TM4 Smartmotion™ AC-M1 Low-Voltage Inverters

Controller for AC Induction Motor
Dana TM4 inverters provide advanced control of AC induction motors for traction or pump functions of any electrical vehicle working with speed or torque control algorithms.

Mobile Machine Management
SmartMotion is an integrated controller which can manage multi-function and fully configurable I/O pins for any I/O functions like digital & analogue inputs and outputs, capable of driving fans, relays’ and hydraulic valves’ coils, contactors, negative brakes and many others inductive/resistive loads.

Vehicle Application Development
Users develop AC-M1 applications with the TM4 TAU™ System: All features are offered as standard (“one fits all” philosophy). Virtually everything can be changed with one click in an intuitive graphical tuning environment. The clone file technology allows uploads, downloads and modifications of your configuration. With TM4 TAU system, a first run for a wired vehicle can be made in minutes (not days).

Ideal for Off-Highway Applications.
AC motor control features:
- Indirect Field Oriented Control (IFOC) with unsurpassed dynamic and performance in full speed range by decoupling and regulating flux and torque vectors of stator current components
- Advanced Space Vector Modulation (SVM) technique for high system efficiency reducing motor harmonics and losses
- Accurate Rotor Flux Model and Fully Developed Field Weakening technique for high motor efficiency and dynamic across full speed range
- Motor model fully compatible with IEEE Standard in order to get the parameters of motor’s equivalent circuit from no-load and blocked rotor tests; it can work with all AC motors of all manufactures
- Quick and easy selection between Torque Control and Speed Control

General features
- Fully configurable through supplied GUI TM4 TAU™ called SmartView™, which reduces abruptly the time to market start-up of the system
- Flexible configuration of I/O in order to couple them to any provided functions
- Standard and same firmware for all inverter series (easily extendable to future models)
- Robust, safe and self-diagnostic (both for hardware and software fault conditions)
- CAN Open and serial interfaces
- Powerful logging of all sensible working variables
- Fuills automotive EMC standard ECE R10-05, Annex 7-8-9-10

Specifications
- Switching frequency: 9kHz
- Efficiency: 95%
- Output frequency: 0-300 Hz
- Ambient temperature range: -40°C to 55°C
- Maximum heat-sin temp @ Full current: 80°C
- Signal line connectors: 2x AMPSEAL 23 pins
- IP protection: IP65
- EMC: EN12895 / ECE R10-05, Annex 7-8-9-10
- Safety: EN 1175-1
- Vibration IEC 60068-2-6: 5g, 10 – 500 Hz, 3 axes
- Shock IEC 60068-2-27: +/-30g
- Bump IEC 60068-2-29: +/-10g
- UL: Designed to meet UL583

Interface
- Digital input: 19
- Analog input bipolar ± 10V: 8
- Analog input unipolar 0…10V: 0
- Digital output: 2
- PWM output: 3
- Motor temp sensor: 1
- Incremental encoder: 1
- 5V sensor power supply: 1
- 12V sensor power supply: 1
- CAN interface: 1
- Serial Interface RS232: 1
- LIN Bus: 1

Product part number
- AC-M1 24V 350A SWS: ACM1P35000000
- AC-M1 24V 450A SWS: ACM1P45000000
- AC-M1 36/48V 375A SWS: ACM1Q37000E00
- AC-M1 36/48V 500A SWS: ACM1Q50000E00
- AC-M1 72/80V 350A SWS: ACM1R35000000
- AC-M1 72/80V 450A SWS: ACM1R45000Y00

Related product part number
- AMPSEAL 23 pin Mating Connector Bag: 900KC00000019
- Fuse 300A: 744EFCLN300
- Fuse 400A: 744EFCLN400
- Fuse 500A: 744EFCLN500
- Kit Fuse Support for AC-M1: 900KC00000022
- Thermal Pad for AC-M1: 768VR455A00

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Application Policy
Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana TM4; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.

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