



The world of motor feedback systems for electrical drive engineering

ULTIMATE PERFORMANCE FOR EVERY APPLICATION

Motor feedback systems

SICK
Sensor Intelligence.



1985

With the patented synchronous serial interface (SSI), SICK-STEGMANN GmbH created an interface which established itself as an undisputed standard in industrial environments.

1996

With the innovative universal HIPERFACE® interface, SICK-STEGMANN set another global standard in 1996: There was now only one interface on the speed controller for all applications and only one type of signal line between the speed controller and feedback system.

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The HIPERFACE® interface is known for its compactness, speed and precision – the installed base is globally present. In order to better serve customer requirements our engineers kept just a single goal in mind: to make a great system even better.

ARTISE WITH INTERFACES IS PART OUR TRADITION. HIPEFACE DSL®



The digital evolution

2011

HIPERFACE® goes digital: With HIPERFACE DSL®, technology leader SICK presents a purely digital protocol that uses a minimum of connection cables between the frequency converter and motor feedback system.

2017

SICK opens the one cable interface for servo motors - by opening HIPERFACE DSL®, SICK is now providing a safe, real-time and open communication interface for servo technology. This interface forms the basis for efficient processes and reliable movement monitoring of the servo drive. The opening of HIPERFACE DSL® marks another innovative milestone in SICK's history of interface expertise, thereby creating a new market standard. Vendors of servo drives can therefore obtain motor feedback systems from several manufacturers.

They looked for areas where improvements could be made, simplified or accelerated.
The result: HIPERFACE DSL®.

This “digital servo link” interface enables an entirely new architecture for the servo drive with completely new options, as it is now fully digital instead of hybrid (analog/digital).

With SSI and HIPERFACE® we have succeeded in setting new industry standards.
HIPERFACE DSL® fulfills all requirements to establish itself as a premium system.

MOTOR FEEDBACK SYSTEMS FROM SICK



Innovation & partnership

Innovations lead to the development of new products and technologies.

This has been demonstrated by SICK for decades with its range of motor feedback systems and interfaces.

It goes without saying for us that close partnerships are essential for success. The mutual development of solutions for creating successful projects and offering you the best possible service are equally important to us. This forms the basis for long-term and sustainable partnerships.

Flexibility

SICK offers you a product portfolio which combines various technologies into a minimum of mechanisms. Do you require various performance levels? Do you require a customized solution? We can deliver!

SICK's motor feedback systems additionally optimize your products, reduce system costs and offer you the flexibility you need to succeed in today's marketplace.



Safety

SICK's certified safety motor feedback systems are available in a broad range of performance levels, enabling individual selection in order to fulfill market requirements.

These safety components represent the state-of-the-art and facilitate certification of systems compared to non-certified products.

With SICK you always have a competent partner at your side.

Solutions for electrical drive engineering

The wide range of available technologies covering everything from compact servo drives through to powerful direct drives are ideal for creating bespoke solutions.

A mechanical interface to the customer's equipment serves to minimize variances on-site across a broad spectrum of technologies.

In addition to its comprehensive product portfolio, technology leader SICK also continually brings innovation to the field of drive engineering. Building on SSI and HIPERFACE®, HIPERFACE DSL® represents the next stage of evolution in terms of drive engineering.

PERFORMANCE



| | Product family | Number of sine/cosine periods per revolution | |
|---|-----------------------------------|--|---|
| | | | Highend |
|  | SFS/SFM60 → see page 34 | 1024 | Typical applications <ul style="list-style-type: none"> • Servo systems in printing press • Servo systems in semiconductor industry |
|  | SRS/SRM50 → see page 32 | 1024 | |
| | | | Midrange |
|  | SKS/SKM36 → see page 30 | 128 | Typical applications <ul style="list-style-type: none"> • Servo systems in packaging industry • Servo systems in milling center |
| | | | Lowend |
|  | SEK/SEL37 → see page 29 | 16 | Typical applications <ul style="list-style-type: none"> • Servo systems for cutting and folding • Servo hydraulic systems • Robotic |
|  | SEK/SEL34 → see page 28 | 16 | |

HIPERFACE[®] DSL

Product family Resolution



EDS/EDM35
→ see page 24

20/24 bit



EFS/EFM50
→ see page 22

21/23 bit



EKS/EKM36
→ see page 20

18/20 bit



EES/EEM37
→ see page 18

15/17 bit

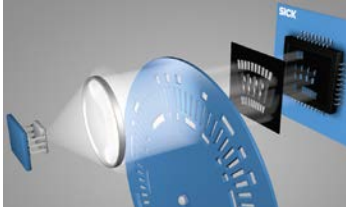
TECHNOLOGY



Speed and position measurement with ultimate precision

Motor feedback systems from SICK fulfill important requirements, such as temperature resistance, high resolution, electronic type labeling, multiturn designs with mechanical gear mechanisms, high stability, and last but not least, small dimensions, enabling short motor lengths. The wide range of available technologies offer solutions for applications in all performance levels.

Optical technology

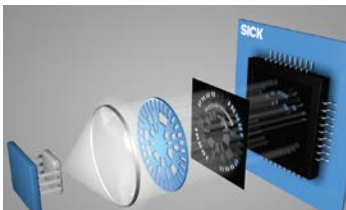


For high-end applications

- Ultimate resolution
- Sensing at the edge of the code disc

Example uses: SRS/SRM50, SFS/SFM60,
EFS/EFM50, EDS/EDM35

Optical technology

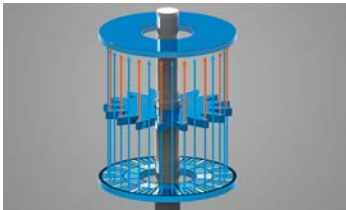


For mid-range applications

- High resolution combined with compact housing design
- Sensing centrally to rotary axis

Example uses: SKS/SKM36, EKS/EKM36

Capacitive technology



For low-end applications

- Rugged technology
- Sensing by measuring of the electrical field

Example uses: SEK/SEL34, SEK/SEL37,
SES/SEM70, SES/SEM90,
SEK160, EES/EEM37

Multiturn technology

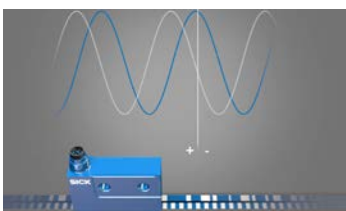


For all performance classes

- Maximum reliability
- Gear technology

Used for all multiturns.

Magnetic technology



For linear motors

- Rugged technology
- Sensing by measuring of the magnetical field

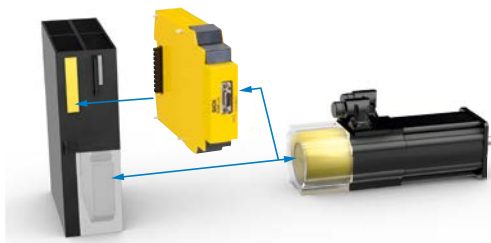
Example uses: TTK50, TTK70

SAFE MOTION CONTROL: ALWAYS THE RIGHT SAFETY CONCEPT FOR ANY APPLICATION

EXTERNAL SAFETY CONCEPT

COMPONENTS OF THE DRIVE SYSTEM:

- Digital servo drive without safety function
- Motor feedback system or encoder, available as a variant for standard applications or safety applications
- External safety monitor



THE SICK SOLUTION:

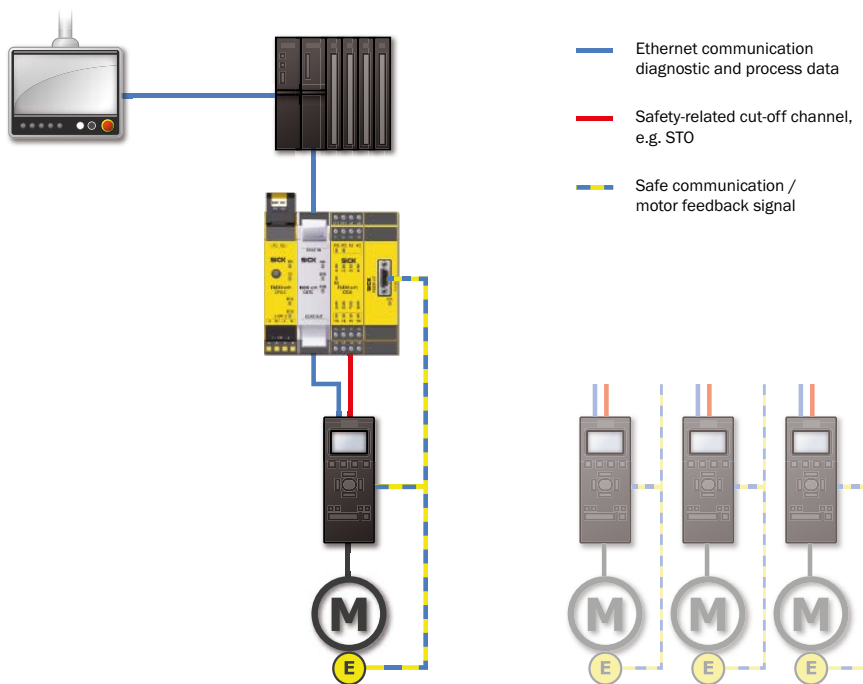
- Motor feedback system with HIPERFACE® or encoder such as SRM50S
- Drive Monitor FX3-MOC0/ FX3-MOC1



Drive Monitor FX3-MOC0/ FX3-MOC1 SRM50S

TYPICAL APPLICATIONS:

- Retrofitting of existing drive systems
- Automated guided transport systems
- Storage and conveying technology
- Machine building
- Handling systems
- Machine tools, servo presses



ADVANTAGES OF THE EXTERNAL SAFETY CONCEPT:

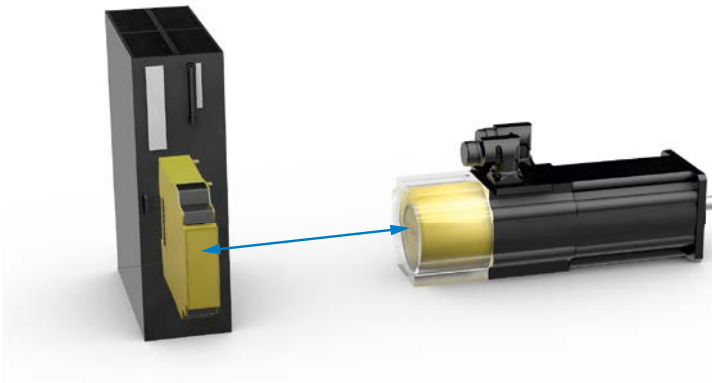
- High protection from manipulations thanks to separation of safety and automation tools
- The external safety concept is independent of the drive system
 - High flexibility in the drive selection:
 - Focus can be placed on machine parameters, customer requirements and budget
 - Easy retrofitting of existing machines
 - Scalable safety and machine concept
- All safety solutions in one software save time and money
 - Fast creation of configurations
 - Faster software adjustments for changing requirements
 - Fast and easy validation and verification, thanks to an automatically generated report
- Monitoring multiple drives in a system
 - Dependencies between the movements of individual drives can be taken into account
 - Even complex applications can be implemented
- Our verified and industry-specific application packages relieve you of engineering efforts
 - Components coordinated to each other
 - Prepared application software and calculation examples
 - Detailed application descriptions

SAFE MOTION CONTROL: ALWAYS THE RIGHT SAFETY CONCEPT FOR ANY APPLICATION

INTEGRATED SAFETY CONCEPT

COMPONENTS OF THE DRIVE SYSTEM:

- Digital servo drive with integrated safety function
- Servomotor with safe motor feedback system



- Safe motor feedback system with HIPERFACE® or HIPERFACE DSL® such as SRM50S or EKM36-2

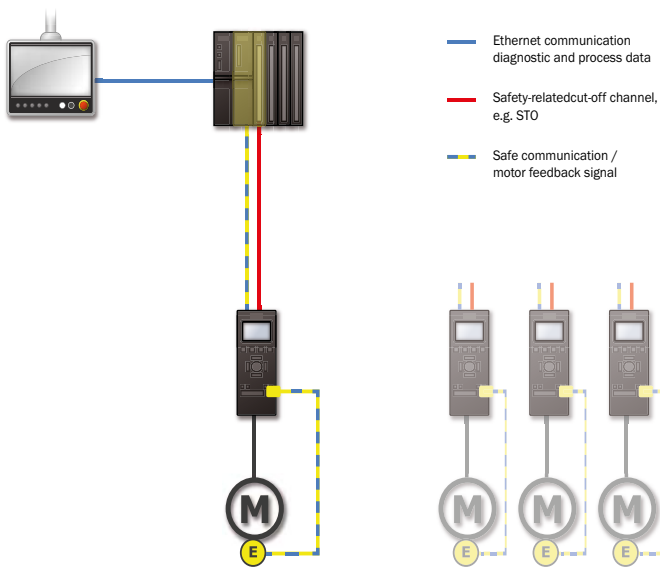


Motor feedback systems EKM36-2



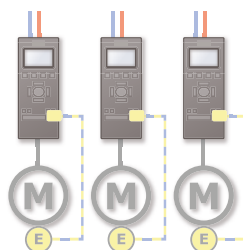
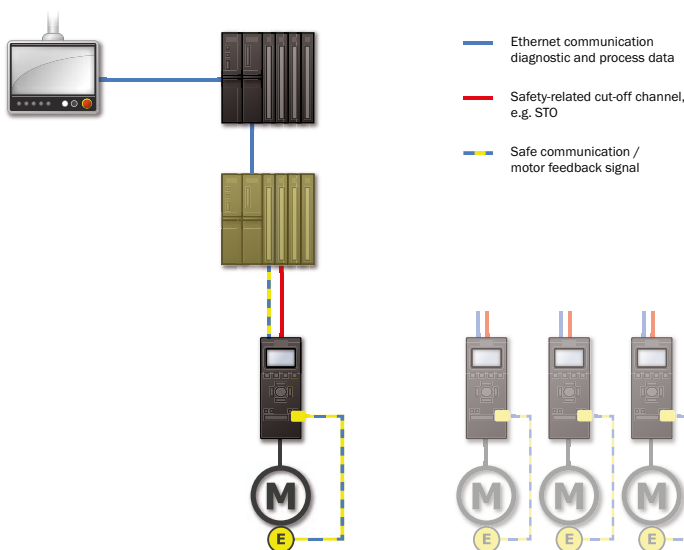
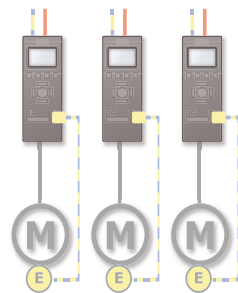
TYPICAL APPLICATIONS:

- Packaging systems
- Metalworking machines
- Handling systems



ADVANTAGES OF THE INTEGRATED SAFETY CONCEPT:

- Only a few male connectors and cables are required
- Fewer components
- Complete drive system from one manufacturer
- Quick certification
- Short response time for errors
- Easy availability of the control parameters



HIPERFACE DSL®

The original – single cable technology with HIPERFACE DSL®

Launched in 2011 by SICK, HIPERFACE DSL® was the first one-cable interface for servomotors on the market. Since then, it has become an established product among manufacturers of motors and drives around the world.



This purely digital interface offers a direct connection to the future. The innovative and interference-free HIPERFACE DSL® protocol enables communication using just two wires that are integrated into the motor cable – ensuring an extremely reliable process. This interface is therefore the most important factor in the evolution from a traditional motor feedback system to a smart solution.

Controller-side, analog devices become superfluous, and implementation is made easier through the use of an FPGA or ASIC. This leaves only one connector for connecting the servomotor, including power, communication and the temperature sensor.

The IP-Core “DSL Master” allows implementing the motor-feedback protocol HIPERFACE DSL® on drives. HIPERFACE DSL® is a fast digital protocol for motor feedback systems that connects servo drives with SICK motor feedback encoders. For details of the protocol, IP-Core details, all implementation and test aspects please see the HIPERFACE DSL® Manual (Doc No 8017595).

Order information:

Type: CD-ROM IP-Core DSL Master **Part-No.:** 2055752

These manufacturers offer HIPERFACE DSL®:



HIPERFACE DSL®

Facts made transparent

The servomotor drives the process. Motor feedback systems supply data for regulating and operating motors and therefore ensure a smooth and efficient process.

But motor feedback systems are more than simple data providers. During operation, intelligent sensor technology not only checks parameters such as speed, safe positioning, acceleration, temperature, and the number of revolutions. Predictive maintenance and permanent process condition monitoring are also made possible with additional functions such as the electronic type label, histograms, and user-defined warnings in particular.

This transforms the motor feedback systems from SICK into Smart Motor Sensors.

What is measured?

Servomotors have a lot to tell us. To enable our customers to understand everything that is happening inside the motor, motor feedback systems measure a variety of parameters:



Speed



Acceleration



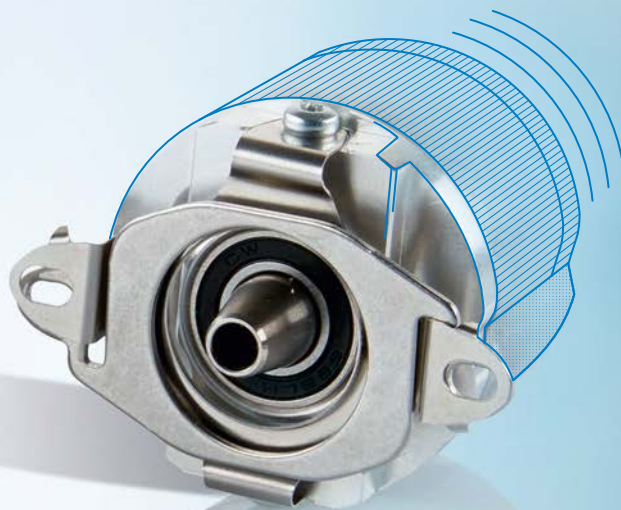
Angles



Temperature



Number of revolutions



HIPERFACE DSL® is your gateway to the future!

The infographic consists of eight circular icons arranged in a 4x2 grid, each with a corresponding text label below it. The icons are: 1. A bar chart with four bars of increasing height. 2. A magnifying glass over a waveform. 3. A sine wave with an arrow pointing to the right. 4. A central blue circle with four arrows pointing outwards. 5. A bar chart with five bars of increasing height, with 'SIL3' and 'IEC 61508' written above it. 6. A calendar icon with a wrench and screwdriver crossed over it. 7. A hand holding a dollar sign with a downward arrow. 8. A padlock icon.

| | |
|---|---|
|  MORE PERFORMANCE |  DIAGNOSTIC FUNCTION |
|  SMOOTHER OPERATION |  REMOTE DIAGNOSTICS |
|  SIL3-COMPLIANT |  PREDICTIVE MAINTENANCE |
|  CONNECTION COSTS AND CABLE VARIANCE REDUCED BY 50% |  INCREASED SAFETY IN FUNCTIONS AND INVESTMENTS |

More about HIPERFACE DSL® under following link:

www.sick.com/hiperfacedsl



At a glance

- Capacitive motor feedback system with HIPERFACE DSL®
- Up to 17-bit resolution per revolution and 4,096 revolutions with the multi-turn system
- Certified according to SIL2 and PL d
- Status monitoring and mission time histogram; Temperature, speed, and supply voltage are stored throughout the service life

Your benefits

- The compact design allows manufacturers of small and very small motors to reduce the lengths of their motors significantly
- The EES/EEM37 motor feedback systems are extremely well suited to use in harsh environments where resolvers were previously the only option
- The capacitive measurement principle with holistic sensing enables high axial and radial tolerances, simplifying the motor design
- Certification allows for easy integration into a safe drive system

→ www.sick.com/EES_EEM37

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EES37-0KF0A015A | 1068810 |
| EES37-0KF0A017A | 1068811 |
| EES37-0KF0B015A | 1086281 |
| EES37-0KF0B017A | 1086282 |

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EES37-2KF0A015A | 1067126 |
| EES37-2KF0A017A | 1067127 |
| EES37-2KF0B015A | 1086283 |
| EES37-2KF0B017A | 1086284 |

Multiturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EEM37-0KF0A015A | 1068808 |
| EEM37-0KF0A017A | 1068809 |
| EEM37-0KF0B015A | 1086277 |
| EEM37-0KF0B017A | 1086278 |

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EEM37-2KF0A015A | 1067124 |
| EEM37-2KF0A017A | 1067125 |
| EEM37-2KF0B015A | 1086279 |
| EEM37-2KF0B017A | 1086280 |



At a glance

- Motor feedback system with HIPERFACE DSL® interface
- Compact, robust design with 36 mm diameter
- Up to 20 bit resolution per revolution and 4,096 revolutions measurable with the multiturn system
- Facility for connecting an external temperature sensor
- E²Prom with 8 kbyte of free memory space
- SIL2-certified (only valid for EKS/EKM36-2...)
- Service life histogram

Your benefits

- Saving all analog components on the controller part through exclusively digital data transmission
- Enormous cost saving thanks to the separate encoder cable no longer being necessary, data transmitted synchronously to the controller cycle
- Minimal cabling thanks to integration of the encoder communication into the motor cable
- Optimization of the controller circuit via automated synchronization with the controller cycle

→ www.sick.com/EKS_EKM36

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EKS36-0KF0B018A | 1084229 |
| EKS36-0KF0B020A | 1084230 |

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EKS36-2KF0B018A | 1084231 |
| EKS36-2KF0B020A | 1084232 |

Multiturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EKM36-0KF0B018A | 1084233 |
| EKM36-0KF0B020A | 1084234 |

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EKM36-2KF0B018A | 1084235 |
| EKM36-2KF0B020A | 1084236 |



At a glance

- Motor feedback system with HIPERFACE-DSL® interface
- Compact, rugged design with 50 mm diameter
- Up to 23-bit resolution per revolution and 4,096 revolutions measurable with the multiturn system
- Option for connecting an external temperature sensor
- E²Prom with 8 KB of free memory space
- SIL2-certified (only valid for EFS/EFM50-2)
- 12-bit resolution of the safe position value
- Service histogram

Your benefits

- Thanks to data transmission exclusively in digital format, no analog components are necessary on the controller side
- The absence of a separate encoder cable considerably reduces costs. Data transmission is synchronized with the controller cycle.
- Minimum cabling thanks to integration of encoder communication into the motor cable
- Optimization of the controller circuit via automated synchronization with the controller cycle

→ www.sick.com/EFS_EFM50

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EFS50-0KF0A021A | 1073485 |
| EFS50-0KF0A023A | 1073501 |

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EFS50-2KF0A021A | 1073487 |
| EFS50-2KF0A023A | 1073503 |

Multiturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EFM50-0KF0A021A | 1073486 |
| EFM50-0KF0A023A | 1073502 |

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EFM50-2KF0A021A | 1073488 |
| EFM50-2KF0A023A | 1073504 |



At a glance

- Optical motor feedback system with HIPERFACE DSL®
- Up to 24-bit resolution per revolution and 4,096 revolutions with the multi-turn system

Your benefits

- A single model with different performance levels allows system suppliers to implement a variety of applications using only one type of encoder
- EDS/EDM35 motor feedback systems

- Certified according to SIL2 and PL d
- Status monitoring and mission time histogram; temperature, speed, and revolution data are stored throughout the service life of the device

tems are ideal for use in high-precision, dynamic applications

- The 13-bit secure absolute singleturn resolution meets the requirements of tomorrow's safety servo drives

→ www.sick.com/EDS_EDM35

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EDS35-0KF0A020A | 1090708 |
| EDS35-0KF0A024A | 1090732 |

- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EDS35-2KF0A020A | 1090710 |
| EDS35-2KF0A024A | 1090734 |

Multiturn

- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|-----------------|----------|
| EDM35-0KF0A020A | 1090709 |
| EDM35-0KF0A024A | 1090733 |

- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE DSL®

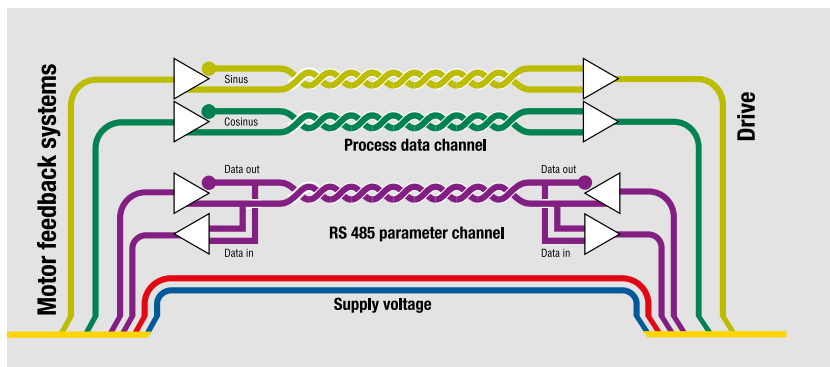
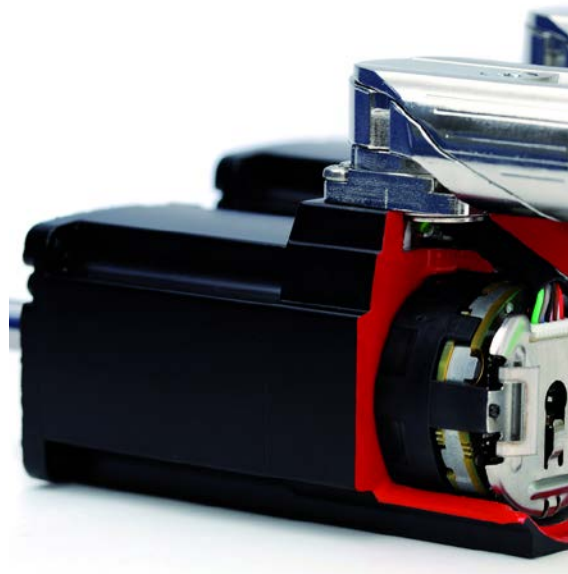
| Type | Part no. |
|-----------------|----------|
| EDM35-2KF0A020A | 1090711 |
| EDM35-2KF0A024A | 1090735 |

HIPERFACE®

HIPERFACE® – the standard interface in electrical drive engineering

The HIPERFACE® interface is supported by numerous drive manufacturers, thus offering broad market coverage. By this hybrid interface, it transmits both analog and digital sensor values.

The speed measurement is performed using high-precision analog sin- and cosine signals (process data channel). The digital absolute position is transmitted via the parameter channel.



This information is transmitted by HIPERFACE®

- Commutation
- Absolute position
- Speed
- Data from the electronic type label

Your benefits as a result of HIPERFACE®

- Optimum market penetration, as it is implemented worldwide
- Analog signals (sine and cosine signals) can be picked up externally
- Enables an external safety concept
- Easy commissioning thanks to the electronic type label



These renowned manufacturers offer HIPERFACE®





At a glance

- Motor feedback system for the basic power range
- Special design for motors with a 40 mm edge dimension
- 16 sine/cosine periods per revolution
- Absolute position with a resolution of 512 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value
- Electronic type label
- HIPERFACE® interface
- RoHS-compliant

Your benefits

- The small dimension allows manufacturers of low-power and minimalpower motors to considerably reduce the size of their motors
- The SEK/SEL34 motor feedback systems are excellently suited for use under rough environmental conditions
- The capacitive principle of measurement with holistic scanning allows for high axial and radial tolerances

→ www.sick.com/SEK_SEL34

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Shaft version:** Tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|---------------|----------|
| SEK34-HFB0K02 | 1053402 |

Multiturn

- **Shaft version:** Tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE DSL®

| Type | Part no. |
|---------------|----------|
| SEL34-HFB0K02 | 1053403 |



At a glance

- Motor feedback systems for the basic performance range
- 16 sine/cosine periods per revolution
- Absolute position with a resolution of 512 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value
- Electronic type label
- HIPERFACE® interface
- Installed version with tapered shaft and axial or radial connector outlet
- Conforms to RoHs

Your benefits

- Its small dimensions allow manufacturers of small and very small motors to achieve a significant reduction in the length of their motors
- The SEK/SEL37 motor feedback systems are particularly suitable for use under harsh ambient conditions
- The capacitive measurement principle with holistic sensing enables high axial and radial tolerances
- Due to the uniform mechanical component, a high level of flexibility can be achieved with SKS/SKM36 when using with various encoder systems

→ www.sick.com/SEK_SEL37

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE®

| Type | Part no. |
|----------------|----------|
| SEK37-HFA0-K02 | 1037376 |
| SEK37-HFB0-K02 | 1037378 |

Multiturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Communication interface:** HIPERFACE®

| Type | Part no. |
|----------------|----------|
| SEL37-HFA0-K02 | 1037377 |
| SEL37-HFB0-K02 | 1037379 |



At a glance

- Motor feedback systems for the standard performance range
- 128 sine/cosine periods per revolution
- Absolute position with a resolution of 4,096 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value and electronic type label
- HIPERFACE® interface
- Integrated version and stand-alone design
- Certified according to SIL2/PL d (only valid for SKS36S/SKM36S-H...)
- Conforms to RoHS

Your benefits

- The small dimension allows manufacturers of low-power and minimal-power motors to considerably reduce the size of their motors
- The stand-alone version is ideally suited as a master and path encoders
- The SKS/SKM36 motor feedback systems have strongly penetrated the drive technology market
- The consistent mechanical components in SEK/SEL37 allow for a high degree of flexibility with various encoder systems

→ www.sick.com/SKS_SKM36

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Communication interface:** HIPERFACE®

| Shaft version | Type | Type | Part no. |
|---------------|-----------------|----------------|----------|
| Solid shaft | Stand-alone | SKS36-HVA0-K02 | 1035603 |
| | | SKS36-HVV0-K02 | 1035604 |
| Tapered shaft | For integration | SKS36-HFA0-K02 | 1034095 |

- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Shaft version | Type | Type | Part no. |
|---------------|-----------------|-----------------|----------|
| Solid shaft | Stand-alone | SKS36S-HVA0-K02 | 1036557 |
| Tapered shaft | For integration | SKS36S-HFA0-K02 | 1036556 |

Multiturn

- **Communication interface:** HIPERFACE®

| Shaft version | Type | Type | Part no. |
|---------------|-----------------|----------------|----------|
| Solid shaft | Stand-alone | SKM36-HVA0-K02 | 1035601 |
| | | SKM36-HVV0-K02 | 1035602 |
| Tapered shaft | For integration | SKM36-HFA0-K02 | 1034094 |

- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Shaft version | Type | Type | Part no. |
|---------------|-----------------|-----------------|----------|
| Solid shaft | Stand-alone | SKM36S-HVA0-K02 | 1036559 |
| Tapered shaft | For integration | SKM36S-HFA0-K02 | 1036558 |



At a glance

- Motor feedback systems for the top performance range
- 1,024 sine/cosine periods per revolution
- Absolute position with a resolution of 32,768 increments per revolution and 4,096 revolutions with the multi-turn system
- HIPERFACE® interface: Programming

Your benefits

- Motor feedback system with HIPERFACE® interface
- High shock/vibration resistance thanks to built-in metal code disk
- Consistent motor design due to identical size of single and multiturn

- of the position value and electronic type label
- Insert shaft or tapered shaft with various torque supports
- Integrated version, mounted version or stand-alone design
- Certified according to SIL2/PL d (only valid for SRS50S/SRM50S...)
- Conforms to RoHS

- design
- To use of a motor feedback system certified to SIL2/PL d makes it easier to have your system certified
- Very smooth running thanks to maximum ball bearing distance



→ www.sick.com/SRS_SRM50

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Communication interface:** HIPERFACE®

| Shaft version | Shaft diameter | Type | Type | Part no. |
|---------------|----------------|-----------------|----------------|----------|
| Solid shaft | 10 mm | Stand-alone | SRS50-HWA0-K22 | 1037092 |
| | | | SRS50-HWV0-K22 | 1037094 |
| Tapered shaft | - | For integration | SRS50-HFA0-K22 | 1037068 |
| | | | SRS50-HFV0-K22 | 1037070 |

Multiturn

- **Communication interface:** HIPERFACE®

| Shaft version | Shaft diameter | Type | Type | Part no. |
|---------------|----------------|-------------|----------------|----------|
| Solid shaft | 10 mm | Stand-alone | SRM50-HWA0-K22 | 1037096 |
| | | | SRM50-HWV0-K22 | 1037098 |

| Shaft version | Shaft diameter | Type | Type | Part no. |
|---------------|----------------|-----------------|----------------|----------|
| Tapered shaft | - | For integration | SRM50-HFA0-K22 | 1037072 |
| | | | SRM50-HFV0-K22 | 1037074 |

Singleturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Type | Part no. |
|-----------------|----------|
| SRS50S-HFA0-K22 | 1051790 |
| SRS50S-HFV0-K22 | 1051792 |

Multiturn

- **Shaft version:** tapered shaft
- **Type:** for integration
- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Type | Part no. |
|-----------------|----------|
| SRM50S-HFA0-K22 | 1051794 |
| SRM50S-HFV0-K22 | 1051796 |



At a glance

- HIPERFACE® motor feedback system in singleturn and multiturn design, compatible with the world's leading drive systems
- 1,024 sine/cosine periods per revolution
- Absolute position with a resolution of 32,768 increments per revolution and 4,096 revolutions with the multi-turn system
- Mechanical flexibility through different blind hollow shaft and through hollow shaft diameters (8 to 15 mm diameter), available with various stator couplings
- IP65 protection class
- Certified according to SIL2/PL d (only valid for SFS60S/SFM60S...)

Your benefits

- Convenient traceability and simple maintenance thanks to storage of motor-specific data in the electronic type label
- Large ball bearing distances reduce uneven wear and minimize vibration on the encoder housing, which increases the encoder's service life
- The nickel code disk offers a high degree of vibration resistance and an extended temperature range
- Shorter development times through standardized mechanical interface
- Platform for the future, since all electrical interfaces (TTL/HTL, 1Vpp, SSI, PROFIBUS, HIPERFACE DSL®) are or will be available in this mechanical component

→ www.sick.com/SFS_SFM60

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

- **Type:** Stand-alone
- **Communication interface:** HIPERFACE®

| Shaft version | Shaft diameter | Type | Part no. |
|----------------------|----------------|----------------|----------|
| Blind hollow shaft | 12 mm | SFS60-HMAB0K02 | 1053951 |
| | 15 mm | SFS60-HPAB0K02 | 1053300 |
| Through hollow shaft | 12 mm | SFS60-HMKT0K02 | 1051090 |
| | 14 mm | SFS60-HRKT0K02 | 1050528 |
| | 15 mm | SFS60-HPKT0K02 | 1050531 |

Multiturn

- **Type:** Stand-alone
- **Communication interface:** HIPERFACE®

| Shaft version | Shaft diameter | Type | Part no. |
|----------------------|----------------|----------------|----------|
| Blind hollow shaft | 12 mm | SFM60-HMAB0K02 | 1053160 |
| | 15 mm | SFM60-HPAB0K02 | 1053573 |
| | | SFM60-HPKB0K02 | 1053044 |
| Through hollow shaft | 12 mm | SFM60-HMKT0K02 | 1051091 |
| | 14 mm | SFM60-HRKT0K02 | 1050527 |
| | 15 mm | SFM60-HPKT0K02 | 1051311 |

Singleturn

- **Shaft version:** through hollow shaft
- **Type:** Stand-alone
- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Shaft diameter | Type | Part no. |
|----------------|-----------------|----------|
| 12 mm | SFS60S-HMKT0K02 | 1081506 |
| 14 mm | SFS60S-HRKT0K02 | 1081504 |
| 15 mm | SFS60S-HPKT0K02 | 1076852 |

Multiturn

- **Type:** Stand-alone
- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Shaft version | Shaft diameter | Type | Part no. |
|----------------------|----------------|-----------------|----------|
| Blind hollow shaft | 12 mm | SFM60S-HMAB0K02 | 1081517 |
| | 15 mm | SFM60S-HPAB0K02 | 1081515 |
| | | SFM60S-HPKB0K02 | 1081514 |
| Through hollow shaft | 12 mm | SFM60S-HMKT0K02 | 1081525 |
| | 14 mm | SFM60S-HRKT0K02 | 1081521 |
| | 15 mm | SFM60S-HPKT0K02 | 1076951 |

MOTOR FEEDBACK SYSTEMS WITH HIPERFACE® INTERFACES FOR DIRECT DRIVES

A direct drive is a system whereby the motor (actuator) is directly fastened to the moving part (for example a rotary table). With this design the motor and machine speed is identical, therefore there is no loss of torque due to a gear mechanism, ball joint spindle or other coupling.

Main advantages of direct drives:

- Extended service life – low maintenance
- Increased dynamic
- Precision and smooth running
- Compact design
- Energy efficiency

The past years have shown a clear trend towards direct drives in the field of electronic drive engineering.

Today companies are forced to take energy efficiency into greater consideration for production in order to ensure competitiveness, as energy costs are playing an increasingly significant role in the cost structure. In doing so, they are faced with the challenge of finding the right balance between dynamic performance and productivity. This task can be ideally realized with the help of direct drives.

SICK, the innovative provider of industrial automation products, recognized this trend towards direct drives very early on and developed a range of bespoke motor feedback systems:

- Motor feedback systems SES/SEM70, SES/SEM90 and SEK160 for torque-motors and rotary table applications
- Motor feedback systems TTK50 and TTK70 for linear motors

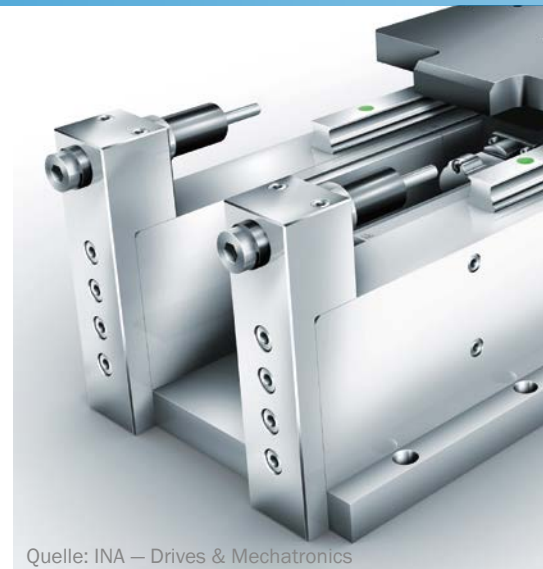
These motor feedback systems are equipped with the industry standard HIPERFACE® interface and are compatible with the world's leading drive systems.



Extended service life – low maintenance

Conventional drive systems with servomotors and gears or ball joint spindles are subject to wear, meaning that the drive system requires regular maintenance and servicing.

Because direct drives contain no gear mechanisms within the drive train, they are extremely low-maintenance. This leads to a significant reduction in maintenance time and costs as oil changes for gear mechanisms becomes a thing of the past.



Quelle: INA – Drives & Mechatronics



Increased dynamic

The drive system is more immediate and dynamic because the control circuit requires no elastic coupling elements. Ball joint spindles limit or dampen torque transmission and speed and therefore are subject to structural limitations.

For this reason, dynamic linear direct drives with their time-saving potential in production cycles offer an interesting alternative for customers.



Precision and smooth running

Direct drives offer improved precision and smooth running compared to servomotors with gear mechanisms or ball joint spindles. Gear play can be compensated for with a complex mechanical structure, however, this often leads to higher development and construction costs.



Compact design

The overall system is extremely compact with direct drives due to the fact that the range of components and moving parts is limited. This leads to two distinct advantages: Easy handling for the machine engineer and simple integration for the end user.



Energy efficiency

The development of efficient, ecologically-sound systems is an increasingly important matter today. A direct-drive system saves energy costs due to the fact that transmission losses are practically eliminated.



At a glance

- Singleturn and multiturn variants with 25 mm hollow shaft
- 32 sine/cosine periods per revolution, 4,096 revolutions with the multiturn variants
- HIPERFACE® interface with extended

Your benefits

- Integrated mechanical multiturn function for additional measuring of revolutions without external battery
- Direct mounting on the drive shaft renders transmission components such as timing belts or couplings unnecessary
- Simple, compact design, wear-free, low maintenance costs

- type label
- Maximum speed: 8,500 rpm
- Easy mounting without special mounting tools
- High shock and vibration resistance

- Quick installation without special mounting tools: easy to put on, turn, and go
- Rugged and reliable thanks to high shock and vibration resistance
- Reliable establishment of the absolute position at high speeds
- Mounting check for reading out the axial position of the rotor

→ www.sick.com/SES_SEM70

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

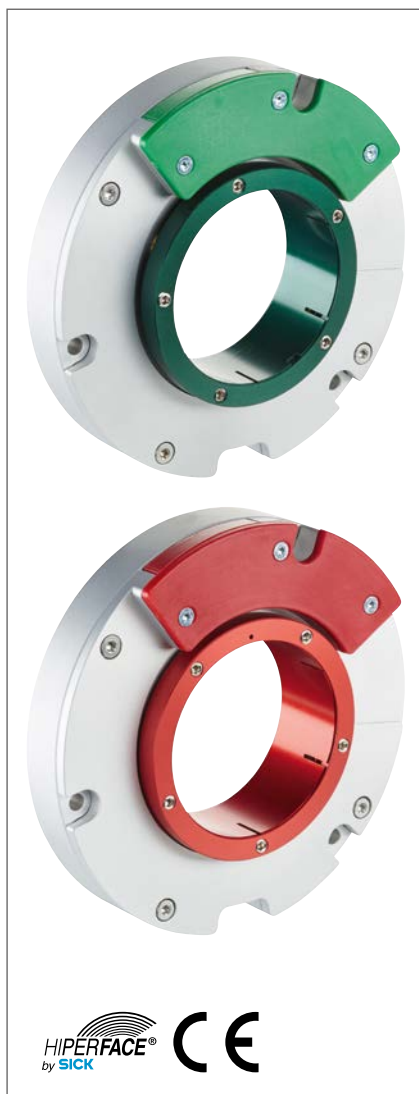
Additional device designs and corresponding accessories can be found at the link above.

Singleturn

| Shaft version | Shaft diameter | Type | Communication interface | Type | Part no. |
|----------------------|----------------|-----------------|-------------------------|-----------------|----------|
| Through hollow shaft | 25 mm | For integration | HIPERFACE® | SES70-HN025AK22 | 1074671 |

Multiturn

| Shaft version | Shaft diameter | Type | Communication interface | Type | Part no. |
|----------------------|----------------|-----------------|-------------------------|-----------------|----------|
| Through hollow shaft | 25 mm | For integration | HIPERFACE® | SEM70-HN025AK22 | 1074669 |



At a glance

- Singleturn and multiturn variants with 50 mm hollow shaft
- 64 sine/cosine periods per revolution, additionally 4,096 revolutions with the multiturn variants
- HIPERFACE® interface with extended

Your benefits

- Integrated mechanical multiturn function for additional measuring of revolutions without external battery
- Direct mounting on the drive shaft renders transmission components such as timing belts or couplings unnecessary
- Simple, compact design, wear-free, low maintenance costs

- type label
- Maximum speed: 6,000 rpm
- Easy mounting without special mounting tools
- High shock and vibration resistance

- Quick installation without special mounting tools: easy to put on, turn, and go
- Rugged and reliable thanks to high shock and vibration resistance
- Reliable establishment of the absolute position at high speeds
- Mounting check for reading out the axial position of the rotor

→ www.sick.com/SES_SEM90

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

| Shaft version | Shaft diameter | Type | Communication interface | Type | Part no. |
|----------------------|----------------|-----------------|-------------------------|-----------------|----------|
| Through hollow shaft | 50 mm | For integration | HIPERFACE® | SES90-HN050AK22 | 1075350 |

Multiturn

| Shaft version | Shaft diameter | Type | Communication interface | Type | Part no. |
|----------------------|----------------|-----------------|-------------------------|-----------------|----------|
| Through hollow shaft | 50 mm | For integration | HIPERFACE® | SEM90-HN050AK22 | 1075348 |



At a glance

- HIPERFACE® motor feedback systems for large hollow shaft and torque motors
- 128 sine/cosine periods per revolution
- Absolute position with a resolution of 4,096 increments per revolution
- Programming of the position value

Your benefits

- Direct seat on the drive shaft renders transmission elements such as toothed belt or coupling superfluous
- The simplified, compact design is wear-free, thus helping to reduce maintenance costs
- Measuring accuracy is no longer affected by magnetic fields thanks to

- and electronic type label
- HIPERFACE® interface
- Turn & play – for simple assembly without tools
- High resistance to shock and vibration due to holistic scanning
- Bearingless motor feedback system

- the capacitive measuring principle
- Time-saving mounting, since no mounting tools are required: simply fit it on, turn it and start
- The minimal dimensions enable you to save space and weight, allowing for a more efficient use of space

→ www.sick.com/SEK160

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

Singleturn

| Shaft version | Shaft diameter | Type | Communication interface | Type | Part no. |
|----------------------|----------------|-----------------|-------------------------|------------------|----------|
| Through hollow shaft | 110 mm | For integration | HIPERFACE® | SEK160-HN110AK02 | 1038272 |



At a glance

- Absolute, non-contact, wear-free length measurement system for linear motors
- Measured lengths of up to 1 m
- Suitable for high traverse speeds of up to 10 m/s
- Reliable location positioning even in the event of condensation and contamination of the magnetic tape
- Electronic type label and programming of the position value
- Absolute location positioning, no reference run
- HIPERFACE® interface
- Certified according to SIL2 and PL d

Your benefits

- Reference traverse no longer necessary due to absolute measuring system
- Maintenance-free thanks to non-contact measuring principle
- Simple integration of the system due to the HIPERFACE® interface
- Developed specifically for use in linear direct drives
- Also for use in rough ambient conditions
- Certification allows for easy integration into a safe drive system

→ www.sick.com/TTK50

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

- **Communication interface:** HIPERFACE®

| Type | Part no. |
|----------------|----------|
| TTK50-HXJ0-K02 | 1057791 |
| TTK50-HXQ0-K02 | 1057793 |

- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Type | Part no. |
|-----------------|----------|
| TTK50S-HXJ0-K02 | 1099696 |
| TTK50S-HXQ0-K02 | 1099698 |



At a glance

- Non-contact absolute position and speed recording
- With HIPERFACE® or SSI interface
- Measurement lengths of up to 4 m
- For high traversing speeds of up to 10 m/s

Your benefits

- Available with the HIPERFACE® and SSI interfaces
- Measurement lengths of up to 4 m
- Maintenance and wear-free thanks to non-contact measurement principle
- Compact design, low weight, and high traversing speed

- Reliable measurements, even in the event of contamination and condensation on the magnetic tape
- Small, compact read head
- Certified according to SIL2 and PL d (HIPERFACE® interface)

- Immune to ambient conditions such as contamination and condensation
- No need for a reference run due to the absolute position recording
- Certification allows for easy integration into a safe drive system

→ www.sick.com/TTK70

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Ordering information

Additional device designs and corresponding accessories can be found at the link above.

- **Communication interface:** HIPERFACE®

| Type | Part no. |
|----------------|----------|
| TTK70-HXA0-K02 | 1037434 |
| TTK70-HXI0-K02 | 1068879 |
| TTK70-HXJ0-K02 | 1063567 |

- **Safety system:** ✓
- **Communication interface:** HIPERFACE®

| Type | Part no. |
|-----------------|----------|
| TTK70-HXA0-K02 | 1099700 |
| TTK70S-HXI0-K02 | 1099702 |
| TTK70S-HXJ0-K02 | 1099701 |

The brand new sVip® visualization and programming tool impresses very clear advantages: it comes with brand-new, innovative features and is universally compatible for use with all SICK motor feedback systems. Connect, log in, get going.

Powerful: sVip® Has it Covered

The sVip® supplements the familiar functions of predecessor programming tools by offering additional and improved applications for programming and analysis. What's more, the sVip® has a single standard user interface for all tasks.

Innovative: A True All-Rounder

- Oscilloscope function – for qualitative signal analysis
- Presentation of histograms, e.g., temperature
- Reading out and saving of E²PROM content
- Enables synchronization of analog signals and the absolute position of HIPERFACE® products such as the SRS/SRM50, SKS/SKM36, etc.

Unique: A Single Tool for All Systems

The motivation behind the development of sVip® was very clear: We wanted a single programming tool to support all existing and future motor feedback systems, and with this 'one-for-all' tool we have achieved this. The sVip® is ideally suited to our systems and replaces all previous programming tools.

Intuitive: User-Friendly Operation

The sVip® tool works with SOPAS – the proven SICK standard software for SICK's extensive product portfolio. Combined with the standardized user interface, this makes sVip® straightforward and transparent in operation.



Order information

| Description | Part no. |
|---------------------|----------|
| PGT-11-S LAN sVip® | 1057324 |
| PGT-11-S WLAN sVip® | 1067474 |

Scope of delivery

| | |
|-----------------|----------------------------------|
| Power supply | 100–240V AC / 12V DC |
| Primary adapter | Europe, UK, USA/Japan, Australia |
| Ethernet cable | 3 m length |

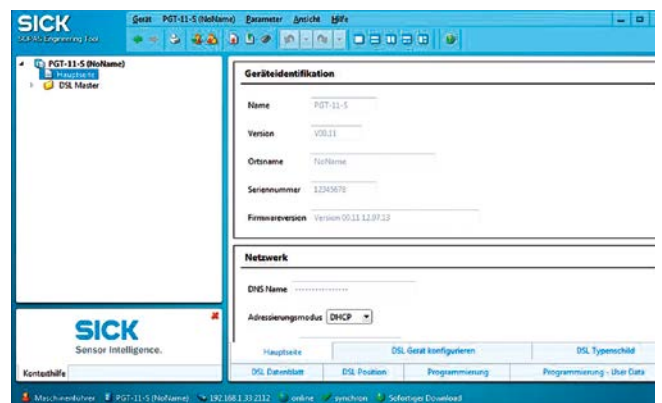
Note: The corresponding accessory leads for the connection of the motor feedback systems must be ordered separately.



Fast: Straightforward commissioning in accordance with the plug and play principle



Adaptable: LAN or WLAN version



Transparent: Standard user interface for intuitive operation



For more information visit
www.sick.de/sVip

From now on, developers and service engineers only need one tool: the sVip® from SICK. For programming and straightforward diagnostics. Versions for Ethernet (LAN) or WLAN.

Game for any Challenge: Versatile in Every Sense

The sVip® is suitable for many areas of application, including clients' research and development projects and on-site diagnostics by service engineers. The tool can be connected to a PC, a laptop, or a tablet computer via Ethernet (LAN) or wirelessly via WLAN. Suitable for SICK incremental encoders, HIPERFACE DSL®, and HIPERFACE® products.

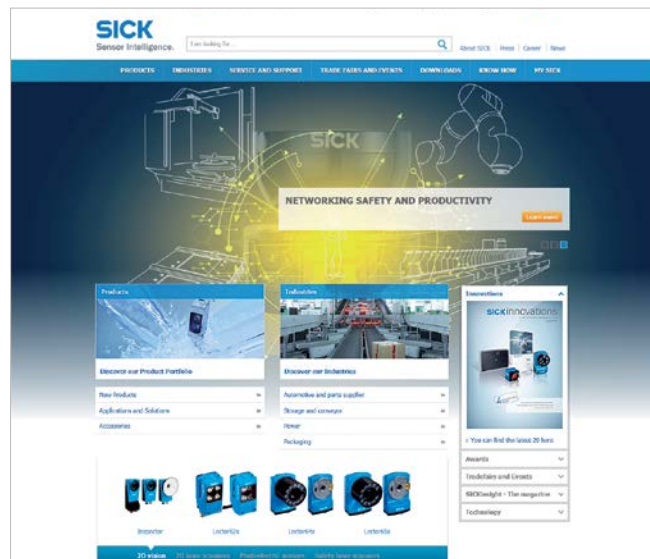
Efficient: More Performance for Measurable Success

- sVip® can support you in the implementation of HIPERFACE DSL®: a variety of errors can be simulated in slave mode.
- Improved technical support for advanced diagnostics based on saved E²PROM data.
- Oscilloscope function for qualitative analysis of analog HIPERFACE® signals.



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SERVICES FOR MACHINES AND PLANTS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.



- 
Consulting and design
 Safe and professional
- 
Product and system support
 Reliable, fast, and on-site
- 
Verification and optimization
 Safe and regularly inspected
- 
Upgrade and retrofits
 Easy, safe, and economical
- 
Training and education
 Practical, focused, and professional

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 8,800 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the customers need. In application centers in Europe, Asia, and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

That is “Sensor Intelligence.”

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com