WI180C-EC

WI180C-EC EtherCAT coupler

SICK
Sensor Intelligence.

PWR
BF/ERR/NS
SF/RUN/MS
STATUS
L/A 1
L/A 2

SICK

SICK AG
D-79183
Waldkirch,
Germany
WI180C-PN
6 068 088

Described product

WI180C-EC

Manufacturer

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
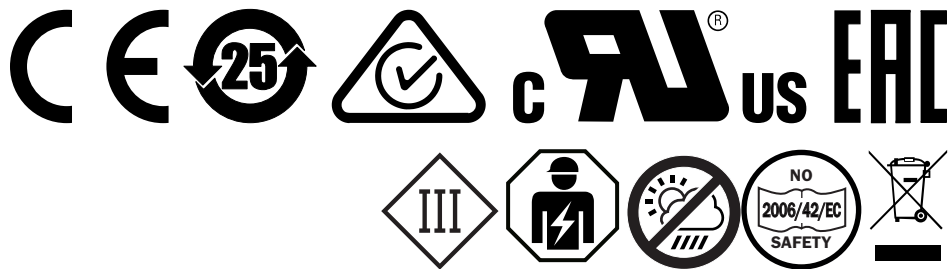Germany

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Original document

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Contents

1 About this document

1.1 Purpose of this document

These operating instructions contain information required during the life cycle of the device.

These operating instructions must be made available to all those who work with the device.

Please read these operating instructions carefully and make sure that you understand the content fully before working with the device.

1.2 Target group

These operating instructions are intended for the following target groups: Project developers (planners, developers, designers), installers, electricians, programmers, operators and maintenance personnel.

The structure of these operating instructions is based on the life-cycle phases of the device: Project planning, mounting, electrical installation, commissioning, operation, maintenance and disposal.

1.3 Information depth

These operating instructions contain information about the following topics relating to the device:

- Product description
- Mounting
- Electrical installation
- Commissioning and configuration

Furthermore, when planning and using sensors such as the device, technical expertise is required, which is not covered in this document.

Official and legal regulations for operating the device volume measurement system must always be complied with.

You can find further information on the Internet at **www.sick.com**.

1.4 Explanation of symbols

Warnings and important information in this document are labeled with symbols. The warnings are introduced by signal words that indicate the extent of the danger. These warnings must be observed at all times and care must be taken to avoid accidents, personal injury, and material damage.

DANGER
… indicates a situation of imminent danger, which will lead to a fatality or serious injuries if not prevented.

WARNING
… indicates a potentially dangerous situation, which may lead to a fatality or serious injuries if not prevented.

⚠ **CAUTION**
... indicates a potentially dangerous situation, which may lead to minor/slight injuries if not prevented.

❗ **NOTICE**
... indicates a potentially harmful situation, which may lead to material damage if not prevented.

ⓘ **NOTE**
... highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

1.5 Product information

Table 1: Product information

Product name	WI180C-EC
Article number	6068089
Device version	EtherCAT
Manufacturer	SICK AG

1.6 Further information

www.sick.com

The following information is available on the Internet:

* Other language versions
* Data sheets and application examples
* CAD data of drawings and dimensional drawings
* Certificates (e.g. EU declaration of conformity)
* Current device files

2   Safety information

2.1   General safety notes

- The mounting, electrical installation and configuration of the device must be carried out by professionally qualified personnel only.
- Before mounting, it is imperative that you familiarize yourself with the operating instructions for the connected devices.
- When mounting and electrical installation work is being carried out, always comply with applicable health and safety and environmental regulations.
- The device must not be used outdoors or in areas with flammable/explosive atmospheres!
- When installing the device, always consider the electrical connected loads.
- Replace faulty or damaged cables and male connectors immediately.
- Replace damaged or faulty couplers immediately.
- When mounting the device, it is imperative that you use suitable mounting equipment and that you consider their specific requirements.
- Ensure a constant power supply to the device within the set parameters.
- Only operate the device within the set operating parameters.
- Regularly check that the device is functioning properly.
- Structural modifications to the device are not permitted.
- The device is not designed as a safety product.
- This device complies with the Radio Safety Requirements (EMC) for the industrial sector (Radio Safety Class A). It may cause radio interference if used in a residential area.

2.2   Correct use

Correct use requires that the device is used industrially indoors without any specific climatic and atmospheric requirements. Any use outside of the areas mentioned in each case will be considered to be incorrect use and void any warranty claims against SICK AG.

2.3   Forseeable misuse

Not taking account of the pin assignment or using an incorrect adapter cable may damage or destroy the connected EtherCAT coupler.

Connecting the EtherCAT coupler to signal or power cables that are too long may lead to a loss of data and damage to the EtherCAT coupler.

3 Product description

3.1 Product characteristics

The device is an interface coupler that can be used to connect connected devices (e.g. WLL180T) to the EtherCAT network. The relevant devices are connected via a simple plug system on the side of the coupler.

Normally the entire system is installed on a mounting rail near the application.

The coupler supports up to 16 connected devices, which are likewise connected to one another via the plug system.

Further properties:

- EtherCAT slave
- Configuration via CoE protocol (CANopen over EtherCAT)
- 2 Ethernet connections with transmission rate of 100 Mbaud

Further specifications can be found in the technical data (see "Technical data", page 37).

3.2 Setup and function
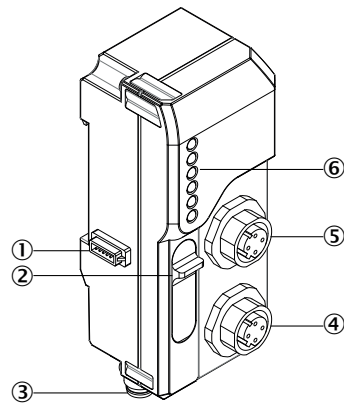
①	Bus male connector (system bus)
②	Service port
③	Power supply connection (M8), 4-pin
④	D-coded M12 connector, 4-pin, EtherCAT
⑤	D-coded M12 connector, 4-pin, EtherCAT
⑥	Status LEDs

3.3 Interfaces

3.3.1 EtherCAT
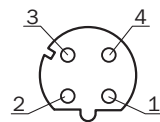
Table 2: EtherCAT pin assignment

Pin	Pin assignment
1	Tx+
2	Rx+

Pin	Pin assignment
3	Tx-
4	Rx-

3.3.2 Power supply
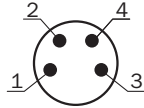
Table 3: Power supply pin assignment

Pin	Pin assignment
1	+12 – 24 VDC
2	Not assigned
3	GND
4	Not assigned

3.3.3 Grounding

The device is grounded via the mounting rail by means of a spring contact:
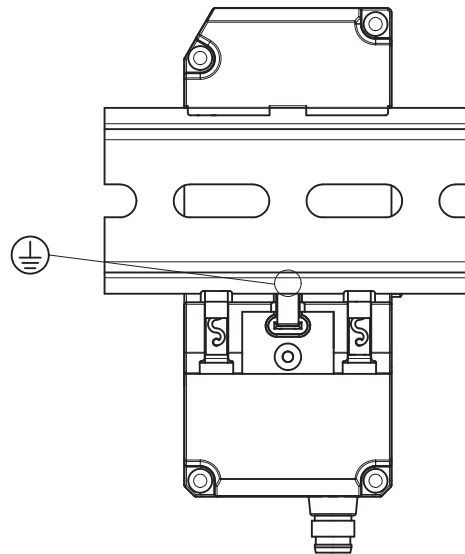
4   Transport and storage

4.1   Transport

Either transport the device in the original packaging or use a padded transport container. Make sure that you comply with the maximum permitted environmental conditions (see "Technical data", page 37).

4.2   Storage

If you want to store the devicefor a relatively long time, pack it as you would for transport. Make sure that the storage location complies with the permitted environmental conditions (see "Technical data", page 37).

5 Mounting

5.1 Required materials

You need the following additional materials to mount the device:

- grounded mounting rail (pre-mounted)
- pre-assembled cable (max. 30 m) with M8 female connector (see "Interfaces", page 8)
- pre-assembled cable for EtherCAT with M12 D-coded male connector (see "Interfaces", page 8)
- one or more signal sources (e.g. WLL180T)
- small slotted screwdriver

5.2 Preparing mounting location

1. Mount a grounded mounting rail in the same area as the application.
2. Lay the two pre-assembled cables so that they can easily be connected to the connections of the device. If necessary, use cable channels, cable ties and cable grips.

5.3 Scope of delivery

- WI180C-EC
- Quick start instructions

5.4 Mounting procedure

1. Carefully unpack the device.
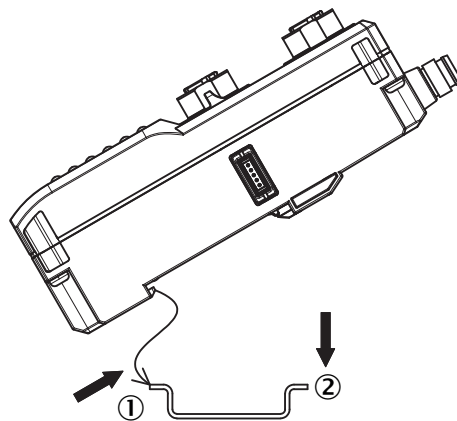
2. Clamp the device onto the mounting rail, as shown in the image.
3. Clamp the series-connected devices onto the mounting rail as shown in their mounting instructions.
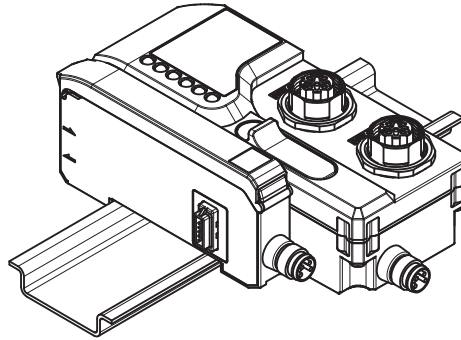
4. Push the series-connected devices onto the 5-pin connection on the left side of the device. Make sure that the sequence is correct.[1]
5. Fix the connected devices on the mounting rail without any spaces.

5.5 Connecting the device

> **ⓘ NOTE**
> Switch off the voltage supply before you connect or replace the devices.

> **ⓘ NOTE**
> Select the right EtherCAT connection for your network. Connection 1 has the function of the "EtherCAT IN port", connection 2 has the function of the "EtherCAT OUT port".

1. Connect the D-coded M12 male connector for the EtherCAT network to the Ether-CAT connection on the device, and fasten it with the coupling nut.
2. Connect the M8 female connector to the voltage supply on the bottom of the device and tighten the corresponding male connector.

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[1] see the operating instructions for the relevant device

6   Commissioning

6.1   Parameterization

The WI180C-EC can be integrated in a Beckhoff control system. An ESI file is loaded in the system for this purpose. The ESI file for the WI180C-EC is available for download from www.sick.de.

> **NOTE**
> All configuration information relates to controls manufactured by Beckhoff, which are configured and diagnosed with the TwinCAT™ configuration tool.

1. Copy the ESI file in the TwinCAT™ directory into the TwinCAT\3.1\Config\IO\Ether-CAT folder.
2. Then restart the TwinCAT™ system manager.
3. Insert WI180C-EC into the device tree as a box.
4. For this purpose, select the WI180C-EC under SICK AG.
   The WI180C-EC is shown in the device tree as box n.
5. Then switch the TwinCAT™ system manager to configuration mode.
   You will be asked in sequence whether the TwinCAT system manager™ should be switched to configuration mode, whether the data should be loaded from the I/O device, and whether the system should be switched to Free Run operating mode.
6. Click OK or Yes in each instance.
   The status display at the bottom right changes between Free Run in red and Config Mode in blue. All object parameters can now be read out and configured on the CoE - Online tab.

6.2   Switching on

1. Switch on the power supply for the device.
2. Wait approximately two seconds until the device indicates that it is ready, see "LED status indicators", page 14.

7 Operation

7.1 Safety

A few guidelines must be followed to ensure the operational safety of the device:

- Carry out a daily functional check (see "Daily thorough check", page 14).
- If you want to connect devices to the device or remove devices, switch off the power supply first.
- Only operate the WI180C-EC under the specified operating conditions (see "Technical data", page 37).

7.2 Daily thorough check

You should carry out the following functional checks once a day:

- Check the function of the LED indicators.
- Use appropriate status queries to check communication with each of the connected devices.

7.3 LED status indicators
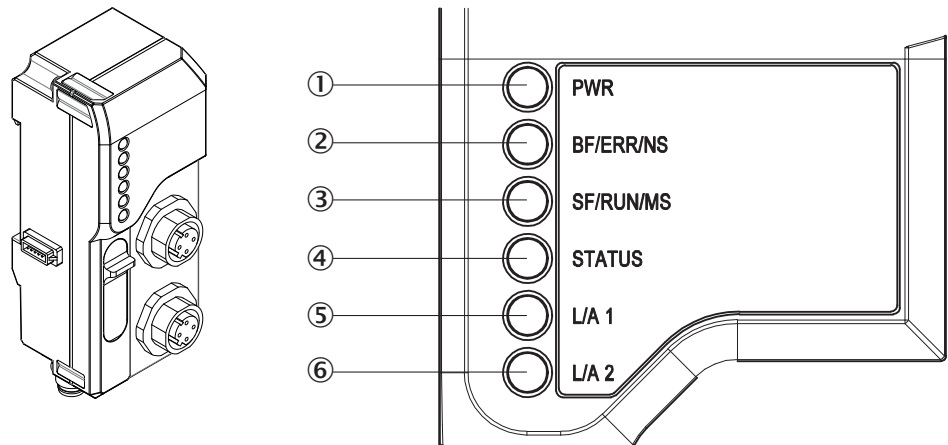
Table 4: LED status indicators

	LED	Display		Meaning
①	PWR	Green	●	Voltage supply on
			○	Voltage supply off
②	ERR (error)	Red	○	No error
			Single flash	Local error in the device
			Double flash	Timeout in the device
			●	Application controller fault
			☀	Invalid configuration
③	RUN (operation)	Green	○	Device initializes
			●	Device has OPERATIONAL status
			☀	Device has PRE-OPERATIONAL status
④	STATUS	Green	○	Device not configured
			●	Device is running

	LED	Display		Meaning
⑤	L/A1 (Link/Activity 1)	Green	○	No network connection at connection 1
			●	Network connection at connection 1 available, no communication
			☀	Network connection, communication active
⑥	L/A2 (Link/Activity 2)	Green	○	No network connection at connection 2
			●	Network connection at connection 2 available, no communication
			☀	Network connection, communication active

7.4 Device slots and modules

WI180C-EC uses the EtherCAT "Modular Device Profile" (MDP) and every connected device occupies one or more module slots.

The module slots 1 to 16 represent the connected devices, as shown in the figure below.
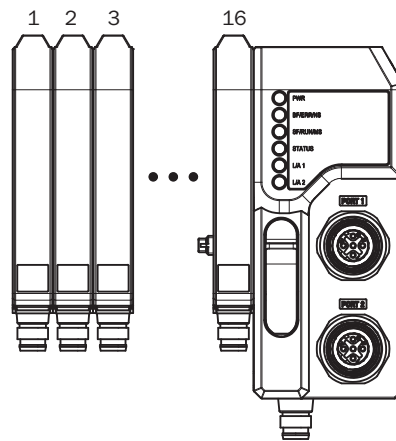
The WI180C-EC supports up to 16 device modules. The following products are supported:

Table 5: Supported products

Supported products	Product description	Note
WLL180T-L* WLL180T-M*	Fiber amplifier basic device	• The WLL180T basic device can be installed only as Module 1 (on the far outside left of the mounting rail) • No additional voltage supply is required for the WLL180T device
WLL180T-E* WLL180T-F*	Fiber amplifier expansion module	• The WLL180T basic device can be installed only as Module 2 to Module 16 • No additional voltage supply is required for the WLL180T device

Supported products	Product description	Note
OD1 at one input of AOD1-M	Displacement sensor Evaluation unit basic device	• For each AOD1 unit connected, the number of pluggable modules decreases by one (max. 8 AOD1 devices possible) • If AOD1 and WLL180T are used in combination with WI180C-EC, all WLL180T devices must be placed on the left of AOD1 • The AOD1-M basic device can be installed only as Module 1/2 (on the far outside left of the mounting rail) • Voltage supply required for the AOD1-M device
OL1 at one input of AOD1-M	Displacement sensor Evaluation unit basic device	
OD1 at one input of AOD1-S	Displacement sensor Evaluation unit expansion module	• For each AOD1 unit connected, the number of pluggable modules decreases by one (max. 8 AOD1 devices possible) • If AOD1 and WLL180T are used in combination with WI180C-EC, all WLL180T devices must be placed on the left of AOD1 • The AOD1-S expansion module can be installed only as Module 3/4 to Module 15/16 • Voltage supply required for the AOD1-S device
OL1 at one input of AOD1-S	Displacement sensor Evaluation unit expansion module	
KTL180-ML* KTL180-MM*	Fiber contrast sensor basic device	• The KTL180 basic device can be installed only as Module 1 (on the far outside left of the mounting rail) • No additional voltage supply is required for the KTL180 device
KTL180-ME* KTL180-MF*	Fiber contrast sensor expansion module	• The KTL180 expansion module can be installed only as Module 2 to Module 16 • No additional voltage supply is required for the KTL180 device

7.5 Cyclic data (process data)

WI180C-EC supports both "Transmit PDOs" (WI180C-EC to control) and "Receive PDOs" (control to WI180C-EC). The PDOs are permanently implemented in the WI180C-EC and it is not possible to map any other objects than the predefined objects. The minimum PDO cycle time is 1000 µs.

7.6 Acyclic data (service data)

WI180C-EC supports the "CANopen over EtherCAT" (CoE) protocol for transmission of service data. Service data objects (SDO) form the communication channel through which device parameters are transmitted (e.g. programming switching thresholds). Transmission of these parameters to SDOs is acyclic (i.e. takes place just once when starting up the network). The objects of the object library (see "Object library", page 17) can be accessed with the SDOs.

NOTE
It is possible to access the device parameters of every connected device via SDOs. The specific addressing for each module depends on which modules were configured in the control software.

7.7 Object library

The WI180C-EC device is structured according to the EtherCAT "Modular Device Profile" (MDP). Objects are correspondingly available in the following address ranges:

Index range	Use
0x1000 ... 0x1FFF	Standard communication objects
0x6000 ... 0x6FFF	Input process data of connected modules
0x7000 ... 0x7FFF	Output process data of connected modules
0x8000 ... 0x8FFF	Configuration data of connected modules
0x9000 ... 0x9FFF	Identification data of connected modules
0xA000 ... 0xAFFF	Diagnostic data of connected modules
0xF000 ... 0xFFFF	Data of the EtherCAT coupler WI180C-EC

NOTE
16 unique data record addresses are available for each module in the address ranges 0x6… / 0x7… / 0x8… / 0x9… / 0xA:

- Slot 1, sensor 1 (outside far left)
Data records
0x6000…0x600F / 0x7000…0x700F / 0x8000…0x800F / 0x9000…0x900F / 0xA000…0xA00F

- Slot 2, sensor 2
Data records
0x6010…0x601F / 0x7010…0x701F / 0x8010…0x801F / 0x9010…0x901F / 0xA010…0xA01F

- …

- Slot 16, sensor 16
Data records
0x60F0…0x60FF / 0x70F0…0x70FF / 0x80F0…0x80FF / 0x90F0…0x90FF / 0xA0F0…0xA0FF

The available objects are listed below. The following abbreviations apply:

Abbreviation	Meaning
R	Read only access
R/W	Read/write access
STRG	String = a chain of characters of varying length
BOOL	Boolean = logical value 0 or 1
ENUM	Freely selectable values with a limited value range (e.g. BLACK, RED, BLUE, YELLOW)
INT	Signed Integer = whole number value with sign (e.g. INT-32 = -2.147.483.648 ... 2.147.483.647)
UINT	Unsigned Integer = whole number value (e.g. UINT-32 = 0 ... 4.294.967.295)
ARRAY	Data sequence of a data type (e.g. Array UINT-8 = character string of the data type UINT-8)
RECORD	Sequence of data containing different data types (e.g. UINT-8, UINT-32, UINT-32, UINT-16)
STRUCT	Sequence of data containing different data types (e.g. UINT-8, UINT-32, UINT-32, UINT-16)

7.7.1 Standard objects

Table 6: Standard objects

Object	Function	Detailed description	Access	Data type	Content/meaning
0x1000	Device type	-	R	UINT-32	EtherCAT device type: 0x00001389, corresponding to Modular Device Profile
0x1008	Device name	-	R	STRG	Type code
0x1009	Hardware version number	-	R	STRG	Hardware revision status
0x100A	Software version number	-	R	STRG	Firmware revision status
0x1018	Identity	Subindex, data type .00, UINT-8 .01, UINT-32 .02, UINT-32 .03, UINT-32 .04, UINT-32	R	RECORD	EtherCAT identification values Subindex 00 = Number of subindices Subindex 01 = Vendor ID (SICK AG) Subindex 02 = Product code Subindex 03 = Revision number (Firmware version) Subindex 04 = Serial number
0x10F3	Diagnostics history	Subindex, data type .00, UINT-8 .01, UINT-8 .02, UINT-8 .03, UINT-8 .04, BOOL .05, UINT-16 .06...xx, ARRAY UINT-8	R	RECORD	Error history Subindex 00 = Number of subindices Subindex 01 = Max. number of stored diagnostic messages (from subindex 06) Subindex 02 = Subindex of the latest diagnostic message Subindex 03 = Latest confirmed diagnostic message Subindex 04 =New diagnostic message present Subindex 05 = Flags for transmission and storage of diagnostic messages Subindex 06...xx = Diagnostic messages
0x1600...0x160F	Receive PDOs modules (0x70n0)	Subindex, data type .00, UINT-8 .01, UINT-32 .02, UINT-32	R	RECORD	Receive PDOs of the connected modules Subindex 00 = Number of subindices Subindex 01 = Object 0x70n0.01, Teach Request Subindex 02 = Object 0x70n0.02, Error Clear

Object	Function	Detailed description	Access	Data type	Content/meaning
0x16FF	Receive PDO gateway (0F700)	Subindex, data type .00, UINT-8 .01, UINT-32 .02, UINT-32 .03, UINT-32	R	RECORD	Receive PDOs of the gateway Subindex 00 = Number of subindices Subindex 01 = Object 0xF700.01, Teach Request, all modules Subindex 02 = Object 0xF700.02, Error Clear, all modules Subindex 02 = Object 0xF700.03, Error Clear Gateway
0x1A00... 0x1A0F	Transmit PDOs modules (0x60n0)	Subindex, data type .00, UINT-8 .01, UINT-32 .02, UINT-32 .03, UINT-32 .04, UINT-32 .05, UINT-32 .06, UINT-32	R	RECORD	Transmit PDOs of the connected modules Subindex 00 = Number of subindices Subindex 01 = Object 0x60n0.01, Output 1 Subindex 02 = Object 0x60n0.02, Output 2 Subindex 03 = Object 0x60n0.03, Output 3 / Ext. input Subindex 04 = Object 0x60n0.04, Error Status Subindex 05 = Object 0x60n0.05, Quality of run Alarm Subindex 06 = Object 0x60n0.06, measured value
0x1AFF	Transmit PDO gateway (0xF600)	Subindex, data type .00, UINT-8 .01, UINT-32 .02, UINT-32 .03, UINT-32 .04, UINT-32 .05, UINT-32 .06, UINT-32	R	RECORD	Transmit PDOs of the gateway Subindex 00 = Number of subindices Subindex 01 = Object 0xF600.01, Output 1, all modules Subindex 02 = Object 0xF600.02, Output 2, all modules Subindex 03 = Object 0xF600.03, Output 3 / Ext. input, all modules Subindex 04 = Object 0xF600.04, Error Status, all modules Subindex 05 = Object 0xF600.05, Quality of run Alarm, all modules Subindex 06 = Object 0xF600.06, Error Status Gateway
0x1C00	Sync manager communication types		R	ARRAY UINT-8	Sync manager communication types Subindex 00 = Number of subindices Subindex 01 = Communication type sync manager 0 Subindex 02 = Communication type sync manager 1 Subindex 03 = Communication type sync manager 2 Subindex 04 = Communication type sync manager 3
0x1C12	Sync Manager 2 (Rx) PDO Assignment	Subindex, data type .00, UINT-8 .01, UINT-16 .02, UINT-16 ... .10, UINT-16 .11, UINT-16	R	RECORD	Sync Manager 2 PDO Assignment Subindex 00 = Number of subindices Subindex 01 = PDO 0x1600 Subindex 02 = PDO 0x1601 ... Subindex 10 = PDO 0x160F Subindex 11 = PDO 0x16FF

Object	Function	Detailed description	Access	Data type	Content/meaning
0x1C13	Sync Manager 3 (Tx) PDO Assignment	Subindex, data type .00, UINT-8 .01, UINT-16 .02, UINT-16 ... .10, UINT-16 .11, UINT-16	R	RECORD	Sync Manager 3 PDO Assignment Subindex 00 = Number of subindices Subindex 01 = PDO 0x1A00 Subindex 02 = PDO 0x1A01 ... Subindex 10 = PDO 0x1A0F Subindex 11 = PDO 0x1AFF

7.7.2 Module data

Table 7: Module data

Object	Function	Detailed description	Access	Data type	Content/meaning
0x60n0	Module Transmit PDO	Subindex, data type .00, UINT-8 .01, UINT-8 .02, UINT-8 .03, UINT-8 .04, UINT-8 .05, UINT-8 .06, INT-16	R	RECORD	Available input process data of a module Subindex 00 = Number of subindices Subindex 01 = Output 1. Output state of first output (00 = Off, 01 = On) Subindex 02 = Output 2. Output state of second output (00 = Off, 01 = On) Subindex 03 = Output 3 / Ext. Input. Output state of third output or external input (00 = Off, 01 = On) Subindex 04 = Error Status. Error status (00 = No error, 01 = Error) Subindex 05 = Quality of run Alarm. Validity of process data (00 = Data valid, 01 = Data invalid) Subindex 06 = Measured value of module
0x70n0	Module Receive PDO	Subindex, data type .00, UINT-8 .01, UINT-8 .02, UINT-8	R	RECORD	Available output process data of a module Subindex 00 = Number of subindices Subindex 01 = The subindex permits teach-in of the module switching point(s). The first switching point is taught at the change from 00 to 01 (or the teach-in process is started in the case of dynamic teach-in). The second switching point is taught at the change from 01 to 00 (or the teach-in process is ended in the case of dynamic teach-in). Subindex 02 = The subindex allows an error message of the module to be acknowledged (when the value changes from 00 to 01)
0x80n0	Module Configuration		R/W	RECORD	Configuration data of a module. See following subchapters for details
0x90n0	Module Identification		R	RECORD	Identification data of a module. See following subchapters for details

Object	Function	Detailed description	Access	Data type	Content/meaning
0xA0n0	Module Diagnostics		R	RECORD	Diagnostic data of a module. See following subchapters for details

7.7.3 Coupler data

Table 8: Coupler data

Object	Function	Detailed description	Access	Data type	Content/meaning
0xF000	Modular Device Profile	Subindex, data type .00, UINT-8 .01, UINT-16 .02, UINT-16	R	RECORD	Definition values of the profile Subindex 00 = Number of subindices Subindex 01 = Index distance of modules (16) Subindex 02 = Max. number of modules (16)
0xF030	Configured Module Ident List		R/W	ARRAY UINT-32	Configured module identification numbers
0xF050	Detected Module Ident List		R	ARRAY UINT-32	Detected module identification numbers
0xF100	Gateway Status	Subindex, data type .00, UINT-8 .01, UINT-16 .02, UINT-16 .03, UINT-16	R	RECORD	Status of the gateway Subindex 00 = Number of subindices Subindex 01 = Operating status (00 = Initialization, 01 = Idle, 02 = Run, 03 = In use by user) Subindex 02 = Number of modules present Subindex 03 = Last error code
0xF200	Gateway Control	Subindex, data type .00, UINT-8 .01, UINT-16	R/W	RECORD	Control of the gateway Subindex 00 = Number of subindices Subindex 01 = Global diagnostics (00 = Off, 01 = On)

Object	Function	Detailed description	Access	Data type	Content/meaning
0xF600	Gateway Transmit PDO	Subindex, data type .00, UINT-8 .01, UINT-16 .02, UINT-16 .03, UINT-16 .04, UINT-16 .05, UINT-16 .06, UINT-8	R	RECORD	Available input process data of the gateway Subindex 00 = Number of subindices Subindex 01 = Output 1, all modules. Output state of first output of all modules (every bit 0 = Off, 1 = On) Subindex 02 = Output 2, all modules. Output state of second output of all modules (every bit 0 = Off, 1 = On) Subindex 03 = Output 3 / Ext. Input, all modules. Output state of third output or external input of all modules (every bit 0 = Off, 1 = On) Subindex 04 = Error Status, all modules. Error status of all modules (every bit 0 = No error, 1 = Error) Subindex 05 = Quality of run Alarm, all modules. Validity of process data of all modules (every bit 0 = Data valid, 1 = Data invalid) Subindex 06 = Error Status Gateway. Error status of the gateway (00 = No error, 01 = Error)
0xF700	Gateway Receive PDO	Subindex, data type .00, UINT-8 .01, UINT-16 .02, UINT-16 .03, UINT-8	R	RECORD	Available output process data of the gateway Subindex 00 = Number of subindices Subindex 01 = Teach Request, all modules. Teach Request for all modules (for bit coding, see object 0x70n0.1) Subindex 02 = Error Clear, all modules. Acknowledgment of error message for all modules (every bit 0 = No action, 1 = Acknowledge error) Subindex 03 = Error Clear Gateway. Acknowledgment of gateway error message (when value changes from 00 to 01)

Object	Function	Detailed description	Access	Data type	Content/meaning
0xF800	Gateway Configuration	Subindex, data type .00, UINT-8 .01, UINT-16 (R) .02, UINT-16 (R) .03, UINT-16 (R) .04, UINT-16 (R) .05, STRG (R) .06, STRG (R) .07, STRG (R) .08, STRG (R/W) .C8, UINT-16 (R) .C9, UINT-16 (R) .CA, UINT-16 (R/W) .D4, UINT-16 (R/W)	R(/W)	RECORD	Identification/parameterization of the gateway Subindex 00 = Number of subindices (255) Subindex 01 = Product series. Bits 15...12 = Manufacturer (1 = SICK), Bits 11...8 = Categories (5 = Communication unit), Bit 7...0 = Family (TBD) Subindex 02 = Product type. TBD = WI180C-EC Subindex 03 = Firmware version (01 h) Subindex 04 = Product version (01 h) Subindex 05 = Vendor name ("SICK AG") Subindex 06 = Product name ("WI180C-EC") Subindex 07 = Product ID ("6068089") Subindex 08 = User ID (max. 32 characters) Subindex C8 = Firmware ID, application Subindex C9 = Firmware ID, communication Subindex CA = Find me (00 = Stop, 01 = Initialization) Subindex D4 = Reset to factory settings (03 = Execute)

7.7.4 WLL180T

Table 9: WLL180T

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.00	Number of module parameters		R	UINT-8	Number of parameters/subindices (155)
0x80n0.01	Display		R/W	UINT-16	0: Numeric display 1: Bar graph 2: Percentage display
0x80n0.03	Teach-in mode	CH1	R/W	UINT-16	0: 1-point 1: 2-point 2: Auto 3: Zone 4: Glass
0x80n0.04		CH2	R/W	UINT-16	
0x80n0.05	Response speed		R/W	UINT-16	0: 16 us 1: 70 us 2: 250 us 3: 2 ms 4: 8 ms
0x80n0.06	Sender strength		R/W	UINT-16	0: low strength 1: medium strength 2: normal

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.07	MF input		R/W	UINT-16	0: External teach-in 1: Test input 2: Synchronization 3: Reset counter 4: Master teach-in 5: No function
0x80n0.08	Key lock		R/W	UINT-16	0: cancel 1: Completely locked 2: Locked, but external teach-in available
0x80n0.09	Operating mode	CH1	R/W	UINT-16	0: Light on 1: Dark on
0x80n0.0A		CH2	R/W	UINT-16	
0x80n0.0B	Threshold	CH1 Lower limit	R/W	UINT-16	-999 … 9,999 All values outside the range will be replaced by the nearest valid values.
0x80n0.0C		CH1 Upper limit	R/W	UINT-16	
0x80n0.0D		CH2 Lower limit	R/W	UINT-16	
0x80n0.0E		CH2 Upper limit	R/W	UINT-16	
0x80n0.0F	Counter setting	CH1	R/W	UINT-16	0: Delay off 1: Single pulse
0x80n0.10		CH2	R/W	UINT-16	
0x80n0.11	Delay time off	CH1	R/W	UINT-16	0 … 9,999: 0 … 9,999 ms -1 … -9: 0.1 … 0.9 ms
0x80n0.12	Delay time on	CH1	R/W	UINT-16	
0x80n0.13	Delay time off	CH2	R/W	UINT-16	
0x80n0.14	Delay time on	CH2	R/W	UINT-16	
0x80n0.18	Hysteresis		R/W	UINT-16	1 … 40
0x80n0.1A	ASC (automated switching threshold adjustment)		R/W	UINT-16	0: Off 1: Normal
0x80n0.1B	Eco Mode		R/W	UINT-16	0: Off 1: Display in energy-saving mode
0x80n0.1C	Reverse display		R/W	UINT-16	0: normal 1: Display reversed
0x80n0.65	Save zero reset		R/W	UINT-16	Write any value to clear zero reset
0x80n0.66	Cancel zero reset		R/W	UINT-16	Write any value to clear zero reset
0x80n0.67	Teach-in 1-point		R/W	UINT-16	1: CH1 2: CH2
0x80n0.68	Teach-in 2-point		R/W	UINT-16	1: CH1 2: CH2
0x80n0.6F	Reset		R/W	UINT-16	3: Execute
0x80n0.70	Return to start menu		R/W	UINT-16	Write any value to return to start menu
0x80n0.71	Reset to factory settings		R/W	UINT-16	3: Execute

Object	Function	Detailed description	Access	Data type	Content/meaning
90n0.00 h	Number of module information elements		R	UINT-8	Number of parameters/subindices (32)

Object	Function	Detailed description	Access	Data type	Content/meaning
90n0.01 h	Product series	-	R	UINT-16	0x1101 (model with 1 output)
		-			0x1102 (model with 2 outputs)
		b15–12 Manufacturer			1: SICK
		b11–8 Categories			1: Fiber amplifier
		b7–0 Family			1: WLL180T 1 output
		-			2: WLL180T 2 outputs
90n0.02 h	Product type		R	UINT-16	17: WLL180T
90n0.03 h	Firmware version		R	UINT-16	0x0200 or higher
90n0.04 h	Product version		R	UINT-16	1
90n0.06 h	Vendor name		R	STRG	"SICK AG"
90n0.07 h	Product name		R	STRG	Respective product type name
90n0.08 h	Product ID		R	STRG	Respective product type code
90n0.09 h	User ID		R/W	STRG	Reserved (max. 32 characters)

Object	Function	Detailed description	Access	Data type	Content/meaning
A0n0.00 h	Number of module diagnoses		R	UINT-8	Number of parameters/subindices (2)
A0n0.01 h	Operating status		R/W	UINT-16	0 = Initialization 1: Idle 2: Execute 3: In use by user
A0n0.02 h	Error code		R/W	UINT-16	Read: last error code Write any value: delete last error code

7.7.5   KTL180

Table 10: KTL180

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.00	Number of module parameters		R	UINT-8	Number of parameters/subindices (155)
0x80n0.01	Display		R/W	UINT-16	0: Numeric display 1: Bar graph 2: Percentage display
0x80n0.03	Teach-in mode	CH1	R/W	UINT-16	0: 1-point
0x80n0.04		CH2	R/W	UINT-16	1: 2-point 2: Dynamic
0x80n0.05	Response speed		R/W	UINT-16	0: 16 us 1: 200 us
0x80n0.06	Receiver amplification		R/W	UINT-16	0: Low 1: Standard 2: High 3: Auto

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.07	MF input		R/W	UINT-16	0: External teach-in 1: Teach-in all 2: L/D selection 3: Blanking 4: No function
0x80n0.08	Key lock		R/W	UINT-16	0: cancel 1: Completely locked 2: Locked, but external teach-in available
0x80n0.09	Operating mode	CH1	R/W	UINT-16	0 = Auto
0x80n0.0A		CH2	R/W	UINT-16	1: Light on 2: Dark on
0x80n0.0B	Threshold	CH1 Lower limit	R/W	UINT-16	-999 … 9,999 All values outside the range
0x80n0.0C		CH1 Upper limit	R/W	UINT-16	will be replaced by the nearest valid values.
0x80n0.0D		CH2 Lower limit	R/W	UINT-16	
0x80n0.0E		CH2 Upper limit	R/W	UINT-16	
0x80n0.0F	Counter setting	CH1	R/W	UINT-16	0: Delay off 1: Single pulse
0x80n0.10		CH2	R/W	UINT-16	
0x80n0.11	Delay time off	CH1	R/W	UINT-16	0 … 9,999: 0 … 9,999 ms -1 … -9: 0.1 … 0.9 ms
0x80n0.12	Delay time on	CH1	R/W	UINT-16	
0x80n0.13	Delay time off	CH2	R/W	UINT-16	
0x80n0.14	Delay time on	CH2	R/W	UINT-16	
0x80n0.16	Synchronization		R/W	UINT-16	0 = Asynchronous 1: Synchronous
0x80n0.18	Sensitivity		R/W	UINT-16	0: 10% 1: 20% 2: 50%
0x80n0.1A	ASC (automated switching threshold adjustment)		R/W	UINT-16	0: Off 1: Normal
0x80n0.1B	Eco Mode		R/W	UINT-16	0: Off 1: Display in energy-saving mode
0x80n0.1C	Reverse display		R/W	UINT-16	0: normal 1: Display reversed
0x80n0.65	Save zero reset		R/W	UINT-16	Write any value to clear zero reset
0x80n0.66	Cancel zero reset		R/W	UINT-16	Write any value to clear zero reset
0x80n0.67	Teach-in 1-point		R/W	UINT-16	1: CH1 2: CH2
0x80n0.68	Teach-in 2-point		R/W	UINT-16	1: CH1 2: CH2
0x80n0.6F	Reset		R/W	UINT-16	3: Execute
0x80n0.70	Return to start menu		R/W	UINT-16	Write any value to return to start menu
0x80n0.71	Reset to factory settings		R/W	UINT-16	3: Execute

Object	Function	Detailed description	Access	Data type	Content/meaning
90n0.00 h	Number of module information elements		R	UINT-8	Number of parameters/subindices (32)

Object	Function	Detailed description	Access	Data type	Content/meaning
90n0.01 h	Product series	-	R	UINT-16	1,111 h (model with 1 output)
		-			1,112 h (model with 2 outputs)
		b15–12 Manufacturer			1: SICK
		b11–8 Categories			1: Fiber amplifier
		b7–0 Family			11: KTL180 1 output
		-			12: KTL180 2 outputs
90n0.02 h	Product type		R	UINT-16	17: KTL180
90n0.03 h	Firmware version		R	UINT-16	0100 h
90n0.04 h	Product version		R	UINT-16	1
90n0.06 h	Vendor name		R	STRG	"SICK AG"
90n0.07 h	Product name		R	STRG	Respective product type name
90n0.08 h	Product ID		R	STRG	Respective product type code
90n0.09 h	User ID		R/W	STRG	Reserved (max. 32 characters)

Object	Function	Detailed description	Access	Data type	Content/meaning
A0n0.00 h	Number of module diagnoses		R	UINT-8	Number of parameters/subindices (2)
A0n0.01 h	Operating status		R/W	UINT-16	0 = Initialization 1: Idle 2: Execute 3: In use by user
A0n0.02 h	Error code		R/W	UINT-16	Read: last error code Write any value: delete last error code

7.7.6 OD1 on AOD1

Table 11: OD1 on AOD1

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.00	Number of module parameters		R	UINT-8	Number of parameters/subindices (155)
0x80n0.01	Threshold	Near	R/W	UINT-16	-32,768 ... 32,767 (default: depending on sensor type)
0x80n0.02		Far	R/W	UINT-16	-32,768 ... 32,767 (default: depending on sensor type)
0x80n0.03	Output hysteresis		R/W	UINT-16	0 ... 32,767 (default: depending on sensor type)
0x80n0.04	Calculation flags		R/W	UINT-16	0: No calculation 1: Calculation
0x80n0.05	Calculation coefficient addition		R/W	UINT-16	-10,000 ... 10,000 (default: 0)
0x80n0.06	Calculation coefficient multiplication		R/W	UINT-16	-10,000 ... 10,000 (default: 1)
0x80n0.07	Calculation coefficient division		R/W	UINT-16	1 ... 32,767 (default: 1)

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.08	Monitor cumulative values		R/W	UINT-16	Field bus channel 2 data selection (0: Head2, 1: Cumulative value)
0x80n0.09	Cumulative values	Head1	R/W	UINT-16	0: None 1: Add 2: Subtract 3: Difference
0x80n0.0A		Head2	R/W	UINT-16	
0x80n0.0B		Left unit Head1	R/W	UINT-16	
0x80n0.0C		Left unit Head2	R/W	UINT-16	
0x80n0.0D	I/O polarity		R/W	UINT-16	0: PNP (N/O / Normally open) 1: NPN (N/O / Normally open) 2: PNP (N/C / Normally closed) 3: NPN (N/C / Normally closed)
0x80n0.0E	Output selection	Out1	R/W	UINT-16	0: Off 1: Calculated GO 2: Calculated LO 3: Calculated HI 4: Head 1 GO 5: Head 1 LO 6: Head 1 HI 7: Head 2 GO 8: Head 2 LO 9: Head 2 HI
0x80n0.0F		Out2	R/W	UINT-16	
0x80n0.10		Out3	R/W	UINT-16	
0x80n0.11	Selection of external input		R/W	UINT-16	0: Off 1: Teach-in (rising: far, falling: near) 2: OBSB teach-in 3: Zero reset 4: Laser off
0x80n0.12	Selection of analog output		R/W	UINT-16	0: Off 1: Calculated 2: Head 1 3: Head 2
0x80n0.13	Analog scaling		R/W	UINT-16	0: Off 1: On
0x80n0.14	Analog scaling (max.)	10 V / 20 mA	R/W	UINT-16	-32,768 ... 32,767 (default: 10,000)
0x80n0.15	Analog scaling (min.)	0 V / 4 mA	R/W	UINT-16	-32,768 ... 32,767 (default: -10,000)
0x80n0.16	Baud rate				0: No sensor head 1: 9.6 k 2: 19.2 k 3: 38.4 k 4: 57.6 k 5: 115.2 k 6: 230.4 k 7: 312.5 k 8: 460 k 9: 500 k 10: 625 k 11: 833 k 12: 921 k 13: 1,250 k (default: 9)

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.1F	Switching point	Near	R/W	UINT-16	OD1 15 mm: -7,499 ... 7,499 (default: -1,000) OD1 35 mm: -2,249 ... 2,249 (default: -300) OD1 100 mm: -7,499 ... 7,499 (default: -1,000)
0x80n0.20		Far	R/W	UINT-16	OD1 15 mm: -7,499 ... 7,499 (default: 1,000) OD1 35 mm: -2,249 ... 2,249 (default: 300) OD1 100 mm: -7,499 ... 7,499 (default: 1,000)
0x80n0.21	Background ObSB		R/W	UINT-16	OD1 15 mm: -7,499 ... 7,499 (default: 0) OD1 35 mm: -2,249 ... 2,249 (default: 0) OD1 100 mm: -7,499 ... 7,499 (default: 0)
0x80n0.22	Tolerance ObSB		R/W	UINT-16	OD1 15 mm: 0 ... 7,499 (default: 1,000) OD1 35 mm: 0 ... 2,249 (default: 300) OD1 100 mm: 0 ... 7,499 (default: 1,000)
0x80n0.23	Moving average		R/W	UINT-16	0: over one value 1: 8 values 2: 64 values 3: 512 values
0x80n0.24	Teach-in mode		R/W	UINT-16	0: 2-point 1: 1-point 2: ObSB
0x80n0.25	Sampling rate		R/W	UINT-16	0: 500 us 1: 1,000 us 2: 2,000 us 3: 4,000 us 4: Auto
0x80n0.26	Key lock		R/W	UINT-16	0: Unlocked 1: Locked
0x80n0.27	Switching behavior		R/W	UINT-16	0: Light ON 1: Dark ON
0x80n0.28	Calibration, near distance		R/W	UINT-16	OD1 15 mm: -7,499 ... 7,499 (default: -5,000) OD1 35 mm: -2,249 ... 2,249 (default: -1,500) OD1 100 mm: -7,499 ... 7,499 (default: -5,000)

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.29	Calibration, far distance		R/W	UINT-16	OD1 15 mm: -7,499 … 7,499 (default: 5,000) OD1 35 mm: -2,249 … 2,249 (default: 1,500) OD1 100 mm: -7,499 … 7,499 (default: 5,000)
0x80n0.2A	Error behavior		R/W	UINT-16	0: Clamp 1: Hold
0x80n0.2B	Clamp holding time		R/W	UINT-16	0 … 9,999 (default: 0)
0x80n0.2D	Zeroing value		R/W	UINT-16	OD1 15 mm: -7,499 … 7,499 (default: 0) OD1 35 mm: -2,249 … 2,249 (default: 0) OD1 100 mm: -7,499 … 7,499 (default: 0)
0x80n0.31	Barycenter		R/W	UINT-16	0: Max. light 1: Closest 2: 2nd point 3: 3rd point 4: 4th point 5: 5th point
0x80n0.34	Hysteresis value		R/W	UINT-16	OD1 15 mm: 0 … 7,499 (default: 50) OD1 35 mm: 0 … 2,249 (default: 50) OD1 100 mm: 0 … 7,499 (default: 50)
0x80n0.35	Sensitivity		R/W	UINT-16	0: Auto adjust 1: Min. sense 2: 2nd sense 3: 3rd sense 4: 4th sense 5: 5th sense 6: Max. sense
0x80n0.36	Light threshold		R/W	UINT-16	0: Lowest 1: Lower 2: Middle 3: Upper
0x80n0.38	Key lock active		R/W	UINT-16	0: Display active if locked 1: Display inactive if locked
0x80n1.00	Number of module commands		R	UINT-8	Number of parameters/subindices (56)
0x80n1.01	Save zero reset		R/W	UINT-16	
0x80n1.02	Cancel zero reset		R/W	UINT-16	
0x80n1.03	Teach-in 1-point		R/W	UINT-16	
0x80n1.04	Teach-in 2-point		R/W	UINT-16	
0x80n1.05	Teach-in ObSB		R/W	UINT-16	
0x80n1.0B	Reset		R/W	UINT-16	3: Execute
0x80n1.0C	Return to start menu		R/W	UINT-16	Write any value to return to start menu

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n1.0D	Reset to factory settings		R/W	UINT-16	3: Execute

Object	Function	Detailed description	Access	Data type	Content/meaning
0x90n0.00	Number of module information elements		R	UINT-8	Number of parameters/subindices (32)
0x90n0.01	Product series	-	R	UINT-16	0x1301 (15 mm model)
		-			0x1302 (35 mm model)
		-			0x1303 (100 mm model)
		b15–12 Manufacturer			1: SICK
		b11–8 Categories			3: Displacement
		b7–0 Family			1: OD1 15 mm
		-			2: OD1 35 mm
		-			3: OD1 100 mm
0x90n0.02	Product type		R	UINT-16	1: AOD1
0x90n0.03	Firmware version		R	UINT-16	0x0100
0x90n0.04	Product version		R	UINT-16	0
0x90n0.06	Vendor name		R	STRG	"SICK AG"
0x90n0.07	Product name		R	STRG	Respective product type name
0x90n0.08	Product ID		R	STRG	Respective product type code
0x90n0.09	User ID		R/W	STRG	Reserved (max. 32 characters)
0x90n0.0A	Product series, amplifier	b15–b0: Amplifier product series	R	UINT-16	0x1503

Object	Function	Detailed description	Access	Data type	Content/meaning
0xA0n0.00	Number of module diagnoses		R	UINT-8	Number of parameters/subindices (2)
0xA0n0.01	Operating status		R/W	UINT-16	0 = Initialization 1: Idle 2: Execute 3: In use by user
0xA0n0.02	Error code		R/W	UINT-16	Read: last error code Write any value: delete last error code

7.7.7 OL1 on AOD1

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.00	Number of module parameters		R	UINT-8	Number of parameters/subindices (53)
0x80n0.01	Threshold	Near	R/W	UINT-16	-32,768 … 32,767 (default: depending on sensor type)
0x80n0.02		Far	R/W	UINT-16	-32,768 … 32,767 (default: depending on sensor type)

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.03	Output hysteresis		R/W	UINT-16	0 … 32,767 (default: depending on sensor type)
0x80n0.04	Calculation flags		R/W	UINT-16	0: No calculation 1: Calculation
0x80n0.05	Calculation coefficient addition		R/W	UINT-16	-10,000 … 10,000 (default: 0)
0x80n0.06	Calculation coefficient multiplication		R/W	UINT-16	-10,000 … 10,000 (default: 1)
0x80n0.07	Calculation coefficient division		R/W	UINT-16	1 … 32,767 (default: 1)
0x80n0.08	Monitor cumulative values		R/W	UINT-16	Field bus channel 2 data selection (0: Head2, 1: cumulative value)
0x80n0.09	Cumulative values	Head1	R/W	UINT-16	0: None 1: Add 2: Subtract 3: Difference
0x80n0.0A		Head2	R/W	UINT-16	
0x80n0.0B		Left unit Head1	R/W	UINT-16	
0x80n0.0C		Left unit Head2	R/W	UINT-16	
0x80n0.0D	I/O polarity		R/W	UINT-16	0: PNP (N/O / Normally open) 1: NPN (N/O / Normally open) 2: PNP (N/C / Normally closed) 3: NPN (N/C / Normally closed)
0x80n0.0E	Output selection	Out1	R/W	UINT-16	0: Off 1: Calculated GO 2: Calculated LO 3: Calculated HI 4: Head 1 GO 5: Head 1 LO 6: Head 1 HI 7: Head 2 GO 8: Head 2 LO 9: Head 2 HI
0x80n0.0F		Out2	R/W	UINT-16	
0x80n0.10		Out3	R/W	UINT-16	
0x80n0.11	Selection of external input		R/W	UINT-16	0: Off 1: Teach-in (rising: far, falling: near) 2: OBSB teach-in 3: Zero reset 4: Laser off
0x80n0.12	Selection of analog output		R/W	UINT-16	0: Off 1: Calculated 2: Head 1 3: Head 2
0x80n0.13	Analog scaling		R/W	UINT-16	0: Off 1: On
0x80n0.14	Analog scaling (max.)	10 V / 20 mA	R/W	UINT-16	-32,768 … 32,767 (default: 10,000)
0x80n0.15	Analog scaling (min.)	0 V / 4 mA	R/W	UINT-16	-32,768 … 32,767 (default: -10,000)

Object	Function	Detailed description	Access	Data type	Content/meaning
0x80n0.16	Baud rate				0: No sensor head 1: 9.6 k 2: 19.2 k 3: 38.4 k 4: 57.6 k 5: 115.2 k 6: 230.4 k 7: 312.5 k 8: 460 k 9: 500 k 10: 625 k 11: 833 k 12: 921 k 13: 1,250 k (default: 9)
0x80n0.23	Moving average		R/W	UINT-16	1 … 128 (scanning points)
0x80n0.24	Measurement type		R/W	UINT-16	0: Positive edge 1: Negative edge 2: Width
0x80n0.25	Sampling rate		R/W	UINT-16	0: 500 µs (fixed value)
0x80n0.2C	Measurement direction		R/W	UINT-16	0: From top to bottom 1: From bottom to top
0x80n0.2D	Zeroing value		R/W	UINT-16	-9,999 … 5,000 (default: 0)
0x80n0.35	Sensitivity		R/W	UINT-16	0: Min. sense 1: 2nd sense 2: 3rd sense 3: 4th sense 4: Max. sense 5: Adjusted
0x80n1.00	Number of module commands		R	UINT-8	Number of parameters/subindices (13)
0x80n1.01	Save zero reset		R/W	UINT-16	
0x80n1.02	Cancel zero reset		R/W	UINT-16	
0x80n1.0D	Reset to factory settings		R/W	UINT-16	3: Execute

Object	Function	Detailed description	Access	Data type	Content/meaning
0x90n0.00	Number of module information elements		R	UINT-8	Number of parameters/subindices (32)
0x90n0.01	Product series	-	R	UINT-16	0x1321
		b15–12 Manufacturer			1: SICK
		b11–8 Categories			3: Displacement
		b7–0 Family			21: OL1
0x90n0.02	Product type		R	UINT-16	11: AOD1 / OL1
0x90n0.03	Firmware version		R	UINT-16	0x1011
0x90n0.04	Product version		R	UINT-16	0
0x90n0.06	Vendor name		R	STRG	"SICK AG"
0x90n0.07	Product name		R	STRG	Respective product type name
0x90n0.08	Product ID		R	STRG	Respective product type code
0x90n0.09	User ID		R/W	STRG	Reserved (max. 16 characters)

Object	Function	Detailed description	Access	Data type	Content/meaning
0x90n0.0A	Product series, amplifier	b15–b0: Amplifier product series	R	UINT-16	0x1503

Object	Function	Detailed description	Access	Data type	Content/meaning
0xA0n0.00	Number of module diagnoses		R	UINT-8	Number of parameters/subindices (1)
0xA0n0.01	Operating status		R/W	UINT-16	0 = Initialization 1: Idle 2: Execute 3: In use by user

8   Diagnosis

The device transmits error states in various ways. If a connected module detects a fault, this is transmitted in the corresponding "Error status" process datum. Details about the detected faults can be retrieved using the "Service Data Object" 0x1F03 (diagnosis history).

In addition, the gateway status object 0xF100 will report in subindex 3 the last occurred error. The following table shows possible errors:

Diagnosis History (0x10F3)		Last Gateway Error (0xF100:3)	Description
Diag Code	**Diag Type**		
0x0006E000	0x02 (Error)	0x0206	Number of connected modules changed during run-time.
0x0007E000	0x01 (Warning)	0x0107	An invalid module is connected to the gateway.
0x0008E000	0x01 (Warning)	0x0108	The order of connected modules is wrong (see ch. 7.4).

9 Decommissioning

9.1 Dismantling

1. Switch off the power supply for the device.
2. Disconnect the male connector of the power supply and the EtherCAT male connector.
3. Detach the mountings for the connected devices.
4. Disconnect the connected devices from the bus male connector of the device.
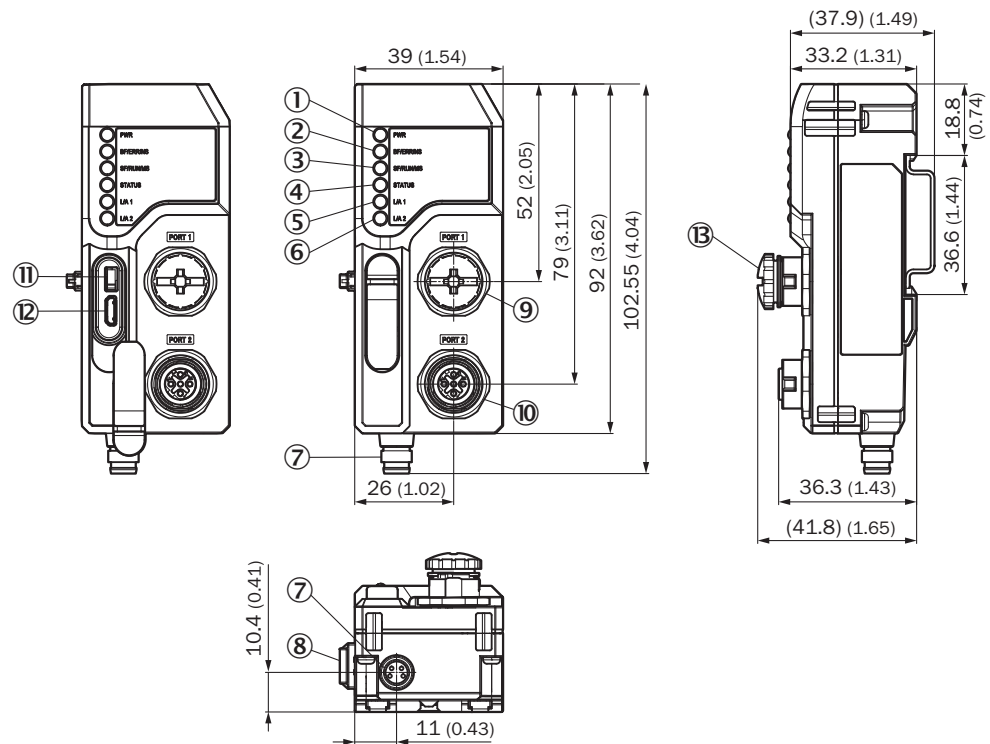5. Carefully push up the device until you can tip it forwards.
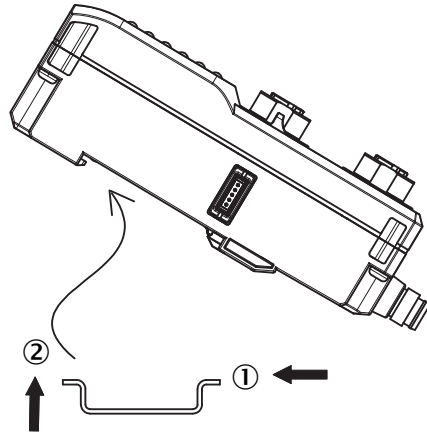
6. Remove the device from the mounting rail.

9.2 Disposal

At the end of its service life, the device must be disposed of correctly as waste electronics. Take the regulations in your country into account also.

10 Technical data

10.1 Dimensional drawings

① PWR-LED

② BF/ERR/NS-LED

③ SF/RUN/MS-LED

④ STATUS-LED

⑤ L/A1-LED

⑥ L/A2-LED

⑦ Power supply connection M8, 4-pin

⑧ Bus male connection, 5-pin (system bus)

⑨ D-coded M12 connector, 4-pin, EtherCAT

⑩ D-coded M12 connector, 4-pin, EtherCAT

⑪ Factory reset button

⑫ Service port (USB, Micro-B)

⑬ M12 Connector Cap (accessory)

10.2 Technical data

Electrical system

Table 12: Electrical data

Description	Value
Supply voltage	12 … 24 VDC ± 10%
Power consumption (without connected devices)	3 W
Switch-on delay	1,000 ms
Switch-on delay (complete system)	2,000 ms

Description	Value
LEDs	PWR, BF/ERR/NS, SF/RUN/MS, STATUS, L/A1, L/A2
Voltage supply	M8 male connector, 4-pin
Other interfaces	Bus male connector, 5-pin, internal system bus 2 x M12 male connector, 4-pin, D-coded, EtherCAT

EtherCAT

Table 13: EtherCAT data

Description	Value
Maximum number of modules that can be connected	16
Transmission rate	100 Mbit/s
Maximum distance between nodes	100 m
Process data	Depending on selected modules 12 bytes input and 6 bytes output Gateway 8 bytes input and 3 bytes output per module Minimum cycle time: TBD
Asynchronous data	Service data objects (SDOs) over CANopen-over-EtherCAT (CoE).
Observed standard	IEEE802.3u (100Base-Tx)
Ethernet connections	2
ESI file	Available on www.sick.com

EMC

Table 14: EMC data

Description	Value
Noise immunity (length of cable ≤ 30 m)	In accordance with EN 61000-6-2 / EN 61131-2
Emission	In accordance with EN 55011, Class A

Product safety

Table 15: Product safety data

Description	Value
Protection class	3
Short-circuit protection	In accordance with VDE 0160

Mechanical system

Table 16: Mechanical data

Description	Value
Enclosure rating	IP54[1]
Vibration resistance	IEC 60068, 10 ... 55 Hz
Shock resistance	IEC 60068, 500 m/s^2 (~50 g)
Housing material	Polycarbonate
Dimensions (W x H x D) in mm	39 x 102.55 x 36.3

[1]   Valid if WI180C-EC is connected to modules that comply with IP54 via internal system bus

Environmental parameters

Table 17: Environmental parameters

Description	Value
Air humidity (operation/storage)	35 ... 85% relative humidity
Temperature range (storage)	-40 ... +70 °C
Temperature range (operation, ≤ 3 connected devices)	-25 ... +55 °C [1]
Temperature range (operation, ≤ 8 connected devices)	-25 ... +50 °C [1]
Temperature range (operation, ≤ 16 connected devices)	-25 ... +45 °C [1]

[1] Temperature ranges apply if there is no output current at the connected devices

10.3 UL Satisfaction Ratings

The total control output current and ambient temperature will be retricted as follows depends on the number of sensors (proximity switch) connected to the programmable controller.

Up to 3 units:

Input	12 - 24 V dc, max. 1.02 A, Class 2
Output	12 - 24 V dc, max. 0.45 A, Class 2
Maximum surround air Temperature +55 °C.	

Up to 8 units:

Input	12 - 24 V dc, max. 1.02 A, Class 2
Output	12 - 24 V dc, max. 0.8 A, Class 2
Maximum surround air Temperature +50 °C.	

Up to 16 units:

Input	12 - 24 V dc, max. 1.02 A, Class 2
Output	12 - 24 V dc, max. 0.8 A, Class 2
Maximum surround air Temperature +45 °C.	

10.4 Ordering information, accessories

Table 18: Ordering information

Type	Description	Part number
YF8U14-020VA3XLEAX	Female connector, M8, 4-pin, straight, 2 m cable	2095888

Type	Description	Part number
YF8U14-050VA3XLEAX	Female connector, M8, 4-pin, straight, 5 m cable	2095889
YG8U14-020VA3XLEAX	Female connector, M8, 4-pin, angled, 2 m cable	2095962
YG8U14-050VA3XLEAX	Female connector, M8, 4-pin, angled, 5 m cable	2095963
SSL-1204-G02MZ90	Male connector, M12, 4-pin, straight, D-coded, 2 m cable	6048241

Australia
Phone +61 (3) 9457 0600
1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Austria
Phone +43 (0) 2236 62288-0
E-Mail office@sick.at

Belgium/Luxembourg
Phone +32 (0) 2 466 55 66
E-Mail info@sick.be

Brazil
Phone +55 11 3215-4900
E-Mail comercial@sick.com.br

Canada
Phone +1 905.771.1444
E-Mail cs.canada@sick.com

Czech Republic
Phone +420 234 719 500
E-Mail sick@sick.cz

Chile
Phone +56 (2) 2274 7430
E-Mail chile@sick.com

China
Phone +86 20 2882 3600
E-Mail info.china@sick.net.cn

Denmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Finland
Phone +358-9-25 15 800
E-Mail sick@sick.fi

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Germany
Phone +49 (0) 2 11 53 010
E-Mail info@sick.de

Greece
Phone +30 210 6825100
E-Mail office@sick.com.gr

Hong Kong
Phone +852 2153 6300
E-Mail ghk@sick.com.hk

Hungary
Phone +36 1 371 2680
E-Mail ertekesites@sick.hu

India
Phone +91-22-6119 8900
E-Mail info@sick-india.com

Israel
Phone +972 97110 11
E-Mail info@sick-sensors.com

Italy
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 3 5309 2112
E-Mail support@sick.jp

Malaysia
Phone +603-8080 7425
E-Mail enquiry.my@sick.com

Mexico
Phone +52 (472) 748 9451
E-Mail mexico@sick.com

Netherlands
Phone +31 (0) 30 229 25 44
E-Mail info@sick.nl

New Zealand
Phone +64 9 415 0459
0800 222 278 – tollfree
E-Mail sales@sick.co.nz

Norway
Phone +47 67 81 50 00
E-Mail sick@sick.no

Poland
Phone +48 22 539 41 00
E-Mail info@sick.pl

Romania
Phone +40 356-17 11 20
E-Mail office@sick.ro

Russia
Phone +7 495 283 09 90
E-Mail info@sick.ru

Singapore
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovakia
Phone +421 482 901 201
E-Mail mail@sick-sk.sk

Slovenia
Phone +386 591 78849
E-Mail office@sick.si

South Africa
Phone +27 10 060 0550
E-Mail info@sickautomation.co.za

South Korea
Phone +82 2 786 6321/4
E-Mail infokorea@sick.com

Spain
Phone +34 93 480 31 00
E-Mail info@sick.es

Sweden
Phone +46 10 110 10 00
E-Mail info@sick.se

Switzerland
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Taiwan
Phone +886-2-2375-6288
E-Mail sales@sick.com.tw

Thailand
Phone +66 2 645 0009
E-Mail marcom.th@sick.com

Turkey
Phone +90 (216) 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 (0) 4 88 65 878
E-Mail contact@sick.ae

United Kingdom
Phone +44 (0)17278 31121
E-Mail info@sick.co.uk

USA
Phone +1 800.325.7425
E-Mail info@sick.com

Vietnam
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Detailed addresses and further locations at **www.sick.com**

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Sensor Intelligence.

SICK AG | Waldkirch | Germany | www.sick.com