Stack / System on Module

presented by

Products & Service Overview

port PROFESSIONAL INDUSTRIAL COMMUNICATION

Stacks, Tools and Middleware	Integration, Consulting & Design In	OEM & Customer-specific Engineering & Production	Module & Devices
✓ CANopen ✓ J1939 ✓ PROFINET ✓ EtherNetIP ✓ EtherCAT ✓ POWERLINK ✓ MODBUS TCP ✓ GOAL - Middleware ✓ CC-LinkIE TSN ✓ CC-linkIE Field Basic ✓ Design Tools ✓ Analysis Tools ✓ Configuration Tools	✓ Stack - Integration in your Hardware ✓ Creation of the List of Requirements ✓ Design In Service ✓ Hardware & Software Consulting ✓ Training (on Request) ✓ SMA Service Maintenance Agreements ✓ Pre-Certification Test	✓ OEM Development ✓ Customized Software-Engineering ✓ Customized Hardware-Engineering ✓ Gateway, I/O, Switch and Router Engineering ✓ Security relevant Engineering ✓ E²MS	✓ SBC – single Board Computer ✓ SoM – System on Module ✓ SoM – Stack on Module ✓ CAN / CANopen - Hardware ✓ I/O Devices ✓ Gateways

goal INDUSTRIAL COMMUNICATION MIDDLEWARE

www.port.de / www.port-automation.com / www.system-on-module.com

Email: service@port.de / Phone: +49345777550

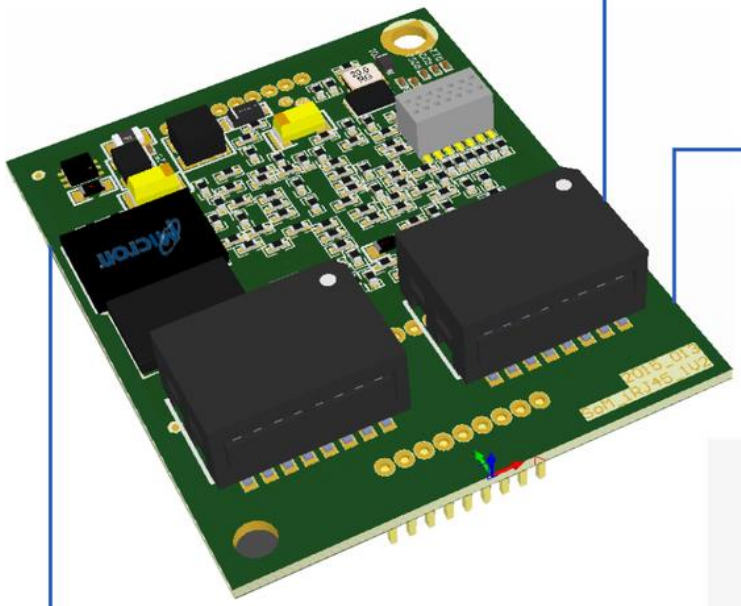
Stack / System on Module

- The SoM (Stack / System on Module) offeres a lot of functionalities in combination with real time communication possibilities.
- various fieldbus protocols are available "on board". **PROFINET CC-B**, **EtherNetIP (CIP)** and **EtherCAT**.
- The SoM modules from PORT, significantly reduce development time and investments in license fees.
- PORT supports customers in the Design-In phase and can obtain the approvals and certifications as an extra service.
- all fieldbus systems pre-certified
- Engineering Tools also available

SoM Facts Step 1

integrated
Ethernet Trans-
former for 2
separate ports

2 PHYs on Board
integrated
L2+ managed
Ethernet Switch



EMC tested
cUL CE RoHS
REACH

3.3V DC supply
voltage necessary
for complete
module operation

easy design-in
simple footprint

very small Size:
32,27mm * 40,00 mm
mounting height:
9,63 mm
easy production

SoM Facts Step 2

Power supply and reset control via male multipoint connector with 1.27 mm pitch

4 wire Serial Peripheral Interface for Application Controller Communication (SPI)

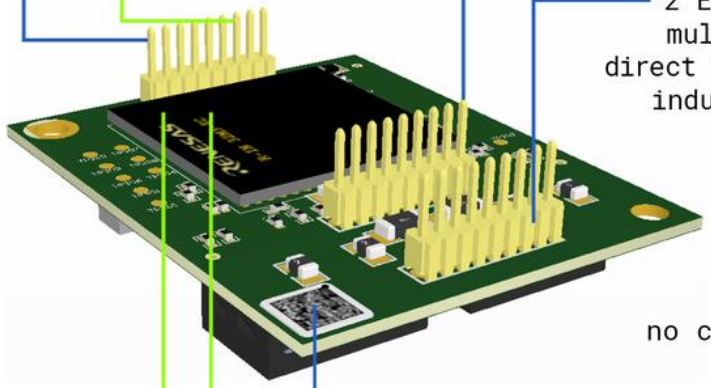
many SPI drivers available

2 CAN ports at male multipoint connector TX/RX

2 Ethernet ports at male multipoint connector for direct routing to individual industrial ethernet jacks

RJ45 +
M12 +
M8 +
V14 +
Mini ETH +
other +

no change of the housing necessary



Multi-Protocol Industrial Ethernet communication controller with (pre certified)

+ PROFINET CC-B
+ EtherNet/IP / DLR
+ EtherCAT
+ CANopen(optional)

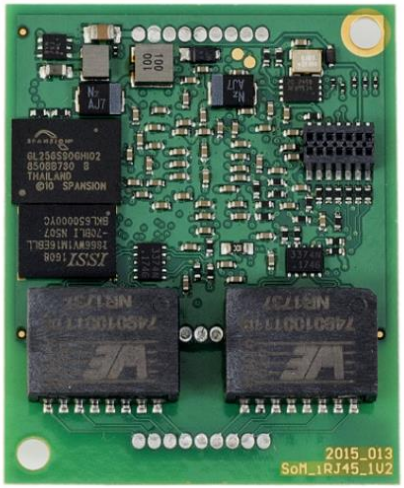
on Board

powered by goal

incl. Management Tool (configuration) Optional: very helpful Design- and Device Tools

SoM versions

Currently two versions are available:



SoM IoT Based on RENESAS RIN32M3

Based on a RIN32M3EC CPU in combination with GOAL technology from PORT, this SoM offers **PROFINET CC-B, EtherNet/IP CIP, EtherCAT and CANopen** on board. Simply connect via the SPI of your host controller - and your applications are already multi-protocol capable.

SoM IoT Raspberry PI

Integrating Raspberry PI into networks such as PROFINET, EtherNetIP and EtherCAT - **no problem with the Raspberry PI expansion board from port.**

How to connect the SoM with the Host CPU

Based on a RIN32M3EC CPU in combination with GOAL technology from PORT, this SoM offers PROFINET, EtherNetIP, EtherCAT on board.

Simply connect via SPI of your host controller - and your applications are already multi-protocol capable.

Functions & Communication

- ✓ Complete dual Ethernet interface compliant to IEEE 802.3 including transformers and PHYs
- ✓ Embedded 2-port Ethernet switch for bus and ring network topologies
- ✓ High speed SPI interface and power pins to connect the module to the host CPU
- ✓ Integrated processor to handle real-time industrial Ethernet protocols
- ✓ All Protocols on board available
- ✓ Support of **PROFINET RT (incl. MRP) , EtherNetIP (incl. DLR), EtherCAT** real-time communication standards
- ✓ Ethernet ports supporting 10 Mbit/s and 100 Mbit/s with auto negotiation
- ✓ Device configuration via “Management Tool” and API through application controller
- ✓ Comprehensive tool support and application examples in source code for many platforms (STM, RENESAS, NXP, TI…) and LINUX

Position within the portfolio of port

- ✓ Port is very well known for Protocol Stacks
- ✓ Contrary to our competitors we have a lot of priceless Know How from employing an own stack in countless customer projects.
- ✓ We learned our trade the old-fashioned way: From the very beginning
- ✓ We are selling not only a System on Module – we sell likewise a Stack on Module and with it our priceless experience.

Advantages

- ✓ cost effectiv and easy to integrate
- ✓ one module for all market leading real-time communication systems
- ✓ open interfaces for more flexibly in the connector area
- ✓ works with RJ45, M12, M8 or MiniIO
- ✓ extensive tool offer for management and integration makes the design very efficient
- ✓ integrated update service – you get always the latest firmware

EVAL Kits

EVAL Kits für following systems are are available:

- STM32F4
- STM32F7
- RENESAS Synergy S7
- RaspBerry PI
- NXP LPC55
- RENESAS RL78/G14

- More are under development an can be finished with limited efford.

Important: host EVAL board requires ARDUINO interface.

https://www.system-on-module.com/evaluation-boards/

What CPU can be used?

Using the GOAL middleware on SoM and µGOAL on the host platform, almost all controllers (starting from 8-Bit) with available SPI can be interfaced to the SoM.

Introduction
µGOAL describes a software package, which allows integration of the SoM module into applications without using a full GOAL framework platform. By stripping down the required dependencies from the GOAL industrial communication framework, integration is possible into a wide range of platforms from a simple ATMEGA 8-bit CPU with 2KB of RAM up to a Linux PC.

µGOAL mimics the required functionality from the GOAL framework specifically needed by the application controller framework. It is configurable in different ways to ensure compatibility with a wide range of targets. Most GOAL functionality is not available, however the CCM specific examples for fieldbus applications can be reused mostly without adaption.

https://portgmbh.atlassian.net/wiki/spaces/IRJ45SOM/pages/138739774/004+-+uGOAL+-+Introduction#Introduction

Engineering Tools

For configuration two different engineering tools are availabe:

https://portgmbh.atlassian.net/wiki/spaces/ICE/overview

Industrial Communication Explorer

(inclusive)

The Industrial Communication Explorer is an accompanying tool for all devices powered by the GOAL Device Detection protocol such as SoM/iRJ45 device and assists in developing applications on Windows, Linux and Mac OS.

The tool allows to configure the device, creating snapshots of the current state, update the firmware, read logs and initiate a PROFINET, EtherNET/IP or EtherCAT connection using the integrated master emulators.

Thus, the tool can also assist in the production line of devices for setting the default state of the device such as the initial firmware or device configuration.

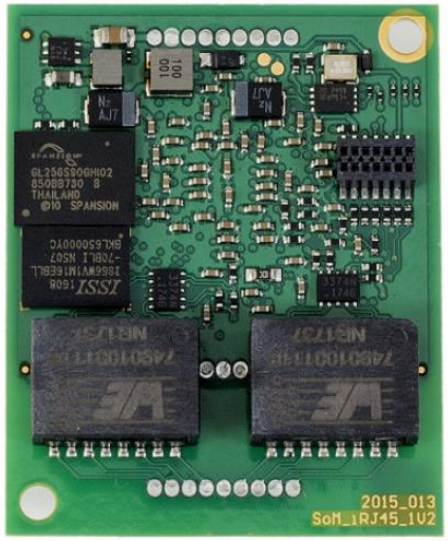
https://portgmbh.atlassian.net/wiki/spaces/ICCX/overview

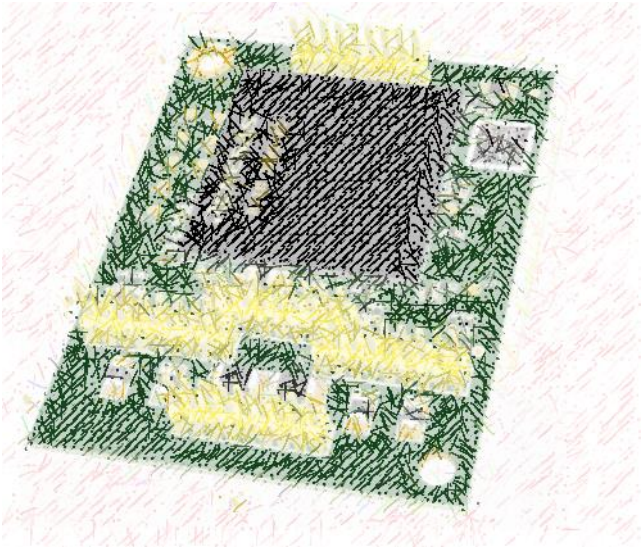
Industrial Communication Creator

For comfortable and easy configuration and object dictionary management, port provides its Unified Industrial Communication Creator Platform which enables the user to develop communication solutions using port stacks rapidly. The individual functionality for each stack is realized by plug-ins for each protocol. So the user has only to learn how to work with one tool.

- Generation of stack configuration file;
- Generation of software model definition (e.g. slots and modules, connections, object dictionary, lines, etc.) file;
- Generation of device description (GSDML, EDS, ESI, CSP+) file;
- User assistance for each configuration setting;
- Detection of common configuration errors;
- Step by step configuration guide in form of task list.

Road Map





2020

PROFINET CC-B
EtherNetIP
EtherCAT

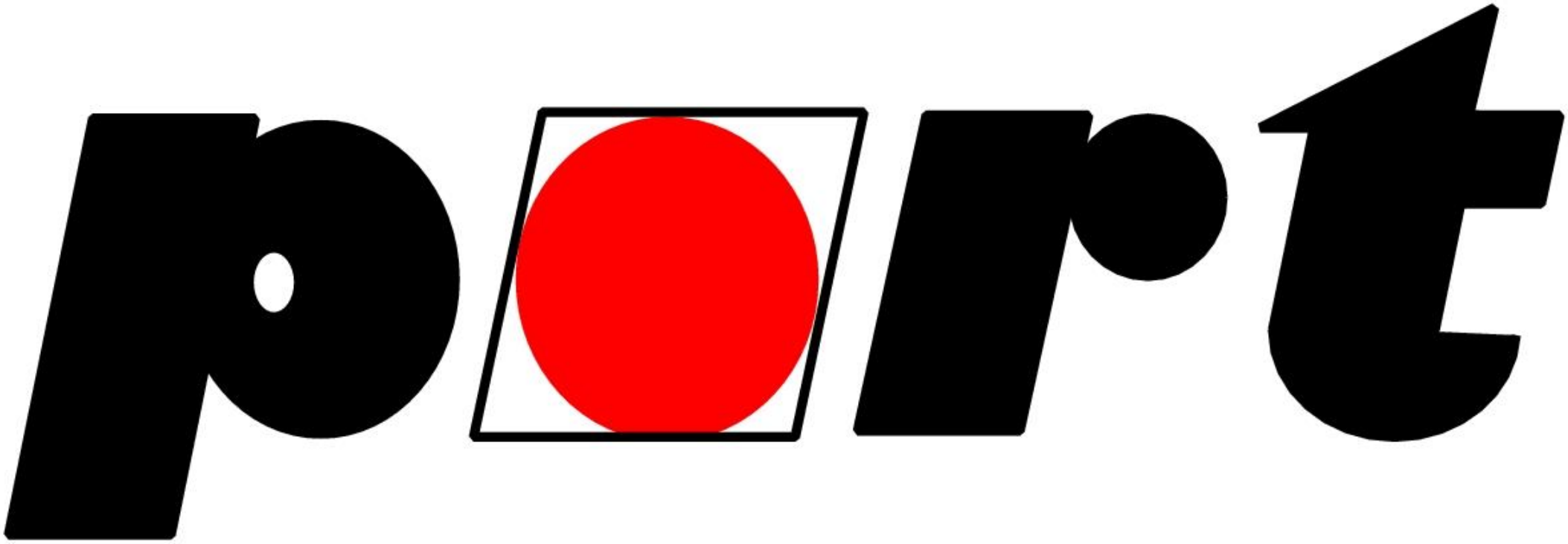
2021

2x UART, 1xI2C, 2xSPI, RS485
and interrupt capable GPIOs

2022

CC-LinkIE TSN
PROFINET CC-D TSN

www.mev-elektronik.com



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