

## FAQ and Press Releases

### Laser Weld Monitoring (LWM) Technology

1. What is the greatest compliment ever received about the HDE LWM systems?

***'Its simplicity belies the sophistication'***

(PhD researcher, very familiar with laser weld monitoring technology)

2. What is the general opinion of people who installed one of the HDE LWM systems?

A: 2017. This engineer is working for a major Aerospace company in Southern California. They bought the Model Gen2HDE LWM and had it integrated by the system builder. As soon as the laser welding system was installed it went into production, given that it had to be first 'validated' complete with the integrated LWM. This was the first of two new systems. The engineer has taken HDE's Laser welding class some years ago and is using laser welders every day. Here are excerpts from his memo:

*'...give you a status update on our laser weld monitor. Bottom line is that it's working very well. We have characterized several of our production welds and set the acceptance profile...'*

3. What is the procedure to turn the HDE LWM system 'ON'?

**A:** In the 'Spot and Seam Weld Monitor' all the software is preloaded. The procedure to turn the system ON is this:

Turn ON the main switch on the Control Cabinet.  
Done.

4. How long it takes an 'operator' to learn to operate the system?

**A:** Years of experience was incorporated in the GUI of the system. Once the HDE LWM system is 'trained', the operator simply logs-on, calls up the program from the directory,

click on the icons START LOT, START WELD.....and then waits for the laser to start welding.

5. What kind of statistical information is available about the laser welding process?

**A:** Please return to the Main page of this web site and Click on the following LINKS to get more information.

6. How can I justify the cost of purchase of one of the HDE LWM systems?

**A:** It seems that the accuracy of the data generated by the HDE LWM systems exceeds expectations! Some clients have taken the initiative to reduce the number of metallographic cross sections. Although HDE makes it clear in the 'Disclaimer' that *'The end user is advised to NOT use the HDE Pulsed LWM System as a device to determine the final quality of the welded product'*, the fact is that even metallographic cross sectioning of the weld provides limited only information (validation) about the weld, while the HDE LWM systems provide 100% coverage (verification).

7. Is the HDE Pulsed LWM system priced competitively?

**A:** Compute the total cost of a LWM system. Include the cost of purchase, the cost of installation and the cost of 'training' the LWM system. Our most recent review of the market shows the following:

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| <p>7.1 There are no commercially available LWM systems that can match the performance of the HDE <u>Pulsed</u> LWM systems.</p> <p>7.2 The original purchase cost of the HDE LWM system is less than 1/3 of some of other LWM systems designed to monitor CW laser welding.</p> <p>7.3 The time to install one of the HDE LWM systems varies from 4 hours to 6 hours.</p> <p>7.4 The time to train the HDE LWM systems is approx. 4 hours.</p> |
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8. Can the HDE LWM systems be used for laser applications other than laser welding?

**A:** Yes. HDE's customers are very 'inventive' and have reported to HDE the following applications for the HDE Pulsed LWM systems:

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| <p>8.1 Soldering.</p> <p>8.2 Drilling.</p> |
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9. Can the HDE LWM systems be used to find the working focus of the focusing optics used in laser welding?

**A:** Yes. As you may be aware, at different laser power levels, the exact focal distance of the focusing optics may be 'different'. This is called 'focus shift'. Computations indicate that if the diameter of focused laser beam changes by more than ~ +/- 5%, the change in power density of the focused spot may significantly affect the welding process. Once again, HDE's customers have reported to HDE the following information:

They were able to identify the focus distance at various laser power setting within 2 microns (=0.000 080").

10. When is a 'good time' to install one of the HDE LWM systems?

**A:** The answer could be a 'funny' one: any time! More realistically, the installation of the LWM may require the re-qualification of the laser welding system (EQ) and the laser welding procedure (PQ). For these reasons, a 'good time' to install the HDE LWM systems is:

- 10.1 When specifying a new laser welding system – have the system integrator install it.
- 10.2 When the current laser welding system is upgraded from one laser to another laser. Example: upgraded from flash lamp pumped laser to a solid state laser.
- 10.3 When the current laser welding system is moved from one location to another and the EQ and PQ has to be repeated.
- 10.4 When one of the industry regulatory agencies demands that detailed PQRs are to be generated, submitted and archived.

11. What level of support is provided by HDE?

**A:** HDE's philosophy is to provide the best documentation for the products and to provide in depth classroom and hands on training of the customers.

- 11.1 The HDE products are shipped with the hard copy and the software copy of the Operators' Manual. This Manual is so complete that most buyers of the HDE LWM systems installed the systems by following the Operators Manual step by step.
- 11.2 As part of the LWM system purchase HDE offers free registration for at least one engineer working for the company that purchased the LWM system at one of the (well known and well established) HDE Laser Welding Technology courses.
- 11.3 HDE provides free software updates and technical support for up to 12 months after the LWM product was received at the customer's site.

## Welding Students at College of the Canyons Gain Laser Precision Experience

The College of the Canyons welding technology department has recently installed a HDEm pulsed laser weld monitoring system at the Valencia Campus, Santa Clarita, Calif.

“Normally, when you’re using a laser welder, we’re talking about using a focused light (laser) beam to do the welding,” explained Tim Baber, chair of the college’s welding technology department. “But since the laser welding process is very fast, it’s hard to get an accurate real-time assessment of the weld quality. Our new laser weld monitor measures certain properties of the laser beam and the welded metal, which provides feedback so instructors can assess the quality of



*Standing (from left) are Simon Engel, president, HDE Technologies, Inc.; Tim Baber, welding technology department chair, College of the Canyons; Bruce Mills, technical support specialist, Laser Star Technologies; Kristin Houser, dean of career technical education, College of the Canyons; John Milburn, director of employee training institute, College of the Canyons (back row); and Dr. Jerry Buckley, assistant superintendent/vice president, instruction, College of the Canyons.*

the weld and identify the location and the nature of weld defects.”

According to Baber, College of the Canyons is also the first learning institution of any kind to possess a laser weld monitor. Funding to purchase this device, and develop corresponding curriculum for student training, was made possible through a National Science Foundation grant.

Additionally, the college’s welding technology department has installed laser touch sensing adaptive control systems on two of its robotic welding machines. Funding was secured through a National Science Foundation Advanced Manufacturing Processing Technicians grant. Following installation, laser touch sense technology and training will be incorporated into the curriculum by the fall 2015 semester.

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Patent Pending

**All specifications are subject to change without notice**