

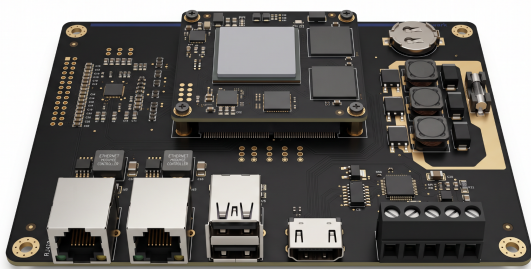
ForgeEdge-Duo

Hybrid Configurable AI and Control Module

PRODUCT DATASHEET | FE-DO-01 | September 2026 | v1.0

ForgeEdge-Duo is a configurable control module that combines real-time processing and edge AI with a Linux processing environment in one system. Its heterogeneous MCU-MPU architecture allows time-critical control, local data processing and low-latency tasks to run on the MCU layer, while Linux applications, networking, data management and higher-level system services run on the MPU layer.

With dual Ethernet, dual USB HS, RS-485 and CAN, ForgeEdge-Duo combines real-time control and Linux processing in one module for automation, intelligent machine control, data acquisition, protocol management and edge computing.



Illustrative product view. Configuration and component placement may vary.

KEY FEATURES

- Heterogeneous MCU-MPU processing architecture.
- Real-time control and Linux applications running together on the same module.
- NPU-based edge AI and low-latency data-processing support.
- Embedded Linux application environment.
- 2 x Ethernet interfaces.
- 2 x USB High-Speed interfaces.
- CAN communications interface.
- RS-485 communications interface.
- Local data acquisition, preprocessing and control.
- Multi-layer RTOS / bare-metal and Linux software architecture.
- Configurable I/O design.

APPLICATION AREAS

- Machine vision and industrial automation.
- Edge AI and intelligent sensor fusion.
- HMI, data acquisition and industrial gateways.
- Edge computing.
- Real-time control and embedded-system applications.
- Hardware-accelerated edge AI, machine vision and real-time image processing.

SYSTEM INTERFACES

2× Ethernet · 2× USB HS · 1× RS-485 · 1× CAN · User Interface I/O

MECHANICAL INTERFACE

Board dimensions	105 x 90 mm
Overall height	50 mm
Mounting holes	35 mm DIN-rail mounting support with an optional mounting adapter Wall mounting support with an optional mounting adapter
Weight	150-200 g
Housing Material	Anodized aluminium enclosure
Board thickness	1.6 mm
IP rating	IP20

ELECTRICAL ENVIRONMENTAL AND RUGGEDIZATION

Supply range	5 V DC (USB + Type-C)	Storage temperature	-40 °C ... +85 °C
Typical consumption	2W	Humidity	5% to 95% RH, non-condensing
Peak consumption	4W	Vibration and shock	IEC 60068-2-27 IEC 60068-2-6
Protection	Reverse polarity and overcurrent	Cooling	Passive cooling
EMC	IEC 61000-6-2 / IEC 61000-6-4 (target)	ESD	IEC 61000-4-2, ±8 kV contact / ±15 kV air (target)

SECURITY FEATURES

Secure Boot

Arm TrustZone support

Hardware cryptography accelerator (AES, SHA, RSA, ECC)

Secure key storage / provisioning

Encrypted storage

Digitally signed firmware updates (OTA)

Public Key Infrastructure (PKI) support

Secure authentication and certificate management

TPM 2.0 support, optional with an external TPM module

Secure Element support

Anti-tamper and debug protection

FEATURE		FEATURE	
GENERAL AND PROCESSOR		MEMORY AND STORAGE	
Primary application	Real-time control, edge AI, embedded Linux, data acquisition, gateways and local data processing	Internal memory	4.2 MB contiguous SRAM 128 KB TCM RAM (ECC) 64 KB Instruction TCM RAM (ECC) 512 MB DDR3L + 4 KB EEPROM
Processor	1× Arm Cortex-M55 2× Arm Cortex-A7 1× Arm Cortex-M4	External memory and storage	eMMC + microSD / SD
Processor speed	Cortex-M55: 800 MHz 2× Cortex-A7: 650 MHz Cortex-M4: 209 MHz	INTERFACES	
RAM	512 MB DDR3L system memory and 4.2 MB SRAM on Arm Cortex-M55	System interfaces	2× Ethernet 2× USB High-Speed 1× CAN 1× RS-485
Core features and cache	Cortex-M55: Helium MVE, DSP, FPU; 32 KB L1 instruction cache and 32 KB L1 data cache; 128 KB TCM RAM (ECC); 64 KB instruction TCM RAM (ECC). Cortex-A7: 32 KB L1 instruction and 32 KB L1 data per core; 256 KB shared L2. Cortex-M4: FPU, MPU	PCIe	None
AI GRAPHICS AND IMAGING		Camera interface	MIPI CSI-2 and DCMIPP / DCMI
NPU (integrated AI acceleration)	600 GOPS		
GPU	NeoChrom 2.5D GPU Vivante 3D GPU, up to 533 MHz, OpenGL ES 1.1 / 2.0 and OpenVG 1.1	SOFTWARE SECURITY AND POWER	
Video and image processing	H.264 hardware encoder JPEG codec ISP Parallel and 2-lane MIPI CSI-2 camera interfaces; DCMI camera and MIPI-DSI display infrastructure	Operating system and software	RTOS + Linux
External AI acceleration	-	Power consumption (typical / peak)	2 / 4 (W)