Product Innovation Kit Technical Reference

For more details, visit: www.zerynth.com

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Overview

The Product Innovation Kit gives developers all of the necessary components to develop innovative and scalable IoT products.

The kit is driven by the powerful ZM1-Development board, The ZM1-DB is an industrially oriented, modular hardware development unit that facilitates the development of scalable, secure and connected IoT (Internet of Things) applications.

The ZM1-DB and the expansion boards can act as a Development Board for prototyping a product and as a core for industrial applications with the modular expansion system.
The DB features I/O connectors (the zBUS) that allow connection in a cascade of different add-on modules to create specific industrial applications that fit into a DIN-RAIL case.

The kit also includes expansion boards that add unique functionality to your prototype in an easy and stable manner.

Package Contents

1. **ZM1-DB**

   The ZM1 Development board is an industrially oriented, modular hardware development unit that facilitates the development of scalable, secure and connected IoT (Internet of Things) applications.

   The ZM1-DB uses the ZM1 module, a 32-bit dual Core MCU based on the ESP32-WROOM-32SE. The ZM1 Core uses a clock frequency of 240 Mhz, an Embedded 16 MB SPI Flash memory, and integrates the ATECC608A crypto element which allows ultra-secure communication.
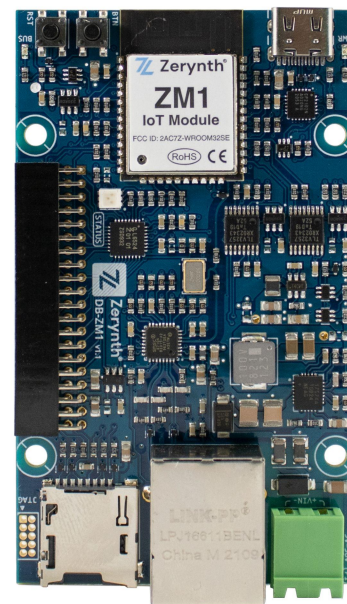
General Characteristics

- Based on Espressif ESP32 - 32bit Microcontroller, xTensaLX6.
- Up to 240MHz clock, 16MB of Flash, 312Kb SRAM.
- Python / C enabled development with Zerynth OS.
- Highly customizable solution thanks to the modular expansion system.
- JTAG support.
- 3 RGB status LEDs.
- 9 to 36V input Power Supply.
- MicroSD card slot.
- WiFi (Client and AP mode supported).
- Bluetooth® Low-Energy.
- Ethernet.
- Crypto Chip - ATECC608A Secure Hardware Encryption.
- Reset button and user configurable button.
- USB-C (power and programming).

2. EXP-IO

The **EXP-IO expansion board** is a mixed input/output module that features:


- **Relay:** The board has 4 Solid state relays, normally open connection, rated at 36Vdc. This enables developers to control actuators easily using Software libraries with the Zerynth SDK.
- **Opto-isolated digital inputs:** 2 channels of opto-isolated digital inputs are available on the board.
- **2 Analog Channels:** Connect your sensor easily and read the data from the sensors over the 2 industrial-compatible channels on the board. The channels support voltage-based at (±10V), current-based at (±20mA) or the resistive sensor (with an internal bias for a nominal 10kΩ impedance).
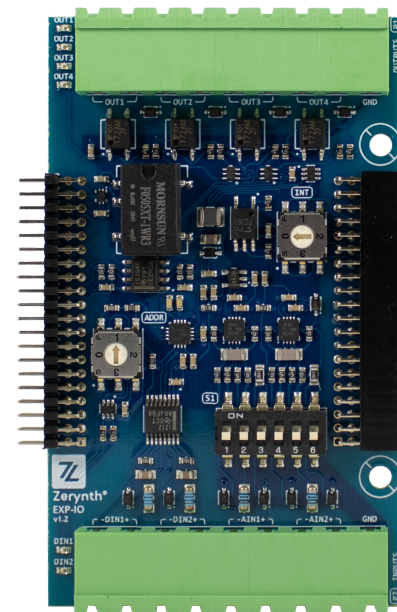
3. EXP-SER

The **EXP-SER expansion board** allows your application to communicate over RS485, RS232 and CAN interfaces. It enables communication with PC, Devices, boards or sensors communicating over serial channels.

The board features pin headers to connect terminals of CAN bus, R485 and RS232, in addition to exposing the UART/USART pins, I2C and SPI pins in the zBUS pin header.The board features pin headers to connect terminals of CAN bus, R485 and RS232, in addition to exposing the UART/USART pins, I2C and SPI pins in the zBUS pin header.
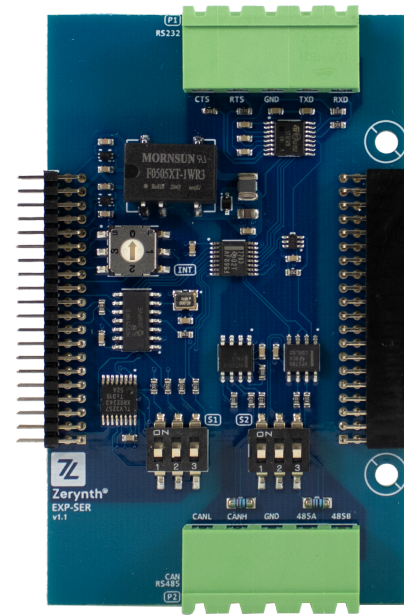
4. EXP-RELAY

The **EXP-RELAY expansion board** is an output module that features 6 General Purpose Relays (GPR) rated at 6A 250VAC. The board enables developers to control motors, fuel pumps, and industrial applications where control of high voltages and currents is intended for controlling large power loads.
Zerynth expansion boards work seamlessly with all of the Zerynth Development boards. Combined, they can act as a Development Board for prototyping a product, and a core for industrial applications.
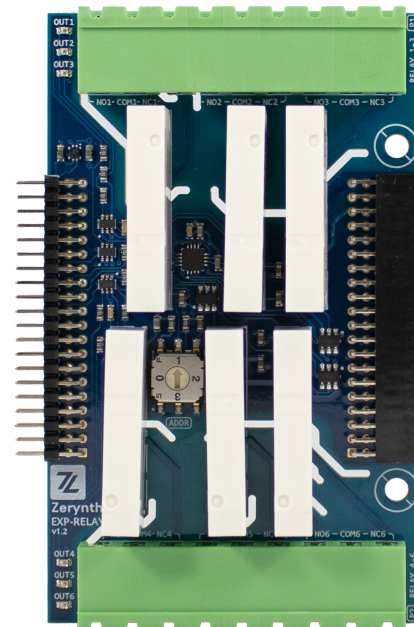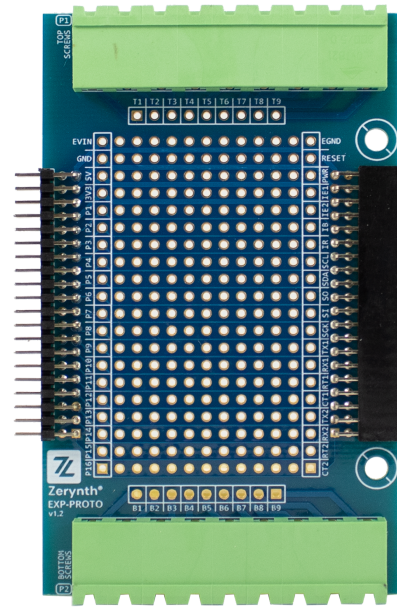
EXP-PROTO

The **EXP-PROTO expansion board** is a prototyping board that enables connecting and interfacing external sensors, actuators or devices.

The EXP-PROTO gives flexibility to the user to prototype any sensor, display, MCU or IC in their project. The developer is free to connect any device to the board and interface it using the zBUS.

Getting Started

- Download the Zerynth SDK from our website : https://www.zerynth.com/zsdk/
- Install the Zerynth SDK and open the VSCode application.
- Register a Zerynth account and log-in
- Connect the board to the PC using the USB Type-C Cable
- Clone the "Hello Zerynth" example
- For more details about the boards, sensors, examples and demos, please visit doc.zerynth.com

Typical Applications

Various applications can be made with the kit. When EXP-PROTO is introduced the number of possibilities is probably infinite because it allows almost any IC to be used by soldering it to the EXP-PROTO expansion board.

Some of the most common applications might be:

- Remote motor/Pump controller
- Wifi/Ethernet Thermostat
- CAN/RS485/RS232 to WiFi/Ethernet gateway
- House automation controller
- Visualize Industrial processes.

Declaration of Conformity

IMPORTANT: KEEP THIS INFORMATION FOR FUTURE REFERENCE. FOR FULL SET UP AND INSTALLATION INSTRUCTIONS, PLEASE VISIT docs.zerynth.com

Warnings

- All external power supplies used with Zerynth boards must comply with the relevant regulations and standards applicable in the country of use and must provide a voltage between 9 and 36 VDC.
- Hereby, ZERYNTH srl declares that the radio equipment type Zerynth Development boards are in compliance with Directive 2014/53/EU (RED). The full text of the EU declaration of conformity is available at the following internet address: https://www.zerynth.com/download/20246/
- The manufacturer cannot guarantee compliance with the RED directive if the end user uses custom circuits other than those supplied by Zerynth (used in conformity tests).
- All expansion boards that require CE markings have been tested and meet the essential requirements set   by the Directives: 2014/30/EU (EMC), 2014/35/EU (LVD), 2011/65/EU (RoHS). The declaration of conformity (DoC) can be downloaded from the website https://www.zerynth.com/download/20246/
- All Zerynth boards have undergone compliance testing for conducted and radiated emissions meeting the requirements of the following standards: FCC Part 15 B and IC ICES-003.
- Any device or component connected to one of the expansion connectors must comply with the electrical characteristics defined in the specifications described in the complete manual to ensure that the performance and safety requirements are met.
- Each cable used to connect other devices or components to the Zerynth boards must be less than 300 cm long and must offer adequate insulation and operation so that the appropriate performance and safety requirements are met.

Instructions for safe use

- Do not expose this product to water or moisture and do not place it on a conductive surface while it is operating.
- Do not expose this product to excessive heat sources which could cause it to operate outside of the permitted temperature range defined in the specifications (-40, +85 ° C).
- Be careful when handling the product to avoid mechanical or electrical damage to the printed circuit board and connectors.
- If a board appears to be damaged, do not use it.
- Do not touch the printed circuit board when it is powered on, and never operate with live electrical parts.
- The printed circuit board must not come into contact with conductive objects when it is powered on.
- Discharge static electricity from your body, and touch only the edges of the board to minimize the risk of damage from electrostatic discharge.

EN - Waste Electrical and Electronic Equipment (WEEE) Symbol

The use of the WEEE symbol indicates that this product/board may not be treated as household waste. By ensuring this product/board is disposed of correctly, you will help protect the environment. For more detailed information about recycling of this product/board, please contact your local authority, your household waste disposal service provider or the shop where you purchased it.

Mouser Electronics

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