RASYNBOARD

TRIA AN AVNET COMPANY

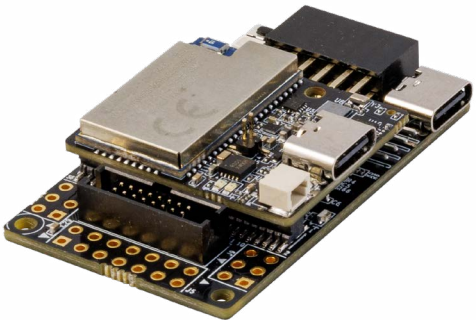
RASynBoard is a tiny (25mm x 30mm), ultra-low power, edge AI/ML board, based on a Syntiant NDP120 Neural Decision Processor, a Renesas RA6M4 host MCU plus a power-efficient DA16600 Wi-Fi/BT combo module. The NDP120 subsystem with on-board digital microphone, IMU motion sensor and SPI Flash memory, achieves highly efficient processing of acoustic- and motion events. Battery and USB-C device connectors facilitate stand-alone use, while a compact under-board connector enables integration with custom OEM boards and additional sensors.

An IO board (50mm x 30mm) is included for implementation of a compact two-board evaluation kit assembly. This pins-out a subset of the NDP120 and RA6M4 I/Os to popular Pmod, Click header and expansion header footprints, enabling connection with additional external microphones and sensor options. An onboard debugger MCU (SWD and UART interfaces), button switches, RGB LED and removable MicroSD storage, further maximize prototyping versatility and utility.

NDP120 AI/ML models for popular use-cases (pre-engineered by Syntiant and other vendors) are loaded from local SPI Flash storage for efficient execution on the ultra-low power NDP120 neural accelerator device.

RA6M4 MCU application software development and debug is supported via the Renesas e2 Studio IDE, interfaced via the E2OB debugger MCU on the IO board.

RASynBoard
(Core Board)



RASynBoard EVK
(Core Board + IO Board)

Core Board Features

Syntiant NDP120 Neural Engine
- Syntiant Core 2 Deep Neural Network
- Arm Cortex M0 and HiFi 3 DSP

Renesas RA6M4 Microcontroller
- 1x Arm Cortex M33 (200 MHz)
- 1 MB flash memory, 256 KB SRAM
- USB 2.0 device interface

Renesas DA16600 Wi-Fi/BT Module
- 802.11bgn 1x1 2.4 GHz Wi-Fi and BT 5.1

Memory
- 16 Mbit SPI NOR Flash

Battery Management
- LiPo battery management and connector

Sensors
- IMU 6-axis motion sensor (ICM42670)
- PDM digital microphone (MMICT5838)

Expansion Connector
- 2x28 pin board-to-board connector

Dimensions
- 25 mm x 30 mm

IO Board Features

Onboard Debugger and USB-Serial interface
- Renesas E2 OB debugger MCU (USB-C to SWD and VCOM serial interface)
- 3.3V buck regulator for debugger circuits

Expansion Interfaces and Storage
- 2x28 pin board-to-board connector
- 2x8 pin MikroE Click shuttle box header
- 2x6 pin Pmod type-6A (I2C) socket
- 2x7 pin MCU expansion header
- 2x3 pin DMIC expansion headers (two)
- 3.3V level-translation of expansion interfaces
- Micro SD card cage for removable storage

User Interfaces
- 2x Button Switches (Reset and User),
- 1x User RGB LED

Dimensions
- 50 mm x 30 mm

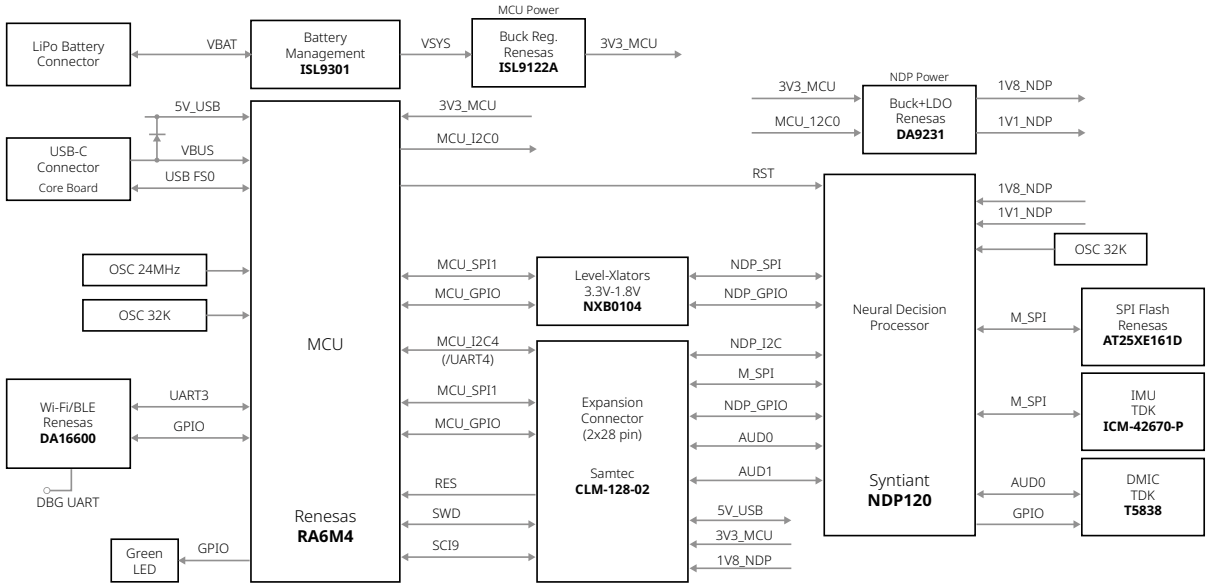
Kit includes

- RASynBoard EVK (Core Board + IO Board)
- Quick Start Instruction Card

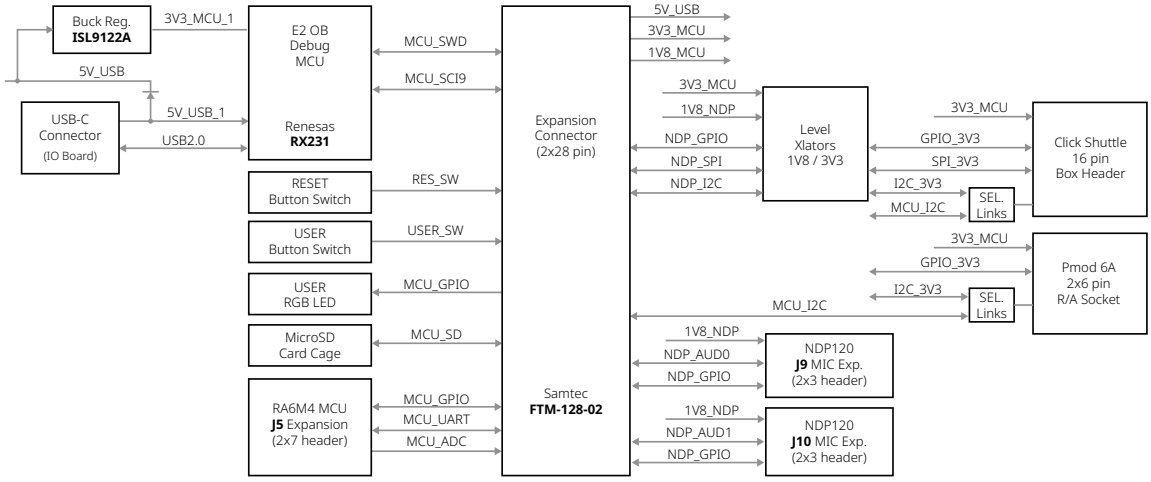
Target apps

- Accelerated Edge-AI and ML applications
- Battery-powered remote sensor systems
- Industrial smart sensors
- Motor predictive maintenance
- Always-on speech recognition and sensor fusion processing

Core Board block diagram



IO Board block diagram



Featured manufacturers

RENESAS SYNTIANT TDK

Parts

Part number	Description	For more information
AES-RASYNB-120-SK-G	RASynBoard NDP120 Evaluation Kit	avnet.me/rasynboard
AES-RASYNB-120-G	RASynBoard NDP120 Core Board only	avnet.me/rasynboard

Regions available for purchase: Americas, EMEA

aws Qualified Device AWS IoT Core

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Tria Technologies | Industriestr. 16, 76297 Stutensee | tria-technologies.com

Worldwide Distributor: Avnet
Online sales: Farnell

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