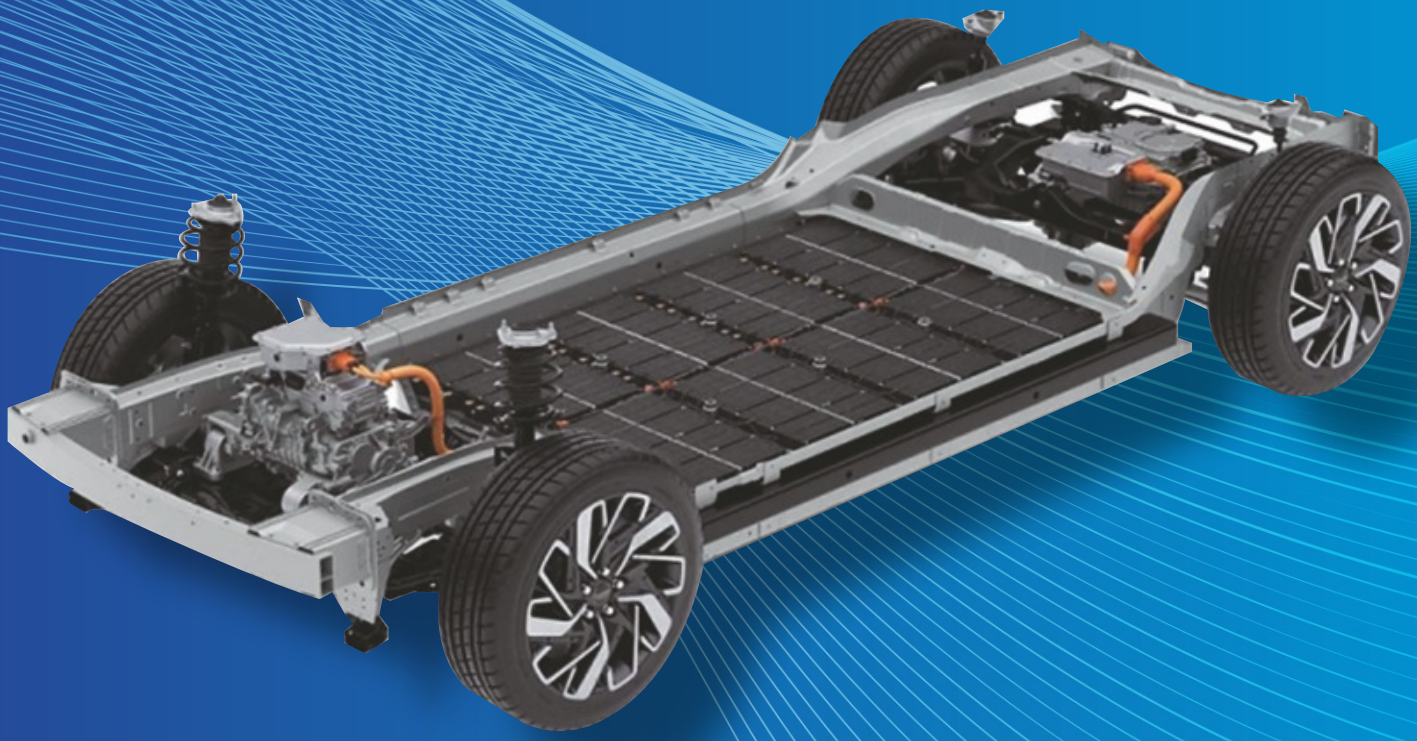
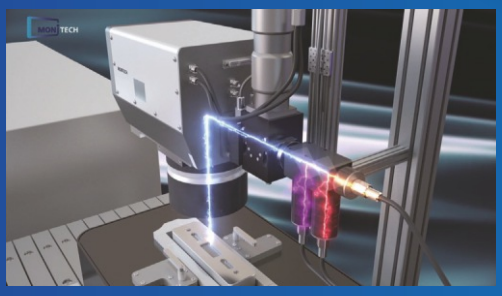
TOTAL SOLUTIONS
for
EV BATTERY WELD QUALITY





LASER | ULTRASONIC | MicroSPOT WELDING

MONITECH

MONITECH CO.,LTD.

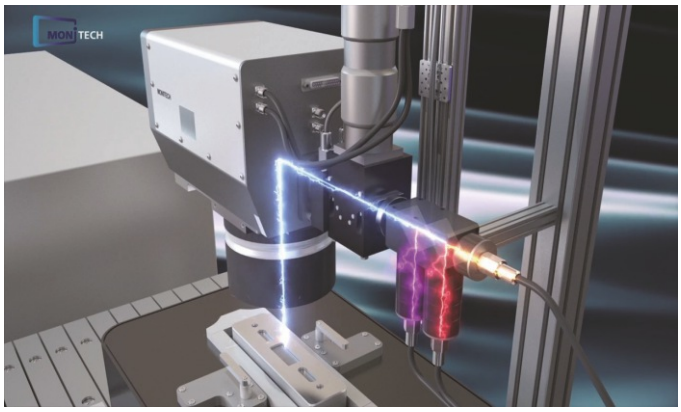
www.monitech.co.kr

Kirti

CE/UL Certification/Patent10-2114359/Patent10-2279074/Patent10-2304925

Laser Weld Monitoring System : **WELM-2000**

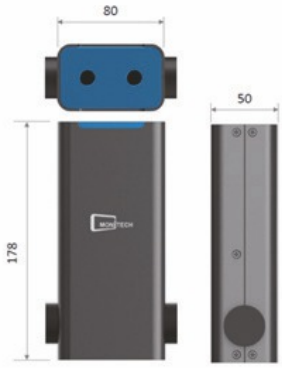
WELM-2000 is a system that can monitor and evaluate the quality of laser welded areas in real-time.
WELM-2000 aims to improve welding quality and productivity by analyzing near-infrared (NIR) signals and visible light (VIS) signals generated during welding to determine the quality of welded areas in real-time.



Main features

- Applicable to various materials (steel, Cu, Al, stainless steel, etc.)
- Compatible with various types of laser light sources
- 100% real-time quality monitoring and result report
- Cause analysis and parts tracking when welding abnormalities occur
- Prevent defects by optimizing welding process
- Provides various sensor attachment methods (scanner, power source and beam switch)
- Customized algorithms, software and hardware available

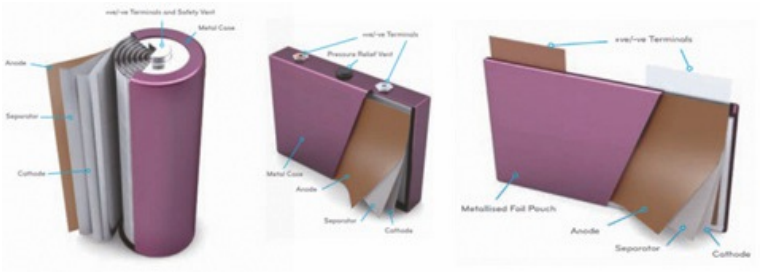
Sensors & S/W



< Sensor Module >

< Software Screen >

Application

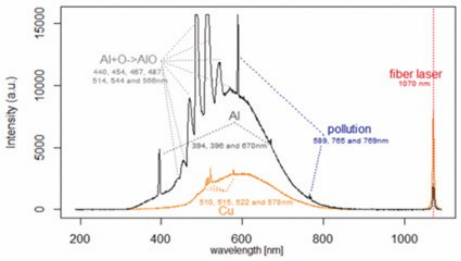


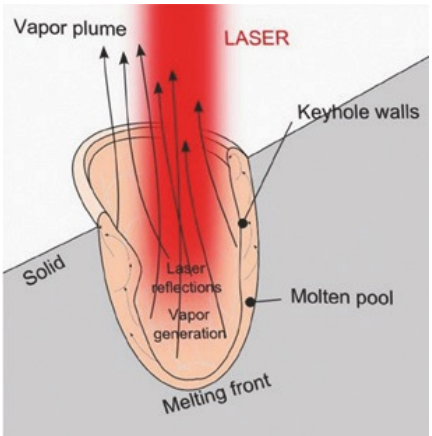
☐ Cylindrical/prismatic battery tab and case welding

☐ Pouch-type battery tab and busbar welding
(mid to large batteries for EV)

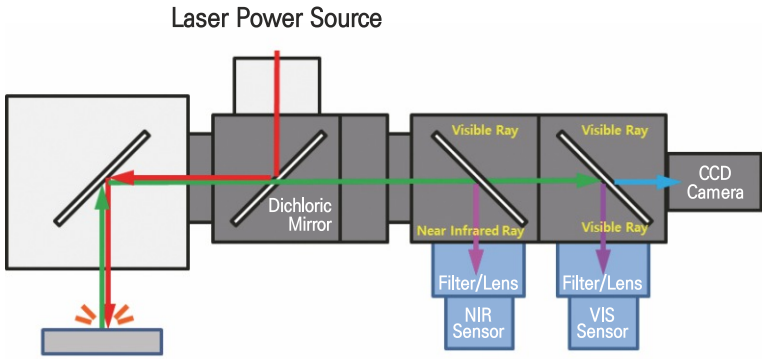
☐ Automobile parts, precision welding parts

Measurement principle





< Plasma emission >



☐ Light of various wavelengths generated during laser welding is measured and used to determine welding quality.

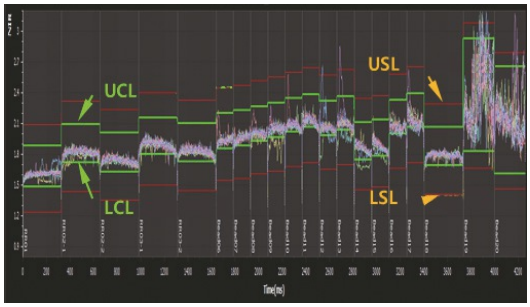
☐ NIR sensor: Measures changes in temperature of the weld zone

☐ VIS sensor: Measures the keyhole behavior of the weld zone

☐ IR high-speed camera: Observe the melting behavior of the weld zone (Optional)

Welding process and welding quality judgment

- In welding processes where conditions change frequently, process improvement and welding quality can be improved by analyzing and managing changes in data distribution and average level.
- Real-time monitoring and diagnosis of process management (USL, LSL) and welding quality control (UCL, LCL) are possible simultaneously.
- Capable of detecting most welding defects that occur during welding

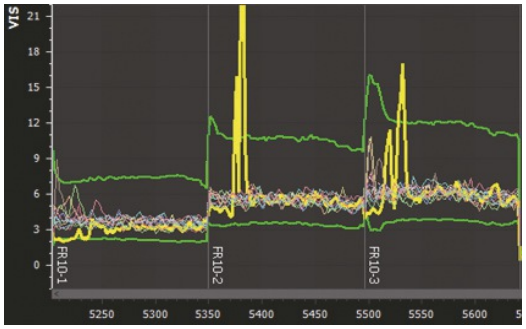


〈 Example of process management 〉

〈 Example of poor welding quality 〉

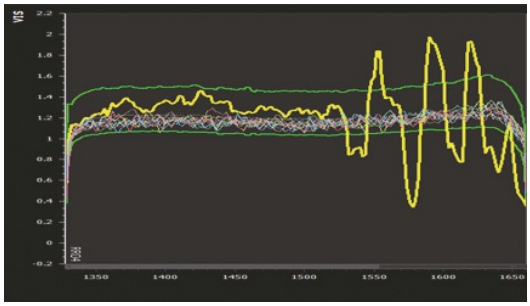
Weld defect case study

- Detect welding defects by monitoring the plasma emitted during welding and the temperature of the molten pool in real-time.
- It is possible to distinguish patterns for each welding defect, minimizing the production of defective parts through welding quality evaluation and analysis.
- It is possible to improve battery module quality issues through management of each weld defect and improve mass production performance through process stabilization

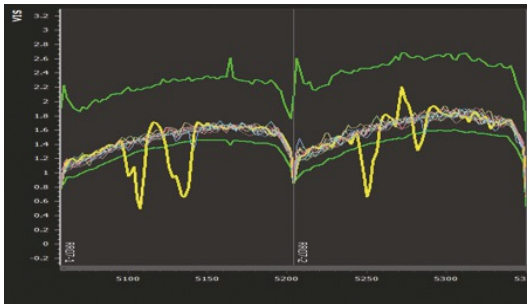


〈 Contaminations 〉

〈 Porosity 〉



〈 Base material trouble 〉



〈 Weak welding 〉

Specification

Sensor		
Type	Visible Ray	Near Infrared Ray
Wavelength Range	350 – 1100nm	800 – 1700nm
Active Area	13 ㎟	3.1 ㎟
Sampling Frequency	Normal : 10kHz / Max : 100kHz	Normal : 10kHz / Max : 100kHz
Operating Temp	-20 to 60 ℃	-20 to 60 ℃
Storage Temp	-55 to 125 ℃	-55 to 125 ℃
Laser Input		
Input Range	±10V	
Sampling Frequency	Normal : 10kHz / Max : 100kHz	
Input Mode	Differential	
Operating Temp	-20 to 60 ℃	
Interface		
Communication Protocol	MX PLC, LS PLC, Siemens PLC, Modbus TCP/IP,	
Digital I/O	Input : 8 ch, Relay : 8 ch	
Data Transmission	SFTP Server & Client, Real-time Data Streaming	

Sales Reference

SK 온 · HYUNDAI MOBIS · HGREEN POWER · INFAC · NVH KOREA

LG Energy Solution · LG전자 · SAMSUNG · SAMSUNG SDI

한빛레이저 · TOPTEC · 광명산업(주) · K2LASER · 대신강업[주]

KITECH 한국생산기술연구원 · KIMM KOREA INSTITUTE OF MACHINERY & MATERIALS · partron · EO TECHNICS

CE/UL Certification/Patent10-1636247/Patent10-2006806

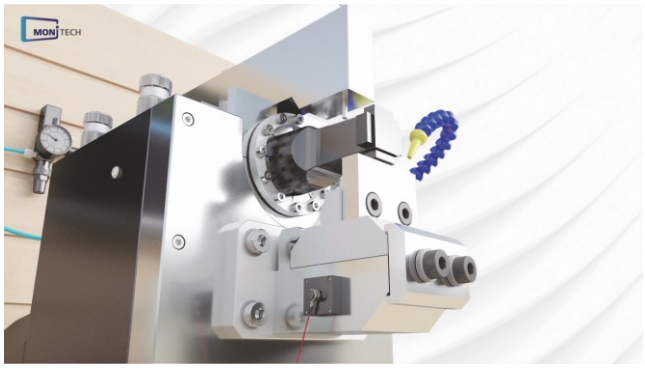
Ultrasonic Weld Monitoring System : WEU-1000

WEU-1000 is a system that can monitor the quality of the weld zone in real-time during the ultrasonic welding process.
WEU-1000 aims to improve welding quality and productivity by measuring and analyzing various parameters such as friction vibration between the horn and anvil that occur during welding, current, and voltage etc.

Main features

- Applicable to various materials
- Determination of welding quality by setting tolerance limits
- User-friendly UI (User Interface)
- Various combinations are possible depending on the purpose, such as vibration, current, voltage, etc.
- Real-time quality judgment possible
- Providing dedicated software and algorithms that can reflect customer's requests

Sensors & S/W



〈 Sensor 〉

〈 Software Screen 〉

Application

- Prismatic battery tab and case welding
- Pouch type battery tab welding
- Automobile parts, precision welding parts

Application Benefits

- 100% inspection of all manufactured products and report on results possible
- Prevent quality defects through optimization of the welding process by monitoring process variables
- In case of component failure, component tracking is possible by securing the production history of each welded product (minimizing the amount of recalls)
- Improved productivity and minimized welding defects by optimizing welding process

Sales Reference

LG Energy Solution, SK 온, SAMSUNG SDI, (주)한화/모멘텀, northvolt, RIVIAN, MORROW, SNF (주)에스엔에프

CE Certification

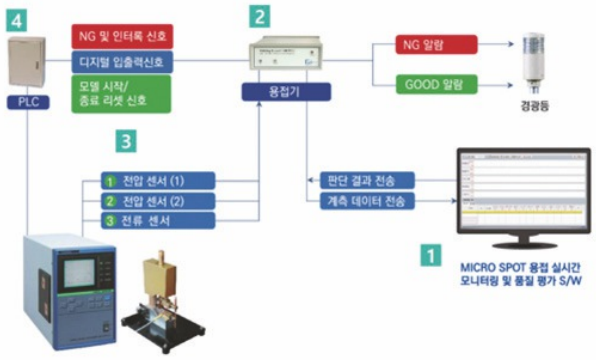
Microspot Weld Monitoring System : WEMS-3000

WEMS-3000 is a system that monitors the quality of welded areas in real-time during micro spot welding. WEMS-3000 aims to improve welding quality and productivity by measuring and analyzing a total of 12 parameters, including current, voltage, and applied pressure that occur during welding.

Main features

- System optimized for micro spot welding of cylindrical batteries, etc.
- Evaluate and guarantee welding quality in real-time
- Management of 12 major parameters including welding current, voltage, and applied pressure
- Process improvement and stabilization through analysis of welding result data
- Automated management by linking result data to manufacturing system

System configuration and S/W UI



System configuration and S/W UI

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