- Measure voltage, current, force and displacement
- Dual channel capability
- Configurable user interface with four display quadrants
- Full on-screen SPC capability
- 99 available schedules with password protection
- Serial output via RS-232
- Weld interrupt function

With increased emphasis on accountability, the MG3 Digital Process Sentry offers the tools required for process development, production monitoring, data collection, and analysis to support your ISO, GMP and TQM requirements.

The MG3 represents the very latest technology in resistance weld monitoring; it provides precision real-time dynamic measurement of all the welding variables and is an invaluable tool for:

Process Development
Welding Evaluation and Research, DoE Studies, Process Optimization, Process Validation

Process Monitoring
Data Logging, Setting Process Limits, Electrode Maintenance, Troubleshooting, Set-up Verification, Statistical Process Control

Quality Control
Traceability, Process Certification and Analysis, Calibration Confirmation, Statistical Process Control

With **three models to choose from**, the MG3 can monitor up to two simultaneous channels of current and voltage from up to two AC, DC or CD power supplies for spot or seam welding. In addition to the basic model, the W1 and W2 models have single and dual channel displacement capability, respectively, and also offer inputs for force and pressure sensors.

Upper and lower limits can be set to trigger alarms for all measurements; for more advanced users, these limits can be set as envelopes that follow the contour of the waveform. Judgment of good/bad welds can be determined by status LED's on the front panel and outputs from the MG3's I/O. All welding parameters are stored in internal memory, available from the built-in RS-232 port, and data may be transferred to a Compact Flash (CF) card and directly exported into Excel® for user-defined analysis. The MG3 also has a convenient "**SNAPSHOT**" feature to save screenshots for reports. Comprehensive SPC functions include run chart logging and histograms.

Spirit Of Innovation™

MIYACHI UNITEK™

Designed for Flexible Use – (Configurable Run Screen)

The high resolution color display and user configurable run screen enables users to configure the display to show information relevant to their particular job function or chosen welding environment. Two-channel capability allows simultaneous measurement and comparison of two welding systems.

The MG3 is easy to program via a single rotary encoder knob. Up to 100 monitoring programs can be stored for multiple parameters.
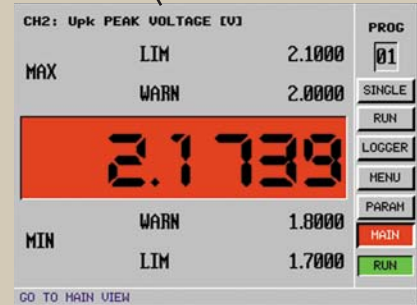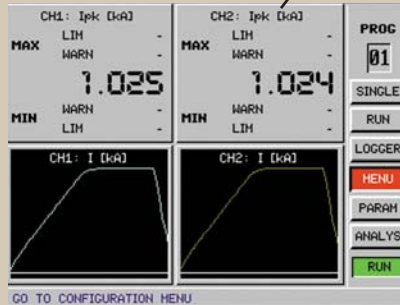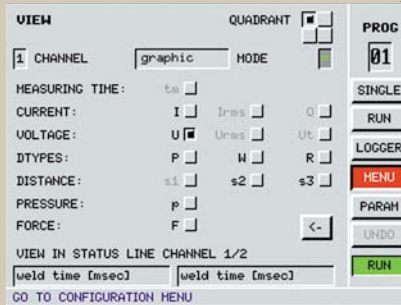

Examples of full view display. View is configurable to show graphic or numeric parameters in each quadrant. An individual quadrant can be selected as the main view.

Measurement Capability

The MG3 can measure AC, CD and DC welding systems and monitor the following parameters when fully configured with sensors:

- Current (RMS, Peak, Amp-Sec.)
- Voltage (RMS, Peak, Volt-sec.)
- Power
- Energy
- Resistance

- Time (ms/cycles)
- Displacement (mm, In.)*
- Force (lbs., N)*
- Pressure (psi, bar)*
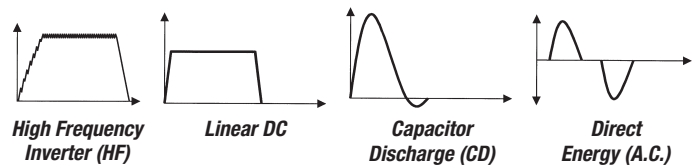
Available on MG3 W1 and W2 only

High Frequency Inverter (HF)   Linear DC   Capacitor Discharge (CD)   Direct Energy (A.C.)

# Welding Oscilloscope Functionality (Process Development)

The MG3 can be used like an oscilloscope to analyze waveforms and compare parameters on a single screen using different pen colors for up to 4 measurement traces.
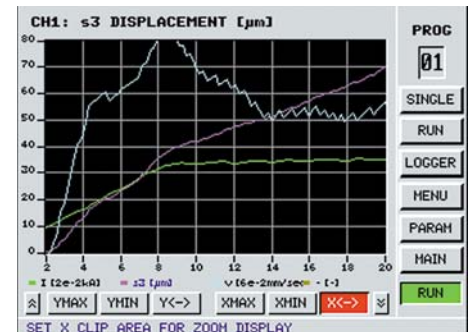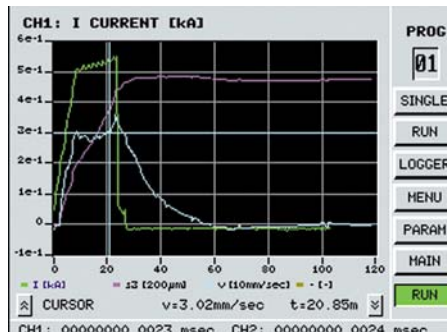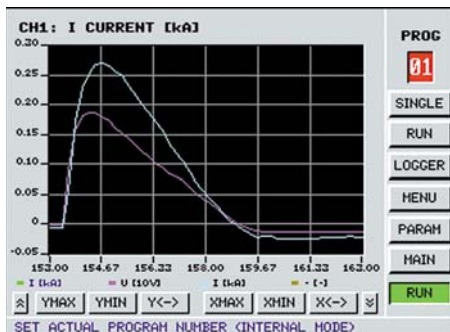

Multiple graphic trace with moveable cursors and zoom functions are perfect for weld analysis.

"Snap Shot" to Compact Flash Memory Card – (Quality Assurance)

Pressing the control button for three seconds saves the current screen as a .bmp file on the Compact Flash (CF) memory card. Waveforms can also be saved in .csv format for importing to an Excel file.
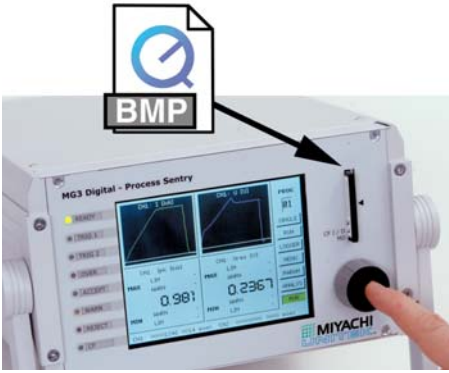

Snapshot of screen is saved to CF card as a .bmp file.
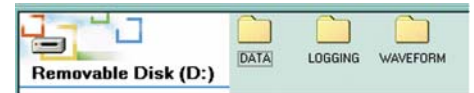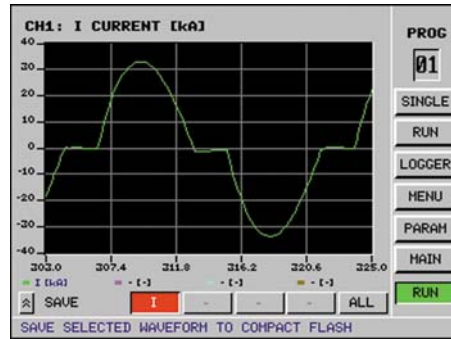
32MB CF card supplied. Accepts up to 1GB CF card. Alternatively, data can be collected via RS-232 for storage and analysis.

Limits and Envelope Functionality (Process Monitoring)

Maximum and warning values can be set for parameters, which will trigger both front panel LED's and alarm outputs.
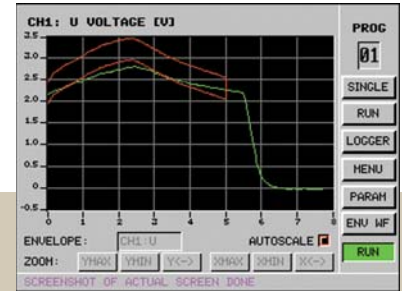
Reference waveforms can be automatically averaged from numerous welds and results may be used to specify envelope limits applied to the average or typical weld. Two envelopes may be applied to any parameter or two separate parameters, or to a specific section of the weld to ensure weld consistency.
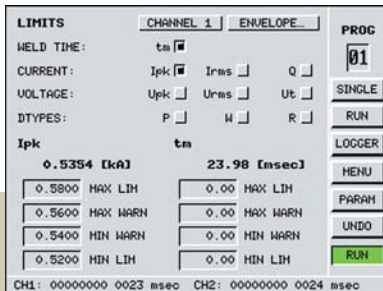
Maximum and Pre-Warning
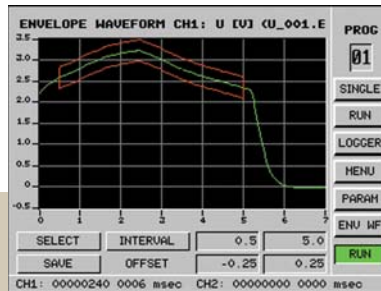


Acceptable – Weld Envelope

Reject – Weld Envelope

Statistical Process Control (SPC) and Quality Assurance

The MG3 performs a vital role in any production process and provides both data logging and on-screen SPC including run charts, histograms and analysis. Welds can be collected in the on-screen histogram, and pre-determined standard variation (2, 3, 4, 5, 6 sigma) values can be processed and set as production limits. The unit is able to transfer all weld data to a host PC and can save it to a log file on the CF card for further analysis in programs such as Excel.
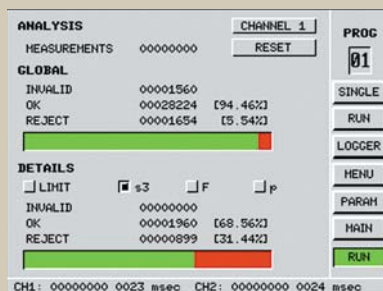
Winweld® data collection and analysis software provides an easy method for process and variable comparison and storage.
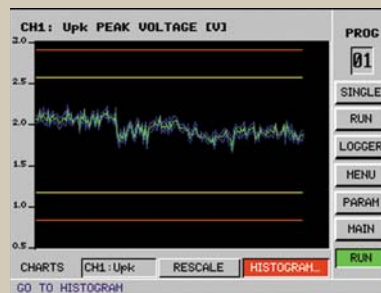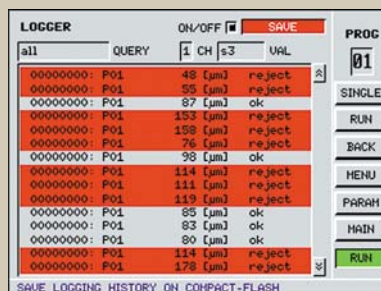

Run Chart with Limits
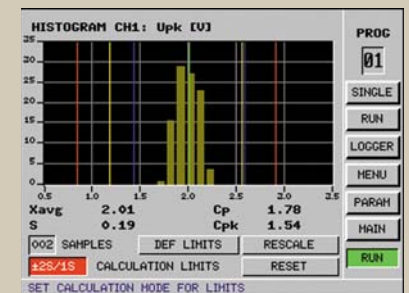
Histogram with Limits

Good/Bad Analysis Ratios

SPC Data Logger. All welds, rejects or last can be saved to the memory card.
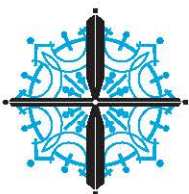
SPECIFICATIONS

Model Numbers	MG3 Digital Basic	MG3 Digital W1	MG3 Digital W2
Measurement Capability	2 channel current 2 channel voltage	2 channel current 2 channel voltage 1 channel displacement Includes 1 sensor Analog inputs for force or pressure	2 channel current 2 channel voltage 2 channel displacement Includes 2 sensors Analog inputs for force or pressure
Current Measurement Range (X1 Coil)	2, 5 ,20, 100, 500 kA		
Current Measurement Range (X10 Coil)	0.2, 0.5, 2, 10, 50 kA		
Voltage Measurement Range	0.5, 2.5, 10, 50 V		
Profile: AC	ms or cycles, 50/60 Hz. Peak I / Average I / Cond. angle		
DC	Rectified, Inverter, DC		
CD	Capacitor Discharge, ms		
Seam	Inverter, AC		
Derived Parameters	Power $P = VRMS \times IRMS$		
	Energy $E = VRMS \times IRMS \times t$		
	Charge $Q = IRMS \times t$		
	Resistance $R = P/IRMS^2$		
Accuracy (Current/Voltage)	$\pm 1.5\%$ of full scale		
Time: Range *Sampling Rate*	DC 1–2,000 ms, AC 1–5,000 ms (.5 cycles – 300 cycles) (V, I) = 100 kHz per channel, simultaneous sampling V, I of each channel		
Graphic Resolution *Current/Voltage*	measure time <= 50msec: resolution 40 points per msec measure time > 50msec: resolution 5 points per msec		
Pressure	n/a	Pressure 10 points/ms	
Force	n/a	Force 10 points/ms	
Distance	n/a	Digital distance 5 points/ms	
Pressure	n/a	0.0 Bar – 10 Bar External sensor with output DC 0-10V Power supply 24V DC 2 channels parallel measurement	
Force Note: unit will measure force <u>or</u> pressure, not both.	n/a	External sensor with output DC 0-10V Power supply 24V DC Force depends on sensor 2 channels parallel measurement	
Displacement (Digital Distance) *Models W1 and W2*	1μm – 99999μm (incremental, glass scale, noise free, 1 micron resolution) 2 channels parallel measurement		
Input Power	90 - 260V, 50 / 60 Hz		
Memory	2500 welds internal, 1 GB Compact Flash (32 Mb card supplied)		
Communication	RS-232 data collection, CF card, Win Weld Data Collection Software		
Front Panel	QVGA Display, 6 LED's dedicated fault and good indications		
Binary Inputs	11 dedicated inputs plus 8 binary for schedule selection		
Binary Outputs	13 dedicated outputs plus 8 binary for schedule selection		
Additional Displacement I/O	7 inputs and 15 outputs for displacement functions		
Size Inches H x W x D (mm)	5.3 (135) x 11.0 (279) x 13.0 (330)		
Weight Lbs. (kg)	11.0 (5.0)		

SUPPLIED ACCESSORIES

MG3 Digital Basic	MG3 Digital W1	MG3 Digital W2
1 ea. current coil (internal dia.) 2.5"	1 ea. current coil (internal dia.) 2.5"	2 ea. current coils (internal dia.) 2.5"
1 ea. voltage measurement leads	1 ea. voltage measurement leads	2 ea. voltage measurement leads
1 ea. 32MB CF card	1 ea. 32MB CF card	1 ea. 32MB CF card
	1 ea. displacement sensor (1μm)	2 ea. displacement sensors (1μm)