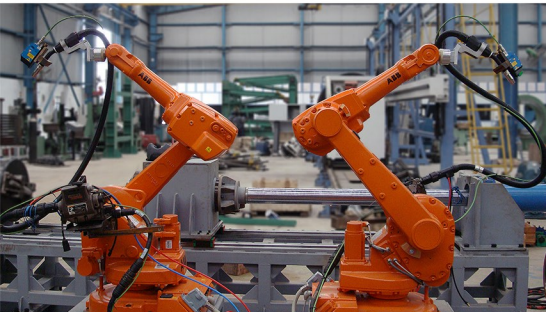


# Meta Laser Vision for Robot Welding Applications



## Robot Welding using Laser Vision

- Standard robots are very cost effective and versatile but are designed to repeat a fixed programmed path precisely.
- For many reasons, the actual path required to make a good weld on a production part is often **not** exactly the same as the path taught on the master part.
- Laser Vision solves this problem by sensing the actual required path and adjusting the taught path accordingly.

## Benefits of Laser Vision for Robot Welding

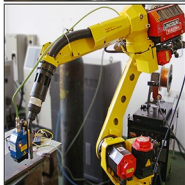
- Improves weld quality by accurately sensing the actual joint position and controlling the robot to put the wire in the joint.
- Follows the actual path required even when there is dynamic thermal distortion so the weld is made in **the correct place**.
- The only solution for some robot welding jobs.
- Reduces fixturing costs.
- Reduces scrap and/or rework.

# Meta Vision Systems



## Robot Welding Applications of Laser Vision

Laser vision systems are widely used for seam finding and for seam tracking in robot arc welding applications. One new development is to use the same robot and vision system for inspecting welds after making them.



The global auto industry is the major user of welding robots, and not surprisingly, the major user of robots equipped with laser vision systems. Meta has been closely involved in automotive robot welding applications from the earliest days of the company until today. Typical automotive applications using Meta systems include:

- Track chassis
- Truck cabs
- Car doors
- Car roofs
- Catalytic converters
- Suspension components
- General body welding applications

While most automotive robot welding is MIG, Meta has also been involved with many laser and laser hybrid welding systems.



Welding tanks of all kinds, including air and fuel tanks, is another large application area which overlaps with the auto industry in the case of air and fuel tanks for trucks. Robot welding of tanks is gradually taking over from fixed automation because of the increased flexibility and functionality of the robot system, especially when equipped with laser vision.

Transport in general, whether in the form of building railway wagons, ships or space rockets is another user of advanced robot welding with laser vision. Meta has been involved with many projects in this global transport arena.

With thirty years experience in robot welding, thousands of successful installations and the most modern product line up in the industry, Meta is well qualified to be your partner for robot welding in the future.

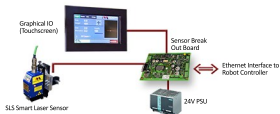


## Smart Laser Pilot

Meta's Smart Laser Pilot system exploits the latest technology in optics and electronics to provide a laser tracking system at an entirely higher level of performance against price.

The system incorporates several major advances over competitive systems including:

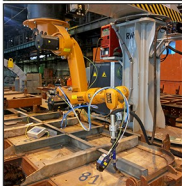
- Image processing and robot interface direct from the sensor head, minimising external components and reducing cost while improving performance.
- Ethernet backbone simplifying the system architecture and matching well to modern robot controller interface requirements.
- Megapixel sensor for high resolution with integrated real time processing
- Unique image acquisition control system for optimising image quality automatically with no operator setup or intervention.



Ethernet interfaces exist with the most commonly used industrial robots using their own specific interface protocol. The SLPI is also available with the DIN-VDMA 66430-1:2006-07 communications protocol.

For less complex tasks, the SLPI can be provided with a flexible Ethernet I/O board providing a wide range of digital and analogue I/O signals which can be used to provide a simple *analogue-digital* interface to any type of robot.

The heart of the SLPI system is Meta's Smart Laser Sensor which is available in different models with a range of different standoffs and fields of view from 12 mm to 100 mm to suit the application.





Meta was formed in 1984 as a spin out of a robotics research project at the world renowned Oxford University. The university project was aimed at developing laser seam tracking for robot welding in the automotive industry, so Meta's roots in robot welding with laser vision go back well over thirty years.

With over three decades of experience, Meta's engineering team has built up a tremendous wealth of knowledge about laser sensors for welding and about their application in all types of robot welding, ranging from super precise TIG welding for space rocket engine nozzles to multi pass robot submerged arc welding of massive power station components.

### Meta has two product families for robot welding: Smart Laser Pilot (SLPi) and Meta Scout

#### Smart Laser Pilot

This innovative product sets new milestones in versatility, performance and cost for all kinds of robot welding applications.

By performing the image processing and robot interfacing in the sensor head itself, the overall system architecture is greatly simplified with consequent improvements in performance and reductions in cost.



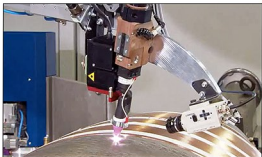
The compact design of the Smart Laser Sensor (SLS) at the heart of the SLPi system is matched to the welding environment making it the ideal choice for all common welding processes.

#### Meta Scout

Meta Scout is a unique product for robot laser welding. The Scout sensor projects a special pattern of five laser lines on to the weld joint.

This provides two major advantages:

1. Higher data rate
2. More detailed information about the weld joint



Using five laser lines gives a fivefold increase in the data rate of weld joint positions. This is exactly what is required for high speed robot laser welding, for which the Scout system is intended and very well proven.

Using multiple laser lines also allows the Scout system to extract more information about the weld joint than is possible from conventional single stripe systems. This allows the Scout system to calculate the angles of the weld joint and enables the possibility of the Scout system controlling both the position and angle of the welding head relative to the part in real time.

Scout has been used extensively in the auto industry thanks to its unique combination of features giving significant benefits.

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