# OCS-I/O - HE959ADU100

## ANALOG INPUT MODULE

## 1 TECHNICAL SPECIFICATIONS

### 1.1 General Specifications

| | |
|---|---|
| Required Power (Steady State) | 96mA @ 5V |
| Analog Inputs | 4 |
| Relative Humidity | 5-95% non-condensing |
| Port Wiring | 16-24 AWG / 0.2-1.4mm² |
| Analog Input Wiring | 16-24 AWG / 0.2-1.4mm² |
| Operating Air Temp | -40°C (-40°F) to 60°C (140°F) |
| Storage Temp | -40°C (-40°F) to 85°C (185°F) |
| Weight | 2.9 oz |
| Dimensions | 76.5mm x 124.5mm x 19mm<br>3" x 4.9" x 0.75" |
| Certifications (UL/CE) | North America: https://hornerautomation.com/certifications/<br>Europe: https://www.hornerautomation.eu/support/certifications-2 |

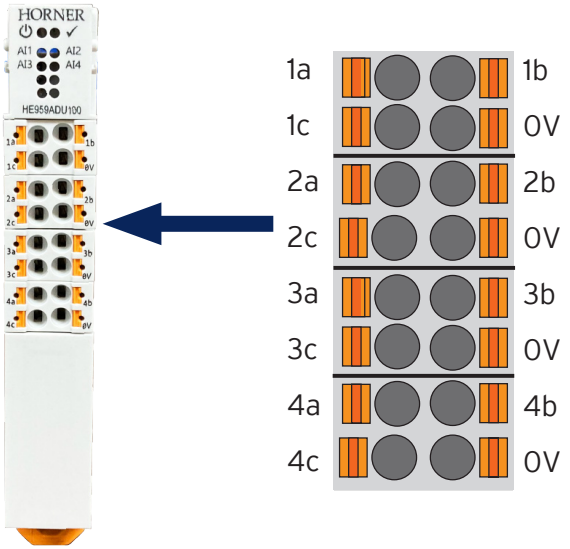
### 1.2 Analog Inputs

| | |
|---|---|
| Number of Channels | 4 |
| Input Ranges | 0-20mA, 4-20mA, 0-10V, 0-60mV |
| Safe Input Voltage Range | -30V to +30V |
| Nominal Resolution | 16 Bit |
| Accuracy | 0.2% of full scale |
| Thermocouple | J / K / T / N / E / R / S / B |
| Converter Type | 16-Bit ADC |
| RTD Excitation Current | 0.250mA |
| RTDs supported & Temperature Ranges | PT100 : -200°C to 500 °C<br>PT1000: -50 °C to 200 °C |
| Data Conversion for RTD and Thermocouples | 10 counts/degree Celsius. For example, if the input temperature is 123.4, then count will be 1234. |

| | Input Type: | Range: | Accuracy: |
|---|---|---|---|
| Sensor Range and Accuracy | TC J (Ungrounded) | -120 to 1000°C /-184 to 1832°F | +/-0.2% of full scale +/-1°C |
| | TC K (Ungrounded) | -130 to 1372°C /-202 to 2501.6°F | +/-0.2% of full scale +/-1°C |
| | TC T (Ungrounded) | -130 to 400°C /-202 to 752°F | +/-0.2% of full scale +/-1°C |
| | TC E (Ungrounded) | -130 to 780°C /-202 to 1436°F | +/-0.2% of full scale +/-1°C |
| | TC N (Ungrounded) | -130 to 1300°C /-202 to 2372°F | +/-0.2% of full scale +/-1°C |
| | TC R, S (Ungrounded) | 20 to 1768°C /68 to 3214.4°F | +/-0.2% of full scale +/-3°C |
| | TC B (Ungrounded) | 500 to 1820°C /212 to 3308°F<br>Functions below 500°C with reduced accuracy | +/-0.2% of full scale +/-3°C |


**Cscape Configuration**
**See MAN1174 for the HE959CNX116.**

## 2 WIRING



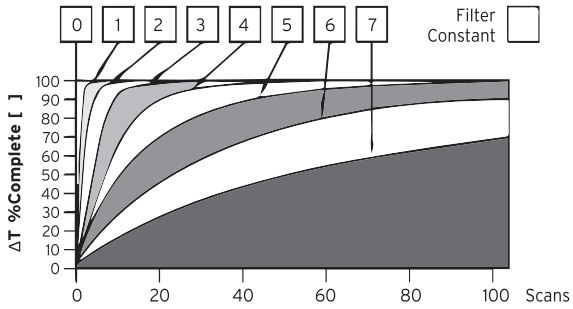

**WARNING:** Do not put any voltage on the 1A, 2A, 3A, or 4A port. Doing so will damage the board.

Use 75°C copper conductors only.

| SIGNAL | LABEL | DESCRIPTION | SIGNAL | LABEL |
|---|---|---|---|---|
| AI1a | 1a | Universal Analog Input "1a" | A1b | 1b |
| A1c | 1c | | 0V | Common |
| AI2a | 2a | Universal Analog Input "2a" | A2b | 2b |
| A2c | 1c | | 0V | Common |
| AI3a | 3a | Universal Analog Input "3a" | A3b | 3b |
| A3c | 3c | | 0V | Common |
| AI4a | 4a | Universal Analog Input "4a" | A4b | 4b |
| A4c | 4c | | 0V | Common |

## Analog Input Information

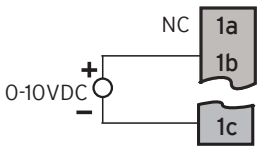
Raw input values are found in the registers as Integer-type data with a range from 0 – 32000.
Analog inputs may be filtered digitally with the Filter Constant found in the Cscape Hardware Configuration for Analog Inputs. Valid filter values are 0 – 7 and act according to the following chart.



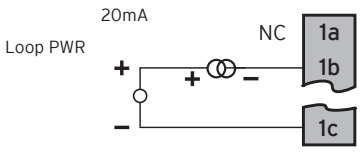

| Data Values | |
|---|---|
| INPUT MODE: | DATA FORMAT, 16-bit INT: |
| 0-20mA, 4-20mA | 0-10VDC, 0-60mV, 0-32000 |
| Thermocouple & RTD | 20 Counts/ °C |

## Analog Input Wiring

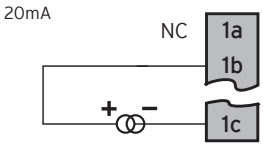
0-10V Analog In



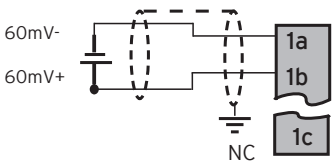

20mA Analog In - Not Self Powered



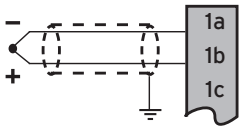

20mA Analog In - Self Powered



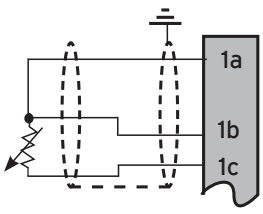

mV In




Thermocouple In




RTD In



## 2 DIAGNOSTIC LED INDICATORS

| Status | OK LED |
|---|---|
| **OFF** | Power Up |
| **ON** | IO Module Running Normally |
| **BLINK (1Hz)** | On of the following errors:<br>a. Communication between IO Base and IO Module (IO ERROR)<br>b. No Configuration<br>c. OCS idle mode |
| **LED Status for Individual I/O Channels** | |
| **AI1** | Analog Input - 1 Active* |
| **AI2** | Analog Input - 2 Active* |
| **AI3** | Analog Input - 3 Active* |
| **AI4** | Analog Input - 4 Active* |

**NOTE:** LED will be in OFF state if the channel is disabled from Cscape configuration.

***NOTE:**
- LED will be ON during Normal operations.
- Analog Input channel configured as ma, Volts or mv LED will be OFF till the input signal is 0+0.2%
- Analog Input channel configured as PT100, PT1000 LED will be OFF if open circuit is detected, LED will be ON during Normal operation
- Analog Input channel configured as Thermocouple Input LED will be ON if the channel is Enabled.

## 3 SAFETY

### 3.1 - WARNINGS

WARNING - If the equipment is used in a manner not specified by Horner APG, the protection provided by the equipment may be impaired.

WARNING - EXPLOSION HAZARD - Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous
AVERTISSEMENT - RISQUE D'EXPLOSION -Ne débranchez pas l'équipement tant que l'alimentation n'a pas été coupée ou que la zone n'est pas dangereuse.

WARNING - EXPLOSION HAZARD - Substitution of any component may impair suitability for Class I, Division 2
AVERTISSEMENT - RISQUE D'EXPLOSION -Le remplacement de tout composant peut nuire à la compatibilité avec la classe I, division 2

WARNING – POSSIBLE EQUIPMENT DAMAGE - Remove power from the I/O Base and any peripheral equipment connected to this local system before adding or replacing this or any module.
AVERTISSEMENT - DOMMAGES POSSIBLES À L'ÉQUIPEMENT - Coupez l'alimentation de la base d'E / S et de tout équipement périphérique connecté à ce système local avant d'ajouter ou de remplacer ce module ou tout autre module.

### 3.2 - SAFETY

a. All applicable codes and standards should be followed in the installation of this product.
b. Shielded, twisted-pair wiring should be used for best performance.
c. Shields should be grounded at one end only, preferably at the end providing the best noise shunting.
d. Use the following wire type or equivalent: Belden 8441.

## 4 PART NUMBER

HE959ADU100

## 5 TECHNICAL SUPPORT

For assistance and manual updates, contact Technical Support at the following locations:


**North America**
(317) 916-4274
www.hornerautomation.com
APGUSATechSupport@heapg.com

**Europe**
(+) 353-21-4321-266
www.hornerautomation.com
technical.support@horner-apg.com







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