SIEMENS

SIPLUS CMS4000

Cable

6AT8000-2AB…

Operating Instructions - English
Version 2017-06

Safety Guidelines

This document contains notices which you should observe to ensure your own personal safety as well as to avoid property damage. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only have no safety alert symbol.

Danger

Indicates an **imminently** hazardous situation which, if not avoided, will result in death or serious injury.

Warning

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution

Used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Notice

Used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state.

When several danger levels apply, the notices of the highest level (lower number) are always displayed. If a notice refers to personal damages with the safety alert symbol, then another notice may be added warning of property damage.

Qualified Personnel

The device / system may only be set up and operated in conjunction with this documentation. Only qualified personnel should be allowed to install and work on the equipment. Qualified persons are defined as persons who are authorized to commission, to earth, and to tag circuits, equipment and systems in accordance with established safety practices.

Intended Use

Please note the following:

Warning

This device and its components may only be used for the applications described in the catalog or technical description, and only in connection with devices or components from other manufacturers approved or recommended by Siemens.

Trademarks

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Disclaimer of Liability

We have checked the contents of this document for agreement with the hardware and software desribed. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in the manual are reviewed regularly, and any necessary corrections will be included in subsequent editions. Suggestions for improvement are welcomed.

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Table of Contents

1 Preface

1.1 Purpose of this document

This operating instructions decribe the wiring of SIPLUS CMS4000 ION, IFN, MCN11 and RPN IEEE1394.

1.2 Required basic knowledge

Basic knowledge of automation technology and condition monitoring equipment is necessary.

This operating instructions contain a description of the components, which are valid at the time of publishing the manual. We reserve the right, to enclose product information with current information to new components and updated components.

1.3 Validity of this document

This document is valid for the Condition Monitoring System SIPLUS CMS1000.

1.4 Modification compared with the previous version

- None

Notice

You will find the version of the operating instructions in the number of the footer: A5E02298098B-01.

1.5 CE marking

According to EG cable must not be CE marked.

1.6 Standards

Notice

The specified concessions are only valid according to an authorized label on the product.

1.7 Position in information environment

In addition to this operating instructions you need the manual of the applied ION and IFN hardware.

SIPLUS CMS4000 IFN AI, IFN VIB-A, ION PROFIBUS DP Spy T001, MCN11 and RPN IEEE1394.

1.8 Directory

This operating instructions consist of chapters for guidance and of technical data.

They contain the following topics:

- Product overview (Chapter 2)
- Typical configurations (Chapter 3)
- Cable types (Chapter 4)
- Connecting the cable (Chapter 5)
- List of abbreviations with explanation of the general definitions of the used terms (Chapter 6.2)

1.9 Recycling and disposal

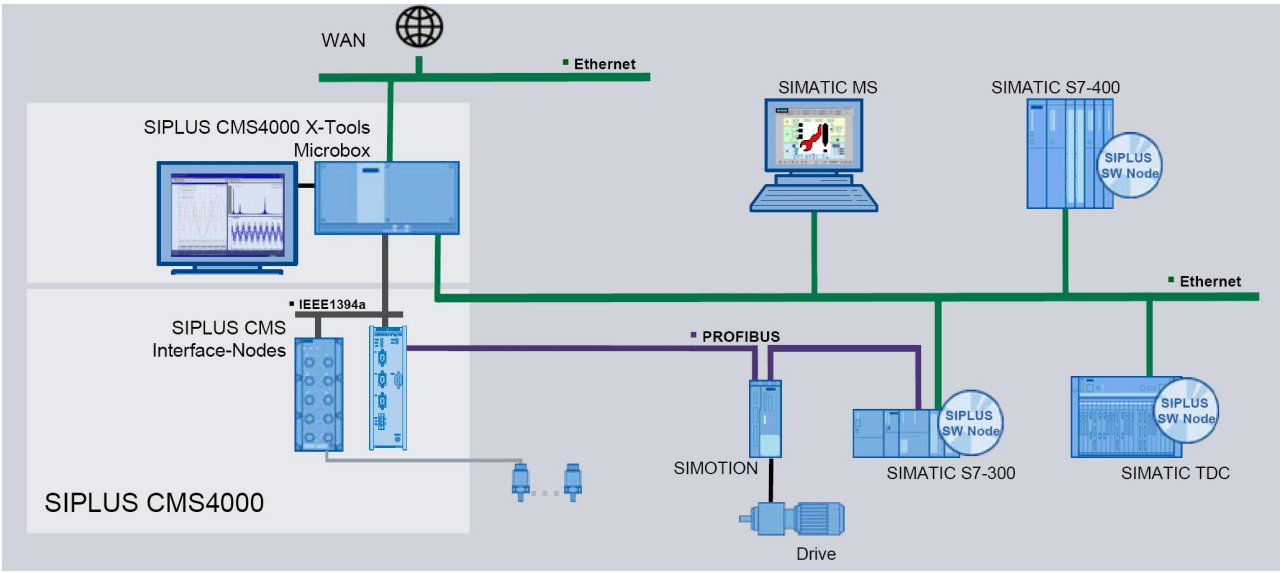
For environmentally compatible recycling and disposal of your old device contact a certified waste disposal for electronic.

2 Product Overview

2.1 What is SIPLUS CMS?

SIPLUS CMS is an industrial-suited Condition Monitoring System for technical and technological services in industrial plants. SIPLUS CMS is a modular, scalable analysis and diagnosis system. It is optimized for reaction less measurement of analog, binary and numerical data. SIPLUS CMS can be integrated in existing and new industrial plants.

SIPLUS CMS can be integrated into the TIA-Architecture.



Picture 1 Typical Configuration

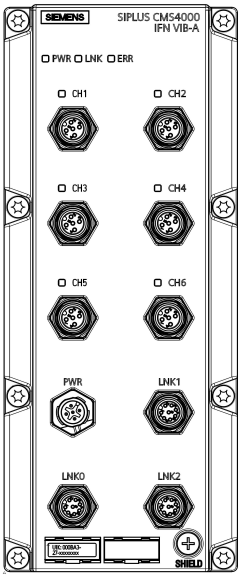
2.2 What is an Interface Node ION or IFN?

Definition

With an ION or IFN binary, analog or vibration signals are measured and transfered via bus system to an industry PC according to the EEE1394a Standard.

The application of an ION or IFN allows the recording/digitalization of voltage signals (IFN AI, IFN VIB-A) or the sampling of bus signals (ION PROFIBUS DP Spy T001).

Example

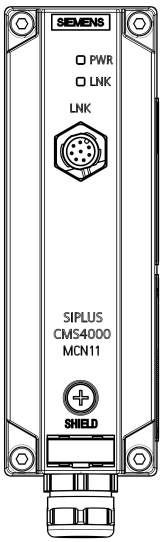


Picture 2 Front view IFN VIB-A

2.3 What are Media Converter Node (MCN11) and Repeater Node (RPN IEEE1394)?

Definition

MCN11 and RPN IEEE1394 transform the data on the IEEE1394-bus (firewire bus) physical from one medium (electrical) into another medium (optical) and the other way around. MCN and RPN are used if the required linking length is longer than 4.5 meter. The RPN IEEE1394 is designed in protection category IP20, the MCN11 in protection category IP67.



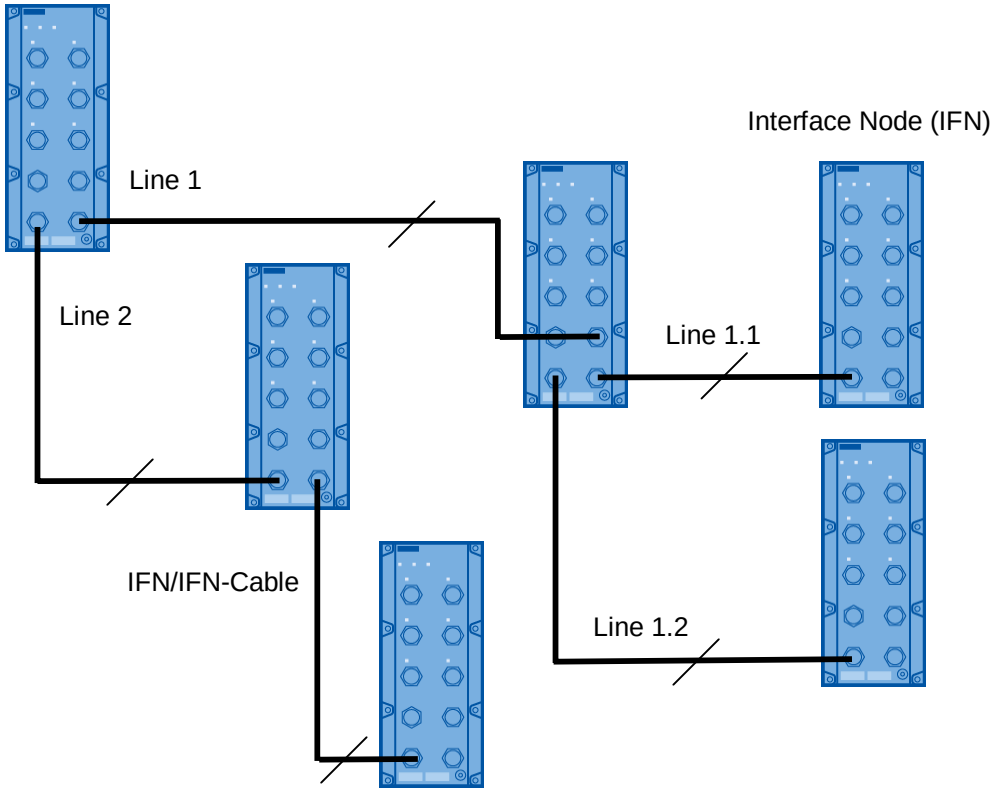
Picture 3 Front view MCN11

3 Typical Configurations

3.1 Tree topology

The IEEE1394a technology allows to create extended networks with up to 63 participants. The attendance of one branch must not be more than 16 devices.

The tree-topology allows the construction of a network system by connecting one bus participant with two further ones.



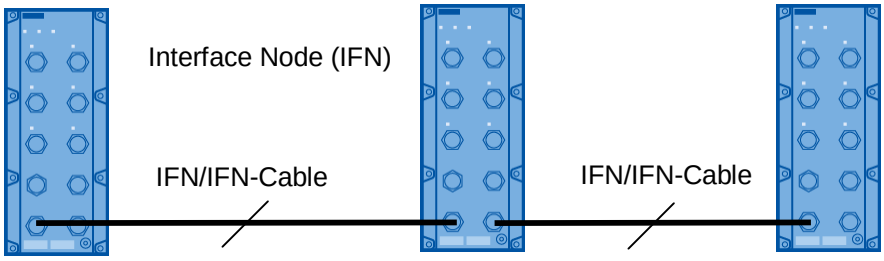
Picture 4 Tree topology with IFN

3.2 Line topology

The line topology allows the construction of a network system by connecting one bus participant with one other participant.

The maximum number of point-to-point connections from one bus participant to any other participant in the IEEE1394 bus is limited to 15 – which means that not more than 16 devices are allowed to be connected in series (line topology)

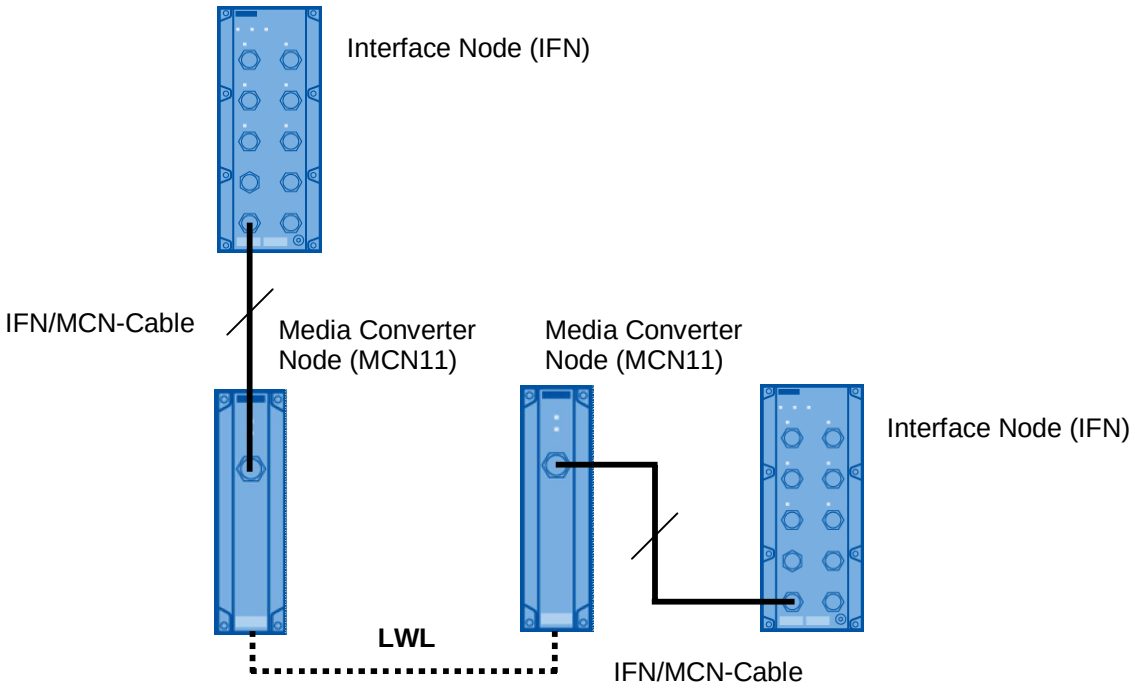
This is the most used topology since only in rare cases the number of devices in a measuring system exceed 16 devices.



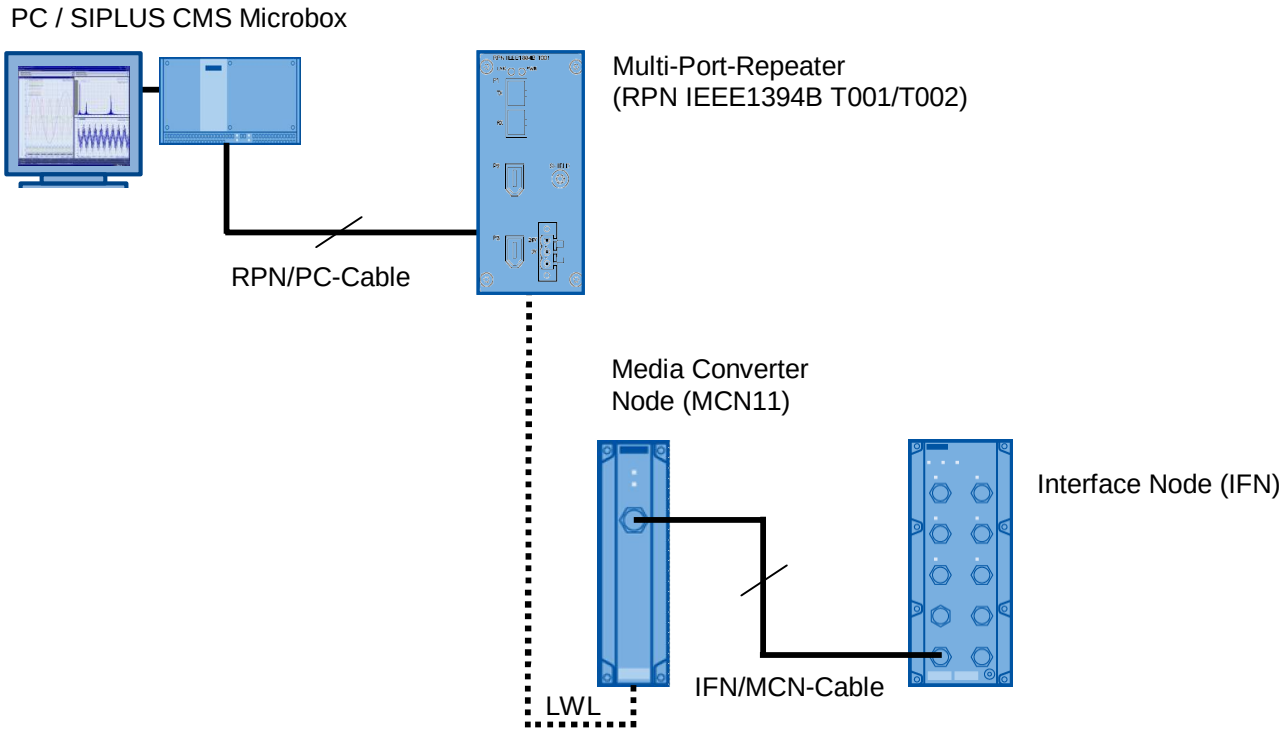
Picture 5 Line topology with IFN

3.3 Connection with fibre optic cable

The MCN11 can be connected to any IEEE1394 – connection (LNK0/1/2) on the IFN. In accordance to the minimum distance up to three MCN11 can operate at the same time.



Picture 6 Configuration with fibre optic cable between two IFN



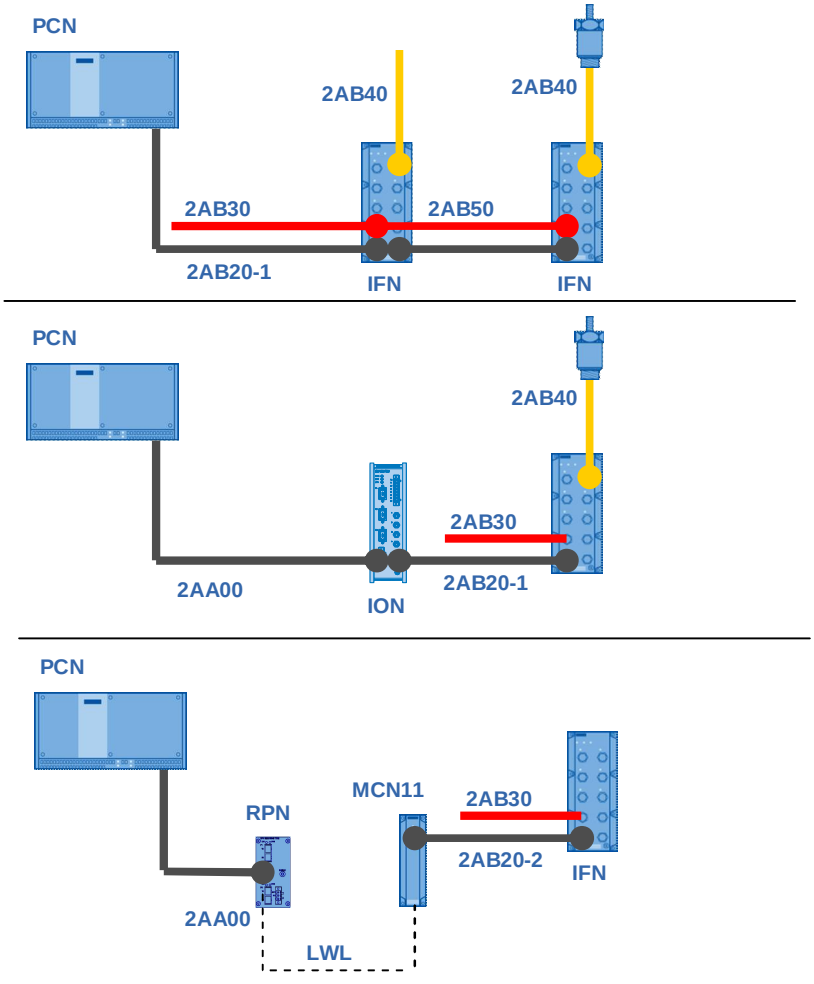
Picture 7 Optical connection of a PC on a CMS4000 System

4 Cable Types

4.1 Overview

The following chart gives a survey about all cables and their usage combined with ION, IFN, MCN und RPN:

Name	Chapter	Identifier
CABLE-IEEE1394A-66/46	4.2	2AA00
CABLE-IEEE1394A-8F	4.3	2AB20-1
CABLE-IEEE1394A-8M	4.4	2AB20-2
CABLE-Power	4.5	2AB30
IFN ADD	4.6	2AB50
CABLE-IO	4.7	2AB40



Picture 8 Cable overview

4.2 CABLE-IEEE1394A-66/46

Name:	CABLE-IEEE1394A-66/46	
Application:	IEEE1394 coupling cable PC-ION, PC-RPN, ION-ION, ION-RPN	
Length:	30cm, 100cm, 200cm, 450cm	
Order numbers:	CABLE-IEEE1394A-66-0030 (30 cm) CABLE-IEEE1394A-66-0100 (100 cm) CABLE-IEEE1394A-66-0200 (200 cm) CABLE-IEEE1394A-66-0450 (450 cm) CABLE-IEEE1394A-46-0450 (450 cm)	6AT8000-2AA00-1AA3 6AT8000-2AA00-1AB0 6AT8000-2AA00-1AC0 6AT8000-2AA00-1AE5 6AT8000-2AA10-1AE5

Picture 9a CABLE-IEEE1394A-66

Picture 9b CABLE-IEEE1394A-46

This cable is used for IEEE1394 coupling of ION-ION, ION-PC, PC-RPN and ION-RPN. The CABLE-IEEE1394A-46-0450 allows the conection of a notebook.

On ION and RPN the IEEE1394a interfaces (P1 / P2 / P3) are designed as 6-pin jacks.

Picture 9 IEEE1394a Interface

Notice

Only cables with maximum length of 4.5 m are allowed to be connected on an IEEE1394a interface.

4.3 CABLE-IEEE1394A-8F

Name:	CABLE-IEEE1394A-8F	
Application:	IEEE1394 coupling cable PC-IFN, ION-IFN, RPN-IFN	
Length:	40cm, 200cm, 450cm	
Order numbers:	CABLE-IEEE1394A-8F-0040 (40 cm) CABLE-IEEE1394A-8F-0200 (200 cm) CABLE-IEEE1394A-8F-0450 (450 cm)	6AT8000-2AB20-1AB0 6AT8000-2AB20-1AC0 6AT8000-2AB20-1AE5

Picture 10 CABLE-IEEE1394A-8F

This cable is used for IEEE1394 coupling of PC-IFN, ION-IFN and RPN-IFN.

4.4 CABLE-IEEE1394A-8M

Name:	CABLE-IEEE1394A-8M
Application:	IEEE1394A coupling cable with power supply included IFN-MCN11
Length:	30cm
Order numbers:	CABLE-IEEE1394A-8M-0030 (30 cm) 6AT8000-2AB20-2AA2

Picture 11 CABLE-IEEE1394A-8M

This cable is used for IEEE1394 coupling of IFN-MCN11.

4.5 CABLE-Power

Name:	CABLE-Power	
Application:	Power cable IFN	
Length:	135cm, 200cm, 500cm, 1000cm	
Order numbers:	CABLE-Power-135-0000 (135 cm) CABLE-Power-200-0000 (200 cm) CABLE-Power-500-0000 (500 cm) CABLE-Power-1000-0000 (1000 cm)	6AT8000-2AB30-1AA1 6AT8000-2AB30-1AA2 6AT8000-2AB30-1AA5 6AT8000-2AB30-1AB0

Picture 12 CABLE-Power

This cable is used for energy supply of the IFN. To forward the power from the first IFN to the following ones in a line topology IFN ADD must be applied, see. chapter 4.6.

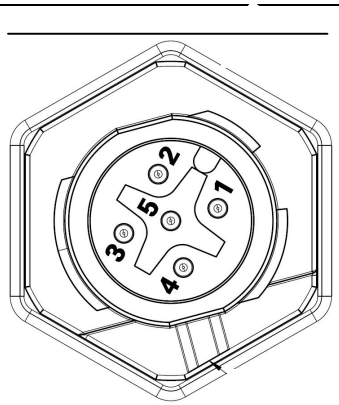
Warning

The IFN device is built to operate with reliable low voltage. Therefore only reliable low voltage according to IEC950/EN60950/VDE0805 must be connected to the supply connection.

The power adapter for feeding the IFN must fulfil NEC Class 2 (voltage range 18-32 V).

The IFN must not be connected to DC voltage higher than 32 V DC, or to AC voltage.

Chart 1: Pin assignment PWR

PIN	Assignment	Wire color	View
1	M24 (ground)	brown	
2	+24 V DC (18…32 V DC)	white	
3	PD (power down, ext. restart)	blue	
4	free	black	
5	free	grey or green/yellow	

4.6 IFN ADD

A cable set consists of one power cable with Y-plug for straight power forwarding to a neighbour IFN and one IEEE1394A coupling cable.

Name:	IFN ADD
Application::	Power cable and IEEE1394A coupling cable IFN-IFN
Length:	20cm, 100cm, 200cm, 450cm
Order numbers:	IFN ADD0020 (20 cm) 6AT8000-2AB50-1AA2 IFN ADD0100 (100 cm) 6AT8000-2AB50-1AB0 IFN ADD0200 (200 cm) 6AT8000-2AB50-1AC0 IFN ADD0450 (450 cm) 6AT8000-2AB50-1AE5

Picture 13 IFN ADD CABLE-Power with Y-plug

Picture 14 IFN ADD CABLE IEEE1394A

Warning

The IFN ADD power cable with Y-plug is designed for max. current load of 4 A .
Maximum 16 IFNs are allowed to be connected in a line.

Notice

CABLE-Power-xxx-0000 (6AT8000-2AB30-1Axx) and CABLE-IEEE1394A-88-0020 (6AT8000-2AB20-2AD2) must be applied to obtain protection class IP67.

IFN ADD power cable with Y-plug does NOT fulfil protection class IP67 !

Name:	CABLE-IEEE1394A-88
Application:	IEEE1394A coupling cable IFN-IFN
Length:	20cm
Order numbers:	CABLE-IEEE1394A-88-0020 (20 cm) 6AT8000-2AB20-2AD2

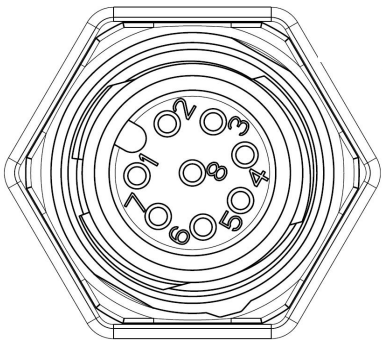
Picture 15 CABLE-IEEE1394A-88

Join the IFN ADD CABLE IEEE1394A and CABLE-IEEE1394A-88 bus connections to the 8-pole flange sleeves M12 (LNK0 / LNK1/ LNK2) on the front of the device.

Notice

Only join cables of maximum 4.5m length to the IEEE1394 connections. We recommend the usage of standard SIPLUS CMS cables.
When using self-made cable connections no warrenty is assumed..

Cahrt 2 Pin assignment IEEE1394

PIN	Assignment	View
1	TBIAS *)	
2	Wire *)	
3	TPA- (Twisted-pair A)	
4	TPA+ (Twisted-pair B)	
5	Masse	
6	TPB+ (Twisted-pair B)	
7	TPB- (Twisted-pair A)	
8	Power supply *)	

*) only relevant while coupling with MCN11

4.7 CABLE-IO

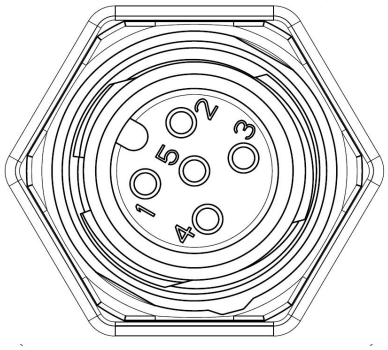
Name:	CABLE-IO	
Application:	Input/Output-cable IFN-sensor	
Length::	200cm, 500cm, 1000cm	
Order numbers:	CABLE-IO-200-0000 (200 cm) CABLE-IO-500-0000 (500 cm) CABLE-IO-1000-0000 (1000 cm)	6AT8000-2AB40-1AA2 6AT8000-2AB40-1AA5 6AT8000-2AB40-1AB0

Picture 16 CABLE-IO

This cable allows connecting the sensor technology to the IFN. The cable can be used for IFNA AI and IFN VIB-A.

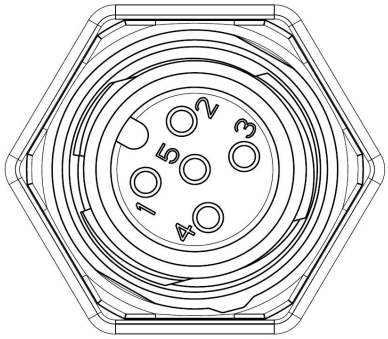
The following chart shows the assignment of the analog inputs (CH1-CH6) using an IFN AI.

Chart 3 Pin assignment analog input (CH1-CH6)

PIN	Assignment	Wire color	View
1	GND (ground)	brown	
2	free	white	
3	signal	blue	
4	free	black	
5	free	grey or green/yellow	

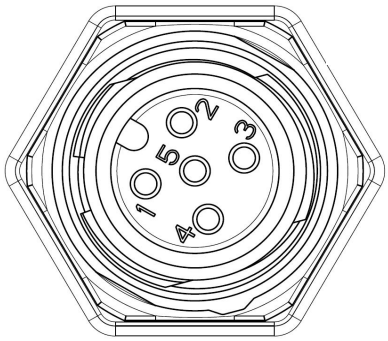
The following chart shows the assignment of the IEPE inputs (CH1 - CH6) using an IFN VIB-A.

Chart 4 Pin assignment IEPE sensor input (CH1-CH6)

PIN	Assignment	Wire color	View
1	GND (ground)	brown	
2	free	white	
3	signal	blue	
4	free	black	
5	free	grey or green/yellow	

The following chart shows the assignment of the IFN VIB-A CH6 input used as analog input.

Chart 5 Pin assignment CH6 as analog input

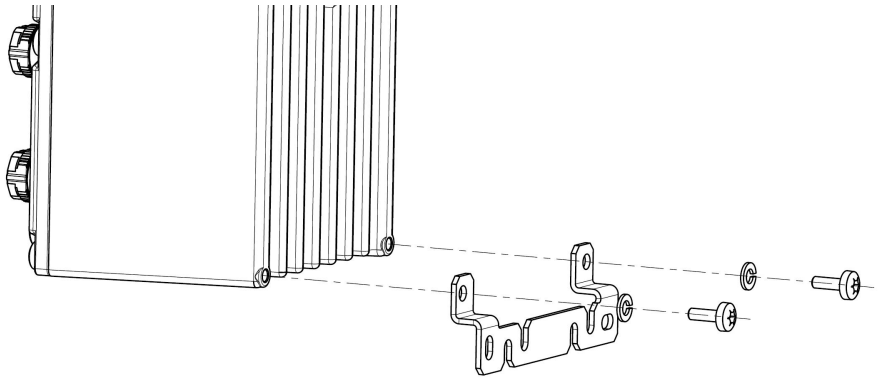
PIN	Assignment	Wire color	View
1	GND (ground)	brown	
2	+/- 24 V signal	white	
3	free	blue	
4	free	black	
5	Free	grey or green/yellow	

Notice
Only use the factory assembled shielded CABLE-IO! There shield on IFN AI and VIB-A is electronical connected to the plug housing!

4.8 Accessories

Mounting brackets for wall mounting are available for IFN - IFN Mounting Set (6AT8000-2BB00-0XB0) and for MCN11 - MCN Mounting Set (MLFB 6AT8000-2BB00-0XC0).

Unused jacks can be closed by a capping set, IFN Coping Set (MLFB 6AT8000-2BB00-0XA0).



Picture 17 Mounting Set

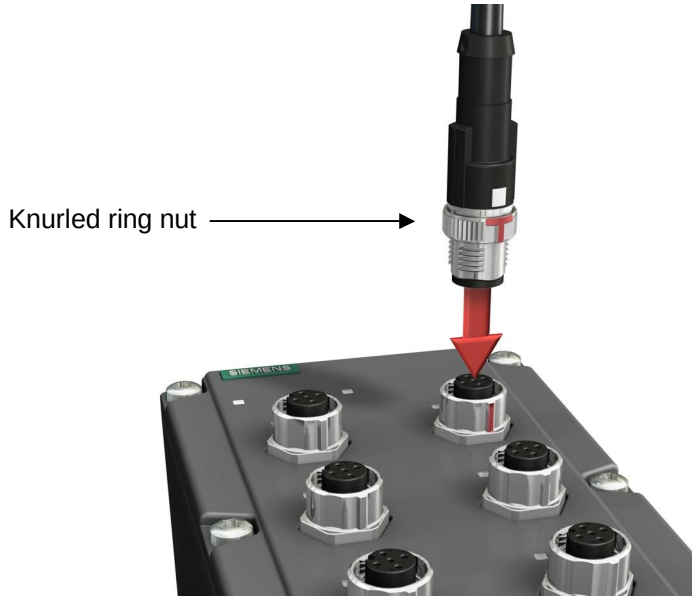
5 Connecting Cable

5.1 Connect M12-plug

Caution

The following pictures (picture 17, picture 18 , picture 19) shall explain the principle of connecting the cable and may contain deviations from the used plug types.

1. Push the M12 connector vertical in the respective flange sleeve, so that connector slot and the knurled ring nut lie on top of each other.



Picture 18 plug in

2. Twist the M12-socket plug with the knurled ring nut tight until it snaps (about 1/2 rotation).

Picture 19 lock the plug

3. The end position (interlock) of the M12-socket plug is finished now.

Picture 20 correctly plugged in

Caution

Avoid canting between M12 connector and socket plug!

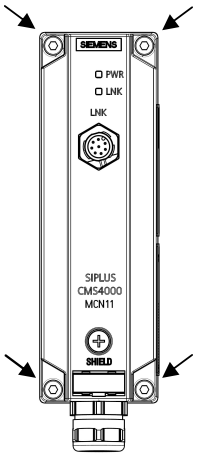
Only when the installation is correct, the protection category IP67 and safe contacting is guaranteed.

Never pull and insert cables and plugs, when the ambient temperature is 0° Celsius and below.

5.2 Fibre optic cable connection

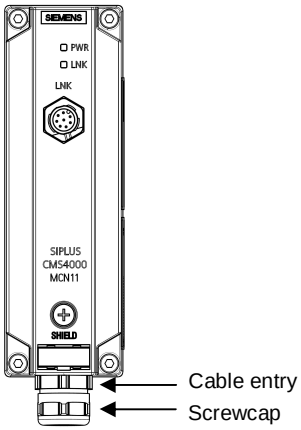
5.2.1 MCN11 fibre optic cable (LWL)

1. Open the 4 screws on the device with an Allen key (SW3).



Picture 21 Open all 4 screws

2. Release only the screwcap of the screw connection (PG-screwing) and pull the „SC/PC plug“ of the LWL single conductor in the right position through the screwcap.



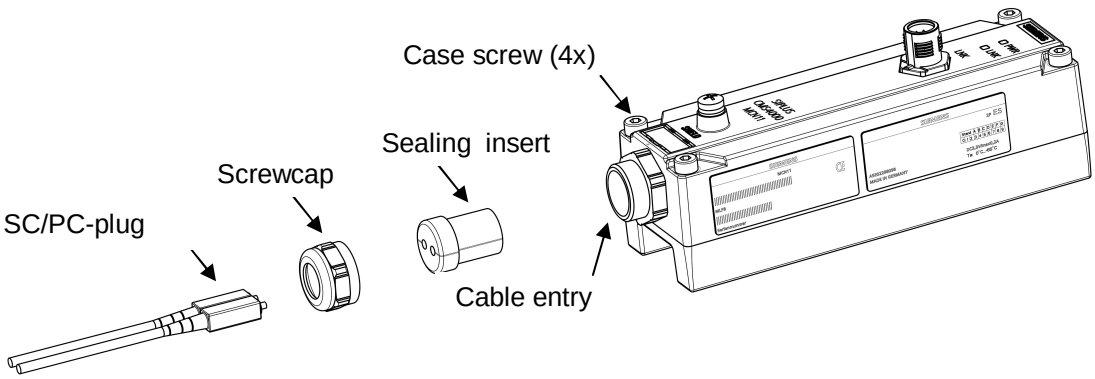
Picture 22 Loose the retainer nut

3. Remove the sealing insert and insert the LWL-single connectors in the suited leadthrough of the folding sealing insert.

Notice

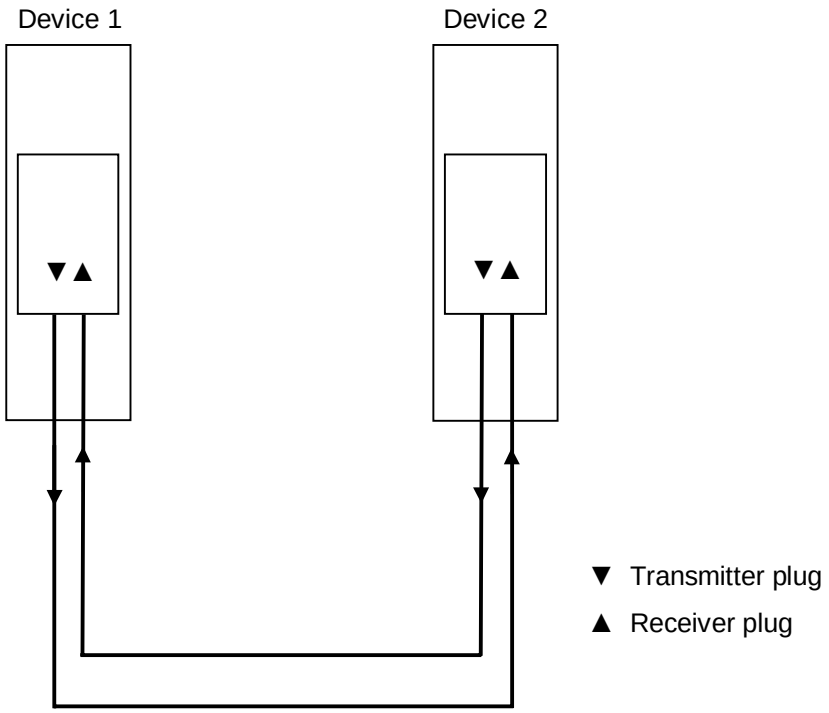
Avoid mechanical overloading (e.g. folding) of the fibre optic cables!

4. Insert the SC/PC-plug of the LWL cable strands through the cable entry into the housing.



Picture 23 LWL-cable entry configuration

5. Connecting „SC/PC-plugs“.



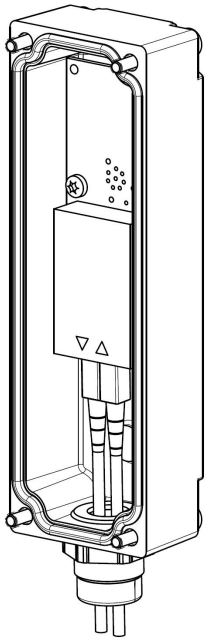
Picture 24 Connection twin cable (view on the device as shown in Picture 25)

Caution

Take note of a correct assembly while connecting the plug! Connect transmitter ▼(device 1) with receiver ▲(device 2) and receiver ▲(device 1) with transmitter ▼(device 2).

6. Slide the sealing insert flush in the cable entry so that the LWL-single connector lays parallel in the box (in order to avoid a mechanical overload of LWL).

7. Screw the retainer nut tightly onto the cable entry. The recommended torsional moment is 10Nm.



Picture 25 Completed installation

8. Close the casing cover and screw the 4 included screws (from 1) tight. The recommended torque: 3Nm.

Caution

Only when the installation is correct, the screwcap fits tight and the cover screw fits tight the protection category IP67 is guaranteed.

Never pull and insert optical fiber, when the ambient temperature is 0° Celsius and below (risk of breakage).

According to the type of fibre-optic cable an applicable sealing insert must be used.

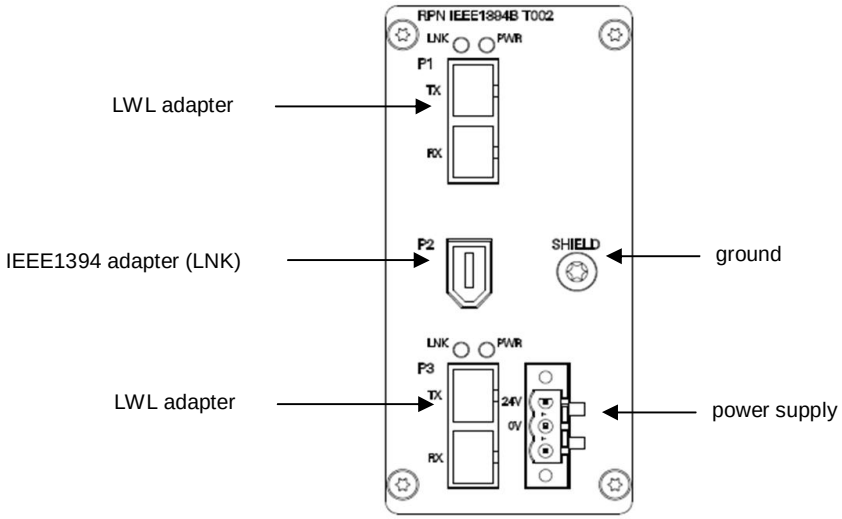
The included sealing insert is applicable for a twin fibre-optic cable (diameter 3mm).

Notice

The advices for installation that are given by the fibre-optic cable manufacturer must be observed!

5.2.2 RPN IEEE1394A fibre optic cable (LWL)

According to its design the RPN has one or two duplex SC/PC62.5 fibre optic cable adapter.



Picture 26 RPN IEEE1394B T002 Interface

6 Appendix

6.1 Service & Support in the Internet

In addition to our documentation pool we offer our complete knowledge basics on the Internet:

www.siemens.com/automation/service&support

There you find:

- The newsletter, which is constantly updated to provide you with the latest information about your products.
- The right documents via our search function under Service & Support.
- The bulletin board, a worldwide knowledge exchange for users and experts.
- Your local representative for Industry Automation & Drives Technologies via our representatives database.
- Information about on-site services, repairs, spare parts, and lots more you will find under ”Support”.

6.2 List of Abbreviations

Abbreviation	**Item**
CH	Channel
CMS	Condition Monitoring System
LWL	Fibre-Optic Cable
IEEE	Institute of Electrical and Electronics Engineers
ION	Node
IFN	Interface Node
PD	Power Down
TIA	Totally Integrated Automation