Computer Weld Technology, Inc.

SmartSensor ™

The SmartSensor™ is an Embedded Microcontroller device designed to collect and monitor welding parameters. In its basic form the SmartSensor is configured to monitor welding current and provides two user 24 VDC inputs and 24 VDC outputs. It also provides a RS-485 serial port with the Modbus™ protocol to allow the user to access the run time data and enable control functions. Additional sensors can be added to monitor other welding parameters. The SmartSensor can monitor Voltage, Wire Speed, Travel Speed, Gas Flow or Temperature. The SmartSensor can be used for the following monitoring functions:

- Arc On Time
- Weld Counter
- Average Current and Arc On Time
- Record Average Volt, Amp, Wire Speed, Gas Flow or Temperature and Travel Speed
  (requires additional sensors)
- With user supplied inputs and optional sensors, the control can provide PASS/FAIL testing for each completed weld based on a four-part mapped learn cycle and user defined Sigma values
- Sensor can provide two levels of PASS/FAIL testing:
  - Weld Pass/Fail
  - Part Pass/Fail

The Smart Sensor™ also provides a RS-485 serial port with the Modbus™ RTU protocol. This allows the user to access the run time data and enable control functions.

Total isolation of all sensors from the welding arc. Arc current is measured using a laser trimmed hall-effect transducer. Arc voltage sensor provides a 1 KV isolation using capacitive isolation technology.

FEATURES

- Hall-effect current transducer with 25 mm opening for welding cable
- A screw terminal block connections for positive and negative voltage sense leads
- The unit provides weld current detection and can be used as an arc active sensor
- There are two 24 VDC inputs and two 24 VDC SSR outputs.
- The sensor can be configured to store up to 1040 weld summaries in internal NVRAM. The Date/Time stamped summaries may then be downloaded via the Modbus Port

BENEFITS

- Provides electrical isolation and reduces cable heating by eliminating additional mechanical connections
- Provides easy installation of voltage sense leads and allows custom wire length
- Communication with multiple SmartSensors devices with optional software package
- The sensor can also be used with an Ethernet port and provide Modbus over Ethernet connectivity. This will allow multiple users to connect to multiple sensors via an Ethernet connection.

SmartSensor™ SPECIFICATIONS

Micro ADM™ General Specifications

Dimensions	2.1"H x 2.5"W x 5.6"L (53mm x 64mm x 143mm) Note: Allow an additional clearance of 1.5" (38mm) below sensor for connector clearance. Max welding cable size 1" (25 mm)
Weight	7 oz (0.198 kg)
Communications	MODBUS™ RTU
Power Requirements	12 – 26 Vdc @ 100ma
System Interface	2 – 24 vdc inputs, 2 vdc SSR outputs

Micro ADM™ Sensor Specifications

Parameters	Range	Accuracy
Arc Current	0 – 500 adc 0 – 950 adc	±2.0% of full scale ±2 digits ±2.5% of full scale ±3 digits
Arc Voltage	0 – 80 vdc 0 – 100 vdc	±1.5% of full scale ±2 digits ±2.0% of full scale ±2 digits
Wire Feed Speed	10 – 1000 ipm (4.2 – 423 mm/s)	±3% of full scale ±2 digits
Travel Speed	1.0 – 100.0 ipm (0.4 – 42 mm/s)	±3% of full scale ±2 digits
Analog Input	0 – 5.0 vdc	±1.5% of full scale ±2 digits
Digital Inputs	10 – 28 vdc @ 5 ma	
Digital Outputs	12 – 26 vdc @ 100 ma (depends on voltage input)	
Welds/Part	1 – 200 Welds/Part	
Weld Memory	1040 Welds summaries stored in NVRAM	
Weld Testing*	Pass/Fail per Weld based on Volume, AAD and Work applied	
Part Testing*	Pass/Fail per Part based on Weld Count, Total Volume, Total AAD and Total Work applied	

* Testing requires volt, amp and wire speed sensor for calculations of volume and work applied.

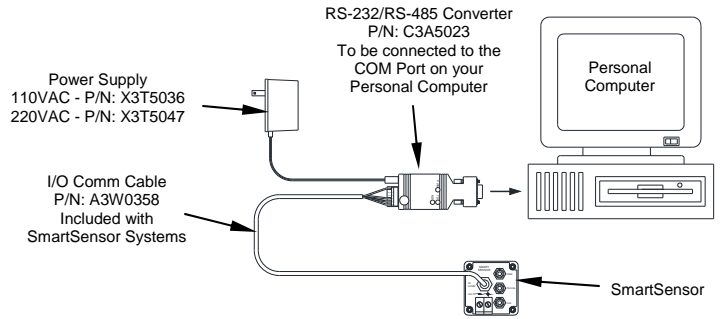## WireLog Plus™ Wire Speed Sensor Data Logging Program
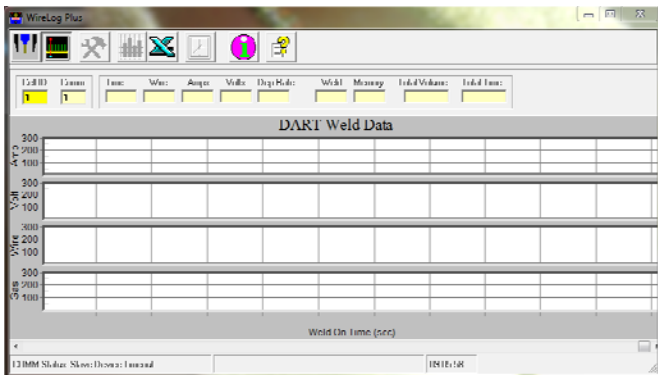
The WireLog Plus™ Program is used with the SmartSensor and provides a simple MODBUS terminal to program and to download data from multiple SmartSensor™ devices. The program uses the MODBUS™ RTU protocol to establish communication with multiple SmartSensor devices. The interface to the Sensor is via a RS-485 duplex network.
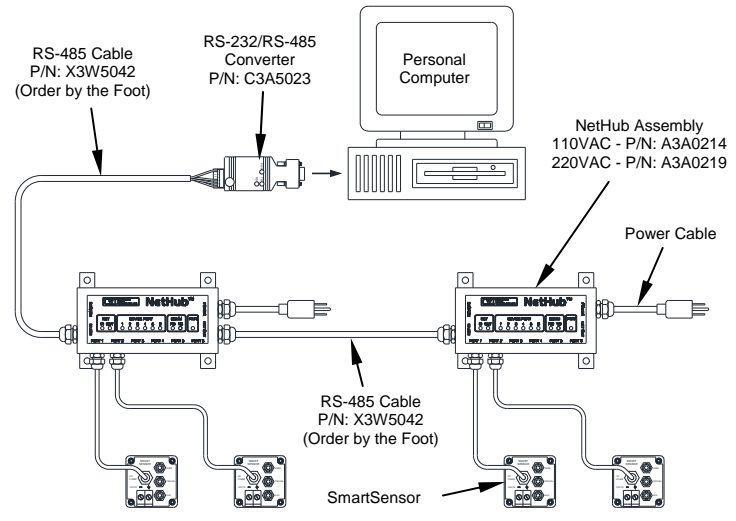
WireLog Plus™ Product Part Numbers

Part Numbers	Description
A5Z0036	WireLog Plus™ Software

SmartSensor – Single Unit Communications

RS-232/RS-485 Converter
P/N: C3A5023
To be connected to the COM Port on your Personal Computer

Power Supply
110VAC - P/N: X3T5036
220VAC - P/N: X3T5047

Personal Computer

I/O Comm Cable
P/N: A3W0358
Included with SmartSensor Systems

SmartSensor

SmartSensor – Multiple Unit NetHub RS-232 Communications

RS-485 Cable
P/N: X3W5042
(Order by the Foot)

RS-232/RS-485 Converter
P/N: C3A5023

Personal Computer

NetHub Assembly
110VAC - P/N: A3A0214
220VAC - P/N: A3A0219

Power Cable

RS-485 Cable
P/N: X3W5042
(Order by the Foot)

SmartSensor

SmartSensor – Multiple Unit NetHub Ethernet Communications

RS-232/RS-485 NetHub Patch Cable
P/N: C3W5053

RS-232/RS-485 Ethernet Converter
P/N: C3A5049

Ethernet Cable

To TCP-IP Network

NetHub Assembly
110VAC - P/N: A3A0214
220VAC - P/N: A3A0219

Power Cable

RS-485 Cable
P/N: X3W5042
(Order by the Foot)

SmartSensor