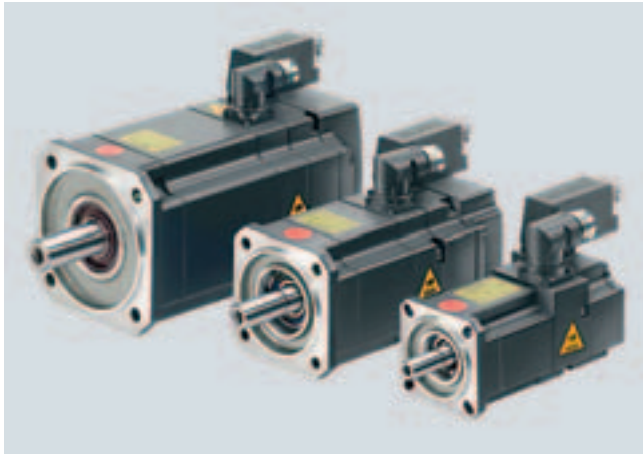


### Encoder system connection

#### Overview

##### Motors with DRIVE-CLiQ interface



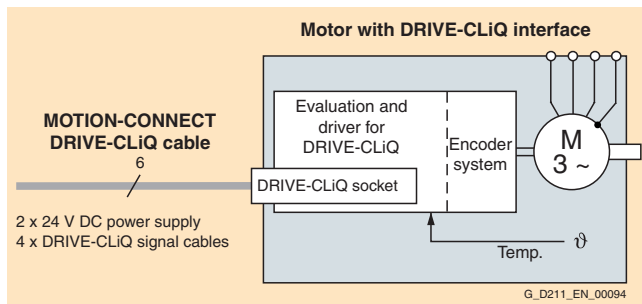
DRIVE-CLiQ is the preferred method for connecting the encoder systems to SINAMICS S120.

Motors with DRIVE-CLiQ interface can be ordered for this purpose, for example, 1FK7/1FT6 synchronous motors, 1FW3 torque motors and 1PH7, 1PL6 and 1PH4 asynchronous motors.

Motors with DRIVE-CLiQ interface can be directly connected to the associated Motor Module via the available MOTION-CONNECT DRIVE-CLiQ cables. The connection of the MOTION-CONNECT DRIVE-CLiQ cable at the motor has degree of protection IP67.

The DRIVE-CLiQ interface supplies the motor encoder via the integrated 24 V DC supply and transfers the motor encoder and temperature signals and the electronic rating plate data, e.g. a unique identification number, rated data (voltage, current, torque) to the Control Unit. This means that for the various encoder types – e.g. resolver or absolute encoder – different encoder cables with varying permissible lengths are now no longer required; just one cable type, MOTION-CONNECT DRIVE-CLiQ, can be used for all encoders.

These motors simplify commissioning and diagnostics, as the motor and encoder type are identified automatically.



##### Motors without DRIVE-CLiQ interface

The encoder and temperature signals of motors without DRIVE-CLiQ interface, as well as those of external encoders, must be connected via Sensor Modules. Sensor Modules Cabinet-Mounted are available in degree of protection IP20 for control cabinet installation, as well as Sensor Modules External-Mounted (degree of protection IP67).

Only one encoder system can be connected to each Sensor Module.

#### Technical data for motors with DRIVE-CLiQ interface

Motors with DRIVE-CLiQ interface and resolver (2-pole/multi-pole), incremental encoder sin/cos 1 V <sub>pp</sub> , absolute encoder EnDat (512 pulses/revolution, 2048 pulses/revolution) or single absolute encoder	
Max. current requirement at 24 V DC (via Motor Module and MOTION-CONNECT DRIVE-CLiQ cable)	190 mA
Max. DRIVE-CLiQ cable length	<ul style="list-style-type: none"> <li>• 100 m (328 ft) when using MOTION-CONNECT 500 DRIVE-CLiQ cables</li> <li>• 50 m (164 ft) when using MOTION-CONNECT 800 DRIVE-CLiQ cables</li> </ul>

#### Further information

Motor encoder and temperature signals must be connected to the corresponding Motor Module or Power Module and external encoders to the Control Unit.

#### Overview



The SMC10 Sensor Module Cabinet-Mounted is required to evaluate the encoders of motors without a DRIVE-CLiQ interface. External encoders can also be connected via the SMC10.

The following encoder signals can be evaluated:

- 2-pole resolver
- Multi-pole resolver

#### Design

The SMC10 Sensor Module Cabinet-Mounted features the following interfaces as standard:

- 1 DRIVE-CLiQ interface
- 1 encoder connection including motor temperature detection (KTY84-130 or PTC) via SUB-D connector
- 1 connection for the electronics power supply via the 24 V DC power supply connector
- 1 PE (protective earth) connection

The status of the SMC10 Sensor Module Cabinet-Mounted is indicated via a multi-color LED.

The SMC10 Sensor Module Cabinet-Mounted can be snapped onto a TH 35 top-hat rail to EN 60715 (IEC 60715).

The maximum encoder cable length between SMC10 modules and encoders is 130 m (427 ft).

#### Integration

The SMC10 Sensor Module Cabinet-Mounted communicates with the CU320 Control Unit via DRIVE-CLiQ.

#### Technical data

##### SMC10 Sensor Module Cabinet-Mounted

Max. current requirement (at 24 V DC) not taking encoder into account	0.2 A
Max. connectable cross section	2.5 mm <sup>2</sup>
Max. fuse protection	20 A
Power loss	< 10 W
PE connection	On housing with M4 screw
Width	50 mm (1.97 in)
Height	150 mm (5.91 in)
Depth	111 mm (4.37 in)
Weight, approx.	0.8 kg (2 lb)

#### Selection and ordering data

Description	Order No.
<b>SMC10 Sensor Module Cabinet-Mounted</b> (without DRIVE-CLiQ cable)	<b>6SL3055-0AA00-5AA0</b>

# SINAMICS S120

## Encoder system connection

### SMC20 Sensor Module Cabinet-Mounted

#### Overview



The SMC20 Sensor Module Cabinet-Mounted is required to evaluate the encoders of motors without a DRIVE-CLiQ interface. External encoders can also be connected via the SMC20.

The following encoder signals can be evaluated:

- Incremental encoder sin/cos 1 V<sub>pp</sub>
- Absolute encoder EnDat
- SSI encoder with incremental signals sin/cos 1 V<sub>pp</sub> (firmware version 2.4 and later)

The motor temperature can also be detected using KTY84-130 or PTC thermistors.

#### Design

The SMC20 Sensor Module Cabinet-Mounted features the following interfaces as standard:

- 1 DRIVE-CLiQ interface
- 1 encoder connection, including motor temperature detection (KTY84-130 or PTC) via SUB-D connector
- 1 connection for the electronics power supply via the 24 V DC power supply connector
- 1 PE (protective earth) connection

The status of the SMC20 Sensor Module Cabinet-Mounted is indicated via a multi-color LED.

The SMC20 Sensor Module Cabinet-Mounted can be snapped onto a TH 35 top-hat rail to EN 60715 (IEC 60715).

The maximum encoder cable length between SMC20 modules and encoders is 100 m (328 ft).

#### Integration

The SMC20 Sensor Module Cabinet-Mounted communicates with the CU320 Control Unit via DRIVE-CLiQ.

#### Technical data

SMC20 Sensor Module Cabinet-Mounted	
Power supply for encoder	5 V DC
Max. current requirement (at 24 V DC) not taking encoder into account	0.2 A
Max. connectable cross section	2.5 mm <sup>2</sup>
Max. fuse protection	20 A
Power loss	< 10 W
PE connection	On housing with M4 screw
Width	50 mm (1.97 in)
Height	150 mm (5.91 in)
Depth	111 mm (4.37 in)
Weight, approx.	0.8 kg (2 lb)

#### Selection and ordering data

Description	Order No.
<b>SMC20 Sensor Module Cabinet-Mounted</b> (without DRIVE-CLiQ cable)	<b>6SL3055-0AA00-5BA1</b>

#### Overview



The SMC30 Sensor Module Cabinet-Mounted is required to evaluate the encoders of motors without a DRIVE-CLiQ interface. External encoders can also be connected via the SMC30.

The following encoder signals can be evaluated:

- Incremental encoders TTL/HTL with/without open-circuit detection
- SSI encoders with incremental signals TTL/HTL (firmware version V2.4 and later)
- SSI encoders without incremental signals (firmware version V2.4 and later)

The motor temperature can also be detected using KTY84-130 or PTC thermistors.

#### Design

The SMC30 Sensor Module Cabinet-Mounted features the following interfaces as standard:

- 1 DRIVE-CLiQ interface
- 1 encoder connection including motor temperature detection (KTY84-130 or PTC) via SUB-D connector
- 1 connection for the electronics power supply via the 24 V DC power supply connector
- 1 PE (protective earth) connection

The status of the SMC30 Sensor Module Cabinet-Mounted is indicated via a multi-color LED.

The SMC30 Sensor Module Cabinet-Mounted can be snapped onto a TH 35 top-hat rail to EN 60715 (IEC 60715).

The maximum encoder cable length between SMC30 modules and encoders is 100 m (328 ft). For HTL encoders, this length can be increased to 300 m (984 ft) if signals A+/A- and B+/B- are evaluated and the power supply cable has a minimum cross section of 0.5 mm<sup>2</sup>.

The signal cable shield can be connected to the SMC30 Sensor Module Cabinet-Mounted via a shield connection terminal, e.g., Phoenix Contact type SK8 or Weidmüller type KLBÜ CO 1.

#### Integration

The SMC30 Sensor Module Cabinet-Mounted communicates with the CU320 Control Unit via DRIVE-CLiQ.

#### Technical data

SMC30 Sensor Module Cabinet-Mounted	
Power supply for encoder	5 V DC and 24 V DC
Max. current requirement (at 24 V DC) not taking encoder into account	0.2 A
Max. connectable cross section	2.5 mm <sup>2</sup>
Max. fuse protection	20 A
Power loss	< 10 W
Cut-off frequency	500 kHz
Resolution absolute position SSI	30 bit
Max. cable length	
• TTL encoders	Max. 100 m (328 ft) (only bipolar signals permitted)
• HTL encoders	Max. 100 m (328 ft) for unipolar signals Max. 300 m (984 ft) for bipolar signals
PE connection	On housing with M4 screw
Width	50 mm (1.97 in)
Height	150 mm (5.91 in)
Depth	111 mm (4.37 in)
Weight, approx.	0.8 kg (2 lb)

#### Selection and ordering data

Description	Order No.
<b>SMC30 Sensor Module Cabinet-Mounted</b> (without DRIVE-CLiQ cable)	<b>6SL3055-0AA00-5CA1</b>

## SME20/SME25 Sensor Modules External

## Overview



SME20/SME25 Sensor Modules External are encoder evaluation units for machine encoders (direct measuring systems). The devices are designed with IP67 degree of protection. This means that the units can be installed outside the control cabinet near the machine encoder.

The following encoder signals can be evaluated:

- Incremental encoder sin/cos 1 V<sub>pp</sub> without rotor position track (C/D track)
- Absolute encoder EnDat
- Absolute encoder SSI with incremental signals sin/cos 1 V<sub>pp</sub> (firmware version 2.4 and later)

SME20/SME25 Sensor Modules External evaluate the encoder signals and convert the information obtained to DRIVE-CLiQ.

## Design

SME20/SME25 Sensor Modules External feature the following interfaces as standard:

- 1 DRIVE-CLiQ interface
- 1 encoder connector (circular plug)
- 24 V DC electronics power supply via DRIVE-CLiQ link from the Control Unit/Motor Module
- 1 PE (protective earth) connection

The maximum cable length between the measuring system and SME20/SME25 modules is 3 m (9.84 ft).

The maximum cable length between SME20/SME25 modules and the drive control is 100 m (328 ft).

## Integration

SME20/SME25 Sensor Modules External communicate with a Control Unit via DRIVE-CLiQ.

## Selection and ordering data

Description	Order No.
<b>SME20 Sensor Module External</b> for incremental measuring systems (without DRIVE-CLiQ cable)	<b>6SL3055-0AA00-5EA0</b>
<b>SME25 Sensor Module External</b> for absolute systems (without DRIVE-CLiQ cable)	<b>6SL3055-0AA00-5HA0</b>

## Technical data

	SME20 Sensor Module External	SME25 Sensor Module External
Encoder	<ul style="list-style-type: none"> <li>• Incremental encoder sin/cos 1 V<sub>pp</sub> with 5 V voltage supply</li> </ul>	<ul style="list-style-type: none"> <li>• Absolute encoder EnDat with 5 V voltage supply</li> <li>• Absolute encoder SSI with incremental signals sin/cos 1 V<sub>pp</sub> with 5 V voltage supply</li> </ul>
Multiplication factor	2048	2048
Measuring system interface	12-pin circular connector	17-pin circular connector
Outlet	IP67 DRIVE-CLiQ connector	IP67 DRIVE-CLiQ connector
Max. current requirement (at 24 V DC) not taking encoder into account	0.11 A	0.11
Max. cross section that can be connected	Acc. to connector contacts	Acc. to connector contacts
Max. fuse protection	via DRIVE-CLiQ power supply source	via DRIVE-CLiQ power supply source
Power loss	W < 10	< 10
PE connection	On housing with M4/1.8 Nm screw	On housing with M4/1.8 Nm screw
Degree of protection	IP67	IP67
Width	mm (inch) 58 (2.28)	58 (2.28)
Height	mm (inch) 44 (1.73)	44 (1.73)
Depth	mm (inch) 112 (4.41)	112 (4.41)
Weight, approx.	kg (lb) 0.18 (0.4)	0.18 (0.4)