The mission of emBRICK® is offering an **open-source** embedded I/O platform to realize cost efficient and industrial suited control systems by assembling existing modules (bricks)

emBRICK® combines in a perfect way the cost-efficient and tailored characteristics of a dedicated embedded system with the ready to use and flexibility of a PLC system. To ensure a high acceptance, it is an open and free system. I.e. besides buying existing devices, everyone can develop his own components to realize easily his individually tailored, cost-efficient and industrial-suited measure and control system.

Typical Applications

- Small, medium and large size industrial measure and control systems (autonomous, distributed)
- Autonomous single box control solutions i.e. with HMI and communication interfaces
- Rapid hardware prototyping system for control and measuring applications
- PLC replacement (i.e. with a Soft-PLC, IPC or an embedded controller)
- Physical front-end for (I)IoT, I4.0, Edge Controller, Testing Systems

Advantages / Characteristics

- free - also for commercial use in own appliances (for pure EMS with a license fee)
- open - supplying reference schematics, protocol source code, samples and starter kits
- more than 100 components (70 I/O bricks) from different producers available
- available as open frame components or in a DIN-rail enclosure
- uses standard SPI (local) or LAN, RSxx, CAN (remote) for communication.
- cost reduction by sectoral purpose modules, for direct sensor/actor adaption (building, energy, water, ...)
- adaptable to all systems, using common, low cost standard µCs/components
- 50 ... 33% price compared to common PLC systems (complete system view)
- scalable local and remote topologies, 5 ... >1000 I/Os, up to 2ms update rate (deterministic)
- low own power consumption, average 50mW/slave module in operation (outputs inactive)
- easy installation, no configuration necessary, simple plug modules together and use
- works with various well known platforms/languages

Available Hardware Products

Beside own developments, currently the following components are available from different producers:

Slave-Modules	70 different modules for the sectors: General Purpose, Building Automation, Process Control (Safety, Medical/Analytics planed)
Master boards	Core: Cortex-M3/4/7, PIC24/32; HMI: 128x64 ... WVGA
Couplers-/Adaption boards	for LAN, WLAN, CAN, RSxxx / Raspberry Pi, Beaglebone Black, Arduino
Appliances / Enclosures	ready Single Box Controller for and DIN-rail and wall mounting

Available Host Platforms, Connectivity

emBRICK® can be adapted to all platforms with almost every footprint/performance. For master units, currently the following system implementations are available (others planed):

Computer platforms	PC, IPC, Embedded-PC, Module-PC, Raspberry Pi, Beaglebone Black
µController platforms	ARM-Ax, ARM-Cortex-Mx, Microchip PIC24 / PIC32, Arduino
Host Interfaces	Ethernet, CAN, RS232, RS485
Wireless Interfaces	WLAN, PAN

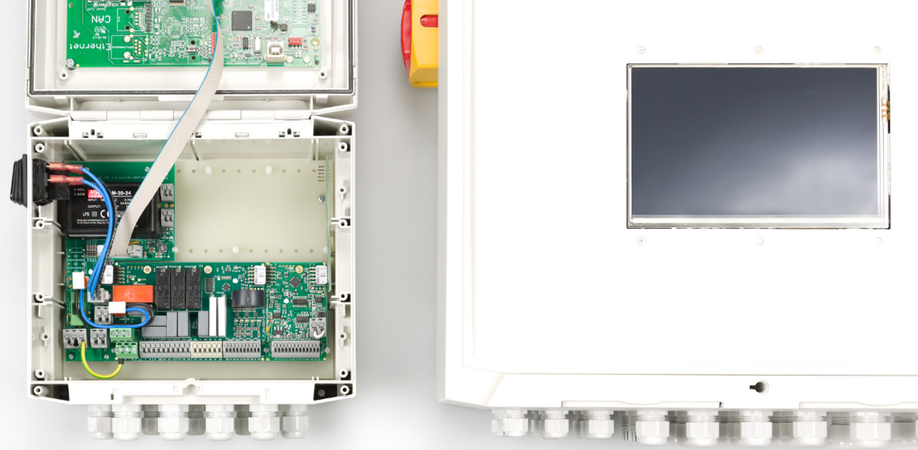
Available Programming Platforms

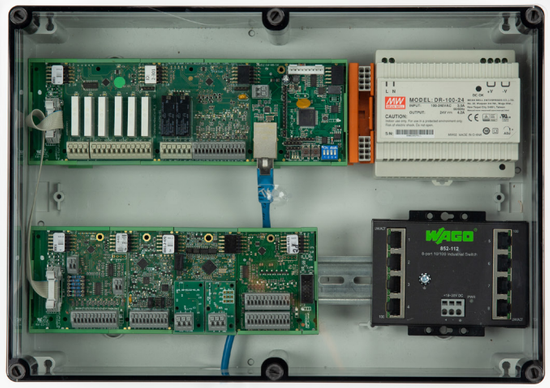
emBRICK® can be programmed by various systems, languages and IDEs (integrated development interface). Currently for master units the following platforms are available (others planed):

OS / RTOS / Middleware	Windows, Linux, FreeRTOS, Gamma, proprietary
Programming languages	C, C++, IEC61131, IEC64199, Model-based (by UML), planed: C#, Phyton
Model-based / Soft-PLC	CODESYS, logi.CAD, 4diac, radCASE, Enterprise Architect, LabVIEW, planed: MatLAB
C/C++ IDEs	MS-VC, GCC, MPLab (Microchip), Geany (Raspberry Pi), any other C/C++ IDE

For detailed information, product overview, datasheets, downloads see www.embrick.de

emBRICK
modular hardware

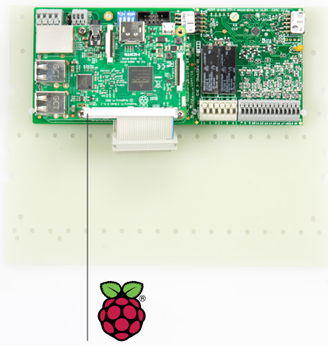


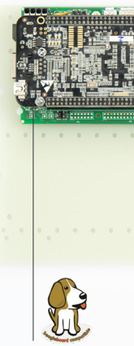


MODULAR open-source I/O-SYSTEM
Embedded PLC/Edge Controller out of the box

more than 100 components | more than 70 bricks available

Works with:





Assemble your individual Embedded Solution with emBRICK®. Your freedom out of the box.

emBRICK
modular hardware

Your Business

- Industrial
- Building
- Agriculture
- Energy
- Water Purification
- Medical
- Education/Maker
- Your Business

Your Application

- Automation
- Process Control
- I4.0
- (I)IoT
- Egde-Control
- Testing
- Data Acquisition
- Rapid-Prototype
- Your Application

Installation

Integration

- Patchboard
- Rail (open frame)
- Front Mounting
- Merge Units
- Rail (closed box)
- Your System

Standalone / Autonom

- BC160 – 2,8“
- BC200 – 4,3“
- Control Cabinet
- BC200 – 7“
- Control Box
- Your System

Cloud

IBM Cloud · aws · Google Cloud · Azure · Your System

HTTP, MQTT, ...
OPC-UA, Modbus, ...
Gamma, SQL, ...

Controller
Master

CPU-Bricks

Cortex · Microchip · Raspberry Pi · ARM · Arduino · intel · Your System

Operation System

freeRTOS · Linux · Windows · Your System

Electric Adaption
Slaves

I/O-Bricks

- General Purpose CAE-G-#
- Safety CAE-S#
- Building CAE-B#
- Process Control CAE-B#
- Testing CAE-T#
- Medical/Analytic CAE-M#
- Education/Other CAE-E#
- Customized CAE-C#
- Your System

LAN/RS485/RS422/CAN

Programming

Tool / IDE

openHAB · radCASE model-based tools · CODESYS · logi.CAD · 4diac · Gamma · Visual Studio · LabVIEW · MATLAB · Your System

Language/Methode

C# / C++ · IEC 61131 IEC 61499 · UML · Java · python powered · Your System

Wide Area Distribution

Coupling Bricks