PROGRAMMING SOLUTIONS FOR ENCODERS AND INCLINATION SENSORS

Configuration using a handheld device, computer, control unit, web server or DIP switch

SICK
Sensor Intelligence.

FOR THE SPECIFIC ADAPTATION AND EVALUATION OF ENCODERS AND INCLINATION SENSORS

SICK offers a variety of solutions for custom adaptation of encoders and inclination sensors to user-specific and application-specific circumstances. The programming options range from a compact, light display unit to computer-based tools and integration into control units and web-based interfaces. This means that suitable solutions are available for every user and every application — for developers or service staff, for small batch series, spare parts sales, or highly automated systems. The available product range of incremental and absolute encoders as well as wire draw encoders and inclination sensors offers the right product for every application. Each product can be programmed specifically to your needs.

PROGRAMMING FROM A-Z

PGT-10-Pro
PGT-12-Pro
Pocket-sized programming unit for self-contained programming in the workplace or at a building site.

PGT-08-S
Computer-based programming unit for convenient programming at the workstation or in production.

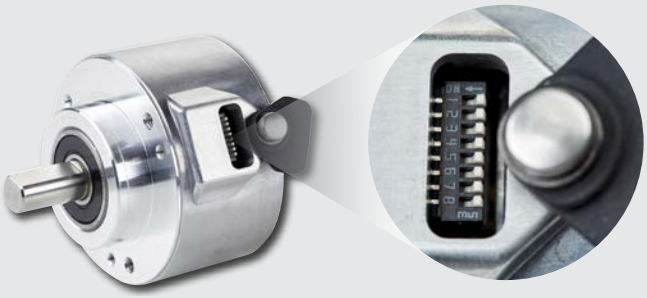
Ethernet via web server
Programming using an integrated web server.

8016862/2016-11-30

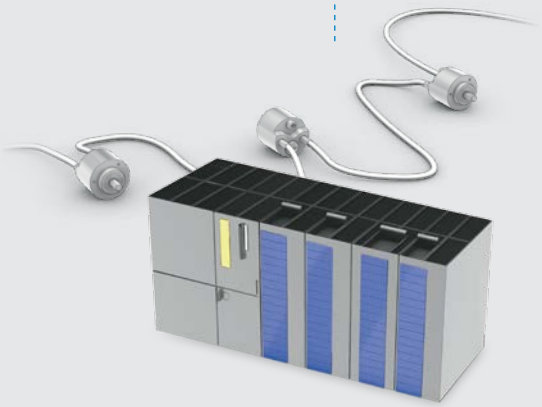
Benefits for you

- The sensor properties can be quickly adapted to specific requirements
- Solutions tailored to the target group in question, from service and maintenance to large-scale production
- Option to save and clone sensor settings enables fast programming and good traceability
- Cost savings for storage and data management due to reduced variant diversity
- Fast spare parts supply if service is required

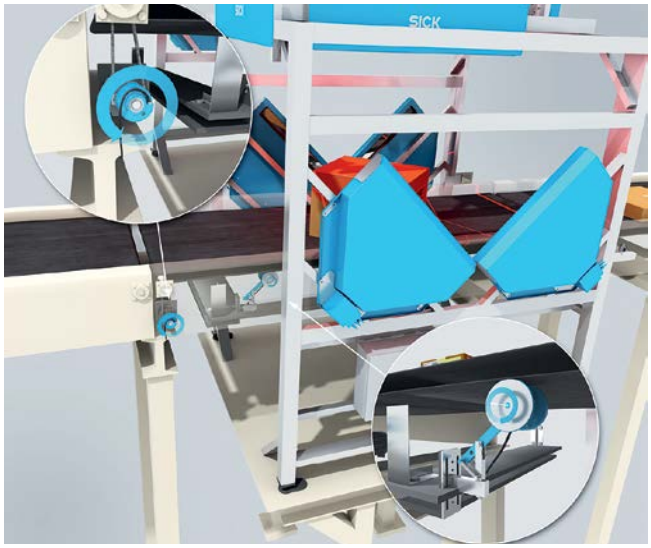
RS-485
Programming via an RS-485 interface using a computer or user-specific control units.



DIP switch
Parameters such as resolution, output signal and counting direction are set directly on the encoder.



Ethernet/fieldbus
Programming with user-specific control units and engineering software from the manufacturer of the PLC using fieldbus/Ethernet.



ENCODER HANDHELD PROGRAMMING UNIT FOR UNIVERSAL MOBILE USE

The PGT-10-Pro is a light and compact programming unit for incremental and absolute encoders from SICK. Because it has an integrated voltage supply, it is able to work in a fully self-contained manner and is thus particularly suitable for mobile use in customer service. Various encoder parameters can be saved in the internal memory or on an SD card. Through firmware updates, the user can supplement the PGT-10-Pro with new sensor variants and functions. For this reason, the programming unit can be used for a very long time, thereby offering an optimal price/performance ratio.

At a glance

- Programms incremental and absolute encoders from SICK
- Various menu languages can be selected
- Can be operated intuitively using four buttons
- Large four-line display with backlighting
- Simple encoder parameter cloning
- Exchange of configurations with PGT-08-S using an SD card
- Capable of updating to new encoder variants and functions

Your benefits

- Fewer costs, because the customer has to store fewer encoder variants thanks to the programming
- Fast exchange of encoders
- Programming unit with low weight and compact dimensions for mobile use
- Large, intuitive display, making extra training for operating personnel unnecessary
- Can be used worldwide thanks to the availability of various menu languages and is easy to operate
- Cloning function saves time and reduces programming errors

Fields of application

- Programming of the DFS60, DFS60 Inox, DFS20, DFS21, DFS22 and DFS25 incremental encoders as well as the DFV60 measuring wheel encoders
- Programming of the AHS36 SSI, AHM36 SSI, AFS60 SSI, AFM60 SSI, AFS60 Inox and AFM60 Inox absolute encoders
- Ideal for device manufacturers, customer service, developers and distributors
- Ideal for mobile use, particularly for applications that are difficult to access

Programmable sensors	Description
DFS60	Incremental encoder
DFV60	Measuring wheel encoder
DFS60 Inox	Incremental encoder
DFS2x	Incremental encoder
AHS/AHM36 SSI	Absolute encoder
AFS/AFM60 SSI	Absolute encoder
AFS/AFM60 Inox	Absolute encoder

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HANDHELD PROGRAMMING UNIT FOR MOBILE APPLICATIONS

The PGT-12-Pro is a light and compact programming unit for absolute encoders with CANopen interface as well as inclination sensors with CANopen and analog interface from SICK. Because it has an integrated voltage supply, it is able to work in a fully self-contained manner and is thus particularly suitable for mobile use in customer service. Various parameters for encoders and inclination sensors can be saved in the internal memory or on an SD card. Through firmware updates the PGT-12-Pro can be supplemented with new sensor variants and functions. That is why the PGT-12-Pro has a long operational lifetime, therefore offering an optimal price/performance ratio.

At a glance

- Compact programming unit with large display for inclination sensors and absolute encoders with CANopen interface
- First portable programming unit for sensors with CANopen interface
- Simple sensor parameter cloning
- Storage of configurations on SD card
- Firmware update via SD card for adding new functions and sensor families
- Intuitive menu structure and menu language options

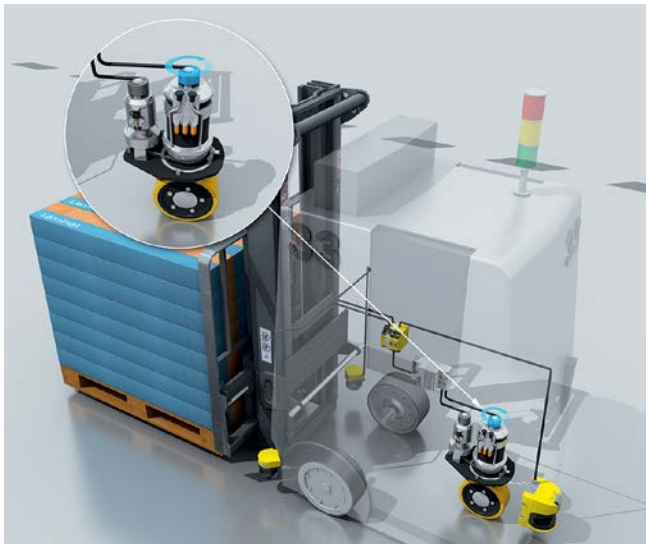
Your benefits

- Programming of AHS/AHM36 CANopen and inclination sensors with CANopen and analog interfaces with just one device
- Easy modification of node ID, baud rate and sensor parameters without PLC software
- Fast exchange of encoders and inclination sensors
- Low weight and compact dimensions for mobile use
- Can be used immediately without installing software or hardware
- Large, intuitive display, making extra training for operating personnel unnecessary

Fields of application

- Programming the AHS36/AHM36 CANopen absolute encoders
- Programming the inclination sensors TMS/TMM61 CANopen, TMS/TMM88 CANopen and TMS/TMM88 analog
- Ideal for device manufacturers, customer service, developers and distributors
- Ideal for mobile use, particularly for applications that are difficult to access

Programmable sensors	Description
AHS/AHM36 CANopen	Absolute encoder
TMS/TMM61 CANopen	Inclination sensors
TMS/TMM88 CANopen	Inclination sensors
TMS/TMM88 Analog	Inclination sensors



THE CONVENIENT AND CLEAR DEVICE THAT DOES IT ALL

The PGT-08-S is a computer-based programming unit for all programmable incremental and SSI absolute encoders. Its versatility makes it a convenient option, even for machine facilities.

At a glance

- Programming unit with SOPAS software for commercially available computers
- Clear graphical user interface for simple operation
- Programming settings can be saved and loaded
- Can be updated for future products and programming functions by performing a software update
- Modular product concept consisting of programming unit, adapter cables and software
- Connection to the encoders using encoder-specific adapter cables

Your benefits

- Free driver and software updates via SOPAS
- Graphical user interface clearly displayed on the computer monitor and ergonomic operation using mouse and keyboard
- Programming settings can be saved and loaded to/from the computer memory, which enables fast duplication and traceability
- Encoder position information via the display enables diagnosis without disassembly
- Programming lowers storage costs due to reduced variant diversity

Fields of application

- Ideal for device manufacturers, development divisions, small batch series, prototype construction, and distribution

Programmable sensors	Description
DFS60	Incremental encoder
DFV60	Measuring wheel encoder
DFS60 Inox	Incremental encoder
DFS2x	Incremental encoder
AHS/AHM36 SSI	Absolute encoder
AFS/AFM60 SSI	Absolute encoder
AFS/AFM60 Inox	Absolute encoder

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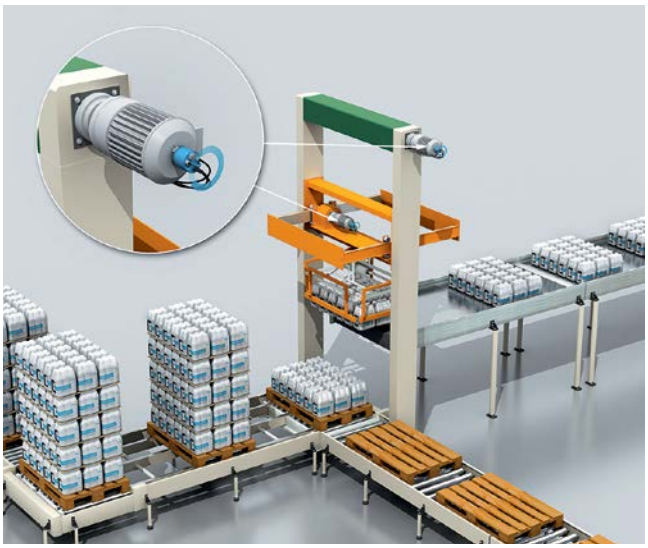


INTEGRATED AND SIMPLE REMOTE ACCESS

The encoders can be programmed easily over the integrated web server. To do this, a device capable of running a browser, such as a computer, laptop, tablet or HMI (human machine interface) is required for visualization. No interface-specific technical knowledge is required. The encoders can be programmed directly on the control unit via the interface or via the web browser. Combined access is also possible. The device can be replaced easily using plug and play as the encoder data is mirrored on the control unit side and can be downloaded onto the new device. The encoders also have an integrated FTP server which makes it possible to update firmware directly in the application. The new option for programming via a web browser allows people with varying levels of interface knowledge to access the encoder data, which allows for flexible implementation, service, and maintenance.

At a glance

- Active web server installed as a programming tool
- Integrated FTP server
- Easy device replacement, plug and play
- No programming software required
- Comprehensive diagnostic functions

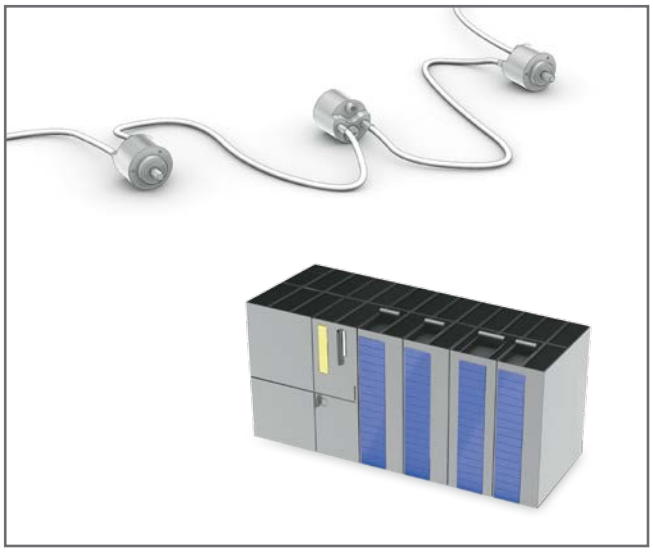
Your benefits

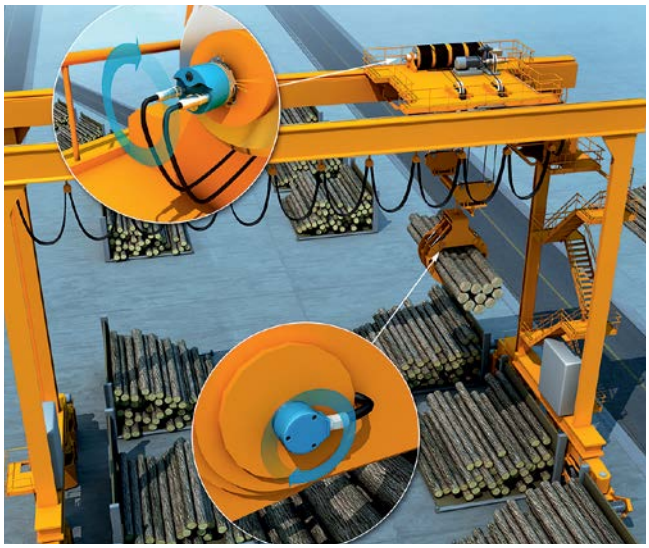
- No interface-specific technical knowledge is required
- Less work required for programming and reduced frequency of errors due to simple operation
- Reduction of service and maintenance required due to preventive diagnostic evaluation
- Cost savings for storage and data management due to reduced variant diversity because it can be programmed freely

Fields of application

- Programming absolute encoders with Ethernet-based interfaces and integrated web server functionality

Programmable sensors	Description
AFS/AFM60 EtherNet/IP	Absolute encoder





DIRECT ACCESS VIA FIELDBUS/ETHERNET

SICK absolute encoders and inclination sensors can be programmed using the relevant engineering software and the customer control unit through the fieldbus interface without a programming unit or any additional software. It is possible to change the sensor values during the process without disconnecting the electrical connection. This means that a new sensor setting can be programmed in seconds and rapid changeover of machine properties is guaranteed. On Ethernet-based encoders, there are function blocks available which make even complex programming tasks much simpler. As a result, the work required for programming and the error rate are significantly reduced. The encoders also have various diagnostics options. An office computer, industrial computer or control unit can be used as the user interface.

At a glance

- Flexible programming options: in the workplace or directly in assembled state
- Supports function blocks and makes complex programming tasks easier
- Comprehensive diagnostic functions
- No programming software required, programming via control commands
- Save the sensor settings in the control unit or the industrial computer

Your benefits

- Programming without electrical and mechanical disassembly
- Less work required for programming and reduced frequency of errors due to pre-assembled function blocks
- Reduction in service and maintenance required due to preventive diagnostic evaluation
- Customer-specific programming and evaluation functions
- Cost savings for storage and data management thanks to reduced variant diversity because it can be programmed freely

Fields of application

- Programming absolute encoders with standard fieldbus interfaces and Ethernet-based interfaces
- Programming of inclination sensors with CANopen interface

Programmable sensors	Description
AHS/AHM36 CANopen	Absolute encoder
AFS/AFM60 EtherNet/IP	Absolute encoder
AFS/AFM60 PROFINET	Absolute encoder
AFS/AFM60 EtherCAT®	Absolute encoder
A3M60 PROFIBUS	Absolute encoder
ATM60 PROFIBUS	Absolute encoder
ATM60 CANopen	Absolute encoder
ATM60 DeviceNet	Absolute encoder
ATM90 PROFIBUS	Absolute encoder
TMS/TMM61 CANopen	Inclination sensors
TMS/TMM88 CANopen	Inclination sensors

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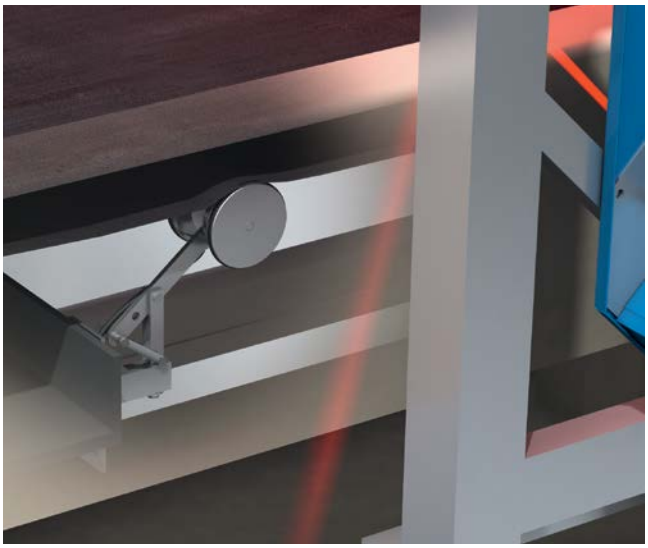

VERSATILE CONFIGURATION RIGHT AT THE ENCODER

Integrated DIP switches on SICK encoders allow for fast and direct configuration. There is no need for additional software or hardware tools to get your encoder configured and running.

At a glance

- Encoder configuration built directly into the encoder
- Changes to the configuration will happen in real-time during operation

Your benefits

- Quick configuration by direct access
- No additional programming software or hardware required
- Real-time changes to the encoder during operation without idle time
- Configuration lowers storage costs due to reduced variant diversity

Fields of application

- Ideal for fast configuration on the machine and for distributors

Programmable sensors	Description
DUS60	Incremental encoder
DUV60	Measuring wheel encoder

DIRECT ACCESS VIA RS-485

SICK incremental and SSI absolute encoders can be programmed using a computer, industrial computer or a control unit supplied by the customer via the RS-485 interface. An RS-485 interface is required for communication with the encoder. It is possible to change the encoder values during the process and without disconnecting the electrical connection. This means that a new encoder setting can be programmed within seconds and rapid changeover of machine properties is guaranteed.

At a glance

- Programming in assembled state
- No programming software required, programming via control commands
- Save the encoder settings in the control unit or the industrial computer
- Functions are independent of the control unit manufacturer
- Switch between write mode and read mode using digital I/O card
- Connection to encoder over signal lines provided by the customer and RS-485 or RS-232 card

Your benefits

- Programming without electrical and mechanical disassembly
- Real-time changes to the encoder properties during operation
- Optimal integration into customer-specific control environment
- Customer-specific programming and evaluation functions

Fields of application

- Ideal for fast programming directly in the production line while processes are running, or during format adjustment

Programmable sensors	Description
DFS60	Incremental encoder
DFV60	Measuring wheel encoder
DFS60 Inox	Incremental encoder
DFS2x	Incremental encoder
AHS/AHM36 SSI	Absolute encoder
AFS/AFM60 SSI	Absolute encoder
AFS/AFM60 Inox	Absolute encoder

SICK encoders and inclination sensors provide a wide range of programmable properties to meet your individual requirements and streamline your processes—these include resolution, electrical interfaces, offset/zero-set, and round axis functionality. The table below gives an overview of the type-specific programmable parameters.

ENCODER

Encoder	Programming functions	DFS2x	DFS60	DFS60 Inox	DFV60	DUS/DUV60	AFS/AFM60 SSI	AFS/AFM60 Inox	AHS/AHM36 SSI	AHS/AHM36 CANopen	AFS/AFM60 EtherNet/IP	AFS/AFM60 PROFINET	AFS/AFM60 EtherCAT	A3M60 PROFIBUS	ATM60 PROFIBUS	ATM60 CANopen	ATM60 DeviceNet	ATM90 PROFIBUS
Incremental encoder	Number of lines	x	x	x	x	x												
	TTL/HTL electrical interface	x	x	x	x	x												
	Zero pulse width, electrical	x	x	x	x													
	Zero pulse width, mechanical	x	x	x	x													
	Signal sequence / direction of rotation	x	x	x	x	x												
	Reset to factory settings	x	x	x	x													
	Set zero pulse	x	x	x	x													
Absolute encoder	Singleturn scaling						x	x	x	x	x	x	x	x	x	x	x	x
	Multiturn scaling								x	x	x	x	x	x	x	x	x	x
	Counting direction CW/CCW						x	x	x	x	x	x	x	x	x	x	x	x
	Set preset value						x	x	x	x	x	x	x	x	x	x	x	x
	Speed format									x	x	x	x	x	x	x	x	x
	Round axis functionality								x	x	x	x	x	x				
	Diagnostics									x	x	x	x	x				

INCLINATION SENSORS

	Programming functions	TMS/TMM61 CANopen	TMS/TMM88 CANopen	TMS/TMM88 Analog
Inclination sensors	Measuring range scaling			x
	Output signal scaling			x
	Axis assignment			x
	Output limiting			x
	Set zero point	x	x	x
	Digital filter settings	x	x	x
	Counting direction	x	x	x
	Reset to factory settings	x	x	x

Description of programming functions

Number of lines	Number of pulses emitted by the encoder per mechanical rotation.
TTL/HTL electrical interface	Choice between TTL-compatible or HTL-compatible signal output.
Zero pulse width, electrical	Width of the zero pulse (= length of the high signal) in relation to an impulse period.
Zero pulse width, mechanical	Width of the zero pulse in relation to a mechanical revolution of the shaft.
Signal sequence / direction of rotation	This function can be used to change the signal sequence: A leads B – A comes before B when rotating in a clockwise direction and looking at the shaft. B leads A – B comes before A when rotating in a clockwise direction and looking at the shaft.
Reset to factory settings	All programmable values are reset to the values that the encoder / inclination sensor had when leaving the production plant.
Set zero pulse	This function can be used to change the position of the zero pulse on a mechanical rotation of the encoder. The zero point is assigned to the current position of the encoder. The rotary encoder should not be rotated while the function is being executed.
Singleturn scaling	Adjustability of the resolution output by the encoder per rotation.
Multiturn scaling	Adjustability of the resolution output by the encoder via the number of rotations.
Counting direction CW/CCW	Counting direction rising/falling.
Set preset value	Sets the position value to zero or to a preset value.
Speed format	Selects the appropriate speed format (e.g. rpm, rps, etc.).
Round axis functionality	The round axis functionality permits resolutions for non-integer numbers of rotations (e.g. 3,600 steps at 2.75 rotations).
Diagnostics	Additional data provided by the encoder (such as temperature monitoring, operating hour counter, speed monitoring, etc.).
Measuring range scaling	To increase the resolution, the measuring range of the inclination sensors can be individually adapted to the application within the maximum measuring range.
Output signal scaling	The output signal of the analog inclination sensors is set at the factory to 4 to 20 mA or 0 to 10 V, but can also be freely programmed (value range is type-dependent).
Axis assignment	The analog inclination sensors have two output channels, to which a measuring axis can be assigned.
Output limitation	This function can be used to define whether the output value rises further when the configured limit value is reached or remains at the limit value.
Set zero point	The zero point of the inclination sensors can also be set as desired after the installation. In addition, it is possible to allocate a defined angle value to the current position.
Digital filter settings	A low-pass filter is used to stabilize the output value. The characteristic and the limit frequency can be configured.
Counting direction	Adjustability of the plus/minus sign of the angle values.

Technologies	Handheld		Software + computer tool	RS-485		Bus		Web server
Products	**PGT-10-Pro**	**PGT-12-Pro**	**PGT-08-S**	**RS-485 using a computer**	**RS-485 via drive/control system**	**Fieldbus**	**Ethernet**	**Web server**
DFS2x [1]	x		x	x	x			
DFS60 [1]	x		x	x	x			
DFS60 Inox[1]	x		x	x	x			
DFV60 [1]	x		x	x	x			
AFS/AFM60 SSI [1]	x		x	x	x			
AFS/AFM60 Inox [1]	x		x	x	x			
AHS/AHM36 SSI [1]	x		x	x	x			
AHS/AHM36 CANopen		x				x		
AFS/AFM60 EtherNet/IP							x	x
AFS/AFM60 PROFINET							x	
AFS/AFM60 EtherCAT®							x	
A3M60 PROFIBUS						x		
ATM60 PROFIBUS						x		
ATM60 CANopen						x		
ATM60 DeviceNet						x		
ATM90 PROFIBUS						x		
TMS/TMM61 CANopen		x				x		
TMS/TMM88 CANopen		x				x		
TMS/TMM88 Analog		x						

[1] Only applies to programmable versions.

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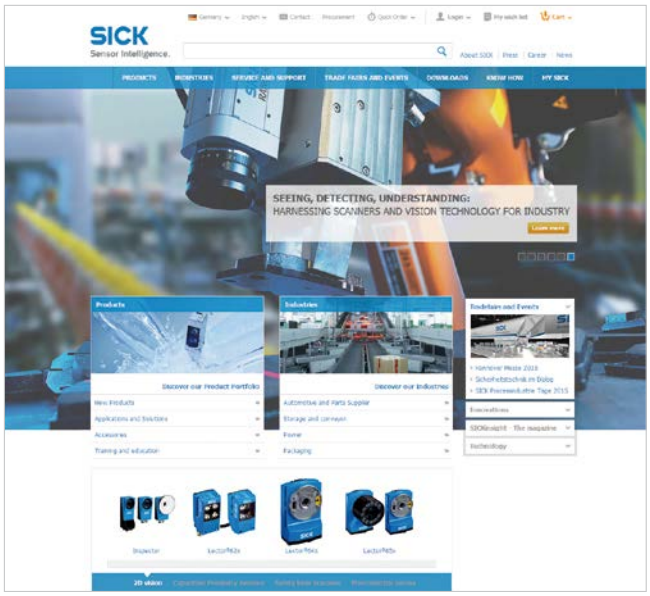

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 7,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, we are always close to our 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.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our 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 us a reliable supplier and development partner.

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

For us, that is "Sensor Intelligence."

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