

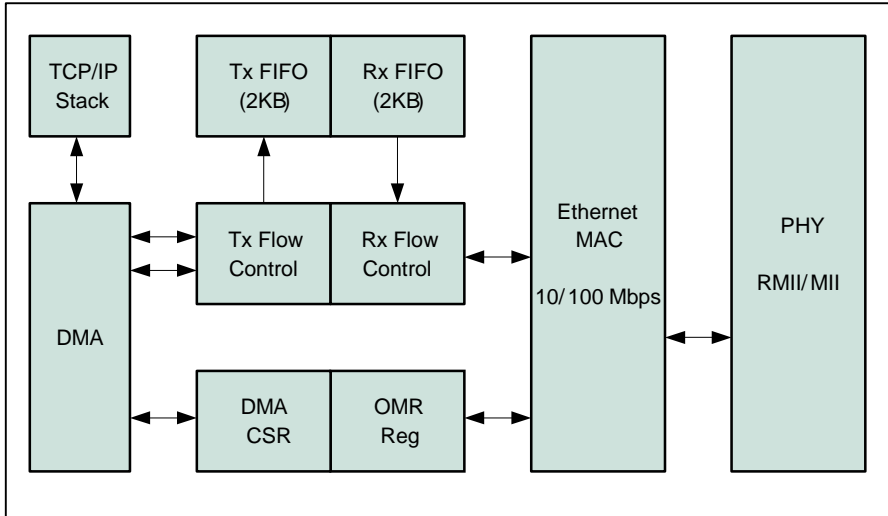
ETH

Ethernet MAC

AURIX™ Microcontroller Training
V1.0 2019-03



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Highlights

- > The Ethernet core supports 10/100 Mbit/s data transfer rates which is compliant with IEEE 802.3
- > Allows an external Fast Ethernet PHY interface with RMII/MII

Key Features

Automatic CRC and pad generation

Flexible address filtering modes

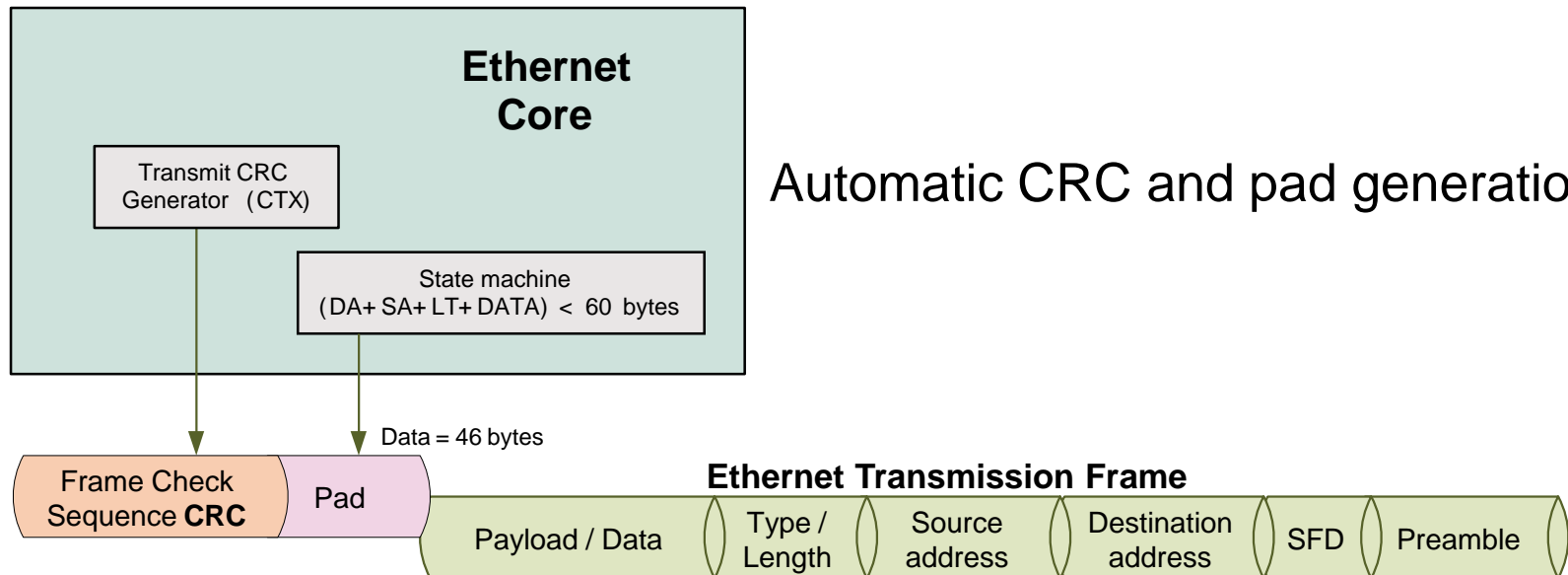
Support Ethernet frame time stamping

Customer Benefits

- > User does not have to take care of CRC calculation and pad insertion
- > Auto checking of the destination and source address of receive frame
- > Better accuracy to synchronize clocks throughout a network

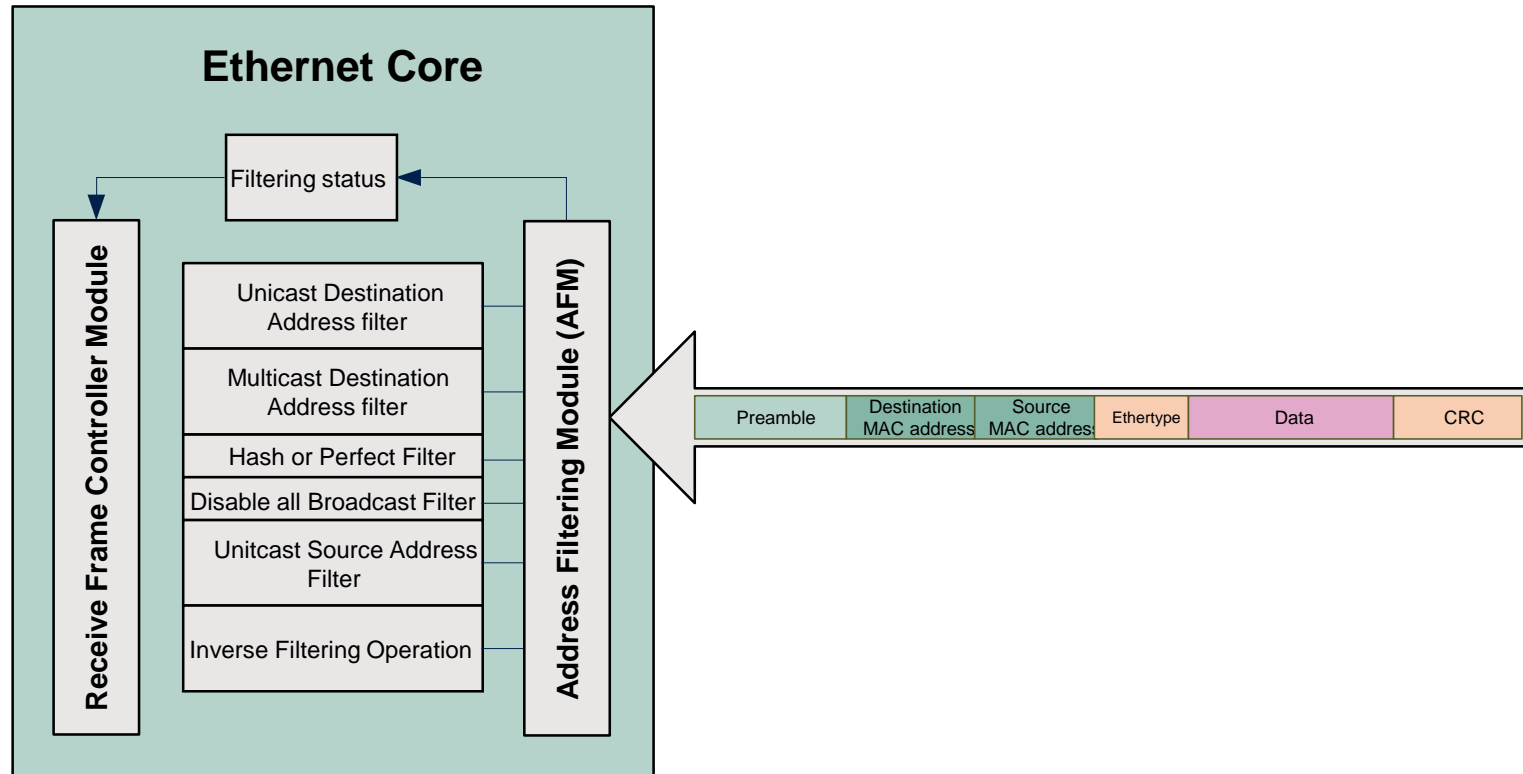
Automatic CRC and pad generation

- › CRC and Pad generation for Transmission frame
 - When the number of bytes received falls **below 60 bytes**, the **state machine** automatically appends zeros to the Tx frame to make the **data length exactly 46 bytes**.
 - The **Transmit CRC Generator** module calculate the CRC for the Frame Check Sequence (FCS) field before transmission to the TPE module.



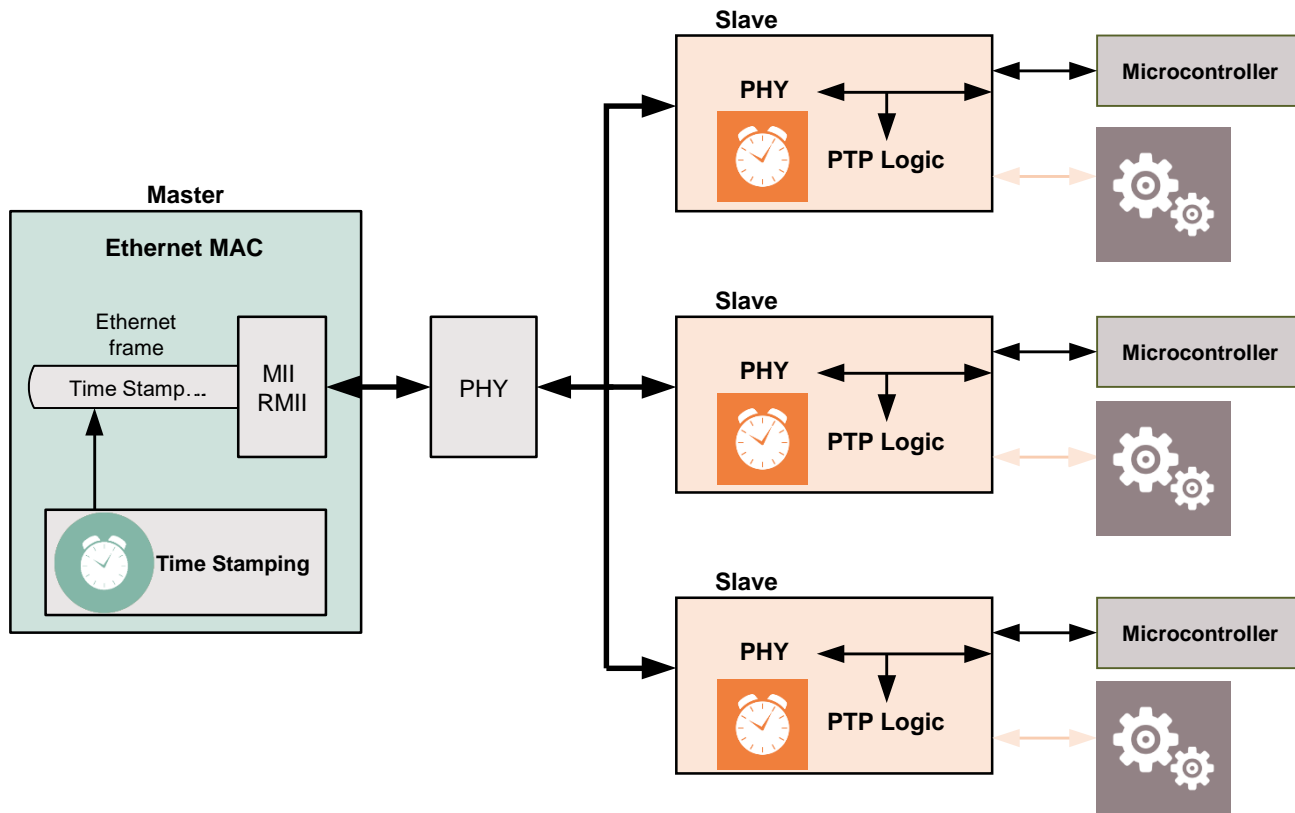
Flexible address filtering modes

- › The Address Filtering (AFM) module performs the destination and source address checking function on all received frames and reports the address filtering status to the Receive Frame Controller module.
- › The Receive Frame Controller (RFC) module performs frame filtering based on the destination/source address.



Ethernet frame time stamping

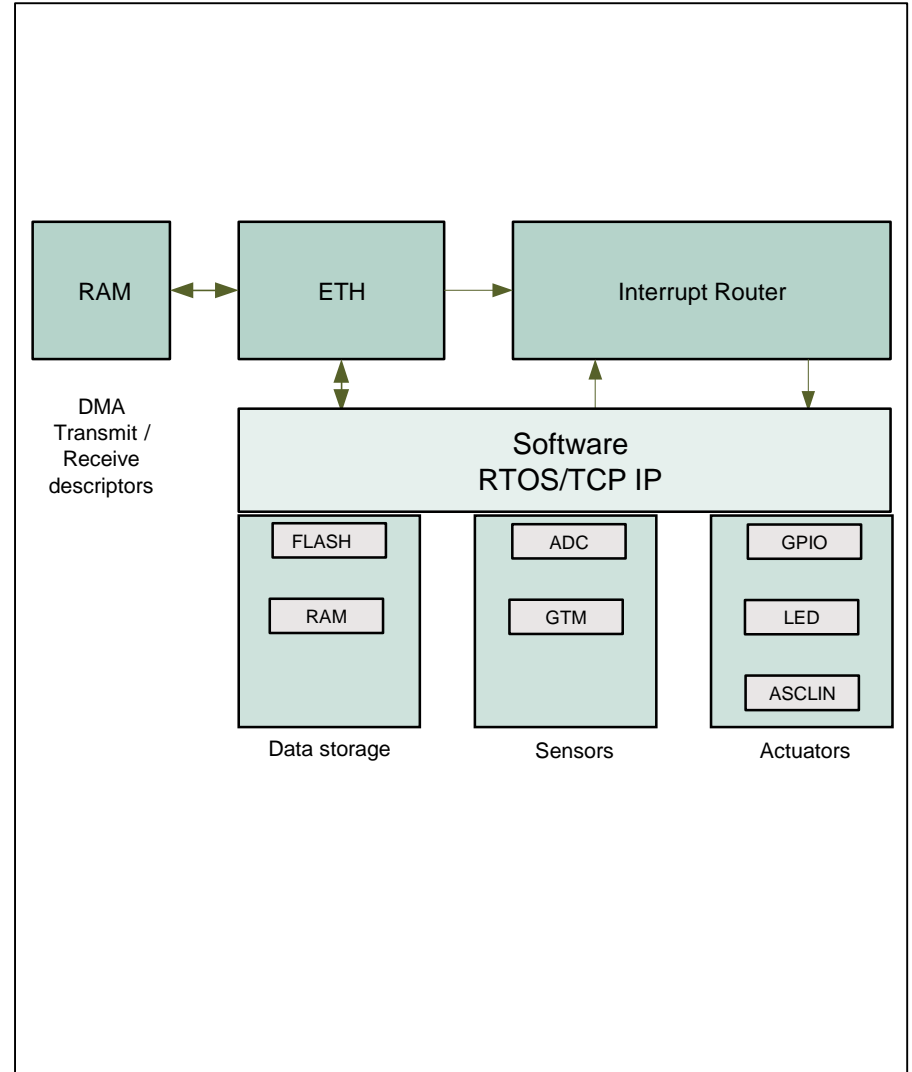
- › If IEEE 1588 time stamping is enabled for the transmit frame, this block takes a snapshot of the system time when the SFD is put onto the transmit MII bus.
- › The time stamping feature can be used in Precision Time Protocol to synchronize clock throughout a network of rotary encoder and control stepping motor at required timing.



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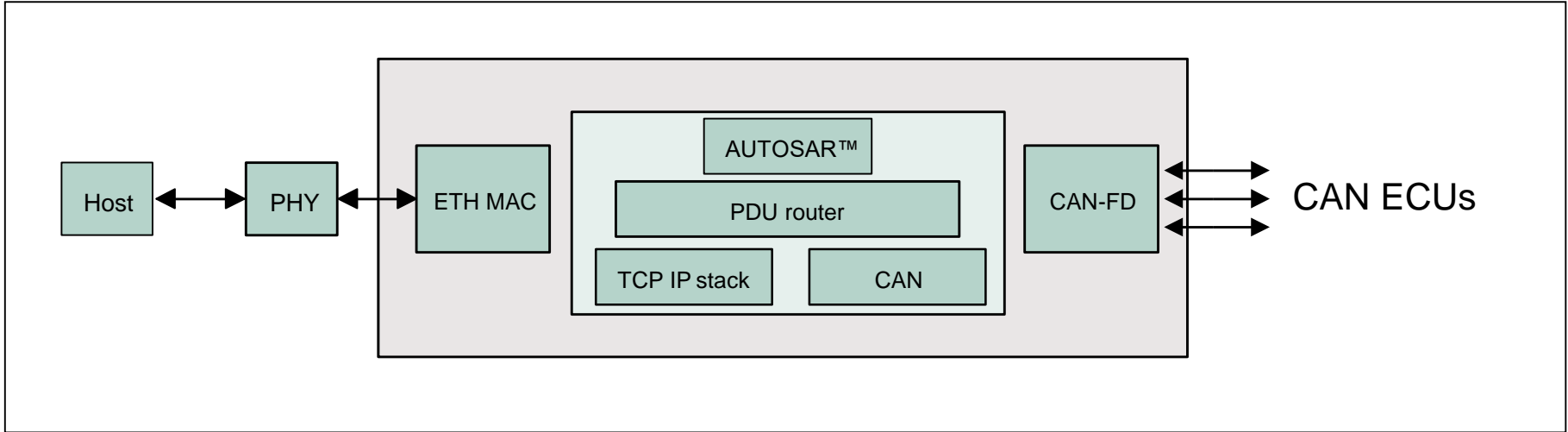
System integration

The Ethernet MAC can make use of the internal Flash/RAM for data storage and handling. The internal RAM is used as well for DMA Transmit / Receive descriptors and Ethernet Frame storage. The Interrupt Router handles all request coming from the Ethernet, as example a received frame notification. Combined with the automotive AUTOSAR™ software new Applications can be developed. Faster ECU Firmware updates, Service oriented communication via SOME/IP or Service and diagnosis via DoIP are just some examples.



Application example

Firmware updates of multiple ECUs



Overview

- > Firmware updates in cars can make use of Ethernet to exchange data much faster compared to other existing communication interfaces

Advantages

- > The Ethernet MAC allows with the high speed data transfer to update multiple ECUs in parallel in a car
- > The faster update time saves money at line end programming and in field garage firmware updates

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