OCS-I/O - CSCAN COMMUNICATION BASE

MAN1500_R01_HE959CNX100_DS

1 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
Relative Humidity	5-95% non-condensing
Port Wiring (power)	16-24 AWG / 0.2-1.4mm²
Operating Air Temperature	-40°C (-40°F) to 60°C (140°F)
Storage Air Temperature	-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: https://hornerautomation.com/certifications/ Europe: https://www.hornerautomation.eu/support/certifications-2/

NOTE: Max of 7 Modules per base

1.2 Connectivity	
CAN Protocols	CsCAN - IN and OUT

2 CAN PINOUT TABLE

CAN Pin Assignments		
PIN	SIGNAL	DESCRIPTION
1	CAN_H	CAN Data High
2	CAN_L	CAN Data Low
3	GND	Ground
4	Reserved	Do Not Connect
5	Reserved	Do Not Connect
6	CAN_SHLD	Shield
7	GND	Ground
8	VIN Passthrough	Do Not Connect

3 WIRING

The OCS-I/O HE959CNX100 Base should be powered independently from the I/O power supplied to the OCS-I/O modules themselves. The recommended approach is to power the CsCAN network from one power supply, and I/O devices from at least one separate power supply.

To power the HE959CNX100, use the six pin connector.

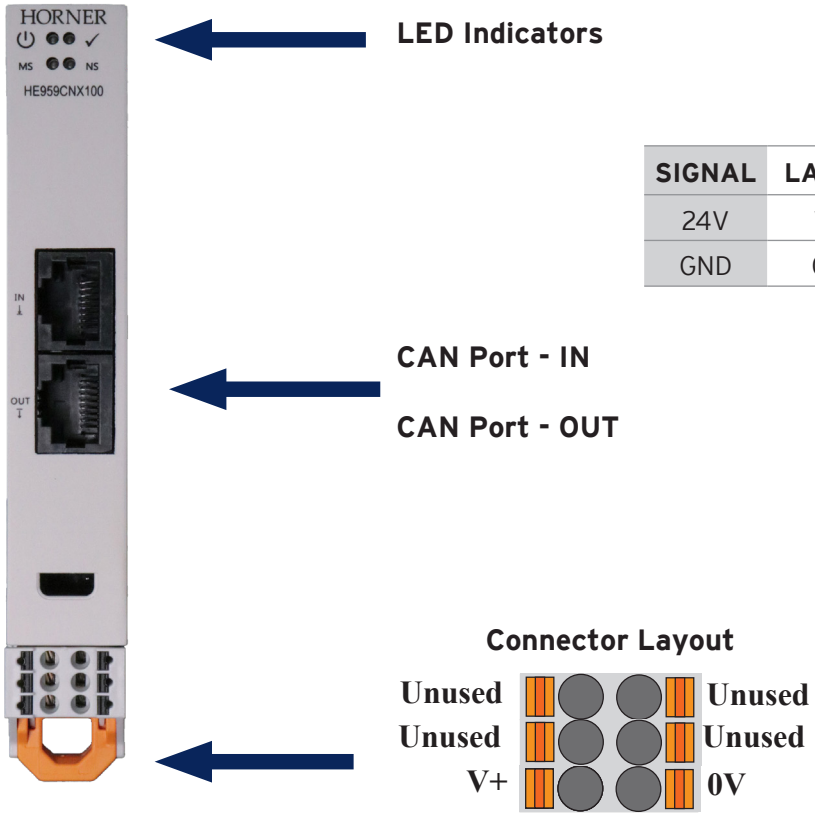
For network wiring, the recommended approach is to daisy-chain each node, with a continuous connection for shield. The center pin of the CAN port does not provide a connection to earth ground. The cable shield should be connected to earth ground at one location only – usually at the DC supply powering the network. The network DC supply should have its V- terminal connected directly to earth ground.

If multiple DC supplies are used to power the network, the V+ from any one supply should be connected only to nodes it is powering – disconnected from other sections powered by other supplies. The V- connection should be continuous across the entire network, although V- should connect to earth at exactly one point only.

At each end of the network, a 121Ω, 1/4W, 1% resistor should be used for termination – installed between the CAN_H and CAN_L terminals. Only appropriate Thin (for <100m) or Thick (<500m) cabling should be used (assuming 125 KBaud) available from a variety of sources. See available HE-RJTRM121 that can be used to terminate the end of the network if needed.

Use 75°C copper conductors only.

Onboard Wiring



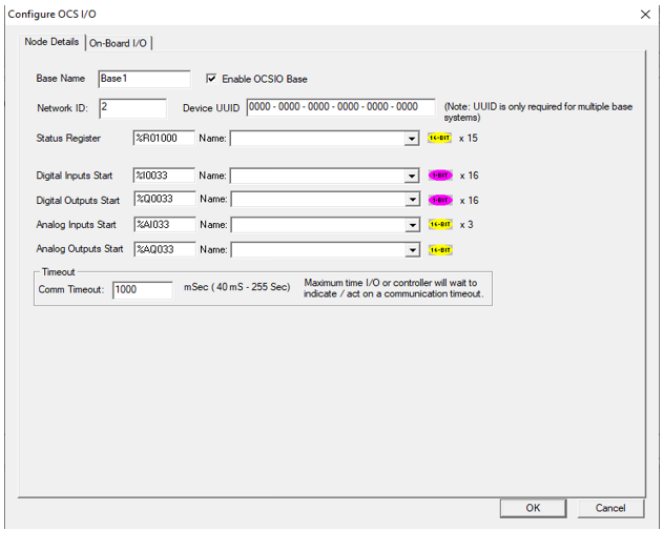
SIGNAL	LABEL	DESCRIPTION
24V	V+	V+ Input for Power
GND	0V	Power Ground

4 CSCAPE CONFIGURATION

The HE959CNX100 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.

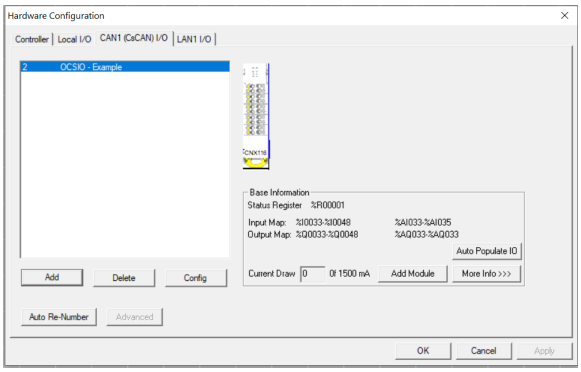
General configuration procedure:

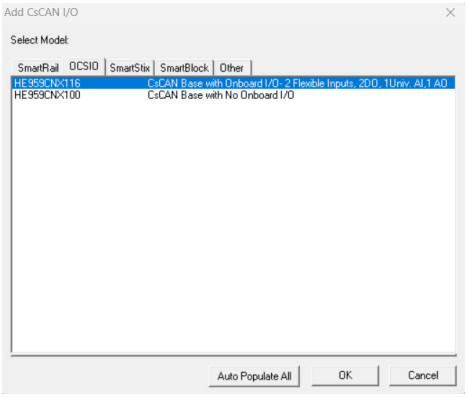
1. In Cscape, select Controller > Hardware Configuration.
2. Make sure the OCS controller to be used in the application has been properly selected.
3. Select the "CsCAN I/O" Tab.
4. Click the "Add" Button
5. Select "HE959CNX100" in the OCS-I/O tab
6. Click the "OK" button. This opens the following dialog:



- **Base Name** – any descriptive text (up to 15 characters)
- **Enable OCS-I/O Base** - When this option is checked Input/Output data from the host controller will get transmitted to OCS-I/O. If the option is unchecked Input /Output data will NOT get transmitted to OCS-I/O but communication between the Host controller and OCS-I/O 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 time-out (40ms to 255 seconds)

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





8. 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.

9. 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.

10. Right clicking on an I/O module will allow detailed configuration to be performed, as follows:
    a. 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.
    b. Digital Output modules can optionally be configured to hold last state in Stop/Idle mode.
    c. 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.
    d. 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.

11. Press "OK" to complete the process.

5 STATUS REGISTERS

Register	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1	IOE								CME							
2	IOCS								WDG TRIP							
3	Reserved							NO_ CFG	LIFE ERROR*	ALME	ALM1**	ALM0**	DI2 US	DI1 US	OFFLINE	PUP
4	IO Base Net ID															
5	IO Base Type															
6	IO Base Scan Rate															
7	IO Base Watchdog Trip Count															
8 to 15	Firmware Version															

CME- Each bit (bi1-bit 8) represents configuration mismatch error of each IO Modules (Module 1 to Module 8)
IOE – Each bit (bit9 – bit 16) represents IO modules error (Module 1 to Module 8)
WDG TRIP – IO base watchdog trip count
IOCS- Each bit (bit9 – bit 16) represents IO modules calibration status (Module 1 to Module 8)
PUP – Power up error (sticky bit)
OFFLINE – OCSIO is offline
DI1 US - High when Digital input 1 is in undefined state
DI2 US – High when Digital input 2 is in undefined state
e.g: If 24V input range is selected then DI1 US bit set if voltage is between 8V to 16V.
ALME- Alarm Error
ALM1 – Alarm bit** See table below
ALM0 – Alarm Bit** See table below
LIFE ERROR* – Sticky bits must be reset by the user or program to re-arm those notifications.
NO CFG – OCSIO configuration status

ALE	ALM1	ALM0	Alarm
1	0	0	Low-Low (LL)
0	0	1	Low (L)
0	0	0	Normal
0	1	0	High (H)
1	1	1	High-High (HH)

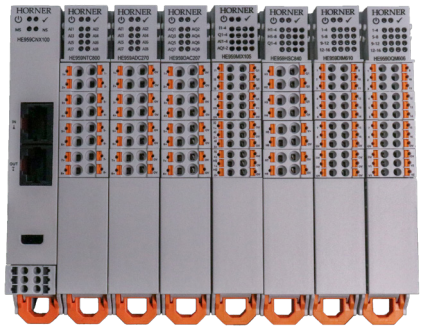
6 DIAGNOSTIC LED INDICATORS

LED Indicators				
Status	Power	OK (✓)	MS	NS
V+ Power Applied	ON	ANY	ANY	ANY
Self-Test FAIL	ON	ANY	OFF	ANY
Self-Test PASS	ON	ON	ANY	ANY
Network Normal	ON	ON	ON	ON
Duplicate Net ID	ON	ON	ON	OFF
Configuration Mismatch	ON	Flash (1Hz)	ON	Flash (1Hz)
OCS Stop Mode/Communication Timeout	ON	ON	ON	Flash (1Hz)
OCS Run Mode	ON	ANY	ANY	ANY
Onboard I/O Fault	ON	OFF	ON	ON
Invalid Dynamic Configuration	ON	Flash (1Hz)	ON	ON
Power Up/Waiting to be Configured	ON	ON	Flash (1Hz)	Flash (1Hz)

7 INSTALLATION

The HE959CNX100 is compact and mounts on DIN-rail. Each I/O module installed adds width in increments of 19mm. **NOTE**: The distance between wiring duct and surrounding modules, above and below each module, should be at least 50mm apart.

Modules can be added after the HE959CNX100 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:

1. Connect the bus connectors together to form a backplane that can accept up to 8 modules including the CNX100 or another base.
2. Snap the bus connectors into the DIN rail. The DIN rail should be 35 mm ✣ 7.5 mm and made to EN 60715 standards.
3. Place the CNX100 or other bus head to the leftmost connector.
4. Insert 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.
5. To remove a module, insert a flat blade screwdriver through the orange loop and into the metal DIN rail latch at the bottom of the module. Pry down to the release the latch, then rock the module up and off the DIN Rail. Modules may be removed while powered - however, the 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.

8 SAFETY

8.1 - 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.

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.

8.2 - 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.

9 PART NUMBER

HE959CNX100

10 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.eu
technical.support@horner-apg.com