

AMRC-ORN

Base on Nvidia Orin NX SOM Module
[Preliminary Release] Robot Controller



Features:

- Base on NVIDIA Jetson Orin NX 8G/16G DDR SOM module
- Provide M.2 M key 2280 slot with PCIe Gen3 x4 signal
- M12 X-coded Gigabit Ethernet port x 3
- CAN FD interface with isolation feature x 2
- Provide 7-channel Time sync output for external sensor
- GMSL2 camera FAKRA Z code interface with frame sync x 4
- HMTD Base-T1 Ethernet port for solid states 3D LiDAR x 4/8, Radar, and camera

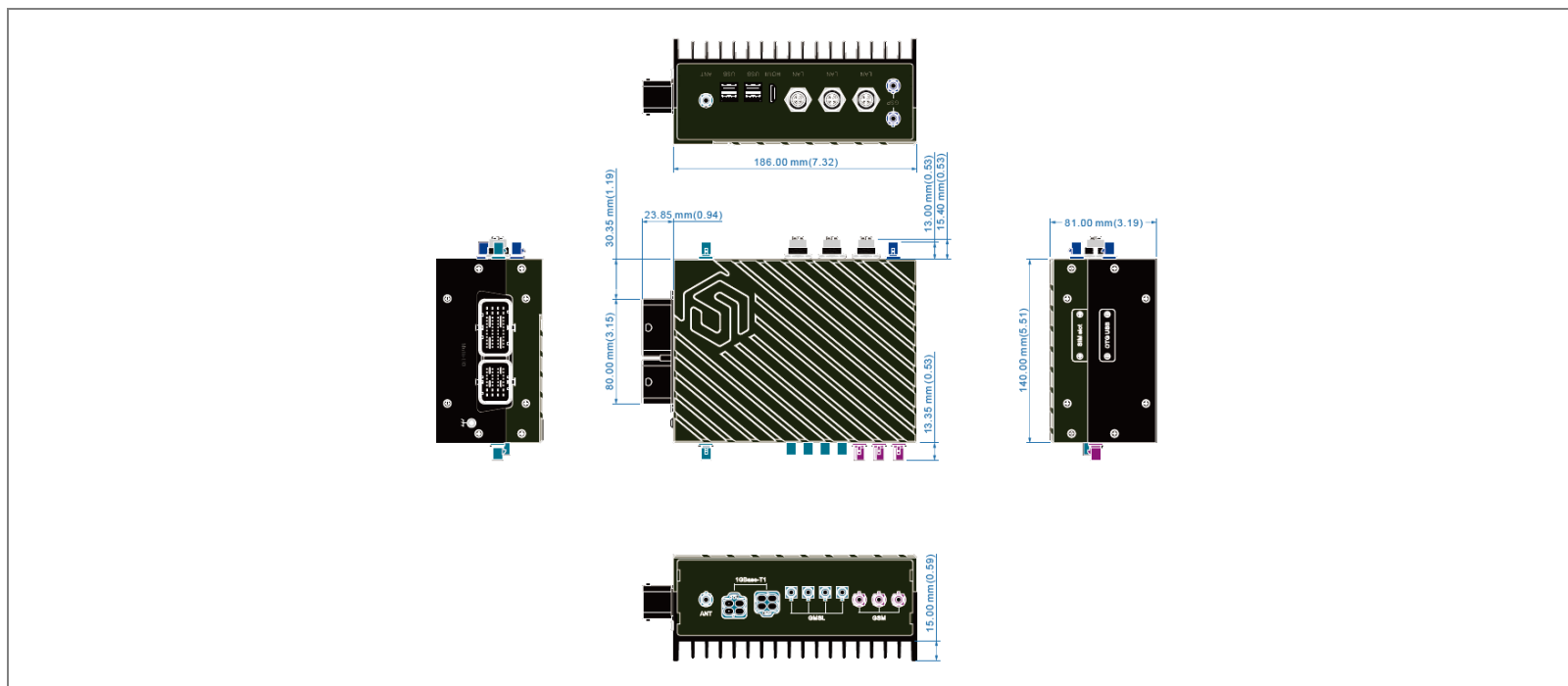
Specifications

System 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	NX 16GB: 16GB 128-bit LPDDR5 DRAM, 102GB/s ONX 8GB: 8GB 128-bit LPDDR5 DRAM, 102GB/s
Front Panel Interface	
M12 X-Coded	M12 X-coded GbE Ethernet ports x 3
HDMI interface	HDMI 2.0a/b x 1
USB Port	USB 3.2 Gen1 type A x 4
ANT 1/2	FAKRA C code connector for Wi-Fi x 2
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 Microphone input x1, Speaker output with 10W amplifier x1 PWM GPIO, 2x CAN H/L interface with isolation x3 FAN control output x 1, RS232(TXD/RXD/CTS/RTS) x 1 1x Recovery, 1x Reset, 1x PWR_BTN
32pin CMC lockable connector	PPS + ToD syncout for external sensor x7 12V/3.5A Power output for external sensor x2
Rear Panel Interface	
FAKRA Z code (left side)	GMSL 2 camera FAKRA Z code interface with frame sync x 4
GSM radio 1/2/3	Max. FAKRA D coded connector for 4G/5G x 3
HMTD 1/2	1G Base-T1 Ethernet ports x 8
OTG USB	micro-USB for recovery BSP x 1

Power	
Ignition Feature	Power on delay: 10 sec (default) Power off delay: 3 min (default)
Input power range	9-36Vdc±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 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
Others	
Warranty	2 years

Dimension

Unit: mm / inch



Ordering Information

Part Number	Part Number
TBD AMRC-ORN-A09-8G01 , Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, GMSL2 x4, HMTD x4, ignition power, -20 to 60	TBD AMRC-ORN-A09-8G02, Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, GMSL2 x 4, HMTD x 8, ignition power, -20 to 60
TBD AMRC-ORN-A09-8G03 , Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, GMSL2 x4, HMTD x4, ignition power, GPS module x1, time sync output -20 to 60 x 7	TBD AMRC-ORN-A09-8G04 , Rugged robot controller based on Orin NX 8GB SOM module, W/ 1TB SSD, GMSL2 x 4, HMTD x 8, ignition power, 1x GPS module, 7x time sync output -20 to 60
TBD AMRC-ORN-A09-16G1, Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, GMSL2 x4, HMTD x4, ignition power, -20 to 60	TBD AMRC-ORN-A09-16G2, Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, GMSL2 x 4, HMTD x 8, ignition power, -20 to 60
TBD AMRC-ORN-A09-16G3, Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, GMSL2 x4, HMTD x4, ignition power, GPS module x1, time sync output -20 to 60 x 7	TBD AMRC-ORN-A09-16G4, Rugged robot controller based on Orin NX 16GB SOM module, W/ 1TB SSD, GMSL2 x 4, HMTD x 8, ignition power, GPS module x 1, time sync output -20 to 60 x 7

Optional Accessories

Part Number / Item	
TBD	48pin CMC multi-IO cable
TBD	32pin CMC sync output cable
TBD	IP65 ToF camera with Sony IMX570, 940nm, 640x 480 30fps, sub-millimeter precision
TBD	Sony IMX390 with GW5200 ISP, 2M pixels, FOV 120, GMSL2 camera
TBD	Sony IMX490 with GW5300 ISP, 5M pixels, FOV 30, GMSL2 camera
TBD	Sony ISX021, 2.46M pixels, FOV 195, GMSL2 camera
TBD	FAKRA Z plug to FAKRA Z plug cable, 5m
TBD	M12 X-code to RJ45 cable, 5m
TBD	FAKRA D plug to SMA cable, 10cm (for 4G/5G)
TBD	FAKRA C plug to SMA cable, 10cm (for wi-fi)
TBD	FAN kit for active thermal dissipation
TBD	4x HMTD plug to 4x HMTD plug