

## TECHNICAL SPECIFICATIONS

### 1.1 General Specifications

Required Power (Steady State)	630mA @24VDC (<15W @ 24V)
Required Power (Inrush)	24A @ 30 μS
Primary Power Range	10-30VDC
Flex Inputs (Digital or Analog)	2
Digital Outputs per Module	2
Analog Inputs	1
Analog Outputs	1
Relative Humidity	5-95% non-condensing
Port Wiring (Analog Inputs and Digital I/O)	16-24 AWG / 0.2-1.4mm <sup>2</sup>
Operating Air Temp	-40°C (-40°F) to 60°C (140°F)
Storage Temp	-40°C (-40°F) to 85°C (185°F)
Weight	87g (3.05 oz)
Dimensions	76.5mm x 124.5mm x 19mm 3" x 4.9" x 0.75"
Certifications (UL/CE)	North America: <a href="https://hornerautomation.com/certifications/">https://hornerautomation.com/certifications/</a> Europe: <a href="https://www.hornerautomation.eu/support/certifications-2/">https://www.hornerautomation.eu/support/certifications-2/</a>

### 1.2 Connectivity

CAN Protocols	CsCAN - IN and OUT
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### 1.3 Universal Analog Inputs

Number of Channels	1
Input Ranges	0-10V / 0-20mA / 4-20mA / 0-60mV
Resolution	16 Bit
%AI Full Scale	0.20%
Thermocouple	J / K / T / N / E / R / S / B
Converter Type	16-Bit ADC
RTD	PT100 : -200°C to 500 °C PT1000: -50 °C to 200 °C
RTD Excitation Current	.250mA

### 1.4 Digital Outputs

Outputs per Module	2
Commons per Module	1
Output Type	Sourcing with 10kΩ pull down
Absolute Max Voltage	28VDC
Output Protection	Short Circuit
Max Output per Point	2A
Max. Total Out Current	4A
Max. Output Supply Voltage	30VDC
Min. Output Supply Voltage	10VDC
Max Voltage Drop at rated Current	550mV
Min Load	1mA
OFF to ON Response	1ms
ON to OFF Response	1ms
I/O Indication	Status LED per Output

### 1.5 Analog Outputs

Number of Channels	1 Analog
Analog Outputs	0-20mA / 4-20mA / 0-10V
Analog Output Data Ranges	0~4000 / -2000~2000 / 0~1000 / 0~2000/ 0~32000
Nominal Resolution	12 Bit
Minimum 10V Load	500Ω
Maximum Current Load	500Ω
Analog Output Halt State	Current / Minimum / Maximum / Median

### 1.6 Flexible Inputs - Digital / Analog

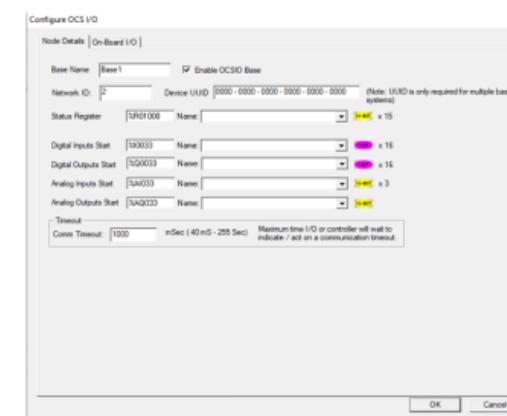
Number of Channels	2 (Digital or Analog)
Configured as Analog I/O	
Analog Input Ranges	4-20mA / 0-10V
Analog Input Data Ranges	0~4000 / -2000~2000 / 0~1000 / 0~32000
Alarm	Value / Register
Configured to Digital Inputs	
Digital Input Ranges	24V / 12V / 5V / Custom
Input Voltage Range	0 - 24VDC
Absolute Max Voltage	+/- 30VDC
Input Impedance	10kΩ
Custom Digital Input Ranges	Threshold ON Threshold OFF
OFF to ON Response	1ms
ON to OFF Response	1ms
Digital Input Active Mode	Positive / Negative Logic
Connector Type	Phoenix Contact Z202234

## CSCAPE CONFIGURATION

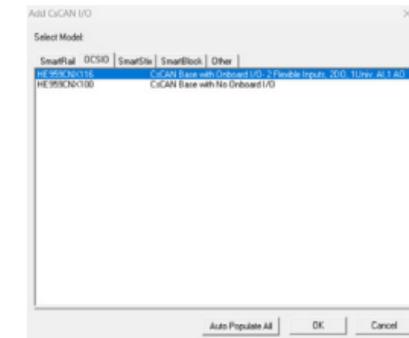
The HE959CNX116 Base is configured from Cscape, under "Hardware Configuration". Cscape 9.9 (SP8 or later) is required. OCS firmware must be updated to support OCS-I/O. Please check the release notes on your OCS model to ensure OCS-I/O support is included.

General configuration procedure:

- In Cscape, select Controller > Hardware Configuration.
- Make sure the OCS controller to be used in the application has been properly selected.
- Select the "CsCAN I/O" Tab.
- Click the "Add" Button
- Select "HE959CNX100" in the OCS-I/O tab
- Click the "OK" button. This opens the following dialog:

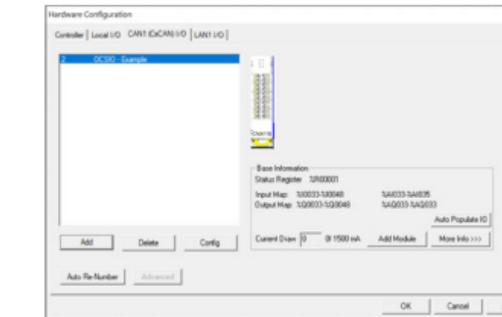


- Base Name** - any descriptive text (up to 15 characters)
- Enable OCSIO** - When this option is checked Input/Output data from the host controller will get transmitted to OCSIO. If the option is unchecked Input /Output data will NOT get transmitted to OCSIO but communication between the Host controller and OCSIO will be healthy
- Network ID** - unique CsCAN ID (1-79 decimal)
- Device UUID** - Each OCS-I/O base requires a Unique CAN ID to establish communication with the host controller. In the case of using a single base, entering the UUID is not required, as the host controller can automatically assign the CAN ID. In the case of multiple bases, you can either connect to all bases via CsCAN to an OCS and select "Auto Populate All" to bring in the UUIDs, or you can manually type in the UUID if available on the label.



- Status Register** - Location where fifteen consecutive words are reported
- Digital Inputs / Digital Outputs / Analog Inputs / Analog Outputs Start** - starting locations for each type of I/O for this base. Be careful to choose starting addresses that do not conflict with OCS built-in I/O mapping.
- Comm Timeout** - Maximum amount of time the HE959CNX100 will wait to act on a communications timeout (40 to 255000ms)

- After entering all the required information (above), click "OK". At this point the following Hardware Configuration dialog will appear:



- Now modules can be added via the "Add Module" button. As I/O modules are added the Input Map, Output Map, and Current Draw are updated, showing the accumulated I/O Module Information. More details regarding each module can be viewed via the "More Info" button.

- If the OCS-I/O base and I/O modules are properly connected and powered up, and if Cscape currently has communications to the OCS, the "Auto Populate IO" button may be used to recognize all modules installed on this OCS-I/O base.

- Right clicking on an I/O module will allow detailed configuration to be performed, as follows:
  - Digital Input modules can be configured to update on a change of state (typical) or periodically (rare). Input filtering can also be adjusted from the default of 1mS.
  - Digital Output modules can optionally be configured to hold last state in Stop/Idle mode.
  - Analog Input modules can be configured with an update rate of 10mS to 255 seconds. Analog Inputs also have configurable data type and range which varies by module type.
  - Analog Output modules have configurable type and range, and also can have Stop/Idle behavior adjusted to Hold Last State, or go to Minimum (default), Medium or Maximum value.

- Press "OK" to complete the process.



## 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.

**WARNING** - Outputs should be connected to the same voltage levels (all connect to 24V supply sources)

**WARNING** - Digital Outputs are non-isolated and considered hazardous live.

**WARNING** - Loads for outputs require a Class 2 or Limited Power Source from a UL Listed power supply.

## SAFETY

- All applicable codes and standards should be followed in the installation of this product.
- Shielded, twisted-pair wiring should be used for best performance.
- Shields should be grounded at one end only, preferably at the end providing the best noise shunting.

## TECHNICAL SUPPORT

For further details, please refer to the Datasheets on the Horner website.

For assistance, contact Technical Support at the following locations:

**North America**  
+1 (317) 916-4274  
[www.hornerautomation.com](http://www.hornerautomation.com)  
APGUSATechSupport@heapg.com

**Europe**  
+353 (21) 4321-266  
[www.hornerautomation.eu](http://www.hornerautomation.eu)  
technical.support@horner-apg.com

## INSTALLATION

The HE959CNX116 is compact and mounts on a DIN-rail. Each I/O module installed adds width in increments of 19mm.

**NOTE:** The distance between wiring duct and surrounding modules should be at least 50mm apart.

OCS-I/O modules can be added after the OCS-I/O base has been installed on the DIN-rail and can be hot swapped with power applied. I/O scanning will stop until the correct modules for the system are detected in all slots.

I/O modules are physically added with the following procedure:

- Connect the bus connectors together to form a backplane that can accept up to 8 modules including the CNX116 or another base.
- Snap the bus connectors into the DIN rail. The DIN rail should be 35 mm x 7.5 mm and made to EN 60715 standards.
- Place the OCS-I/O base to the leftmost connector.
- Inset modules by latching at the top of the DIN rail first and rocking down until the latch at the bottom of the DIN rail engages.
- To remove a module, insert a flat blade screwdriver into the metal DIN rail latch at the bottom of the module. Pry down to release the latch, the rock the module up and off the DIN Rail. Modules may be removed while powered however I/O scanning on the remaining modules will stop and I/O will go to the default state until a new module is inserted and all modules in the configuration are present.

## WIRING



**LED Indicators**  
See page 6

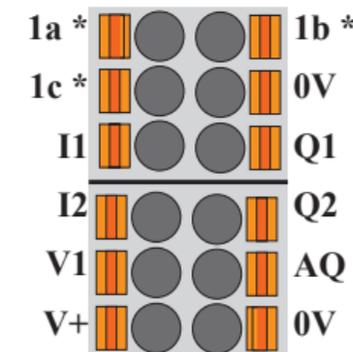
**CAN Port - IN**

**CAN Port - OUT**

**Onboard I/O**

**\*WARNING:** Do not put voltage on 1a and no more than 12V on 1b or 1c ports. Doing so will damage the board.

SIGNAL	LABEL	DESCRIPTION
Alla	1a	Universal Analog Input "a"
Allc	1c	Universal Analog Input "c"
I1	I1	Digital / Analog Input 1
I2	I2	Digital / Analog Input 2
VEXT	V1	V+ Input for Digital Output
24V	V+	V+ Input for Power
Allb	1b	Universal Analog Input "b"
GND	0V	Digital and Analog Ground
Q1	Q1	Digital Output 1
Q2	Q2	Digital Output 2
AQ1	AQ	Analog Output
GND	0V	Digital and Analog Ground



**HORNER**  
AUTOMATION GROUP



**OCS-I/O**

**MAN1432\_R02\_HE959CNX116\_QRG**  
**CSCAN COMMUNICATION BASE**