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

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

AMCLIB

GFLIB

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

GDFLIB

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

Σ
|X|
|X>>N|
F32toFloat

(a*b)+(c*d)

Auto AMMCLIB Architecture for KEA Block Diagram

GMCLIB

- Park/Clark Transformation
- Inverse Park/Clark
- Space Vector Modulation
- DC Bus Ripple Elimination
- PMSM Decoupling

GFLIB

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

GDFLIB

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

Σ
|X|
|X>>N|
F32toFloat

(a*b)+(c*d)
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
- PM5M Decoupling
- BackEMF Observer
- Tracking Observer

Advanced Motor Control Library

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

General Digital Filter Library

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

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

JosephAutomotive software General Block Diagram

NXP TOOLS & IDE

SERVICES / APPLICATION SOFTWARE

MIDDLEWARE

OS / DRIVERS / SAFETY

HYPERSVISOR (if available)

ARM CORTEX CORE(S)

FIRMWARE / HW ACCELERATORS

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