UniStream™ Uni-I/O™ Modules UIS-WCB2 Art. No. 1478*(

Technical Specifications

This guide provides specifications for Unitronics' Uni-I/O™ Wide module UIS-WCB2. This module comprises:

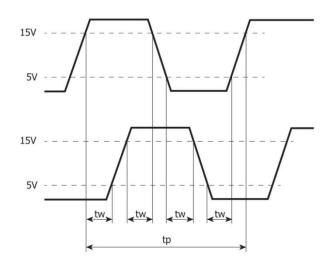
- 10 Digital inputs, 24VDC, sink/source, including 2 High speed counter input channels (1) (2)
- 2 x Analog inputs, $0 \div 10V / 0 \div 20mA$, 14 bits
- 2 x Temperature inputs, RTD / Thermocouple
- 8 x Transistor outputs, source
- 2 x Transistor outputs, sink including 2 High speed PWM output channels (1)(3)
- 2 x Analog outputs, $0 \div 10V / -10 \div 10V / 0 \div 20mA / 4 \div 20mA$, 13/14 bits

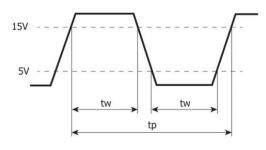
Uni-I/O Wide modules are compatible with UniStream™ Programmable Logic Controllers. They may be either snapped onto the back of a UniStream™ HMI Panel next to a CPU-for-Panel to create an all-inone PLC + HMI controller, or installed on a standard DIN Rail using a Local Expansion Adapter.

Installation Guides are available in the Unitronics Technical Library at www.unitronics.com.

| Power Supply | |
|-----------------------------|----------------|
| Nominal operating voltage | 24VDC |
| Operating voltage | 20.4 – 28.8VDC |
| Maximum current consumption | 180mA@24VDC |
| Isolation | None |

| Digital Inputs | |
|---------------------------|--|
| Number of inputs | 10 |
| Туре | Sink or Source |
| Isolation voltage | |
| Input to bus | 500VAC for 1 minute |
| Input to input | None |
| Input to power supply | 500VAC for 1 minute |
| Nominal voltage | 24VDC @ 6mA |
| Input voltage | |
| Sink/Source | On state: 15-30VDC, 4mA min. |
| | Off state: 0-5VDC, 1mA max. |
| Nominal impedance | 4kΩ |
| Filter | Settable between 1 to 32ms |
| High speed inputs (1) (2) | |
| Frequency / Period | Pulse/Direction mode: $10kHz$ max. / $100\mu s$ min. (t_p in the Pulse/Dir Mode figure below) |
| | Quadrature mode: $5kHz$ max. / $200\mu s$ min. (t_p in the Quadrature Mode figure below) |
| Pulse width | $40\mu s$ min. for each state (t_w in the figures below) |
| Cable | Shielded twisted pair |





Quadrature Mode

Pulse/Direction mode

| Analog Inputs | | | | | |
|-----------------------------|--|---------------------------------------|------------------------------|--|--|
| Number of inputs | 2 | 2 | | | |
| Input range (4) (5) | Input Type | Nominal Values | Over-range Values * | | |
| | 0 ÷ 10VDC | 0 ≤ Vin ≤ 10VDC | 10 < Vin ≤ 10.15VDC | | |
| | 0 ÷ 20mA | 0 ≤ Iin ≤ 20mA | 20 < Iin ≤ 20.3mA | | |
| | * Overflow (6) i boundary. | s declared when an input | value exceeds the Over-range | | |
| Absolute maximum rating | ±30V (Voltage) | , ±30mA (Current) | | | |
| Isolation voltage | | | | | |
| Input to bus | 500VAC for 1 m | inute | | | |
| Input to input | None | | | | |
| Input to temperature inputs | None | | | | |
| Input to power supply | 500VAC for 1 minute | | | | |
| Conversion method | Delta-sigma | | | | |
| Resolution | 14 bits | | | | |
| Accuracy | ±0.2% / ±0.5% | ±0.2% / ±0.5% of full scale (Voltage) | | | |
| (25°C / -20°C to 55°C) | ±0.2% / ±0.3% of full scale (Current) | | | | |
| Input impedence | 492 k Ω (Voltage), 30 Ω (Current) | | | | |
| Noise rejection | 10Hz, 50Hz, 60Hz, 400Hz | | | | |

| Step response (7) | Smoothing Noise Rejection Frequency | | | | |
|----------------------------|--|-----------|-----------|-----------|------------|
| (0 to 100% of final value) | | 400Hz | 60Hz | 50Hz | 10Hz |
| | None | 251.6 ms | 411.6 ms | 491.6 ms | 2411.6 ms |
| | Weak | 503.2 ms | 823.2 ms | 983.2 ms | 4823.2 ms |
| | Medium | 1006.4 ms | 1646.4 ms | 1966.4 ms | 9646.4 ms |
| | Strong | 2012.7 ms | 3292.7 ms | 3932.7 ms | 19292.7 ms |
| Update time ⁽⁷⁾ | Noise Rejection Frequency Update Time | | | | |
| | 400Hz 251.6 ms | | | | |
| | 60Hz 411.6 ms 50Hz 491.6 ms 10Hz 2411.6 ms | | | | |
| | | | | | |
| | | | | | |
| Cable | Shielded twisted pair | | | | |
| Diagnostics ⁽⁶⁾ | Analog input overflow | | | | |

| Temperature Inputs | | | | | |
|----------------------------|---|--|---|--|--|
| Number of inputs | 2 | 2 | | | |
| Sensor Type | RTD (4, 3 and Themocouple | 2 wire ⁽⁸⁾), | | | |
| Input range ⁽⁹⁾ | Input type | Nominal values | Over/Under-range Values * | | |
| | RTD PT100 0.00385 0.00392 0.00391 | -200°C ≤ T ≤ 850°C (-328°F ≤ T ≤ 1,562°F) | Under-range: -220°C ≤ T < -200°C (-364°F ≤ T < -328°F) Over-range: 850°C < T ≤ 860°C (1,562°F < T ≤ 1,580°F) | | |
| | RTD NI100 0.00618 | -100°C ≤ T ≤ 260°C (-148°F ≤ T ≤ 500°F) | Under-range: $-150^{\circ}C \le T < -100^{\circ}C$ $(-238^{\circ}F \le T < -148^{\circ}F)$ Over-range: $260^{\circ}C < T \le 270^{\circ}C$ $(500^{\circ}F < T \le 518^{\circ}F)$ | | |
| | RTD NI120 0.00672 | -80°C ≤ T ≤ 260°C (-112°F ≤ T ≤ 500°F) | Under-range: $-130^{\circ}C \le T < -80^{\circ}C$ $(-202^{\circ}F \le T < -112^{\circ}F)$ Over-range: $260^{\circ}C < T \le 270^{\circ}C$ $(500^{\circ}F < T \le 518^{\circ}F)$ | | |
| | RTD NI100 0.00617 | -60°C ≤ T ≤ 180°C (-76°F ≤ T ≤ 356°F) | Under-range: $-104^{\circ}C \le T < -60^{\circ}C$ $(-219^{\circ}F \le T < -76^{\circ}F)$ Over-range: $180^{\circ}C < T \le 210^{\circ}C$ $(356^{\circ}F < T \le 410^{\circ}F)$ | | |

| Thermocouple type J | -200°C ≤ T ≤ 1,200°C (-328°F ≤ T ≤ 2,192°F) | Under-range: -210°C ≤ T < -200°C (-346°F ≤ T < -328°F) Over-range: 1,200°C < T ≤ 1,250°C (2,192°F < T ≤ 2,282°F) |
|------------------------|--|---|
| Thermocouple type K | -200°C ≤ T ≤ 1,372°C (-328°F ≤ T ≤ 2,501.6°F) | Under-range: -270°C ≤ T < -200°C (-454°F ≤ T < -328°F) Over-range: |
| | | $1,372^{\circ}C < T \le 1,400^{\circ}C$ (2,501.6°F < T \le 2,552°F) |
| Thermocouple type T | -200°C ≤ T ≤ 400°C (-328°F ≤ T ≤ 752°F) | Under-range: -270°C ≤ T < -200°C (-454°F ≤ T <-328°F) |
| | | Over-range: $400^{\circ}C < T \le 430^{\circ}C$ $(752^{\circ}F < T \le 806^{\circ}F)$ |
| Thermocouple type E | -200°C ≤ T ≤ 1,000°C (-328°F ≤ T ≤ 1,832°F) | Under-range: -270°C ≤ T < -200°C (-454°F ≤ T < -328°F) Over-range: 1,000°C < T ≤ 1,010°C (1,832°F < T ≤ 1,850°F) |
| Thermocouple type R | 0°C ≤ T ≤ 1,768°C (32°F ≤ T ≤ 3,214.4°F) | Under-range: -50°C ≤ T < 0°C (-58°F ≤ T < 32°F) Over-range: 1,768°C < T ≤ 1,800°C (3,214.4°F < T ≤ 3,272°F) |
| Thermocouple type S | 0°C ≤ T ≤ 1,768°C (32°F ≤ T ≤ 3,214.4°F) | Under-range: -50°C ≤ T < 0°C (-58°F ≤ T < 32°F) Over-range: 1,768°C < T ≤ 1,800°C (3,214.4°F < T ≤ 3,272°F) |
| Thermocouple type B | 200°C ≤ T ≤ 1,820°C (392°F ≤ T ≤ 3,308°F) | Under-range: 100°C ≤ T < 200°C (212°F ≤ T < 392°F) Over-range: 1,820°C < T ≤ 1,870°C (3,308°F < T ≤ 3,398°F) |
| Thermocouple type N | -210°C ≤ T ≤ 1,300°C (-346°F ≤ T ≤ 2,372°F) | Under range: -270°C ≤ T < -210°C (-454°F ≤ T < -346°F) |
| | | Over-range: $1,300^{\circ}C < T \le 1,350^{\circ}C$ $(2,372^{\circ}F < T \le 2,462^{\circ}F)$ |

| Thermocouple type C 10°C ≤ T ≤ 2,315°C (50°F ≤ T ≤ 4,199°F) Under-range: 0°C ≤ T < 10°C (32°F ≤ T < 50°F) Over-range: 2,315°C < T ≤ 2,370°C (4,199°F < T ≤ 4,298°F) Over-range: 2,315°C < T ≤ 2,370°C (4,199°F < T ≤ 4,298°F) | | | | | | |
|--|----------------------------|---|---------------|---|---|-------------------|
| mV | | | | | 0°C ≤ T < 10 (32°F ≤ T < 5 Over-range: 2,315°C < T ≤ | 0°F) ≤ 2,370°C |
| -71.05mV ≤ V < -70mV Over-range: 70mV ≤ V < 71.05mV ≤ V | | Resistance | 0Ω ≤ R ≤ 39 | 0Ω | 390Ω < R ≤ 3 | 95.85Ω |
| Solation voltage | | mV | -70mV ≤ V ≤ | ≨ 70mV | -71.05mV ≤ V Over-range: | |
| Input to bus S00 VAC for 1 minute | | II. | | | • | ue exceeds the |
| Input to bus 500 VAC for 1 minute Input to input None Input to analog inputs Input to power supply 500 VAC for 1 minute Conversion method Delta-sigma Resolution Temperature - 0.1°C (0.1°F) (10) Resistance - 14 bits mV - 13 bits plus sign Accuracy (25°C / -20°C to 55°C) RTD, all type Accuracy RTD, all types ± 0.5°C / ± 1.0°C (± 0.9°F / ± 1.8°F) Thermocouple type J (11) ± 0.4°C / ± 0.7°C (± 0.72°F / ± 1.26°F) Thermocouple type K (11) ± 0.5°C / ± 1.0°C (± 0.9°F / ± 1.8°F) Thermocouple type T (11) ± 0.6°C / ± 1.2°C (± 1.08°F / ± 2.16°F) Thermocouple type F (11) ± 0.6°C / ± 1.2°C (± 1.08°F / ± 2.16°F) Thermocouple type R (11) ± 0.4°C / ± 0.8°C (± 0.72°F / ± 1.44°F) Thermocouple type R (11) ± 1.2°C / ± 2.4°C (± 2.16°F / ± 4.32°F) Thermocouple type B (11) ± 1.2°C / ± 2.4°C (± 2.16°F / ± 4.32°F) Thermocouple type B (11) ± 1.2°C / ± 2.4°C (± 2.16°F / ± 4.32°F) Thermocouple type B (11) ± 1.0°C / ± 1.5°C (± 1.8°F / ± 2.7°F) Thermocouple type D (11) ± 0.8°C / ± 2.0°C (± 1.44°F / ± 3.46°F) Resistance ± 0.05% / ± 0.1% of full scale mV ± 0.05% / ± 0.1% of full scale Noise rejection Thermocouple type Noise Rejection Frequency Noise Rejection Frequency Noise Rejection Frequency | Absolute maximum rating | ±36 V | | | | |
| Input to input Input to analog inputs Input to power supply Conversion method Resolution Resolution Accuracy (25°C / -20°C to 55°C) Input type RTD, all types Thermocouple type V(11) Thermocouple V(11) Thermoc | Isolation voltage | | | | | |
| Input to analog inputs Input to power supply Conversion method Delta-sigma Temperature - 0.1°C (0.1°F) (10) Resistance - 14 bits mV - 13 bits plus sign Accuracy (25°C / -20°C to 55°C) Input type RTD, all types Thermocouple type J (11) Thermocouple type T (11) Thermocouple type T (11) Thermocouple type E (11) Thermocouple type E (11) Thermocouple type R (11) Thermocouple type S (11) Thermocouple type S (11) Thermocouple type B (12) Thermoco | Input to bus | 500 VAC for 1 | minute | | | |
| Input to power supply Conversion method Delta-sigma Temperature - 0.1°C (0.1°F) (10) Resistance - 14 bits mV - 13 bits plus sign Accuracy (25°C / -20°C to 55°C) RTD, all types Thermocouple type J (11) Thermocouple type K (11) Thermocouple type T (11) Thermocouple type E (11) Thermocouple type E (11) Thermocouple type R (11) Thermocouple type B (12) Thermocouple ty | Input to input | None | | | | |
| Conversion method Resolution Temperature - 0.1°C (0.1°F) (10) Resistance - 14 bits mV - 13 bits plus sign Accuracy (25°C / -20°C to 55°C) RTD, all types Thermocouple type J (11) Thermocouple type K (11) Thermocouple type T (11) Thermocouple type E (11) Thermocouple type E (11) Thermocouple type R (11) Thermocouple type S (11) Thermocouple type S (11) Thermocouple type S (11) Thermocouple type R (11) Thermocouple | Input to analog inputs | None | | | | |
| Resolution Temperature - 0.1°C (0.1°F) (10) Resistance - 14 bits mV - 13 bits plus sign Accuracy (25°C / -20°C to 55°C) RTD, all types Thermocouple type J (11) Thermocouple type K (11) Thermocouple type T (11) Thermocouple type T (11) Thermocouple type T (11) Thermocouple type E (11) Thermocouple type E (11) Thermocouple type E (11) Thermocouple type B (11) Thermocouple type D (11) Thermoc | Input to power supply | 500 VAC for 1 | minute | | | |
| Resistance - 14 bits mV - 13 bits plus sign | Conversion method | Delta-sigma | | | | |
| (25°C / -20°C to 55°C) RTD, all types | Resolution | Resistance – 14 bits | | | | |
| Thermocouple type J $^{(11)}$ $\pm 0.4^{\circ}\text{C} / \pm 0.7^{\circ}\text{C} (\pm 0.72^{\circ}\text{F} / \pm 1.26^{\circ}\text{F})$ Thermocouple type K $^{(11)}$ $\pm 0.5^{\circ}\text{C} / \pm 1.0^{\circ}\text{C} (\pm 0.9^{\circ}\text{F} / \pm 1.26^{\circ}\text{F})$ Thermocouple type T $^{(11)}$ $\pm 0.6^{\circ}\text{C} / \pm 1.0^{\circ}\text{C} (\pm 0.9^{\circ}\text{F} / \pm 1.8^{\circ}\text{F})$ Thermocouple type E $^{(11)}$ $\pm 0.4^{\circ}\text{C} / \pm 0.8^{\circ}\text{C} (\pm 1.08^{\circ}\text{F} / \pm 2.16^{\circ}\text{F})$ Thermocouple type E $^{(11)}$ $\pm 0.4^{\circ}\text{C} / \pm 0.8^{\circ}\text{C} (\pm 0.72^{\circ}\text{F} / \pm 1.44^{\circ}\text{F})$ Thermocouple type R $^{(11)}$ $\pm 1.2^{\circ}\text{C} / \pm 2.4^{\circ}\text{C} (\pm 2.16^{\circ}\text{F} / \pm 4.32^{\circ}\text{F})$ Thermocouple type S $^{(11)}$ $\pm 1.2^{\circ}\text{C} / \pm 2.4^{\circ}\text{C} (\pm 2.16^{\circ}\text{F} / \pm 4.32^{\circ}\text{F})$ Thermocouple type B $^{(11)}$ $\pm 1.0^{\circ}\text{C} / \pm 1.8^{\circ}\text{C} / \pm 3.46^{\circ}\text{F} / \pm 6.84^{\circ}\text{F})$ Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}\text{C} / \pm 1.5^{\circ}\text{C} (\pm 1.8^{\circ}\text{F} / \pm 2.7^{\circ}\text{F})$ Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}\text{C} / \pm 2.0^{\circ}\text{C} (\pm 1.44^{\circ}\text{F} / \pm 3.46^{\circ}\text{F})$ Resistance $\pm 0.05\% / \pm 0.1\%$ of full scale Noise rejection Noise rejection Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 50Hz 50Hz 10Hz | Accuracy | Input type Accuracy | | | | |
| Thermocouple type K $^{(11)}$ $\pm 0.5^{\circ}$ C / $\pm 1.0^{\circ}$ C ($\pm 0.9^{\circ}$ F / $\pm 1.8^{\circ}$ F) Thermocouple type T $^{(11)}$ $\pm 0.6^{\circ}$ C / $\pm 1.2^{\circ}$ C ($\pm 1.08^{\circ}$ F / $\pm 2.16^{\circ}$ F) Thermocouple type E $^{(11)}$ $\pm 0.4^{\circ}$ C / $\pm 0.8^{\circ}$ C ($\pm 0.72^{\circ}$ F / $\pm 1.44^{\circ}$ F) Thermocouple type R $^{(11)}$ $\pm 1.2^{\circ}$ C / $\pm 2.4^{\circ}$ C ($\pm 2.16^{\circ}$ F / $\pm 4.32^{\circ}$ F) Thermocouple type S $^{(11)}$ $\pm 1.2^{\circ}$ C / $\pm 2.4^{\circ}$ C ($\pm 2.16^{\circ}$ F / $\pm 4.32^{\circ}$ F) Thermocouple type B $^{(11)}$ $\pm 2.0^{\circ}$ C / $\pm 3.8^{\circ}$ C ($\pm 3.46^{\circ}$ F / $\pm 6.84^{\circ}$ F) Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}$ C / $\pm 1.5^{\circ}$ C ($\pm 1.8^{\circ}$ F / $\pm 2.7^{\circ}$ F) Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}$ C / $\pm 2.0^{\circ}$ C ($\pm 1.44^{\circ}$ F / $\pm 3.46^{\circ}$ F) Resistance $\pm 0.05^{\circ}$ M / $\pm 0.1^{\circ}$ M of full scale Noise rejection Noise rejection Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 60Hz 50Hz 10Hz | (25°C / -20°C to 55°C) | RTD, all types $\pm 0.5^{\circ}\text{C} / \pm$ | | | .0°C (± 0.9°F/ | ± 1.8°F) |
| Thermocouple type T $^{(11)}$ | | Thermocouple type J $^{(11)}$ \pm 0.4°C / \pm | | | .7°C (± 0.72°F | / ± 1.26°F) |
| Thermocouple type E $^{(11)}$ $\pm 0.4^{\circ}$ C $/ \pm 0.8^{\circ}$ C $(\pm 0.72^{\circ}$ F $/ \pm 1.44^{\circ}$ F) Thermocouple type R $^{(11)}$ $\pm 1.2^{\circ}$ C $/ \pm 2.4^{\circ}$ C $(\pm 2.16^{\circ}$ F $/ \pm 4.32^{\circ}$ F) Thermocouple type S $^{(11)}$ $\pm 1.2^{\circ}$ C $/ \pm 2.4^{\circ}$ C $(\pm 2.16^{\circ}$ F $/ \pm 4.32^{\circ}$ F) Thermocouple type B $^{(11)}$ $\pm 2.0^{\circ}$ C $/ \pm 3.8^{\circ}$ C $(\pm 3.46^{\circ}$ F $/ \pm 6.84^{\circ}$ F) Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}$ C $/ \pm 1.5^{\circ}$ C $(\pm 1.8^{\circ}$ F $/ \pm 2.7^{\circ}$ F) Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}$ C $/ \pm 2.0^{\circ}$ C $(\pm 1.44^{\circ}$ F $/ \pm 3.46^{\circ}$ F) Resistance $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Noise rejection Noise rejection Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 50Hz 10Hz | | , ,, | | ± 0.5°C / ± 1 | .0°C (± 0.9°F / | ± 1.8°F) |
| Thermocouple type R $^{(11)}$ $\pm 1.2^{\circ}\text{C} / \pm 2.4^{\circ}\text{C} (\pm 2.16^{\circ}\text{F} / \pm 4.32^{\circ}\text{F})$ Thermocouple type S $^{(11)}$ $\pm 1.2^{\circ}\text{C} / \pm 2.4^{\circ}\text{C} (\pm 2.16^{\circ}\text{F} / \pm 4.32^{\circ}\text{F})$ Thermocouple type B $^{(11)}$ $\pm 2.0^{\circ}\text{C} / \pm 3.8^{\circ}\text{C} (\pm 3.46^{\circ}\text{F} / \pm 6.84^{\circ}\text{F})$ Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}\text{C} / \pm 1.5^{\circ}\text{C} (\pm 1.8^{\circ}\text{F} / \pm 2.7^{\circ}\text{F})$ Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}\text{C} / \pm 2.0^{\circ}\text{C} (\pm 1.44^{\circ}\text{F} / \pm 3.46^{\circ}\text{F})$ Resistance $\pm 0.05\% / \pm 0.1\%$ of full scale mV $\pm 0.05\% / \pm 0.1\%$ of full scale Noise rejection Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 50Hz 50Hz 10Hz | | Thermocouple type T (11) | | ± 0.6°C / ± 1 | .2°C (± 1.08°F | / ± 2.16°F) |
| Thermocouple type S $^{(11)}$ $\pm 1.2^{\circ}$ C $/ \pm 2.4^{\circ}$ C $(\pm 2.16^{\circ}$ F $/ \pm 4.32^{\circ}$ F) Thermocouple type B $^{(11)}$ $\pm 2.0^{\circ}$ C $/ \pm 3.8^{\circ}$ C $(\pm 3.46^{\circ}$ F $/ \pm 6.84^{\circ}$ F) Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}$ C $/ \pm 1.5^{\circ}$ C $(\pm 1.8^{\circ}$ F $/ \pm 2.7^{\circ}$ F) Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}$ C $/ \pm 2.0^{\circ}$ C $(\pm 1.44^{\circ}$ F $/ \pm 3.46^{\circ}$ F) Resistance $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Noise rejection Noise rejection Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 50Hz 50Hz 10Hz | | Thermocouple type E (11) ± | | ± 0.4 °C / ± 0 | .8°C (± 0.72°F | / ± 1.44°F) |
| Thermocouple type B $^{(11)}$ $\pm 2.0^{\circ}$ C $/ \pm 3.8^{\circ}$ C $(\pm 3.46^{\circ}$ F $/ \pm 6.84^{\circ}$ F) Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}$ C $/ \pm 1.5^{\circ}$ C $(\pm 1.8^{\circ}$ F $/ \pm 2.7^{\circ}$ F) Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}$ C $/ \pm 2.0^{\circ}$ C $(\pm 1.44^{\circ}$ F $/ \pm 3.46^{\circ}$ F) Resistance $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Noise rejection Noise rejection 10Hz, 50 Hz, 60 Hz, 400 Hz Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 60Hz 50Hz 10Hz | | Thermocouple type R $^{(11)}$ \pm 1. | | ± 1.2°C / ± 2 | .4°C (± 2.16°F | / ± 4.32°F) |
| Thermocouple type N $^{(11)}$ $\pm 1.0^{\circ}$ C $/ \pm 1.5^{\circ}$ C $(\pm 1.8^{\circ}$ F $/ \pm 2.7^{\circ}$ F) Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}$ C $/ \pm 2.0^{\circ}$ C $(\pm 1.44^{\circ}$ F $/ \pm 3.46^{\circ}$ F) Resistance $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Noise rejection Noise rejection Step response $^{(7)}$ (0 to 100% of final value) Noise Rejection Frequency 400Hz 60Hz 50Hz 10Hz | | Thermocouple | type S (11) | ± 1.2°C / ± 2.4°C (± 2.16°F / ± 4.32°F) | | |
| Thermocouple type C $^{(11)}$ $\pm 0.8^{\circ}$ C $/ \pm 2.0^{\circ}$ C $(\pm 1.44^{\circ}$ F $/ \pm 3.46^{\circ}$ F) Resistance $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Moise rejection $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Noise rejection $\pm 0.05\%$ $/ \pm 0.1\%$ of full scale Step response $^{(7)}$ (0 to 100% of final value) $\pm 0.05\%$ Noise Rejection Frequency $\pm 0.00\%$ Smoothing $\pm 0.00\%$ Noise Rejection Frequency $\pm 0.00\%$ Solution $\pm 0.00\%$ | | • | · · | ± 2.0°C / ± 3.8°C (± 3.46°F / ± 6.84°F) | | |
| Resistance $\pm 0.05\% / \pm 0.1\%$ of full scale $\pm 0.05\% / \pm 0.1\%$ of full scale Noise rejection 10Hz, 50 Hz, 60 Hz, 400 Hz Step response (7) (0 to 100% of final value) Noise Rejection Frequency $\pm 0.05\% / \pm 0.1\%$ of full scale ± 0 | | • | · · | ± 1.0°C / ± 1.5°C (± 1.8°F / ± 2.7°F) | | |
| mV $\pm 0.05\%$ / $\pm 0.1\%$ of full scale Noise rejection 10Hz, 50 Hz, 60 Hz, 400 Hz Step response (7) (0 to 100% of final value) Noise Rejection Frequency 400Hz 60Hz 50Hz 10Hz | | Thermocouple | type C (11) | ± 0.8°C / ± 2.0°C (±1.44°F / ± 3.46°F) | | |
| Noise rejection Step response (7) (0 to 100% of final value) Noise Rejection Frequency 400Hz 60Hz 50Hz 10Hz, 50 Hz, 60 Hz, 400 Hz | | Resistance | | \pm 0.05% / \pm 0.1% of full scale | | |
| Step response (7) (0 to 100% of final value) Smoothing Noise Rejection Frequency 400Hz 60Hz 50Hz 10Hz | | mV | | $\pm 0.05\% / \pm 0$ | 0.1% of full sca | le |
| (0 to 100% of final value) 400Hz 60Hz 50Hz 10Hz | <u> </u> | 10Hz, 50 Hz, 6 | 0 Hz, 400 Hz | | | |
| 7 400112 00112 30112 10112 | • • | Smoothing | Noise Rejecti | on Frequency | | |
| None 251.6 ms 411.6 ms 491.6 ms 2411.6 ms | (0 to 100% of final value) | | 400Hz | 60Hz | 50Hz | 10Hz |
| | | None | 251.6 ms | 411.6 ms | 491.6 ms | 2411.6 ms |
| Weak 503.2 ms 823.2 ms 983.2 ms 4823.2 ms | | Weak | 503.2 ms | 823.2 ms | 983.2 ms | 4823.2 ms |
| Modium 1006 4 ms 1646 4 ms 1966 4 ms 9646 4 ms | | Medium | 1006.4 ms | 1646.4 ms | 1966.4 ms | 9646.4 ms |
| ווואס בווו דיטדטל בווו איטטלו אוואס בווו דיטדטל בווו איטטלו אוואס בווואס בוווואס בווואס בווואס בווואס בווואס בווואס בוווואס בוווואס בוווואס בוווואס בוווואס בווואס בוווואס בווווואס בווווואס בוווואס בוווואס בווווואס בוווווואס בווווואס בווווווואס בווווואס בווווווווואס בוווווווווו | | Mediam | 1000.11115 | 10 10.1 1115 | 2500111110 | 30 10. 1 1113 |

| Update time (7) | Noise Rejection Frequency | Update Time | | |
|--|---|-----------------|--|--|
| | 400Hz | 251.6 ms | | |
| | 60Hz | 411.6 ms | | |
| | 50Hz | 491.6 ms | | |
| | 10Hz 2411.6 ms | | | |
| Thermocouple Cold junction error (11) | ±1.5°C (±2.7°F) | ±1.5°C (±2.7°F) | | |
| Cable | Shielded, see installation guide for details | | | |
| Diagnostics (6) | Input Overflow or Underflow, sensor connection fault (12) | | | |

| Source Transistor Outputs | | | |
|--------------------------------|---|--|--|
| Number of outputs | 8 (O2 to O9) | | |
| Output type | Transistor, Source (pnp) | | |
| Isolation voltage | | | |
| Output to bus | 500VAC for 1 minute | | |
| Output to output | None | | |
| Outputs power supply to bus | 500VAC for 1 minute | | |
| Outputs power supply to output | None | | |
| Current | 0.5A maximum per output | | |
| Voltage | See Source Transistor Outputs Power Supply specfication | | |
| ON state voltage drop | 0.5V maximum | | |
| OFF state leakage current | 10μA maximum | | |
| Switching times | Turn-on/off: $80\mu s$ max. (Load resistance < $4k\Omega$) | | |
| Short-circuit protection | Yes | | |

| Source Transistor Outputs Power Supply | | |
|--|---|--|
| Nominal operating voltage | 24VDC | |
| Operating voltage | 20.4 - 28.8VDC | |
| Maximum current consumption | 30mA@24VDC Current consumption does not include load current | |

| Sink Transistor Outputs | |
|---------------------------|---|
| Number of outputs | 2 (O0 and O1) |
| Output type | Transistor, Sink |
| Isolation | None |
| Current | 50mA max. per output |
| Voltage | Nominal: 24VDC Range: 3.5V to 28.8VDC |
| On state voltage drop | 1V max |
| Off state leakage current | 10μA max |
| Short circuit protection | None |
| Switching times | Turn-on: $0.4\mu s$ max. $(470\Omega$ and $4k\Omega$ load) Turn-off: $1.1\mu s$ max. $(470\Omega$ load), $3.4\mu s$ max. $(4k\Omega$ load) |
| High speed outputs (1)(3) | |
| PWM Frequency | 6Hz min. 250kHz max. (470 Ω load) 100kHz max. (4k Ω load) |
| Cable | Shielded twisted pair |

| Analog Outputs | | | | |
|---|---|---|--|--|
| Number of outputs | 2 | | | |
| Output range (14) | Output Type | Over/Under-range Values * | | |
| | 0 ÷ 10VDC | 0 ≤ Vout ≤ 10VDC | 10 < Vout ≤ 10.15VDC | |
| | -10 ÷ 10VDC | -10 ≤ Vout ≤ 10VDC | -10.15 ≤ Vout < -10VDC 10 < Vout ≤ 10.15VDC | |
| | 0 ÷ 20mA | $0 \le Iout \le 20mA$ | 20 ≤ Iout ≤ 20.3mA | |
| | 4 ÷ 20mA | 4 ≤ Iout ≤ 20mA | 20 ≤ Iout ≤ 20.3mA | |
| | | Underflow is declared w Under-range boundaries r | when an output value exceeds the espectively. | |
| Isolation | None | | | |
| Resolution | -10 ÷ 10VDC - 0 ÷ 20mA - 13 | 0 ÷ 10VDC - 14 bit -10 ÷ 10VDC - 13 bit + sign 0 ÷ 20mA - 13 bit 4 ÷ 20mA - 13 bit | | |
| Accuracy (25°C /-20°C to 55°C) | | $\pm 0.3\%$ / $\pm 0.5\%$ of full scale (Voltage) $\pm 0.5\%$ / $\pm 0.7\%$ of full scale (Current) | | |
| Load impedance | Voltage – $2k\Omega$ minimum Current – 600Ω maximum | | | |
| Settling time (95% of new value) | $0 \div 10$ VDC – 1.8 ms (2 k Ω resistive load), 3.7 ms (2 k Ω + 1 uF load) – $10 \div 10$ VDC – 3 ms (2 k Ω resistive load), 5.5 ms (2 k Ω + 1 uF load) $0 \div 20$ mA and $4 \div 20$ mA – 1.7 ms (600Ω load), 1.7 ms ($600\Omega + 10$ mH load) | | | |
| Short circuit protection (voltage mode) | , | Yes (no indication) | | |
| Cable | Shielded twiste | d pair | | |
| | Spectra GmbH & Co. KG Spectra (Schweiz) AG | | | |

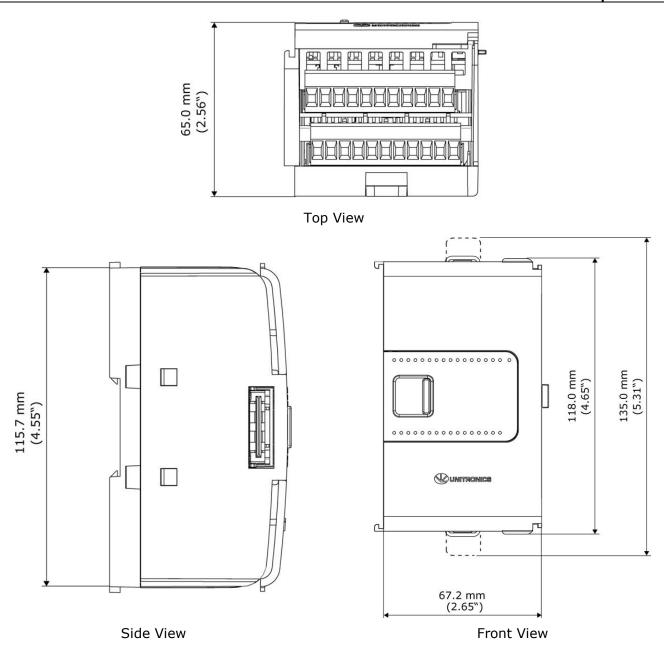
| Diagnostics (6) | Current – Open circuit indication |
|-----------------|--|
| | Supply level – Normal / Low or missing |

| IO/COM Bus | |
|---------------------------------|-------|
| Bus maximum current consumption | 110mA |

| LED Indications | | | |
|-------------------------------------|---|---|---|
| Digital Input LEDs | Green | Input state | |
| Analog Input LEDs | Red | On: Input value is in Overflow | |
| Temperature Input LEDs | Red | On: Input value is in Overflow, Underflow, or a connection fault occurs | |
| Relay and Transistor Output LEDs | Green | Output state | |
| Analog Output LEDs | Red | On: Open Circuit (when set to Current mode) | |
| Status LED | A triple color LED. Indications are as follows: | | |
| | Color | LED State | Status |
| | Green | On | Operating normally |
| | | Slow blink | Boot |
| | | | |
| | | Rapid blink | OS initialization |
| | Green/Red | Rapid blink Slow blink | OS initialization Configuration mismatch |
| | , | · · | |
| | Green/Red Red | Slow blink | Configuration mismatch |

| Environmental | | | |
|------------------------|---|--|--|
| Protection | IP20, NEMA1 | | |
| Operating temperature | -20°C to 55°C (-4°F to 131°F) | | |
| Storage temperature | -30°C to 70°C (-22°F to 158°F) | | |
| Relative Humidity (RH) | 5% to 95% (non-condensing) | | |
| Operating Altitude | 2,000m (6,562 ft) | | |
| Shock | IEC 60068-2-27, 15G, 11ms duration | | |
| Vibration | IEC 60068-2-6, 5Hz to 8.4Hz, 3.5mm constant amplitude, 8.4Hz to 150Hz, 1G acceleration. | | |

| Dimensions | |
|------------|--|
| Weight | 0.250 kg (0.551 lb) |
| Size | Identical for all models, as shown in the images below |



Notes

- 1. The UIS-WCB1 utilizes two high speed blocks that can each be assigned either to the inputs or to the outputs.
- 2. Four of the digital inputs may be configured to function either as normal, or as high speed digital inputs, that can receive high speed pulse signals from up to two sensors or shaft encoders.
- 3. The two transistor outputs may be configured to function either as normal, or as high speed PWM outputs.
- 4. The 4-20mA input option is implemented using 0-20mA input range.
- 5. The UIS-WCB1 analog inputs measure values that are slightly higher than the nominal input range (Input Over-range).

Note that when the input overflow occurs, it is indicated in the corresponding I/O Status tag while the input value is registered as the maximum permissible value. For example, if the specified input

range is $0 \div 10V$, the Over-range values can reach up to 10.15V, and any input voltage higher than that will still register as 10.15V while the Overflow system tag is turned on.

- 6. See LED Indications Table for description of the relevant indications. Note that the diagnostics results are also indicated in the system tags and can be observed through the UniApps™ or the online state of the UniLogic™.
- 7. Step response and update time are independent of the number of channels that are used.
- 8. The UIS-WCB1 inherently supports 3-wire sensors.
 - 4-wire sensors may be connected by utilizing 3 of the sensor wires; in-order to achieve the specified performance, all sensor wires shall be of identical type and length just as with a 3-wire sensor connection.
 - 2-wire sensors may also be connected; performance in this case will degrade because of the wires` resistance.
 - Refer to the UIS-WCB1 installation guide for detailed installation instructions.
- 9. The UIS-WCB1 temperature inputs measure values that are slightly higher or lower than the nominal input range (Input Over/Under-range respectively).

Note that when input Overflow, Underflow or a connection fault occurs, it is indicated in the corresponding I/O Status tag (refer to the UniLogic[™] help for details) as well as by the respective input LED (see LED Indications), while the input value is registered as follows:

| Fault Type | Registered Value in the Input Tag | |
|------------------|-----------------------------------|--|
| Overflow | 32,767 | |
| Underflow | -32,767 | |
| Connection fault | -32,768 | |

- 10. For temperature measurement, the value is represented in 0.1° units. For example, a temperature of 12.3° is represented as 123 at the Value tag.
- 11. The overall accuracy for thermocouples is a combination of the per-sensor specified accuracy and the thermocouple cold junction error specification.
 - The module requires at least 30 minutes of warm-up in order to meet the accuracy specifications.
- 12. Sensor connection fault check is active by default for temperature, resistance and mV measurements. This may interfere with some test equipment like RTD, thermocouple, resistance and voltage simulators and thus may induce reading errors or cause malfunction of the test equipment and/or the UIS-WCB1.
 - In order to interoperate correctly with such equipment, you may set the Disable Fault Detection I/O tag. This will disable connection fault check for all inputs.
 - Note that when this tag is set, the UIS-WCB1 will not check, or report, connection faults; thus, the reading in such case is unpredictable.
- 13. Life expectancy of the relay contacts depends on the application that they are used in. The product's installation guide provides procedures for using the contacts with long cables or with inductive loads.
- 14. The UIS-WCB1 analog outputs are able to output values that are slightly higher or lower (if applicable) than the nominal output range (Output Over/Under-range respectively).

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