

# LightWELD<sup>®</sup>

Handheld Laser Welding & Cleaning





# LightWELD® Handheld Laser Welding & Cleaning

LightWELD® handheld laser welding and cleaning devices are fast, easy to learn and operate, and produce high quality, consistent results across a wide range of materials and thicknesses. Pre-weld and post-weld laser cleaning functionality optimizes weld quality while increasing productivity.

## LightWELD 1500

Cost-effective laser welding for steel, stainless steel, and aluminium up to 4 mm thick.

## LightWELD 1500 XR

A higher-brightness beam for welding an extended range of materials up to 6.35 mm, including materials like titanium and copper.

## LightWELD 2000 XR

A higher-brightness beam and increased power for high-speed welding of a full range of materials up to 8 mm thick.

## LightWELD 1000

Reduced power and a higher-brightness beam for the most cost-effective laser welding of steel, stainless steel, and aluminium up to 4 mm thick.

## LightWELD 1500 XC

The same capabilities as LightWELD 1500 with added pre-weld and post-weld cleaning functionality.



	2000 XR	1500 XR	1500 XC	1500	1000
Steels (Stainless Steel, Mild Steel, Galvanized Steel)	up to 8 mm	up to 6.35 mm	up to 4 mm	up to 4 mm	up to 4 mm
Aluminium 3 & 5 Series	up to 8 mm	up to 6.35 mm	up to 4 mm	up to 4 mm	up to 4 mm
Aluminium 6 Series	up to 5 mm	up to 5 mm	---	---	---
Nickel Alloy	up to 7 mm	up to 5 mm	---	---	---
Titanium	up to 7 mm	up to 5 mm	---	---	---
Copper	up to 3 mm	up to 2 mm	---	---	---
Wobble Welding Width	up to 5 mm	up to 5 mm	up to 5 mm	---	---
Cleaning Width (Pre- & Post-weld)	up to 15 mm	up to 15 mm	up to 15 mm	---	---
High Frequency Peak Power for Cleaning	3000 W	2500 W	2500 W	---	---
Laser Power	up to 2000 W	up to 1500 W	up to 1500 W	up to 1500 W	up to 1000 W



### LASER WELDING

High speed, low heat input, and a small HAZ make laser welding thick, thin, reflective materials, and materials with dissimilar thicknesses far less challenging for all skill levels.



### LASER PRE-CLEANING

Pre-weld cleaning removes rust and other contaminants from materials and increases weld quality. This is much faster than manual cleaning and uses no chemicals or abrasives.



### LASER POST-CLEANING

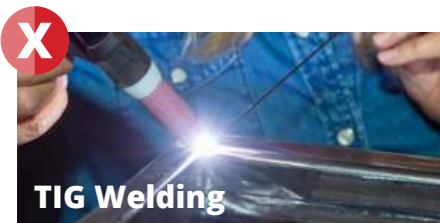
Post-weld cleaning removes heat discoloration and improves visual finishes without post-weld grinding.



# LightWELD ADVANTAGES & BENEFITS

LightWELD enables dramatically faster welding and is easier to learn and operate than MIG or TIG. LightWELD provides higher-quality, consistent results with minimal distortion or part deformation.

	MIG & TIG	LightWELD
<b>Speed</b>	Average	Fast - Over <b>4X Faster</b> than TIG
<b>Quality</b>	Depends on user experience	Consistent high-quality results
<b>Learning curve</b>	Steep	Quick and easy
<b>Part Setup</b>	Critical and time consuming	Minimal and fast
<b>Material flexibility</b>	Limited with consumables changes	Wide range with no set up
<b>Heat affected zone</b>	Large	Small
<b>Distortion &amp; Deformation</b>	High	Very Low
<b>Wobble welding</b>	No	Yes - up to 5 mm
<b>Pre-Weld Cleaning</b>	No	Yes - Removes rust, oxides, oil & grease
<b>Post-weld Polishing</b>	No	Yes - Removes soot, debris & discoloration



**TIG Welding**

**TIG welding** can generate extreme heat that deforms thin materials and produces poor visual finishes. Welding copper is difficult and welding metals of dissimilar thicknesses is limited. TIG welding is a highly skilled process, and experienced TIG welders are a scarce resource.



**MIG Welding**

**MIG welding** requires consumable wire, material pre-cleaning, and beveled joints for full penetration of thick metals. Travel and work angles are limited, and vertical positions are extremely challenging. MIG is a high-heat process that can cause part deformation.



LightWELD is easier to learn and operate, and is **4X** faster than TIG welding. The low heat input and extensive material and thickness capabilities increase productivity, repeatability, and improve weld quality for operators of all skill levels.

For LightWELD devices that offer laser cleaning capability in addition to welding, pre-weld cleaning remove oxides, rust, paint, oil, or grease from surfaces to be welded. Post-weld cleaning removes soot and weld-related debris.

# LightWELD LASER WELDING & CLEANING CAPABILITY

LightWELD built-in optimized presets provide high-quality, consistent welds for any skill level. LightWELD 1500 XC, 1500 XR, and 2000 XR offer the added functionality of pre- and post-weld cleaning. Pre-weld cleaning removes oil, grease, paint, or any potential contaminants that can affect weld quality. Post-weld cleaning creates visually appealing welds while eliminating need for post processing



**Maximum Welding Capability For Minimal Rework**

LightWELD easily welds steels and aluminium 3 & 5 series, plus LightWELD XR devices increase the welding capability for aluminium 6 series, titanium, copper, and nickel alloys without part deformation. Preset modes ensure proper laser settings for consistent high-quality welds. Built-in wobble function accommodates wider seams, while wire welding capability extends welding application to poorly fit up parts.



**Pre-Weld Cleaning for Improved Weld Quality**

**Post-Weld Cleaning for Improved Visual Appearance**

To improve weld quality and reduce porosity, best results are attained by pre-cleaning to remove any oil, grease, or any debris that could enter the weld pool and create a defect.

Even the best welders can leave soot, debris, and visual signs of localized heating. A quick, final cleaning pass leaves a beautiful, clean weld without the need for manual post-finishing.



## Weld Safety Detection

1. Laser only fires while the nozzle is in contact with the part
2. Laser power shuts off if no welding plume is detected



# LightWELD FEATURES

Laser welding power up to 2000 W is easily adjusted with intuitive controls to quickly dial in optimum weld settings for various materials and thicknesses. With up to 100 stored preset and user-defined process parameters, novice welders can be trained and welding in a matter of hours.

## Lightweight Handheld Welding & Cleaning Torch

The handheld welding & cleaning torch is compact, ergonomic, and comfortable. Specially designed nozzle tips for welding and cleaning applications, plus built in wobble functionality enable operators to produce high quality welds consistently. Nozzle tips switch out quickly and easily to accommodate fusion welding, wire welding, and cleaning, further optimizing and increasing productivity.



## Optimized Factory Presets and Laser Power Control

- Built-in parameters ensure high-quality results and can be customized for later use
- Switch Instantly between presets to accommodate many material combinations
- Simple controls allow new welders to be productive immediately

## Built-in Wobble Welding for Increased Productivity

- Create highly aesthetic seams and weld parts with poor fit up
- Adjustable frequency and weld width up to 5 mm optimizes results
- Use preprogrammed parameters or create custom parameter sets



## Simple Installation and Operation



230V Power

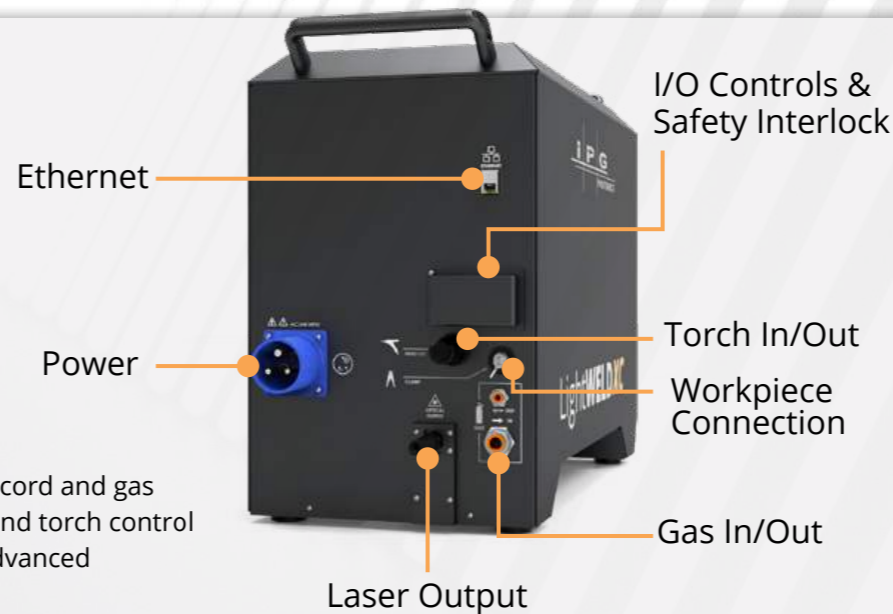


Standard Gas



Workpiece Clamp

Clearly labeled rear connections make getting started fast and easy. Just plug in the power cord and gas connection, attach the workpiece clamp, and LightWELD is ready to go. Laser power, gas, and torch control is delivered through a single cable. An ethernet computer connection provides access to advanced settings to fine tune and save process parameters.

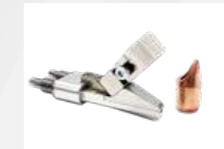


## OPTIONAL



### Wire Feeding Package

Package includes wire feed unit, electrical connections, nozzle assembly & IPG Process Mode software



### Dual Wire Feeder Adapter

Increase fillet dimensions. Increase tolerance for poor part fit up. Faster material build up.



### Gas Lens Nozzle

Improves gas shielding welding materials sensitive to oxygen, moisture, or other contaminants.



### Carbon Fiber Helmet

Ultra lightweight construction designed to be compliant with EN207 and ANSI Z87+W16 ratings.



# ACCESSORIES

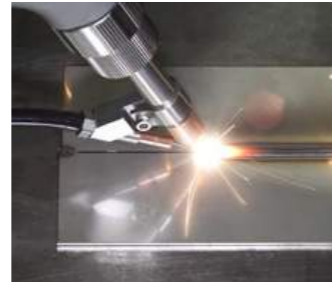
## LIGHTWELD WIRE FEEDER PACKAGE



This optional wire feeder package includes all necessary hardware and software to add wire welding capability to LightWELD.

**Included with Wire Feeder Kit:**

- Wire Feed Unit
- Proprietary Weld Head Nozzle Attachment
- System Trigger Cable
- 4 Tips: 0.8mm, 0.9mm, 1.2mm, 1.6mm
- 4 Rollers (2 U-Rollers, 2 V-Rollers)
- 4 Liners (2 Teflon liners, 2 Steel liners)
- LightWELD Wire Welding Presets



Used for manual laser wire welding of low carbon steel, stainless steel, aluminium, non-ferrous metals & other alloys. Wire feed settings adjusted on the wire feed unit and LightWELD unit provides synchronization trigger signal to wire feed unit. Wire feeder nozzle attachment guides wire precisely to the weld pool. LightWELD Process Modes provide standard parameter settings for typical materials and wire types.

LightWELD Wire Feeder Specifications	
<b>Wire feed delivery length</b>	2.7 m (9 ft)
<b>LightWELD Interface</b>	Low Voltage enable signal cable
<b>Wire Feed Speed Range</b>	30 - 600 cm/min (12 - 230 ipm)
<b>Compatible Wire Diameters</b>	0.8 mm - 1.6 mm
<b>Wire Reel Capacity</b>	1 kg (2 lb), 5 kg (10 lb) or 10 kg (25 lb)
<b>Compatible Wire Materials</b>	Steel, Stainless Steel, Aluminium
<b>Power Requirements</b>	115 - 230V 50/60 Hz
<b>Weight and Dimensions</b>	13 kg (28.7 lb)   520 mm (20.5") L x 245 (9.7") W x 420 (16.5") H

# CONSUMABLES



**Cover Slides**  
Pack of 5



**Gas Lens Nozzle**  
Ideal for materials sensitive to oxygen, moisture, or other atmospheric gases, this nozzle features a precision laser-drilled diffuser in a showerhead configuration.

## DUAL WIRE FEED ADAPTER



The optional Dual Wire Feeder Adapter allows simultaneous feeding of two wires into the weld pool to create larger welds. Parallel feeding of the wires at the nozzle tip with the laser centered between allows simultaneous welding both wires during feeding.

**Features**

- Dual Wire Feed
- Wire diameter up to 0.063"
- Twin Groove Weld Tip

**Benefits**

- Increase fillet dimensions
- Increase tolerance for poor part fit up
- Faster material build up

# ACCESSORIES

## LIGHTWELD PPE



### Carbon Fiber Welding Helmet

The helmet features a lightweight carbon fiber shell incorporating both UV and IR filters appropriate for use with LightWELD systems. Designed to be compliant with EN207 DLB8 + ILB9 @ 1070nm & ANSI+W16 rated for superior protection.



### Welding Helmet with Shield

Auto-Darkening Laser Welding Helmet with IR Shield & IR coated lens provides protection from specular reflections.



**Safety Glasses**  
w/ Side Shield Protection  
1000-1550 nm OD 7+



**Safety Glasses LFO**  
Large Fit Over  
1000-1550 nm OD 7+



**Safety Glasses ADJ**  
Adjustable temple bar  
1000-1550nm OD7+

# CONSUMABLES COPPER WELDING NOZZLES



Copper Nozzle Set



1 point



2 point 6 mm



2 point 9 mm



Cone

# ALUMINIUM WELDING NOZZLES



Al 1100 Nozzle Set



1 point



2 point 6 mm



2 point 9 mm



Cone

# CLEANING NOZZLES



Cleaning Nozzle Set



2 prong



1 prong



Outer Corner





## MADE IN GERMANY

The LightWELD is manufactured specifically for European users at IPG's German headquarters in Burbach (NRW). Proximity to users ensures efficient sales and support.



## THE COMPANY IPG - A BRIEF INTRODUCTION

IPG Laser GmbH & Co. KG is a leading company in the field of fiber laser technology and part of the IPG Photonics Corporation headquartered in the USA. Since its foundation in 1990, IPG has established itself as the market leader in the development and production of high-power fiber lasers. At its German site in Burbach (NRW), where the European Customer Center with its 800

m<sup>2</sup> showroom is also located, IPG employs over 1500 people. Thanks to vertical integration, the company develops and manufactures almost all components itself, which guarantees high quality and rapid adaptation to market requirements. In this way, IPG helps its customers to increase their productivity and set new standards.

### WOULD YOU LIKE TO FIND OUT MORE?

YOUR SPECIALIST ADVISOR WILL BE HAPPY TO ANSWER ALL YOUR QUESTIONS.



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$P_e < 2500\text{ W}$   
 $P_o < 6000\text{ W}$   
 $\lambda = 900 - 1200\text{ nm}$   
 $t \geq 1\ \mu\text{s}$   
 $F = 0 - 100\text{ kHz}$

**DANGER – INVISIBLE LASER RADIATION**  
AVOID EYE OR SKIN  
EXPOSURE TO DIRECT OR  
SCATTERED RADIATION  
CLASS 4 LASER PRODUCT  
IEC 60825-1:2014

**LASER RADIATION**  
DO NOT STARE INTO THE BEAM  
OR VIEW DIRECTLY  
WITH OPTICAL INSTRUMENTS  
CLASS 2M LASER PRODUCT  
 $P_e < 1\text{ mW}$   
 $\lambda = 600 - 700\text{ nm}$   
IEC 60825-1:2014

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