

Connection Validation Robotic Soldering System

Reduce Risk and Increase Productivity with Robotic Soldering

Robotic soldering is becoming more commonplace as manufacturers look to reduce risk and increase productivity. Metcal's new Robotic Soldering System addresses these needs by combining our patented Connection Validation (CV) technology and Smart Interface System. CV mitigates solder joint defects by validating the intermetallic compound (IMC) formation in a soldered joint, and reduces unnecessary dwell time by signaling to the system to move to the next solder joint in the program after a good joint is detected.

Powerful and Simple

The Smart Interface System combines dual cameras, a touchscreen interface and powerful software, enabling easy programming and reduced turnover time. Importing your Gerber or DXF file capturing the image of your printed circuit board starts the programming process. Control of the system is integrated through the touchscreen interface, enabling users to select the solder joints, control the integrated solder feeder or manage process parameters through a graphical user interface. The Connection Validation Robotic Soldering System is the newest example of Metcal's Industrial Ingenuity.



Features & Benefits

SmartHeat

Provides power on demand, in response to the thermal load.

Connection Validation

Validates the intermetallic compound (IMC) formation of a solder joint via a patented algorithm and signals the system to move to the next joint.

Smart Interface System

Integrates control of the system into an easy to control interface. The custom graphical user interface (GUI) provides a powerful user experience that allows a user to quickly program and control all aspects of their solder program. The system allows quick and easy edits of solder programs, ensuring changes are easily implemented with minimal downtime.

Quick-Change Cartridge System

The Robotic Soldering System features a new quick-change cartridge collet that enables the system to utilize and exchange any CV compatible soldering cartridge with the system.

Integrated Solder Feeder Controls

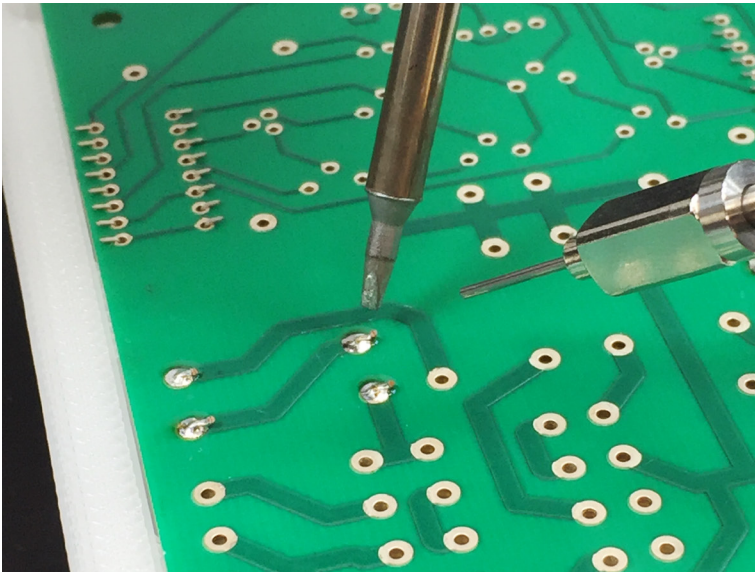
Customize the application of solder to the solder joint via the Smart Interface System. Control the speeds and feeds of each application of solder to ensure the correct volume at each solder joint.

Pattern Recognition and Array Programming

Speed up the programming process by letting the Smart Interface System find repeating patterns and apply the same soldering program. Each pattern can be stored in a library that is available to the user for each new printed circuit board. Using Array Programming takes programming to the next level. Using a base program, the system effortlessly generates a user-defined array of the given program. As a result, productivity is increased and the overall time to setup a new program is significantly reduced.

Merge Profile

Merge Profile allows the user to insert previously created profiles in locations defined by the user. This is useful when creating multiple instances of solder points that have already been created, with this feature the user can create a single profile that contains solder points from a collection of other profiles.



System Part Number	Description
RSS-1000-CVSI	Robotic Soldering System with Cover
RSS-1000-CVSI-NC	Robotic Soldering System, No Cover
System with No Cover Includes:	Five-axis Robot (four motorized) with 400mm x 400mm active soldering area
CV-PS5200R	CV Soldering System Power Supply
CV-H8-AV	CV Advanced Soldering Iron
AC-RSS-SWFKIT	Ø 0.8mm Solder Wire Feeder
SPR-RSS-COMPVCAM	RSS, Computer Vision Camera
SPR-RSS-PROCAM	RSS, Process Camera
SPR-RSS-MONITOR	RSS, Process Camera Monitor
SPR-RSS-TOUCHSCREEN	RSS, Touch Screen, 16.9 Aspect Ratio
SPR-RSS-CONTROLLER	RSS, Controller
SPR-RSS-STC	RSS, Solder Tip Cleaner
AC-RSS-TOOL-TA	RSS, Tip Alignment Fixture
SPR-RSS-TOOL-CAMCAL	RSS, Camera Calibration Tool
SPR-RSS-LENS	RSS, Computer Vision Lens

Robotic Soldering System



Optional Accessories and Spare Parts

Part Number	Description
AC-RSS-1KSC	Safety Cover with Integrated Safety Interlock
AC-RSS-TOOL-CPA	Center Point Alignment Tool
SPR-RSS-FAN	Chassis Fan 24V
AC-RSS-HPC-3PK	Hand-piece Collet (3 pack)
AC-RSS-1KSC-HDMI-EXT	HDMI Extension Cable, Safety Cover
AC-RSS-05-SWFKIT	Solder Feeder Kit, Ø 0.5mm
AC-RSS-06-SWFKIT	Solder Feeder Kit, Ø 0.6mm
AC-RSS-08-SWFKIT	Solder Feeder Kit, Ø 0.8mm
AC-RSS-10-SWFKIT	Solder Feeder Kit, Ø 1.0mm
AC-RSS-12-SWFKIT	Solder Feeder Kit, Ø 1.2mm
SPR-RSS-PWRSPPLY48	Power Supply, 115-230 VAC, 48V
SPR-RSS-PWRSPPLY24	Power Supply, 115-230 VAC, 24V
SPR-RSS-ROBCON-XYR	Robot Motor Controller, X, Y & R-Axis
SPR-RSS-ROBCON-Z	Robot Motor Controller, Z-Axis
SPR-RSS-LIMITSW-X	Limit Switch, X-Axis
SPR-RSS-LIMITSW-YZR	Limit Switch, Y,Z & R-Axis
SPR-RSS-BRUSHES	Tip Cleaning Brushes
SPR-RSS-HDMI	HDMI Cable
SPR-RSS-USB-CV	USB 2.0 Cable, CV Communication
SPR-RSS-USB-CAM	USB 3.0 Cable, Camera Communication
SPR-RSS-MAINPCB	RSS, Controller PCBA
SPR-RSS-IOPCB	RSS, Input/Output PCBA
SPR-RSS-SWFCON	Solder Wire Feeder Controller
SPR-RSS-LPS	Lighting Controller Power Supply



Robotic Soldering System

Technical Specifications



Robotic Soldering System

Power Requirement		115/230 VAC, 50/60HZ, 200 Watt Single Phase	
Resolution		X, Y, Z	0.01 mm
		Theta (θ)	0.01°
Operations Range		X, Y	400 mm x 400 mm (±0.02%)
		Z	100 mm (±0.02%)
		θ	300° (±0.02%)
Speed	Vector	X, Y	Up to 100 mm/s Max
		Z	Up to 80 mm/s Max
		θ	Up to 100 °/s Max
	Interpolation	X, Y	Up to 150 mm/s Max
		Z	Up to 150 mm/s Max
		θ	Up to 150 °/s Max
	Space	X, Y	Up to 300 mm/s Max
		Z	Up to 300 mm/s Max
		θ	Up to 300 °/s Max
Repeatability		X, Y, Z	±0.02 mm
		θ	±0.02°
Weight		83 kg	
Dimensions (W x D x H)		1055 mm (41.5") x 775 mm (30.5") x 820 mm (32")	

CV-PS5200R w/ CV-H8-AV

Soldering System Type	Inductive
Power Consumption	125W
Power Output (per channel)	80W
Output Line Frequency	13.56Mhz
Tip-to-Ground Potential	<2 mV
Tip-to-Ground Resistance	<2 ohm
Tip Temperature Accuracy	Meets or exceeds IPC J-STD-001
Idle Temperature Stability	$\pm 1.1^\circ\text{C}$ in still air
Connections	
RF Connector	F-Type Power Connector
LED power Connector	6 pin DIN
Communications	USB A Female and RJ11

SPR-RSS-PROCAM

Lighting	LED
Monitor	
Resolution	1280 x 800
Diagonal	10.1"
Aspect Ratio	16:9

SPR-RSS-COMPVCAM

Resolution	2048 x 1536 dpi	
Megapixels	3.2 MP	
Chroma	Color	
Compliance	CE, FCC, KCC, RoHS	
Camera Lens		
Focal Length	8mm	
Effective Lens Aperture Front	Φ 21.5mm	
Rear	Φ 12.0mm	
Operating Range	Iris	F1.4 - F16C
	Focus	0.2-Inf
Control	Iris	Manual
	Focus	Manual

SPR-RSS-MAINPCB

CPU	Intel® Atom™ E3826, Dual-Core 1.46 GHz
Memory	2 GB DDRL3 RAM
Video	Integrated Intel® HD Graphics
Audio	Digital via HDMI
I/O	1x 10/100/1000 Ethernet via RJ-45 connector 6x USB 2.0 1x Serial connection
Power	5V DC
Operating System	Linux with custom GUI

AC-RSS-SWF

Solder Feeder Speed	1.0 mm/sec-50 mm/sec
Solder Diameter	0.5mm-1.2mm
Solder Feeder Resolution	± 1.5 or $\pm 5\%$ of value (whichever is greater)

Other

Nitrogen	Optional, Plumbed
Fume Extraction	Optional, Plumbed
Port Size	75mm

SPR-RSS-TOUCHSCREEN

Active Display Area	345.2 mm (10.06") x 194.6 mm (7.66")
Monitor Dimensions	Width: 387mm (15.24"); Height: 244.4mm (9.62"); Depth: 32.9mm (1.29")
LCD Technology	Active Matrix TFT LCD with LED Backlighting
Diagonal Size	15.6"
Aspect Ratio	10 Touch Points
Resolution	HD 1366 x 768
Colors	262,000
Brightness (Typical)	LCD Panel: 220 nits; with IntelliTouch Pro PCAP: 187 units
Response Time	10 ms
Viewing Angle	Horizontal: $\pm 90^\circ$ total; Vertical: $\pm 65^\circ$ total
Contrast Ratio (Typical)	600:1
Connection	HDMI
Power	12 VDC
Temperature (Operating)	0°C - 40°C (32°F-104°F)
Humidity	20%-80%
(Non-Condensing) (Operating)	