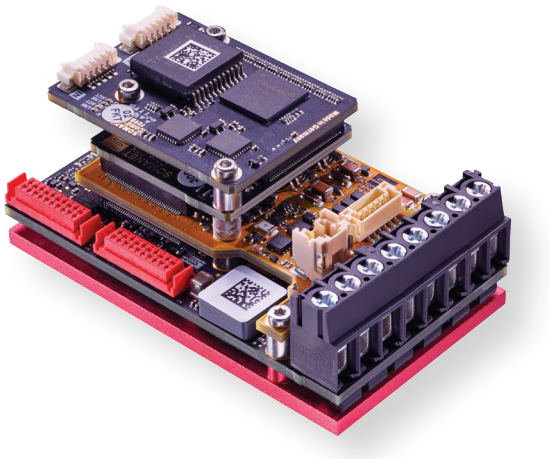
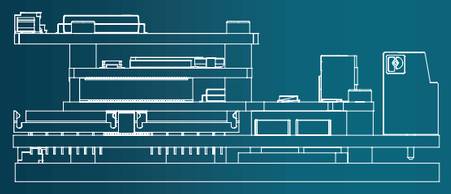
synapticon®
INTEGRATED MOTION



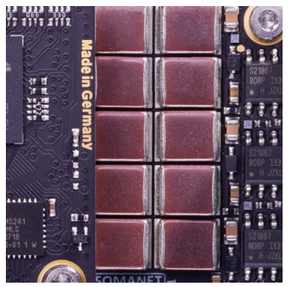
NODE SERIES

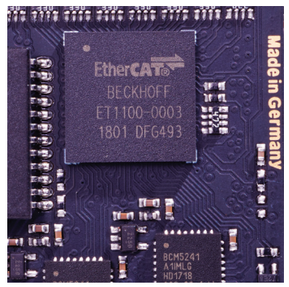
HIGH PERFORMANCE SERVO DRIVES

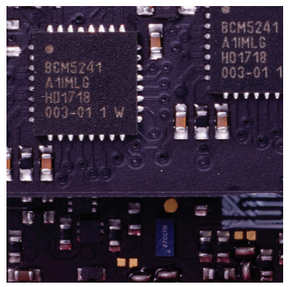
SMART
MOTION CONTROL
FLEXIBILITY
EMBEDDED

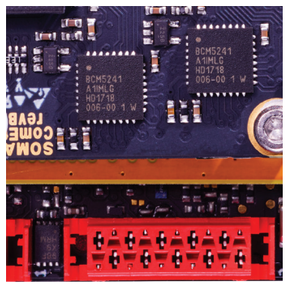


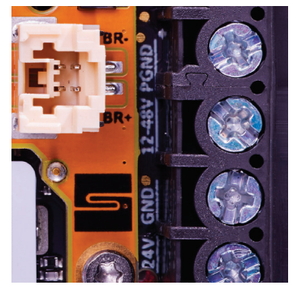
TO STRIKE











CHOOSE SOMANET

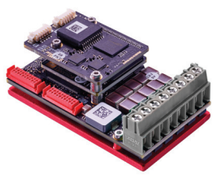
- Miniature form factor for decentral integration
- Up to 100A / 66A_{RMS} continuous
- Advanced brake control functions
- Frameless EMC
- All connectors on board
- Dual position sensor interface
- Integration support
- Safety certified (SIL 3, PL e)
- Highest motion control performance

HIGHEST CURRENT DENSITY **EXTRA LOW VOLTAGE**

■ Quiet.
Advanced disturbance compensation, e.g. for sensor noise, non-linearities in motor and gearbox as well as cogging torque, enable high quality motion even with medium to low cost motors and sensors

■ Cool.
Synapticon's proprietary control technologies, such as Model-predictive Deadbeat Field-oriented Control, allow a low heat dissipation of the drives while keeping up very high motion control performance.

■ Safe.
SOMANET Motion Cores enable safe motion functions at SIL 3-PL e level via FSoE (FailSafe over EtherCAT).



.

Synapticon SOMANET Motion Cores integrate dedicated industrial communication, sensor data acquisition and motor control in a single device. Being based on xCore and ARM processor architectures, the devices offer highly parallel, hard real-time processor cores that are the foundation for Synapticons advanced motor control algorithms. Using SOMANET Motion Cores, Synapticon provides a quick and reliable path to custom servo drive designs. ■

YOU NEVER WALK ALONE

■ Extensive documentation and Synapticon support for mechanical, thermal and electrical integration

Ease of use is one of our most important values when designing products. Synapticon drives are highly compatible with motors and sensors of various manufacturers and highly auto-adaptive.

Nevertheless the integration, bring-up and tuning of motion axes and systems is a multidimensional and challenging task, that requires much expertise and experience.

Synapticon gladly supports its customers as intensive as possible and necessary, to be mutually successful.

CENTRAL CONCERN: DECENTRALIZE

Synapticon's servo drives are among the most compact power electronics in the world. The drives can be integrated right next to the motors in a robot arm or inside a servo motor. Safety functions and additional sensors can be integrated and the number of wires is reduced from hundreds to only six: one DC power bus and one communication line. Expensive shielding and wear protection becomes obsolete. Cables never need to be maintained again. Product design becomes simpler. Robot or machine system cost are reduced.

TO BECOME CABINET-FREE

SPECS	Node 400	Node 1000	Node 2000
Rated supply voltage	12 - 48 / 60 V DC		
Maximum input current DC	9.6 A	24 A	48 A
Maximum Continuous Phase Current RMS	13.2 A	33 A	36 A
Maximum phase current RMS	13.2 A	33 A	66 A
Maximum Continuous Output Power	415 W	1040 W	1200 W
Maximum peak power output	415 W	1040 W	2080 W
Number of PMSM (BLDC) / brushed DC motors*	1 / 2*		
Brake power output	PWM controllable (0-48 V)		
Efficiency at rated power	98%		
Position feedback sensor support (2 ports)	Hall, QEI, BiSS-C, SSI, Half-Duplex, A-Format		
Analog inputs (auxiliary)	2 single-ended 0-10 V, 2 × differential ±5 V (hardware- configurable upon request: 0-5 V, 0-10 V, 0-20 V, 5 V, 10 V)		
Digital I/O	4 GPIO / SPI** / I²C** / UART		

NODE SAFETY INFORMATION

Safety Integration level (SIL) according to IEC 61508:2010	SIL 3
Performance Level (PL) according to ISO 13849-1:2015	PL e cat. 3
Safe Failure Fraction (SFF)	99.99 %
Probability of dangerous failure per hour (PFH_d)	1.07E-10 /hour
Probability of dangerous failure on demand (PFD_avg)	9.41E-6
Common Cause Failure (CCF)	>65
Hardware Fault Tolerance (HFT)	1
Reaction time	10ms
De-activation time	10ms
Mean Time to dangerous Failure (MTTF_d)	3035 years (capped to 100 years)
Diagnostic coverage (DC_avg)	99%
HW-type	Type A
Mission time T_M	20 a

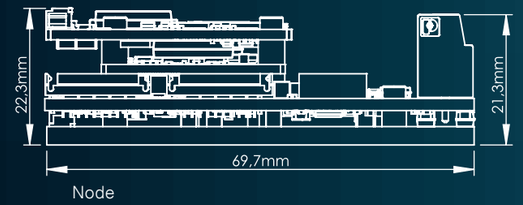
Compliance with standards:
CISPR 11 Class B (EN 55011:2016)
CISPR 11 Class B
IEC 61000-4-6:2013
IEC 61000-4-3:2020
IEC 61000-4-2:2008
IEC 61000-4-8:2009
IEC 61800-5-1:2007
IEC 60204-1:2016
IEC 61800-5-2:2017
ISO 13849-1:2015
IEC 61508:2010 parts 1-7

Compliance with European directives:
CE (EMC Directive 2014/30/EU)
CE (Machinery Directive 2006/42/EC)

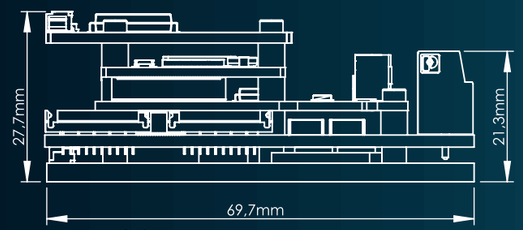
Certificates:
TÜV Süd Mark (Functional Safety)

UL listed:
Node 400, Node 1000 with soldered cables, Node 2000 with soldered cables

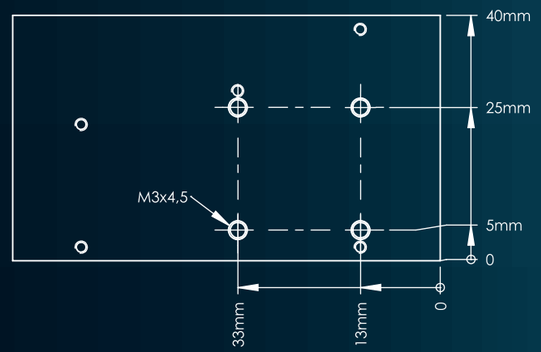
UL recognized:
Node 1000, Node 2000



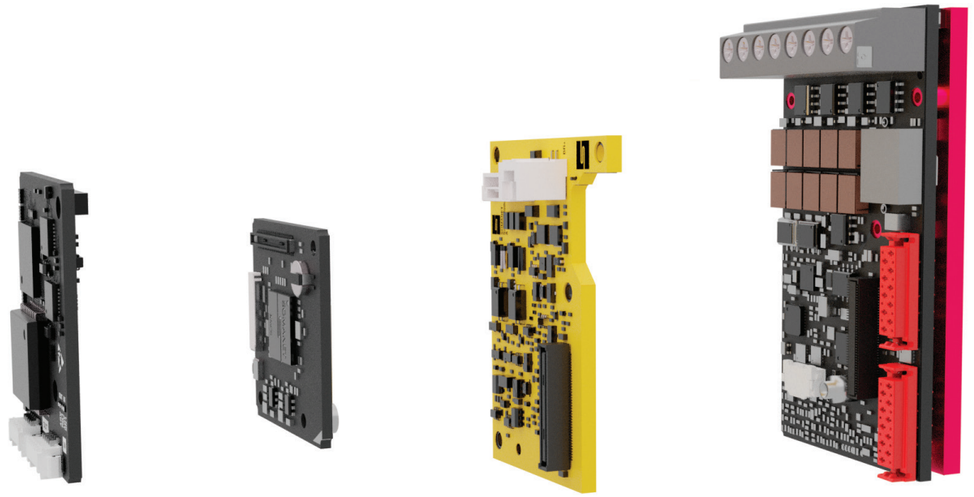
Node



Node Safety



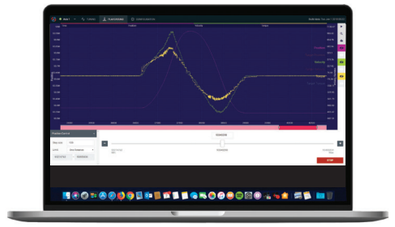
MODULAR



COM	CORE		DRIVE
Com EtherCAT	Core C2X	Safety SIL3 PLe	400 48V / 13.2A_{RMS}
Special Options: CAN, Ethernet, PROFINET, SERCOS III	SOMANET SoC 16xCore 32-bit RISC		1000 48V / 33A_{RMS}
			2000 48V / 66A_{RMS}

A SOMANET Node consists of three Modules: Communication (Com), Processor (Core) and Drive Module.
For the driver module are several standard options available. The safety module is included in Node Safety and features certified safety according to SIL 3 PL e.

ARCHITECTURE

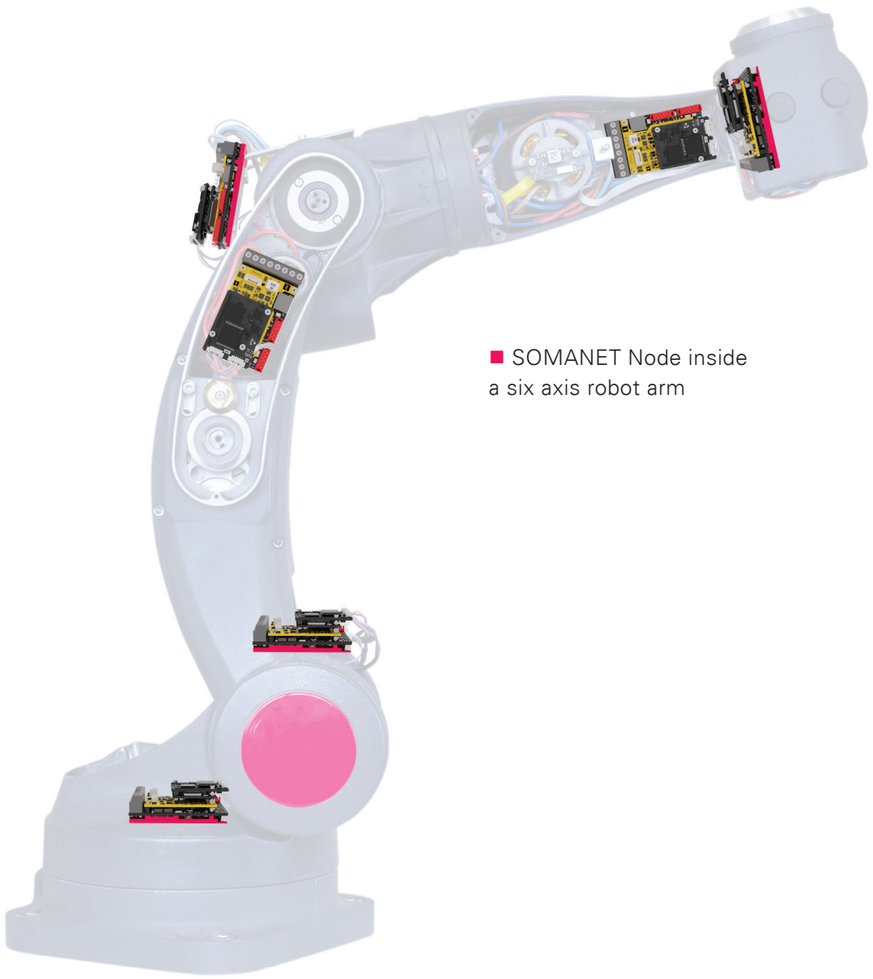


Only 5 easy steps – and your servo drive is set up and your motor turns! Here is a quick walkthrough of Synapticons unparalleled setup wizard in OBLAC Drives, the free commissioning and tuning software suite for servo drives.

OBLAC DRIVE BOX is a physical machine that comes preinstalled with Linux OS and runs OBLAC Drives and the related services. It supports access over WiFi or local area network.

COMMISSIONING AND TUNING

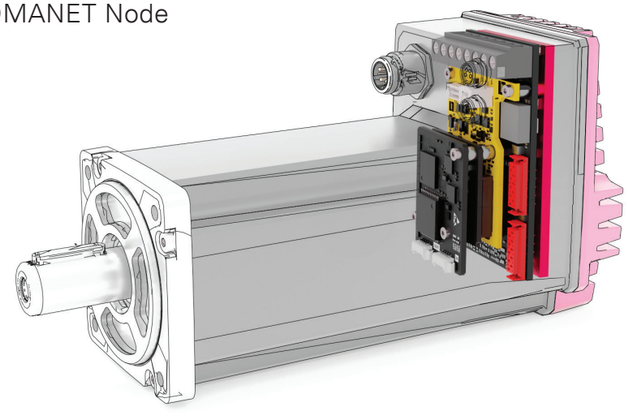
AS EASY AS SETTING UP A SMARTPHONE



■ SOMANET Node inside
a six axis robot arm

SOMANET NODES – HIDDEN CHAMPIONS AT WORK.

■ Integrated Drive Servo
Motor, powered by
SOMANET Node



Meet the Synapticon team,
we will show you how
our customers integrate
SOMANET in their
applications. ■

synapticon™
INTEGRATED MOTION

Europe (HQ)
Synapticon GmbH
Steinbeisstraße 26
71101 Schönaich
Germany
sales@synapticon.com

Asia
Synapticon Co. Ltd
1588 Zhuguang Road
201700 Shanghai
China
sales-ap@synapticon.com

USA
Synapticon Inc.
303 Twin Dolphin Drive
Redwood City 94065
California
sales-us@synapticon.com

synapticon.com/node