



# Mark\* VleS Functional Safety Universal Analog I/O Module Summary Sheet



**IS430SSUAH1A**  
Universal Analog  
I/O Module

The Mark\* VleS Functional Safety IS430SSUAH1A Universal Analog Input/Output (I/O) module is an enhanced I/O device that offers users significant flexibility as compared to traditional analog I/O modules. Each of the 16 points of I/O can be uniquely configured to any of the 10 different I/O types. This flexibility allows optimization during the system design phase, lowering cabinet footprint and reducing system cost. The module facilitates last-minute field changes through simple software reconfiguration of individual I/O points for faster commissioning. Your project stays on schedule and on budget. It also provides flexibility for upgrades and expansions by simply reconfiguring the point to match the type of I/O being connected.

The Universal Analog I/O module consists of a Universal Analog IS420YUAAS1A I/O pack mounted on an IS410SUAAS1A terminal board. The ordering part number is IS430SSUAH1A (complete Universal Analog I/O module). The module is only available in a Simplex configuration.

Sixteen Simplex Analog channels can be configured individually as any of the following types: Thermocouple (TC), Resistance Temperature Device (RTD), voltage input ( $\pm 5$  V or  $\pm 10$  V), 4 to 20 mA current input, 0 to 20 mA current output, pulse accumulator, digital input (DI), and digital output (DO). Highway Addressable Remote Transducer (HART®) is optional for all internally powered mA input modes. There are two connections per Analog channel that provide I/O signal + and return for the mA output mode, which also supports HART.

The YUAA I/O pack supports several types of digital (discrete) inputs and outputs, as enabled by the configuration, including: digital input modes of NAMUR, and externally wetted, internally wetted, and digital outputs using mA outputs and interposing relays.

The Universal Analog I/O module also supports a simple Pulse Accumulator input that counts pulse edges on an input channel across a specified threshold voltage up to a limited frequency.

The following table provides the specifications for the Universal Analog I/O module. For more information on the YUAA I/O pack and the SUAAS1A terminal board, refer to the *Mark VleS Functional Safety Systems for General Market Volume II System Guide for General-purpose Applications* (GEH-6855\_Vol\_II), the chapter *YUAA Universal I/O Modules*.

### Universal Analog I/O Module Specifications

Item	IS430SSUAH1A Specification
Product Name	Mark VleS Universal Analog I/O
Life-cycle Status	Active
I/O Pack Redundancy	Simplex
I/O Pack	IS420YUAAS1A (qty 1) (order separately)
Number of Channels	16 channels per module
Supported I/O Types	Thermocouple (TC) RTD 4 to 20 mA current input with HART option $\pm 5$ or $\pm 10$ V input 0 to 20 mA current output with HART option Digital inputs (DI) and digital outputs (DO) Pulse accumulators
mA / HART Inputs	4 to 20 mA at 0.1% accuracy over temperature range
Voltage Inputs	$\pm 5$ V dc or $\pm 10$ V dc at 0.1% accuracy over temperature range

**Universal Analog I/O Module Specifications (continued)**

Item	IS430SSUAH1A Specification
Input Span	4 to 20 mA dc with allowance for 0 to 24 mA to cover NAMUR fault conditions
HART Rx and Cx Values	250 $\Omega$ in parallel with 5,000 pF for inputs; 14 k $\Omega$ with 11,000 pF for outputs
mA Outputs	0 to 20 mA with 0.5% accuracy, compliance up to 18 V dc with 22 V dc or higher field supply
Output Converter	16-bit D/A converter with 0.5% accuracy over 0 to 24 mA
Output Load	800 $\Omega$ for 0 to 20 mA output
Thermocouples	E, J, K, S, T, B, N, R with 0.1% measurement accuracy of full scale Local / Remote Cold Junction options $\pm 16.7^{\circ}\text{C}$ ( $2^{\circ}\text{F}$ ) ( $\pm 15.5^{\circ}\text{C}$ , $4^{\circ}\text{F}$ if I/O configured for mA outputs)
RTD	120 $\Omega$ Nickel $\pm 16.7^{\circ}\text{C}$ ( $2^{\circ}\text{F}$ ) at $204.4^{\circ}\text{C}$ ( $400^{\circ}\text{F}$ ) 100 $\Omega$ Platinum $\pm 15.6^{\circ}\text{C}$ ( $4^{\circ}\text{F}$ ) at $204.4^{\circ}\text{C}$ ( $400^{\circ}\text{F}$ ) 200 $\Omega$ Platinum $\pm 16.7^{\circ}\text{C}$ ( $2^{\circ}\text{F}$ ) at $204.4^{\circ}\text{C}$ ( $400^{\circ}\text{F}$ ) 10 $\Omega$ Copper $\pm 12.2^{\circ}\text{C}$ ( $10^{\circ}\text{F}$ ) at $204.4^{\circ}\text{C}$ ( $400^{\circ}\text{F}$ ) Resistance up to 450 $\Omega$ ; scan time: 500 ms 2 and 3 wire support
Discrete Inputs	10 to 20 V external wetted switches into 12.5 k $\Omega$ internal load line monitoring - 22 to 30 V external wetted switches using a series or series-parallel set of 8.2 k $\Omega$ Internal wetted switches with 10 mA contact current, 22 V open contact volt
Discrete Outputs	0 to 24 mA at up to 22 V using mA output mode
Pulse Accumulators	16-bit; voltage range: -10 to 20 V; frequency range: 0 to 500 Hz
Input Converter Resolution	16-bit analog-to-digital converter
Measurement Accuracy	Better than 0.1% full scale over the temperature range $-40$ to $70^{\circ}\text{C}$ ( $-40$ to $158^{\circ}\text{F}$ )
Common Mode Rejection	AC common mode rejection 60 dB at 60 Hz, with up to $\pm 5$ V common mode voltage DC common mode rejection 80 dB with $-5$ to $+7$ peak V common mode voltage
Field Wiring	24 AWG min, 12 AWG max
I/O Scan Time	Supported controller I/O scan rates: 10 ms, 40 ms, 80 ms, 160 ms
Diagnostic Fault Detection	Power-up self test, support for all I/O types, continuous monitoring of power supplies, both configurable sensor limit and system function limit checks, and incorrect terminal board check
Sensor Input Line Monitoring	Open/Short circuit detection for sensor outputs with DC bias, but not for zero bias signals
I/O Pack DC Control Power	28 V dc, 8.1 W quiescent plus power per channel: <ul style="list-style-type: none"> <li>• TC, 5 V, 10 V, external wetted DI, pulse accumulator, or RTD = 0.02 W per channel</li> <li>• External fed mA input and internal wetted DI = 0.04 W per channel</li> <li>• Internal fed mA input or mA output = 0.68 W per channel</li> </ul>
I/O Pack DC Power Connector	Phoenix <sup>®</sup> contact (MC1.5/S-STF-3.81) (included)
I/O Pack Construction	Aluminum case
I/O Pack Health	Visual status LEDs, circuit health variables available to control logic
Termination Module Dimensions (includes cover and I/O pack) (H x W x L)	11.2 x 8.6 x 16.8 cm (4.4 x 3.4 x 6.6 in)
Safety Rated	Yes, compliant with IEC 61508
Hazardous Locations Capability	Class 1, Div 2 / Class 2, Zone 2 / ATEX For ratings and further details, refer to the <i>Mark VIeS Functional Safety System Equipment in Hazardous Locations (HazLoc) Instruction Guide</i> (GEH-6861).
G3 Compliant	Yes
Ambient Operational Temperature	$-40$ to $70^{\circ}\text{C}$ ( $-40$ to $158^{\circ}\text{F}$ )
Storage Temperature	$-40$ to $85^{\circ}\text{C}$ ( $-40$ to $185^{\circ}\text{F}$ )
Mounting Method	DIN-rail mounted
Module Replacement Part Number	IS430SSUAH1A



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