

# TM4 Smartmotion™ AC-S1 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

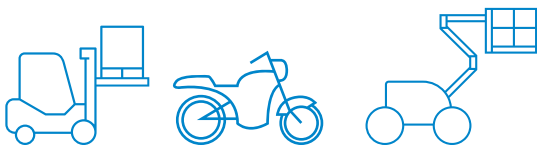
SmartMotion is an integrated controller which can manage multi-function and fully configurable I/O pins for any I/O functions like digital & analogue inputs and outputs, capable of driving fans, relays' and hydraulic valves' coils, contactors, negative brakes and many others inductive/resistive loads.

## Vehicle Application Development

Users develop AC-S1 applications with the TM4 TAU™ Software: 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.



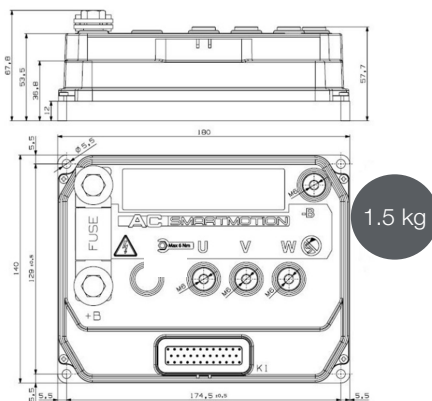
# TM4 Smartmotion™ AC-S1 Low-Voltage Inverter

## 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
- Fulfills automotive EMC standard ECE R10-05, Annex 7-8-9-10
- Optional DC Motor Control



AC-S1	24V			36-48V			72-80V
Nom. voltage (Vdc)	24			36-48			72-80
Input voltage range (Vdc)	11-32.4			22-64.8			42-108
Cont. current (Arms)	38	75	150	38	100	150	32
Nom. current S2- 2 min (Arms)	75	150	300	75	200	300	63
Option plus DC motor driver max current S2 - 2 min [A]	-	200	300	-	-	-	-
Output voltage (VAC)	3 x 0 to 16 (@24 VDC)			3 x 0 to 24 (@36 VDC) 3 x 0 to 32 (@ 48 VDC)			3 x 0 to 47 (@72 VDC) 3 x 0 to 53 (@80 VDC)
Power terminals	M6(U/V/W/-B), M8(+B)						

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 @ linear de-rated current (down to 50%) @ 50% current	80°C 80°C- 95°C 95°C- 100°C
Signal line connectors	AMPSEAL 35 pins
IP protection	IP65
EMC	EN12895 / ECE R10-05, Annex 7-8-9-10
Safety	EN 1175-1
Vibration IEC 60068-2-6 Shock IEC 60068-2-27 Bump IEC 60068-2-29	5g, 10 – 500 Hz, 3 axes +/-30g +/-10g
UL	Designed to meet UL583

Interface	Number	Product part number	
Digital input	12	AC-S1 24V 75A SWS	ACS1P07000000
Analog input unipolar 0...10V	4	AC-S1 24V 150A SWS	ACS1P15000000
		AC-S1 24V 150A + 200DC SWS	ACS1P15C20000
Analog input bipolar ± 10V	0	AC-S1 24V 300A SWS	ACS1P30000000
Digital output	2	AC-S1 24V 300A + 300DC SWS	ACS1P30C30000
PWM output	3		
Motor temp sensor	1	AC-S1 36/48V 75A SWS	ACS1Q07000A00
Incremental encoder	1	AC-S1 36/48V 200A SWS	ACS1Q20000000
		AC-S1 36/48V 300 A SWS	ACS1Q30000000
5V sensor power supply	1	AC-S1 72/80V 63A SWS	ACS1R06000A00
12V sensor power supply	1		
CAN interface	1		
Serial Interface RS232	1		
LIN Bus	1		

\*Plate-Type Heat Sink. For other heat sink type please contact us

Related product part number	
AMPSEAL 35 pin Mating Connector Bag	900KC0000013
Thermal Pad for AC-S1	768VR457A00

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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.

