SoCe

CPPS - Gate40

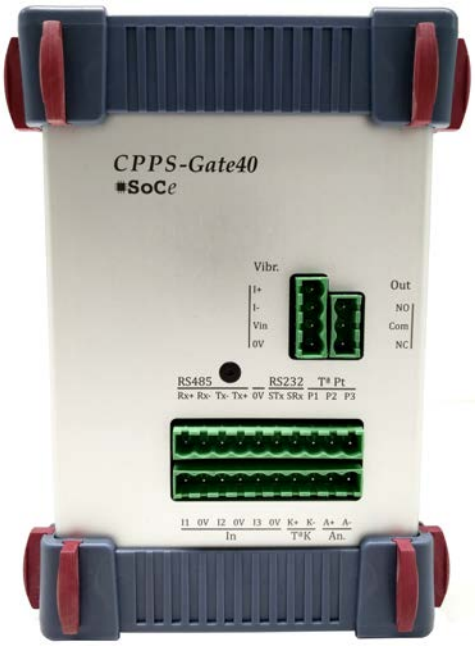
Sensor

Merging the Industrial and IT worlds

General Description

The new era in Industry demands interconnecting heterogeneous systems, high computational capacity and flexible interfaces with the "physical" world.

CPPS - Gate40 Sensor is a powerful Smart Gateway that faces Cyber-Physical Production System requirements. It merges high computational capability, flexible and high availability industrial and IT networking, physical processing sensing and database management.



CPPS - Gate40 Sensor simplifies the implementation of advanced data acquisition and industrial networking infrastructures focused on Big Data analytics, M2M solutions and applications for remote monitoring and automation.

CPPS - Gate40 Sensor consists of a modular embedded hardware and software system, designed to offer easy access to a huge variety of field devices through a wide range of industrial interfaces. It is powered by SMARTZynq module and by high-availability and synchronization IPs from SoCe. This technology is field proven and present in more than 15 countries worldwide.

CPPS - Gate40 Sensor integrates different technologies and protocols to offer a Smart gateway solution which allows users to achieve accelerated business development into the IoT environment, merging the plant with the IT world.

Hardware Key Features

The "heart"' of the ***CPPS - Gate40 Sensor*** is a Xilinx Zynq device. This is the last generation of programmable System-on-Chip platforms. It embeds in the same device a double-core ARM-9 processor and a high-end FPGA section.

Communication interfaces:

- 4 SFP cages for 10/100/1000Base-Tx Ethernet copper or 1000Base-X fiber. These interfaces are driven by the FPGA section of the Zynq device providing low-latency switching capabilities. All switching implementations include an internal port that provides access to the network to the internal ARM9 multiprocessor.
- 1 10/100/1000Base-Tx Ethernet copper port directly attached to the internal ARM9 multiprocessor.
- 1 serial RS232 port.
- 1 half and full duplex RS485 port with Serial Modbus and Profibus support.

Memory features:

- 8 Gb DDR3: Fast DDR memory to store operating systems, software applications, protocols stacks or large buffers.
- 256 Mb Quad SPI Flash: Memory for firmware and bitstream storage.
- µSD connector: High density and low cost large storage for complex operating systems, permanent data storage and quick upgrade.
- EEPROM with unique MAC integrated: Ready to use unique MAC in each module to reduce the time-to-market of the customer product.

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Networking Key Features

SoCe IP cores provide on the FPGA section of the internal SoC chip flexible and powerful networking capabilities for both the Industrial and the IT Section. Tri-speed Legacy Ethernet ports can be combined with high availability "Plug&Work" Ethernet ports based on HSR and PRP zero-delay recovery time redundancy protocols. Among other switching configurations, it is worth to mention:

- 4x Legacy Ethernet ports.
- 2x HSR/PRP ports and 1 Legacy Ethernet port.
- 4x HSR/PRP ports.
- 2x HSR/PRP or Legacy ports and 2x Real Time Profinet ports.
- 2x HSR/PRP or Legacy ports and 2x Ethernet IP/DLR ports.

IEEE 1588 SoCe technology for sub-microsecond synchronization integrated on *CPPS - Gate40 Sensor* offers an "out-of-the-box" for IEEE 1588 implementations. The device can work as Master of the network, Slave and Boundary Clock. Furthermore, all SoCe switching implementations include Transparent-Clock functionality ensuring high precision synchronization in different and complex implementations.

Cyber-security Key Features

- Zynq-7000 Secure Boot, which provides private key cryptography (AES/HMAC) and public key cryptography (RSA) allowing sensitive software to be encrypted and authenticated in a chain of trust.
- IEEE 802.1X protocol, which provides an authentication mechanism to the devices wishing to attach to the network.
- MACsec standard, which defines a security infrastructure to provide data confidentiality, data integrity and data origin authentication.

Applications and Services

- Soft PLC
- Modbus Server/Client management
- HMI integration
- Synchronization: IEEE 1588v2 Master/Slave/Boundary Clock, SNTP to synchronize system clock in Internet
- Database management: CouchDB, SQL, Cassandra, JSON, etc.
- Sensor RAW data preprocessing by hardware and software
- OPC UA support
- Fiware
- Event and Log
- Environmental Monitoring
- Multiprotocol stack: Siemens S7, Profinet, Profibus, etc.
- Maintenance: Configuration backup and restore
- Management: SNMP/Web/Telnet/CLI, SSL/SSH for secure management

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Specifications

Network interfaces characteristics
4 SFP cages for 10/100/1000Base-Tx Ethernet copper or 1000Base-X fiber with LED indicators
1 10/100/1000Base-Tx Ethernet copper port with LED indicators
1 serial RS232 port
1 half and full duplex RS485 port with Serial Modbus and Profibus support
1 USB Female B type connector
External sensor interfaces characteristics
Digital inputs: Up to 3, 0-24 V
Analog input: 0/4-20mA
Potential-free relay output 250 V AC max
Temperature sensor interfaces: 1 three-wire RTD (PT100) and 1 thermocouple Type K
Integrated electronic piezoelectric (IEPE) accelerometer input
Power Supply
supports input voltage range from 6V DC to 30V DC
Physical characteristics
Dimensions: 174 mm x 125 mm x 62 mm
Material: aluminium case with a tough plastic frame and interchangeable rubber brackets
Mounting: DIN rail wall mounting
Working temperature
-40 ºC to +85 ºC

Supported standards
IEC 62439-3 Clause 4 PRP "Parallel Redundancy Protocol"
IEC 62439-3 Clause 5 HSR "High-availability Seamless Redundancy"
IEEE 1588v2 PTP "Precision Time Protocol" Default, Power Profile and IEC 61850-9-3
IEEE 802.3 for 10Base-T
IEEE 802.3u for 100Base-TX
IEEE 802.z for 1000Base-X
IEEE 802.1Q for VLAN Tagging
IEEE 802.1D for STP (Spanning Tree Protocol)
IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol)
IEEE 802.1Q for VLAN based Ethernet Priorities
IEEE 802.1p for Class of Service (CoS)
IEEE 802.1X access control for port based and MAC based authentication, MAC-Port binding and authentication for login security
IEEE 802.1ab for Link Layer Discovery Protocol (LLDP)
Profinet IEC 61158/IEC 61784
Profibus IEC 61158/EN 50170
SNMP RFC 1157/RFC 3410
SNTP RFC 4330

Ordering information and contact

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