

Microcontroller Comparison for Smart Conveyor Belt Automation

Feature / MCU	NXP LPC4357 (Keil MCB4300)	STM32F407VG	TI TM4C1294NCPDT (Tiva C Series)	Espressif ESP32	Rowspan=5
Core	Dual-core Cortex-M4 + M0	Cortex-M4	Cortex-M4	Dual-core Xtensa	
Clock Speed	204 MHz	168 MHz	120 MHz	240 MHz	1
Flash Memory	1 MB	1 MB	1 MB	4 MB (external)	2
SRAM / RAM	264 KB	192 KB	256 KB	520 KB	2
ADC Resolution	10-bit	12-bit	12-bit	12-bit	1
Timers / PWM	Supported (Advanced)	Supported	Supported	Supported	5
Ethernet	Supported (Built-in MAC)	Supported (PHY external)	Supported (MAC + PHY)	Not Supported	Not Supported
Wi-Fi / Bluetooth	Not Supported	Not Supported	Not Supported	Supported	Not Supported
RTOS Support	Supported (FreeRTOS, RTX)	Supported	Supported	Supported	Supported
GPIO Count	70+	50+	43	34	2
USB Support	Supported (Host/Device)	Supported	Supported	Supported	Supported
Industrial Grade	Yes	Yes	Yes	No	Not Supported
Development Tools	Keil, IAR, MCUXpresso	STM32CubeIDE, Keil	Code Composer Studio	ESP-IDF, Arduino	Not Supported
Typical Use	Industrial automation	Motor control, general sensing	Ethernet-based automation	IoT and smart devices	Motor control
Price (INR)	INR 1,500-INR 3,000	INR 800-INR 1,500	INR 1,200-INR 2,000	INR 250-INR 400	INR 1,000-INR 2,000
Overall Suitability	Excellent for real-time industrial automation	Versatile and well-documented	Strong Ethernet and automation focus	Good for IoT applications	Good for IoT applications