Automation and Engineering Services

Welding Controller

RACONT-WC-2100

#23, 4TH MAIN, 3RD BLOCK,
THEAGARAJA NAGAR,
BANGALORE – 560 028 INDIA
PH:- 080 2676 0875 / 94484 50969
URL: www.aes-india.in E-Mail – info@aes-india.in

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Overview

The RACONT-WC-2100 is a Industrial Controller for controlling the weld process in a resistance welding machine.

Process type Flexibility

The RACONT-WC-2100 can control the welding process in types such as

- Resistance Welding
- Spot Welding
- Butt Welding
- Flash Butt Welding

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Control Objectives

The weld quality in the weld process types depends on the following control parameters

- Electrode Position, Velocity and Force
- Weld Voltage
- Weld Current
- Weld Power
- Weld Energy

All the above parameters are precisely controlled to achieve highest weld quality.

Control Implementation

The weld controller RACONT-WC-2100 has advanced high speed closed loop control functions to control the

- Weld electrode Position, Velocity and Force.
- Weld Voltage Control.
- Weld Current Control.

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Program Structure

The controller is programmable with multi step programming like a CNC part program with similar programming codes.

Multiple programs, up to 19999 numbers, can be stored and processed in the controller and selected for running the process.

Selection can be by manual operator input or through automated selection methods such as Field Bus , RFID Reader, Bar Code Reader and I/O signals.

Typical Flash Butt Weld Sequence

- Pre-flash
- Pre-Heating
- Flashing
- Upsetting
- Post Heating

Program Steps

Every Program can have a maximum of 99 steps.

In each step of the program the electrode position/ Speed / Force , weld voltage , weld current , weld energy and time can be programmed as set points.

Some steps can be repeated for a number of times with wait time between repeats.

Along with the set values in each step, user can also program the monitoring limits for electrode position/ Speed / Force , weld voltage , weld current , weld energy and time.

For each step the completion conditions for the step execution can be programmed so that the program can process the next step.

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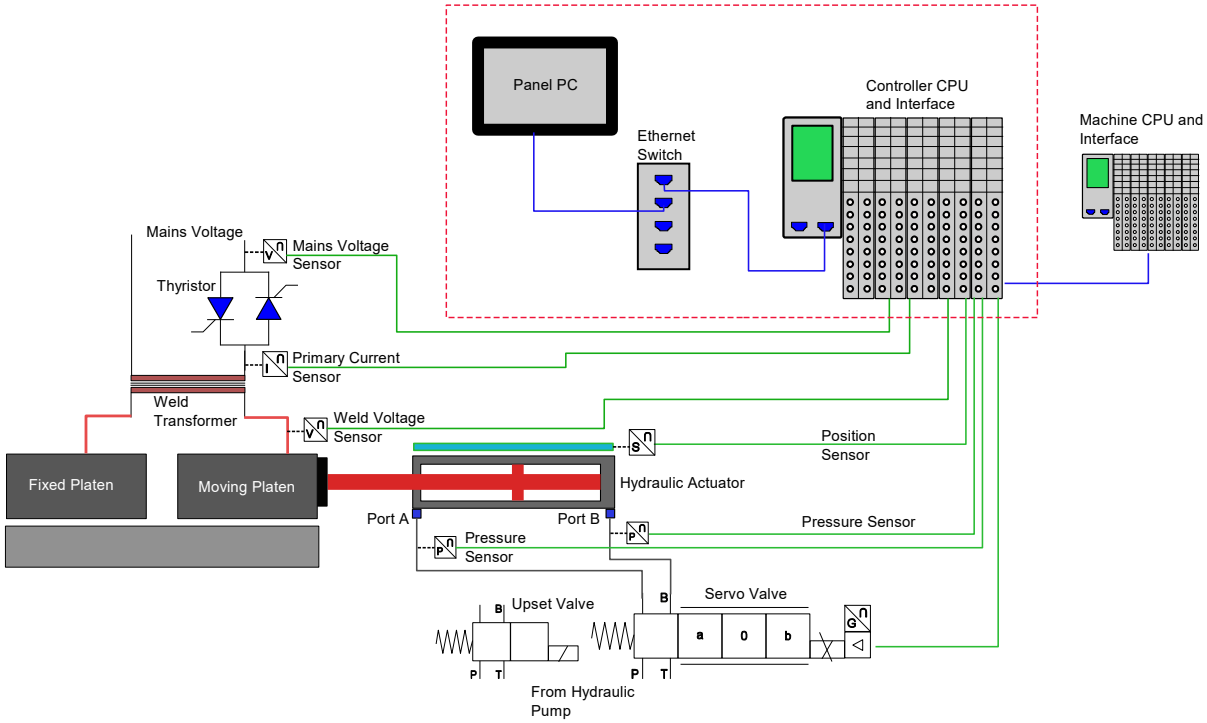
Weld Machine Components

- RACONT-WC-2100 controller
- Machine Logic Controller
- Electrode position actuator
- Electrode position feedback
- Electrode force feedback sensor
- Weld Power Converter
- Weld Transformer
- Weld Electrode Voltage sensor
- Weld Current Sensor
- AC Mains Line Voltage Sensor.

Optional Components

- Component Clamp force sensor (Pressure feedback / Load cell)
- Electrode Drop Voltage sensor.

Typical Machine with Hydraulic Actuators



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RACONT-WC-2100 System

- Embedded Hardware controller with interfaces for the Machine PLC, Weld actuators and feedback sensors.
- Industrial PC with touch screen display and keyboard with integrated touch pad
- Software application for the weld process control and data logging.

Features

- Alarm Logging for 5 years.
- Process parameter Logging as curves for all cycles in the Harddisk. Every cycle is identified with a auto serial number and stored in the inbuilt database for future retieval and reporting for 5 years.
- AI and ML ready data structures for future third party software integration.
- OEE parameters for 5 years.
- Remote diagnostics.
- Email alerts for critical machine events.
- TPM settings and alerts.
- Machine setup files for ease of integration with any type of machine / series production.

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Variants of machines

- Electric Servo Motor Linear Actuator instead of Hydraulic actuator.
- Load cells for force feedback instead of pressure sensors
- Position sensor with interfaces such as analog, SSI, Profinet.
- Machine Automation interface with ROBOT

Scope

- Embedded Hardware controller supplied for OEM for plug and play operations.
- Embedded Hardware controller supplied for End User retrofit apllications.
- Startup assistance at site by our personnel for fast deployment of the controller in the machine.
- Optional supply with all sensors and thyristor Pack.

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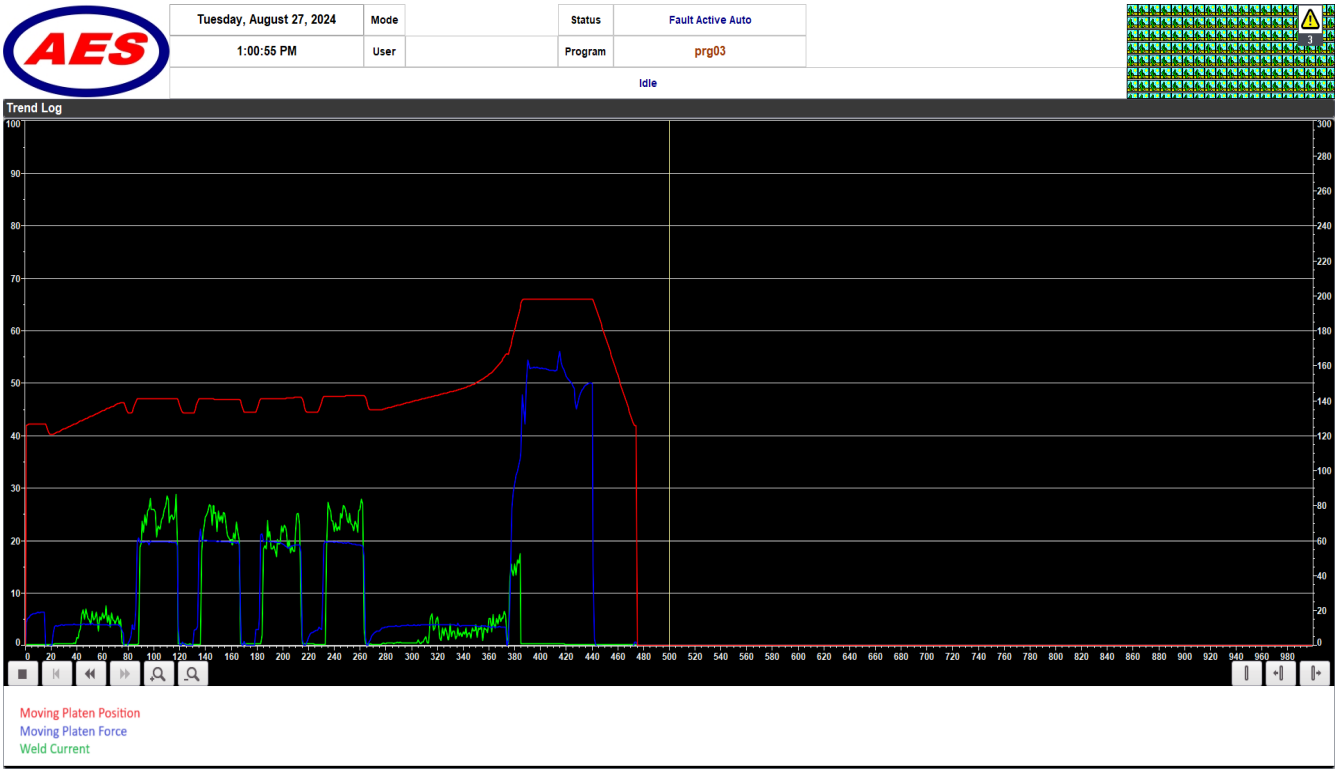
Typical Data Log Curve for a Flash butt Welding Cycle on the Controller PC



Typical Data Log Curve for a Flash butt Welding Cycle on the Software Logger database – All Curves in One Pane

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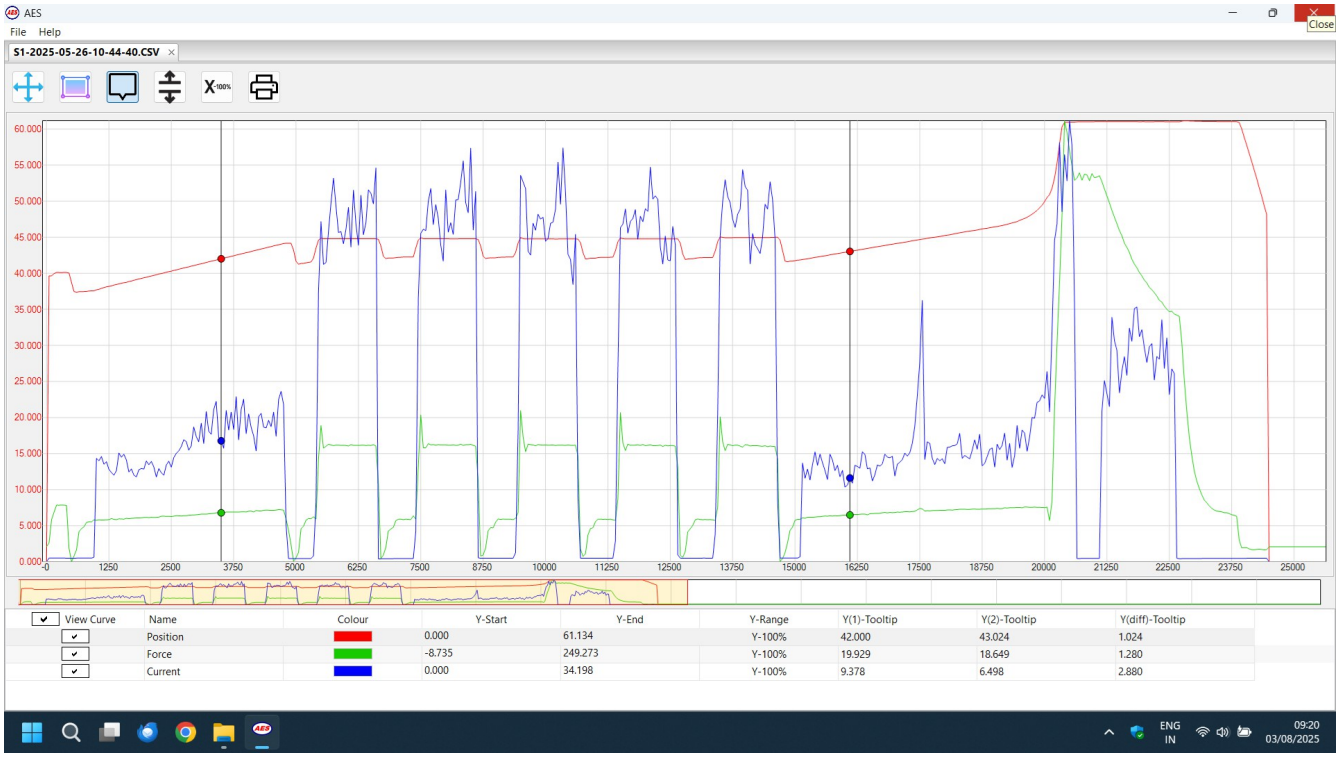
Typical Data Log Curve for a Flash butt Welding Cycle on the Software Logger database – All Curves in Separate Pane

Typical Data Log Curve for a Flash butt Welding Cycle on the Software Logger database – With Guide lines and measurement



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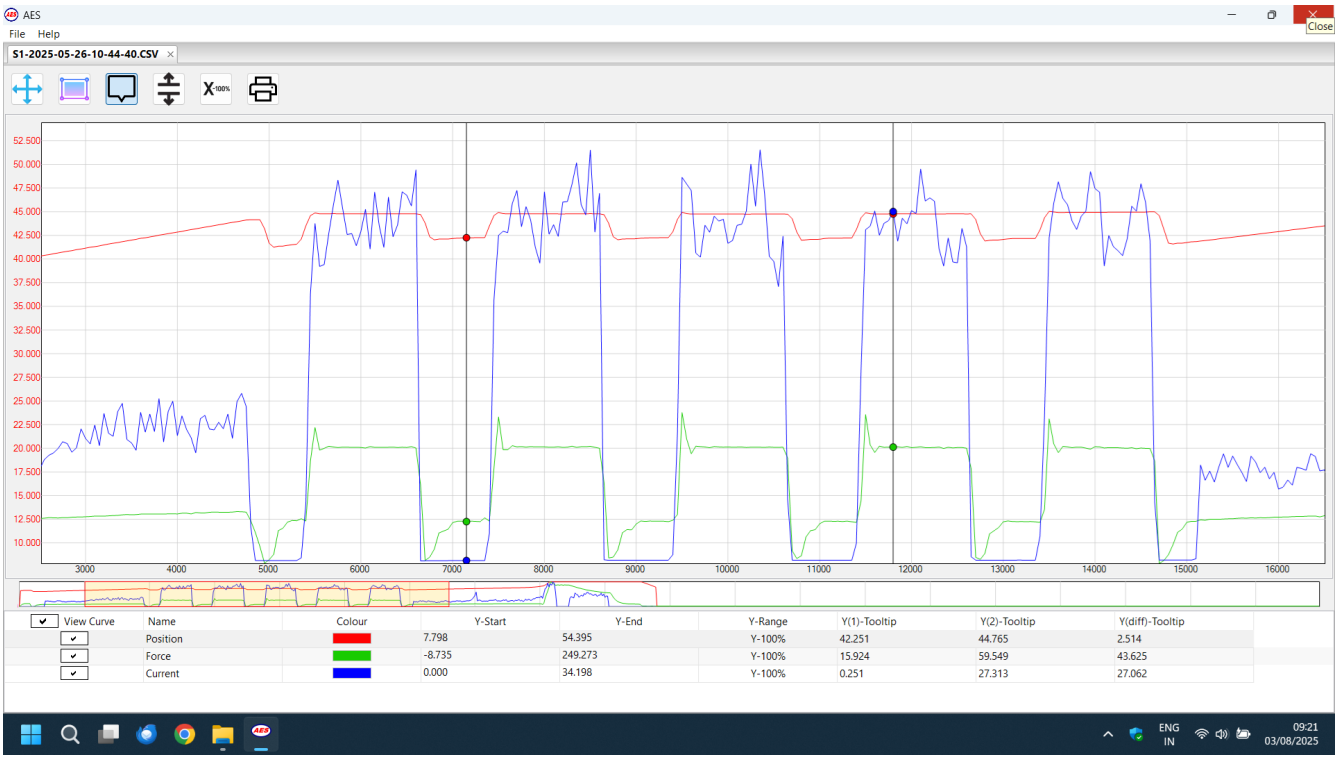
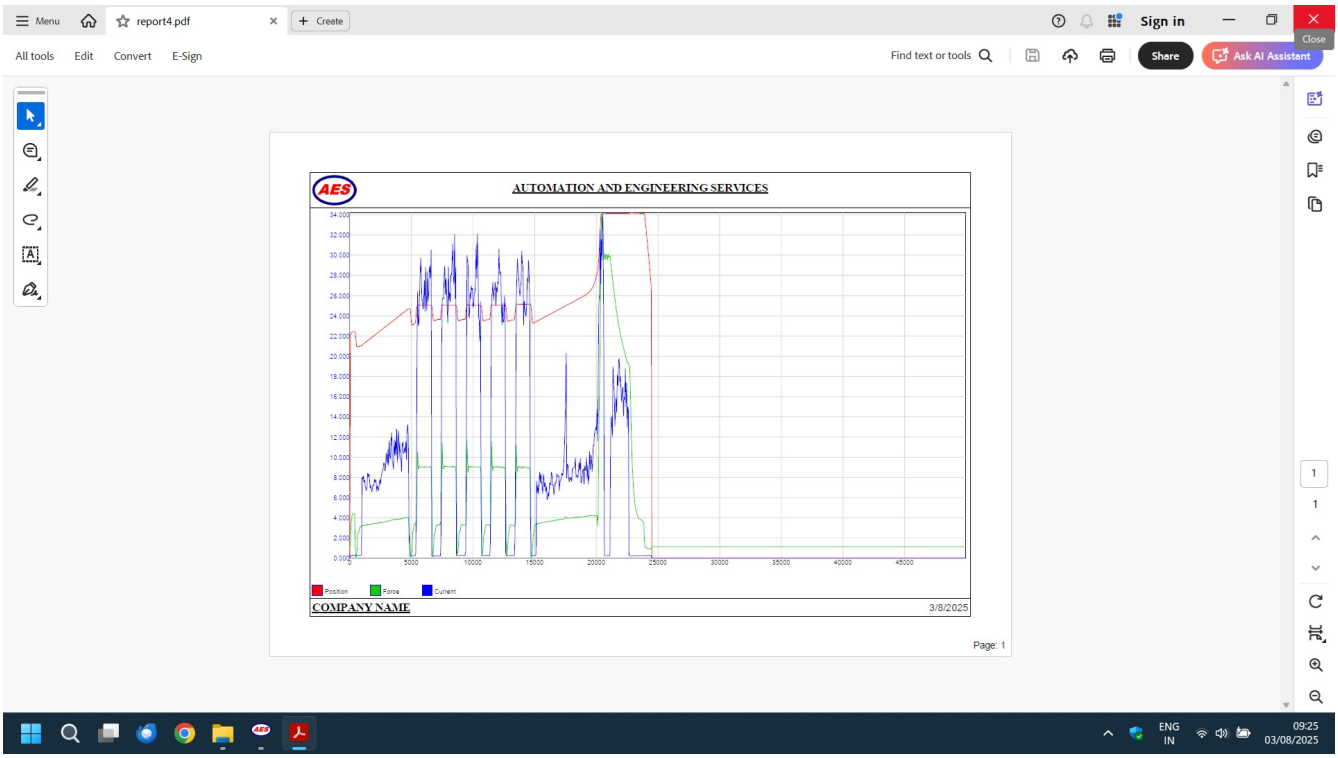
Typical Data Log Curve for a Flash butt Welding Cycle on the Software Logger database – With Zoom on X and Y axis



Typical Data Log Curve for a Flash butt Welding Cycle on the Software Logger database – Printout in Pdf format



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Front Veiw of Controller.

End of section