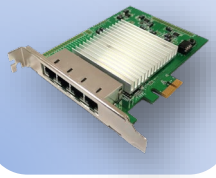
AXM57104 TSN Development Platform Product Brief

Release Date: 06/13/2023

AXM57104 TSN Development Platform

AXM57104 Quad Port TSN Gigabit PCIe NIC



The AXM57104 TSN Development Platform provides an easy way to enter the new generation industrial Ethernet, Time-Sensitive Networking (TSN) world on Real-Time Linux (RT-Linux) industrial computers.

AXM57104 TSN Development Platform is a fanless industrial computer (IPC) with one AXM57104 Quad Port TSN Gigabit Ethernet PCIe NIC card installed, which is equipped with high-performance 8th Gen Intel® Core™ i7 processor and pre-installed AXM57104 TSN software applications on Linux operating system with real-time extensions.

AXM57104 TSN Gigabit PCIe NIC supports enhanced TSN functions, compliant to IEEE 802.1AS-Rev/AS, 1588V2, 802.1Qav, 802.1Qbu, 802.1Qbv and 802.1CB. AXM57104 TSN software applications includes AXM57104 Linux network driver, TSN configuration, PTP4L, RSTP, Netconf, Web Server configuration, Net Latency Test, OPC UA demo, etc. applications and FPGA firmware upgrade tool. AXM57104 also supports FPGA hard-core field upgradable via In-Application Programming (IAP) for TSN standards evolution.

Industrial Computer (IPC)	
Single Board Computer	Avalue EMX-WHLGP
Processor	Onboard 8th Gen Intel® Core™ i7-8665UE Processor (up to 2.0 GHz)
System Memory	2 x 4GB DDR4 2133 MHz RAM @ 260-pin SODIMM socket (Max. up to 32GB)
Storage	1x 256GB SSD @ 2.5” Drive Bay 1 x M.2 B Key 3042/2242/2260/2280, support SSD (share with expansion slot)
TPM	Onboard TPM 2.0
Ethernet	3 x PCIe Gigabit Ethernet Ports (1 x Intel® I219-LM; 2 x Intel® I210-IT)
USB	3 x USB3.2 Gen1, 1 x USB Type C w/o ALT mode
Antenna	2 x Antenna with dust cover
PS/2	1 x PS/2 Keyboard, 1 x PS/2 Mouse
Display	Intel® Processor Graphics, 3 x HDMI 1.4b: 3840 x 2160 @ 30 Hz, Triple Display
Audio	Realtek ALC888S, Line-OUT, Mic-IN
Expansion	2 x PCIe*4 slot (one with **AXM57104 TSN PCIe NIC**) 1 x M.2 A Key 2230 for Wi-Fi & BT Module, 1 x M.2 B Key 3042/2242/2260/2280, support SATA 3/PCIe lll x 1/RS-232 x 4/SIM slot x 1
Power Input	AT/ATX (ATX is default), DC Input +12V ~ +24V, 1 x 24V DC/7.5A Power Adapter
Dimension	217 mm (W) x 115 mm (L) x 220 mm (H), 2.6 Kg
Certification	CE/FCC Class A
Fanless Operation Temperature	-20 ~ 50°C

AXM57104 TSN Gigabit PCIe NIC	
PCIe Spec.	Compliant to PCI Express base spec. v2.1 Gen1
Network Interface Controller (NIC)	• Gigabit Ethernet Network Interface Controller • Ethernet packet through Bus-Master DMA • Unicast/multicast/broadcast filters • Support Legacy and MSI interrupt
TSN Gigabit Ethernet Switch	• 4-Port TSN Gigabit Ethernet Switch • Support Enhanced TSN functions, compliant to **IEEE 802.1AS-Rev/AS, 1588V2, 802.1Qav, 802.1Qbu, 802.1Qbv, 802.1CB** standards • Support 8 priority queues • QoS based on PCP bits (802.1p), or Ethertype • Port-based and 802.1Q tag-based VLANs • Support Independent VLAN Learning (IVL) • Distributed Switch Architecture (DSA) for frame tagging • 32 Kbytes packet buffer per port
Firmware Upgrade	FPGA hard-core field upgradable via In Application Programming (IAP) for TSN standards evolution
TSN Software Support	
OS	RT-Linux Kernel v5.4.93-asix-rt on Ubuntu 20.04
AXM57104 Software Support	• AXM57104 TSN PCIe NIC Linux Network Driver • TSN Configuration Tool • IP Config Service • PTP4L Application for 802.1AS • Netconf Application • Rapid Spanning Tree Protocol (RSTP) Application • Net Latency Test Application • OPC UA Demo Application • Web Server Configuration Application • AXM57104 FPGA Firmware Upgrade Tool

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