cSCALE Control Solutions
**cSCALE controller**

➤ Solutions for mobile machines

**Performance in harsh environments**

In a networked and increasingly complex world the requirements on efficient and reliable control solutions for mobile applications are continually on the rise. Off-highway vehicles, construction machinery, and agricultural mobile machinery as well as machinery for hoisting and material handling have to operate under extreme environmental conditions. Stringent safety regulations have to be fulfilled to ensure the protection of persons, environment and machine. Therefore, flexible adaption to changing market conditions is essential. The cSCALE controller is built into extremely robust housings and is highly protected against shock, vibration, dust and water.

**Tailored Control Solutions for mobile machinery**

- Individually tailored control solutions based on scalable architecture
- Support of central or distributed control architectures for mobile automation
- Modular I/O configurations according to machine requirements
- Protection class IP20 or IP66/67, depending on the preferred installation, fulfilling the same level of sinusoidal vibrations, broadband noise and temperature range
- Flexibility in application programming, CoDeSys 2.3 and C/C++
- Flexible selection of communication interfaces (embedded Ethernet, up to 6 independent CAN interfaces, USB)

**Safety with high availability**

The certified cSCALE contains a unique combination of a high-performance functional CPU in combination with a certified safety CPU. Hardware as well as software are completely certified. That allows highly sophisticated application programs to run in the same PLC control system as the SIL 2 safety applications.

- Certified SIL 2/PL d Cat.2 controller according to IEC 62061 and EN 13849
- TÜV certified in conformity with EN ISO 13849 PL d and IEC 62061 SIL 2
- Complete control solutions according to EN13849/EN13000
- High-performance application CPU
- Certified arithmetic floating point and trigonometric functions
- Support of redundant system architectures

**Product Overview:**

**cSCALE controller**

cSCALE controllers provide control solutions that grow in line with any requirements.

**cSCALE S-Series**

➤ Modular PLC control – safe or non safe

**cSCALE IMC A0525**

➤ Intelligent Mobile Controller

**cSCALE I2**

➤ Compact Solution with integrated PLC Control into graphical HMI

Any HMI connectable | Any HMI connectable | HMI
---|---|---
PLC control | PLC control | PLC control

Integrated safety | – | –
cSCALE S-Series

- Modular controller for harsh environments
  - Ethernet, USB, CANopen, CANopen Safety, J1939 interfaces
  - Higher electromagnetic compatibility levels than standards require
  - Rugged design and high resistance to shock and vibration for rough operating conditions and the influence of dirt, moisture and water (IP66/67 and IP50)
  - Extremely high temperature range from -40°C to +70°C

NEW

cSCALE I2

- Intelligent Mobile Controller
  - cSCALE IMC A0525 is a powerful mobile controller for the use under demanding conditions in off-highway applications. It is part of a compatible product family and protected by a robust housing designed for the off-highway industry.
  - 32-bit ARM Cortex-M4 processor, 180 MHz, 256 kB int. RAM, Optional: 2 MB int. Flash
  - 2 KB FRAM
  - 1 x RS-232 serial interfaces
  - 2 x CAN 2.0 B, 50 kbit/s up to 1 Mbit/s
  - 8 x analog input, 0...5 V or 4...20 mA/12bit, can be configured by software
  - 2 x frequency input, 10 Hz to 15 kHz
  - 12 x digital input, high valid > 4 V
  - 3 x digital input, low valid < 2 V
  - 4 x digital output, 1 A high-side, PWM, open load detection
  - 12 bit current feedback, current output accuracy 0.5 %
  - 1 x sensor supply 5 V, 100 mA
  - 3 x status LED, PWR, SYS, USER
  - Internal: monitoring of board temperature, sensor supply and battery
  - Software: C/C++, KW Multiprog

- Compact Solution with integrated PLC Control into graphic HMI
  - cSCALE I2 combines a real PLC control with graphic HMI in only one device. This represents an ideal and cost-effective alternative for small applications where a HMI console and some PLC control functions are required.
  - Both parts of the application program (HMI and PLC control) are programmed on the same unit with CoDeSys 3.5. Due to the fact that both application parts are running on the device, an easy and fast exchange of data is given without communication via any network.

- Collecting I/O data via CANopen, cSCALE I2 can be used on its own or in combination with a cSCALE DIO (distributed I/O).

- CANopen bus
- Sensor
- Sensor
- Actuator
- CANopen bus
- Sensor
- DIO
- Sensor
- DIO

- cSCALE I2 with I/O expansion over distributed I/O

- CANopen bus
- cSCALE I2
- DIO

- cSCALE I2 – Technical Data

<table>
<thead>
<tr>
<th>Description</th>
<th>cSCALE IMC A0525</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>8...36 V DC</td>
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<tr>
<td>Idle current</td>
<td>&lt; 160 mA/24 V DC</td>
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<tr>
<td>Operating temperature</td>
<td>-40°C to +70°C</td>
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<tr>
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<td>-40°C to +85°C</td>
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<td>Weight</td>
<td>0.691 kg</td>
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<td>Housing material</td>
<td>Aluminum</td>
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<tr>
<td>Protection class</td>
<td>IP66/IP67</td>
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<tr>
<td>Vibration</td>
<td>IEC 60068-2-6,2008</td>
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</table>
cSCALE S-Series
Modularity

CPU
- Different CPU modules

Power supply
- 8...48 V
- 8...33 V for safety applications
- Cut-off relay

I/O
- Digital & analog standard or diagnostic inputs and outputs

Housing
- IP20
- IP66/67

Optional & Modular extendable
- Integrated SLI = qSCALE
- 8.2 V/500 mA i.e. NAMUR
- 12 V/500 mA (stabilized CAN 1 V)
- Further I/O
- Modular housing sizes
- Basic housing + expansion
- CAN extensions

Basics
- Ethernet
- USB
- CAN

cSCALE S-Series
Configuration Examples

cSCALE IP66/67
28 I/Os, 1x ETH, USB, 3x CAN
I/Os:
- 4x digital input DI with HSC option
- 8x digital input DI DIAG with extended diagnostics
- 8x analog input 4…20 mA (up to 4 could be used also as 0…10 V)
- 4x digital output with 1 Aav
- 4x digital output with PWM and current control and 2 Aav
- 1x output with 2 cut-off relay in serial (1+1)
Interfaces:
- 1x Ethernet 10/100 Base-T
- 3x CANopen/CANopen Safety/J1939
- 1x USB
- 1x cSCALE SYS-Ext. for local I/O expansion (max. 128 further I/O)

cSCALE IP20
16 I/Os, 1x ETH, USB, 1x CAN, SYS-Ext.
I/Os:
- 8x digital input DI DIAG with extended diagnostics
- 4x digital output with 1 Aav
- 4x digital output with PWM and current control and 2 Aav
- 1x output with 2 cut-off relay in serial (1+1)
Interfaces:
- 1x Ethernet 10/100 Base-T
- 1x USB
- 1x CANopen/CANopen Safety/J1939
- 1x cSCALE SYS-Ext. for local I/O expansion

CSCALE S-Series
- Different CPU modules

Power supply
- 8...48 V
- 8...33 V for safety applications
- Cut-off relay

I/O
- Digital & analog standard or diagnostic inputs and outputs

Housing
- IP20
- IP66/67

Optional & Modular extendable
- Integrated SLI = qSCALE
- 8.2 V/500 mA i.e. NAMUR
- 12 V/500 mA (stabilized CAN 1 V)
- Further I/O
- Modular housing sizes
- Basic housing + expansion
- CAN extensions

Basics
- Ethernet
- USB
- CAN

cSCALE S-Series
Configuration Examples

cSCALE IP66/67
100 I/Os, 1x ETH, USB, 1x CAN, SYS-Ext., 8.2 V PS (500 mA)
I/Os:
- 8x digital input DI with HSC option
- 20x digital input DI DIAG with extended diagnostics
- 24x analog input 4…20 mA (up to 4 could be used also as 0…10 V)
- 32x digital output with 1 Aav
- 14x digital output with PWM and current control and 2 Aav
- 2x digital output with PWM and current control and 4 Aav
- 1x output with 2 cut-off relay in serial (1+1)
Interfaces:
- 1x Ethernet 10/100 Base-T
- 1x USB
- 1x CANopen/CANopen Safety/J1939
- 1x cSCALE SYS-Ext. for local I/O expansion (max. 128 further I/O)

cSCALE IP20
168 I/Os, 1x ETH, USB, 1x CAN, SYS-Ext., 8.2 V PS (500 mA)
I/Os:
- 24x digital input DI with HSC option
- 40x digital input DI DIAG with extended diagnostics
- 16x analog input 4…20 mA (up to 4 could be used also as 0…10 V)
- 60x digital output with 1 Aav
- 24x digital output with PWM and current control and 2 Aav
- 4x digital output with PWM and current control and 4 Aav
- 1x output with 2 cut-off relay in serial (1+1)
Interfaces:
- 1x Ethernet 10/100 Base-T
- 1x USB
- 1x CANopen/CANopen Safety/J1939
- 1x cSCALE SYS-Ext. for local I/O expansion (max. 208 further I/O)
**CPU Modules**

A wide range of powerful 32-bit CPUs cover a large variety of applications, from the integrated controller into a graphic HMI with safety CPU, PL d and SIL 2 certification.

### Flexible programming

One common software platform for the complete controller range offers overall software compatibility. For this reason the same application software can run on all CPUs. Program or firmware updates can be easily implemented by using a USB memory stick.

All cSCALE CPUs are designed for usage under extreme external environmental conditions, i.e. in an extended temperature range from -40°C up to +70°C. They are also shock and vibration resistant. Furthermore, systems without CPUs are available as expansion rack (IP20) or module (IP66/67).

The cSCALE Controller is programmable with CoDeSys according to IEC 61131-3 or alternatively in C/C++.

### cSCALE (IP20 & IP66/67) CPU Modules

<table>
<thead>
<tr>
<th>CPU Module</th>
<th>CPU</th>
<th>Flash</th>
<th>RAM</th>
<th>RAM battery buffer</th>
<th>Optional Micro SD Card</th>
<th>CANopenCANopen Safety</th>
<th>Support of J1939 on standard CANopeninterface</th>
<th>Ethernet 10/100 Base-T</th>
<th>CANopen power supply (12 V) (500 mA) for CAN1</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>cSCALE I</td>
<td>32-bit/180 MHz</td>
<td>32-bit/180 MHz</td>
<td>532 MB</td>
<td>128 MB</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>8…48 V</td>
</tr>
<tr>
<td>cSCALE IMCA025</td>
<td>32-bit/180 MHz</td>
<td>32-bit/180 MHz</td>
<td>532 MB</td>
<td>128 MB</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>8…48 V</td>
</tr>
<tr>
<td>cSCALE S6</td>
<td>32-bit/500 MHz</td>
<td>32-bit/500 MHz</td>
<td>48 MB</td>
<td>128 MB</td>
<td>–</td>
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<td>–</td>
<td>8…48 V</td>
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<tr>
<td>cSCALE S9</td>
<td>32-bit/528 MHz</td>
<td>32-bit/528 MHz</td>
<td>256 MB</td>
<td>144 MB</td>
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<td>–</td>
<td>–</td>
<td>–</td>
<td>8…48 V</td>
</tr>
</tbody>
</table>

*Not expandable with PS and I/O*

### Base Module: Power Supply with I/O

<table>
<thead>
<tr>
<th>Type</th>
<th>Power Supply (PS)</th>
<th>I/O</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>PS 5</td>
<td>X</td>
<td>8…48 V</td>
</tr>
<tr>
<td>B</td>
<td>PS 5N</td>
<td>X</td>
<td>8…48 V</td>
</tr>
<tr>
<td>C</td>
<td>PS 512</td>
<td>X</td>
<td>8…48 V</td>
</tr>
</tbody>
</table>

*Selection of voltage input reduces number of current input

*** 8 with HSC option

** 8 with HSC option

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The power supplies of the cSCALE Controller are designed for mobile applications. The DC/DC power supply is fully developed according to ISO 16732-2.

The power supplies are already equipped with some I/Os as well as 2 serially connected safety cut-off relays. Three power supply options are available with the IP20 and IP66/67 housings:

- **Type A**: Internal power source only
- **Type B**: External 8.2 V NAMUR input
- **Type C**: 12 V CAN bus power

- Reverse voltage protection up to 100 V
- Short circuit protection
- Low-pass filter
- Active over voltage protection
- Redundant safety cut-off relays
- Diagnostic LEDs: power ON, power OK, safety relay ON, RUN, Error, S1-free programmable LED

### Future release

- **Selection of voltage input**

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**cSCALE S-Series Base Module: Power Supply & I/O Module included**

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- Redundant safety cut-off relays
- Diagnostic LEDs: power ON, power OK, safety relay ON, RUN, Error, S1-free programmable LED

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**IP20 power supplies**

<table>
<thead>
<tr>
<th>DC</th>
<th>PS-ISO 01</th>
<th>PS-ISO 03-02</th>
<th>PS-ISO 11-12</th>
<th>PSIC-ISO 15</th>
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<tbody>
<tr>
<td>DC 3</td>
<td>5 V</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DC 2</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PS 5</td>
<td>–</td>
<td>–</td>
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<tr>
<td>PS 5N</td>
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<tr>
<td>PS 512</td>
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</tbody>
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**IP66/67 power supplies**

<table>
<thead>
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<th>DC</th>
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<td>5 V</td>
<td>X</td>
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<tr>
<td>DC 2</td>
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<tr>
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<tr>
<td>PS 512</td>
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</tbody>
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**DC 1 3 V**

**DC 3 3 V**

**DC 5 5 V**

**DC 7 7 V**

**DC 10 10 V**

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**DI DIAG**

<table>
<thead>
<tr>
<th>DC</th>
<th>PS-ISO 01</th>
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<td>DC 3</td>
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<td>DC 2</td>
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<tr>
<td>PS 512</td>
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**AI 4-20 mA**

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**AI 0-10 V**

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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DC 2</td>
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<td>PS 512</td>
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**AI 24 mA max. 5 V, usable also as AI 0…10 V or DI**

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<td>PS 512</td>
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**DO (1 Aav)**

<table>
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<td>PS 512</td>
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**DO PWM with CC (2 Aav)**

<table>
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<td>PS 512</td>
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**DO PWM with CC (4 Aav)**

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<td>PS 512</td>
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**8.2 V power supply (500 mA)**

<table>
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<th>DC</th>
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<tr>
<td>DC 2</td>
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<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PS 5</td>
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<td>–</td>
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<td>–</td>
</tr>
<tr>
<td>PS 5N</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PS 512</td>
<td>–</td>
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**CANopen power supply (12 V)**

<table>
<thead>
<tr>
<th>DC</th>
<th>PS-ISO 01</th>
<th>PS-ISO 03-02</th>
<th>PS-ISO 11-12</th>
<th>PSIC-ISO 15</th>
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<tbody>
<tr>
<td>DC 3</td>
<td>5 V</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DC 2</td>
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</tr>
<tr>
<td>PS 5</td>
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<td>–</td>
</tr>
<tr>
<td>PS 512</td>
<td>–</td>
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</tbody>
</table>

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**12 V**

<table>
<thead>
<tr>
<th>DC</th>
<th>PS-ISO 01</th>
<th>PS-ISO 03-02</th>
<th>PS-ISO 11-12</th>
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</thead>
<tbody>
<tr>
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<td>–</td>
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</tr>
<tr>
<td>PS 512</td>
<td>–</td>
<td>–</td>
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</tr>
</tbody>
</table>

---

**3 options**

**Future release**

**Selection of voltage input** reduces number of current input

**Sum of current 8 A**
I/O Modules of cSCALE Control Systems

The modular design of the cSCALE controllers allows a wide range of specialized input and output options including PWM outputs with current control or DIAG inputs with additional diagnostics. The DI DIAG inputs on safety I/Os provide self-testing acc. to PL d EN 13849:
- Short to battery
- Short to ground
- Open load

In addition, within the safety system all safety I/Os provide self-tests to fulfill PL d and SIL 2 acc. to EN 13849 Cat. 2. They provide diagnostic information to the system integrator. All digital outputs are equipped with the latest generation of high voltage PROFET technology with integrated short-circuit, TVS and overheating protection. The PWM outputs offer a high crest factor 4 for 2 A and 2.25 for 4 A outputs. The frequency of the PWM outputs can be configured between 50 Hz and 400 Hz.

Intelligent I/Os have a complex, flexibly configurable diagnosis function. The powerful self-diagnosis and monitoring functions on the CPU board and each individual I/O card have been designed to recognize faults immediately. The machine returns into a safe operating condition. Each I/O cell has an autonomous safety system consisting of a particular processor and separate watchdog. When a fault is recognized every cell immediately switches off.

The safe programming can be realized flexibly in CoDeSys/IEC61131 languages (FUP, KOP, ST, AWL) or C/C++. Up to 2 GB flash storage space is available for program and data storage. A battery-buffered storage area (RAM) permanently ensures safe data.

The following I/Os can be used as safety declared I/Os according to EN ISO 13849-1 Cat. 2 with performance level PL d (or SIL 2):

- **I/O 03**: AI (4...20 mA)/AI (0...10 V) dual
- **I/O 02**: DI DIAG
- **I/O 06**: DO PWM with CC dual channel
- **I/O 05**: DO Dual channel
- **I/O 04**: DI with HSC option dual channel
- **I/O 03-02**: DI with current control
- **I/O 06-06**: DO PWM with CC: Sum of current 12 Aav
- **I/O 02, I/O 05**: Sum of current 8 Aav

### Application safe used I/Os:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>I/O Modules for Safe Control solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital input</td>
<td>DI DIAG</td>
</tr>
<tr>
<td>Digital input for NAMUR sensor</td>
<td>DI NAMUR</td>
</tr>
<tr>
<td>Analog input (11Bit)</td>
<td>AI (4...20 mA)</td>
</tr>
<tr>
<td>Digital PWM output with current control</td>
<td>DO PWM with CC</td>
</tr>
<tr>
<td>Digital static output</td>
<td>DO</td>
</tr>
</tbody>
</table>

### Communication Options

To adapt the cSCALE Control System to specific communication requirements, several CANopen modules are available in addition to the standard CANopen interface on the CPU. CAN extensions are certified according to EN 13849 PL d and IEC 62061 SIL 2. The cSCALE control is suitable in mobile applications when a high-end CPU performance, a tailor-made I/O configuration or a special I/O (diagnosis, NAMUR ...) is required. The basic versions can be extended by up to six safe CAN interfaces. Apart from the flexibility of the I/O configuration in the basic housing, the certified decentral extension by other I/O cells is possible. In addition to the standard communication interfaces Ethernet and CAN are also CANopen Safety, J1939, TCP/IP and TCP/IP UDP available.

The integrated USB interface offers extensive possibilities, such as software/data updates or data logger via USB stick.

#### Local I/O Expansions

In case additional I/Os are required, both cSCALE controller IP20 and IP66/67 can be expanded through the SYS-Ext interface with one expansion rack (max. 6 additional I/O modules).

### Visualization of I/O Modularity in a IP66/67 Housing

![Visualization of I/O Modularity in a IP66/67 Housing](image)

![Image](image)

<table>
<thead>
<tr>
<th>I/O Modules for cSCALE IP20</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O 02</td>
</tr>
<tr>
<td>DI with HSC option</td>
</tr>
<tr>
<td>DI DIAG</td>
</tr>
<tr>
<td>DI NAMUR</td>
</tr>
<tr>
<td>AI 4...20 mA</td>
</tr>
<tr>
<td>AI 0...10 V</td>
</tr>
<tr>
<td>AI 0-UB (max. 36 V), usable also as AI 0...10 V or DI</td>
</tr>
<tr>
<td>DO (1 Aav)</td>
</tr>
<tr>
<td>DO low-side (1 Aav)</td>
</tr>
<tr>
<td>DO PWM with CC high-side (2 Aav)</td>
</tr>
<tr>
<td>DO PWM with CC high-side (4 Aav)</td>
</tr>
</tbody>
</table>

* Selection of voltage input reduces number of current input
** Sum of current 8 Aav
*** I/O 06 cell DO PWM with CC: Sum of current 12 Aav

### I/O Modules for cSCALE IP66/67

![Image](image)

<table>
<thead>
<tr>
<th>I/O 02</th>
<th>I/O 03</th>
<th>I/O 04</th>
<th>I/O 05</th>
<th>I/O 04</th>
<th>I/O 06</th>
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</thead>
<tbody>
<tr>
<td>DI with HSC option</td>
<td>4</td>
<td>--</td>
<td>8</td>
<td>8</td>
<td>--</td>
</tr>
<tr>
<td>DI DIAG</td>
<td>4</td>
<td>--</td>
<td>8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>DI NAMUR</td>
<td>--</td>
<td>--</td>
<td>8</td>
<td>--</td>
<td>--</td>
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<td>AI 4...20 mA</td>
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<td>AI 0...10 V</td>
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<td>8-4</td>
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<td>4**</td>
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* Selection of voltage input reduces number of current input
** Sum of current 8 Aav
*** I/O 06 cell DO PWM with CC: Sum of current 12 Aav
Safety Technology for Mobile Applications

The cSCALE safety controller is setting standards in safety technology for mobile applications. The controller meets the current requirements of the new Machinery Directive as well as the safety-specific norms DIN EN ISO 13849 PL d/IEC 62061 SIL 2.

With the introduction of the new Machinery Directive (MD) 2006/42/EC in conjunction with the safety enforcing norm DIN EN ISO 13849, new safety considerations and corresponding risk analyses for applications of mobile machines are needed. In order to find potential weak points and increase the technical reliability, functions have to be analyzed and weighted within the scope of safety management in a Risk Analysis. This includes the function of safe cut-off in case of dangerous movements or overloads.

The dangers associated with machinery and plants are classified by performance level in accordance with DIN EN ISO 13849. The classification of the performance level value goes from a to e, the lowest to the highest contribution to risk reduction. For most mobile applications it is sufficient to reach safety level PL d/SIL. To reach PL d appropriate measures have to be taken.

The cSCALE SIL 2 safety controller

Along with the new cSCALE SIL 2 safety controller, WIKA Mobile Control is offering an integrated certified control solution. Hardware, firmware and runtime system have been certified. A qualified IEC 61131 development environment for the implementation of safety functions rounds out the universal safety control concept.

WIKA Mobile Control guarantees a non-reactive execution for safety functions and non-safety functions on one control unit. This is accomplished via an integrated certified safety task on the main CPU.

One advantage: due to the modular concept, the I/O combinations can be implemented within the smallest space.

The controller supports both CANopen stacks and CANopen safety stacks.

Along with the hardware of the controller, the firmware and corresponding software libraries are certified in accordance with SIL 2 and PL d.

The controller has inputs and outputs that are diagnosis capable. In addition to complying with standards, better fault management for reduction of machine downtimes has to be facilitated.

Along with the certified SIL 2 control solution, manufacturers of mobile machinery have to be supported according to their specific needs in the type approval of their entire system by the TÜV (German Technical Inspection Association) with the following additional services:

- Establishment of safety functions/safety chains
- SISTEMA calculation for assessment of operating safety within the scope of DIN EN ISO 13849-1
- Application programming (C/C++/IEC 61131/CoDeSys)
- Support in TÜV certification
- Pre-programmed, qualified function blocks.
- Additional communication interfaces such as USB, Ethernet, CAN extensions.
- The relevant environmental requirements for mobile machinery are supported:
  - Suitable controller for ambient temperatures from -40 °C to +70 °C
  - Compliance with protection classes IP20 and IP66/67
  - Shock and vibration resistant
- EMC
- Certified safety engineers support your system integration
- Integrated safety system (Hardware and Software) to watch all safety critical functions
- Real time operating system

Reliability & Safety

As the leading supplier of advanced technologies WIKA Mobile Control is setting standards for the market of mobile safety critical applications with the new SIL 2 controller.

Due to the certification of the cSCALE safety controller in accordance with safety enforcing requirements as per DIN EN ISO 13849 PL d/IEC 62061 SIL 2, all necessary measures have been taken to prevent accidents by minimization of risk.

Reasons to work with WIKA Mobile Control

The following points must be taken into consideration when selecting a suitable control system for safety critical applications:

- A non-reactive execution for safety functions and non-safety functions on one control unit has to be guaranteed.
- Every I/O card has its own safety equipment for error detection. During error detection the I/O cards can be disconnected separately from one another via an independent hardware watch dog. In the process both safety and availability have to be guaranteed.
- The controller supports both CANopen stacks and CANopen safety stacks.
- Along with the hardware of the controller, the firmware and corresponding software libraries are certified in accordance with SIL 2 and PL d.
- The controller has inputs and outputs that are diagnosis capable. In addition to complying with standards, better fault management for reduction of machine downtimes has to be facilitated.
- Along with the certified SIL 2 control solution, manufacturers of mobile machinery have to be supported according to their specific needs in the type approval of their entire system by the TÜV (German Technical Inspection Association) with the following additional services:
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  - Certified safety engineers support your system integration
  - Integrated safety system (Hardware and Software) to watch all safety critical functions
  - Real time operating system
The cSCALE Control System for mobile applications

- **Of any size:**
  - Scalable architecture delivers tailored control solutions
  - From compact controller up to more than 300 I/Os
  - High-performance CPU with sufficient data and program memory

- **Of any complexity:**
  - Embedded Ethernet connectivity for networked control and HMI systems
  - Support for distributed control architectures for mobile plant automation

- **With any safety requirements:**
  - PL d/SIL 2-compliant
  - Supports redundant system architectures
  - Stand-by control system

- **Requiring any type of communication:**
  - Embedded Ethernet
  - CANopen, CANopen Safety, J1939
  - Customized CAN protocols
We make lifting loads safer!

As an experienced specialist, we have spent many years providing reliable safety solutions for lifting loads, setting innovative standards in the process and ensuring dependable communication between machines and their operators, particularly in harsh environments.

By developing application software, mobile controllers and robust sensors, we ensure that our customers benefit from maximum safety and equipment uptime.

We are system integrators, supporting our customers through all project phases: from analysis and concept evaluation, through system design and project planning to prototype testing and field launches. Our safety experts support certification processes and are available for seamless life cycle management.

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