SICK.COM



OPERATING INSTRUCTIONS

DMM4

Extension module

SICK Sensor Intelligence

Described product

DMM4

Manufacturer

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Original document

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1 About this document

1.1 Purpose of this document

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

These operating instructions must be made accessible to all persons who work with the extension module.

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

1.2 Scope

Product

This document applies to the following products:

- Product code: DMM4
- “Operating instructions” type label entry: 8028457

Document identification

Document part number:

- This document: 8028472
- Available language versions of this document: 8028457

You can find the current version of all documents at **www.sick.com**.

1.3 Target groups of these operating instructions

Some sections of these operating instructions are intended for certain target groups. However, the entire operating instructions are relevant for intended use of the product.

Table 1: Target groups and selected sections of these operating instructions

Target group	Sections of these operating instructions
Project developers (planners, developers, designers)	"Project planning", page 14 "Configuration", page 23 "Technical data", page 34
Installers	"Mounting", page 15
Electricians	"Electrical installation", page 18
Safety experts (such as CE authorized representatives, compliance officers, people who test and approve the application)	"Project planning", page 14 "Configuration", page 23 "Commissioning", page 27 "Technical data", page 34
Operators	"Operation", page 28 "Troubleshooting", page 30
Maintenance personnel	"Maintenance", page 29 "Troubleshooting", page 30

1.4 Related applicable documents

Related applicable documents from SICK

Document	Title	Part number	Source
Operating instructions	deTec4	8021643	**www.sick.com**/8021643
Operating instructions	deTem4	8028055	**www.sick.com**/8028055

Document	Title	Part number	Source
Operating instructions	deTem4 A/P	8024641	www.sick.com/8024641

1.5 Additional information

www.sick.com

The following information is available on the Internet:

- Data sheets and application examples
- CAD data and dimensional drawings
- Certificates (e.g. EU declaration of conformity)
- Guide for Safe Machinery Six steps to a safe machine

1.6 Symbols and document conventions

The following symbols and conventions are used in this document:

Warnings and other notes

DANGER
Indicates a situation presenting imminent danger, which will lead to death or serious injuries if not prevented.

WARNING
Indicates a situation presenting possible danger, which may lead to death or serious injuries if not prevented.

CAUTION
Indicates a situation presenting possible danger, which may lead to moderate or minor injuries if not prevented.

NOTICE
Indicates a situation presenting possible danger, which may lead to property damage if not prevented.

NOTE
Highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

Instructions to action

→ The arrow denotes instructions to action.

1. The sequence of instructions for action is numbered.
2. Follow the order in which the numbered instructions are given.

✔ The check mark denotes the result of an instruction.

LED symbols

These symbols indicate the status of an LED:

○ The LED is off.
☼ The LED is flashing.
● The LED is illuminated continuously.

2 Safety information

2.1 Basic safety notes

Integrating the product

DANGER
The product can not offer the expected protection if it is integrated incorrectly.

→ Plan the integration of the product in accordance with the machine requirements (project planning of the ESPE).
→ Implement the integration of the product in accordance with the project planning of the ESPE.

Mounting and electrical installation

DANGER
Death or severe injury due to electrical voltage and/or an unexpected startup of the machine

→ Make sure that the machine is (and remains) disconnected from the voltage supply during mounting, electrical installation and configuration.
→ Make sure that the dangerous state of the machine is and remains switched off.

Repairs and modifications

DANGER
Improper work on the product

A modified product may not offer the expected protection if it is integrated incorrectly.

→ Apart from the procedures described in this document, do not repair, open, manipulate or otherwise modify the product.

2.2 Intended use

The DMM4 extension module is used in combination with an electro-sensitive protective equipment (ESPE).

The extension module can be used as a stand-alone device without a connected ESPE to use its service functions.

You can use the product with a compatible version of the following products:

- deTec4
- deTem4
- deTem4 A/P

The product may be used in safety functions.

The product must only be used within the limits of the prescribed and specified technical specifications and operating conditions at all times.

Incorrect use, improper modification or manipulation of the product will invalidate any warranty from SICK; in addition, any responsibility and liability of SICK for damage and secondary damage caused by this is excluded.

Further topics

- "Compatible devices", page 10

2.3 Inappropriate use

The DMM4 extension module is **not** suitable for the following applications (this list is not exhaustive):

- At altitudes over 3,000 m above sea level
- In environments with increased levels of ionizing radiation
- Underwater
- In explosion-hazardous areas

Complementary information

The application diagnostic outputs must not be used for safety-related functions.

2.4 Cybersecurity

Overview

To protect against cybersecurity threats, the operator must have a comprehensive cybersecurity concept, which must be continuously monitored and maintained. A suitable concept consists of organizational, technical, procedural, electronic, and physical levels of defense and considers suitable measures for different types of risks. The measures implemented in this product can only support protection against cybersecurity threats if the product is used as part of such a concept.

You will find further information at www.sick.com/psirt, e.g.:

- General information on cybersecurity
- Contact option for reporting vulnerabilities
- Information on known vulnerabilities (security advisories)

3 Product description

3.1 Product identification via the SICK product ID

SICK product ID

The SICK product ID uniquely identifies the product. It also serves as the address of the web page with information on the product.

The SICK product ID comprises the host name pid.sick.com, the part number (P/N), and the serial number (S/N), each separated by a forward slash.

For many products, the SICK product ID is displayed as text and QR code on the type label and/or on the packaging.



Figure 1: SICK product ID

3.2 Structure and function

The DMM4 extension module extends the functional scope of an electro-sensitive protective equipment (ESPE). The extended functional scope of the ESPE is referred to as a function package DMM4.

The extension module has several inputs and outputs to which the ESPE and other devices or sensors can be connected.

Connection of the extension module

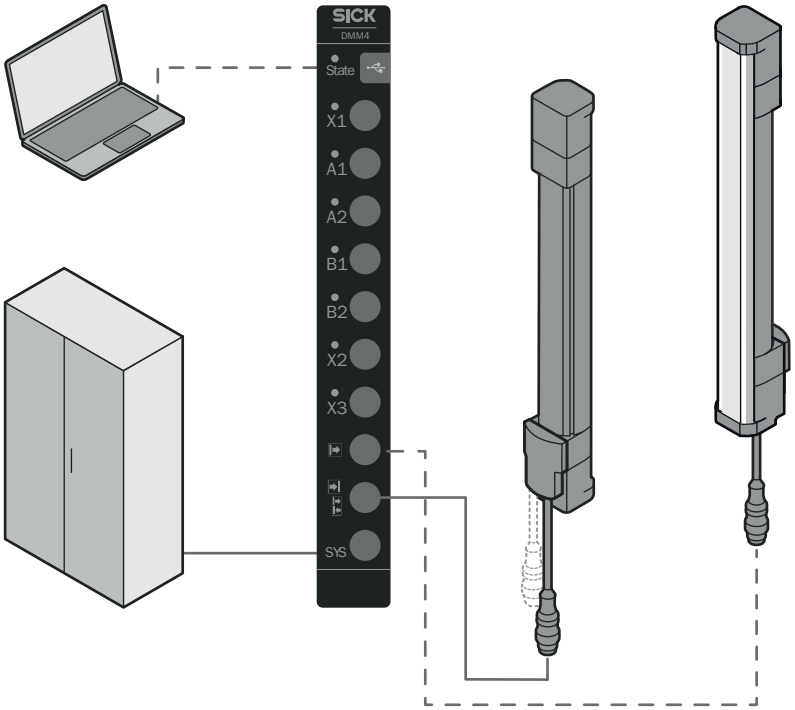


Figure 2: Illustrative example of the DMM4 extension module with a connected ESPE

The extension module is connected to the system connection of the receiver or the active unit of the ESPE. As soon as this is done, the system connection of the extension module becomes the system connection for the complete system.

The sender can optionally also be connected to the extension module.

A USB interface allows the use of the Safety Designer configuration software. The following functions are then available:

When using the extension module as a stand-alone device:

- Service functions and diagnostics of the extension module

When using the extension module with connected ESPE:

- Configuration and diagnostics of the extension module as well as the devices connected to the ESPE

3.3 Configuration memory

The DMM4 extension module has a configuration memory for the devices of the connected ESPE (sender, receiver, active unit) and the extension module. This enables the configuration to be restored automatically when the device is replaced.

When configuring the extension module with a connected ESPE via the Safety Designer configuration software, the configuration is saved in the configuration memory of the extension module.

If the extension module is connected to another ESPE, the configuration contained in the configuration memory of the extension module is transferred to the devices of the ESPE.

If there is no configuration in the configuration memory of the extension module and the ESPE is already using a software configuration, the extension module adopts the software configuration of the ESPE.

With the factory settings, the extension module does not contain any configuration in the configuration memory.

3.4 Compatible devices

The functional scope of a sender, receiver or active unit describes the technical changes or extensions made in the course of product maintenance. We use a three-digit version number to identify the different revision statuses of the functional scope.

The following table shows the products and associated functional scopes with which the extension module is compatible.

Table 2: Compatible devices

Product	Functional scope of the receiver or active unit	Sender functions
deTec4	V 1.2.0 or higher	V 1.1.0 or higher
deTem4	V 1.0.0 or higher	V 1.0.0 or higher
deTem4 A/P	V 1.1.0 or higher	-

3.5 Overview of the product

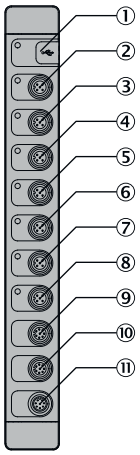


Figure 3: DMM4 extension module

① USB connection
② Device connection X1 (M12, 5-pin)
③ Device connection A1 (M12, 5-pin)
④ Device connection A2 (M12, 5-pin)
⑤ Device connection B1 (M12, 5-pin)
⑥ Device connection B2 (M12, 5-pin)
⑦ Device connection X2 (M12, 5-pin)
⑧ Device connection X3 (M12, 5-pin)
⑨ Sender connection (M12, 8-pin)
⑩ Receiver or active unit connection (M12, 8-pin)
⑪ System connection (M12, 8-pin)

3.6 Function package DMM4

Overview

The function package DMM4 describes all the functions of an ESPE that are available when using the following device combination:

- Extension module DMM4
- Devices of the ESPE (receiver and sender or active unit), each with SP1 system plug (recommended)

Functions

The scope of the function package DMM4 depends on the connected ESPE.

Table 3: Function package DMM4

Function	deTec4	deTem4	deTem4 A/P
Beam coding	✓	✓	✓
Restart interlock	✓	✓	✓
Smart restart interlock	✓ [1)]	–	-
External device monitoring (EDM)	✓	✓	✓
Application diagnostic output	✓ [2)]	✓	✓
Cascading	✓	-	-
Smart presence detection	✓	-	-
Reduced resolution (Basic)	✓	-	-

Function	deTec4	deTem4	deTem4 A/P
Manual adjustment of the protective field width	✓	✓	-
Transmitting power adjustment	✓	✓	-
Muting (2-signal muting)	✓	✓	✓
Muting (4-signal muting)	✓	✓	✓
Partial muting	✓	✓ 3)	-
Operating modes	✓	✓	✓
Configurable multiple sampling	✓	–	-
Inputs for safety sensors (SDI)	✓	✓	✓
Fixed blanking	✓ 4)	–	–

1) For functional scope V 1.3.0 or higher, the range of the smart restart interlock can be restricted.

2) The virtual detection field function is available for functional scope V 1.3.0 or higher.

3) For devices with 2, 3 or 4 beams only.

4) Available with functional scope V 1.3.0 or higher.

3.7 Communication with the ESPE

Overview

The DMM4 extension module communicates directly with compatible devices as soon as they are connected. No further configuration is required for communication.

Communication with receiver or active unit

The extension module forwards the status of the safe input signals to the connected receiver or the connected active unit.

The extension module receives output signals from the connected receiver or from the connected active unit and activates or deactivates the outputs accordingly.

Communication between sender and receiver

If the sender is also connected to the extension module, the extension module transmits the data between the sender and receiver.

Communication between the sender and receiver via the extension module has no limitations as opposed to communication when the sender and receiver are connected directly.

Verification of the transmitted signals

The connected ESPE expects the extension module to transmit the safe input signals according to the configuration.

The ESPE issues an error if the extension module transmits no input signals or invalid input signals.

Diagnostic data

The extension module transmits the following diagnostic data to the connected ESPE:

- Device information of the extension module
- Device status of the extension module

This means that the diagnostic data can also be retrieved via the connected ESPE (e.g., via the NFC interface on the receiver) without connecting the extension module to a computer.

3.8 USB connection

Overview

The DMM4 extension module has a USB port for configuration and diagnostics of the extension module as well as the ESPE connected to the computer. To do this, you need the Safety Designer configuration software provided by SICK.

The USB port can be used for the following:

- When using the extension module as a stand-alone device:
  - Service functions and diagnostics of the extension module
- When using the extension module with connected ESPE:
  - Service functions, configuration and diagnostics of the extension module as well as the devices connected to the ESPE

The USB port complies with the USB 2.0 Type-C® standard [1].

NOTE
When you are not using the USB connection for configuration or diagnostics, you need to protect the USB connection from dust using the supplied USB cover.

3.9 Status indicators

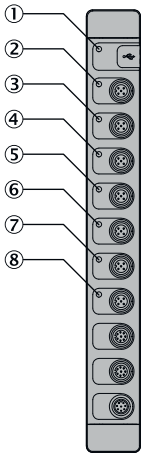


Figure 4: Position of the LEDs

Position	LED color	Function
①	Red/yellow/green	Device status
② ... ⑧	Yellow	IO indicator for the respective device connection

1) USB Type-C® and USB-C® are registered trademarks of USB Implementers Forum.

4 Project planning

4.1 Overview

NOTE
For information, see the operating instructions of the connected ESPE.

5 Mounting

5.1 Unpacking

Procedure

→ Check the components for completeness and the integrity of all parts.
→ In the event of complaints, contact the responsible SICK subsidiary.

Further topics

- "Ordering information", page 37

5.2 Mounting the extension module

Overview

The extension module is mounted using one M5 screw at each end. Fixing holes are provided at both ends under the covers for this purpose.

You can mount the extension module with either a side or the rear facing the desired base.

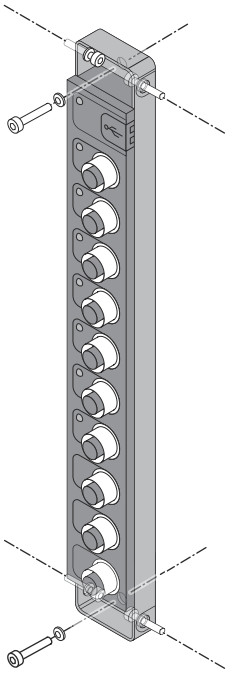


Figure 5: Mounting holes of the extension module

Important information

NOTE
Select the installation location of the extension module so the maximum lengths of cable are not exceeded for the:

- Receiver or active unit
- Sender
- System connection
- Devices connected to the extension module

Prerequisites

- Project planning is completed.
- Assembly is carried out according to the project planning.
- Dangerous condition of the machine is and remains switched off during mounting.
- The outputs of the device do not affect the machine during mounting.

Mounting options

You can use the following objects as a base for mounting the extension module:

- Mounting on a suitable component of the system, e.g., on a profile frame.
- Mounting on the device column of an ESPE connected to the extension module.
  - The extension module is attached to the outside of the device column using sliding nuts.
- Mounting on the bracket of a device to be connected.
  - Compatible brackets: FlexFix bracket. Mounting with a Quick-Fix bracket is also optionally possible in suitable applications.
  - Only possible for devices with a protective field height of at least 450 mm.
  - For devices with a protective field height of 750 mm or higher, a third alignment bracket must be mounted.

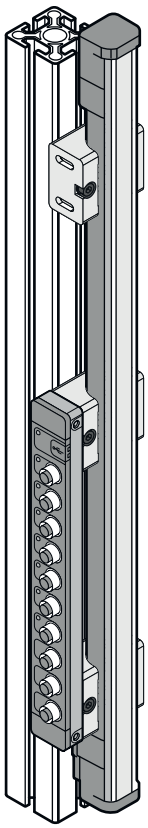


Figure 6: Mounting example: Rear mounting on a FlexFix bracket

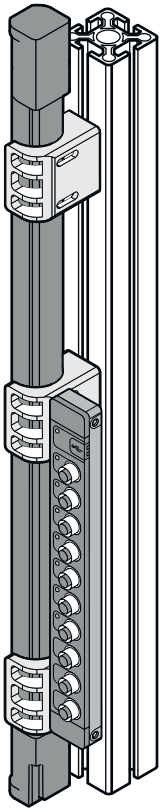


Figure 7: Mounting example: Side mounting on a FlexFix bracket

Procedure

1. Fold up the covers at both ends of the extension module. Ensure that the covers are not overstretched.
2. Align the extension module with its side or rear facing the base.
   Ensure that all connections are accessible.
3. Mount the extension module on the base using one M5 screw at each end through the desired mounting holes.
   - Torque: 4.5 Nm ... 5.5 Nm
   - Use M5 washers.
4. Close the covers at both ends of the extension module.

✔ The extension module is mounted on the base.

5. Complete the mounting procedure as per the operating instructions of the ESPE.

6 Electrical installation

6.1 Safety

DANGER
Hazard due to electrical voltage

Hazard due to unexpected starting of the machine

→ Make sure that the machine is (and remains) disconnected from the voltage supply during the electrical installation.
→ Make sure that the dangerous state of the machine is (and remains) switched off during electrical installation.
→ Ensure that the outputs of the device have no effect on the machine during the electrical installation work.
→ Use a suitable voltage supply.

DANGER
Hazard due to lack of effectiveness of the protective device

Malfunctions can occur if unused inputs or outputs are wired incorrectly.

→ Unused inputs must either not be connected or be permanently switched to LOW.
→ Unused outputs must either not be connected or be permanently switched to LOW.

DANGER
Hazard due to lack of effectiveness of the protective device

Malfunctions can occur if connections of the same type are wired incorrectly, e.g., if connectors are mixed up.

→ Make sure (e.g., by routing the cables appropriately) that connections of the same type cannot be mixed up.
→ After each change to the wiring, ensure that connections of the same type are connected correctly.

DANGER
Hazard due to lack of effectiveness of the protective device

Malfunctions can occur as a result of cross-circuits between different signals in a plastic-sheathed cable.

→ Use a separate plastic-sheathed cable for each M12 connection.

NOTE
The protective device complies with the regulations for electromagnetic compatibility (EMC) for the industrial sector.

NOTE
Using the device in residential areas may cause radio interference. The operating entity is responsible for taking appropriate measures (e.g., shielding).

6.2 Connecting the extension module

Overview

A connection for the receiver or the active unit and a connection for the sender are provided for devices of the ESPE.

The devices connected to the ESPE are supplied with voltage via the system connection of the extension module.

Important information

NOTE

→ Ensure that no electrical potential is present at the metal sleeves of the M12 connections.

NOTICE

The enclosure ratings IP65 and IP67 only apply if the connections of the extension module are either used or closed.

→ Seal each M12 connection with a male cable connector or a protective cap.
  - Tightening torque for male connector: 0.6 Nm.
  - Tightening torque for protective cap: 0.4 Nm.

Prerequisites

- The extension module with connected ESPE is de-energized.
- Mounting is complete.

Procedure

1. Implement the system connection via the extension module.
2. Connect the receiver or active unit of the ESPE.
3. If required: Connect the sender.
4. If required: Connect further devices or sensors to connections A1, A2, B1, B2, X1, X2 or X3.
5. Close unused M12 connections with a protective cap.
6. Complete the electrical installation as per the operating instructions for the connected ESPE.

6.3 System connection (M12, 8-pin)

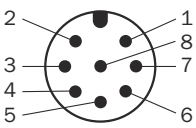


Figure 8: System connection (male connector M12, 8-pin)

Table 4: Pin assignment of system connection on the extension module (M12 plug, 8-pin)

Pin	Wire color [1]	Function
1	White	In3 [2] Reset or override or reset/override or belt stop for muting or muting release or switching from partial muting to muting

Pin	Wire color [1]	Function
2	Brown	+24 V DC (power supply input)
3	Green	MFP3 [2] ADO (application diagnostic output)
4	Yellow	In4 [2] EDM or muting signal 1 or belt stop for muting or muting release or switching from partial muting to muting
5	Gray	OSSD1 (switching output 1)
6	Pink	OSSD2 (switching output 2)
7	Blue	0 V DC (power supply input)
8	Red	In17 [3] Belt stop for muting

1) Applies to the connecting cables recommended as accessories.

2) Not available if the extension module is connected via a 5-pin adapter (on the system connection of the extension module, or when connecting the extension module to the receiver).

3) Not available if the extension module is connected via a 5-pin adapter (on the system connection of the extension module).

6.4 Receiver or active unit connection (M12, 8-pin)

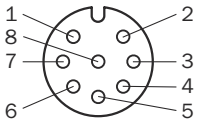


Figure 9: Connection for receiver or active unit (female connector, M12, 8-pin)

6.5 Sender connection (M12, 8-pin)

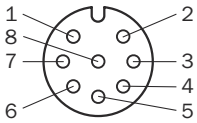


Figure 10: Connection for sender (female connector, M12, 8-pin)

6.6 Additional device connections

Overview

The extension module has additional connections for external devices. You can connect the following devices.

- Control switch for reset and/or override: X1 connection
- Muting sensors: A1, A2, B1, B2 connections
- Sensor for muting enable or switching from partial muting to muting: X1, X2 connections
- Operating mode selector switch: X3
- Safety sensors: X1, X2, X3
- Consumer (e.g. lamp) on application diagnostic output: X1, X2

Important information

WARNING

Risk of ineffectiveness of the protective device

If the extension module or the operating mode selector switch is mounted outside the control cabinet, you must protect the corresponding connecting cables from short-circuits and cross-circuits, e.g., by laying them in suitable cable ducts.

Pin assignment on the device connections

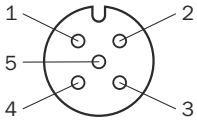


Figure 11: Additional device connections on the DMM4 extension module (female connector, M12, 5-pin)

Table 5: Pin assignment of A1, A2, B1, B2 connections (DMM4, female connector, M12, 5-pin)

Pin	Wire color [1]	A1	A2	B1	B2
1	Brown	+24 V DC (voltage supply output)			
2	White	Not assigned			
3	Blue	0 V DC (voltage supply output)			
4	Black	In5 Muting signal	In6 Muting signal	In7 Muting signal	In8 Muting signal
5	Gray	Not assigned			

1) Applies to the connecting cables recommended as accessories.

Table 6: Pin assignment of X1, X2, X3 connections (DMM4, female connector, M12, 5-pin)

Pin	Wire color [1]	X1	X2	X3
1	Brown	+24 V DC (voltage supply output)		
2	White	In9 Override or input for safety sensors (SDI)	In11 or DO2 ADO (application diagnostic output) or input for safety sensors (SDI)	In13 Operating modes or input for safety sensors (SDI)
3	Blue	0 V DC (voltage supply output)		
4	Black	In10 Reset or override or reset/override or switching from partial muting to muting or muting release or input for safety sensors (SDI)	In12 Switching from partial muting to muting or muting enable or input for safety sensors (SDI)	In14 Operating modes or input for safety sensors (SDI)
5	Gray	DO1 ADO (application diagnostic output)	Not assigned	In15 Operating modes

1) Applies to the connecting cables recommended as accessories.

6.6.1 Inputs for safety sensors (SDI)

Overview

The DMM4 extension module has 2 inputs for safety sensors on each of 3 connections (X1, X2, X3). This allows you to connect up to 3 additional safety sensors with dual-channel outputs.

You can connect safety sensors with the following properties:

- Safety sensors with dual-channel semiconductor outputs (equivalent switching, self-monitored, positive switching (PNP))
  - Example: OSSDs
  - Connections: X1, X2, X3
  - The test pulse width of the connected safety sensors is ≤ 1 ms.
- Dual-channel, contact-based switching elements (equivalent switching)
  - Example: Emergency stop pushbutton
  - Connections: X1, X3

The OSSDs are in the OFF state if at least one configured input for safety sensors is deactivated (LOW state).

Important information

WARNING
Hazard due to lack of effectiveness of the protective device

The manufacturer of the machine must check whether contact-based switching elements can be used and which requirements must be met for the use of contact-based switching elements.

The requirements for the regular thorough check of contact-based switching elements must be defined by the manufacturer of the machine.

DANGER
Hazard due to lack of effectiveness of the protective device

If contact-based switching elements are used and the switching elements or the DMM4 extension module are mounted outside the control cabinet, you must protect the corresponding connection cables from short-circuits and cross-circuits, e.g., by laying them in suitable cable ducts.

7 Configuration

7.1 Overview

The extension module allows software configuration via the Safety Designer. For software configuration, the extension module must be connected to a computer via USB.

A distinction is made between the following use cases:

- When using the extension module as a stand-alone device.
  - You can perform service functions for the extension module.
- When using the extension module with a connected ESPE.
  - You can perform service functions for the extension module and the devices connected to the ESPE.
  - You can configure the extension module and the devices connected to the ESPE.

In this document you will find information for the use case that the extension module is connected as a stand-alone device.

All information on configuration, diagnostics and service functions with a connected ESPE can be found in the operating instructions for the relevant device. This also includes the functions provided by the function package DMM4.

7.2 Security

DANGER
Hazard due to lack of effectiveness of the protective device

→ Ensure unauthorized persons cannot gain access to the devices via Safety Designer.

NOTICE
When you log into a device, the configuration software stores the password so that you do not need to re-enter it for other configuration steps.

If you do not change any other settings in the login dialog, the password is deleted as soon as you exit the configuration software, or log out in the main window or Device window.

If you enable the **Temporarily store password for login on additional devices.** function, the password will be retained even if you log out in the device window only.

If you leave the computer unattended, you must log off to prevent unwanted access to the device.

NOTICE
The computer used for configuration must be protected against unintentional interference or modification (e.g. by anti-virus software and firewall).

When using the Safety Designer, assign a unique device name for each system to avoid confusion.

During commissioning, change the default password SICKSAFE for all devices to protect them against unauthorized access. The devices in a system use the same password. When a password is changed, the password for all connected devices in the system is changed.

If devices are connected to a system for which a password has already been changed, all connected devices in the system must have been changed to the same password.

If the configuration is restored automatically, the passwords are also restored.

7.3 Factory settings

Overview

With the factory settings, the extension module does not contain any configuration for the devices of an ESPE (receiver, sender or active unit) and the extension module in the configuration memory.

Resetting to factory settings has the following effects:

- The configuration in the configuration memory is reset to the factory settings.
- The Maintenance and Authorized Client user groups are deactivated.
- The password of the Administrator user group is reset to the factory settings.
- The error memory is cleared.

Further topics

- "Resetting the extension module to factory settings", page 24

7.4 Safety Designer configuration software

For information on the Safety Designer, see the operating instructions for the Safety Designer item no. 8018178.

7.4.1 Device window

If the extension module is connected as a stand-alone device, you will find all device-specific settings, data and functions for the extension module in the device window. The device window has a similar user interface to the main window of Safety Designer.

You can switch between the different areas via the main navigation menu:

- **Overview**: Here you can check the most important information and the current status of the device.
- **Service**: Here you can restart the device, reset it to factory settings or manage the user passwords (see "Service", page 24).
- **Diagnostics**: Here you can display the messages of the device (see "Diagnostics using Safety Designer", page 31).

7.5 Service

Overview

Various service functions are available to you when using the extension module as a stand-alone device.

Make sure that no ESPE is connected to the extension module. Otherwise, apply the service functions to the entire system.

You can run the following under service:

- Reboot device
- Reset the device to factory settings
- Manage user groups and passwords

7.5.1 Resetting the extension module to factory settings

Overview

If a configuration for an ESPE and the extension module is saved in the configuration memory, this configuration is transferred to the ESPE as soon as the ESPE is connected.

To prevent an unwanted configuration from being transferred to the connected devices, you can first reset the extension module as a stand-alone device to the factory settings.

Prerequisites

- The extension module is connected to the computer.
- No devices of the ESPE are connected to the extension module.

Procedure

1. Establish connection to the device.
2. Click on **Identify the device** on the toolbar to check whether the desired device is connected.

✔ The STATE LED flashes red and green alternately.

3. In the main navigation pane, click on **Service**.
4. In the **Navigation** area, click on **Factory settings**.

✔ The **Factory settings** page opens.

5. In the **Fully reset device** area, click on **Resetting the device completely**.

✔ The device is reset to the factory settings.

7.5.2 Assigning or changing passwords

Prerequisites

- The extension module is connected to the computer.
- No devices of the ESPE are connected to the extension module.

Procedure

1. Establish connection to the device.
2. Click on **Identify the device** on the toolbar to check whether the desired device is connected.

✔ The STATE LED flashes red and green alternately.

3. In the device window under the main navigation **Service**, select the **User password** entry.
4. If you are assigning the password of a user group for the first time, the user group may need to be activated first.
5. In the **User password** dialog box, select the user group.
6. Enter the new password twice and use **Transmit to device** to confirm.
7. When you are prompted to log on, select your user group and enter the corresponding password.

✔ The new password is valid for the user group immediately.

7.5.3 Resetting the password

Overview

If you have forgotten the password of the Administrator user group, you can reset it with the assistance of SICK.

Prerequisites

- The extension module is connected to the computer.
- No devices of the ESPE are connected to the extension module.

Procedure

Reset password

1. Request the form for resetting your password from SICK support.
2. Connect to the device in Safety Designer.

3. Click on **Identify the device** on the toolbar to ensure that the desired device is connected.
✔ The STATE LED flashes red and green alternately.
4. In the device window under the main navigation **Service**, select the **User password** entry.
5. In the **User password** dialog box, select the **Start password reset process** option.
6. Send the information displayed on the form to SICK support.
✔ You will then receive an activation code.
7. Enter the activation code in the field provided.
✔ The password of the Administrator user group is reset to the factory settings (SICKSAFE). The Maintenance and Authorized Client user groups are deactivated. The configuration is not changed.

7.6 User groups

Overview

The devices contain a hierarchy of user groups that regulate access to the devices.

For certain actions, you are requested to log onto the device with the respective user group.

You can view the diagnostic data of a device with any user group.

User groups

Table 7: User groups

User group		Password	Authorization
	Operator	No password required. Anyone can log on as a machine operator.	• Permitted to read diagnostic data from the device.
	Maintenance personnel	Deactivated ex-works, i.e. it is not initially possible to log on as a maintenance technician. The user group can be activated by the user group administrator and provided with a password.	• Permitted to read diagnostic data from the device. • Changing own password allowed.
	Authorized client	Deactivated ex-works, i.e. it is not initially possible to log on as an authorized customer. The user group can be activated by the user group administrator and provided with a password.	• Permitted to read diagnostic data from the device. • Changing own password allowed. • Changing the password of the **Maintenance personnel** user group is allowed.
	Administrator	The password SICKSAFE is created at the factory. → Change this password to protect the device against unauthorized access.	• Permitted to read diagnostic data from the device. • Resetting whole device to factory settings allowed. • Activating and deactivating the **Maintenance personnel** and **Authorized client** user groups is allowed. • Changing own password allowed. • Changing the passwords of the **Maintenance personnel** and **Authorized client** user groups is allowed.

8 Commissioning

8.1 Overview

NOTE
For information, see the operating instructions of the connected ESPE.

8.2 Switching on

Overview

After switching on, the extension module initializes and the status display briefly lights up red after the start process.

The status display then shows the status of the extension module.

Further topics

- "Diagnostic LEDs", page 30

8.3 Check during commissioning and modifications

The thorough check is intended to ensure that the safety functions are fulfilling their planned purpose and whether persons are being adequately protected.

→ Carry out the checks specified in the test plan of the manufacturer of the machine and the operating entity.

9 Operation

9.1 Regular thorough check

The thorough check is intended to ensure that the safety functions are fulfilling their planned purpose and whether persons are being adequately protected.

→ Carry out the checks specified in the test plan of the manufacturer of the machine and the operating entity.

10 Maintenance

10.1 Regular thorough check

The thorough check is intended to ensure that the safety functions are fulfilling their planned purpose and whether persons are being adequately protected.

→ Carry out the checks specified in the test plan of the manufacturer of the machine and the operating entity.

11 Troubleshooting

11.1 Overview

Information on the status as well as diagnostics and troubleshooting of the extension module can be displayed as follows:

- Diagnostic LEDs

  Status and error information on the extension module is displayed via the status indicator.

  Status information on the inputs and outputs of the extension module is displayed via the IO displays.
- Safety Designer configuration software

  Status and error information as well as diagnostic data of the extension module can be displayed in the Safety Designer.
- Connected systems (ESPE)

  Status and error information as well as diagnostic data of the extension module are transmitted to the connected systems.

  You can then read out this data via the Safety Designer or the interfaces (e.g. IO-Link or NFC) of the connected system.

11.2 Security

DANGER

Hazard due to lack of effectiveness of the protective device

Persons and parts of the body to be protected may not be recognized in case of non-observance.

→ Immediately shut the machine down if the behavior of the machine cannot be clearly identified.

→ Immediately put the machine out of operation if you cannot clearly identify or allocate the error and if you cannot safely remedy the error.

→ Secure the machine so that it cannot switch on unintentionally.

NOTE

Additional information on troubleshooting is available from your SICK subsidiary.

11.3 Diagnostic LEDs

11.3.1 Indication when switching on

Immediately after switching on, the status indicator briefly lights up red.

11.3.2 Status indicator

The indicated status depends on the device status.

Table 8: Status indicator

LED color	Meaning
Green/Red	The “Identify device” function is executed.
Red	The device is in the locked state.
Red/yellow	The device has detected a configuration error.

LED color	Meaning
Yellow	The configuration saved in the configuration memory corresponds to the factory settings and no receiver or active unit is connected to the extension module. see "Configuration memory", page 10
Yellow	The device is in normal operation.

○ LED off. ☼ LED flashes. ● LED illuminates.

11.3.3 IO indicators

There is an IO indicator on each 5-pin device connection. The indication is independent of the configured functionality of the pins.

Table 9: IO indicators

Device connection	LED color	Meaning
A1	Yellow	Active signal detected on pin4 (InX).
A2	Yellow	
B1	Yellow	
B2	Yellow	
X1	Yellow	Active signal detected on pin2 (In9) or pin4 (In10).
X2	Yellow	Active signal detected on pin2 (In11 / DO2) or pin4 (In12)
X3	Yellow	Active signal detected on pin2 (In13) or pin4 (In14) or pin5 (In15).

○ LED off. ☼ LED flashes. ● LED illuminates.

11.4 Diagnostics using Safety Designer

Using the extension module as a stand-alone device

The following diagnostics tools are available in the device window:

- Message history

The diagnostic data are transferred via the USB connection.

Using the extension module with a connected ESPE

All information on diagnostics with a connected ESPE can be found in the operating instructions for the corresponding device.

11.4.1 Message history

On the **Message history** page, you can see all errors, warnings and information about the extension module. You can access the status information on the application via the messages of the extension module.

You have the option of saving or printing the message history as a PDF. You can also mark all entries as viewed or delete them.

By right-clicking on the table header, you can select the columns displayed in the message history.

Safety Designer shows details about the events in the bottom part of the window, ways to solve them are also shown.

Table 10: Message history

	Start automatic update

	Stop automatic update
	Mark all entries as viewed
	Delete all entries Deleted entries are hidden for the current user group and for user groups with lower permissions. They are still visible to user groups with higher permissions.
	Print message history
	Save message history as a PDF
	Save message history as CSV

12 Decommissioning

12.1 Disposal

Procedure

→ Always dispose of unusable devices in accordance with national waste disposal regulations.



Complementary information

SICK will be glad to help you dispose of these devices on request.

13 Technical data

13.1 Version numbers and functional scope

The table below describes the technical changes or extensions of the functional scope made to the product in the course of product maintenance.

We use a three-digit version number to identify the different revision statuses of the functional scope. The revision statuses are backward compatible with devices already in use.

The range of functions of the device is found at the following locations:

- On the type label: Field under the “Type” field
- In the Safety Designer on the “Overview” page
- In the SICK Safety Assistant app via NFC: Technical data or report

Table 11: Version numbers and functional scope

Version number	Amendments and new functions	Additional information
V 1.0.0	Initial device version	

13.2 Data sheet

Table 12: Safety-related parameters

	Minimum	Typical	Maximum
Typ (IEC 61496)	Type 4		
Category (ISO 13849)	Category 4		
Performance level (ISO 13849)	PL e		
Safety integrity level (IEC 61508)	SIL 3		
Safety integrity level (IEC 62061)	SIL 3		
PFH_D (average frequency of a dangerous failure per hour) [1]	3.5×10^{-9}		
T_M (mission time) (ISO 13849)	20 years		

1) The values apply for an installation height of up to 2,000 m above sea level. Additional information can be found at your SICK subsidiary.

Table 13: Electrical data

	Minimum	Typical	Maximum
Operating data			
Protection class [1]	III (IEC 61140)		
Supply voltage U_V at the device [2] [3] [4]	19.2 V	24 V	28.8 V
Power consumption (single device)		1.6 W	1.9 W
Permissible current consumption of the complete system (with connected ESPE)			4 A
Residual ripple (peak-to-peak) [5]			10%
Length of cables for the system connection and connection of the ESPE	Depends on the ESPE, see "Related applicable documents", page 5		
Device connections (A1, A2, B1, B2, X1, X2, X3)			
Supply voltage for connected devices	U_V - 1 V		U_V
Total current output at all device connections			2 A
Length of cable for the device connection			10 m [6]

	Minimum	Typical	Maximum
Inputs on extension module			
Digital inputs [7]	12 safe digital inputs (In5 ... In15, In17)		
Input voltage HIGH (active)	11 V	24 V	30 V
Input current HIGH	6 mA	10 mA	15 mA
Input voltage LOW (deactivated)	-3 V	0 V	5 V
Input current LOW	-2.5 mA	0 mA	2 mA
Input capacitance			15 nF
Inputs on system connection (In3, In4)	Depends on the ESPE, see "Related applicable documents", page 5		
Output signal switching devices (OSSDs)	Depends on the ESPE, see "Related applicable documents", page 5		
Application diagnostic output (ADO) on system connection	Depends on the ESPE, see "Related applicable documents", page 5		
Outputs			
Digital outputs [8]	2 digital outputs (DO1, DO2), PNP semiconductor, short-circuit protected [9]		
Output voltage (HIGH)	U_V - 3 V		U_V
Output voltage (LOW)	High resistance		
Current carrying capacity			100 mA each
Inputs for safety sensors (SDI)			
Duration of the LOW state at an input for safety sensors (SDI), which leads to the safe change of the OSSDs to the OFF state	6 ms		

1) The system must be supplied with SELV/PELV in accordance with IEC 60204-1.
2) The external voltage supply must be capable of buffering brief power failures of 20 ms as specified in IEC 60204-1. Suitable power supply units are available as accessories from SICK.
3) A fuse rated maximum 4 A shall be installed in the 24 V DC power supply circuit to the device in order to limit the available current.
4) All inputs of the connected system must be supplied by the same voltage supply.
5) Within the limits of U_V.
6) For conductor cross section 0.34 mm^2.
7) Corresponding to digital inputs of types 1 and 3 according to IEC 61131-2.
8) Compatible with type 1, 2 and 3 digital inputs in accordance with IEC 61131-2.
9) Applies to the voltage range between -30 V and +30 V.

Table 14: Ambient data

	Minimum	Typical	Maximum
Enclosure rating (IEC 60529)	IP65 IP67		
Ambient operating temperature	–30 °C		+55 °C
Air humidity (non-condensing)	15%		95%
Storage temperature	–30 °C		+70 °C
Vibration resistance [1]	5 ... 150 Hz, 3,5 mm / 1 g (EN 60068-2-6)		
Shock resistance [2]	15 g / 6 ms (EN 60068-2-27)		
Class	3M4 (IEC TR 60721-4-3)		
EMC	According to IEC 61496-1, IEC 61000-6-2, IEC 61000-6-4		

1) Test conditions per axis: 1 octave/minute, 20 sweeps.
2) Test conditions per axis: 200 shocks.

Table 15: Mechanical data

Dimensions	see "Dimensional drawings", page 36

Weight	195 g

Table 16: Interfaces

USB interface for configuration and diagnostics	
Connection type	USB 2.0 Type-C
Transmission rate	12 Mbit/s (Full Speed)
Length of cable	≤ 5 m

13.3 Dimensional drawings

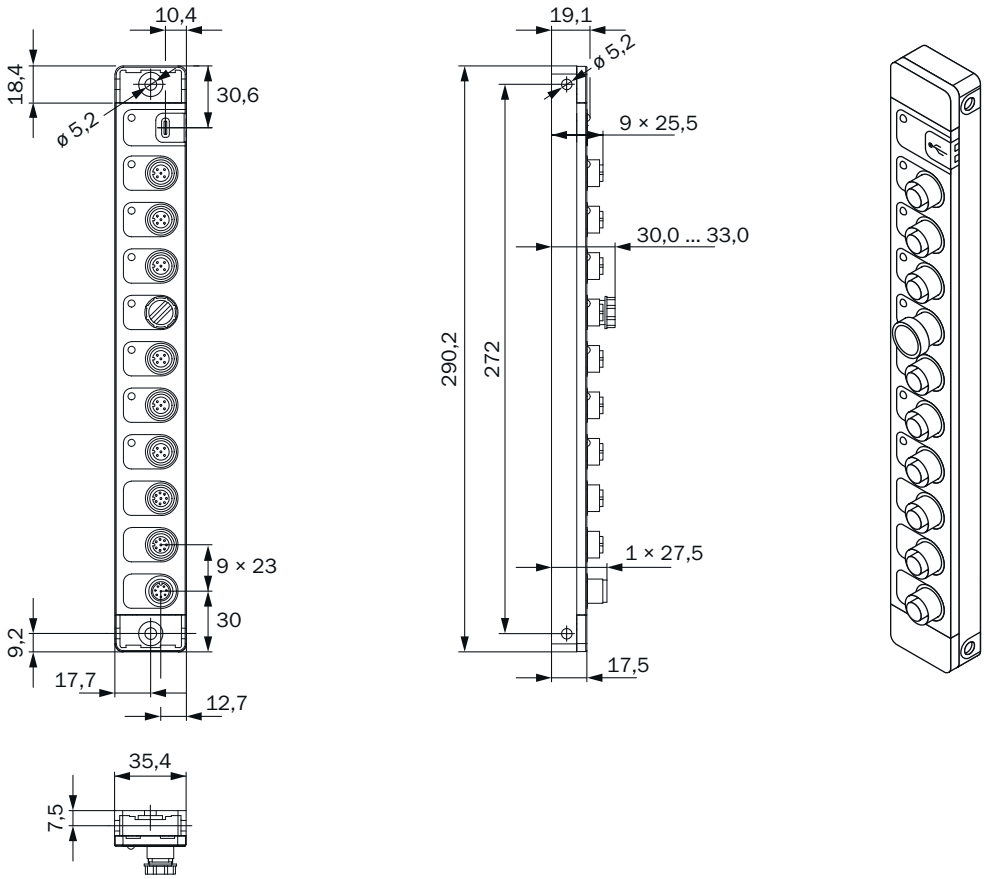


Figure 12: Dimensional drawing of the DMM4 extension module

14 Ordering information

14.1 Scope of delivery

- Extension module DMM4
- USB protective cover
- Blind plugs for M12 round connectors
- Safety note
- Mounting instructions
- Operating instructions for download: **www.sick.com**

14.2 Ordering information

Table 17: DMM4 ordering information

Part	Type code	Part number
DMM4	DMM4-AA110A0A0	1125562

15 Annex

15.1 Conformities and certificates

You can obtain declarations of conformity, certificates, and the current operating instructions for the product at **www.sick.com**. To do so, enter the product part number in the search field (part number: see the entry in the “P/N” or “Ident. no.” field on the type label).

15.1.1 EU declaration of conformity

Excerpt

The undersigned, representing the manufacturer, herewith declares that the product is in conformity with the provisions of the following EU directive(s) (including all applicable amendments), and that the standards and/or technical specifications stated in the EU declaration of conformity have been used as a basis for this.

15.2 Note on standards

Standards are specified in the information provided by SICK. The table shows regional standards with similar or identical contents. Not every standard applies to all products.

Table 18: Note on standards

Standard	Standard (regional)
	China
IEC 60068-2-6	GB/T 2423.10
IEC 60068-2-27	GB/T 2423.5
IEC 60204-1	GB/T 5226.1
IEC 60529	GB/T 4208
IEC 60825-1	GB 7247.1
IEC 61131-2	GB/T 15969.2
IEC 61140	GB/T 17045
IEC 61496-1	GB/T 19436.1
IEC 61496-2	GB/T 19436.2
IEC 61496-3	GB 19436.3
IEC 61508	GB/T 20438
IEC 62061	GB 28526
ISO 13849-1	GB/T 16855.1
ISO 13855	GB/T 19876

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SICK AT A GLANCE

SICK is a globally leading company in intelligent sensors and sensor solutions. With over 10,000 employees, more than 60 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers.

With a unique range of products and services for factory and logistics automation, SICK creates added value along the entire value chain of its customers. In addition, SICK brings extensive industry and application experience as well as a deep understanding of its customers' processes and requirements.

Partnering for the better, optimizing productivity, elevating quality, and protecting health and safety – this is what SICK stands for.

THAT IS "SENSOR INTELLIGENCE".

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