



Nsync-200 series Robot Controller

Based on NVIDIA Orin NX SOM module

Features

- Based on NVIDIA Jetson Orin NX 8G/16G DDR SOM module
- Provide M.2 M key 2280 slot with PCIe Gen3 x4 signal
- 3x M12 X-coded Gigabit Ethernet port
- 2x CAN FD interface with isolation feature
- Provide 7-channel Time sync output for external sensor
- 4x GMSL2 camera FAKRA Z code interface with frame sync
- 4/8x HMTD Base-T1 Ethernet port for solid states 3D LiDAR, Radar, and camera
- Integrated TMSC module card (Optional)
- 4x USB 3.2 Gen1 type A interface
- One M.2 E key 2230 slot for Wi-Fi module
- One M.2 B+M key 3052 slot for 4G/5G module
- Support 2x 12V DC/3.5A power output for external sensors
- Support 10W speaker output and microphone on CMC connector
- Provide active FAN kit to maximum the system capability.
- Wide operating temperature up to -20°C to 60°C (-4°F to 140°F)

Introduction

The Nsync robot controller is based on NVIDIA Jetson Orin NX 8GB/16GB SOM module and integrated multichannel sync of TSMC module for external sensor time synchronization and provide robot high-accuracy position feature, with and AI-enabled perception, precision positioning, and autonomous control drive, Nsync synchronized more sensor, like 3D LiDAR, 9-axis IMU, stereo camera, ToF camera and RTK GPS etc. The controller provides rugged design with M12 X-coded, lockable CMC, FAKRA and HMTD of 1GBase-T1 Ethernet interface to maximum the sensor connection support max. up to -20°C to 60°C (-4°F to 140°F) wide range operating temperature.

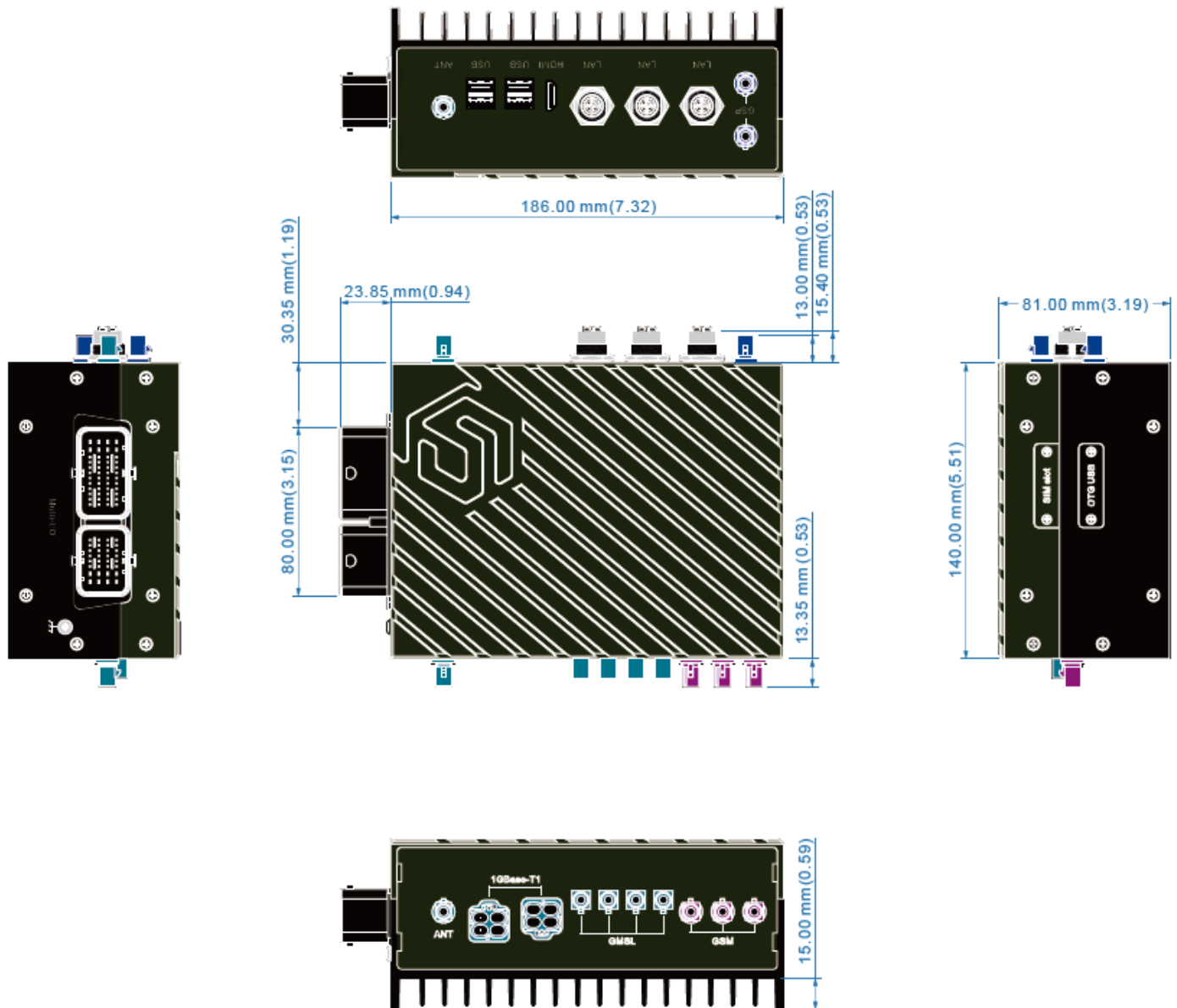
Specification

Model Name	NSync-200 series
Platform	
Processor	NVIDIA Jetson Orin NX 8G/16G DDR SOM module
GPU capacity	ONX16GB: 1024 NVIDIA CUDA cores, 32 Tensor cores, 918MHz ONX 8GB: 1024 NVIDIA CUDA cores, 32 Tensor cores, 765MHz
CPU	ONX 16GB: Eight-core Cortex A78AE ARMv8.2, 64-bit ONX 8GB: Six-core Cortex A78AE ARMv8.2, 64-bit
AI Performance	ONX 16GB: Up to 100(Sparse) INT8 TOPs and 50(Dense) INT8 TOPs ONX 8GB: Up to 70(Sparse) INT8 TOPs and 35(Dense) INT8 TOPs
Deep Learning Acceleration	ONX 16G: 2x NVDLA, maximum frequency up to 614MHz, 20 TOPs (Sparse INT8) ONX 8G: 1x NVDLA, maximum frequency up to 610MHz, 20 TOPs (Sparse INT8)
Internal Memory	ONX 16GB: 16GB 128-bit LPDDR5 DRAM, 102GB/s ONX 8GB: 8GB 128-bit LPDDR5 DRAM, 102GB/s
Front Panel Interface	
M12 X-coded	3x M12 X-coded GbE Ethernet ports
HDMI interface	1x HDMI 2.0a/b
USB port	4x USB 3.2 Gen1 type A
ANT 1 / 2	2x FAKRA C code connector for Wi-Fi
Rear Panel Interface	
FAKRA Z code (left side)	4x GMSL 2 camera FAKRA Z code interface with frame sync
GSM radio 1/2/3	Max. 3x FAKRA D coded connector for 4G/5G
HMTD 1/2	8x 1G Base-T1 Ethernet ports
OTG USB	1x micro-USB for recovery BSP
Side Panel Interface	
48pin CMC lockable connector	Multi-channel interface for robotic: 4pin 9-36VDC ignition power input, 1x ACC trigger input for power on 1x Microphone input, 1x Speaker output with 10W amplifier 3x PWM GPIO, 2x CAN H/L interface with isolation 1x FAN control output, 1x RS232(TXD/RXD/CTS/RTS) 1x Recovery, 1x Reset, 1x PWR_BTN
32pin CMC lockable connector	7x PPS + ToD syncout for external sensor 2x 12V/3.5A Power output for external sensor
Power	
Ignition Feature	Power on delay: 10 sec (default) Power off delay: 3 min (default)
Input power range	9-36V DC \pm 5%
Power consumption	100W (full loading) ONX 8G/16G SOM module: default 20W

	Thermal dissipation: Passive (default), Active (Optional)
Physical Characteristics	
Enclosure	IP40 design, Aluminum
Dimension (mm)	186 x 140 x 86mm (7.32 x 5.51 x 3.385 inch)
Mounting/Installation	Wall mount
Environmental	
Operating Temperature	-20°C to 60°C (-4°F to 140°F)
Operating Humidity	Approx. 95% @40 (non-condensing)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Vibration	IEC 60068-2-64: 5Grms, 5-500Hz, 3 axes
Shock	Operating: 3G, half sine, 11ms duration
EMI	CE (EN 55032, EN 55035) & FCC class A (ANSI C63.4, 4a)
EMS (TBC)	IEC 61000-4-2 ESD: ±15kV Air, ±8kV contact IEC 61000-4-3 RS: 80M~1000MHz, 3V/m(rms), 80% AM (1kHz) IEC 61000-4-4 EFT: Power port ±1KV, Data port ±0.5kV IEC 61000-4-5 Surge: Power port L-L ±1kV, L-G ±4kV, Data port ±4kV IEC 61000-4-6 CS: 0.15M~10MHz 3Vrms, 10M~30MHz 3-1Vrms, 30M~80M 1Vrms 80% AM 1kHz IEC 61000-4-8 PFMF: 50/60Hz, 1A/m
Reliability	
Warranty	2 years

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Description
NSync-200	Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, 4x GMSL2, 4x HMTD, ignition power, -20 to 60
NSync-201	Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, 4x GMSL2, 8x HMTD, ignition power, -20 to 60
NSync-202	Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, 4x GMSL2, 4X HMTD, ignition power, 1x GPS module, 7x time sync output -20 to 60
NSync-203	Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, 4x GMSL2, 8x HMTD, ignition power, 1x GPS module, 7x time sync output -20 to 60
NSync-210	Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, 4x GMSL2, 4x HMTD, ignition power, -20 to 60



NSync-211	Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, 4x GMSL2, 8x HMTD, ignition power, -20 to 60
NSync-212	Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, 4x GMSL2, 4x HMTD, ignition power, 1x GPS module, 7x time sync output -20 to 60
NSync-213	Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, 4x GMSL2, 8x HMTD, ignition power, 1x GPS module, 7x time sync output -20 to 60

Optional Accessory

Model Name	Description
CMC-0048 Receptacle cable	48pin CMC multi-IO cable
CMC-0032 Receptacle cable	32pin CMC sync output cable
oToCAM500-E62M ToF camera	IP65 ToF camera with Sony IMX570, 940nm, 640x 480 30fps, sub-millimeter precision
oToCAM264ISP-C120M	Sony IMX390 with GW5200 ISP, 2M pixels, FOV 120, GMSL2 camera
oToCAM260ISP-C30M	Sony IMX490 with GW5300 ISP, 5M pixels, FOV 30, GMSL2 camera
oToCAM268-S195M	Sony ISX021, 2.46M pixels, FOV 195, GMSL2 camera
FAKRA Z cable, 5m	FAKRA Z plug to FAKRA Z plug cable, 5m
FAKRA D to SMA, 10cm	FAKRA D plug to SMA cable, 10cm (for 4G/5G)
FAKRA C to SMA, 10cm	FAKRA C plug to SMA cable, 10cm (for wi-fi)
M12 X-code cable	M12 X-code to RJ45 cable, 5m
Active thermal dissipation	FAN kit for active thermal dissipation
HMTD cable	4x HMTD plug to 4x HMTD plug