## **Process Monitoring**



# WeldPASS-II

### **Resistance Spot Welding Process Monitor**

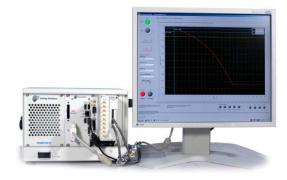
## by JoiningSolutions

A Joining Engineering Company



### WeldPASS-II Resistance Spot Welding Process Monitor

The WeldPASS-II offers capability of joining process monitoring, quality analysis and traceability. It utilizes sensors and high speed data acquisition card to measure welding force, displacement, shielding gas flow rate, current, and voltage during welding for each weld.



#### Hardware Features:

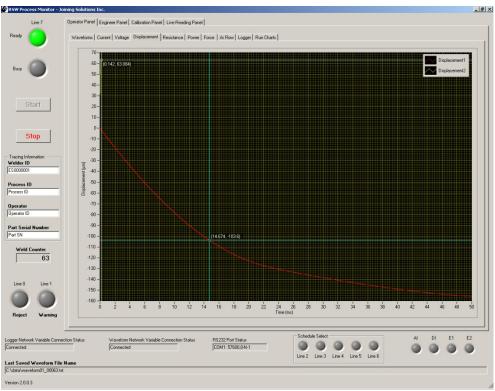
- Industrial standard PXI platform
- Measurements: current, voltage, displacement (2 channels), force (2 channels), gas flow rate.
- 16 bit high accuracy Analog-to-Digital conversion.
- High speed 500k samples/second/channel data acquisition.
- Digital I/O for communication with automated welder or other equipments. (Ready output, Reject output, Warning output, Schedule Selection input)
- Ethernet and RS232 communication ports available.

#### Software Features:

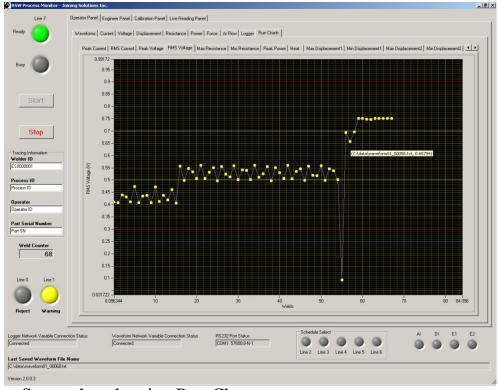
- 3 levels (Operator, Engineer and Calibration) secure configuration access administration.
- Record waveforms and measurement data for every weld.
- Run charts for all measurement data.
- Waveforms are indexed in log file.
- Accepts user Transfer Function input.
- Limit control and out-of-limit alarm for every weld.
- Source code of communication client software available for customer to tailor customized communication interface to corporate database.



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#### Screenshot showing displacement waveform



#### Screenshot showing Run Chart



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ady 🔵	Waveforms   Current   Voltage   Displac	ement   Resistance	Power   Force   Ar	Flow Logger Run	Charts					
	is (A)	start_U (ms)	end_U (ms)	U_peak (V)	U_rms (∀)	start_R (ms)	end_R (ms)	R_max (mΩ)	R_min (mΩ)	\$
	C:\data\waveform 6.27	1.0	20.0	0.445	0.508	1.0	20.0	0.5100	0.0000	1.
	C:\data\waveform 1.60	1.0	20.0	0.751	0.561	1.0	20.0	0.5096	0.0000	1.
	C:\data\waveform 0.00	1.0	20.0	0.751	0.505	1.0	20.0	0.5107	0.0000	1.
	C:\data\waveform 0.93	1.0	20.0	0.667	0.535	1.0	20.0	0.5110	0.0000	1.
Start	C:\data\waveform 3.73	1.0	20.0	0.722	0.547	1.0	20.0	0.5109	0.0000	1.
Start	C:\data\waveform 38	1.0	20.0	0.751	0.500	1.0	20.0	0.5109	0.0000	1.
	C:\data\waveform 4.89	1.0	20.0	0.751	0.557	1.0	20.0	0.5092	0.0000	1.
	C:\data\waveform 8.36	1.0	20.0	0.556	0.519	1.0	20.0	0.5111	0.0000	1.
Stop	C:\data\waveform 6.53	1.0	20.0	0.751	0.519	1.0	20.0	0.5099	0.0000	1.
	C:\data\waveform 6.46	1.0	20.0	0.751	0.558	1.0	20.0	0.5097	0.0000	1.
	C:\data\waveform 90	1.0	20.0	0.275	0.499	1.0	20.0	0.5114	0.0000	1.
der ID	C:\data\waveform 1.84	1.0	20.0	0.751	0.546	1.0	20.0	0.5102	0.0000	1.
000001	C:\data\waveform 4.71	1.0	20.0	0.751	0.538	1.0	20.0	0.5093	0.0000	1.
	C:\data\waveform 6.75	1.0	20.0	0.376	0.503	1.0	20.0	0.5107	0.0000	1.
cess ID	C:\data\waveform 59	1.0	20.0	-0.093	0.093	1.0	20.0	0.4977	0.4969	1.
ess ID	C:\data\waveform 5.22	1.0	20.0	0.751	0.693	1.0	20.0	0.5007	0.5002	1.
rator	C:\data\waveform 4.73	1.0	20.0	0.751	0.658	1.0	20.0	0.5007	0.5002	1.
rator ID	C:\data\waveform 3.60	1.0	20.0	-0.696	0.696	1.0	20.0	0.4996	0.4995	1.
	C:\data\waveform 0.92	1.0	20.0	0.751	0.751	1.0	20.0	0.5005	0.5004	1.
Serial Number	C:\data\waveform 0.92	1.0	20.0	0.751	0.751	1.0	20.0	0.5005	0.5004	1.
SN	C:\data\waveform 5.30	1.0	20.0	0.756	0.748	1.0	20.0	0.5081	0.0000	1.
	C:\data\waveform 4.41	1.0	20.0	0.756	0.747	1.0	20.0	0.5081	0.0000	1.
Weld Counter	C:\data\waveform 1.01	1.0	20.0	0.751	0.751	1.0	20.0	0.5005	0.5004	1.
70	C:\data\waveform 0.99	1.0	20.0	0.751	0.751	1.0	20.0	0.5005	0.5004	1.
	C:\data\waveform 1.24	1.0	20.0	0.751	0.751	1.0	20.0	0.5005	0.5004	1.
	C:\data\waveform 1.01	1.0	20.0	0.751	0.751	1.0	20.0	0.5004	0.5004	1.
ine 0 Line 1	C:\data\waveform 1.25	1.0	20.0	0.751	0.751	1.0	20.0	0.5005	0.5004	1.
	C:\data\waveform 1.13	1.0	20.0	0.751	0.751	1.0	20.0	0.5004	0.5003	1.
	C:\data\waveform 1.39	1.0	20.0	0.751	0.751	1.0	20.0	0.5004	0.5003	1. 🖵
eject Warning	•									•
r Network Variable Connectio	n Status Waveform Network )	/ariable Connection S		Port Status : 57600,8-N-1		Schedule Select		A	DI E1	E2

### Screenshot showing Logger

<sup>ady</sup>	Unlock Panel	Lock Panel		
	Timing Configuration Trigger Edge Start Delay (ms)	Peak Current (A)	Max Resistance (mΩ) 0.500 Reject UCL	Max Displacement1 (µm) 0.00 Reject UCL
uty	Trigger Edge         Start Delay (ms)           Falling         20.0	1400.0 1500.0 1	18.00 20.00 -	18.0 20.0 20.0 20.0 20.0 20.0 20.0 20.0 2
	Measurement Duration (ms) Low Pass Filter (Hz)	□ Limits On 1100.0 1000.0 1	E Limits On 12.00 - 10.00 -	□ Linits On 12.0 🛨 10.0 🛨
	50.0 5000.0 =	RMS Current (A)	Min Resistance (mΩ)	Min Displacement1 (µm)
Start	Selection	1501.3 1400.0 * 1500.0 *	0.500	18.0 1 20.0 1
	Schedule 01  Save	Limits On 1100.0 😤 1000.0 🐳	Limits On 1.20 1.00	Limits On 12.0 10.0
	Remote Selection	Peak Voltage (V)	Peak Power (W)	Max Force1 (lbs)
Stop	Evaluation Duration	0.751 Warry U.S. Reject UCL	1128.0 1400.0 1500.0 1	8.04 11.5 ÷ 12.0 ÷
	Start (ms) End (ms) Current 1.0 - 20.0 -	Warring LCL Reject LCL	Winning ALL Reject LCL	Warrang U.L. Reject LCL
der ID		Limits On 1.20 1.00 1.00	E Limits On   1100.0 국   1000.0 국	Limits On 10.5 110.0
000001	Voltage 1.0 - 20.0 -	0.751 Warner U.S. Reject UCL	21.428 Warning HL, Reject UCL 18.00 + 20.00 +	8.03 No eng 11 Reject UCL 11.5 + 12.0 +
ess ID	Resistance 1.0 😴 20.0 😴	Warring LCL Reject LCL	Waning ICL Reject LCL	Ware of the Reject LCL
	Power 1.0 - 20.0 -		Limits On 12.00	□ Limits On 10.5 💼 10.0 💼
ator ID	Displ. 1 1.0 + 20.0 +	Max Displacement2 (µm) 54.73 Naming U.S. Reject UCL	Max Force2 (bs) 9.18 Working UD. Reject UCL	Max Ar Flow (cfh)
Serial Number	Force 1 1.0 ÷ 20.0 ÷	18.0 20.0 20.0	11.5 12.0 1	11.5 1120
SN	Ar Flow 1.0 - 20.0 -	□ Limits On 12.0 📫 10.0 📫	□ Limits On 10.5 🔹 10.0 🔹	□ Linits On 10.5 📑 10.0 🛨
Weld Counter		Min Displacement2 (µm) 54.68 Reject UCL	Min Force2 (bs) 9.18 9.19 9.10 9.10 9.10 9.10 9.10 9.10 9.10	Min Az Flow (cfh)
68	Displ. 2 1.0 + 20.0 +	18.0 20.0 20.0 20.0 20.0 20.0 20.0 20.0 2	11.5 + 12.0 +	11.5 12.0 1 Werene U.L. Reject LCL
	Force 2 1.0 7 20.0 7	□ Limits On 12.0 🛨 10.0 🜩	🗆 Limits On 🛛 10.5 🔅 10.0 🖆	🗆 Linits On 🛛 10.5 🚔 10.0 🔿
ine 0 Line 1	Destination Waveform File Name:		Transfer Function	Function Output Mining 313, Reject UCL
	C:\data\waveform01.txt		0	0 0.0 100 100
	Destination Log File Name: C:\data\logfile01.txt			Limits On 0.0 = 0.0 =
Reject Warning				
r Network Variable Connec	tion Status Waveform Network Variable Con	nection Status RS232 Port Status	Schedule Select	AI DI E1 E2
ected	Connected	COM1: 57600,8-N-1		
Saved Waveform File M	lame		Line 2 Line 3 Line 4 Line 5 Lin	e 6

#### Screenshot showing Engineer Panel