

# Be ahead of the curve in education with **SIMATIC IOT2000**

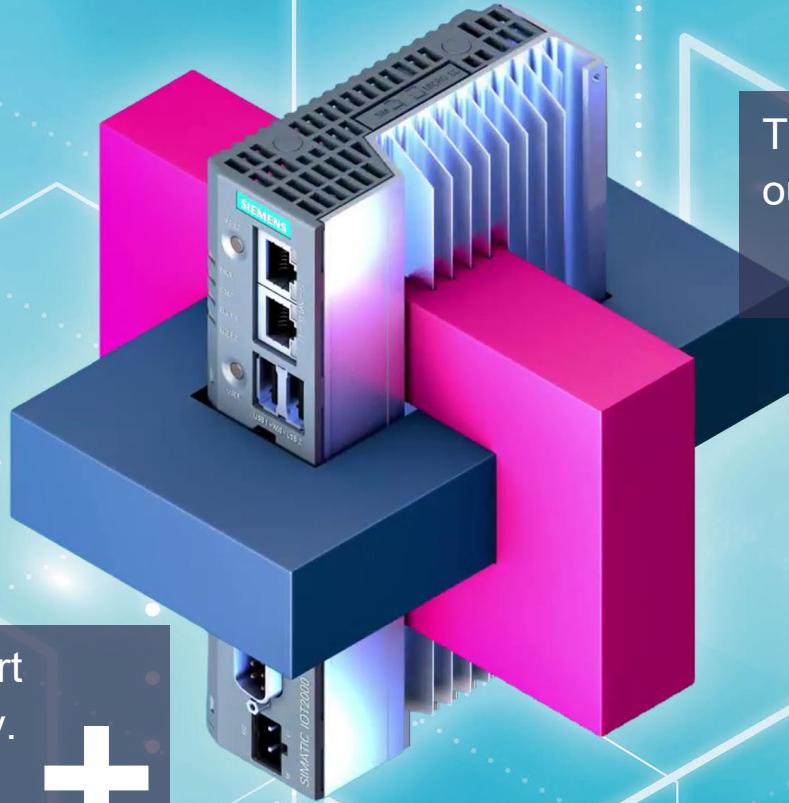
Siemens Automation Cooperates with Education

# SIMATIC IOT2000 at a glance

With this, Siemens offers a solution for open source applications for training – with **SIMATIC quality for 24/7 operation**.



**SIMATIC IOT2000** is the smart gateway for cloud connectivity.



The Internet of Things is changing our world.



You benefit from the open, expandable hardware, the Debian-based Linux operating system, and the PCIe-compatible and Arduino Uno R3-compatible interface.



# Fields of application for SIMATIC IOT2000

## No matter your branch of study:

- Electrical-, automation-, process engineering
- Computer science
- Civil engineering
- Mechanical engineering
- Mechatronics
- Robotics or
- Embedded systems

## SIMATIC IOT2000 is the right open IOT platform for:

- Technical high schools
- Vocational/engineering schools
- Community colleges
- In-house vocational training departments
- Technical colleges/universities
- R&D institutions

## Because IOT2000 covers a wide range of education subjects, such as:

- Micro controllers
- Software
- High-level languages
- Cloud connection
- Manage machine and production data

# The Highlight

**SIMATIC IOT 2050** enables students to gain hands-on experience on challenging projects, including on

- sensor and open- and closed-loop control applications with high-level language programming such as C/C++, Python, Java, JSON and Node.js/Node-RED.



“Be ahead of the curve and prepare yourself for the larger disruptive innovations taking place in education and industry with our new open source platform ecosystem.”

## The new **SIMATIC IOT2050**

Industrial IoT gateway is an open, industrial PC-like platform for implementation of diverse IoT, gateway and Edge applications.

It is distinguished by its large number of interfaces, expandability and user-programmability in high-level languages.

# IOT2050

# Overview

# IOT2050 Overview

## SIMATIC IOT2050

IOT2050 for high-level language programming



with

- Quad Core processor (AM6548 HS)
- 2 GB RAM (DDR4)
- 16GB eMMC
- 2x Ethernet Gigabit (IE/PN), RJ45
- 2x USB 2.0
- 1x serial interface (switchable RS 232/485/422)
- SD Card slot
- preinstalled SIMATIC Industrial OS 2.0 (incl. License) on the eMMC
- included battery for RTC
- 24 V DC supply voltage

## IO-Shield expansion

IOT2000 IO-Shield for connection of external signals



## SIMATIC IO-Shield

- SIMATIC IOT2000 Input/Output Module with
  - 5 DI
  - 2 DO
  - 2 AI
- ARDUINO Shield for IOT2020 / IOT2040 / IOT2050

## 3rd Party IO-Shield

- IKHDS-Powershield for IOT2050 with
  - 10 DE
  - 8 DA (PWM)
  - 2 AE
- CE testing

# IOT2050 Overview

# Setup

## **Simplified short guide for setting up your IOT2050 (6ES7647-0BA00-1YA2)**

## Installation with MicroSD Card

1. Provide needed hardware and install the "Win32 disc imager, Eclipse" software on the PC.
2. Install IO-Shield for connection of external signals.
3. Insert MicroSD card in the PC. It is designated for the operating system and provides space for programs and data.
4. Save [Debian Linux SD Card example image](#) to the SD card and insert in the IOT2000. Save [EMMc example image](#) into the IOT2000 via USB Stick.

It contains the ready-to-use Linux operating system with runtime environment for all supported programming languages.



# Programming

# High-level language programming with IOT2050

The [Quick Install Guide](#) and the [Operating Instructions](#) help you to get started with high-level programming with C/C++ and Eclipse.

Other programming environments are described using programming examples and FAQs in the [IOT2000 Forum](#).

For example: Python, Java, Json, Node.js/Node-RED.

# IOT2020/2040 – Previous models

# IOT2020/2040 – Previous models

## SIMATIC IOT2020/2040

IOT2020 or IOT2040 for high-level language programming



### SIMATIC IOT2020

- Intel Quark® CPU, x1000 (Galileo)
- 512 MB RAM
- 1x 10/100 Mbps Ethernet RJ45 interface
- 1x USB2.0
- 1x USB client
- SD Card slot
- 24 V DC supply voltage

### SIMATIC IOT2040

- Intel Quark® CPU, x1020 (+Secure Boot)
- 1 GB RAM
- 2x 10/100 Mbps Ethernet interfaces RJ45
- 1x USB2.0, 1x USB client
- 2x RS232/485 interfaces
- SD Card slot
- Battery-buffered real time clock (RTC)
- 24 V DC supply voltage

## IO-Shield expansion

IOT2000 IO-Shield for connection of external signals



### SIMATIC IO-Shield

- SIMATIC IOT2000 Input/Output Module with
  - 5 DI
  - 2 DO
  - 2 AI
- ARDUINO Shield for IOT2020 / IOT2040

### 3rd Party IO-Shield

- E.g. IKHDS Power Shield for IOT2020/2040 with
  - 6 DI
  - 5 DO (Relay)
  - 1 DO (PWM)
  - 2 AI
  - 1 AO

# IOT2020/2040 – Previous models

## Setup

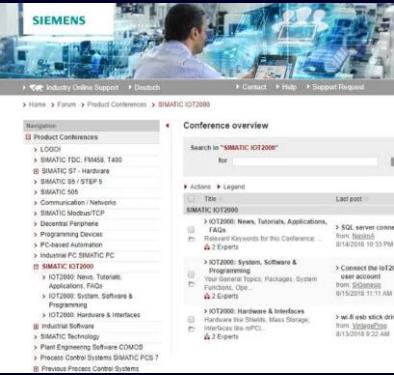
**Simplified short guide for setting up your IOT2020 or IOT2040**

1. Provide needed hardware and install the "Win32 disc imager, Eclipse" software on the PC.
2. Install IO-Shield for connection of external signals.
3. Insert MicroSD card in the PC. It is designated for the operating system and provides space for programs and data.
4. Save [Yocto Linux SD Card example image](#) to the SD card and insert in the IOT2000. It contains the ready-to-use Linux operating system with runtime environment for all supported programming languages.

Use the following guide to perform steps 1-4:

### [Setting up the SIMATIC IOT2000](#)

Experts are available in the [IOT2000 Forum](#). The forum provides instructions on the first project steps, application examples, introduction videos, downloads and FAQs.



## Programming

**High-level language programming with IOT2000**

The [Getting Started](#) helps you get started with high-level programming with C/C++ and Eclipse. Other programming environments are described using programming examples and FAQs in the [IOT2000 Forum](#).

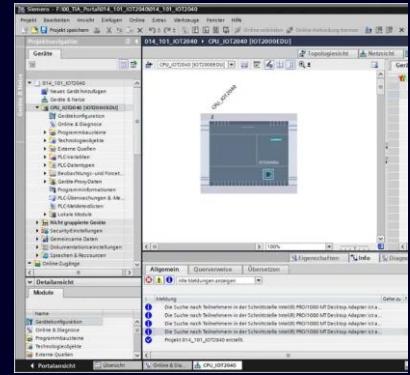
For example: Python, Java, Json, Node.js/Node-RED.

### **Specific hardware configuration with SIMATIC IOT2000EDU**

- In this module you will learn
  - how to setup the IOT2000 and
  - how to prepare the TIA Portal for the IOT2000.
  - Afterwards, a project is created and the hardware is configured.

### **FC programming with SIMATIC IOT2000EDU**

- In this module you will learn
  - the basic elements of a controller program, organization blocks (OB), functions (FC), function blocks (FB) and data blocks (DB).
  - In addition, we introduce library-compatible functions and function block programming.
  - You learn more about the Function Block Diagram (FBD) programming language and use it to program a function (FC1) and an organization block (OB1).





# SIMATIC IOT2050

## Your link to digital dimensions



- [SIMATIC IOT2040 – the intelligent gateway for industrial IoT solutions](#)
- [SIMATIC IOT2040 from Siemens – The IoT Gateway](#)
- [IoT 2040 – Digitalisierung | Siemens | Conrad Business Supplies](#)
- [SIMATIC IOT2000 – What is it](#)
- [Winner Announcement IOT2020 Contest](#)
- [SIMATIC IOT2000 & Arduino IDE Sketches](#)
- [IOT2020 Firmware 2.1.3 Preview](#)
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- [Win an IOT2020 and a chance for a \\$4500 Electronics LAB Kit](#)
- [Arduino Relay Shield and new lid for the IOT2020](#)
- [IOT2020 – the educational intelligent gateway for industrial IOT solutions](#)
- [The Siemens industrial IOT2020 educational gateway unboxing and technical look](#)
- [SIMATIC IOT2020 – Create SD card boot image and configure network](#)
- [Siemens IOT2020 – Installing and testing Node-Red, MQTT and SQLITE3](#)
- [Siemens IOT2020 – Running Arduino Sketch on Linux, I2C, SPI and PWM](#)

# Videos



- [SIMATIC IOT2040 – the intelligent gateway for industrial IoT solutions](#)
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# Join the SIMATIC IOT2000 community

**SIMATIC IOT2000** gives you lots of room for ideas. In our IOT forum, we supply you with updates, information, introductory videos, expert tips, and numerous applications that our users have implemented with **SIMATIC IOT2000**.

**SIMATIC IOT2000**  
SIMATIC IOT2000

EN DE Ask the Community

Sort by Default

All Current Latest

**IOT2000: News, Tutorials, Applications, FAQs**  
Relevant Keywords for this Category: > SIMATIC IOT2000 FAQs > SIMATIC IOT2000 Application > SIMATIC IOT2000 Documents

**IOT2020 / IOT2040**  
News, Tutorials, Applications, Your General Topics, System Functions, Programming advice and Hardware Questions about IOT2020 / IOT2040

**IOT2050**  
News, Tutorials, Applications, Your General Topics, System Functions, Operating Systems, Programming advice and Hardware Questions about IOT2050

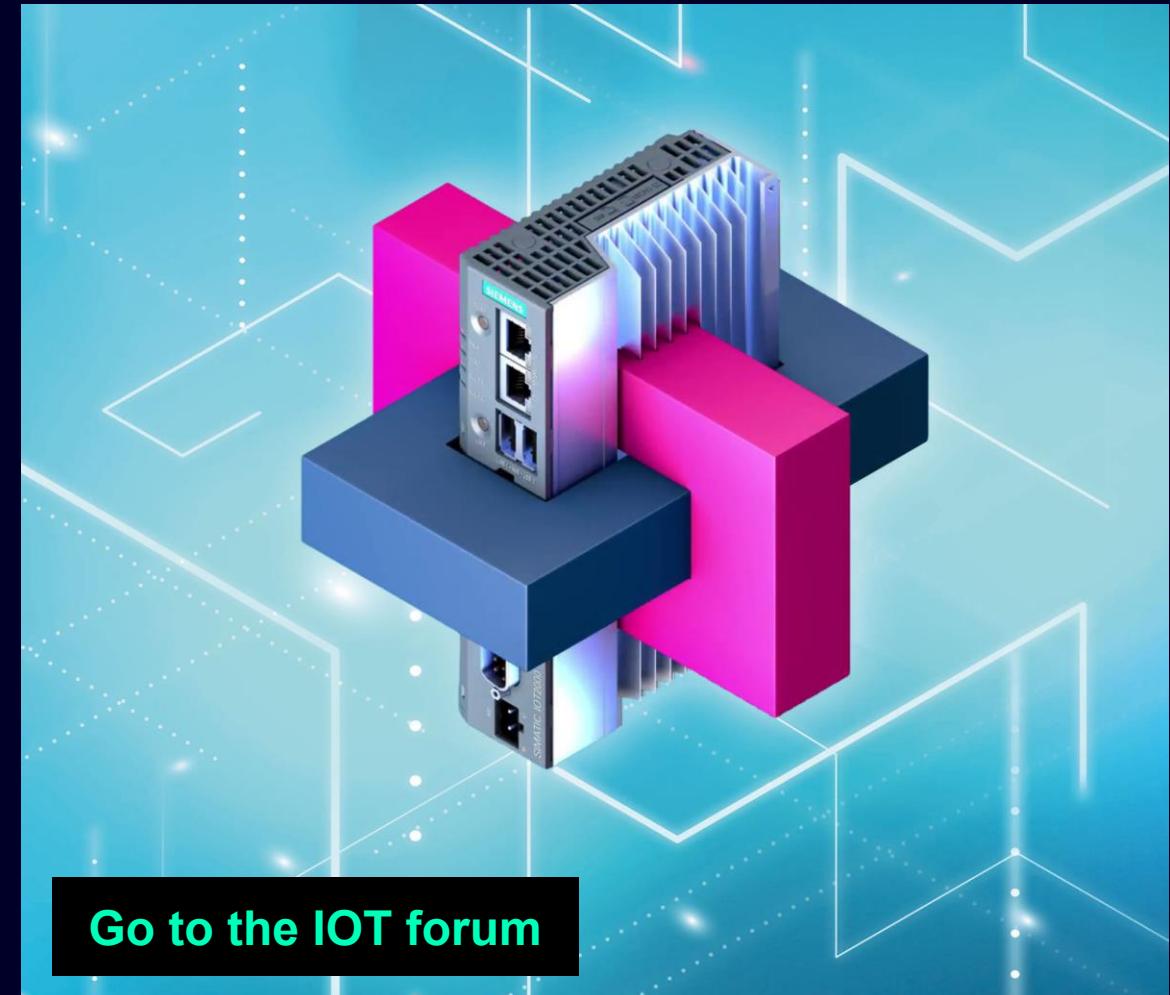
**IOT2000: Hardware & Interfaces**  
Hardware like Shields, Mass Storage; Interfaces like mPCIe, I2C, SPI

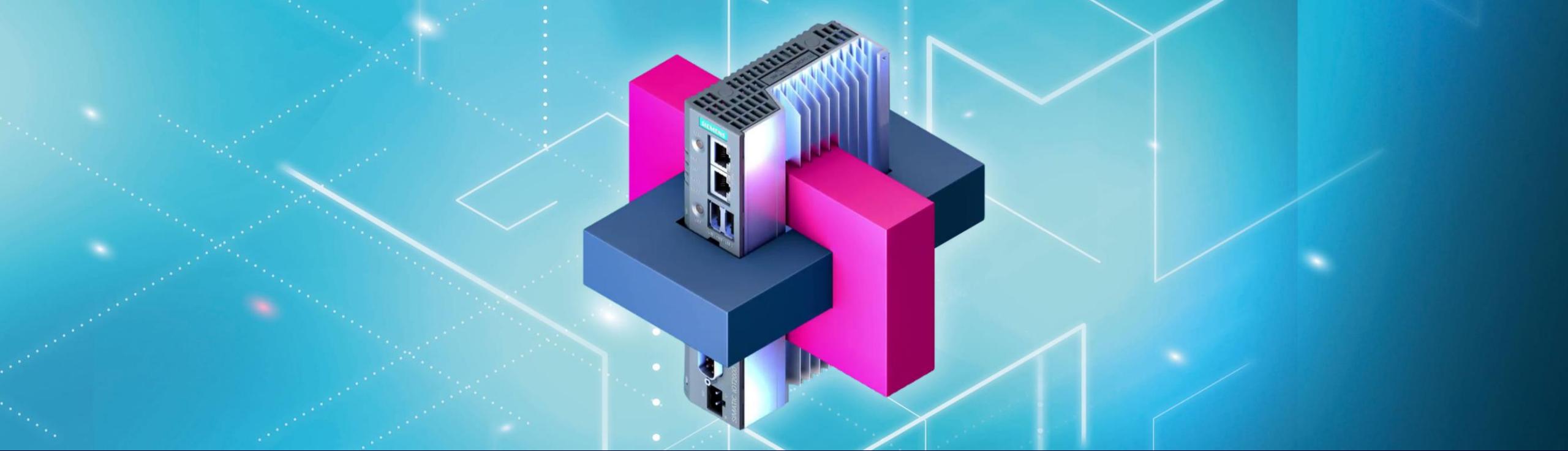
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- Automation Systems
- Industrial Communication
- PC based Automation
  - Programming Devices
  - PC-based Automation
  - Industrial PC SIMATIC PC
- SIMATIC IOT2000**
  - IOT2000: News, Tutorials, Applications, FAQs
  - IOT2040
  - IOT2050
  - IOT2000: Hardware & Interfaces
- Operation control and monitoring systems
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  - Low-Voltage Controls
  - Process Instrumentation / ProcessAnalytics
  - Building Technology
  - Solutions, Applications and Initiatives
  - General Categories

**Forum Help**  
Visit our Future Forum Help section for the Forum Terms.

Explore now





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