser device connected to an optical head by a flexible cord. Components are located in the base enclosure with the laser board, laser diodes, and optical scanner.

#### 3.1.1 LASER MARKING MODULE ARCHITECTURE

##### 3.1.1.1 LASER MARKING MODULE XY2-100

Figure 3-1 illustrates the architecture of the Laser Marking Module XY2-100.

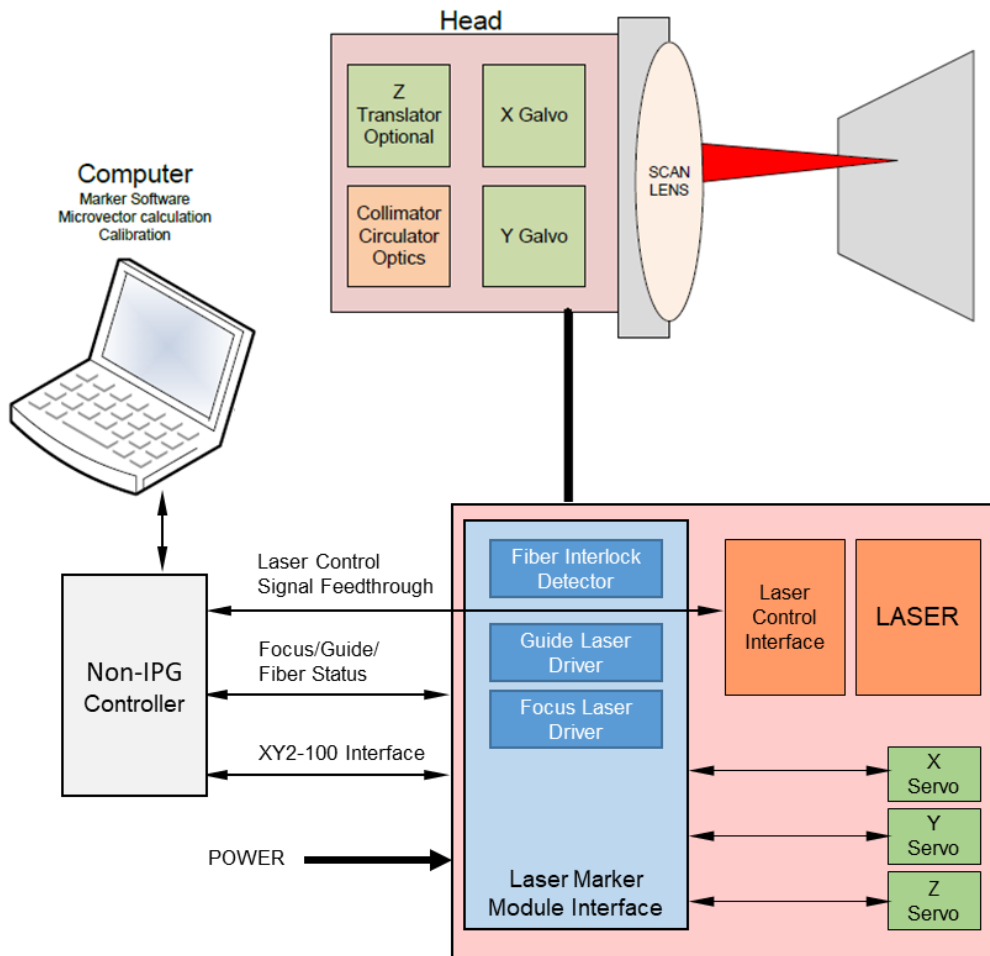
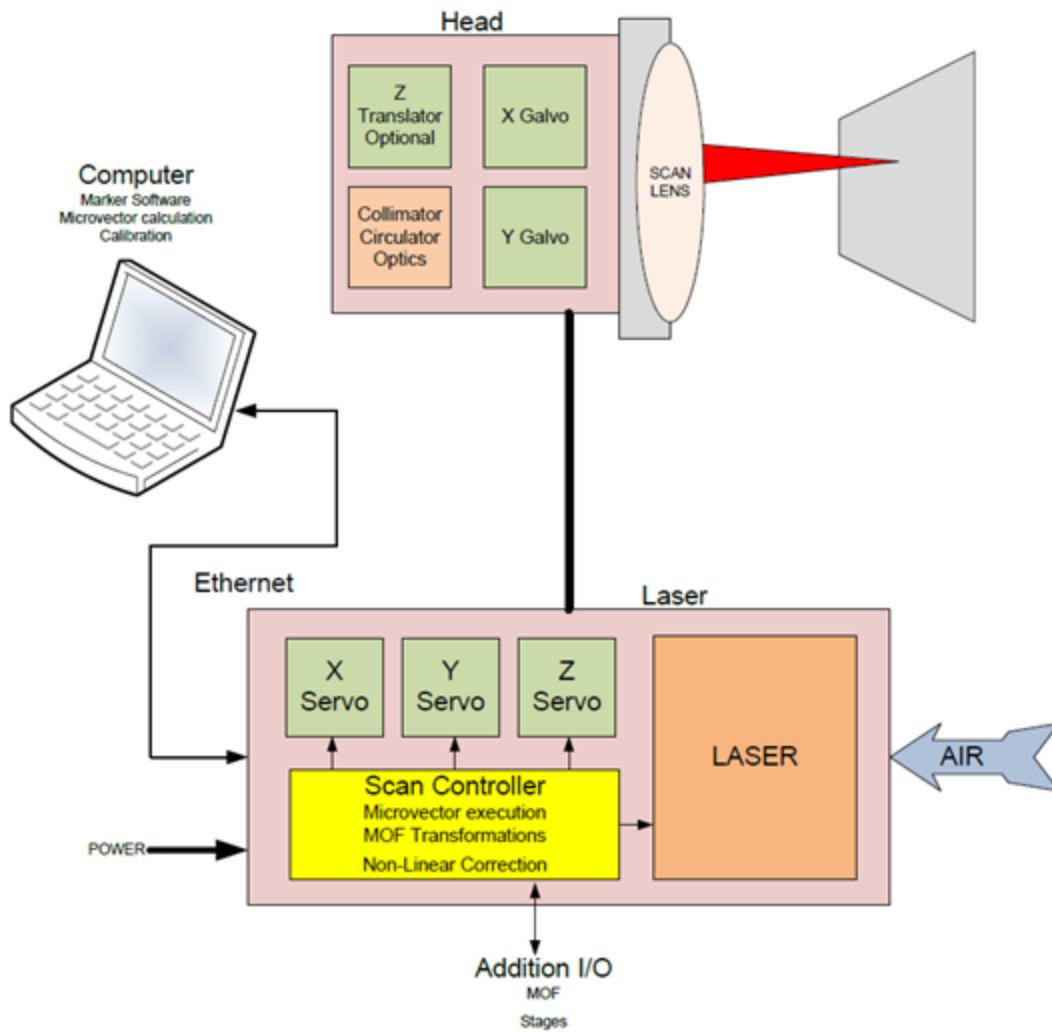


Figure 3-1. Laser Marking Module XY2-100 Architecture



### 3.1.1.2 LASER MARKING MODULE WITH INTEGRATED SCAN CONTROLLER

Figure 3-2 illustrates the architecture of the Laser Marking Module with Integrated Scan Controller.



**Figure 3-2. Laser Marking Module with Integrated Scan Controller Architecture**

The Scan Controller interfaces between a software dll on a PC, servo drivers, stages, encoders, lasers, and any other external systems. When used with external stages, the Scan Controller can monitor the stage location and output the image objects when the correct workspace location is in view or control external stages.

### 3.2 SPECIFICATIONS

#### 3.2.1 LASER SPECIFICATIONS

**Table 3-1. Laser Marking Module Specifications**

Item		Specification
Average Output Power		3 W
Mode of Operation		Pulsed
Polarization		Linear
Maximum Pulse Energy		10 uJ
Nominal Average Output Power:	Minimum	2.4 W
	Typical	3.0 W
	Maximum	3.2 W
Output Power Adjustment Range		20-100%
Pulse Duration:	Minimum	1.0 ns
	Typical	1.5 ns
	Maximum	1.8 ns
Central Emission Wavelength		355 nm
Pulse Repetition Rate		10-300 kHz
Laser Switching On/Off Time		2 μs

#### 3.2.2 MARKING UNIT SPECIFICATIONS

**Table 3-2. Optical Scanner**

Item	Specification
Clear Aperture	12 mm
Square Field Size	60 x 60 mm - 110 x 110 mm - 170 x 170 mm
Tracking Delay	100 μsec

### 3.3 UNPACKING INSTRUCTIONS

#### IMPORTANT



If the packaging shows any signs of external damage, carefully check the unit for damage and notify the shipping agent immediately.

Particular care must be taken when you remove the unit from the shipping carton to ensure that the fiber optic cord is not broken or damaged.

#### CAUTION



To minimize the risk of damage to the device, IPG Photonics recommends that you unpack your Laser Marking Module and Optical Scanner using the procedure in [Section 3.3.1](#) "Unpacking a Unit from the Shipping Carton."

#### 3.3.1 UNPACKING A UNIT FROM THE SHIPPING CARTON

To unpack your unit from the shipping carton:

1. Place the package on a stable surface such as the floor or a large table.
2. Open the carton and remove the foam cover and store for later use.
3. Carefully lift the Laser Marking Module and Optical Scanner Head out of the box. The flexible yellow cord is already connected to the Optical Scanner Head. IPG strongly recommends two people lift the unit to avoid damaging the fibers in the flexible yellow scanner cord.
4. Carefully place contents on a stable surface.
5. Remove the cover from the Optical Scanner Head before use. Store for later use if needed.
6. If you have the XY2-100 version, remove the USB memory stick and store it in a safe place. Calibration files for third-part controllers are stored in the USB memory stick. Refer to [Section 3.4.3](#) for instructions.
7. Retain all packaging for future transportation or storage needs.

### 3.4 OPTICAL SCANNER HEAD

The Scanner Head connects to the laser module with a flexible, permanent yellow cord.

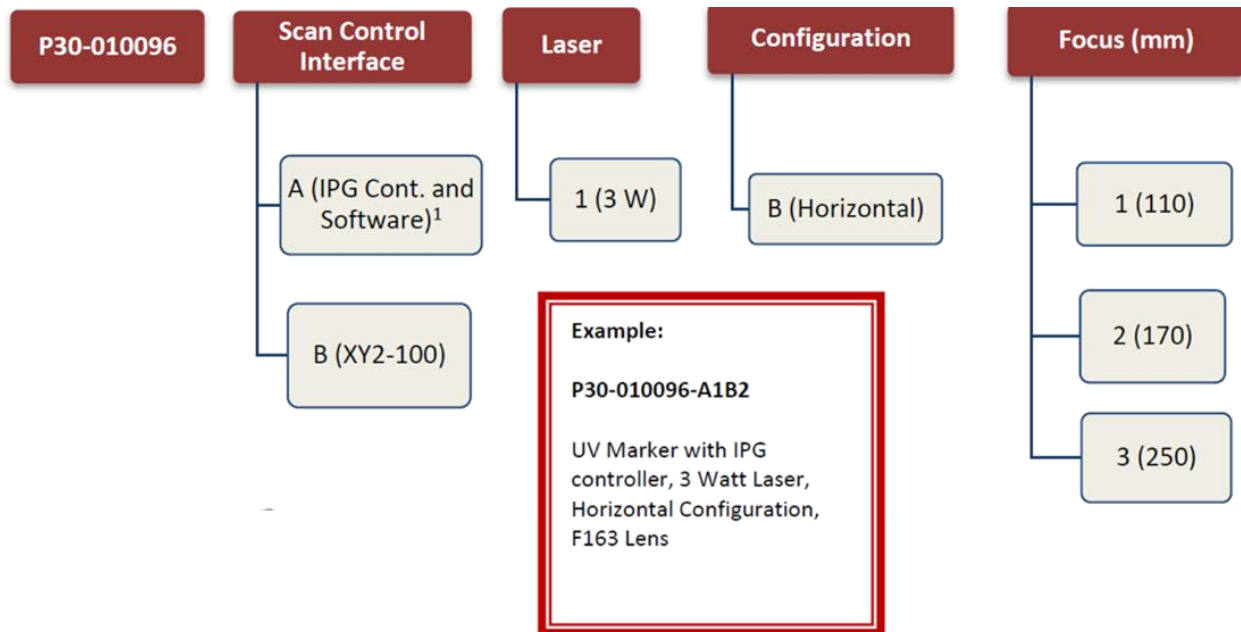


**Figure 3-3. Optical Scanner Head**

The Optical Scanner Head has the following features:

- 2D Factory Calibrated Marker
- 12mm Clear Aperture Optics

Figure 3-4 illustrates the available configurations for the Optical Scanner Head.




**Figure 3-4. Optical Scanner Head Configuration**

Table 3-3 provides lens options for the optical scan head.

**Table 3-3. Specification for Three Lens Option**

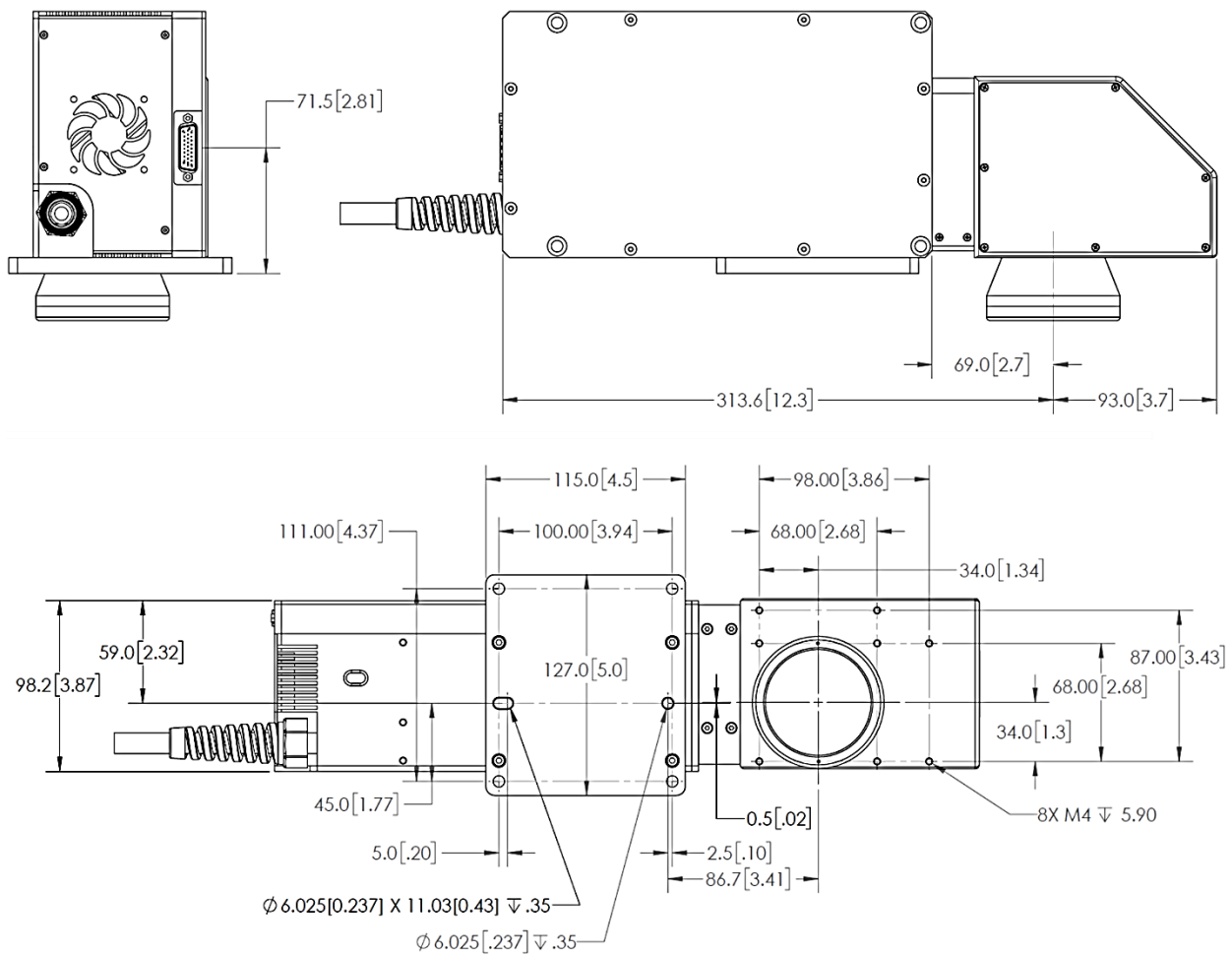
Item	Lens 1	Lens 2	Lens 3
Nominal Focus Length (mm)	110	170	250
Nominal Spot Size <sup>1</sup> @ 1/e <sup>2</sup> (um)	17	27	40
Working Distance (mm)	137	216	300
Field Size (mm <sup>2</sup> )	60 x 60	105 x 105	170 x 170
<sup>1</sup> Theoretical Values			

**IMPORTANT**

 Working distances are taken from the edge of the lens housing.

### 3.4.1 BOLT PATTERN AND FIELD SIZE

The bolt pattern and field center diagrams are shown in Figure 3-5.



**Figure 3-5. Scanner Head Diagram: Horizontal Configuration**

## 3.4.2 CONNECTING CABLES

### 3.4.2.1 LASER MARKING MODULE XY2-100

IPG does not include cables in the shipment of the Laser Marking Module. You are responsible for providing your own cable connectors. Contact IPG Customer support if you need assistance. For details on the rear panel, refer to [Section 3.5](#).

To connect the cables to the Laser Marking Module XY2-100:

1. Connect a 5-pin female cable to the 5-pin male Power Supply.
2. Connect a 25-pin female cable to the 25-pin male Laser Control interface.
3. Connect a 25-pin male cable to the 25-pin female XY2-100 interface.

### 3.4.2.2 LASER MARKING MODULE WITH INTEGRATED SCAN CONTROLLER

Refer to [Section 3.5](#) for details on the rear panel of the Laser Marking Module with Integrated Scan Controller.

To connect the cables to the Laser Marking Module with the Integrated Scan Controller:

1. Connect a 5-pin female cable to the 5-pin male Power Supply.
2. Connect an Ethernet cable to the Ethernet interface.
3. Optionally, connect a 37-pin female cable to the 37-pin male D connector.

## 3.4.3 CALIBRATION FILES

### 3.4.3.1 LASER MARKING MODULE XY2-100

Calibration files for both the main laser and the guide laser in .cbt format are included on the USB memory stick included with your shipment. If you are using a third-party controller, you need to load these configurations to your system.

### 3.5 LASER MARKING MODULE XY2-100: REAR PANEL

Figure 3-6 shows the rear panel of the Laser Marking Module XY2-100. Details on each component are found in the table that follows.

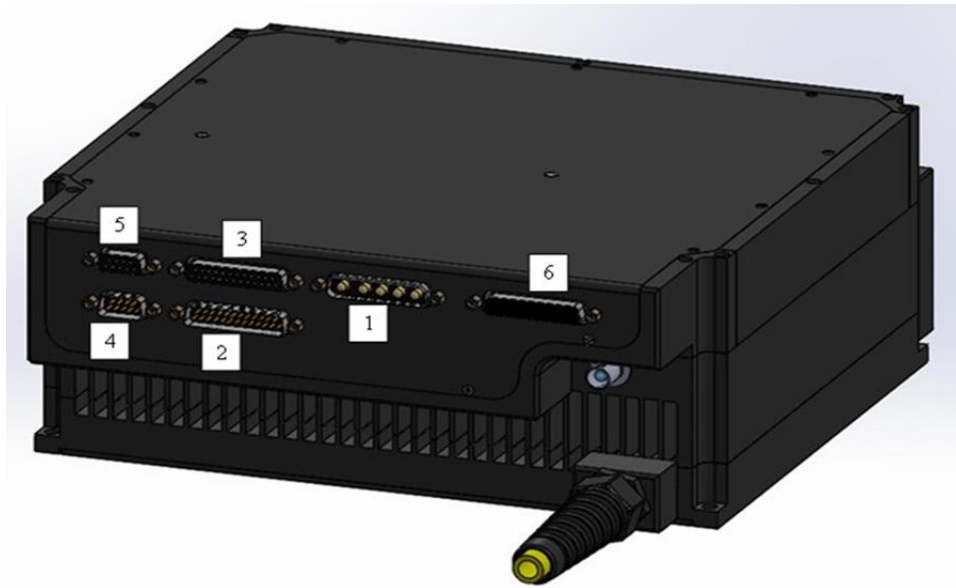
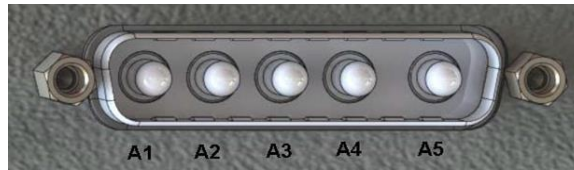


Figure 3-6. Laser Marking Module XY2-100: Rear Panel View

Item	Feature	Description
1	5-pin Male Power Supply	DB 5W5 connector used as the main power supply for the Laser Marking Module.
2	25-pin Male Laser Control	Connector used to control the laser.
3	25-pin Female XY2-100 Sockets	XY2-100 D connector used to control the galvanometers.
4	9-pin Male RS-232	Controls the laser via a RS-232 port.
5	9-pin Female Sockets	D connector for miscellaneous signals.
6	Scanner Ctrl Cable	Provides power and control signals for galvo mirrors.

### 3.5.1 POWER SUPPLY PINOUTS

Figure 3-7 illustrates the male DB 5W5 5-pin power supply pinouts. Details for the power supply pinouts are found in the table that follows.



**Figure 3-7. Laser Marking Module XY2-100: Power Supply Pinouts**

Pin	Function	Description
A5	-V Scanner	Isolated Scanner Power (+V) – (-V) = 24V to 30V
A4	+V Scanner	
A3	Return	Return for HK and Laser Power. Laser Control and the XY2-100 Interface Reference.
A2	+V Laser HK	House Keeping Power
A1	+V Laser Power	Laser Diode Power 24V

### 3.5.2 POWER REQUIREMENTS

**Table 3-4. Laser Marking Module XY2-100: Power Requirements**

Type	Specification
Scanner Power	24-30 V +/-5% @ 10 Amp Peak / 2 Amp Average
Laser HK Power <sup>1</sup>	24 V +/-5% @ < 3.5 Amp
Laser Power (including housekeeping) <sup>1</sup>	24 V +/-5% @ < 6 Amp
<sup>1</sup> Maximum Values	

**Table 3-5. Laser Marking Module XY2-100: Power Supply Options**

Wiring Options	Pin	Voltage
<b>Split Supply:</b> +/-15 V supply for Scanner (10 Amp Peak / 2 Amp RMS) +/-24 V supply for Laser (6 Amp Peak)	A5	-15 V
	A4	+15 V
	A3	Return
	A2	+24 V
	A1	+24 V Safety Switched
<b>Single Supply:</b> 24 V supply for Laser and Scanner (16 Amp Peak / 8 Amp RMS)	A5	Return
	A4	+24 V
	A3	Return
	A2	+24 V
	A1	+ 24 V Safety Switched



Figure 3-8 shows a split supply operation for the Laser Marking Module XY2-100.

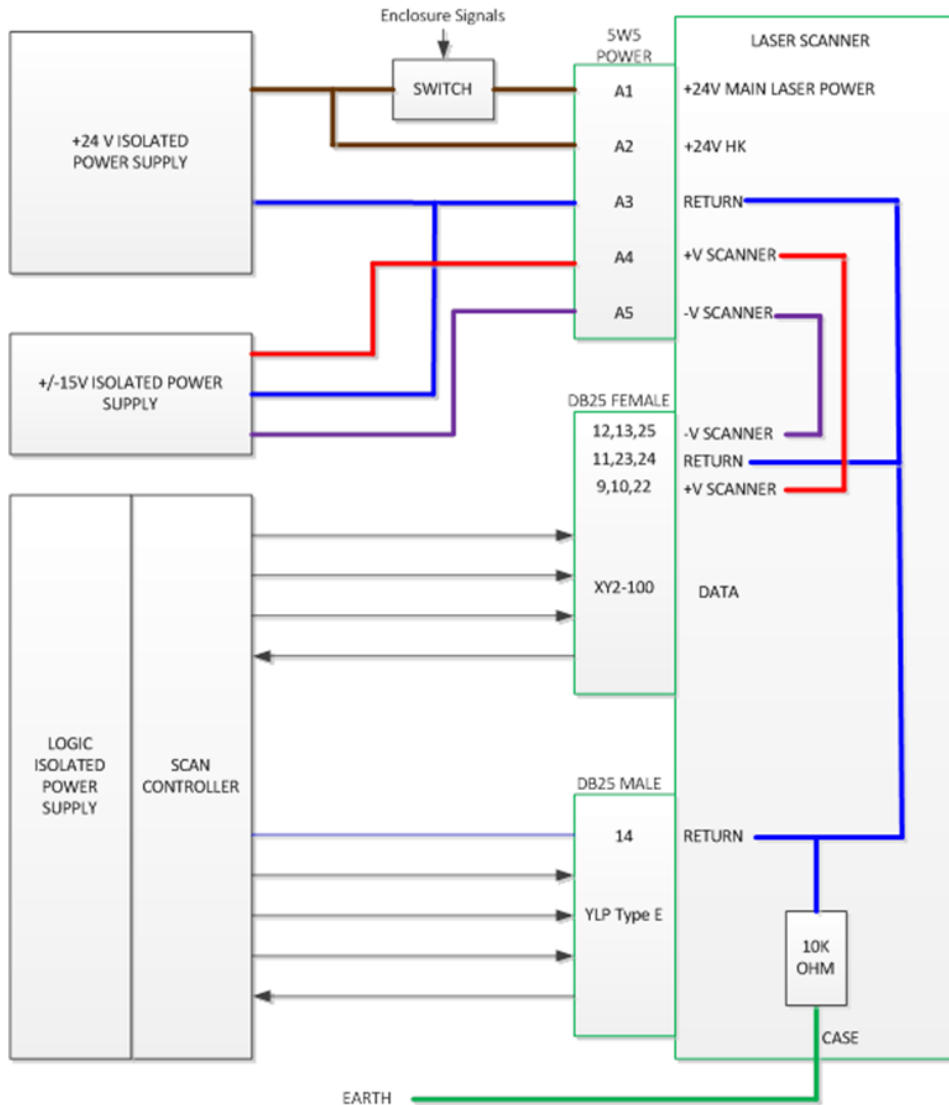


Figure 3-8. Laser Marking Module XY2-100: Split Supply Operation

Figure 3-9 shows a single supply operation for the Laser Marking Module XY2-100.

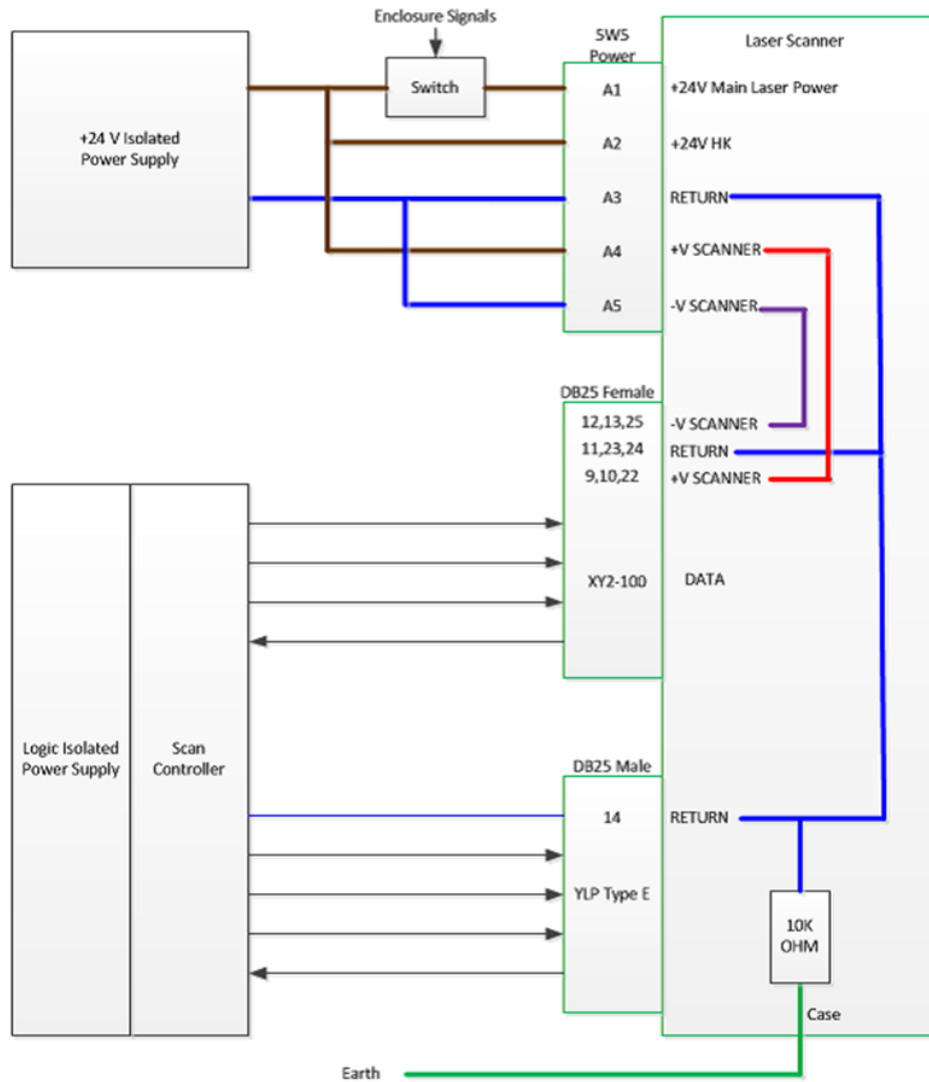
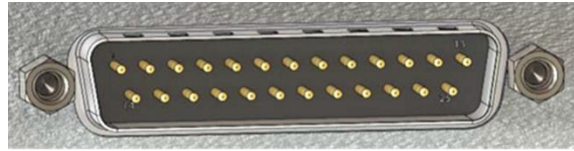


Figure 3-9. Laser Marking Module XY2-100: Single Supply Operation

### 3.5.3 LASER CONTROL

Figure 3-10 illustrates the 25-pin Laser Control Pinouts.



**Figure 3-10. Laser Marking Module XY2-100: Laser Control Pinouts**

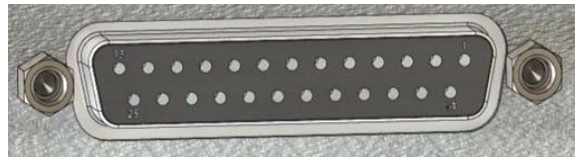
Pin No.	Input / Output	Signal Name	Description
1-8	Input	Power Setting (D0-D7)	8-bit bus range 0..FF(hex) or 0..255(dec) Least significant bit (lsb) (D0) corresponds to Pin 1 Most significant bit (msb) (D7) corresponds to Pin 8 00h (0): Maximum Output Power FFh (255): Maximum Output Power Disconnected state corresponds to 00h
9	Input	Latch	Latches power setting into the laser by the rising edge
10, 13, 24, 25	Input	-	Digital inputs, reserved for future use
12	Output	-	Digital outputs, reserved for future use
11, 16, 21	Output	-	Laser status and digital outputs (see status codes in Table 3-6)
14	-	Ground	Ground
15	-	+5 Vout	+5 VDC output, max current consumption is 80 mA
17	-	5 VRG	+5 ±0.25 VDC power supply input for independent operation of the red guide laser (if installed), maximum current consumption is 150 mA
18	Input	EE	Emission Enable (EE) signal HIGH: Emission ENABLE LOW or disconnected: Emission DISABLE
19	Input	EM	Emission Modulation (EM) input HIGH: Emission ON LOW or disconnected: Emission OFF
20	Input	Sync	Pulse Repetition Rate (Synchronization) External Trigger input
22	Input	RG	Guide Laser option (red diode) ON/OFF input HIGH: ON LOW or disconnected: OFF
23	Input	AuxOFF	Auxiliary Emission OFF input HIGH: OK (normal operation) LOW or disconnected: STOP (laser automatically switches OFF all optical stages)

**Table 3-6. Laser Marking Module XY2-100: Laser Status Codes on Pins 11, 16, and 21**

Pin 11	Pin 16	Pin 21	Alarms and Laser Status Description
LOW	LOW	LOW	<b>Temperature Alarm:</b> Laser temperature is out of the operating temperature range.
HIGH	LOW	LOW	<b>Power Supply Alarm:</b> External +24VDC supply voltage is out of the specified range.
LOW	LOW	HIGH	<b>Normal Operation</b>
HIGH	LOW	HIGH	<b>Laser is not ready for emission</b>
LOW	HIGH	LOW	<b>Back Reflection Alarm:</b> Laser automatically switches OFF due to high optical power reflected back to the laser.
HIGH	HIGH	LOW	Reserved
LOW	HIGH	HIGH	<b>System Alarm:</b> Laser protection system detects internal failure.
HIGH	HIGH	LOW	Reserved

### 3.5.4 SOCKETS

Figure 3-11 illustrates the 25-pin female sockets, which are used for control and status of the galvanometers. Refer to the table that follows for more details.

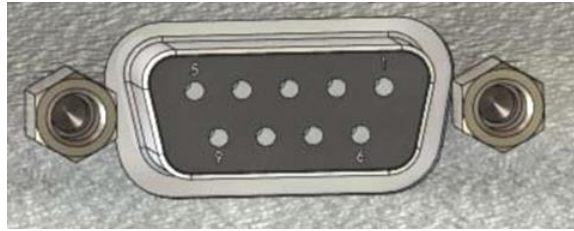


**Figure 3-11. Laser Marking Module XY2-100: Sockets**

Socket	Name	Input or Output	Description
1	CK-	Output	2 MHz Clock
14	CK+		
2	SYNC-	Output	SYNC Signal
15	SYNC+		
3	XD-	Output	X Channel Data
16	XD+		
4	YD-	Output	Y Channel Data
17	YD+		
5	ZD-	Output	Z Channel Data (if Z axis is present)
18	ZD+		
6	STAT-	Input	XY2-100 Status Word
19	STAT+		
7, 20, 8, 21	NC	---	No Connect
9, 22, 10	+V Servo	PWR	Positive Power Supply for galvanometers 24-30 V referenced to – V Servo Connected to A4
23, 11, 24	GND	PWR	Ground reference for Pins 1-6 and 14-19
12, 13, 25	-V Servo	PWR	Negative Power Supply Return for galvanometers Connected to A5

### 3.5.5 MISCELLANEOUS SIGNAL SOCKETS

Figure 3-12 illustrates the 9-pin female sockets. Do not connect to “Reserved”.



**Figure 3-12. Laser Marking Module XY2-100: 9-Pin Female Signal Sockets**

Socket	Name	Description
1	A1	Reserved – <u>DO NOT CONNECT</u>
2	B1	Reserved – <u>DO NOT CONNECT</u>
3	GL_ON	Signal for Guide Laser, 5 V
4	FL_ON	Reserved – <u>DO NOT CONNECT</u>
5	NC	Reserved – <u>DO NOT CONNECT</u>
6	A2	Reserved – <u>DO NOT CONNECT</u>
7	B2	Reserved – <u>DO NOT CONNECT</u>
8, 9	GND	Ground reference for Pin 3

### 3.5.6 RS-232 DB-9 PINOUTS

Figure 3-13 illustrates the 9-pin male RS-232 DB9 pinouts.

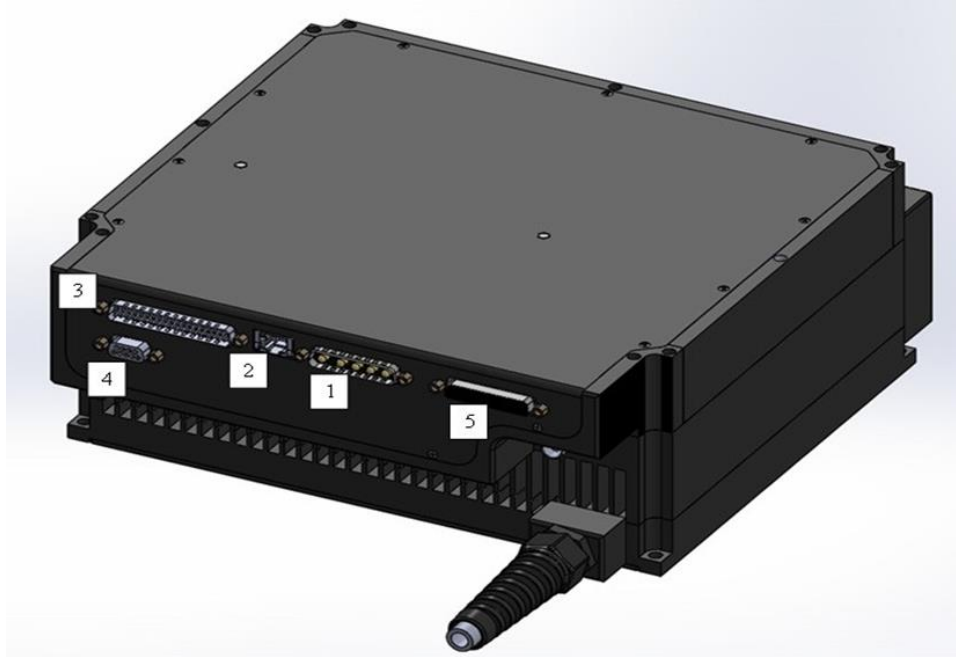


**Figure 3-13. Laser Marking Module XY2-100: 9-Pin Male Pinouts**

Socket	Description
1	Reserved – <u>DO NOT CONNECT</u>
2	Rx Input – Receive
3	Tx Output – Transmit
4	Reserved – <u>DO NOT CONNECT</u>
5	Common
6-9	Reserved – <u>DO NOT CONNECT</u>

### 3.6 LASER MARKING MODULE WITH INTEGRATED SCAN CONTROLLER: REAR PANEL

Figure 3-14 shows the rear panel of the Laser Marking Module with Integrated Scan Controller. The table that follows provides details for each connection.

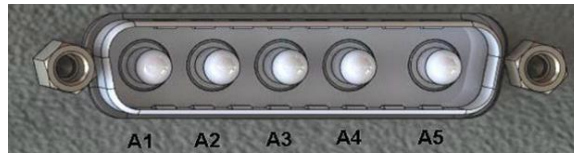


**Figure 3-14. Laser Marking Module with Integrated Scan Controller: Rear Panel View**

Item	Feature	Description
1	5-Pin Male Power Supply	DB 5W5 connector used as the main power supply for the Laser Marking Module.
2	Ethernet Interface	Communication from the IPG ScanPack dll and system console is performed over Ethernet.  Configure an Ethernet connection for DHCP. For optimal results, IPG recommends using a direct Ethernet connection (capable of 100 Mbit/s) directly from the PC to the Scan Controller.  To change an IP address to static, run the IPG Scan Controller Upgrade Utility. Refer to Section 4.6.
3	37-Pin Male D-Connector (optional)	Used for external interface with external controllers, encoders, and safety logic.
4	9-Pin Female DB9 RS-232	The RS-232 port can be used as a system console to set up IP addresses.
5	Scanner Ctrl Cable	Provides power and control signals for galvo mirrors.

### 3.6.1 POWER SUPPLY PINOUTS

Figure 3-15 illustrates the male DB 5W5 5-pin power supply pinouts.



**Figure 3-15. Laser Marking Module with Integrated Scan Controller: 9-Pin Male Pinouts**

Pin	Function	Description
A5	-V Scanner	Isolated Scanner Power (+V) – (-V) = 24V to 30V
A4	+V Scanner	
A3	Return	Return for HK and Laser Power. Laser Control and the XY2-100 Interface Reference.
A2	+V Laser HK	House Keeping Power
A1	+V LaserPower	Laser Diode Power 24V

### 3.6.2 POWER CONFIGURATION OPTIONS

**Table 3-7. Laser Marking Module with Integrated Scan Controller: Power Supply Options**

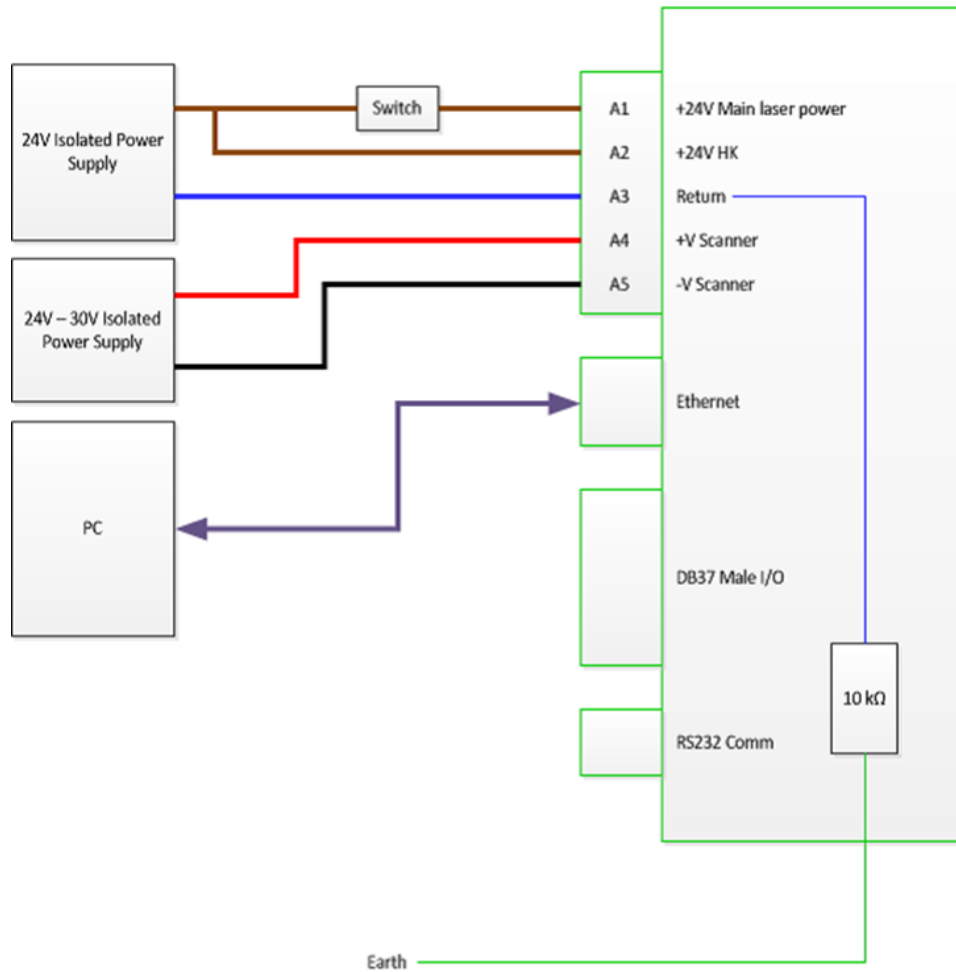
Wiring Options	Pin	Voltage
<u>Split Supply:</u> +/-15 V supply for Scanner 24 V supply for Laser	A5	-15 V
	A4	+15 V
	A3	Return
	A2	+24 V
	A1	+24 V Safety Switched
<u>Single Supply:</u> 24 V supply for Laser and Scanner	A5	Return
	A4	+24 V
	A3	Ground
	A2	+24 V
	A1	+ 24 V Safety Switched

**Table 3-8. Laser Marking Module with Integrated Scan Controller: Power Requirements**

Type	Specification
Scanner Power	24-30 V +/-5% @10 Amp Peak / 2 Amp Average
Laser HK Power <sup>1</sup>	24 V +/-5% @ < 3.5 Amp
Laser Power (including housekeeping) <sup>1</sup>	24 V +/-5% @ < 6 Amp
<sup>1</sup> Maximum Values	

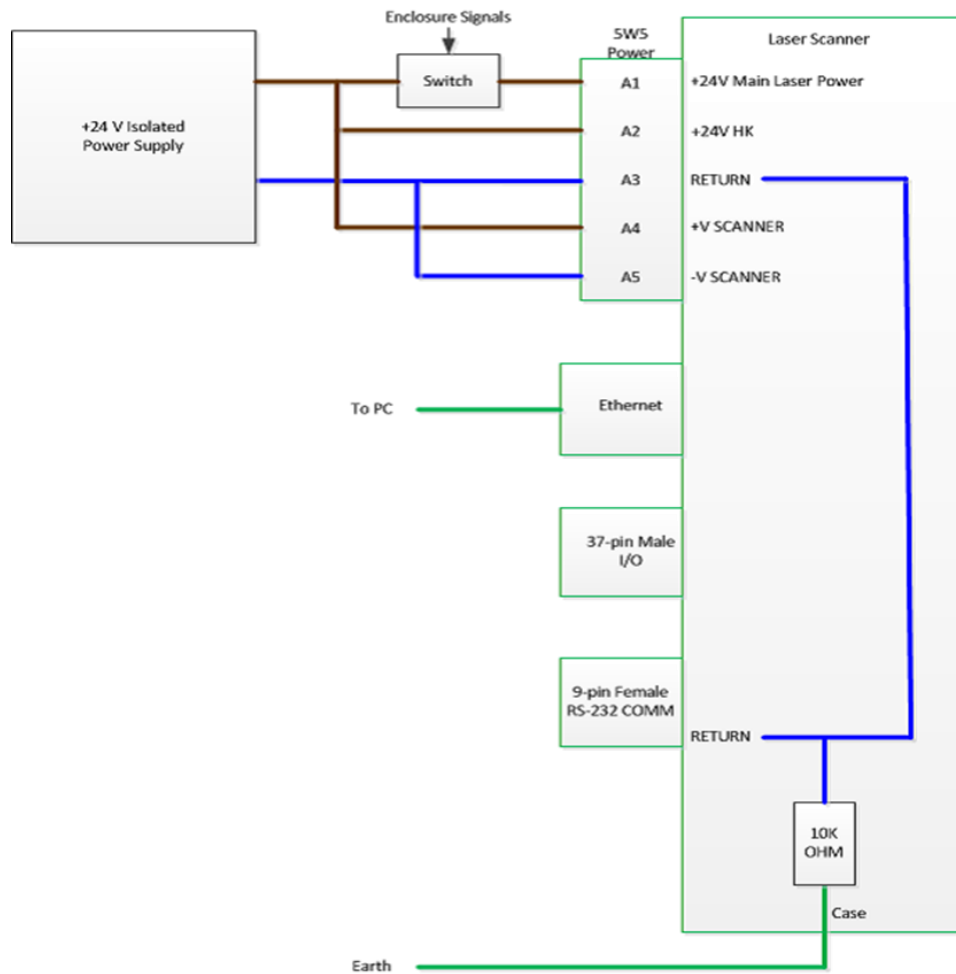


Figure 3-16 shows a split-supply operation for the Laser Marking Module with Integrated Scan Controller.



**Figure 3-16. Laser Marking Module with Integrated Scan Controller: Split Supply Operation**

Figure 3-17 shows a single-supply operation for the Laser Marking Module with Integrated Scan Controller.



**Figure 3-17. Laser Marking Module with Integrated Scan Controller: Single-Supply Operation**

### 3.6.3 37-PIN I/O PINOUTS

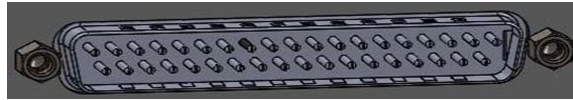
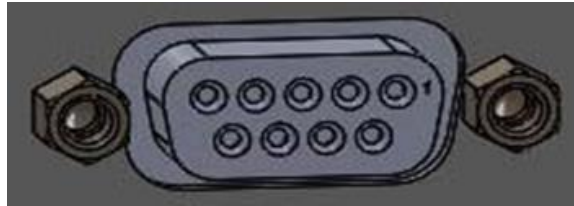


Figure 3-18. Laser Marking Module with Integrated Scan Controller: 37-Pin I/O Pinouts

Pin	Name	I/O	Description
1	Active	Out	Mark in Progress
20	GND	3VTTL	
2	Ready	Out	Ready/Waiting Signal
21	GND	3VTTL	
3	Error	Out	Error Condition
22	GND	3VTTL	
4	Start	In	Start Signal Input
23	GND	3VTTL	Pulled up to 3.3 V
5	Stop	In	Start Signal Input Active Low
24	GND	3VTTL	Pulled up to 3.3 V
6	GPIO[0]	In/Out	General Purpose Input/Output for Synchronization
25	GND	3VTTL	Pulled up to 3.3 V
7	GPIO[0]	In/Out	General Purpose Input/Output for Synchronization
26	GND	3VTTL	Pulled up to 3.3 V
8	A_Axis_A+	In/Out	Axis A, Phase A
27	A_Axis_A-	RS-422	
9	A_Axis_B+	In/Out	Axis A, Phase B
28	A_Axis_B-	RS-422	
10	A_Axis_Z+	In/Out	Axis A, Phase Home (or Zero) Differential or Single Ended (on Z+ Pulled up to 3.3 V)
29	A_Axis_Z-	RS-422 or 3VTTL	
11	B_Axis_A+	In/Out	Axis B, Phase A
30	B_Axis_A-	RS-422	
12	B_Axis_B+	In/Out	Axis B, Phase B
31	B_Axis_B-	RS-422	
13	B_Axis_Z+	In/Out	Axis B, Phase Home (or Zero) Differential or Single Ended (on Z+ Pulled up to 3.3 V)
32	B_Axis_Z-	RS-422 or 3VTTL	
14	C_Axis_A+	In/Out	Axis C, Phase A
33	C_Axis_A-	RS-422	
15	C_Axis_B+	In/Out	Axis C, Phase B
34	C_Axis_B-	RS-422	
16	C_Axis_Z+	In/Out	Axis C, Phase Home (or Zero) Differential or Single Ended (on Z+ Pulled up to 3.3 V) or ClkIn/ClkOut Differential for Synchronization to Laser
35	C_Axis_Z-	RS-422 or 3VTTL	
19	GND	Out	Logic Ground

### 3.6.4 RS-232 DB9 9-PIN SOCKETS

Figure 3-19 illustrates the 9-pin female RS-232 DB 9 sockets. The table that follows provides more detailed socket information.



**Figure 3-19. Laser Marking Module with Integrated Scan Controller: 9-Pin Female Sockets**

Socket	Description
1	Reserved – <u>DO NOT CONNECT</u>
2	Receive Data Output
3	Transmit Data Input
4	Reserved – <u>DO NOT CONNECT</u>
5	Ground
6	Data Set Ready. Internally Connected to Pin-4 data Terminal Ready
7	Request to Send. Internally Connected to Pin-8 Clear to Send
8, 9	Reserved – <u>DO NOT CONNECT</u>

# 4

## SOFTWARE INSTALLATION

---

- **4.1 Overview**
  - Requirements
- **4.2 Installing IPG ScanPack**
- **4.3 Installing WinLase 6**
  - Creating a License File Request
  - Activating WinLase 6 with License Key
- **4.4 Configuring a DHCP IP Address**
- **4.5 Installing the Scan Controller Upgrade Utility**
  - Running the Scan Controller Upgrade Utility

## 4.1 OVERVIEW

This chapter is for users who have the Laser Marking Module with Integrated Scan Controller. It explains how to install the necessary software on your computer to use with the marking module. It also explains how to configure an LAN connection over Ethernet to connect to the Integrated Scan Controller, and how to set up a simple marking job.

Users who have the Laser Marking Module XY2-100 will use a third party controller and software. Please consult your vendor for information on software installation and connection.

### 4.1.1 REQUIREMENTS

The following requirements are necessary:

- Windows 7 or 8 Operating System
- IPG Laser Marking Module with Integrated Scan Controller
- IPG ScanPack Software
- WinLase 6 Software or IPGScan Software (if WinLase 6 is used, WinLase 6 licensing key for product activation)

## 4.2 INSTALLING IPG SCANPACK

In order to use the WinLase 6 software or IPGScan software with the Laser Marking Module with Integrated Scan Controller, users must first install IPG ScanPack.

ScanPack is a .dll file in which the software interfaces for communicating with your Scan Controller over Ethernet. The ScanPack installation program installs Bonjour (a protocol that discovers IP addresses over the network), Microsoft Visual C++ Runtime Libraries, and the ScanPack dll on your system.

### IMPORTANT



Before installing ScanPack, uninstall any previous versions of ScanPack, if applicable.

To install IPG ScanPack:

1. Open a web browser and go to: [software.ipgphotonics.com](http://software.ipgphotonics.com).
2. Click the **Marker** folder.
3. Click the **ScanPack** folder.
4. Download the **ScanPack.zip** file to your computer.
5. Once downloaded, extract the ScanPack.zip file. A folder called ScanPack is created.
6. Open the folder and run **setup.exe** and click **Next**. The Bonjour installer appears (Figure 4-1).

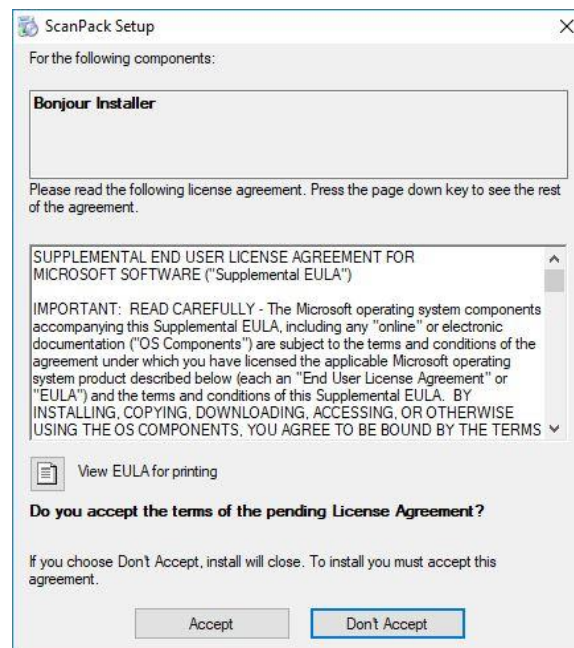
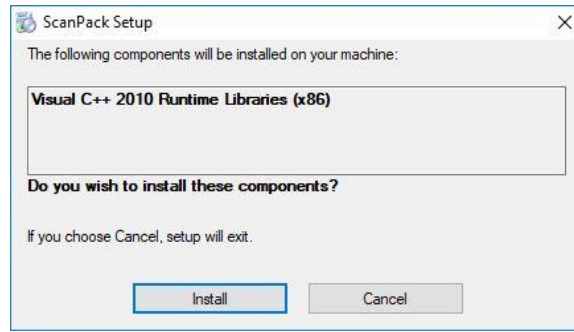


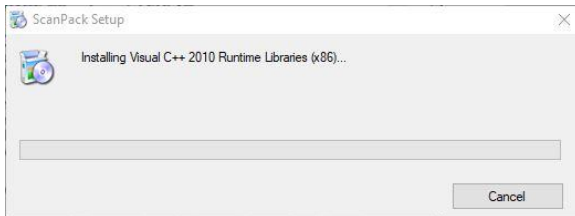
Figure 4-1. Bonjour Installer License Agreement

- Click **Accept** to accept the license agreement. A dialog box appears (Figure 4-2).

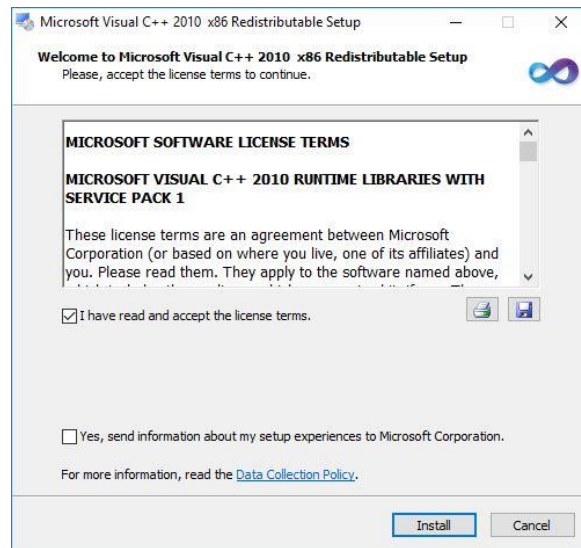


**Figure 4-2. Visual C++ 2010 Runtime Libraries Installation**

- Click **Install** to begin the installation of the Visual C++ 2010 Runtime Libraries to your system. The Status Message will appear (Figure 4-3). Next, the Microsoft Visual C++ 2010 x86 Redistributable Setup window appears (Figure 4-4).



**Figure 4-3. Status Message during Install of Visual C++ Runtime Libraries**



**Figure 4-4. Microsoft Visual C++ 2010 x86 Redistributable Setup**



- Click **I have read and accept the license terms** and click **Install**. The following window appears with the Microsoft Visual C++2010 x86 Redistributable installation progress (Figure 4-5). Next, the Installation Complete window appears (Figure 4-6).

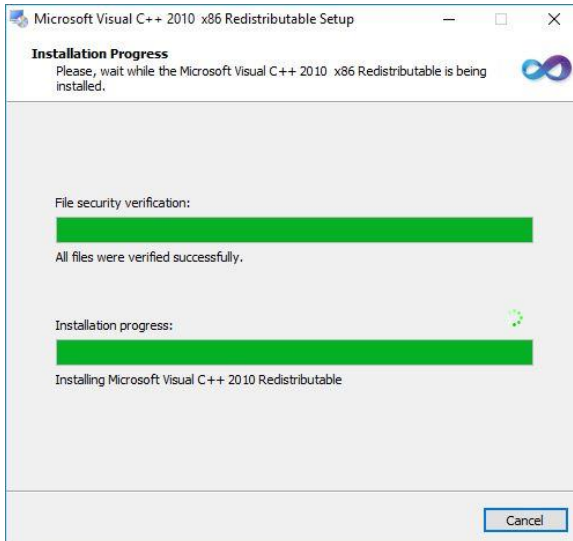


Figure 4-5. Installation Progress Window



Figure 4-6. Installation is Complete

- Click **Finish**. The ScanPack Setup Wizard appears (Figure 4-7).

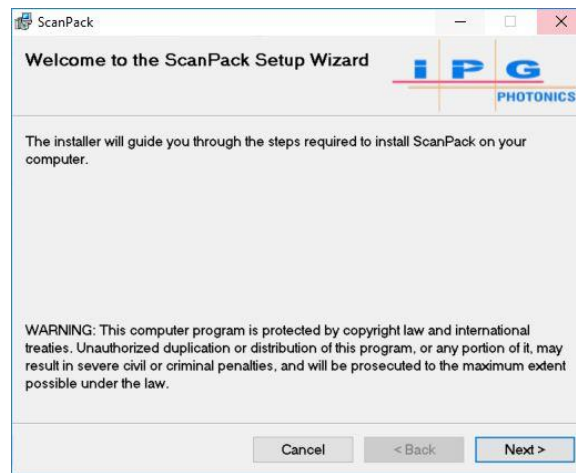
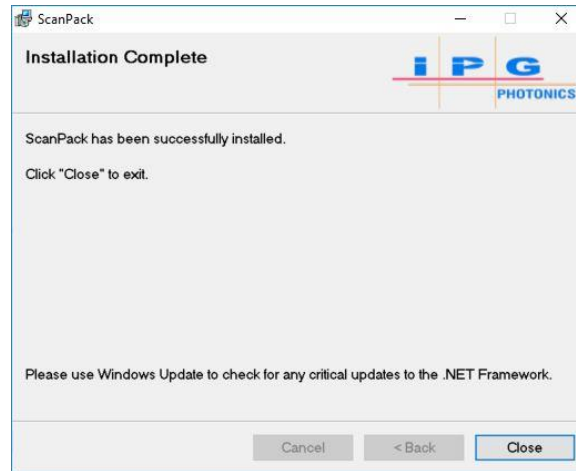


Figure 4-7. ScanPack Setup Wizard Window

- Click **Next** to begin the installation.

12. After the installation is done, the Installation Complete window appears (Figure 4-8).



**Figure 4-8. Installing ScanPack Window**

13. Click **Close** to exit the program.

### 4.3 INSTALLING MARKING SOFTWARE

The WinLase 6 program and the IPGScan software are only compatible with the Laser Marking Module with Integrated Scan Controller.

To install and activate the WinLase 6 program, see Sections 4.3 and 4.4.

To install the IPGScan software, refer to *IPGScan Software User Guide* (DOCOXUGGUXX0001).

#### IMPORTANT

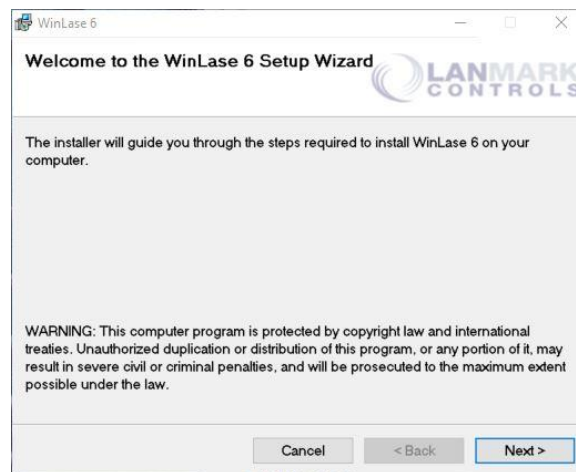


Before installing the WinLase 6 software, uninstall any previous versions of WinLase 6, if applicable. You also need to first install IPG ScanPack, as instructed in [Section 4.2](#).

With WinLase 6, you can edit nodes and vectors and change properties without using an external graphics software package. You can also keep multiple instances of the software open for side-by-side editing of jobs.

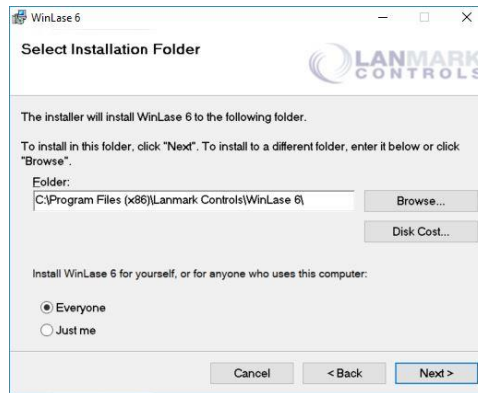
To install the WinLase 6 software:

1. Open a web browser and go to: [software.ipgphotonics.com](http://software.ipgphotonics.com).
2. Click the **Marker** folder.
3. Click the **WinLase6** folder.
4. Download the **WinLase6.zip** file to your computer.
5. Once downloaded, extract the WinLase6.zip file. A folder called WinLase6 is created.
6. Open the folder and run setup.exe. WinLase 6 Setup Wizard appears ([Figure 4-9](#)).



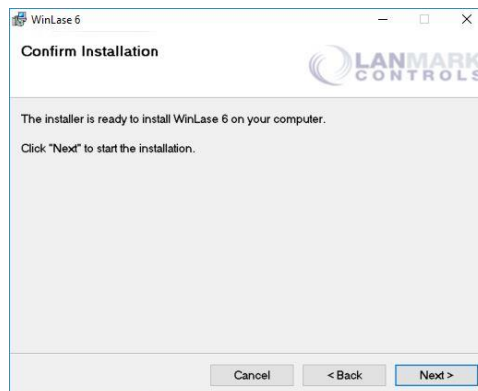
**Figure 4-9. WinLase 6 Setup Wizard**

7. Click **Next**. The Select Installation Folder window appears (Figure 4-10).



**Figure 4-10. WinLase 6 Setup – Select Installation Folder**

8. Click **Next** to accept the default Start Menu folder.
  - a. Click **Browse** if you want to change the default Start menu to another location.
  - b. Click **Everyone** to allow all users to access the WinLase 6 program or **Just me** if only you want access.
9. Click **Next**. Confirm installation window appears (Figure 4-11).



**Figure 4-11. WinLase 6 Setup – Confirm Installation**

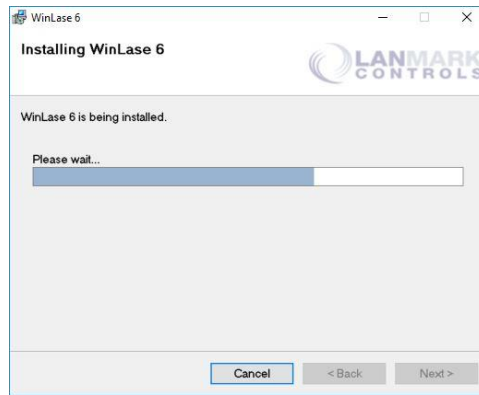
10. Click **Next** to proceed. The License Agreement window appears (Figure 4-12).



**Figure 4-12. WinLase 6 Setup – License Agreement**

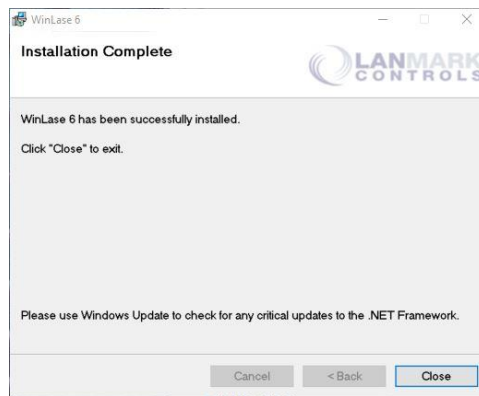
11. Click **I agree** to accept the License Agreement.

12. Click **Next** to proceed. The Installing WinLase 6 window appears (Figure 4-13).



**Figure 4-13. WinLase 6 Setup – Installing WinLase 6**


13. The Installation Complete window appears (Figure 4-14).



**Figure 4-14. WinLase 6 Setup – Installation Complete**

14. Click **Close** to exit. WinLase 6 is successfully installed on your system.

15. Activate the WinLase 6 program using the license key that was provided by IPG Photonics. Refer to [Section 4.4](#) for more information.

<b>IMPORTANT</b>	
	<p>You cannot use WinLase 6 without first activating it with a valid license key.</p>

## 4.4 ACTIVATING WINLASE 6

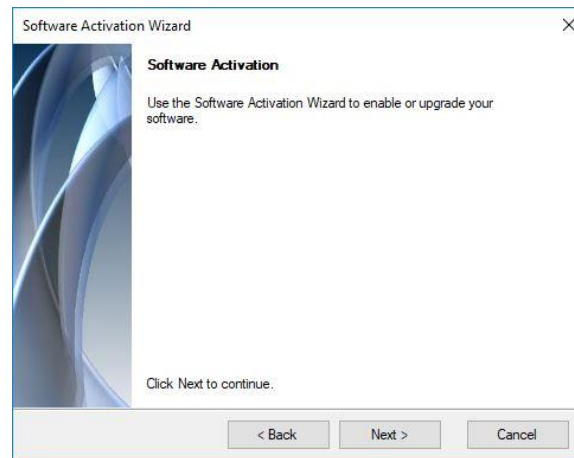
This section explains how to:

- Create a license file request
- Email the license file request to IPG Photonics for obtaining a license key.
- Activate WinLase 6 on your computer.

### 4.4.1 CREATING A LICENSE FILE REQUEST

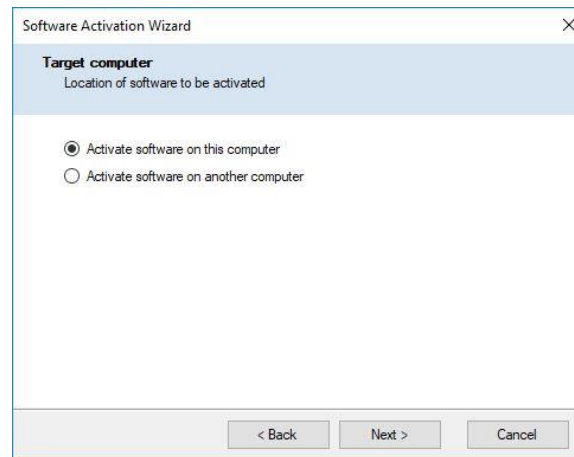
To create a license file request:

1. Open the WinLase 6 program. A message displays prompting you for a license key to use the product.
2. Click **Cancel** to proceed.
3. Select **Software Activation** from the **Help** menu. The Software Activation Wizard appears (Figure 4-15).



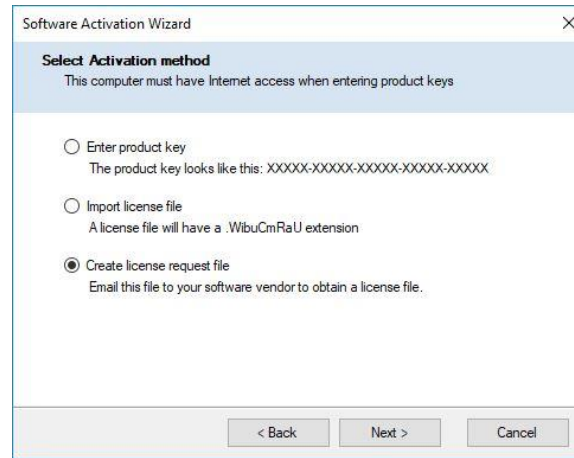
**Figure 4-15. WinLase 6 Software Activation Wizard**

4. Click **Next** to continue (Figure 4-16).



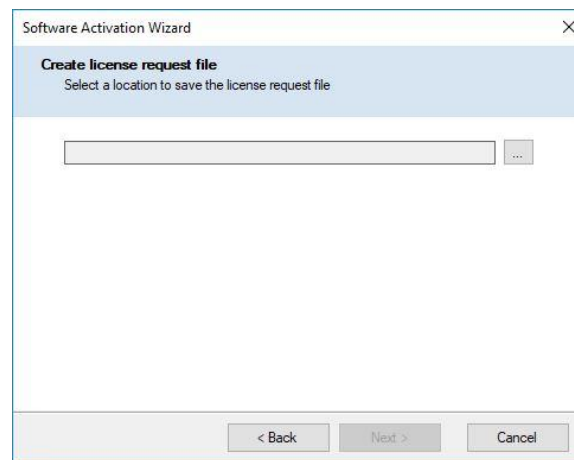
**Figure 4-16. Activate Software on This Computer**

- Click **Activate software on this computer** and click **Next** to continue. The Select Activation Method window appears (Figure 4-17).



**Figure 4-17. Select Activation Method**

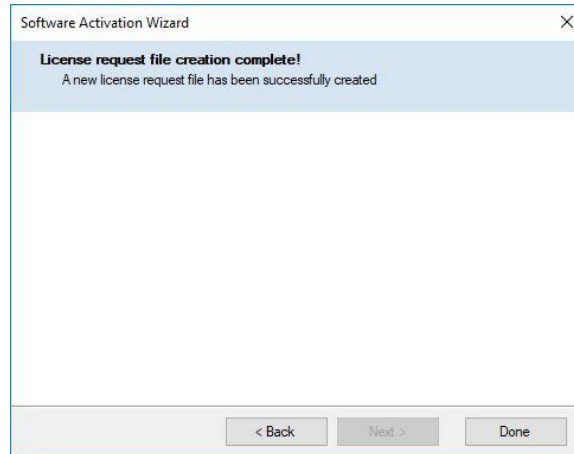
- Click **Create license request file** and click **Next**. The Create License Request File appears (Figure 4-18).



**Figure 4-18. Create License Request File**

- Save the file with the serial number of the laser to a location on your computer. For example: 15041235.WibuCmRaC.

- Click **Next** to continue (Figure 4-19).



**Figure 4-19. License Request Complete**

- Click **Done** to exit WinLase 6.
- Email the license request file from the saved location to IPG Photonics at: [marker@ipgphtonics.com](mailto:marker@ipgphtonics.com).
- Enter “**WinLase6 License Request**” in the subject line of the email.

IPG Photonics emails you the license file once your email is received. The license key is valid for one activation only (one user).



## 4.4.2 ACTIVATING WINLASE 6 WITH A LICENSE KEY

To activate WinLase 6 with a license key:

1. Once you receive the license file from IPG Photonics, follow steps 1 to 5 as instructed in Section 4.1.
2. Click Import license file (Figure 4-20).

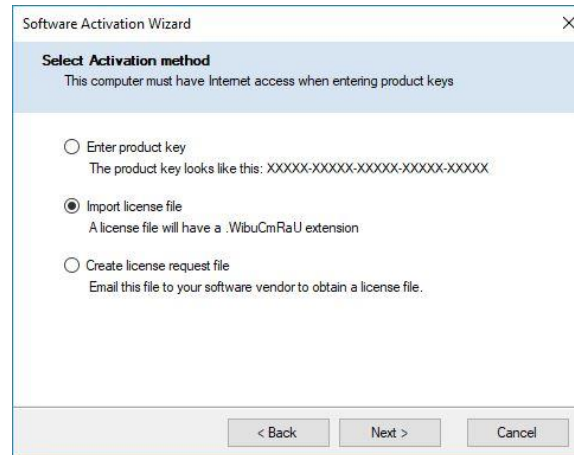


Figure 4-20. Software Activation Wizard – Import License File

3. Click Next to continue (Figure 4-21).

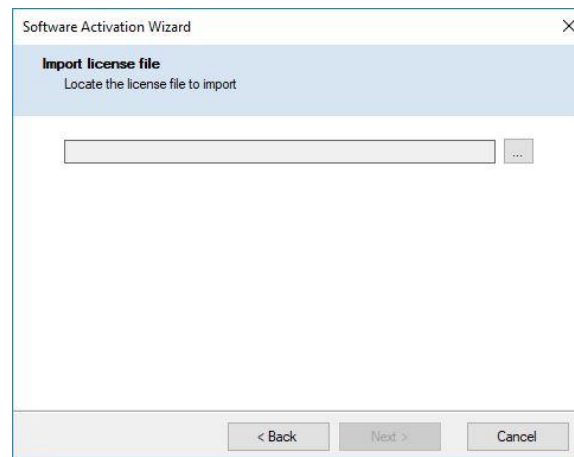


Figure 4-21. Import License File from Saved Location

4. Import the license file to the computer where you generated the request for the license.
5. Click **Next** to continue. A message appears confirming that the WinLase 6 activation was successful.
6. Click **Done** to exit the window. WinLase 6 is activated and ready for use on your computer.
7. Refer to section 5 for step-by-step instructions for creating and running a laser marker job using WinLase 6.

### IMPORTANT



Once the file is activated on your computer, it cannot be used on another computer.

## 4.5 CONFIGURING A DHCP IP ADDRESS

This section explains how to configure a DHCP IP address, which is necessary for proper communication with the Integrated Scan Controller and hence for proper control and use of the Laser Marking Module. The same IP configuration to be discussed in the following applies when either WinLase 6 or IPGScan marking software is used with the Integrated Scan Controller.

For optimal configuration, IPG recommends that you use an Ethernet connection (capable of 100 Mbit/s) directly from the host PC to the Laser Marker with the Integrated Scan Controller.

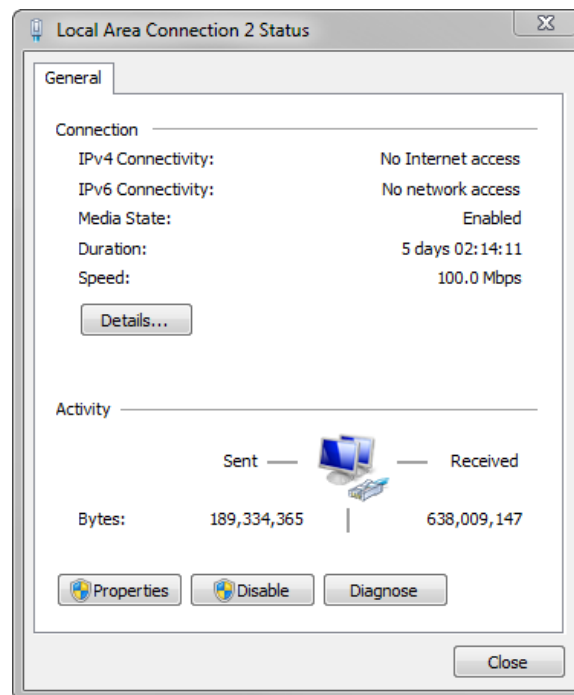
### IMPORTANT



If you want to configure a static IP address, you need to run the Scan Controller Upgrade Utility. Refer to [Section 4.6](#) for step-by-step instructions for changing your network settings.

To configure a DHCP IP Address:

1. Connect your computer to the Ethernet interface on the rear panel of the Laser Marker with Scan Controller using a standard Ethernet cable.
2. Go to **Control Panel > Network and Internet > Network and Sharing Center**.
3. Click **Change adapter settings**.
4. Select a Local Area Connection icon. The following window appears ([Figure 4-22](#)).



**Figure 4-22. Local Area Connection Status Window**

5. Click **Properties** (Figure 4-23).

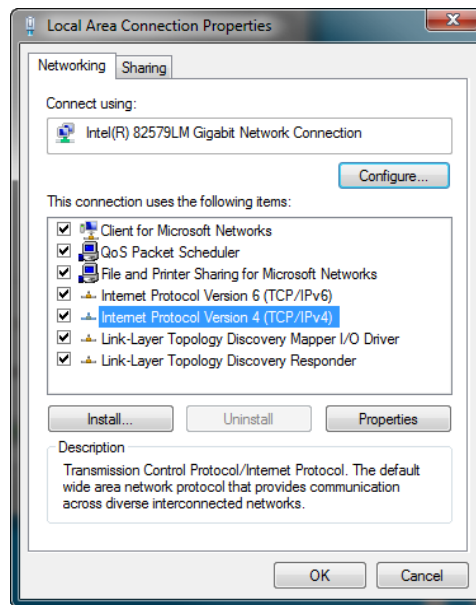


Figure 4-23. Local Area Connection Properties Window

6. Select **Internet Protocol Version 4 (TCP/IPv4)**.
7. Click **Properties** (Figure 4-24).

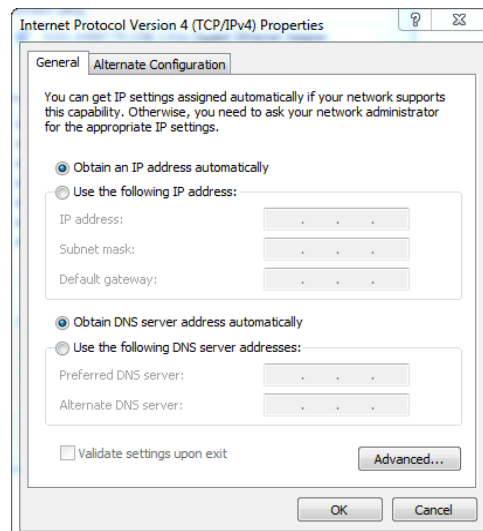


Figure 4-24. Internet Protocol Version 4 Properties Window

8. Click the **Obtain an IP address automatically** radio button.
9. Click the **Obtain DNS server address automatically** radio button.
10. Click **OK** to accept your changes.

## 4.6 INSTALLING THE SCAN CONTROLLER UPGRADE UTILITY

You can set a static IP address and change the host name of the Scan Controller using the Scan Controller Upgrade Utility.

To install the Scan Controller Upgrade Utility:

1. Open a web browser and go to: [software.ipgphotonics.com](http://software.ipgphotonics.com).
2. Click the **Marker** folder.
3. Click the **Utilities** folder.
4. Download the **ScanControllerUtility.zip** file to your computer.
5. Once downloaded, extract the **Utilities.zip** file. A folder called Utilities is created.
6. Open the folder and run **setup.exe** and click **Next** (Figure 4-25).

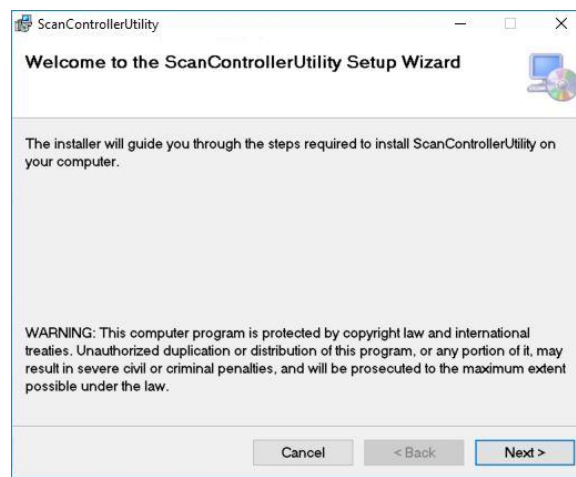


Figure 4-25. Scan Controller Upgrade Utility Window

7. Click **Next**. The Select Installation Folder window appears (Figure 4-26).

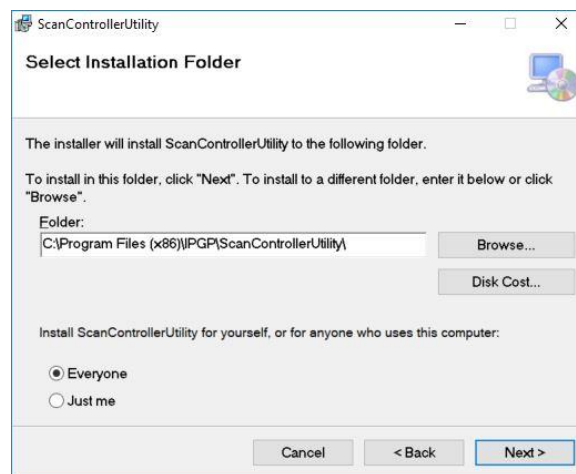
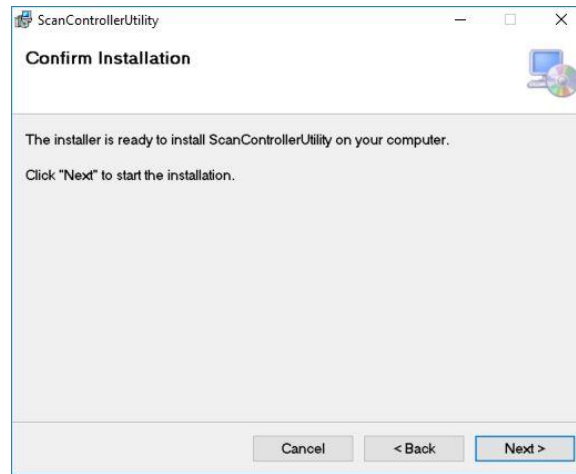


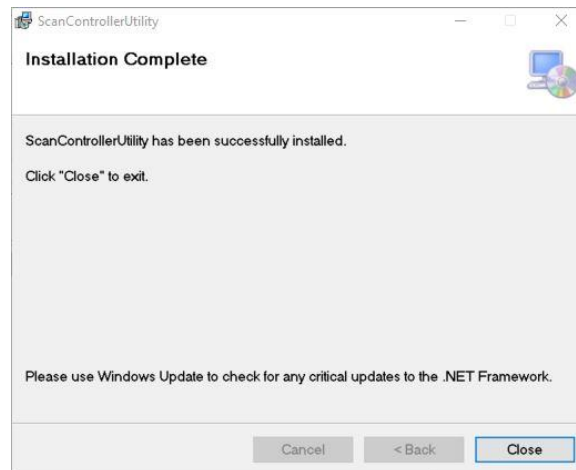
Figure 4-26. Select Installation Folder Window

8. Click **Next** to accept the default Start Menu folder.
  - a. Click **Browse** if you want to change the default Start menu to another location.
  - b. Click **Everyone** to allow all users to access the Scan Controller Upgrade Utility or **Just me** if only you want access.
9. Click **Next**. The Confirm Installation window appears (Figure 4-27).



**Figure 4-27. Confirm Installation Folder Window**

10. Click **Next** to continue with installation. When the installation is done, the Installation Complete message will appear (Figure 4-28).



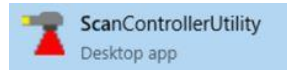
**Figure 4-28. Installation Complete Window**

12. Click **Close** to complete installation.

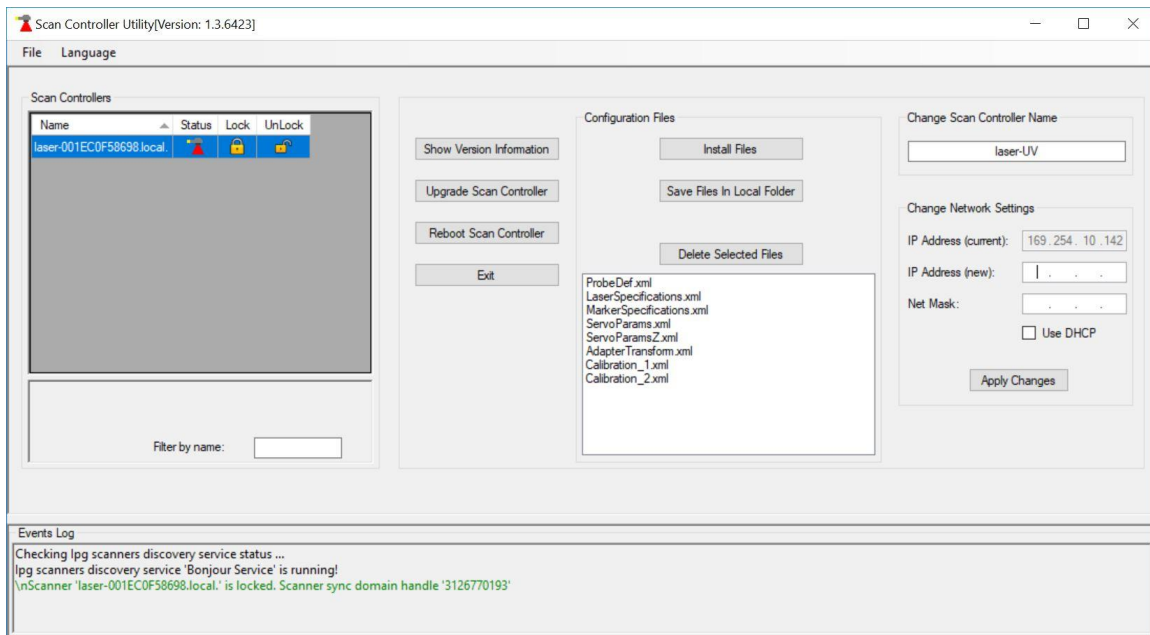
### 4.6.1 RUNNING THE SCAN CONTROLLER UPGRADE UTILITY

To run the Scan Controller Upgrade Utility:

1. Select **All Programs > Scan Controller Upgrade Utility**. The Scan Controller Upgrade Utility window appears (Figure 4-29). The Scan Controller host name automatically appears in the Scanners List (this may take several seconds).



**Figure 4-29. Scan Controller Upgrade Utility Program**



**Figure 4-30. Scan Controller Upgrade Utility Window**

2. To change the host name of the Scan Controller, enter a new name in the **Change Host Name** text box and click **Apply**. A progress status message appears in the Events Log pane.
3. To use a static IP address for the Scan Controller, enter the IP address in the **IP Address** text box and Net Mask in the **Net Mask** text box under **Change Network Settings** and click **Apply**. A progress status message appears in the Events Log pane.
4. Click **Exit** to close the Scan Controller Upgrade Utility.

## WINLASE 6 QUICK START

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- **5.1 Overview**
- **5.2 Starting WinLase 6**
- **5.3 Create a Job**
  - Configuring Marking Parameters
- **5.4 Saving a Job**
- **5.5 Previewing a Job**
- **5.6 Running a One-Tim Job**

## 5.1 OVERVIEW

This chapter explains how to create, save, and run a one-time job using the WinLase 6 program with the Laser Marking Module with Integrated Scan Controller.

To setup and run jobs using the IPGScan software, refer to *IPGScan Software User Guide* (DOCOXUGGUIXX0001).

Before you begin, ensure you have met the following requirements:

- Installed IPG ScanPack as instructed in Section 4.2.
- Installed and activated WinLase 6 as instructed in Sections 4.3 and 4.4
- Configured a local area network as instructed in Section 4.5.

Use appropriate laser safety eyewear when operating this device. The selection of appropriate laser safety eyewear requires the end user to accurately identify the range of wavelengths emitted from this product.

Please review the safety labeling on the product and verify that the personal protective equipment (i.e. enclosures, viewing windows, or viewports, eyewear, etc.) being utilized is adequate for the output power and wavelength ranges.

### LASER WARNING



Use appropriate laser safety eyewear when operating this device. The selection of appropriate laser safety eyewear requires the end-user to accurately identify the range of wavelengths emitted from this product.

Please review the safety labeling on the product and verify that the personal protective equipment (i.e. enclosures, viewing windows, or viewports, eyewear, etc.) being utilized is adequate for the output power and wavelength ranges.



## 5.2 STARTING WINLASE 6

WinLase 6 provides drawings tools for creating custom images. You can also import file formats, for example: .dxf, .bmp, and .hpgl formats.

To start the WinLase 6 program:

1. Go to **All Programs > WinLase 6 Folder**.
2. Select **WinLase 6** (Figure 5-1).

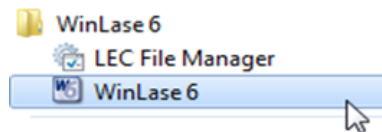


Figure 5-1. Starting WinLase 6 Program

3. The **Job Editor Workspace** appears (Figure 5-2). The Job Editor Workspace provides editing functions and full control sets.

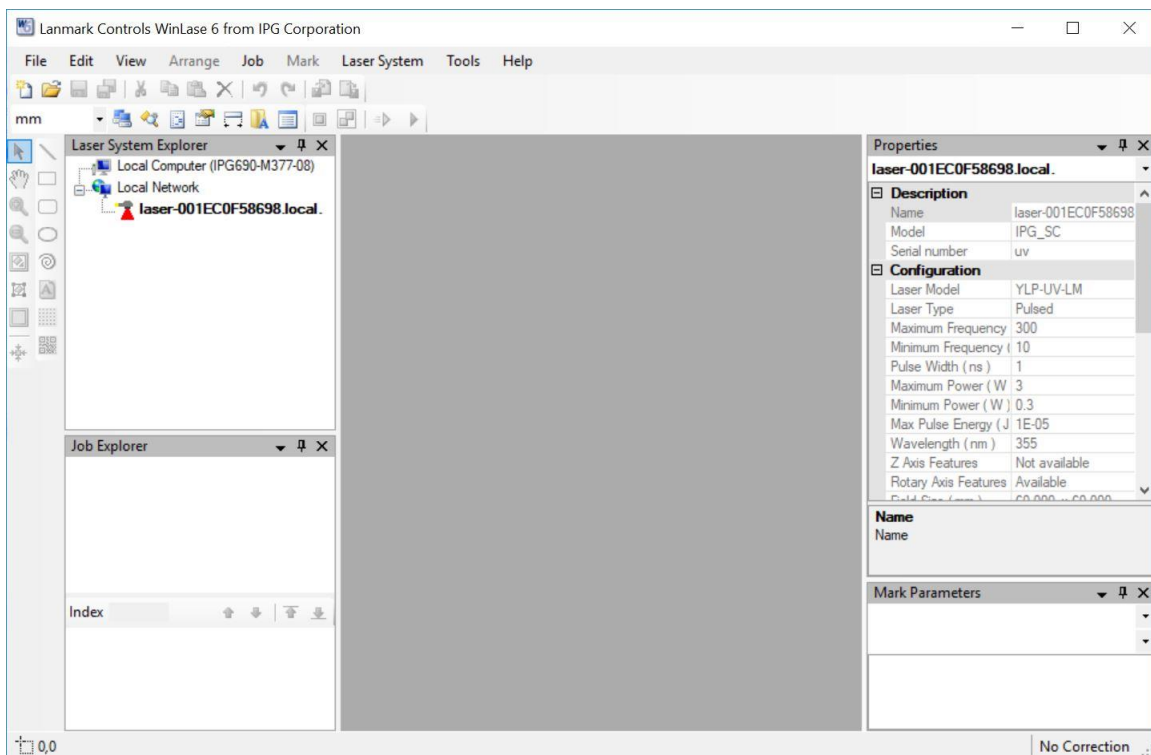


Figure 5-2. Job Editor Workspace

4. The **Laser Marking Module** is automatically detected and appears in the Laser System Explorer window (this may take several seconds).

### 5.3 CREATE A JOB

This section explains how to create a job and interact with objects within this job. A job lets you assemble a series of objects that are marked on the material using the scan head. To create a job:

1. Select **New Job** from the **File** menu. An unsaved and untitled job appears (Figure 5-3).

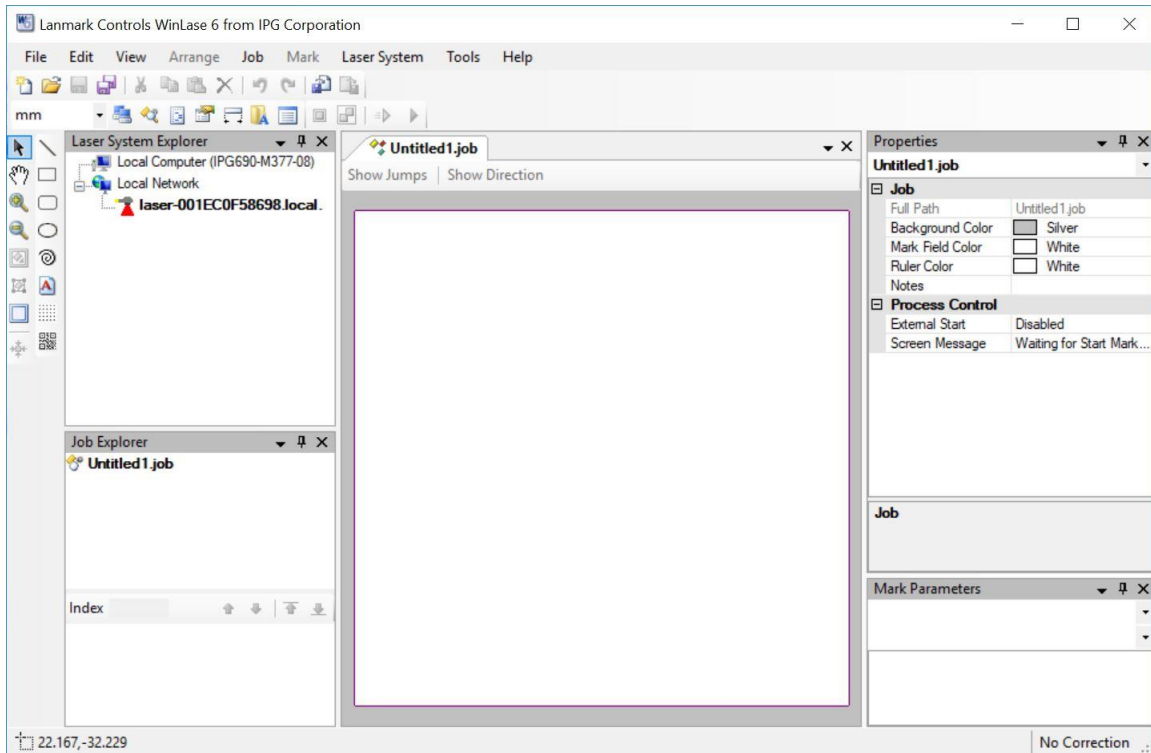


Figure 5-3. New Job Window

2. Define the marking layout by selecting the objects you want to mark. You can add a variety of objects such as text, barcodes, and point arrays. You can also import images by selecting **Import** from the **File** menu. Figure 5-4 shows an example job.

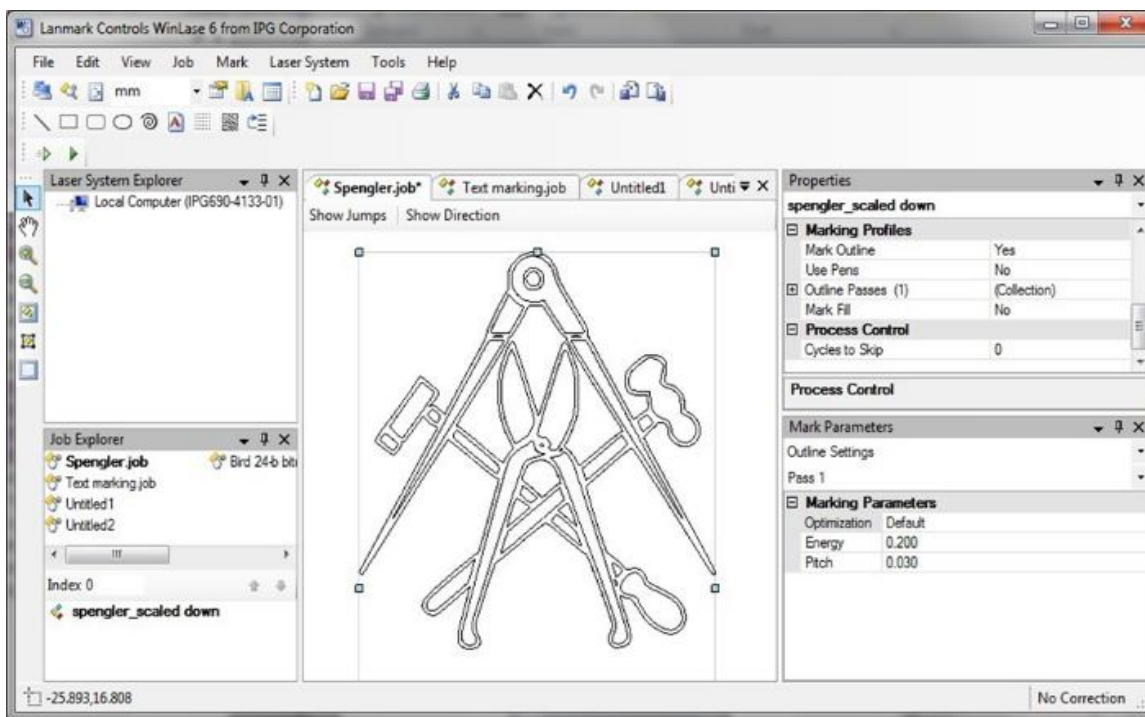


Figure 5-4. Example of a Job

3. Select **Properties Window** from the **View** menu to display the Properties window in the Job Editor Workspace. Drag the window to the right side of the workspace. Make configuration changes in the Properties window, if needed.
4. Select **Mark Parameters** from the **View** menu to display the Mark Parameters window in the Job Editor Workspace. Drag the window to the right side of the workspace. For a recommended marking parameter configuration, refer to [Section 5.3](#).

An example of a job with the Properties and Mark Parameters windows is shown in [Figure 5-4](#).

The order in which the objects appear in the Index window is the order in which they mark when you run the job.

### 5.3.1 CONFIGURING MARKING PARAMETERS

The following marking controls are available in the Marking Parameters window:

- **Optimization** - lets you adjust the speed or quality of the marking job.
- **Pulse Energy** - lets you adjust the energy per laser pulse. The adjustment range is 0 to 1.0 mJ, however since the UV integrated marker can output a maximum of 10uJ, care must be taken to limit this value.
- **Pitch** - lets you adjust the overlapping of the pulses on the laser marking area. This marking parameter lets you modify the contrast of the marking or to create various dot patterns in the engraving (for example, continuous line vs. perforated line).

For a 163mm lens, you can use the following settings for obtaining good results on most metals:

1. Set the Pitch parameter to: 0.020 mm
2. Set the Pulse Energy parameter to: 0.5 mJ.
3. Leave the Optimization parameter as: "Default"

#### IMPORTANT



For bitmaps, the pitch is inherited from the output resolution and is set to approximately the spot size. Quality optimization is automatically invoked, if limited by Laser Power. Setting the Pulse Energy to higher than needed can slow performance. Optimal Pulse Energies and spot sizes change with focal length selection.

Figure 5-5 illustrates the marking parameters configuration options.

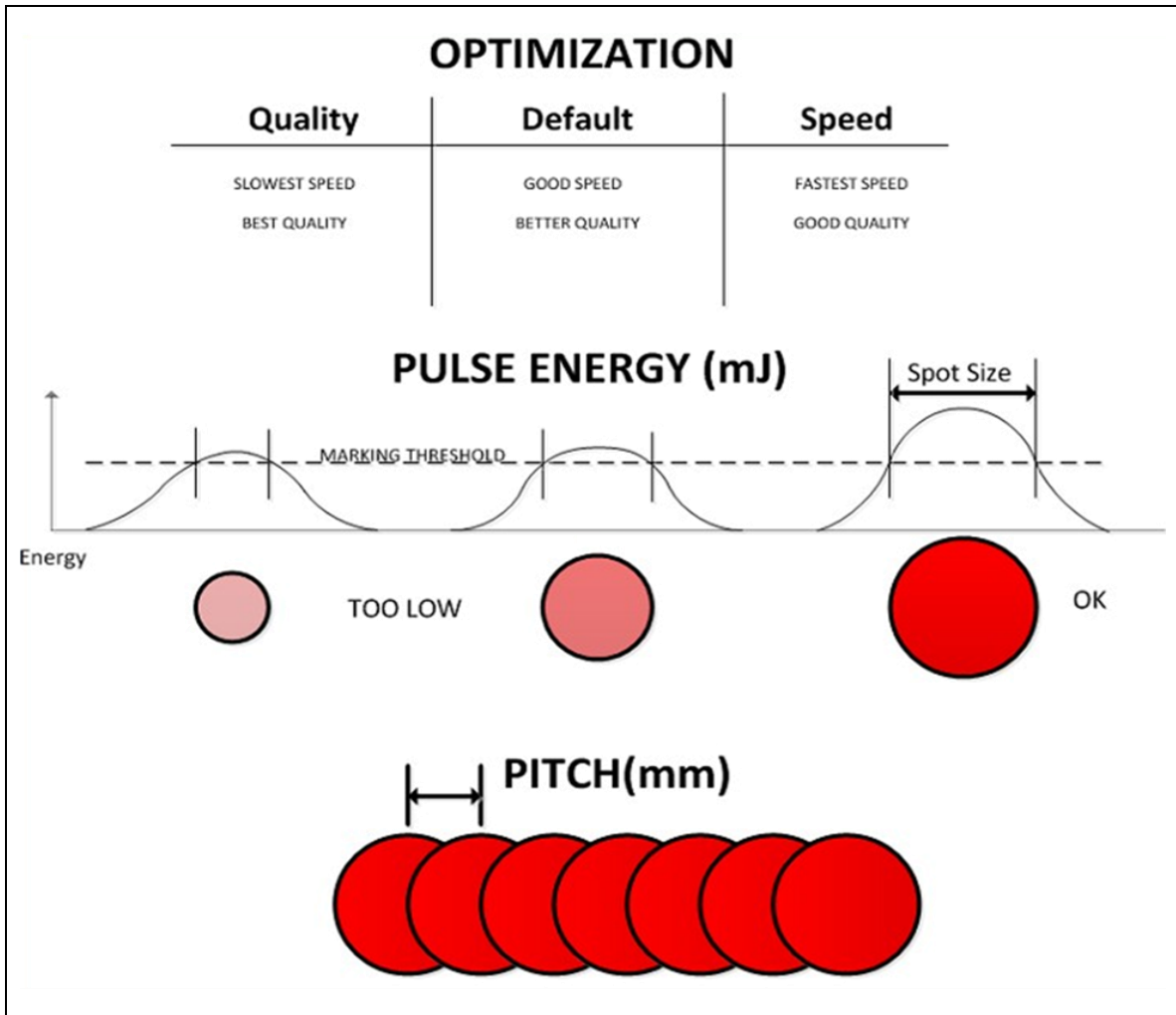


Figure 5-5. Marking Parameters Configurations

## 5.4 SAVING A JOB

The job file contains the basis for all interaction with the Laser Marking Module.

To save a job:

1. Select **Save Job** from the **File** Menu
2. Select a directory location for the saved job.
3. Input a name in the File name box for the job that was created.
4. Click Save.

## 5.5 PREVIEWING A JOB

To preview a job:

- Select **Preview Mark** from the **Mark** menu to preview the job and align where you want the mark to appear on the targeted surface.

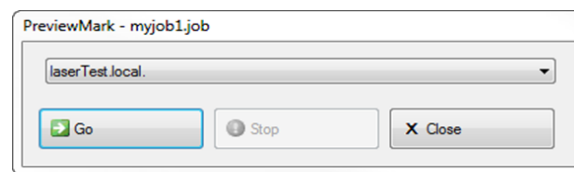


Figure 5-6. Preview Mark Dialogue Box

## 5.6 RUNNING A ONE-TIME JOB

To run a one-time job:

1. Power on the Laser Marking Module.
2. Position the material to be marked on the targeted surface base.
3. Select an object or group of objects in the workspace to be marked using the arrow tool. The object appears with anchor points around it to indicate selection. The name of the object is bolded in the Index window.
4. Select **QuickMark** from the **Mark** menu to preview the job and align where you want the mark to appear.
5. Click **Selected** to mark a single object or **Go** to mark all objects currently in the job.
6. Click **Go**. A progress bar is displayed indicating the status of the job. The optical scanner head draws the shape over the targeted surface.
7. When the marking is complete, the status bar at the bottom of the dialog box displays the mark time.

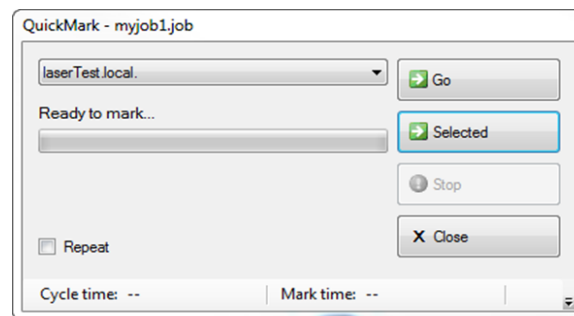


Figure 5-7. QuickMark Dialogue Box



## WARRANTY

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- **A.1 Limited Express Warranty**
- **A.2 Warranty Limitations**
- **A.3 Limitations of Remedies and Liabilities**
- **A.4 Software**

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# B

## SERVICE AND SUPPORT

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- **B.1 Maintenance**
- **B.2 Technical Support**

## B.1 MAINTENANCE

The product is incorporated into a given fixed installation. The safety functions have to be tested in a defined periodic maintenance interval.

The time cycle of this interval is dependent on the safety analysis of the system where the product is installed.

Only personnel knowledgeable in the related functional safety assessment of the system can determine such maintenance.

## B.2 TECHNICAL SUPPORT

Most issues and questions regarding the safety, set-up, operation and maintenance of IPG products can be resolved by carefully reading this User Guide. If you have questions regarding the safety, set-up, operation or maintenance of your IPG product, please call our Customer Service department located in Oxford, Massachusetts, USA, at **508-373-1100**.

If you cannot resolve the issues through the use of this User Guide or over the telephone with our technical support group, you might need to return the product to IPG.



# C

## PRODUCT RETURNS

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**NOTE**

ALL PRODUCT RETURNS REQUIRE A RETURN MERCHANDISE AUTHORIZATION (RMA) FROM IPG.

- **C.1 Returns to the United States**
- **C.2 Returns to Germany**

## C.1 RETURNS TO THE UNITED STATES

To obtain an RMA, contact IPG Customer Service at **508-373-1100**.

- Products must be carefully packed in a suitable shipping container(s). Buyer assumes all responsibility for products damaged in shipment to IPG.
- Buyer must issue a purchase order for the value of the replaced parts/service items and IPG will issue credit or invoice when the parts/service is received. Speak to IPG Customer Service Manager for the amount authorized under the required purchase order.
- All requests for repair or replacement under this warranty must be made to IPG within 30 days after discovery of the defect (but not later than 7 days after warranty expiration).
- All products returned to IPG but which meet applicable specifications, not defectively manufactured or used not in accordance with this User's Guide, will result in the Buyer being charged IPG's standard examination charge.
- Complete packing list with product model and serial number will ensure prompt repair.
- Be sure to include with the returned product your 'ship to' address for the return of the serviced product.

**Warranty Returns:** Domestic & International Buyers\* pay for one-way freight costs and insurance to IPG. IPG will pay for freight return cost and insurance back to the Buyer.

**Non-Warranty Returns:** Domestic & International Buyers\* pay for two-way freight costs and insurance to IPG. If shipment consists of returns that are both warranty and non-warranty, the shipment will be considered as non-warranty. Any UNAUTHORIZED shipments billed to IPG Laser without authorization will be re-invoiced to the Buyer. Confirming purchase orders are required for non-warranty returns.

### NOTE

**\*International Returns must include applicable DUTIES AND TAXES.**

You must mark air bills with "US GOODS, RETURNED FOR REPAIR".

#### Shipping Address

IPG Photonics Corporation  
50 Old Webster Road  
Oxford, MA 01540 USA  
Attn: Product Returns

## C.2 RETURNS TO GERMANY

To obtain an RMA, contact IPG Customer Service at **+49 2736 44 20 451**.

- Products must be carefully packed in a suitable shipping container(s). Buyer assumes all responsibility for products damaged in shipment to IPG.
- Buyer must issue a purchase order for the value of the replaced parts/service items and IPG will issue credit or invoice when the parts/service is received. Speak to IPG Customer Service Manager for the amount authorized under the required purchase order.
- All requests for repair or replacement under this warranty must be made to IPG within 30 days after discovery of the defect (but not later than 7 days after warranty expiration).
- All products returned to IPG but which meet applicable specifications, not defectively manufactured or used not in accordance with this User's Guide, will result in the Buyer being charged IPG's standard examination charge.
- Complete packing list with product model and serial number will ensure prompt repair.
- Be sure to include with the returned product your 'ship to' address for the return of the serviced product.

**Warranty Returns:** Domestic & International Buyers\* pay for one-way freight costs and insurance to IPG. IPG will pay for freight return cost and insurance back to the Buyer.

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**\*International Returns must include applicable DUTIES AND TAXES.**

You must mark air bills with "US GOODS, RETURNED FOR REPAIR".

#### NOTE:

- IPG Laser GmbH will only accept returns for which an approved Return Material Authorization (RMA) has been issued by IPG Laser GmbH. You should address to the customer support team at +49-(0)2736-44-20-451 or support.europe@ipgphotonics.com to discuss the return and request an RMA number. You must return defective products freight prepaid and insured to IPG Laser at the address shown herein. All products which have returned to IPG Laser but which are found to meet all previously applicable specifications for such products or which indicate damage to the fiber connectors not resulting from defect manufacturing, shall be subject to IPG Laser' standard examination charge in effect at the time and these costs shall be charged to the Buyer. All products returned to IPG Laser which are not accompanied by an itemized statement of defects, shall be returned to the Buyer at the Buyer's expense and IPG Laser shall not carry out any evaluation of such products. IPG Laser warrants to Buyer that its services, labor and replacement parts, assemblies and modules will be free of defects in material and workmanship for ninety (90) days from the date of shipment or performance of services.
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- Returns for credit will not be accepted unless authorized in advance, in writing by IPG Laser, in accordance with IPG Laser Terms and Condition, including the warranty provisions, in most cases, restocking fees will apply.
- All returns must be packaged adequately to avoid damage during shipment.
- Complete packing list with product model and serial number will insure prompt repair, if the other terms of this form are not followed.
- See the IPG Terms and Conditions for the applicable warranty for the products before you request the return of the products.
- RMA number will expire 31 days after the date of issue. Thereafter, units received in under the expired RMA number will result in a longer turnaround time. Include a copy of the completed RMA form with the return of your unit(s).

#### Shipping Address

IPG Laser GmbH  
Siemensstrasse 7  
D-57299 Burbach, Germany  
Attn: Product Returns  
Tel: +49-(0)2736-44-20-451



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**Revision B**

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