The Automotive Math and Motor Control Library (AMMCLib) set provides essential building blocks for rapid development of automotive embedded applications with high-performance arithmetic, trigonometric, digital signal processing and math functions. The AMMCLib is available as a production-ready precompiled or source code package.

A significant portion of the AMMCLib supports both sensor-based and sensorless motor control applications; it also assists with fixed-point fractional 16/32-bit and single-precision floating-point arithmetic. All AMMCLib functions come with MATLAB® and Simulink® bit-accurate models for model-based design, simulation and code generation supporting Embedded Coder®.
Auto AMMCLIB General Architecture Block Diagram

- **GMCLIB**
  - General Motor Control Library
  - Advanced Motor Control Library
  - Park/Clark Transformation
  - Inverse Park/Clark
  - Space Vector Modulation
  - DC Bus Ripple Elimination
  - PMSM Decoupling
  - Back/EMF Observer
  - Tracking Observer

- **AMCLIB**

- **GFLIB**
  - General Function Library
  - General Digital Filter Library
  - Sine, Cosine, Tangent
  - Inverse Sine, Cosine, Tangent
  - Hysteresis
  - LUT, Ramp, Limitation
  - First, Second Order IIR Filter

- **GDFLIB**

- **MLIB**
  - Mathematical Library
  - Absolute Value
  - Addition, Subtraction
  - Multiplication, Division
  - Right/Left Shift
  - Type Conversion

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Auto AMMCLIB Architecture for KEA Block Diagram

- **GMCLIB**
  - General Motor Control Library
  - Advanced Motor Control Library
  - Park/Clark Transformation
  - Inverse Park/Clark
  - Space Vector Modulation
  - DC Bus Ripple Elimination
  - PMSM Decoupling

- **GFLIB**
  - General Function Library
  - General Digital Filter Library
  - Sine, Cosine, Tangent
  - Inverse Sine, Cosine, Tangent
  - Hysteresis
  - LUT, Ramp, Limitation
  - First, Second Order IIR Filter

- **GDFLIB**

- **MLIB**
  - Mathematical Library
  - Absolute Value
  - Addition, Subtraction
  - Multiplication, Division
  - Right/Left Shift
  - Type Conversion
Auto AMMCLIB Architecture for S32Z/E and S32V Block Diagram

General Motor Control Library
- Park/Clark Transformation
- Inverse Park/Clark
- Space Vector Modulation
- DC Bus Ripple Elimination
- PMSM Decoupling
- BackEMF Observer
- Tracking Observer

Advanced Motor Control Library

GMCLIB

AMCLIB

ADFLIB

General Function Library
- Sine, Cosine, Tangent
- Inverse Sine, Cosine, Tangent
- Hysteresis
- LUT, Ramp, Limitation
- First, Second Order IIR Filter

General Digital Filter Library

GFLIB

GDFLIB

Advanced Digital Filter Library
- Vector/Matrix Multiplication
- Kalman Filter
- FFT
- Linear System
- Solver
- Cholesky Decomposition
- RBF Interpolation

Mathematical Library
- Absolute Value
- Addition, Subtraction
- Multiplication, Division
- Right/Left Shift
- Type Conversion

MLIB

Automotive software General Block Diagram

SERVICES / APPLICATION SOFTWARE

MIDDLEWARE

OS / DRIVERS / SAFETY

HYPERVISOR (if available)

ARM CORTEX CORE(S)

FIRMWARE / HW ACCELERATORS

View additional information for Automotive Math and Motor Control Library (AMMCLib).