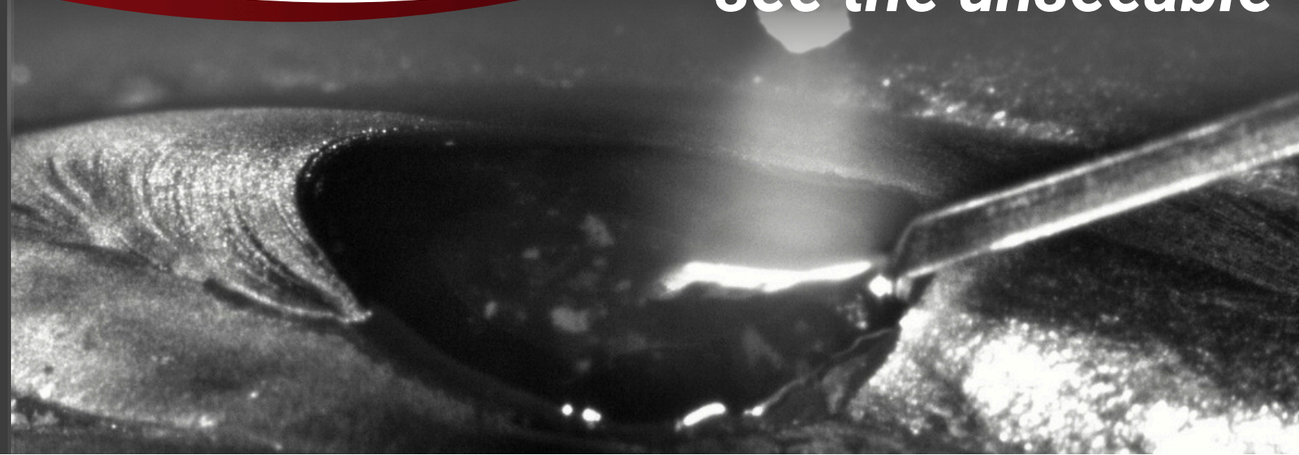
MECAWELD

WELDING VISION CAMERA

- Advanced Weld Inspection & Real-Time Weld Monitoring System for Professional Welding Applications

see the unseeable



The Mecaweld welding vision camera is an advanced tool specifically designed for monitoring and controlling the welding process. With 30 years of experience in welding industry, we created a product that allows us to stay true to our core values, which enables microscopic observations.

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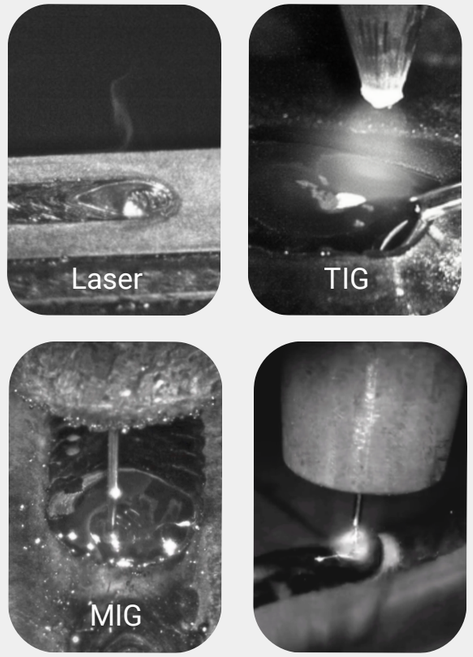
Welding Vision Camera

- Optimized for All Welding Applications, Built for Safety
- High Resolution
- Exceptional Weld Arc Clarity
- Cost-Effective



Detect, analyze, and ensure the highest quality standards in their operations.

Advanced Weld Inspection & Real-Time Weld Monitoring System for Professional Welding Applications

The Mecaweld welding vision camera is an advanced tool specifically designed for monitoring and controlling the welding process. With 30 years of experience in welding industry, we created a product that allows us to stay true to our core values, which enables microscopic observations.

M2-130H / M2-230H & M2-130U / C2-130U

NEW

Specialties

- Complete suppression of welding arc light interference
- Clear imaging through fume and spatter

Purpose

- Prevent eye injuries from arc exposure
- Equip robots with "eyes".
- Cost-effective for users

Key Benefits

- Solves weld torch and wire alignment issues
- Detect Weld Defects in real-time
- Optimize weld quality
- Essential for Smart Welding

1. Active light source visualization technology with built-in infrared light source, providing full-field high-definition images with uniform brightness
2. Robust hardware and cutting edge software algorithms to effectively bypass the arc.
3. Capable of seeing through smoke and dust.
4. One camera, one setting, for all applications: MMA/TIG/MIG/MAG/PAW/LBW/3D Printing, etc, in various materials such as carbon steel, stainless steel, aluminum alloy, etc.
5. Built-in f25mm lens, and an interchangeable with f42mm lens, adjustable effective working distance of 160-450mm.
6. Optional water-cooling plate for continuous operation in high-temperature environments.
7. Fiber optic data cables to avoid electromagnetic fields and high-frequency interference.
8. Compact size.
9. Truly plug-and-play design.

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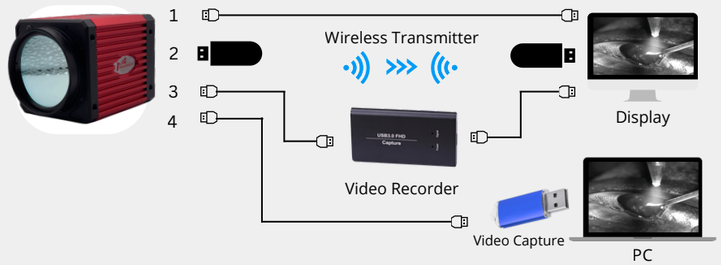
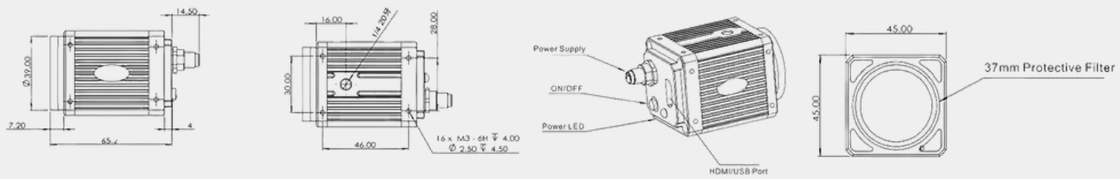
USB Interface Camera M2-130U (monochrome)/ C2-130U (color)

- Resolution of 1280x1024@206fps
- Requires installation of professional SDK software on a computer to view real-time captured images, capture snapshots, or record videos.
- Uses fiber optic USB cables to avoid electromagnetic fields or high-frequency interference.
- It has more adjustable parameters compared to the M2-130H camera, making it suitable for secondary development.

HDMI Interface Camera M2-130H / M2-230H



- M2-130H: Resolution of 1280x1024@60fps | M2-230H: Resolution of 1900x1080@60fps
- No need for a computer, directly connect the camera to a display screen.
- Plug-and-play functionality, ready to use.
- Uses fiber optic HDMI cables to avoid electromagnetic fields and high-frequency interference.
- It can also be used with wireless image transmission and an optional battery power supply to avoid cable clutter, making it more convenient for robotic welding.
- Optional HDMI recorder for recording and playback of captured videos.



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M2-130H/M2-230H & M2-130U/C2-130U

Welding Vision Camera

Technical Specifications

Model	M2-130H	NEW M2-230H	M2-130U	C2-130U
Sensor Type	B&W 1/2.7 CMOS imager		B&W 1/2.7 CMOS imager	Color 1/2.7 CMOS imager
Max Resolution	1280x1024	1900x1080	1280x1024	
Frame Rate	60fps		206fps	
Protocol	HDMI Output		UBS3.0/U3Vision/GenICam	
Operation System/Software	No need for computer		Win7/Win10/Android	
Lens	F=25mm(Built-in) F=42mm(Interchangeable)		F=25mm(Built-in) F=42mm(Interchangeable)	
Working Distance	160-250mm(F25mm lens) 200-450mm(F42mm lens)		160-250mm(F25mm lens) 200-450mm(F42mm lens)	
Working Temperature	-40°--85°C		-40°--85°C	
Dimension	45x45x65.2mm		45x45x65.2mm	
Laser	Laser Class 3R		Laser Class 3B	

M2-130U-T

Externally Triggered High-Speed Welding Vision Camera

The M2-130U-T is a specialized welding camera that captures clear images at up to 1500 fps, eliminating arc glare and fume interference. It allows welding engineers to directly observe droplet transfer and weld pool behavior under different welding parameters. This real-time visualization enables faster process optimization by reducing trial-and-error testing, saving both time and materials. The camera is designed for production monitoring, welding research, and quality control applications where clear weld pool observation is critical.

Key Features:

- **Adjustable Installation Range**: 160mm-450mm working distance with variable focal length for flexible positioning.
- **Electromagnetic Shielding**: Integrated insulating plate provides high-frequency interference protection, preventing arc damage and display blackouts.
- **Heat Management**: Optional water cooling plate ensures reliable operation in high-temperature, continuous-use applications.
- **Network Capability**: Multi-station networking with centralized group control functionality.
- **Advanced Software Integration**: Built-in SDK enables custom image processing, weld recognition, quality detection, and seamless integration with industrial control systems for automated monitoring and intelligent production.
- **Integrated Laser Illumination**: Built-in laser lighting suppresses spatter interference, penetrates smoke, and delivers clear imaging without external lighting requirements.
- **External Trigger Control**: Pulse generator compatibility allows precise frame rate control through adjustable pulse frequency triggering.

Adjustable Resolution

- 1280×1024 @ 206 FPS (High-resolution for detailed weld inspections)
- 640×480 @ 443 FPS (Balanced resolution for quality control)
- 480×240 @ 800 FPS (High-speed for precise welding capture)
- 480×180 @ 1003 FPS (Dynamic welding process analysis)
- 480×98 @ 1500 FPS (Ultra-high-speed for rapid arc events)

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M2-130U-T

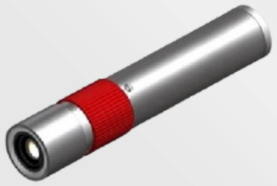
Externally Triggered High-Speed Welding Vision Camera

Technical Specifications

Model	Mecaweld-M2	Mecaweld-C2
Color	Monochrome	Color
Standard Resolution	1280x1024	1280x1024
Sensor Format	1/2.7” CMOS	1/2.7” CMOS
Frame Rate (fps)	1280x1024 @ 206fps	
Video Data Output	16-bit grayscale lossless output	48-bit color lossless output
Vision Software	Compatible with U3VISION/GenICam protocols; seamlessly integrates with Halcon, VisionPro, LabVIEW, and other vision software.	
Dimensions	45 x 45 x 62mm (excluding terminals)	
Weight	220g	
Operating Temperature	-40℃ to 85℃	

Micro Series

Miniature Welding Vision Camera



- **Crystal Clear Welding Vision**
- Specifically designed for **limited spaces**
- High Resolution
- **Cost-Effective**

Industry's First 15mm Diameter, Built-in Active Laser Illumination Welding Monitoring Camera with Adjustable Focus

Engineered for confined space applications, the Micro series integrates a proprietary low-coherence 936nm laser source with advanced algorithms to deliver exceptional welding visualization.

Key Features:

- **Ultra-Compact Design**: Industry-first 15mm diameter welding camera with integrated laser illumination and electrically adjustable focus
- **High-Resolution Performance**: 1920x1080 @ 60fps in minimal form factor
- **Patented Lens System**: Interchangeable straight (0°) and refractive (90°) lenses accommodate diverse installation requirements
- **Plug-and-Play Operation**: Micro HDMI output connects directly to displays without additional hardware
- **Modular Expansion**: Optional wireless transmission and battery power modules for enhanced portability

Recording Solutions:

1. **PC Integration**: Low-cost capture cards enable real-time viewing and recording
2. **Standalone Storage**: HDMI video boxes support USB and CF card recording
3. **Network Recording**: Compatible with standard NVR systems via encoder integration
4. **Enhanced Connectivity**: Optional encoders provide HDMI loop-out, wireless WiFi/network access, and USB recording capabilities for comprehensive monitoring solutions.

HD Wireless Transmission

Various Connection Methods

1080P HD Output

Remote HD Smooth

Wireless Low Latency

M2-200H-M15

Miniature Welding Vision Camera

Technical Specifications

Parameter	Specification
Product Series	Micro Series
Model	M2-200H-M15
Color	Monochrome
Resolution	1920×1080
Frame Rate	60 fps
Sensor Size	1/2.6 inch
Pixel Size	3.0×3.0μm
Interface Protocol	HDMI 1.4
Input Voltage	12VDC@3A
Field of View (FOV)	31°×18°
Working Distance (WD)	30-300mm (optimal: 40-150mm)
Operating Temperature	-40°C to 85°C
Volume	15mm Diameter & 75mm Length

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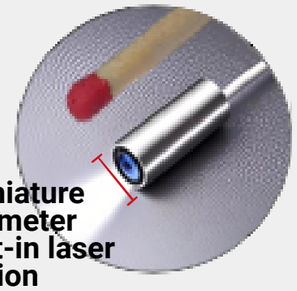
Nano Series

Borescope Welding Vision Camera

- **Clear imaging** in confined welding spaces
- High Resolution
- **Precise** Nano-Second Pulse Gating (NSPG) technology
- **Cost-Effective**



Ultra-miniature 6mm diameter with built-in laser illumination

World's First Smallest Borescope Welding Monitoring Camera - 4.8mm Diameter Camera Head with an External Active Laser Illumination

NSPG® Technology

Precise Nano-Second Pulse Gating (NSPG®) technology with unique laser light source and advanced imaging algorithms

Arc Light Suppression

Suppresses intense welding arc light interference for crystal clear imaging

Smoke Penetration

Capable of penetrating through fume and dust for clear imaging in challenging environments

High Definition

Full-field HD imaging with no flicker at 800×600@60fps

One Camera for All Applications

Compatible with various materials and welding processes: MMA/TIG/MIG/MAG/Plasma/ Laser/Electron Beam/Metal Additive Manufacturing

Ultra-Compact Design

World's smallest at 4.8mm diameter × 16mm length - fits inside narrow gap welding torch bodies

Advanced System Features

Compact Design: Integrated Nano Camera: Head diameter 6.0mm

Modular Nano Camera: Diameter 4.8mm, length 16mm, 1-meter control cable between camera and main controller. – *Compact size allows installation within narrow gap welding torch bodies.*

Adjustable Focus - Variable working distance from 30-300mm (optimal: 40-150mm) for flexible installation. Built-in proprietary patented image algorithms.
Sharp, clean images even under intense arc light and heavy smoke.

Separate Laser Illumination: Modular laser active illumination source.
Front end diameter: 3.2mm × 21mm length / Light source cable: 2m cable, 3.0mm diameter.
Custom lengths available.

Integrated Control Box: Built-in 5-inch HD display for **real-time monitoring** and **easy installation**/debugging. Direct display connection without computer.
Optional HDMI-UVC capture card compatibility / Optional standard wireless and LAN connection

Custom Integration Options: Integrated light source and imaging module available (6mm diameter) with flexible snake tube for 180°-90° bending.
Custom requirements available.

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Nano Series

Borescope Welding VIsion Camera

Technical Specifications

Product Series	Nano Series Borescope Weld Monitoring Camera			
Structure Type	Modular		Integrated	
Model	M2-030H-NM	C2-030H-NM	M2-030H-NI	C2-030H-NI
Color	Monochrome	Color	Monochrome	Color
Resolution	800x600			
Frame Rate	60fps			
Sensor Size	1/7.5 inch CMOS			
Pixel Size	3.0x3.0μm			
Interface Protocol	HDMI 1.4			
Input Voltage	12VDC@3A			
Field of View (FOV)	20°x14.5°			
Working Distance	30-300mm (optimal: 40-150mm)			
Operating Temp	-40°C to 85°C			
Dimensions	**Imaging Module:** Ø4.8mm x 16mm, 1m cable @Ø1.5mm **Light Source:** Ø3.2mm x 21mm, 2m cable @Ø3.0mm		**Integrated Camera:** Ø6.0mm head, bendable snake tube 180°-90°, 1m cable @Ø6mm	
Control Box	105x45x160mm			
Laser Safety Class	Class 3B			

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M2-160E Active Vision Welding Camera

GigE Welding Vision Camera

Real-time Weld Monitoring without External Lighting

The M2-160E combines a built-in 936 nm infrared laser illuminator with active vision imaging technology.

It provides real-time video of the weld seam, welding torch, weld pool and surrounding area before, during and after welding without requiring additional external lighting.

Key Features

- **Active Vision Technology**: Built-in infrared illumination provide high-definition imaging with relatively uniform brightness across the frame.
- **Arc-Glare Suppression:** High-quality hardware and proprietary software algorithms virtually eliminate arc-glare interference in the image.
- **Fume Penetration:** The low-coherence 936 nm laser source enables imaging through welding fumes.
- Uniform Image: Clear full-frame video makes it easier to observe weld-seam position, weld-pool condition and wire orientation.
- Broad Process Compatibility: Suitable for TIG, MIG/MAG, plasma, laser and electron-beam welding across common engineering alloys.

Applications:

The M2-160E is designed for real time visualization and monitoring across a wide range of welding and machine vision applications.

Arc Welding Monitoring

- TIG, MIG/MAG, plasma and arc overlay welding.

Laser & Electron Beam Welding

- Real time observation and recording of welding processes.

Weld Alignment & Positioning

- Monitor torch, wire and seam alignment before and during welding.

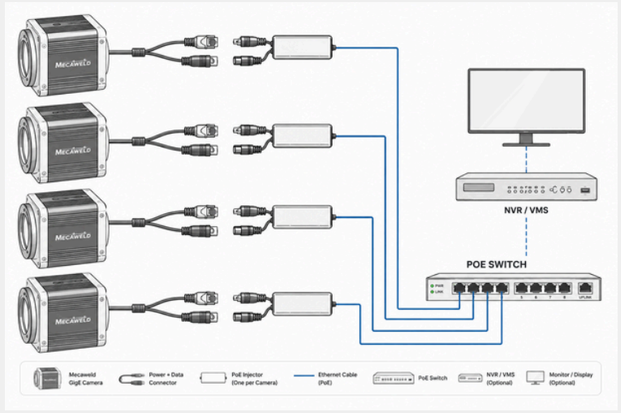
Weld Process Analysis

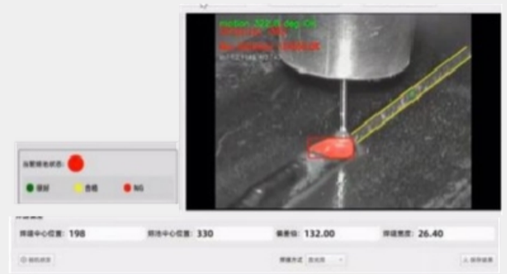
- Support defect detection, parameter optimization and operator training.

Robotic & Automated Welding

- Ideal for robotic cells, automated lines, research and machine vision applications.

Intelligent Weld Pool Measurement & Analysis System





Model	M2-160E
Image Type	Color/Monochrome
Resolution	1440 × 1080
Standard Frame Rate	60 fps
Sensor Type	Global-Shutter CMOS
Power Supply	12 VDC; optional PoE power supply
Data Interface	Gigabit Ethernet (GigE)
Dimension	45 × 45 × 65 mm (L x W x H)
Weight	250g
Working Distance	150-450 mm; adjustable focus
Built-in Illumination	Low-coherence 936 nm infrared laser illuminator
Operating System	Windows 7 / 10 / 11, Linux
Protocol Standard	GigE Vision V1.2
Anti-interference Configuration	Optional insulated mounting base helps shield against high-frequency interference and reduces the risk of image loss during arc starting

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M2/C2-230V-B

Low Power Laser Welding Vision Camera

Designed for low-power laser welding applications (3KW and below), this camera series addresses the need for versatile, economical welding monitoring without requiring high arc transparency performance.

Application Flexibility:

- Multi-Configuration Support: Coaxial, semi-coaxial, and paraxial weld pool monitoring
- High Frame Rate: 90fps for dynamic process observation
- Cost-Effective Solution: Optimized for budget-conscious applications

Advanced Sensor Technology:

- High-Resolution Imaging: 1/2.6" CMOS sensor with 2.3MP (1920×1200) resolution
- Enhanced Dynamic Range: Superior performance in mixed lighting conditions, capturing detail in both bright and dark areas
- Low Noise Performance: Reduced interference signals produce clearer images, particularly in low-light environments

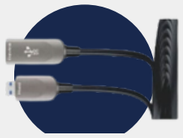
Global Shutter Advantage: Unlike traditional rolling shutter sensors that scan line-by-line, global shutter technology captures the entire frame simultaneously. This eliminates motion distortion and artifacts when monitoring fast-moving arc pools and workpieces, ensuring accurate and complete image capture.

Model	M2-230V-B	C2-230V-B
Color	Monochrome	Color
Resolution	1920×1200	
Frame Rate	90fps	
Sensor Size	1/2.6 inch	
Pixel Size	3.0×3.0μm	
Interface Protocol	UVC Protocol	
Operating System	Windows/Linux/Mac/Android	
Working Distance (WD)	Depends on the focal length of the optical lens	
Operating Temperature	-40°C to 85°C	
Volume	Imaging Module: 38x38x48mm Light Source: 45x45x35mm	

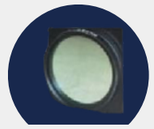
Optional Accessories

Lens

HDMI wireless transmitter



Fiber Optical USB Extension Cable



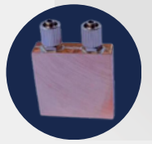
Protective Lens

Recorder

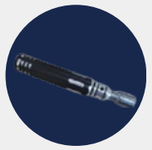
Fiber Optical HDMI Cable

Fine Adjustment Rack

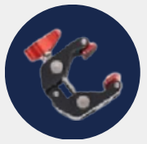
HDMI-UVC Capture Card



Copper Cooling Plate



Focus Wrench



Crab Claw Clip

Waterproof Case

Mounting Bracket

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