

10GBASE-R Ethernet PCS (PCSR) IP

Overview

Cadence IP Factory delivers custom, synthesizable IP to support specific design requirements.

The **Cadence 10GBASE-R Ethernet PCS (PCSR) IP** provides the logic required to integrate a 10GBASE-R PCS into any system on chip (SoC).

Compliant with IEEE Standard 802.3 Clause 49, the **Cadence 10GBASE-R Ethernet PCS (PCSR) IP** has several optional features to customize the PCS for the specific needs of any application. Support for Forward Error Correction (IEEE 802.3ba-2010 Clause 74), and PHY management through MDIO, is also available.

The **Cadence 10GBASE-R Ethernet PCS (PCSR) IP** is architected to quickly and easily integrate into any SoC, and to connect seamlessly to a Cadence, or third-party, MAC through a demultiplexed XGMII (64-bit data, 8-bit control, single clock-edge interface). Connection to the SerDes is through a programmable 16- or 32-bit interface.

The **Cadence 10GBASE-R Ethernet PCS (PCSR) IP** is silicon proven, and has been extensively validated with multiple hardware platforms.

Cadence IP Factory offers a comprehensive IP solution that is in volume production, and has been successfully implemented in more than 400 applications.

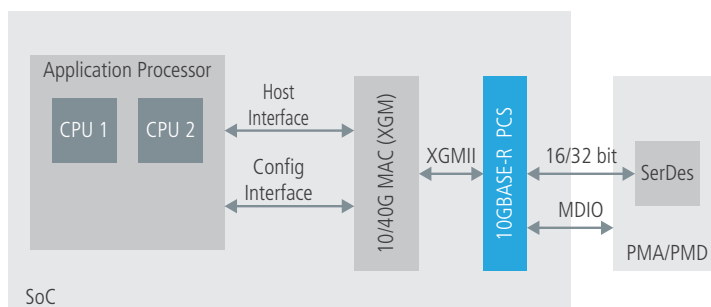


Figure 1: Example System Level Block Diagram

Key Features

- Compliant with IEEE Standard 802.3 Clause 49
- Support for IEEE 802,3az Clause 78 Energy-Efficient Ethernet
- Internal loopback modes available
- Data scrambling on transmit path and descrambling on receive path
- Programmable PRBS31 and PRBS9 (Clause 68) test pattern generators and error checkers
- 64b/66b encoding/decoding
- Clock tolerance compensation on receive path
- Configurable 16- or 32-bit SerDes interface
- Optional Forward Error Correction (Clause 74)
- Optional MDIO interface

Product Details

The **Cadence 10GBASE-R Ethernet PCS (PCSR) IP** is designed as an on-chip PCS for connecting a 10G MAC to a 10G SerDes. It supplies all PCS functionality as well as some PMA features.

64b/66b Encoder and Decoder

The 64b/66b Encoder takes eight octets (64-bits) from the demultiplexed XGMII and codes them into a single 66-bit block.

The 66b/64b Decoder takes 66-bit blocks from the Gearbox or, after FEC transcoding and error correction, from the optional FEC block, and decodes the block into eight octets.

Data Scrambler and Descrambler

The Data Scrambler uses the algorithm defined in IEEE 802.3 Clause 49.2.6 to scramble the data after line coding.

The Data Descrambler reverses the scrambling algorithm applied by the Data Scrambler in accordance with IEEE 802.3 Clause 49.2.10.

Gearbox and SerDes Interface

The Gearbox converts signals between the 66-bit width used by the PCS and the bit-width used by the 10G SerDes. The SerDes interface is configurable for either a 16-bit or 32-bit width.

An optional MDIO interface is also available for PHY management.

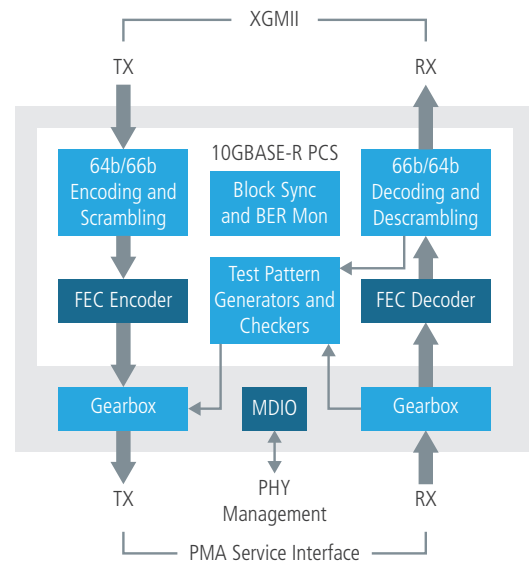


Figure 2: IP Level Block Diagram

Test Pattern Generators

The **Cadence 10GBASE-R Ethernet PCS (PCSR) IP** has built-in PRBS31 and PRBS9 (Clause 68) test pattern generators and checkers for testing the integrity of the link. A separate square wave pattern generator is also included.

Cadence IP Factory

Cadence IP Factory can deliver various configurations of PCS to meet your design requirements.

For more information, visit www.cadence.com/ip

Benefits

- Low Risk solutions – Silicon proven design
- Ease of Use – Customizable with easy integration
- Designed by an industry leader – Cadence is an active contributor to the 802.3 standards working groups

Related Products

- Cadence® Verification IP for Ethernet
- 10G Ethernet MAC IP (XGM)
- 40GBASE-R PCS IP (PCSXL)

Deliverables

- Verilog HDL
- Cadence® Encounter® RTL Compiler synthesis scripts
- User guide with full programming interface, parameterization instructions, and synthesis instructions
- Verilog testbench

Available Products

- 10GBASE-R Ethernet PCS IP (PCSR)



Cadence Design Systems enables global electronic design innovation and plays an essential role in the creation of today's electronics. Customers use Cadence software, hardware, IP, and expertise to design and verify today's mobile, cloud, and connectivity applications. www.cadence.com