## Chapter 1. GMAC Controller

### 1.1 Overview

Implements an Ethernet Media Access Controller compatible with the 10/100/1000 Mbps IEEE 802.3 and 1Gbps IEEE 802.3-2002 specifications. The controller provides half- or full-duplex operation, supports jumbo frames, and optionally provides a reach set of sta-tistics counters enabling station management. A host processor can control the operation of the core via a slave interface that provides access to its control and status registers. The controller features two master ports for data transfers, one for transmit and one for receive. The two DMA engines use buffer descriptors to automatically transfer data from local FIFOs to an external shared memory. The core supports 32-bit AMBA/AHB SoC buses;

### 1.2 Block Diagram



Fig. 1.1 gmac controller module block diagram

### 1.3 Features

■ Programmable 10/100 or 1000 Mbps operation   
■ IEEE 802.3-2002 specification with preamble, start-of-frame delimiter (SFD), and CRC gener-ation and checking   
■ Full- or half-duplex operation   
■ CSMA/CD procedures for half duplex   
■ Flow control for full duplex   
■ Jumbo frames   
■ Flexible address filtering

■ Extensive statistics counters   
■ Detection of too long or too short packets, with programma-ble length limits   
■ Media Independent Interface (MII) for 10/100Mbps   
■ Gigabit Media Independent In-terface (GMII) for 1Gbps   
■ MDIO interface for PHY configu-ration and management