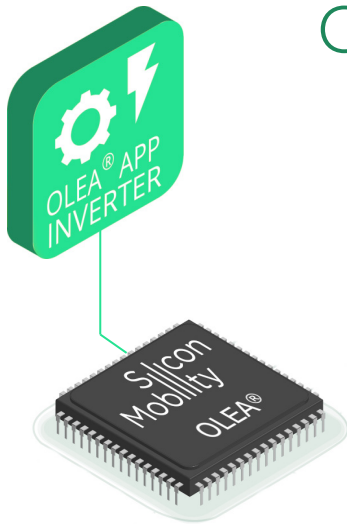


OLEA® APP INVERTER ED



Turnkey Application for the Control of Inverter and Electric Motor

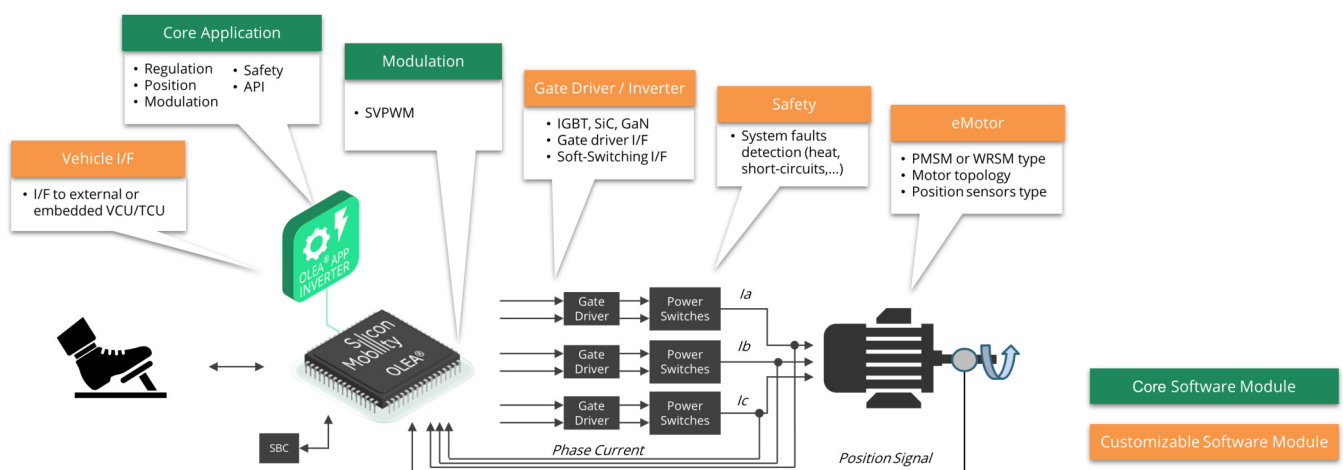
- Dedicated to EV and HEV applications
- Support Low and High-Voltage systems
- Highly customizable and quickly configurable to fit any inverter and e-motor
- Integrated safety and ASIL-D ISO 26262 ready

The most advanced control algorithms

OLEA® APP INVERTER ED is a turnkey software application for the control of inverter and electric motor control, and optimized for the OLEA® FPCU.

OLEA® APP INVERTER ED integrates all the necessary functions for a safe torque or speed regulation of electric motor control. The software is architecture around a core application including the current control loop, the position and speed measurement and the SVPWM modulation. Several customizable modules are available to interface any system configuration such as power transistors, gate drivers type, e-motor topology, position sensor and faults management.

OLEA® APP INVERTER ED software interface is compliant to AUTOSAR 4.3 and is packaged as an application level function with dedicated Complex Device Drivers (CDD) and low-level drivers. The software is accessible either as source code license or object code license.



State-of-the-Art Algorithms

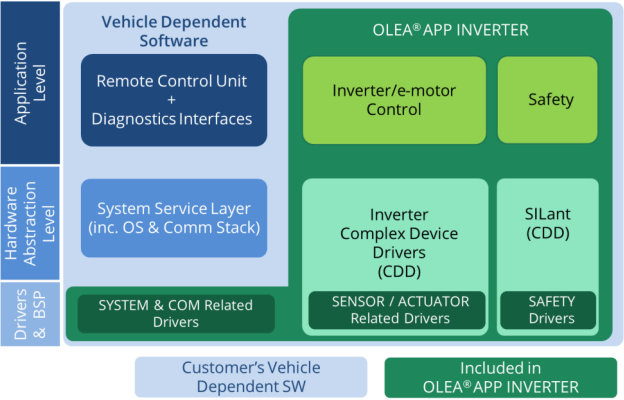
- Field Oriented Control (FoC)
- Space Vector PWM (SVPWM)
- Position Tracking Loop.

Inverter/e-Motor Topologies

OLEA® APP INVERTER ED can be customized to control any e-Powertrain system:

- Compatible with all power transistor technologies (MOSFET, IGBT, SiC and GaN)
- Support any e-Motor voltages (<60V and > 60V) .
- Support all types of e-Motor (PMSM, WRSM and more)
- Support all number of pair poles (1, 2, 4, 8 and more)
- Support 3 or 6 phases current acquisition
- Compatible with all types of position sensor (Resolver, Hall-effect)
- Can be interface with external or embedded VCU/TCU

Key Deliverables

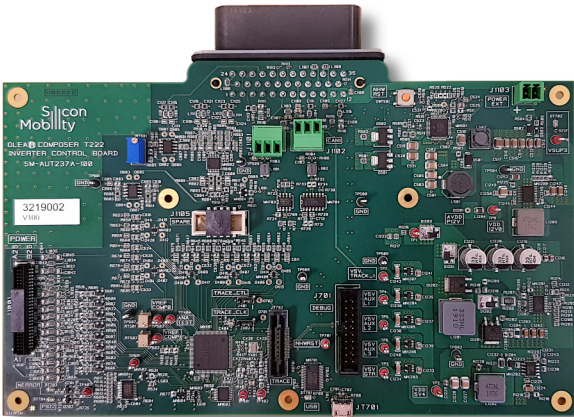


- Complete package including:
- MATLAB Simulink Target Model
 - Application level functions for high level control of the eMotor and Safety functions
 - Complex Device Driver for fine control of the e-motor/ Inverter and Safety mechanisms
 - Low-level drivers of FPCU hardware resources
 - User's guide including detailed API functions description for fast integration into vehicle dependent software.
 - Safety work products
 - Consultation with our in-house experts

All the software interface is compliant with AUTOSAR 4.3 requirements

Starter kit for rapid prototyping

OLEA® COMPOSER – T222 HVIC Starter Kit is a complete and high performance hardware and software solution to evaluate OLEA® technology and rapidly start system integration development. It includes:



- The Starter Kit includes:
- OLEA® COMPOSER HVIC Control Board: a hardware control board based on OLEA® T222 FPCU. The board is a reference design delivered with schematics and BoM.
 - OLEA® APP INVERTER ED + Functional Vehicle Dependent Software: binary pre-flashed on OLEA® T222 FPCU
 - Functional Vehicle Dependent Software demo code includes:
 - Remote Control Unit, XCP interface via CAN-FD
 - Diagnostics Interface,
 - Basic system services inc. scheduler and CAN comm.
 - Post-build configuration, calibration and measurement.
 - Flash downloader and GUI software for e-motor calibration.
 - User's guide for a fast configuration and calibration

Calibration

Silicon Mobility - Calibration Table											
Name	Address	Length	R/W	Type	(Un)Signed	Format	Hex Value	Physical Value	Min	Max	Selectable
Ref_Speed	0x10000090	32	w	float	signed	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
Intake	0x10000094	32	w	float	signed	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
Ref_M	0x10000098	32	w	float	signed	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
Ref_T	0x1000009C	32	w	float	signed	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
Thermalc	0x10000010	32	w	uint32	unsigned	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
FPW_M	0x10000014	16	w	uint32	unsigned	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
Sensor_The	0x10000004	16	w	uint32	unsigned	float32	0x00000000	0.0	-3.4E38	3.4E38	Download
d_Kp	0x10000008	24	w	uint32	signed	float32	0x00000000	0.0	-128.0	127.999985	Download
q_Kp	0x1000000C	24	w	uint32	signed	float32	0x00000000	0.0	-128.0	127.999985	Download
q_Ki	0x10000010	24	w	uint32	signed	float32	0x00000000	0.0	-128.0	127.999985	Download
q_Kd	0x10000014	24	w	uint32	signed	float32	0x00000000	0.0	-128.0	127.999985	Download
vs_Max_SP	0x10000018	16	w	uint32	signed	float32	0x00000000	0.0	-2.0	1.9999847	Download
vs_Max	0x1000001C	16	w	uint32	signed	float32	0x00000000	0.0	-2.0	1.9999847	Download
FDC_Mode	0x10000020	1	w	boolean	unsigned	float32	0x01	1.0	0.0	1.0	Download
FDC_Theta	0x10000024	8	w	uint8	unsigned	float32	0x01	1.0	0.0	255.0	Download
FwV_Kp	0x10000028	32	w	float	signed	float32	0x3E99999A	0.3	-3.4E38	3.4E38	Download
FwV_Ki	0x1000002C	32	w	float	signed	float32	0x3E99999A	0.3	-3.4E38	3.4E38	Download
FwV_Kd	0x10000030	32	w	float	signed	float32	0x3E99999A	0.3	-3.4E38	3.4E38	Download
s_Max	0x10000034	32	w	float	signed	float32	0x41400000	12.0	-3.4E38	3.4E38	Download
Speed_Kp	0x10000038	32	w	float	signed	float32	0x3E4C0000	0.2	-3.4E38	3.4E38	Download
Speed_Ki	0x1000003C	32	w	float	signed	float32	0x3E4C0000	0.2	-3.4E38	3.4E38	Download
Speed_Kd	0x10000040	32	w	float	signed	float32	0x3E4C0000	0.2	-3.4E38	3.4E38	Download
Mode	0x10000044	32	w	uint32	unsigned	float32	0x00000000	0.0	-3.4E38	3.4E38	Download

Silicon Mobility - Measurement Table											
Name	Address	Length	R/W	Type	(Un)Signed	Format	Hex Value	Physical V.	Min	Max	Selectable
q_SP	0x10000018	16	r	uint32	unsigned	float32	0x00000000	0.0	0.0	262143.0	Upload
q_SP	0x1000001C	16	r	uint32	unsigned	float32	0x00000000	0.0	0.0	262143.0	Upload
Thermalc_M	0x10000014	16	r	uint32	unsigned	float32	0x00000000	0.0	0.0	65535.0	Upload
Diag_Vin	0x10000010	16	r	float	signed	float32	0x418F68	23.98293	3.4E38	3.4E38	Upload
FPW_M_Vin	0x10000014	16	r	uint32	unsigned	float32	0x00000004	1155.0	0.0	65535.0	Upload
Diag_Vs	0x10000010	16	r	float	signed	float32	0x418E71	17.805178	3.4E38	3.4E38	Upload
Diag_Sen	0x10000012	16	r	float	signed	float32	0x00778F	-0.00445	3.4E38	3.4E38	Upload
Diag_Sen	0x10000014	16	r	uint32	unsigned	float32	0x0000E3	58135.0	0.0	65535.0	Upload
Sensor	0x10000018	16	r	float	signed	float32	0x41C7A8	24.957931	-3.4E38	3.4E38	Upload

Silicon Mobility GUI for calibration & measurement

The control, calibration and measurement of OLEA® APP INVERTER ED parameters can be done either using Silicon Mobility Graphical User's Interface or any 3rd party tool compliant with ASAM A2L format.

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

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