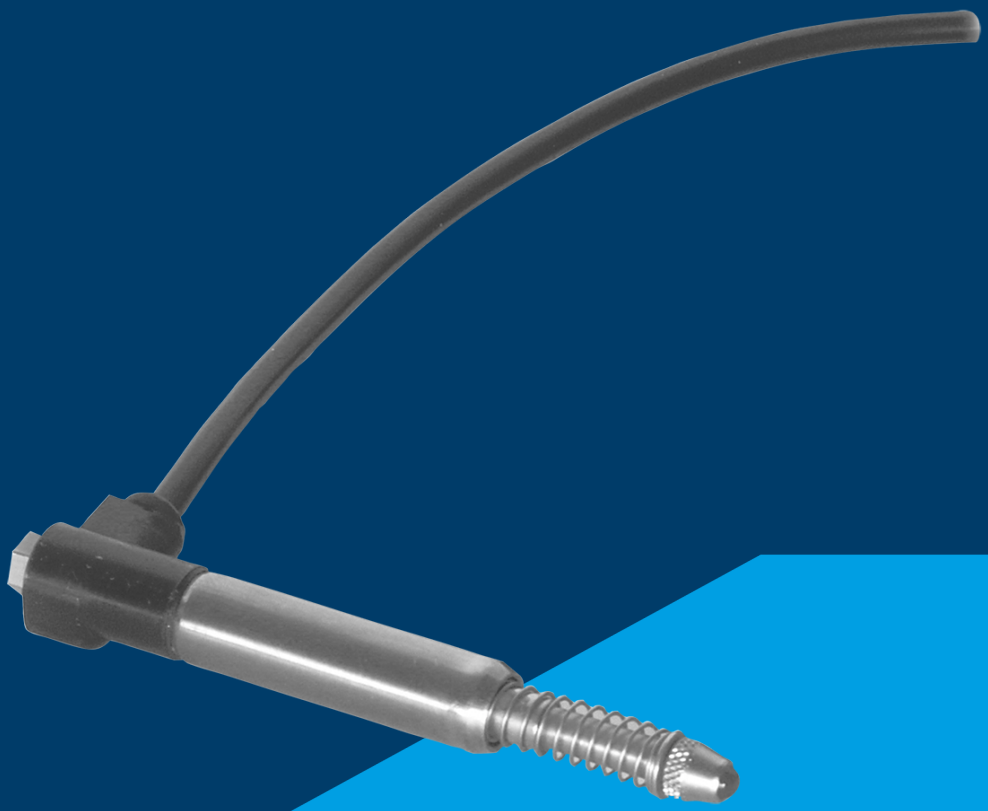


Assembly and Operating Manual APS-M1S

Analog position sensor

Translation of Original Operating Manual

Hand in hand for tomorrow

Imprint

Technical changes:
We reserve the right to make alterations for the purpose of technical improvement.

Document number: 1605606

Version: 01.00 | 15/10/2024 | en

Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management
Tel. +49-7133-103-2503
Fax +49-7133-103-2189
cmg@de.schunk.com

Please read the operating manual in full and keep it close to the product.

Table of Contents

1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

CAUTION

Material damage!

Information about avoiding material damage.

1.1.2 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly- and Operating Manual of the SCHUNK-module, on which the sensor is mounted *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com/downloads**.

1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the applicable documents, ▸ 1.1.2 [🗋 4]
- Observe the ambient conditions and operating conditions, ▸ 2.3 [🗋 5]

2 Basic safety notes

2.1 Intended use

The sensor is used for sensing positions or areas of a SCHUNK module via a control cam or control ramp.

- The product is intended for installation in a machine/ automated system. The applicable guidelines for the machine/ automated system must be observed and complied with.
- The product may only be used within the scope of its technical data, ▸ 4 [🗋 8].

2.2 Inappropriate use

The product is not a safety component in accordance with the EC Machine Directive 2006/42/EC and must not be used in safety-relevant parts of machine control units.

2.3 Environmental and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▸ 4 [🗋 8].
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are products that are designed especially for contaminated environments.

2.4 Constructional changes

Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

2.5 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.

- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

3 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the applicable documents, ▸ 1.1.2 [🗋 4]
- Observe the ambient conditions and operating conditions, ▸ 2.3 [🗋 5]

4 Technical data

Designation	APS-M1S
Ambient temperature [°C]	
Min.	– 20
Max.	+ 80
Nominal voltage [VDC]	24
Min.	10
Max.	30
IP rating	67

More technical data is included in the catalog data sheet. Whichever is the latest version.

5 Notes on operation

The sensor system can be influenced by external forces such as vibrations or high accelerations.

For dynamic applications (e.g. robot applications), SCHUNK recommends signal evaluation only when the module is stationary for accurate measurements.

6 Assembly and settings

6.1 Mechanical connection

NOTE

The assembly instructions in this chapter are generally applicable.

Module-specific assembly instructions for the sensor can be found in the Assembly and Operating Manual for the module, which can be downloaded at schunk.com

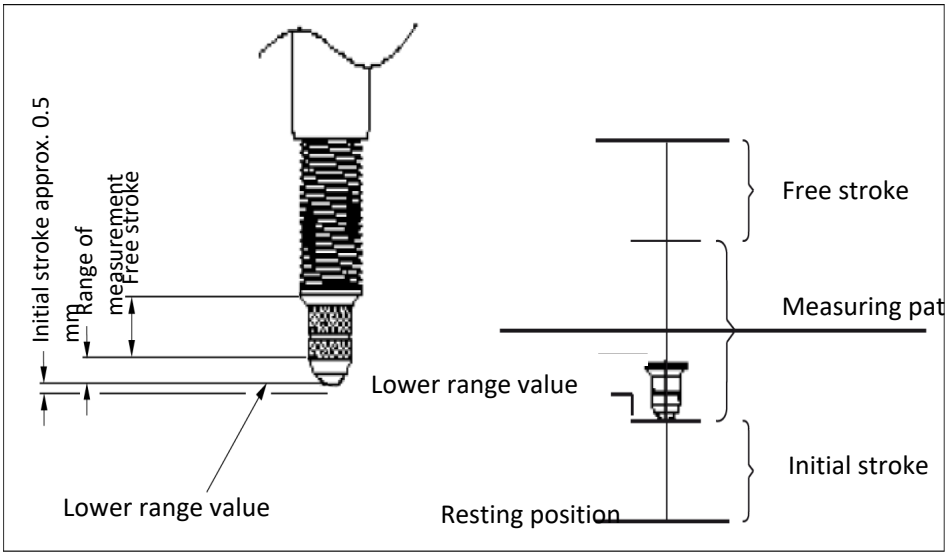
CAUTION

Risk of damage to the sensor during assembly!

- Observe the maximal tightening torque.

Initial stroke

The distance from the rest position of the sensor to the beginning of the sensor measuring range is called the stroke. In sensor rest position, the sensor rod is not actuated.



Initial stroke description

6.2 Electrical connection

CAUTION

Material damage due to incorrect bending radii!

The product may get damaged if the bending radius of the cable is less than the minimum.

- See catalog datasheet for corresponding details.

NOTE

- Do not use the sensor as a safety component.
- Do not pull on the cable of the sensor.
- Secure the cable and connection plug so that they are not taught and cannot move during operation.
- Do not exceed the permitted bending radius of the cable.
- Do not allow the sensor to come into contact with hard objects and chemicals (e. g., nitric acid, chromic acid and sulfuric acid).

NOTE

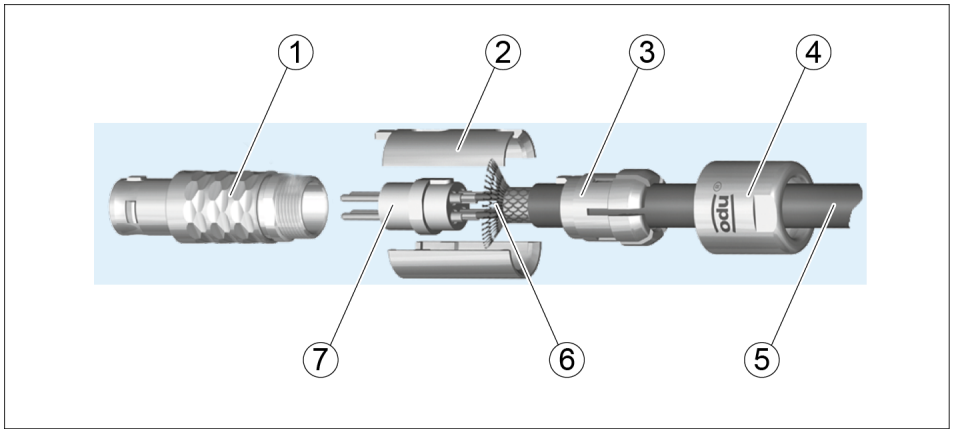
Observe the following when making electrical connections:

- The electrical connection to electronic processor APS-M1E is described in the operating manual for the electronic processor.
- The maximum permissible cable length between sensor and electronic processor is 10 m.
  Greater cable lengths worsen the resolution and limit the maximum output signal span. Other errors may occur.
- If the length of the sensor cable is insufficient: Solder the enclosed connector to the cable ends of the extension.
- The cable extension should be no longer than necessary and as short as possible.

6.3 Installing and connecting the sensor

1. Place the module in "open" switching position.
   ⇨ Base jaws must make full contact with the mechanical stop.
2. Apply adhesive to the top and sides of the mounting kit.
   ⇨ **IMPORTANT! Make sure that there is no adhesive on the slanted side of the control cam, which comes into contact with sensor.**
3. Fasten the mounting kit to the module.
4. Push the sensor into the bracket until there is a stroke of 0.5 mm.
5. Slightly tighten the screws on the bracket.
6. Align the sensor vertical to the module.
7. Tighten screws completely.
8. Check the mounting position of the sensor.
9. If the length of the sensor cable is not sufficient: Mount the connector to the sensor cable, ▸ 6.4 [🗋 13].
   ⇨ Observe pin allocation.
10. Connect the socket of the cable extension with the connector.
11. If necessary, shorten the extension cable.
    ⇨ Maximum permissible cable length between electronic processor and sensor: 10 m
12. Fit the cable ends of the sensor or extension cable with wire end sleeves.
13. Connect the sensor to the electronic processor (see electronic processor operating manual).

6.4 Mount the connector to the sensor cable



Sensor cable connector

1. Push the clamping nut (4) and collet chuck (3) over the cable (5).
2. Strip cable, shield and conductor.
   - ⇨ Cable: 7 mm
   - ⇨ Shield: 2.5 mm
   - ⇨ Core: 2 mm
3. Tin-plate the wires.
4. Solder the wires into the solder insert (7), Link Kolben und Führungen fetten.
5. Splay the shield (6) and insert half shells (2) into the solder insert (7).
6. Push the collet chuck (3) against the half shells (2) so that the screen (6) is clamped between the collet chuck (3) and the half shells (2).
7. Push the cable (5) into the connector (1). Observe the guides on the half-shells and the collet chuck.
8. Screw the clamping nut (4) onto the connector (1) and tighten.
   - ⇨ Tightening torque: 0.6 Nm

7 Declaration of conformity

Manufacturer/ Distributor	SCHUNK SE & Co. KG Spanntechnik | Greiftechnik | Automatisierungstechnik Bahnhofstr. 106 – 134 D–74348 Lauffen/Neckar
Product designation:	Analog position sensor APS–M1S
ID number	0302070, 0302072

We hereby declare that the product complies with all relevant harmonization legislation of the following directives at the time of declaration.
The declaration is rendered invalid if modifications are made to the product.

- **Electromagnetic compatibility (EMC directive) 2014/30/EU**
- **RoHS directive 2011/65/EU**

Applied harmonized standards, especially:

EN 61326–1:2013	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements. (IEC 61326–1:2012)
IEC 61326–2:2022	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2–3: Particular requirements – Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning (IEC 61326–2–3:2020)
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Signed for and on behalf of: SCHUNK SE & Co. KG

Lauffen/Neckar, October 2024

i.V. Nico Peper;
Director Software and Electronics;
Technology & Innovation

8 UKCA Declaration of Conformity

Manufacturer/ Distributor	SCHUNK Intec Limited Clamping and gripping technology 3 Drakes Mews, Crownhill MK8 0ER Milton Keynes
Product designation:	Analog position sensor APS-M1S
ID number	0302070, 0302072

We hereby declare that the product complies with all relevant harmonization legislation of the following directives at the time of declaration.
The declaration is rendered invalid if modifications are made to the product.

- **Electromagnetic Compatibility Regulations 2016**
- **RoHS directive 2011/65/EU**

Applied harmonized standards, especially:

EN 60947-5-7:2003	Low-voltage switchgear and controlgear - Part 5-7: Control circuit devices and switching elements - Requirements for proximity devices with analogue output (IEC 60947-5-7:2003)
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Person authorized to compile the technical documentation:
Marcel Machado, address: refer to manufacturer's address

Signed for and on behalf of: SCHUNK SE & Co. KG

Lauffen/Neckar, October 2024

i.V. Nico Peper;
Director Software and Electronics;
Technology & Innovation

9 Information on the RoHS Directive, REACH Regulation and Substances of Very High Concern (SVHC)

RoHS Directive

SCHUNK products are classified as "large-scale stationary installations" or as "large-scale stationary industrial tools" within the meaning of Directive 2011/65/EU and its extension 2015/863/EU "on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)", or fulfill their intended function only as part of one. Therefore products from SCHUNK do not fall within the scope of the directive at this time.

REACH Regulation

Products from SCHUNK fully comply with the regulations of Regulation (EC) No. 1907/2006 "concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)" and its amendment 2022/477. SCHUNK attaches great importance to completely avoiding chemicals of concern to humans and the environment wherever possible.

Only in rare exceptional cases do SCHUNK products contain SVHC substances on the candidate list with a mass content above 0.1%. In accordance with Article. 33 (1) of Regulation (EC) No. 1907/2006, SCHUNK complies with its duty to "communicate information on substances in articles" and lists the components concerned and the substances used in an overview that can be viewed at **schunk.com\SVHC**.

Signature: see original declaration

Lauffen/Neckar, October 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

SCHUNK SE & Co. KG
Spanntechnik | Greiftechnik | Automatisierungstechnik

Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar
Tel. +49-7133-103-0
info@de.schunk.com
schunk.com

Folgen Sie uns | *Follow us*

Wir drucken nachhaltig | *We print sustainable*

10-2024

01.00 | APS-MIS | Assembly and Operating Manual | en | 1605606