

# **Indus IoT Development Kit**

**(Hardware Version: 1V0)**

## **Quick Start Guide**

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## **1. Introduction**

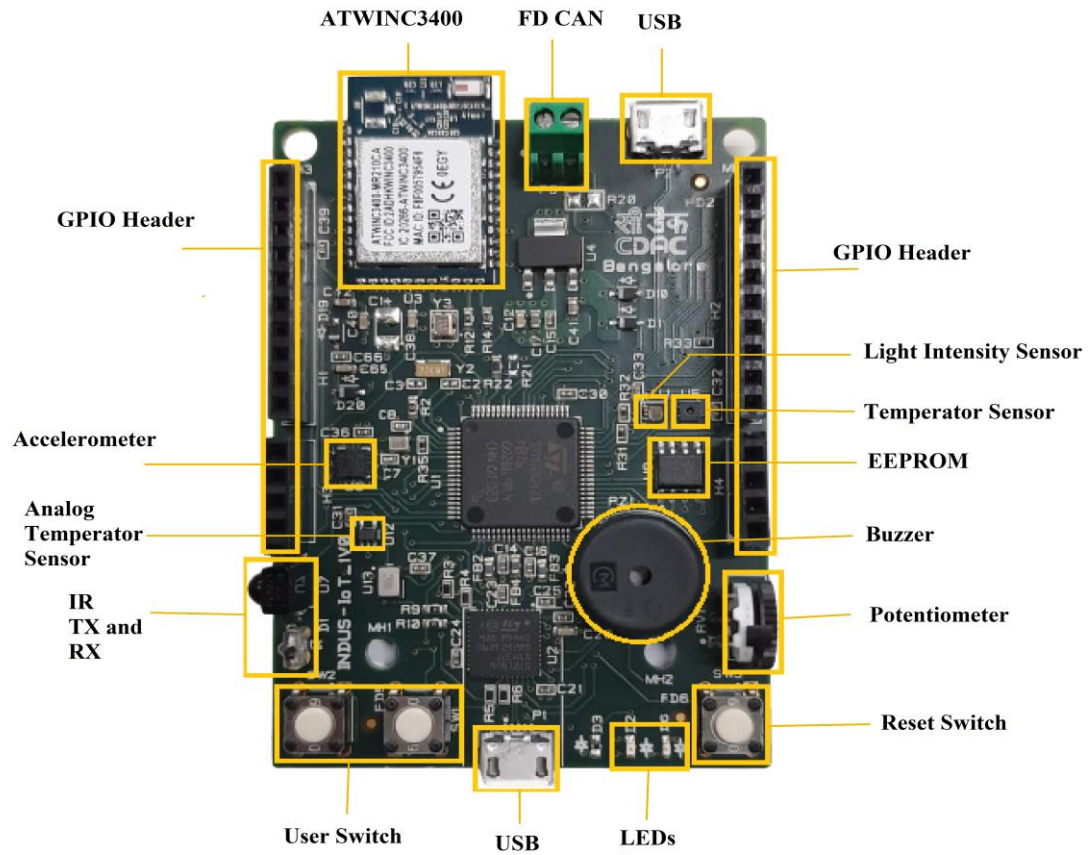
C-DAC's INDUS (Innovation, Development & Up-Skilling) IoT development kit is primarily targeted towards students and hobbyist who would like to quickly get started with building IoT applications and prototyping their IoT based ideas. The INDUS IoT development kit comes with fully loaded features for developing IoT based experiments and IoT applications serving as a simple to use IoT development platform. The INDUS development kit comes with on-board sensors/actuators, ARM microcontroller with floating-point unit supporting DSP operations, Wi-Fi and Bluetooth/BLE wireless communication interfaces and on-board debugger.

## **2. Key Features of the INDUS Board**

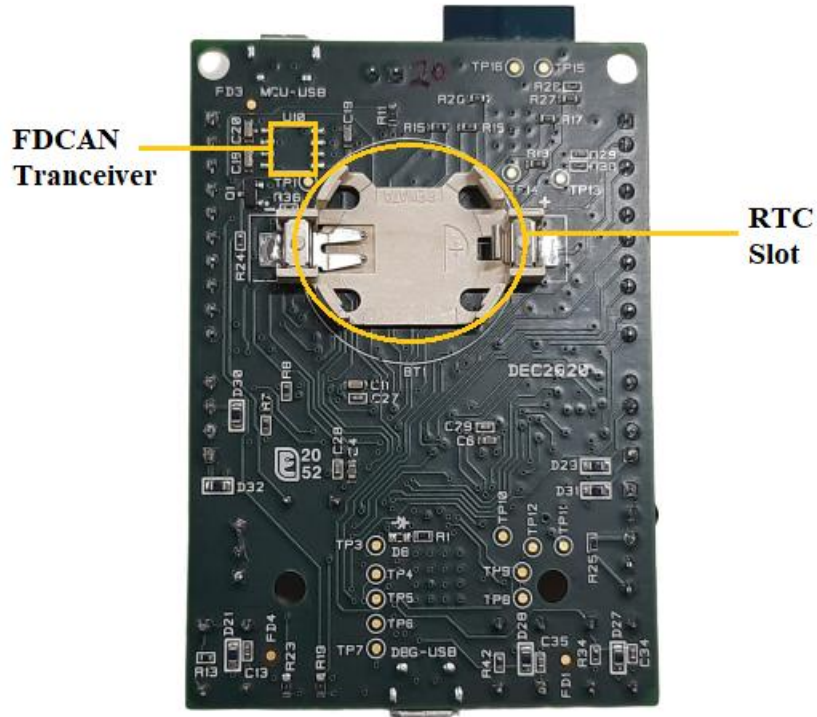
- Microcontroller: ARM Cortex-M4 based Microcontroller clocked up to 170 MHz
- Integrated MCU hardware modules: FPU, ART Accelerator and DSP Instruction support
- Integrated MCU accelerator modules: Mathematical hardware accelerators for trigonometric functions and filters
- Inbuilt MCU Memory: 32 KB SRAM, 128 KB Flash
- External onboard Memory: 32Kbit EEPROM (SPI)
- Dedicated on board SWD hardware debugger (USB-SWD)
- Communication Ports: USB (Device), SPI, USART/UART, I2C, FDCAN
- Analog Ports: ADCs, DACs, Rail to rail Comparators, Op-Amps with PGA mode
- Two headers with pinouts of : SPI, USART/UART, I2C, GPIO, ADC, DAC, Timers
- On board Wireless RF Connectivity: WLAN (Wi-Fi) and Bluetooth/Bluetooth Low Energy
- On board Optical Connectivity: Modulated IR Transmitter and Receiver for remote control
- On board Sensors and Actuators:
  - 3Axis Digital Accelerometer(I2C)
  - Digital Temperature Sensor(I2C)
  - Digital Relative Humidity Sensor(I2C)
  - Digital Light Intensity Sensor(I2C)
  - MEMS based quasi-digital Microphone (PDM)
  - Analog Temperature Sensor with Voltage output
  - Potentiometer for analog ADC input
  - Piezoelectric Buzzer
  - 2 LED indicators
  - 2 Push button switches

### 3. Indus IoT Development Kit Contents

#### Top



**Bottom**



Plastic Box with ESD Foam



Micro USB Cable

#### 4. Software and Resources

##### Download and Install Keil IDE

<https://www.keil.com/>

##### Download and Install Stm32CubeMX

<https://www.st.com/en/development-tools/stm32cubemx.html>

##### Download and Install Jlink Drivers

<https://www.segger.com/downloads/jlink/>

##### Download Provided Experiment SDK

#### 5. Programming Indus IoT Development Kit

- Open SDK provided and Extract it.
- In Keil MDK-ARM, open the project LED\_Blink.uvprojx and build the project.
- Connect the **Micro USB** to Indus IoT Board and power ON the device.
- In Keil MDK-ARM, go to **Project->Options for Target-> Debug**.
- Select **J-LINK** and click on **settings** In **Debug** menu, Select **Port as SW**, **Max Clock as 200KHz (can be changed)**. Device will appear on the SW Device menu.
- Got to **Flash Download** menu, select **Program, Verify, Reset and Run**. And click OK.
- Now click on **Download** button to flash the code into Indus Board and the User LEDs will start blinking now.

## **6. Support**

Technical support is available online at {link} and by email at [iot.training@cdac.in](mailto:iot.training@cdac.in).