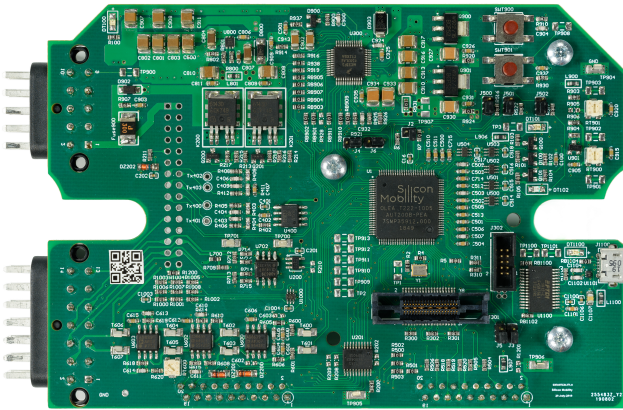# Reference Board for SEMIKRON SKAI® 3 LV Inverter

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.
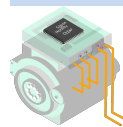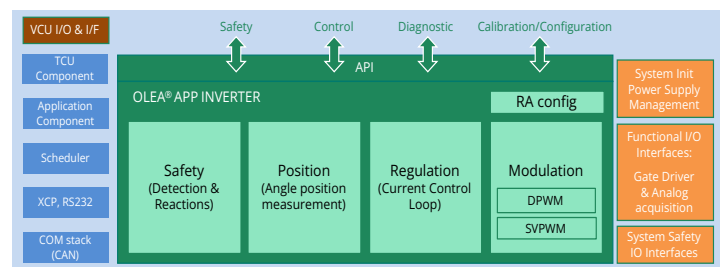
The kit enables fast prototyping and development of any industrial or automotive application. It is delivered with a demonstration version of a vehicle dependent software including a scheduler and communication/interface stacks for the measurement, configuration and calibration of the system. It includes 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.

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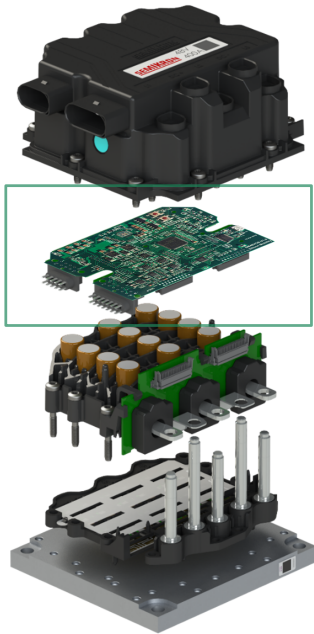
Inverter Control
- Silicon Mobility OLEA® T222 FPCU
- System Basis Chip (power regulation and watchdog)

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
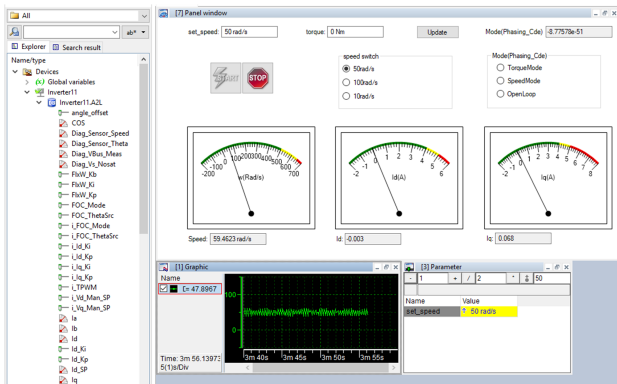- 2 x motor temperature sensors

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

Calibration

Calbriation of OLEA APP INVERTER with CANape from VECTOR

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.

From Starter Kit to custom system application development

OLEA® COMPOSER
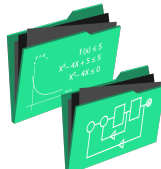
OLEA® LIB ALGO INVERTER

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.

Silicon Mobility