S_Ilicon Mobility

Reference Board for SEMIKRON SKAI[®] 3 LV Inverter



Starter Kit for SKAI 3 LV

The starter kit includes:

- OLEA[®] T222 FPCU based reference control board
- OLEA[®] APP INVERTER Pre-flashed
- Vehicle Dependent Software demo code
- Post build measurement, configuration, calibration and firmware update GUI software
- User guide for **fast setup**

Turnkey control solution for low voltage system

OLEA[®] COMPOSER - T222 for SKAI[®] 3 LV Starter Kit is a complete low voltage electric motor control solution. It is based on OLEA[®] Technology and is using SEMIKRON SKAI[®] 3 LV MOFSET inverter module. The kit is composed of a control board, delivered as reference design, shapped and featured to match the inverter housing mechanical and electrical requirements. The board is powered by OLEA[®] T222 FPCU pre-flashed with OLEA[®] APP INVERTER.

The kit enables fast prototyping and development of any industrial or automotive application. It is delivered with a demonstration version of a vehicle dependent software including a scheduler and communication/interface stacks for the measurement, configuration and calibration of the system. It includes numerous configurable safety mechanisms for faults detection and reactions such as overcurrent, overvoltage, overtemperature.

The Starter Kit comes with a board schematic, user's guide and CAN-based user control interface for Windows.

Highly configurable control software

OLEA[®] APP INVERTER main features

- PMSM and WRSM motors
- Axial and Radial Flux motors
- Control of 3 phases motors
- Configurable number of pole pairs
- Flux weakening and Id/Iq Decoupling
- Field Oriented Control regulation
- Space Vector PWM modulation
- Control in speed and/or in Torque
- Numerous visibility status including temperature and position
- Numerous control parameters for fine configuration/ calibration
- Safety protections such as overcurrent, overtemperature, overvoltage.

Scheduler Safety Position Regulation Modulation Functional VO Interfaces XCP, RS232 COM stack (CAN) Position Regulation DPWM SvPWM Svptw	VCU I/O & I/F TCU Component Application	Safet U OLEA® APP INVERT	ER	Diagnostic PI	Calibration/Configuration	System Init Power Supply Management
(CAN)	Component Scheduler XCP, RS232 COM stack	Safety (Detection & Reactions)	Position (Angle position measurement)	Regulation (Current Control Loop)	Modulation DPWM SVPWM	Functional I/O Interfaces: Gate Driver & Analog acquisition System Safety IO Interfaces



OLEA[®] APP INVERTER software modules

OLEA® APP INVERTER software modules subject to adaptation Optional module specifically developed through engineering service

Board Features



Calibration

Inverter Control

- Silicon Mobility OLEA® T222 FPCU
- System Basis Chip (power regulation and watchdog)

Vehicle Interface

- 2 x CAN FD (Flexible data rate interface up to 8Mbit/s)
- 1x LIN 2.21
- Battery supply

Motor Interface

- Resolver winding
- Incremental encoder
- 2 x motor temperature sensors

Inverter module interface

- Phase voltage and current (U,V,W)
- PWM Gate Driver Phases (U,V,W)
- Reset and Error signals
- PCB & power module temperatures

Developper interface

- 1 x SWD interface (debug)
- 1 xTrace Port Unit interface up to 100MB/
- s (real time debug and measure interface)
- 3 x potentiometers
- 4 x LEDs
- 2 x buttons



The control, calibration and measurement of OLEA[®] APP INVERTER parameters can be done either using Silicon Mobility Graphical User's Interface or Vector CANape.

Silicon Mobility GUI is interfaced via USB and/or CAN port using CAN XCP protocol.

OLEA[®] APP INVERTER supports Vector CANape and Vector CAN interface (VN1610/VX1000) using CAN XCP protocol.

Calbriation of OLEA APP INVERTER with CANape from VECTOR

From Starter Kit to custom system application development



OLEA[®] COMPOSER



OLEA[®] LIB ALGO INVERTER

For custom system application development, Silicon Mobility provides OLEA[®] COMPOSER and OLEA[®] LIB ALGO INVERTER accessible in source code and model.

Source Code and Model: delivered as a MATLAB[®] SIMULINK model based design including OLEA[®] LIB INVERTER model building blocks. Auto-code generation using OLEA[®] COMPOSER development environment. It includes defined APIs to interface with the vehicle dependent software.



Legal Disclaimer: the information given in this Brief shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Silicon Mobility hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party. ©2022 Silicon Mobility. All trademarks are property of their respective owner.