



Caspian C-39N0-160

Overview

The Caspian C-39N0-160 is an electronically focus controllable C-Mount lens, based on the Arctic 39N0 Liquid Lens. It incorporates all necessary electronic components to drive the Liquid Lens, and just needs a DC power supply; focus can be controlled through either an RS232, I2C, Analog or SPI input. With a 16 mm effective focal length, and 2/3" sensor compatibility, it is specifically designed for machine vision applications. For more information on this module, please refer to TEDS – Caspian C-39N0-160.

Ordering information

C-C-39N0-160-XX where **XX** determines objective configuration :

- I2C** : I2C or analog operation
- RS33** : RS232 with 3.3 V signal or analog operation
- RS12** : RS232 with 12 V signal or analog operation
- SPI** : SPI operation only

Key Features

- Variable focus from 11 cm to infinity
- Silent
- Supports I2C - Analog - RS232 - SPI interfaces
- Supports closed loop operation

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Opto-Electrical performance

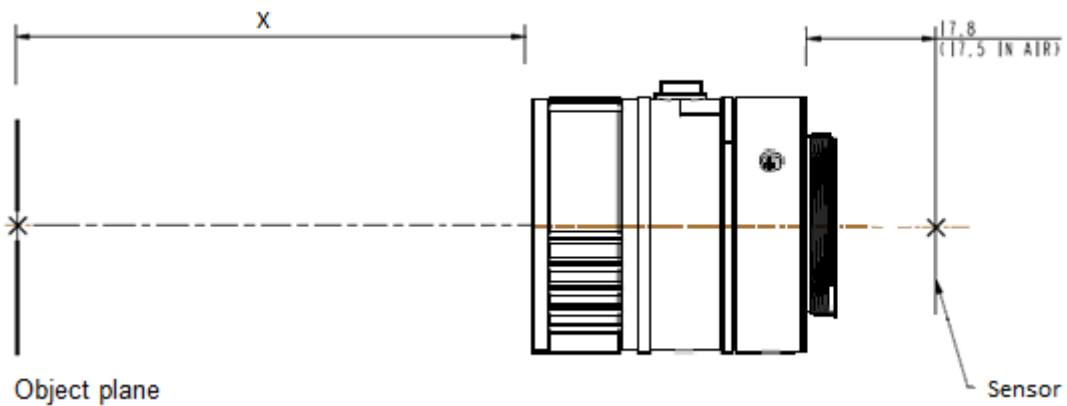
Performances described below are for 25°C

Optical Performances at V_{∞}	Symbol	Min	Typ	Max	Unit	Notes
Voltage for infinite focus	V_{∞}		46		V	(2)
Focal length at V_{∞}	EFL		16		mm	
Image circle diameter			11		mm	
Corner Chief Ray Angle	CRA		0		°	
Flange distance			17.5		mm	(3)
F- number	F#		2.8		-	
Diagonal Field of view	DFOV		38		°	(4)
Focus control performances						
Focus distance	x	11		∞	cm	(2)
Voltage for x= 11 cm	V_{11cm}		62		V	(2)

Notes :

(1) For more information on the behavior of the C-39N0-160 or Arctic 39N0 please refer to lens and module full datasheet.

(2) Distance to object referred to the principal plane of the objective, as described as below:



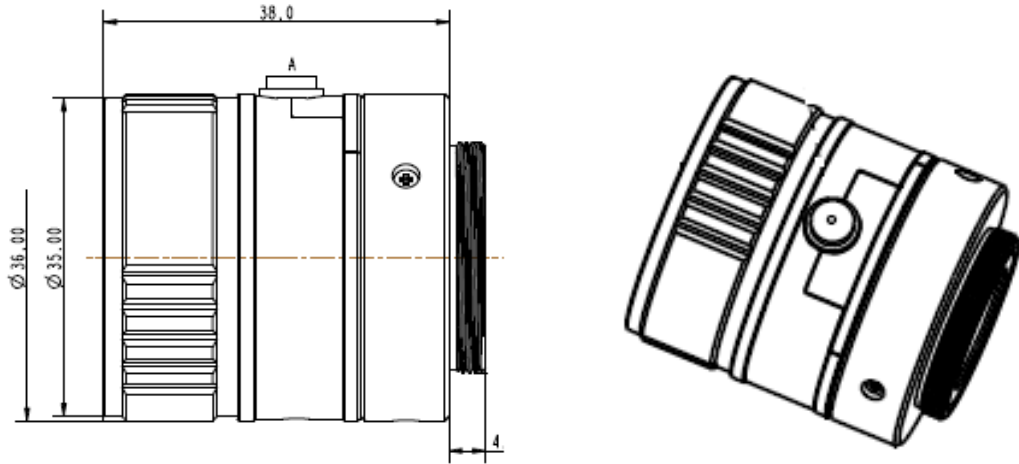
(3) Refer to ISO 10935
 (4) For a sensor size of 2/3"

Temperature Range

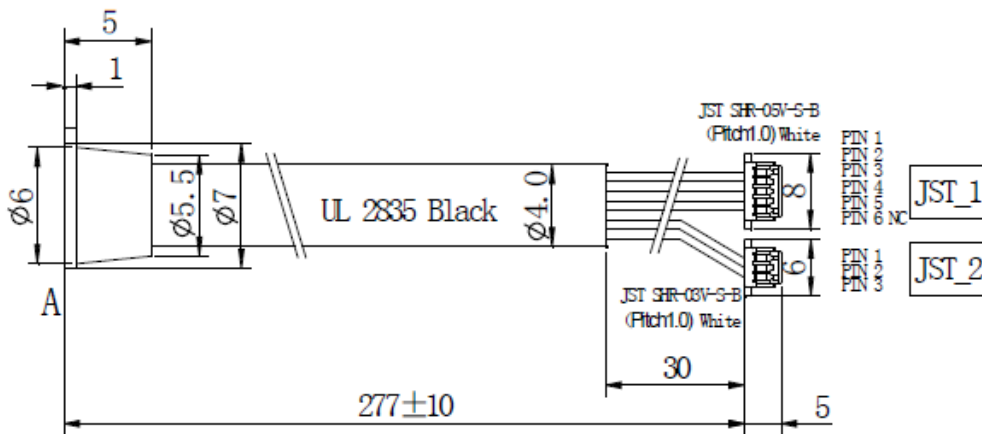
Parameter	Unit	Min	Typ	Max	Notes
Operating temperature range	°C	0°C	25	+50°C	TBC
Storage temperature range	°C	-40°C	25	+85°C	TBC



Mechanical dimensions



Weight: 99g



Electrical connection

The module has a 6 pin connector for power and control (JST_1).

Connector reference: JST SHR-06V-S-B

Wire reference: JST SH3-SH3-28300

These pins have different functions depending on the module version.

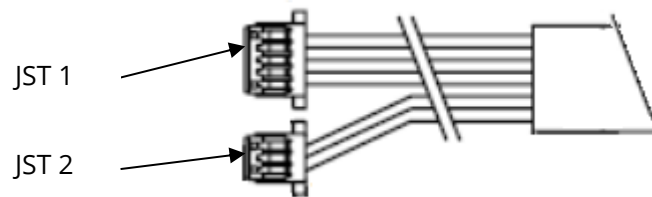


Figure 1: Electrical interface

1.1. Communication terminal JST_1

Pin	Name	Description
1	VIN	Positive power supply (+5 to +24 VDC/ red wire)
2	GND	Ground (black wire)
3	I2Csd_a_Rx_SDI	Multipurpose pin (depending on the part/ yellow wire)
4	I2Csc_l_Rx_SCK	Multipurpose pin (depending on the part/ blue wire)
5	SDO_Ana	Multipurpose pin (depending on the part)
6	MCLR	Programming pin (must be unconnected)

The function of the multipurpose pins depends on the part number:

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Pin	Name	R12	R33	SPI	I2C
3	I2Csd_a_Rx_SDI	Rx (RS232)	Rx (3.3V)	SDI	SDA
4	I2Csc_l_Tx_SCK	Tx (RS232)	Tx (3.3V)	SCK	SCL
5	SDO_Ana	Analog input	Analog input	SDO	Analog input

1.2. Programming terminal JST_2

Pin	Name	R12	R33	SPI	I2C
1	ICSPDAT	Rx (RS232)	Rx (3.3V)	SDI	SDA
2	ICSPCLK	Tx (RS232)	Tx (3.3V)	SCK	SCL
3	MCLR	Analog input	Analog input	SDO	Analog input

Electrical Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Power supply						
Input voltage	V_{cc}	3.3	5	24	V	
Current consumption - Active mode	I_{cc}		50		mA	(1)
Current consumption - Standby mode	$I_{cc\ Stb}$		12		mA	
Control voltage						
<i>RS12</i>						
I2C _{sda} _Rx_SD1 / I2C _{scl} _Rx_SCK		-25		25	V	(2)
<i>RS33/I2C/SPI</i>						
I2C _{sda} _Rx_SD1 / I2C _{scl} _Rx_SCK		-0.3		3.6	V	(2)
SDO_Ana pin		-0.3		3.6	V	(2)
MCLR pin		-0.3		3.6	V	

Notes :

(1) Current consumption depends on the voltage applied on the Liquid Lens, value given for 4.5v power supply, see below chart for more details.

Typical current consumption I_{cc} (mA)

Driver state and voltage applied to Lens	(standby)	25 V	70 V
	3.3V	16.4	70
4.5V	12	50	71
12V	4.5	27	34
24V	2.2	20	23

(2) Absolute Maximum Ratings

Analog control

Caspian C-30N0-160 modules, except the SPI version, can be controlled by an analog voltage. In this case, the voltage seen by the Liquid Lens is given by the following equation:

$$V_{rms} = (V_a * 22.5) + 24 \quad \text{with } 0V < V_a < 2V$$

With:

- V_{rms} : rms value of the voltage seen by the Liquid Lens (AC voltage)
- V_a : analog input voltage (DC voltage)

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