

# MAC-1G

Gigabit Ethernet Media Access Controller

## MAJOR FEATURES

- ◆ IEEE 802.3 CSMA/CD standard compliance enables 10/100/1000 Mbps Ethernet modes
- ◆ Support for half- and full-duplex Ethernet links
- ◆ Compatible with a wide range of PHY interfaces - MII, GMII, RMII, RGMII
- ◆ Internal OCP socket with AMBA® AHB and generic PPCI wrappers for system bus interface
- ◆ Advanced mechanism for flexible address filtering against physical addresses and/or hash table
- ◆ Scatter-gather DMA controller with a configurable 8/16/32/64-bit data bus length
- ◆ Descriptor/buffer architecture for data storage
- ◆ Configurable transmit/receive FIFOs with programmable threshold levels and "store and forward" functionality
- ◆ Fully-automated MII Serial Management data framing for integration with an external PHY
- ◆ Low power capabilities

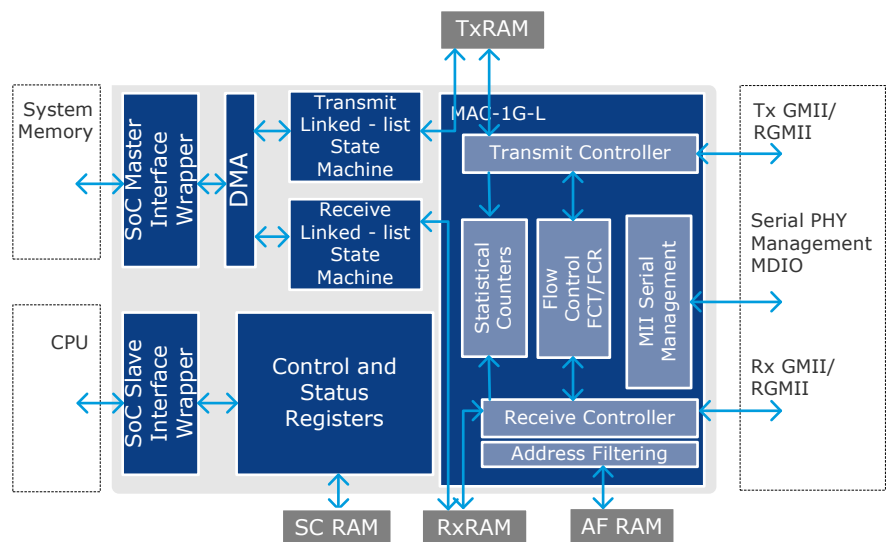
## OVERVIEW

The **MAC-1G** Ethernet Controller implements Carrier Sense Multiple Access with Collision Detection (CSMA/CD) algorithms defined by IEEE 802.3 for media access control over the 10Mbps, 100Mbps and 1Gbps Ethernet.

The controller is available with most popular Ethernet PHY interfaces and the OCP socket for straightforward implementation of any system bus interface. AMBA® AHB and generic PPCI interface wrappers and test benches are available off-the-shelf and may be delivered upon request.

The **MAC-1G** controller is a fully user-configurable IP, with the size-optimized Lite version available. The Lite version implements full 802.3 CSMA/CD standard 10/100/1000 Mbps Ethernet operation modes. It uses simplified FIFO interface and operates directly on input/output signals instead of instantiating a DMA controller and CSRs, respectively.

## BLOCK DIAGRAM



# MAC-1G

## BENEFITS

- ◆ High configurability level together with various host interfaces make the IP suitable for a large scope of SoC applications
- ◆ Advanced DMA Controller provides effective data transfers
- ◆ Compatibility with most popular PHY interfaces gives excellent support for different market solutions

## CONFIGURABILITY

The following parameters allow adjusting the **MAC-1G** core to requirements of target application or technology:

- ◆ Host interface
- ◆ PHY interface
- ◆ Host bus interface width
- ◆ Transmit/receive FIFO size
- ◆ Statistical counters
- ◆ Flow control
- ◆ MII serial management
- ◆ Single/advanced address filtering
- ◆ Interrupt mitigation

## APPLICATIONS

- ◆ Communication systems
- ◆ Ethernet switches and routers
- ◆ VoIP devices
- ◆ Computer systems
- ◆ Network Interface Cards
- ◆ Video web servers
- ◆ Backbone networks

## RELATED PRODUCTS

**MAC-1G-PCS** - a Gigabit MAC Physical Coding Sublayer (PCS) that meets all IEEE 802.3-2002 Standard requirements. It provides both PCS interfaces, GMII and PMA and features the Management Interface for communication with the Station Management layer.

**MAC-PCI** - a combination of the **MAC/MAC-1G** controller and the 32-bit 33 MHz Master/Slave PCI Host Interface core. The solution simplifies development of Ethernet networking functionality in PCI-based systems and applications.

**MAC-PCI Linux Driver** - a Linux-optimized driver for the **MAC-PCI** controller.

## STANDARD DELIVERABLES

- ◆ VHDL/Verilog source code
- ◆ Synthesis support for Synopsys® and Cadence® tools with a set of synthesis scripts
- ◆ Simulation support for Mentor Graphics® and Cadence® tools with a set of scripts and macros
- ◆ Extensive test bench
- ◆ Documentation:
  - ▶ Design Specification
  - ▶ Verification Specification
  - ▶ Test Plan
  - ▶ Integration Manual
- ◆ 30 days of technical support
- ◆ 90 days of warranty against defects

## DELIVERY OPTIONS

- ◆ EDIF netlist for FPGA and low volume production
- ◆ One-year maintenance
- ◆ On-site support and training



For more information on our IP portfolio visit [www.evatronix-ip.com](http://www.evatronix-ip.com)



## ELECTRONIC DESIGN DEPARTMENT

Dubois 16, 44-100 Gliwice, Poland  
T: +48 32 231 11 71  
F: +48 32 231 30 27

info@evatronix-ip.com  
www.evatronix-ip.com