

# Quality Weld Monitoring... made simple



## Overview

An intuitive, accurate and highly cost effective resistance weld monitoring system designed specifically for manual and automated resistance welding applications delivering up to 0.1% process variance detection in a simple to use, "set and forget" package.



## Features

- ✓ Configurable Current, Voltage or Energy Monitoring.
- ✓ 4 Channel PLC/Automation Status Interface.
- ✓ 2 Fully Isolated Analogue Process Monitoring Channels.
- ✓ Designed for Capacitor Discharge, Linear and HFDC power supplies.
- ✓ Suitable for single or double pulse welding, polarity insensitive.
- ✓ Audio, visual and digital warnings on weld process limit violation.

## Benefits

- Independent weld process quality control monitoring.
- QC process checking on every weld - Retrofit to existing kit in 30 minutes.
- Detects changes in welding power supply output – Incorrect setting, wear.
- Detects changes in welding head setup – Force, trigger point, bad connections.
- Detects changes in welding electrodes – Wear, deformation and position.
- Detects misplaced or missing components when welding – Operator error.



**For a lot more information, please visit [www.weld-monitor.com](http://www.weld-monitor.com) or contact [sales@weld-monitor.com](mailto:sales@weld-monitor.com)**

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## Functional Specifications

Feature	Parametric	Notes
<b>Power Requirement</b>	Input Voltage : 24V DC +/- 20% Input Current : < 300mA Standby Current : 70mA	Optional Universal Mains Adapter <i>Inputs fully protected for reverse connection, surge and over voltage</i>
<b>Input Voltage Range</b>	+/- 30V DC - Standard configuration Higher voltage versions available on request for Micro Arc and Percussive Arc Power Supplies	Precision rectified, polarity insensitive <i>Inputs fully protected for reverse connection, surge and over voltage</i>
<b>Input Current Range</b>	0 - 20,000 Amps - sensor dependant	Optional shunts available <i>Inputs fully protected for reverse connection, surge and over voltage</i>
<b>Detection Sensitivity</b>	+/- 0.1% around defined process norm	Link selectable sensitivity
<b>Signal Isolation</b>	DC supply to internal electronics - 500V DC Min Internal electronics to isolated outputs - 500V DC Min	All isolation components have a minimum 1KV isolation rating
<b>Isolated PLC Interface</b>	Hi Fault, Lo Fault, No Fault, Weld Signals	Signals timed to facilitate external analogue data acquisition sampling
<b>Isolated Analogue Channels</b>	CH1 - Amps or Energy CH2 - Energy or Peak Energy	Output Impedance 100 Ohms
<b>Audio Output</b>	Fault Detection via Sounder	Enable / Disable via jumper link
<b>Visual Indications</b>	Power On, Weld Detect, Process Level, Over Limit Fault, Under Limit Fault, No Fault	
<b>Full Kit Composition</b>	Weld Monitor, Current Sense Shunt, Mains Adapter, Shunt Cabling and Connectors, Voltage Sensing Jack	Options : Mains Adapter, Current Sense Shunt, Analogue Outputs, Cabling and Connectors
<b>Dimensions</b>	220mm (L) x 110mm (W) x 60mm (D)	
<b>Operating Conditions</b>	Operating Temperature Range : 0°C to 45°C Humidity Range : Max 95% R.H. Non-condensing	
<b>Warranty</b>	12 Months Parts & Labour	Limited warranty based on fair wear and tear.

## Frequently Asked Questions

### 1. What makes this Weld Monitor so economical to buy ?

The Weld Monitor Unit makes no compromises in its design or construction. The unit offers full internal circuit isolation, full input over voltage, short circuit and reverse polarity protection along with the same degree of high precision electronics you would find in a unit many times the price.

The unit does not include a complex graphical user interface or a plethora of features that you don't need, this keeps the price low and the functionality high.

### 2. Is the Weld Monitor performance as good as much more expensive units ?

Yes.. In many cases, the Weld Monitor will easily out perform much more expensive digital based products simply by virtue of the patent pending mode of operation. The unit incorporates high precision, very low noise electronics which enables the user to define very sensitive process limits. It really does work well.

By accurately measuring the delivered energy into a weld in real time, the unit does not suffer from digitisation and sample speed errors commonly found in other equipment.

### 3. Can the weld monitor be used in Automation ?

Yes.. The Weld Monitor is designed for both basic Manual applications and for fully Automation applications.

For simple low cost, manual setups, the dials on the unit allow the user to quickly configure and monitor a welding process. The dials provide a numeric indication of settings and are easily transferred from process to process.

For automation, timing signals are provided to indicate a weld and any associated fault conditions. With the simple addition of isolated analogue channel monitoring, the user can quickly and economically add full signal monitoring to their welding process either by PLC or PC based data acquisition systems. The user is then free to measure and record current and energy waveforms and levels as required and to apply programmable limits if required.

The accuracy of these signals is comparable to anything available on much more expensive weld monitors, hence a user can quickly configure a fully calibrated SPC data logging system if required.

Moreover, the signals are made available for 100ms post weld, thereby allowing relatively low cost data sampling systems to be used.

Alternatively, the basic isolated weld and fault signals can simply be used to gate PASS or FAIL criteria into the automation.

## **Frequently Asked Questions**

### **4. What types of welding power supply can the monitor be used with ?**

The Weld Monitor Unit is designed to operate with all brands of Capacitor Discharge, Linear, Inverter and Micro Arc Spot Welding Power Supplies.

The monitor includes a small number of user selectable links allowing the unit to be scaled across a very wide operational range.

The unit has two measurement channels, current and voltage from which all other measurements are derived. The unit is also capable of operating in a current measurement only mode.

### **5. Does the weld monitor support multiple welding schedules ?**

Yes.. The Weld Monitoring Unit provides rotary numeric settings that are adjusted to suit each weld schedule, acting as a permanent memory for each process condition.

In automation applications, multiple welding schedules are readily accommodated using the same method or by capturing the measured process signals via an external analogue to digital converter and applying software defined user limits.

### **6. Can I connect the weld monitor directly to a PLC ?**

Yes - The Weld Monitoring Unit provides Weld timing signals and Upper and Lower Limit Fault signals via optically isolated channels. These signals can additionally be used to trigger data acquisition if required.

### **7. Does the Weld Monitor require calibration?**

No, not really - The Weld Monitor is factory calibrated when manufactured and generally should never need further calibration. The monitor uses precision electronic references and components that ensure that the monitored signals remain validated at all times.

Unlike most other monitors that attempt an S.I. Unit reference measurement, the simplicity of design along with the patent pending mode of operation, means that calibration is really only necessary in the case of a malfunction or repair. If needed for quality checking, your sales representative can advise some basic measurement points to verify the factory calibration and precision references.

### **8. What value is the typical current shunt supplied in the kit bundle ?**

Normally a 100 micro ohm current shunt will suffice for most spot welding applications. Such a low resistive value poses practically no insertion loss and is generally several orders of magnitude lower than the associated cable and connection resistances.

The weld monitor can be interfaced to almost any current measuring device including hall effect devices allowing application specific customisation where required.

## Frequently Asked Questions

### **9. Do I need additional equipment with the Weld Monitor ?**

No - The Weld Monitoring Unit is normally supplied as a kit bundle that includes a universal power supply, a current shunt and all the necessary cables to quickly retrofit the system to your welding apparatus.

These items can of course be purchased separately and if you prefer, you can use your own current sensing unit and power supply.

### **10. Can I prevent unauthorised changes being made to the weld monitor ?**

Yes - The Weld Monitoring Unit is self contained in a small box. If you are concerned about unwanted interventions, then simply place the unit in a lockable box or provide a locking cover.

That said, it may be desirable to allow operators to make small changes to the monitor settings over time. The unit will readily track and warn of electrode wear for example, so you may well choose to allow the users a certain tolerance of adjustment, depending on experience.

### **11. What happens if I change my mind ?**

Bespoke Electronics Limited wants happy customers. It could be that you find that weld monitoring creates more questions than it answers and that perhaps you need more time to consider and stabilise your welding processes.

Before supplying the Weld Monitoring Unit, we will endeavour to ensure that the product is right for your application through a simple questionnaire. If in the unlikely event that you are not happy with your monitor, then we will provide a full product refund within 30 days of purchase, assuming the equipment supplied is returned prepaid in an “as new” same condition as was supplied.