

# EDWS-15 Laser Welding Station

## *The new paradigm in ultra small scale laser welding*

The edws-15 is an innovative, self-contained, desktop laser welding station designed for research & development and small scale production requiring laser joining of metallic parts. The system is semi-automatic and the graphical user interface facilitates ease of use. With its small footprint (approx. 3' x 5'), the workstation is ideal where production floor space is at a premium. Components are secured to a breadboard and may be reconfigured easily. The Class I enclosure is fitted with a safety interlock and a wide front door for easy access. The system is built for easy integration into virtually any environment and requires only household 20 amp/110 vac current.



At the core of this versatile workstation is Equilasers' award-winning 15 watt edw-15 nd:yag laser welder. A 25 watt version, the edw-25, is also available. Laser power is delivered via optical fiber to a precision focusing/viewing assembly, which focuses the welding beam to a small spot and is equipped with a video camera to view the weld area. The focusing assembly is attached to a set of x, y & z translation stages – the x and y stages are driven with highly responsive servo-motors with a linear resolution and repeatability to  $\pm 0.0001$ ". A joystick is available for easy remote control of the x and y stages. A stepper motor driven lathe is included for precision circumferential welds.

The video system features a miniature high resolution color camera and monitor. Camera lighting is provided through a fiber optic light guide joined to a high intensity illuminator. The lens configuration has a magnification up to 80x and clearly displays features as small as 1 mil. A red aiming light co-propagates with the laser beam which provides precision aiming of the weld spot.

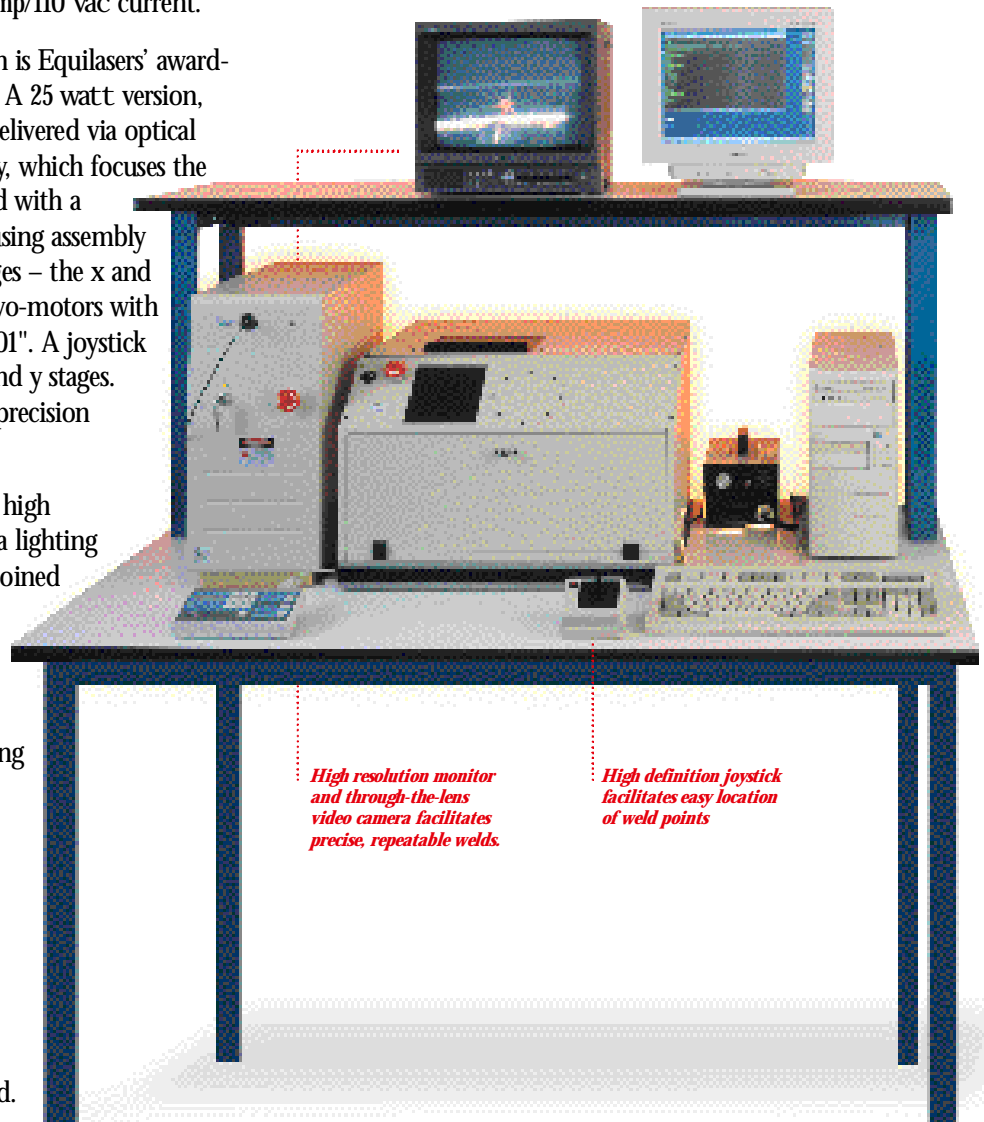
A gas handling system with flow rate adjustment is included. Gas flow and laser firing is controlled through a two-stage footswitch. The first stage activates gas flow while the second fires the laser. Gas delivery accessories are provided to allow the user to direct the gas onto the workpiece at various angles and as close to the workpiece as desired.

### Features and Benefits

- Self-contained, semi-automatic laser welding workstation
- Highly magnified view of weld area with precision aiming light
- Selectable spot sizes from 25 $\mu$ m to 365 $\mu$ m
- Well-controlled, highly reproducible laser energy delivery
- Low maintenance, requires only household 20Amp/110VAC

### Applications

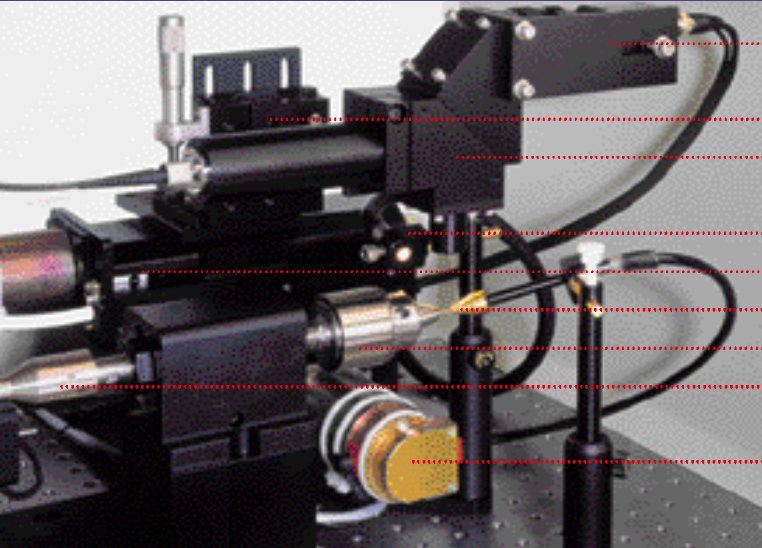
- Stainless steel, titanium, Kovar, Nitinol and other alloys
- Spot and seam welding of miniature medical devices
- Securing fiber-optics components after alignment
- Photonics components packaging process
- Electronic components and sensors packaging process



*High resolution monitor and through-the-lens video camera facilitates precise, repeatable welds.*

*High definition joystick facilitates easy location of weld points.*

# System Components



- Through-the-lens video camera
- Manual Z stage
- Laser focusing head
- Fiber optic light guide
- Servo-motor driven Y stage
- Weld assist gas jet
- Chuck for holding weld pieces
- Stepper motor driven lathe
- Servo-motor driven X stage

## 1. EDW-15 Desktop Laser Welder

### 2. Optical Fiber

EOF-2-3                      200 $\mu$ m Silica/silica fiber, 3m. long, SMA termination both ends  
EOF-4-3                      365 $\mu$ m Silica/silica fiber, 3m. long, SMA termination both ends

### 3. Focusing Head

Focusing head mounted on XY stage has through-the-lens video imagery, changeable objective lens to vary spot size, ring-light illuminator attachment and manual height adjustment\*

### 4. Computer Controlled XY Stage

Motor Type                      Servo-motor with encoder for position feedback  
Linear Travel                    3" in X and Y directions  
Motion Control                   Intelligent motion controller and PC expansion card  
Motion Resolution                $\pm 0.0001$ "  
Motion Repeatability            $\pm 0.0001$ "  
Accessory                        Two direction joystick

### 5. Rotary Stage

Headstock with an adjustable chuck for holding various round pieces. Computer controlled stepper motor.

### 6. High Resolution Camera and Monitor

Miniature color video camera with through-the-lens optics for accurate viewing and 13" monitor.

### 7. PC and software\*\*

PC controlled focusing head movement integrated with laser firing. Visual-basic operator interactive screen provides easy change of laser parameters, macro commands for the XY stages and user teachable motion programs.

### 8. Gas Handling (Argon)

Two stage footswitch and adjustable rate flowmeter with specially designed gas flow attachment.

### 9. Safety Enclosure

Interlocked, Class I enclosure permits easy access to the workpiece and adjustment of controls.

### 10. Breadboard Base

2" thick stainless steel breadboard base with 1/4-20 tapped holes in a 1" x 1" pattern for mounting various components of the workstation. The base is shock mounted for vibration isolation.

\*Optional stepper motor driven z-axis also available.

\*\*Equilasers' engineers can develop software programs for customers' specific laser welding applications as an option



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