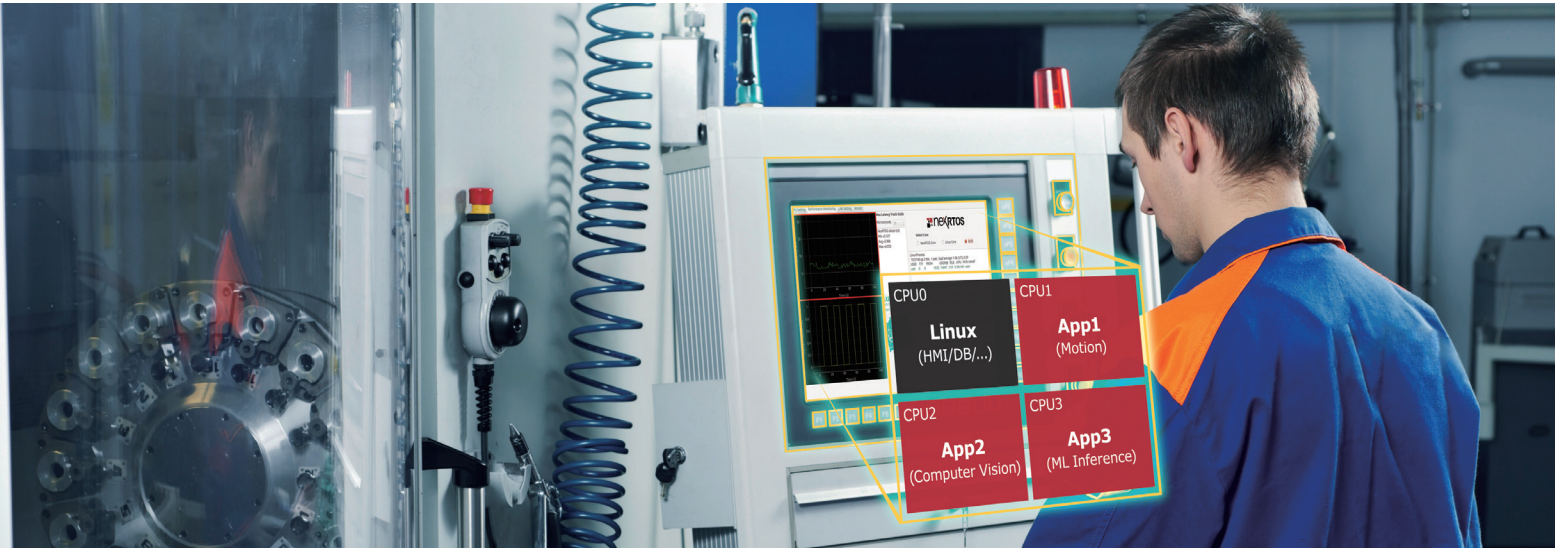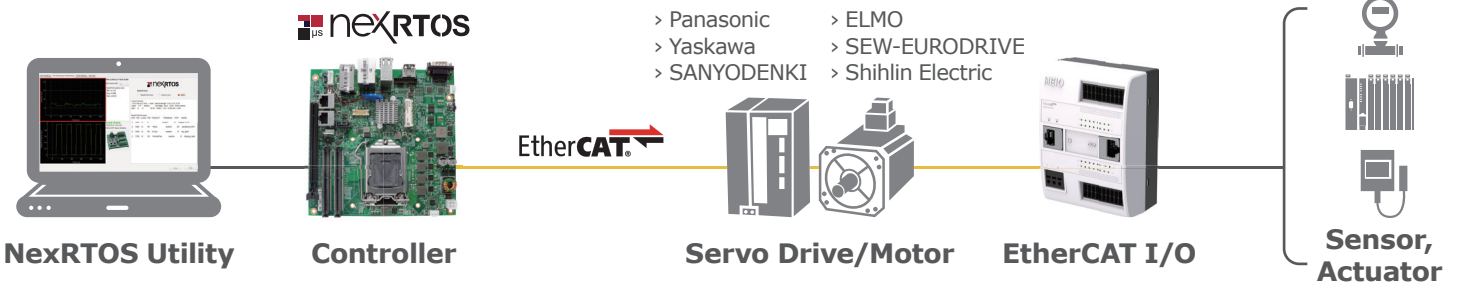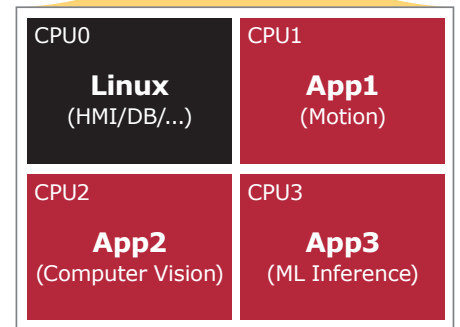# NexRTOS x86 Real-time Linux Control System

NexRTOS is an x86 Linux-based Real-time control system that enables real-time capabilities for complex machinery **performing high-precision motion control, computer vision and critical applications in micro second**, such as CNC, robot controller, injection machine, packaging machine, and so on.

The independent ISR(/IST) performs guaranteed response-time for application through exclusive CPU core and isolated system resource. The CPU cores and LAN ports **can be configured intuitively and the NexRTOS Utility can monitor the signal latency and time-jitter**.

The IGH EtherCAT sample project code **can accelerate the development of EtherCAT-based motion applications of servo drives/motors and distributed I/O** for OEM partners and machine/equipment builders.

μs neXRTOS

Intel CPU Cores

CPU0	CPU1
Linux (HMI/DB/...)	**App1** (Motion)
CPU2	CPU3
App2 (Computer Vision)	**App3** (ML Inference)

μs neXRTOS

> Panasonic   > ELMO
> Yaskawa   > SEW-EURODRIVE
> SANYODENKI   > Shihlin Electric

EtherCAT

NexRTOS Utility   **Controller**   **Servo Drive/Motor**   **EtherCAT I/O**   **Sensor, Actuator**

Features

♦ **Guaranteed Control Response – Time Critical Response**
- Timer periods 250 ms
- Jitter cyclic < 40 us
- IST latencies < 30 us
- Latency in 30 us

♦ **Exclusive CPU Cores & Resources – CPU Isolation**
- Linux kernel and desktop on CPU core 0
- Individual tasks on independent cores

♦ **Sample Projects for Machinery Applications – IGH EtherCAT Sample code**
- HMI application
- Motor & I/O application
- EtherCAT master application

User Scenario

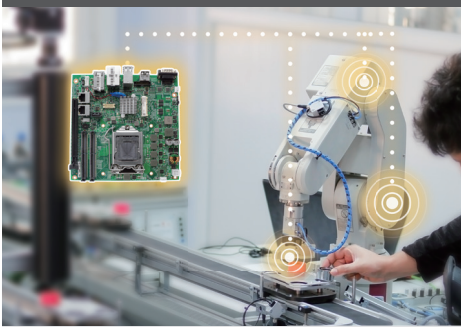### MCB355
(Designed for CNC Machine)

Key Specs

- Intel® Celeron® processor J1900
- 2 x I210 LAN port for EtherCAT
- FPGA feature :
  1 x Encoder, 8 D/I, 4 D/O , MPG support
- 2x Mechatrolink III support

Ordering Information

MCB355 (P/N: 6879MB350000F)

RCB100
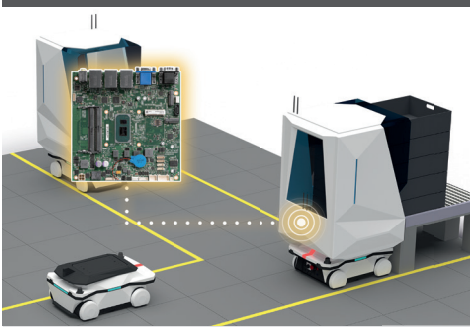(Designed for Robot Control)

Key Specs

- Intel® 6th Gen Core™ i7/i5/i3 and Intel® Celeron
- Internal USB for software license dongle
- Optional 12In/4Out digital isolated I/O
  (need optional I/O board)
- 2 x I210 GbE LAN port for EtherCAT
- 2 x 211AT GbE (One port supports PSE)

Ordering Information

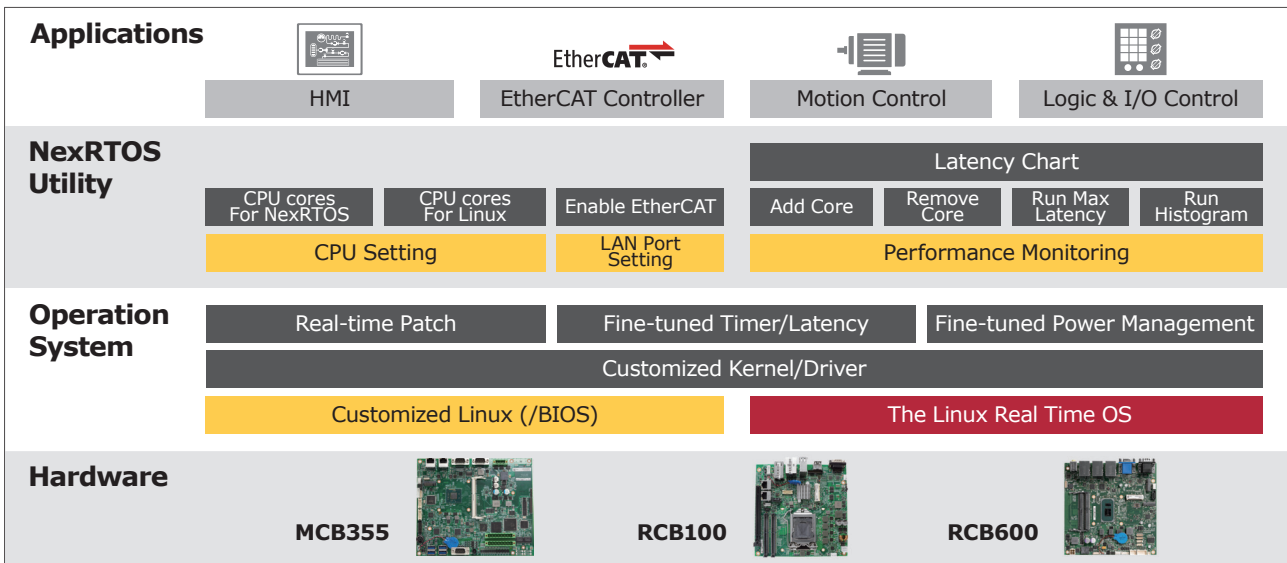RCB100 (P/N: 10J200RCB00X0)

RCB600
(Designed for AMR)

Key Specs

- Intel® Tiger Lake UP3
- mPCIe supports LTE 4G, WiFi+BT
- M.2 supports SATA, LTE 5G
- 1 x I219, 1 x I210, 1 x I225 GbE LAN
  (supports I210 EtherCAT)
- 1 x CANBus and SM or I2C Bus
- 16-bit GPIO, 24V 2DI/2DO

Ordering Information

RCB600 (P/N: 10J200RCB08X0)

Software Building Blocks

Applications

HMI	EtherCAT Controller	Motion Control	Logic & I/O Control

NexRTOS Utility

			Latency Chart			
CPU cores For NexRTOS	CPU cores For Linux	Enable EtherCAT	Add Core	Remove Core	Run Max Latency	Run Histogram
CPU Setting		LAN Port Setting	Performance Monitoring			

Operation System

Real-time Patch	Fine-tuned Timer/Latency	Fine-tuned Power Management
Customized Kernel/Driver		
Customized Linux (/BIOS)	The Linux Real Time OS	

Hardware

MCB355   RCB100   RCB600

Function & UI

1. Configure CPU Cores ▶ **2. Configure LAN port** ▶ **3. Verify the Latency of CPU Cores**