MultiCAN+

Controller Area Network

AURIX™ TC2xx Microcontroller Training
V1.0 2019-03

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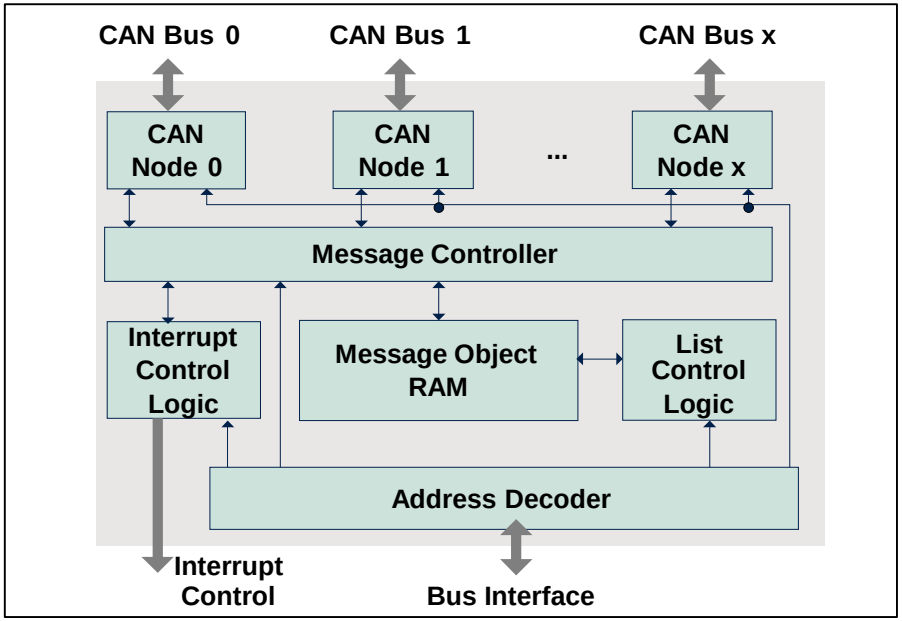
MultiCAN+
Controller Area Network



Highlights

AURIX™ TC2xx provides MultiCAN+ module with up to 5 CAN nodes and conforms to the ISO 11898-1.

Two possible data transfer rates are possible:

- upto 1 Mbit/s (classical CAN)
- upto 5 Mbit/s (CAN FD)

they are separately programmable for each node.

Key Features

- Up to 256 independent message objects (MO)
- Up to 5 independent CAN nodes
- Automatic FIFO and Gateway functionality

Customer Benefits

- Free the CPU to MO re-configuration in run time
- Dedicated control registers for each CAN node increasing system flexibility
- Communication Handled automatically by the module freeing the CPU

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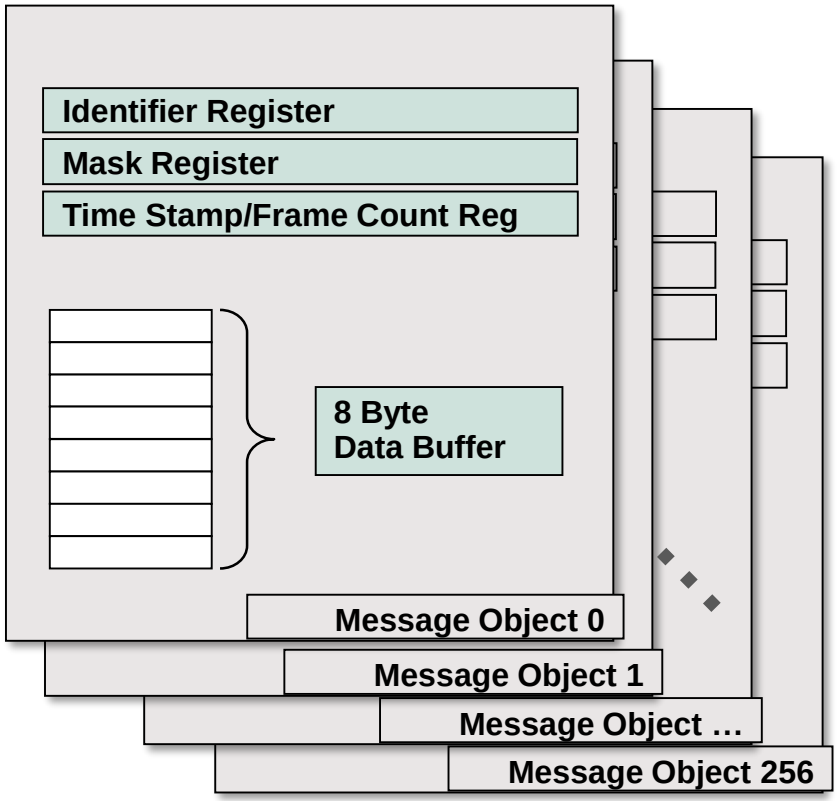
MultiCAN+
Up to 256 independent message objects



- Up to 256 independent MO with ID masking and time stamp features
  - Each MO has it own identifier register: 11 or 29-bit ID
  - One mask register per MO which specifies which bits of ID are not to be considered
  - Independent time stamp and frame count for each MO: this feature serves to indicate when the message has arrived or when it was transmitted

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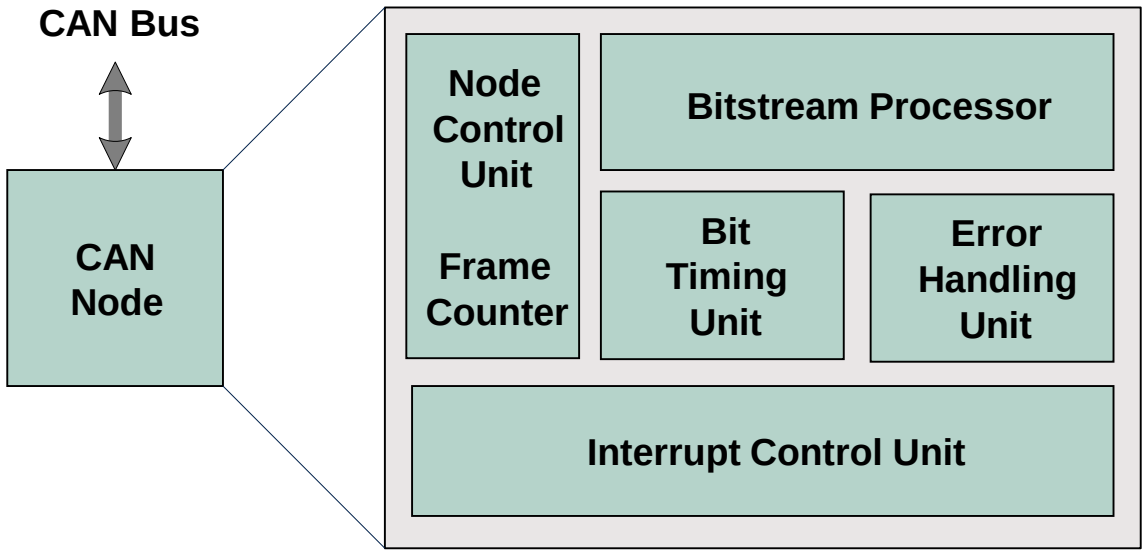
MultiCAN+
Up to 5 independent CAN nodes

- Up to 5 independent CAN nodes flexibly connected to the MOs
  - Baud rate settings
  - Operation and events control
  - Ports control
  - Error analysis
  - Timer Event



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MultiCAN+
Automatic FIFO and Gateway functionality

- FIFO functionality freeing the CPU:
  - Message objects can be combined to build FIFO of a chosen size
  - Message objects can be organized as FIFO buffers for transmission and reception
  - FIFO interacts with message objects rather than lists
- Gateway functionality freeing the CPU:
  - Gateway mode allows transfer of messages between two nodes without CPU intervention
  - Two nodes may operate at different baud rates
  - Gateway FIFOs can be built

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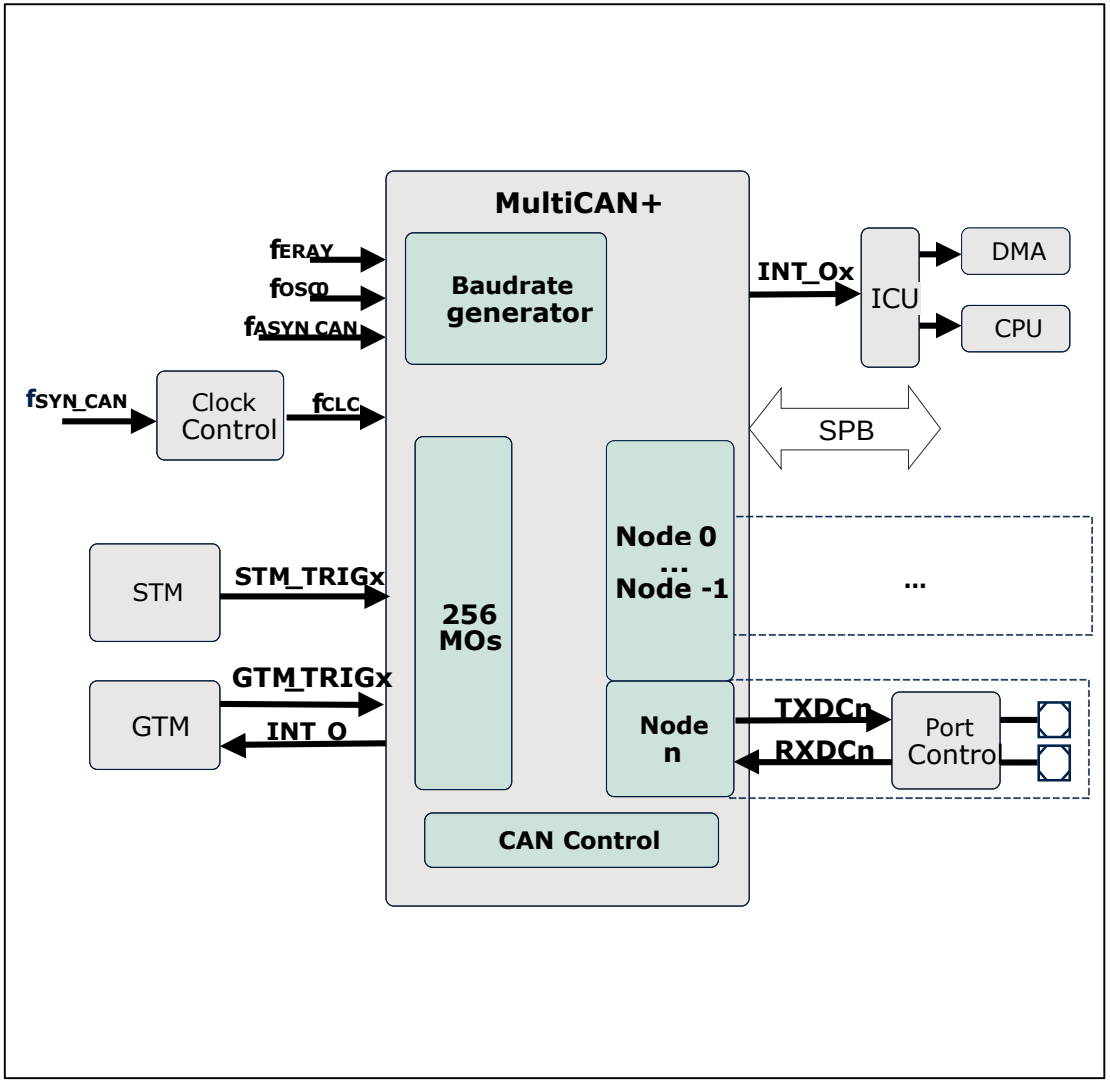
MultiCAN+
System integration



System integration

Each Transmit/Receive line of every CAN node is available for several external ports through the port control logic.

Up to 16 interrupt lines (INT_Ox) connect ICU for CPU trigger and DMA service or as signal trigger of the GTM action.

Up to 3 MOs on each CAN node can be transmitted without CPU (trigger signal from STM/GTM)

Target applications

- Automotive/Motor control
- Industrial automation
- Connectivity
- General purpose

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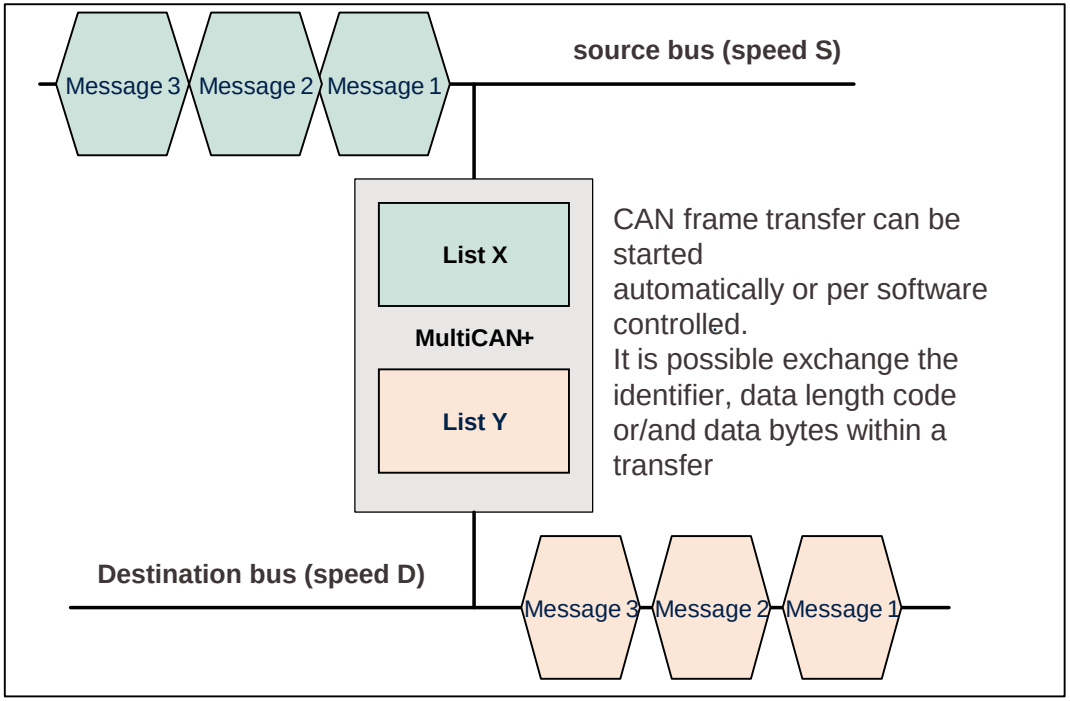
Application example
Gateway mode



Advantages

Using the gateway mode with FIFO buffering CAN frame can be re-routing automatically without loss of incoming frames in high bus traffic
This reduces CPU load and improves the real time behavior of the entire system.

Overview

The MultiCAN+ module offer a so called gateway mode to transfer CAN messages from one CAN bus to another without CPU involvement.

The source and destination bus can be of different speed.

In case of high CPU load and/or high CAN bus traffic a FIFO structure on the gateway destination side can be built to avoid loss of incoming CAN frames and minimize the setup time for outgoing frames.

The size of FIFOs is limited only by the number of available message objects.

A FIFO structure can be installed, resized and de-installed at any time, even during CAN operation.

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