SIEMENS

SIPLUS CMS4000

Interface Node

IFN VIB-ACC (IFN VIB-A)

6AT8000-1BB00-4XA0

Operating Instructions - English

Release 2014-11

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.

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Disclaimer of Liability

We have checked the contents of this document for agreement with the hardware and software described. 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.

Table of Contents

1 Preface

1.1 Purpose of this Document

This operating instructions support you to operate the Media Converter Node SIPLUS CMS4000 IFN VIB-A, named IFN VIB-A as peripheral device in the System SIPLUS CMS4000.

1.2 Required Basic Knowledge

Basic knowledge of automation technology and equipment condition monitoring 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 Interface Node IFN VIB-A.

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: A5E02297871A-AA.

1.5 CE Marking

The Interface Node IFN VIB-A meets the requirements and objectives of the EG-Guideline according to 2004/108/EG.

1.6 Standards

You will find detailed information in chapter 6.1 of this operation instructions.

Notice

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

1.7 Classification of Information

Additional to this operation instructions, you need the operation instructions of

SIPLUS CMS4000 X-Tools.

1.8 Directory

The operating instructions describe the hardware of the Interface Node IFN VIB-A.

It contains the following topics:

- Installation and wiring (Chapter 3 and 4)
- Commissioning and diagnosis (Chapter 5)
- Order Numbers (Chapter 7)
- List of abbreviations with explanation of the general definitions of the used terms (Chapter 7)

1.9 Recycling and Disposal

The IFN VIB-A is environmental compatibility and recyclable.

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.
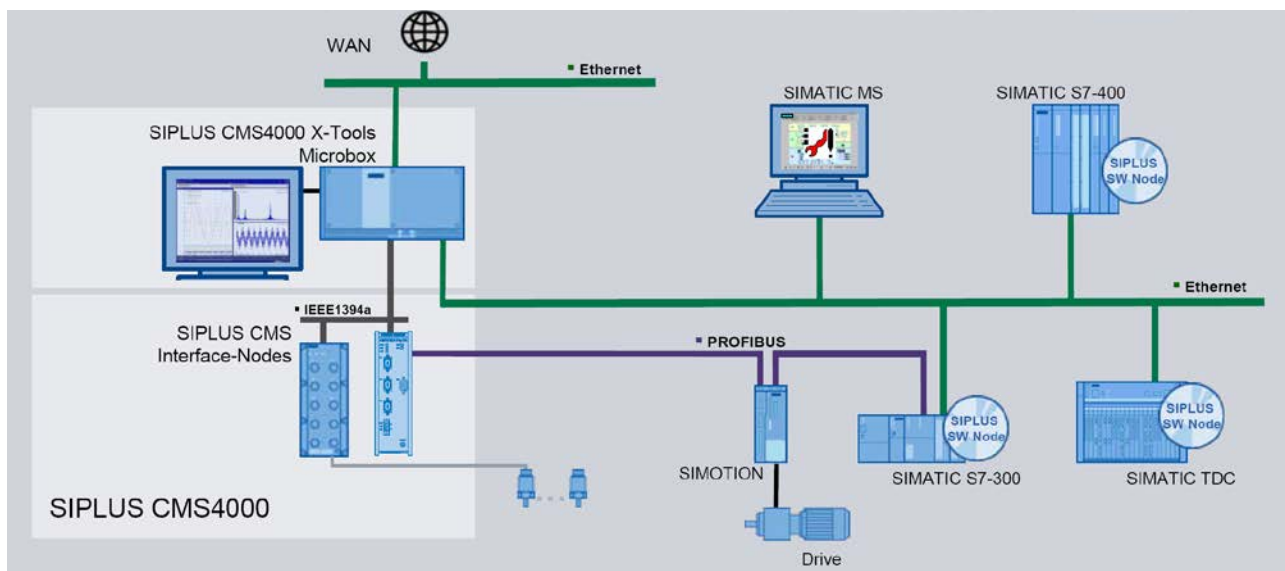
Picture 1 Typical configuration

2.2 What is an Interface Node IFN VIB-A?

Definition

The interface node IFN VIB-A allows the data sampling of six IEPE sensor signals or five IEPE sensor signals and one analog signal (e.g. speed of rotation).

The maximum sampling frequency is 192 kHz per channel. The nodes are connected via bus system (IEEE1394) with 400 Mbps with an industrial PC.

IEPE-Sensors (Integrated Electronics Piezo-Electric) are piezoelectric sensors with integrated electronic.

Application Area

- The IFN VIB-A is suited for the application in the industrial environment, because of the robust construction and the degree of protection IP67.

- The compact design of the IFN VIB-A enables the application in space-saving ranges.

- Easy handling of IFN VIB-A provides a fast commissioning and maintenance

- The product is designed for the application on a DIN Rail or for mounting angles.

Display

The IFN VIB-A has one display (LED), IEPE-Sensor connectors, IEEE1394 connections and one connection for Power Supply.
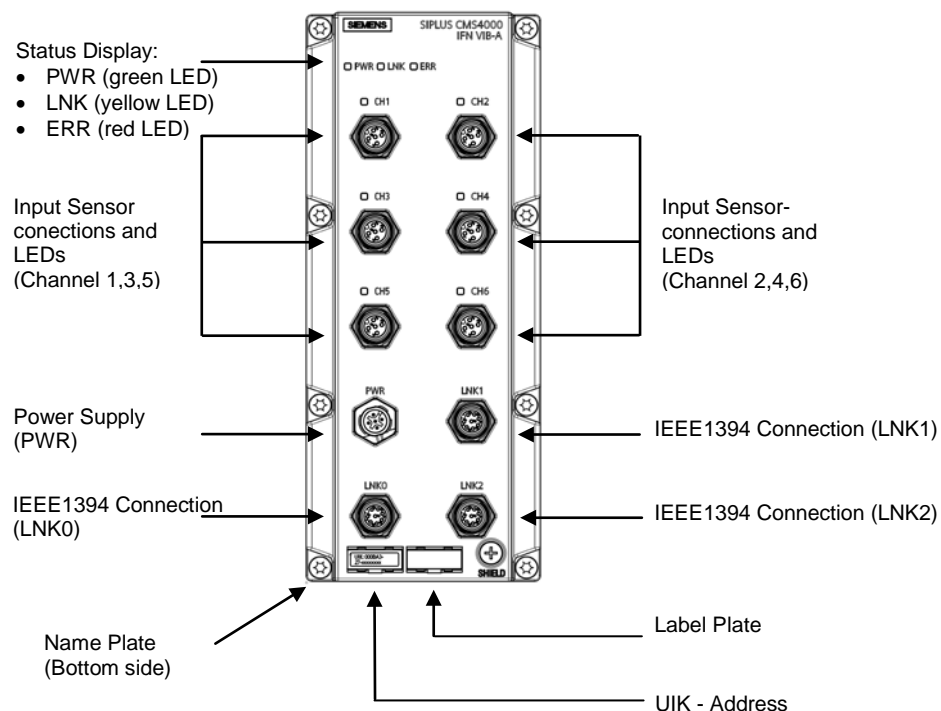
Picture 2 Front view IFN VIB-A

2.3   Scope of Delivery

What is delivered?

- Device IFN VIB-A (incl. clamp for DIN Rail mounting)
- Operating Instructions (compact)

Unpacking and Checking

After unpacking, please check

- the packet for completeness and
- all parts for transport damages.

⚠️	**Warning** Do not use any parts that show signs of damage!!

3 Installation

3.1 Installation Position, Dimensions

Installation Position

The interface node IFN VIB-A is suited for installation on a DIN Rail or for attachment with mounting angles.

Dimensions and Expansion Spaces

Chart 1   Dimensions

Dimensions (mm)	with DIN rail	with mounting angles
Installation face length	86	86
Installation height	210	243
Installation depth	96	97
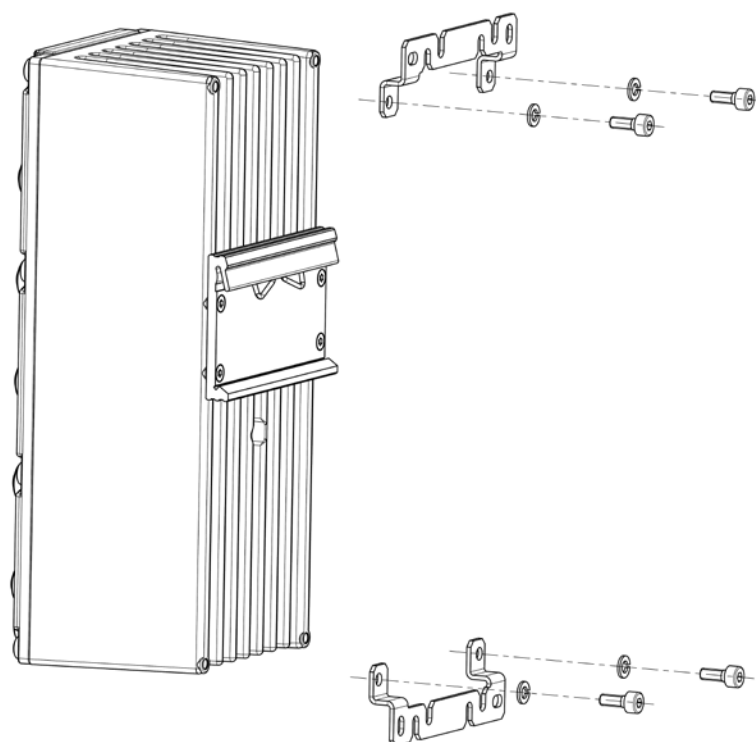
Picture 3 Correct Installation Position

Caution

The spaces which are specified in chapter 6 on top, underneath and in front of the device have to be kept.

3.2 DIN Rail

Characteristics

The Device can be installed on a DIN rail (DIN EN 60715 TH35-15).

3.2.1 Installation

Requirements

The table-track is installed on the device.

Procedure

Hang the upper table-track of the device on the DIN rail and push it down towards the DIN rail so that it snaps in.
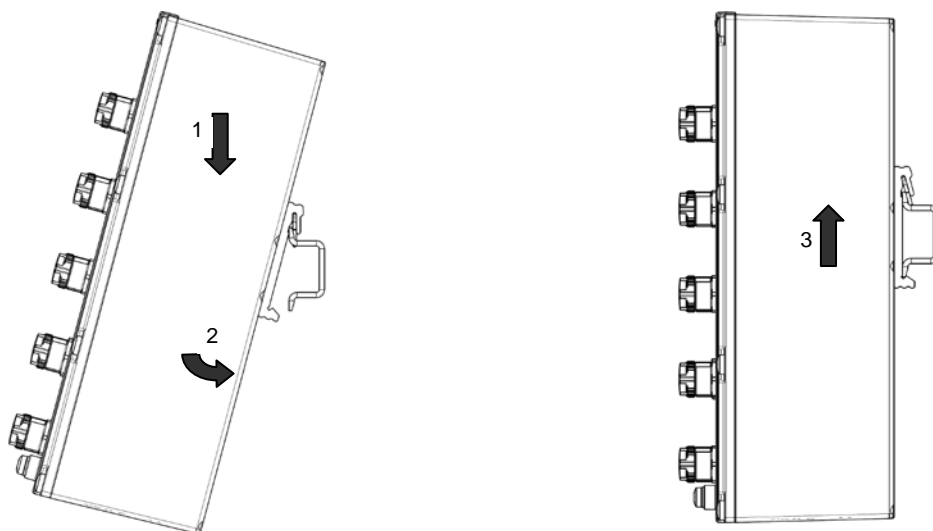
Picture 4 Installation of the device IFN VIB-A on a DIN rail.

⚠ **Caution**

During operation with vibration load use an attachment with mounting angels

3.2.2   Disassembling

Procedure

Dissemble all electronic connection cables.

Remove the device from the DIN rail: Push the device down against the DIN rail and hang it out.
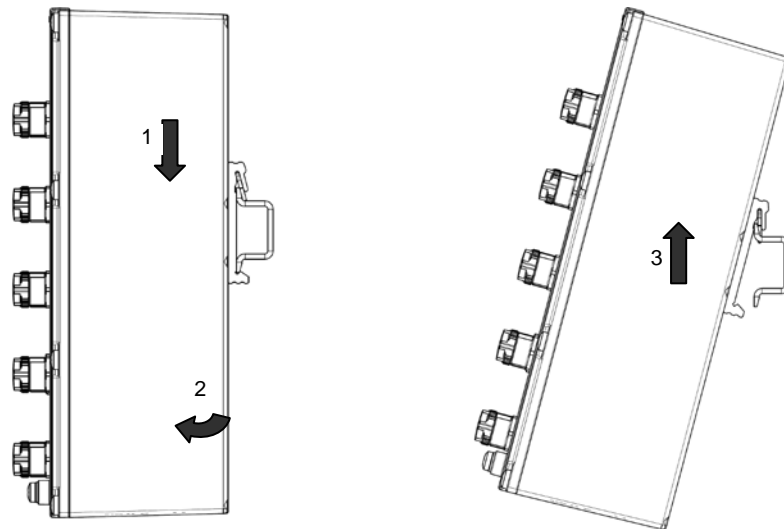
Picture 5 Disassembly of the IFN VIB-A from the DIN rail

3.3   Mounting Angles

Characteristics

The device will be installed with mounting angles on a stable base (e.g. wall, mounting plate).

3.3.1   Installation

Procedure

The „IFN Mounting Set" is necessary for the installation with mounting angles.

In the „IFN Mounting Set" is a drill template included in the equipment pack.

Order Number see chapter 7.1.

Procedure

Connect the mounting angles with the included screws and ring washers to the two connection positions on the device (backside top **and** bottom).

Install the device on a stable base.
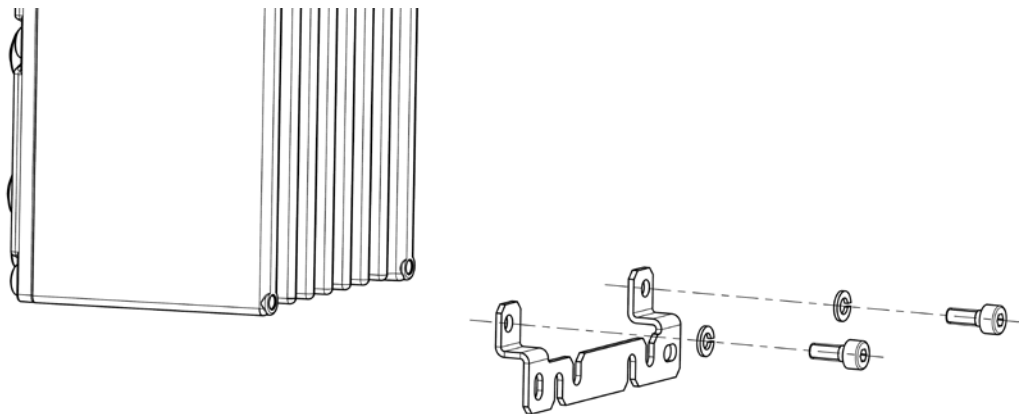
Picture 6 Connection of the mounting angels on the device (e.g. backside below)

3.3.2   Disassembling

Procedure

Dissemble all electronic connection cables.

Demount the device from the site of installation (e.g. wall).

3.4   Label Plate

Characteristics

You can mark the device with a label plate. The label plate is exchangeable.

Exchanging the label plate

1. Push the screwdriver in the small opening on the bottom edge of the label plate and hang it out.
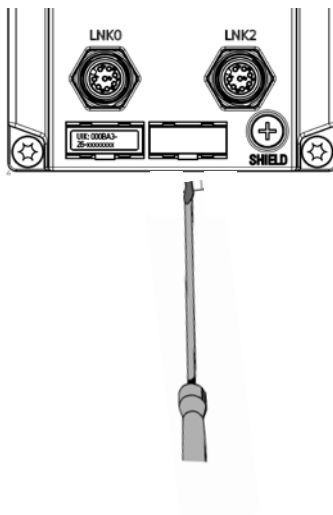
Picture 7 Label Plate

2. Push the label plate with the finger in the indentation.

4 Wiring

4.1 General Rules and Regulations for operation of IFN VIB-A

DC 24V-Supply

The following chart shows what you have to observe for the DC24 V-Supply.

Chart 2 DC 24V-Supply

At…	you must ensure that …	
Buildings	outside lightning protection	Meet the requirements of lightning protection (e.g. lightning elements)
DC 24 V-Supply-line, Signal transmission	inside lightning protection	
DC 24 V-Supply	safe (electrical) disconnection of low voltage	
Chaining of supply voltage	potential drop when chaining	

For Power-Supply of the device on installation location with strong EMV-toxic load/ -irradiation observe the following alternatives:

Chart 3 Recommendation for reaching the EMV- compability

Alternative	Notice
Controlled power adaptor	SITOP SMART
EMV Interference filter	Company TIMONTA e.g. Type FMLB-0109-0640
SMD-Ferrite on both power supply ledges	Company WÜRTH ELEKTRONIK, e.g. No. 74271222

Protection against external electrical influences

The following chart shows what you have to observe for the protection of electrical influences or faults.

Chart 4 Protection of electrical influences

At…	you must ensure that …
all devices or systems, in which the IFN VIB-A is installed	the device or system for conduction of electromagnetic failure on grounding (SHIELD) is connected.
Supply, signal and bus lines	correct wiring arrangement and installation.
Signal and bus lines	a line or strand breakage should not lead to an undefined situation of the device or system.

Grounding

Notice information in the chapter 4.2.1 „Connecting IFN VIB-A to grounding".

4.2 IFN VIB-A

4.2.1 Connecting IFN VIB-A to the ground (SHIELD)

The earth connection has to be implemented with cable cross section of 2,5mm^2

1. Isolate the grounding cable and squeeze a cable lug at the end of the line (M4 ring eye).

2. Screw the cable lug to the device as shown in the picture. The recommended torque is 3 Nm
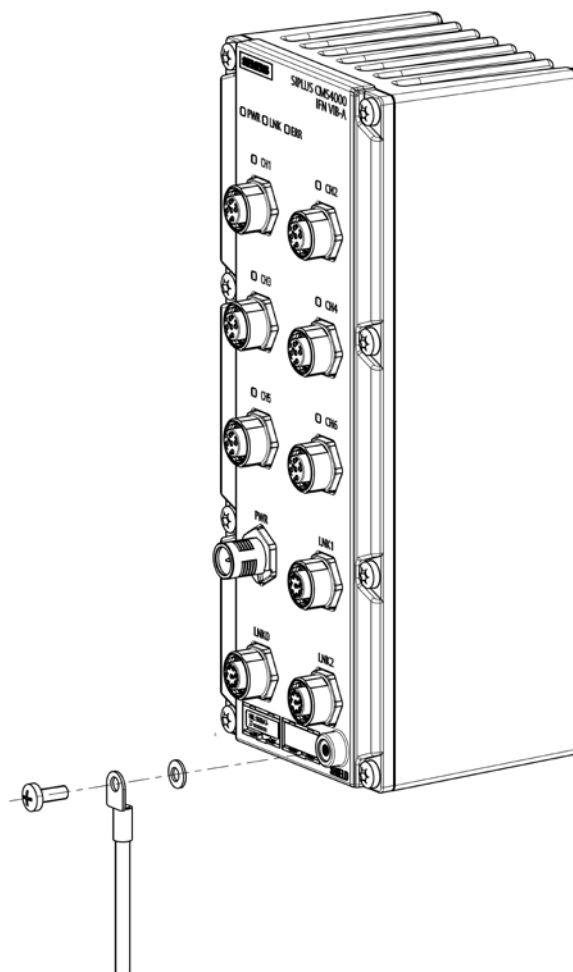
Picture 8 Connecting IFN VIB-A to the ground (SHIELD)

4.2.2 Connecting M12-plugs

Caution

The pictures 9, 10 and 11 shall only explain the concept of the plug type. The principle operation stays the same.

1. Push the M12 connector in vertical position in the socket plug, so that the slot from the connector and knurled ring nut are superposed.
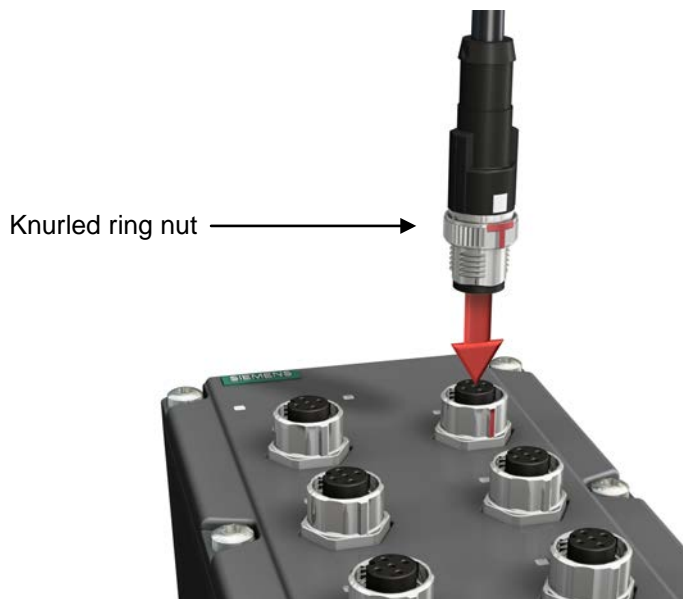
Knurled ring nut ⟶

Picture 9 Connecting M12 connector

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

Picture 10 M12-socket plug interlocking

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

Picture 11 Correct M12-socket plug connection

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.

4.2.3 IEEE1394 – Connection (LNK)
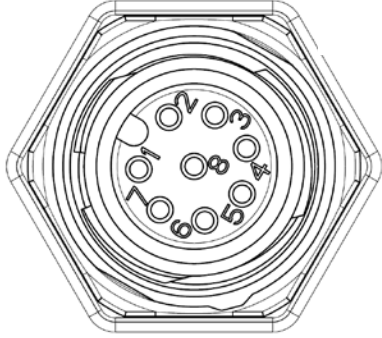
Connect the M12 connector on the front side of the box in the 8-pin socket plug (LNK0 / LNK1/ LNK2).

Caution

The IEEE1394 standard allows only a maximum length of 4,5 m. Using standard SIPLUS CMS cables is necessary. In case of using self-made cable connection there is no warranty assumed.

Pin assignment

Chart 5 Pin assignment IEEE1394

PIN	Assignment	Display
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 when coupling with MCN11

Caution

In configurations with ION devices (ION PROFIBUS DP Spy T001, ION BINARYINPUT T001, RPN IEEE1394B) and IFN devices (IFN VIB-A, IFN AI) in a common communication line, choose for the first device after the controller (PC) an ION.

Fiber Optical Cable Coupling

The product SIPLUS CMS4000 MCN11 is available for fiber optical cable coupling for distances over 4,5 m.

Caution

When using fiber optical cable coupling, the manual SIPLUS CMS4000 MCN11 is additionally needed!

4.2.4   Power Supply Connection (PWR)

The power supply is connected to the 5-pin circular plug M12 (PWR) on the front side of the device.

Y-Connector

The Y-Connector enables looping of the 24V DC power supply and it is designed for maximum current load of 4A.

Caution

When using the Y-Connector from the additional set (note chapter 7.1 „Order Numbers") the degree of protection is reduced to IP54.

⚠ **Warning**
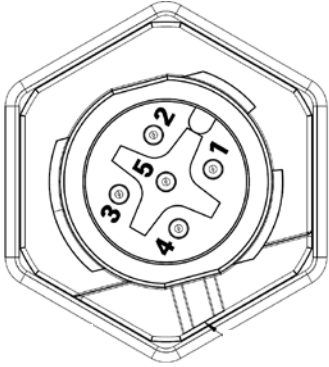
The device IFN VIB-A is designed for operation with safety extra-low voltage. This means that only safety extra-low voltages (SELV) complying with IEC950/EN60950/VDE0805 can be connected to the power supply terminals.

The power supply unit for the supply of the IFN VIB-A has to meet NEC Class 2 (range of voltage 18-32 V).

Never operate the IFN VIB-A with AC voltage or DC voltage higher than 32 VDC.

Connection Assignment

Chart 6 Connection assignment PWR

PIN	Assignment	Wire color	Display
1	M24 (earth)	brown	
2	+24V DC (18…32 V DC)	white	
3	PD (Power Down)	blue	
4	free	black	
5	free	grey or green/yellow	

Power Down

Power Down is used for a delayed restart (Reset) of the IFN VIB-A. Therefore it is necessary to create +24V DC (18…32 V DC) for about 30s, this cause a restart of the device after additional 20...68s.

4.2.5 Messeingänge

Connect the sensors / process signals to the 5-pin circular plug M12 (CH1-CH6) on the front side of the device.

Chart 6 Channel 1-6, see chapter 6.2
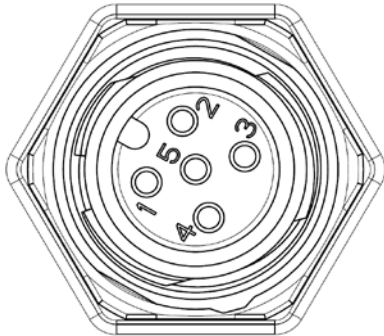
CH1	Input IEPE-Sensor 1
CH2	Input IEPE-Sensor 2
CH3	Input IEPE-Sensor 3
CH4	Input IEPE-Sensor 4
CH5	Input IEPE-Sensor 5
CH6	Input IEPE-Sensor 6 or analog input signal

___

Caution

SIPLUS CMS4000 X-Tools controls the switching of CH6 between IEPE-Sensor or analog input signal.
Use the tool for parameterization.

___
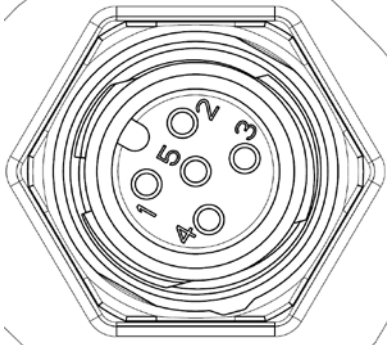
Connector assignment analog input (CH1-CH6)

Chart 8 Connector assignment IEPE sensor input (CH1-CH6)

PIN	Assignment	Wire color	Display
1	M (earth)	brown	
2	free	white	
3	Signal	blue	
4	free	black	
5	free	grey or green/yellow	

Anschlussbelegung CH6 als Analogeingang

Tabelle 7 Anschlussbelegung CH6 als Analogeingang

PIN	Assignment	Wire color	Display
1	M (earth)	brown	
2	+/- 24 V signal	white	
3	free	blue	
4	free	black	
5	free	grey or green/yellow	

Shielding measurement CH1-CH6

Caution

Use only shielded lines, where the shielding is applied to one side of the IFN VIB-A plug housing!

4.2.6 Cable Traction Relief

Caution

You have to prepare adequate cable traction relief!

4.2.7 Sealing of not used round connectors

Seal all not used round connectors with M12 end caps, in order to reach the degree of protection IP 67. Observe the correct fitting of the end caps! Order Number „Coping Set" see chapter 7.1.

5   Commissioning and Diagnosis

5.1   Commissioning and Start-up of IFN VIB-A

5.1.1   Software Requirements

Tabelle 8 Software requirements for the commissioning

Eingesetzte Projektierungssoftware	Version
SIPLUS CMS4000 X-Tools	starting version 3.02 and higher

5.1.2   Requirements for Commissioning

1. IFN VIB-A mounted (view chapter 3).

2. IFN VIB-A wired (view chapter 4).

5.1.3   Commissioning of IFN VIB-A
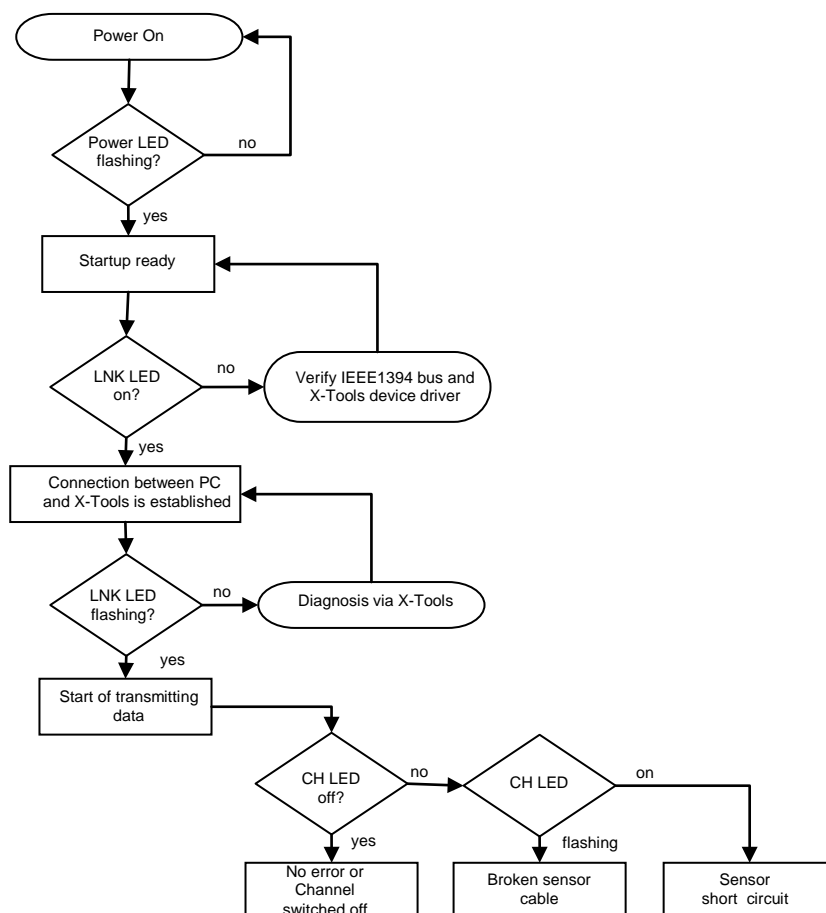
Picture 12   Start-up IFN VIB-A

5.1.4 UIK (Unique Identification Key)

The UIK is a clear, device dedicated identification/address. It is printed on the UIK label plate and deposited in the firmware of the IFN VIB-A. The device is addressed with the UIK.

In order to communicate with the IFN VIB-A, the UIK must be dedicated during the parameterization in X-Tools (see manual „SIPLUS CMS4000 X-Tools reference manual").

5.2 Diagnosis via LED-Indicator

Name		PWR
Description		power Indicator
Color		green
Condition	**off**	no operation voltage
	blinks	firmware operates
Name		ERR
Description		error Indicator
Color		red
Condition	**off**	no error
	on	error
Name		LNK
Description		indicator for connection to the controller
Color		yellow
Condition	**off**	no connection to the controller
	on	connection to the controller established
	blinks	data exchange with the controller
Name		CH1-6
Description		error indicator for sensor input CH1-CH6
Color		red
Condition	**off**	channel is not over parameterization on or no error
	on	sensor cable short circuit
	blinks	sensor cable break

5.3 Parameterization of IFN VIB-A

The IFN VIB-A is parameterized through X-Tools. You will find parameterization details in the „SIPLUS CMS4000 X-Tools Reference Manual".

5.4 Diagnosis through X-Tools

You will find detailed information in the „SIPLUS CMS4000 X-Tools Reference Manual"

5.5 Mixed configurations with ION and IFN

In case of mixed configurations with IFN (IFN AI and IFN VIB-ACC) and ION (ION Profi-bus Spy, ION BI, ION AI, ION VIB-A, …) in a single bus line with a MICROBOX PC, take account of:

Connect the ION and IFN in a single line at plug 2 (Port 3).
The order of the nodes is not relevant.

If an existing MICROBOX PC with CMB IEEE1394A T011 is used, please verify that plug 2 is connected with Port 3 of the PC/104-card.

A mixed configuration at plug 1 (PC/104-card Port 2 or Port 1) could cause communica-tion problems and could inhibit the collection of data with the MICROBOX PC.

plug 1 connected with PC/104-card Port2

plug 2 conneted with PC/104-card Port3
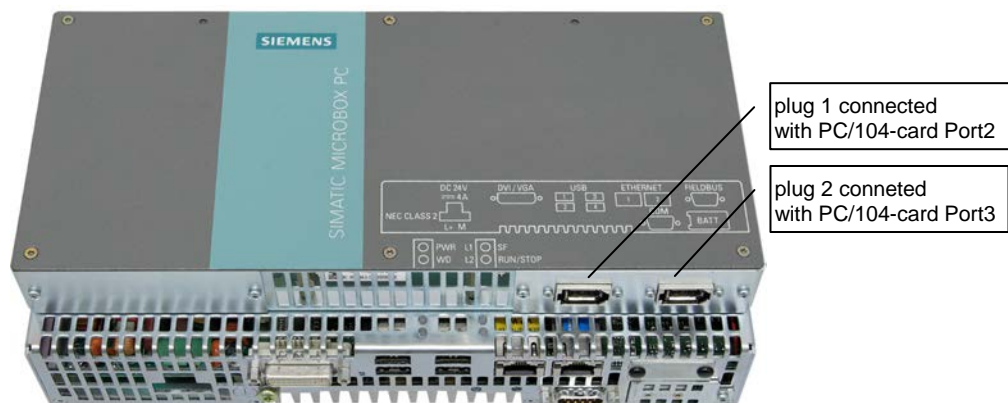
Picture 13   MICROBOX PC, PCN 427C
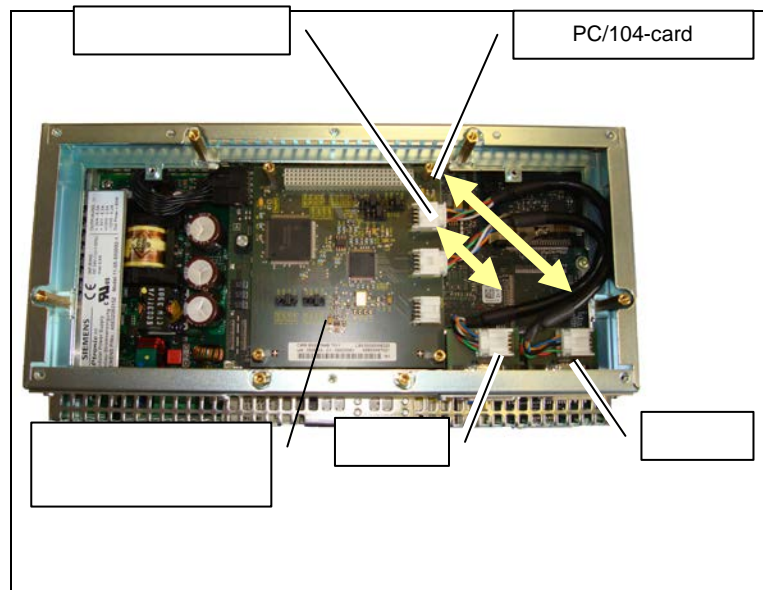
Picture 14   MICROBOX PC with CMB IEEE1394A

6 Technical Data

6.1 Standards and Approvals

Product Name

Device	SIPLUS CMS4000 IFN VIB-A

EMV Directive

The product is designed for use in an industrial environment.

Area of Application	Requirements for Emission	Immunity
Industry	DIN EN 55011:2007 Gruppe 1, Klasse A EN 55011:2007+A2:2007	DIN EN 61000-6-2:2006 EN 61000-6-2:2005
		DIN EN 61000-4-2:2001 EN 61000-4-2:1995+A1:1998+A2:2001
		DIN EN 61000-4-3:2008 EN 61000-4-3:2006+A1:2008
		DIN EN 61000-4-4:2005 EN 61000-4-4:2004
		DIN EN 61000-4-5:2007 EN 61000-4-5:2006
		DIN EN 61000-4-6:2008 EN 61000-4-6:2007

Installation Guide Lines

The product meets the requirements if you meet the installation instructions and safety-related notices as described in this commissioning manual.

Conformity Certificates

The EC Declaration of Conformity is available for the responsible authorities according to the abovementioned EC Directive at the following address:

SIEMENS AG

DF FA SE

BRESLAUER STR. 5

90766 FUERTH

GERMANY

Notes for the manufactures of machines

This product is not a machine in the sense of the EC Machinery Directive. There is therefore no declaration of conformity relating to the EC Machinery Directive 89/392/ECC for this product.

If the product is part of the equipment of a machine, it must be included in the procedure for the declaration of conformity by the manufacturer of the machine.

Safety information

Warning

Personal injury and damage to property may occur

In hazardous areas, injury to persons and material damage may occur if you disconnect plug-in connections during operation of a CMS4000 system.

Always switch off the power to the CMS4000 system when disconnecting plug-in connections in potentially explosive atmospheres.

Warning

Explosion hazard

If you replace components, compliance with Zone 2 could be compromised.

Warning

Deployment requirements

This device is only appropriate for use in Zone 2 or in nonhazardous areas.

6.2 Technical specification

6.2.1 Communication (LNK0…LNK2)

Chart 9communication (LNK0…LNK2)

Communication	Parameter	min.	typ.	max.	Unit
Connector	three connectors (female)	8-pin (M12)			
Data protocol		IEEE1394a / b			
Data transfer rate				400	Mbps
Galvanic isolation	Lines to main electronic	no			

6.2.2 Power supply (PWR)

Chart 10 Power supply (PWR)

Specifications at TA=25ºC; Test conditions U_S = 24V DC (rated Voltage); Analoginputs & Firewireports unconnected; unless otherwise noted; **1)** not allowed; **2)** overshoot is leading to demolition; **3)** only allowed for appropriate IEPE-sensors					
Power supply	**Parameter**	**min.**	**typ.**	**max.**	**Unit**
Connector	**one connector (male)**	5-pin (M12)			
Supply voltage (DC)		19.2	24	32	V
	only under certain conditions 3)	18		32	V
Over voltage protection (DC)	**permitted for max. 500ms; 2)**			35	V
Supply current (DC)	**Us = 18V DC;**			240	mA
	Us = 24V DC;		200		mA
	Us = 32V DC;	150			mA
Reverse voltage protection	**-Us = 0 …-32V DC;**	**yes**			
Reverse current	**-Is @ -32V DC;**			-5	uA
	-Is @ -35V DC permitted for max. 500ms; 2)			-100	mA
Voltage low dump	**< 19,2 V DC;**	**not allowed**			
	< 18 V DC; 3)	**not allowed**			
Power dissipation	**Us = 24V DC;**		**4.8**		W
Shut down (ext. restart)	Shut down time	**30**	**35**	**40**	s
	Restart time	**20**		**68**	s
electrical isolation		**no**			

Caution

Voltages (DC) > 32 V could damage the device!

6.2.3 Measurement input (CH1…CH6)

In general for all 6 channels:

Chart 11 Measurement input 1 to 6 (CH1…CH6)

Specifications at TA=25ºC; Test conditions U_S = 24V DC (rated Voltage); unless otherwise noted; **1)** not allowed; **2)** overshoot is leading to demolition;					
Measurement input	**Parameter**	**min.**	**typ.**	**Max.**	**Unit**
Connector	six connectors (female)	5-pin (M12)			
Resolution	analog digital converter	16 bit (15 + sign)			
Over voltage protection (DC)	permitted for max. 60 s; **2)**			± 60	V

Channel 1 and 2:

Chart 12 Measurement input 1 and 2 (CH1, CH2)

Specifications at TA=25ºC; Test conditions U_S = 24V DC (rated Voltage); unless otherwise noted; **1)** not allowed; **2)** overshoot is leading to demolition; **3)** only allowed for appropriate IEPE-sensors **4)** with connected sensors by Power-Up; **5)** Pulling an pushing the sensors under voltage; **6)** damping at 40 kHz see filter characteristic					
Measurement input	**Parameter**	**min.**	**typ.**	**Max.**	**Unit**
Input voltage (DC)	**Rated voltage**	- 0.75		+ 0.75	V
Quiescent point (DC) of the sensors		8		12	V
Constant DC current feed		4	5.2	7	mA
DC - Input resistance		330			kΩ
Input frequency		0.0001		20 **6)**	kHz
Coupling inputs		**AC**			
Cross talk attenuation (CTA)	**Channel to channel @ f = 1kHz;**		-69		dB
Signal to noise ratio (SNR)			-57		dB
Sampling rate	**each channel**		192		kSPS
Down sampling rate	**to parameterize with "X-Tools"** **0,014 / 0,33 / 4 / 8 / 16 / 24 / 32 / 48 / 96 kSPS**	0.014		96	kSPS
Accuracy 0.1 Hz til 100 Hz	**Abs. (based on full scale)**	- 0.7		+ 1.5	%
Accuracy 100 Hz till 1 kHz	**Abs. (based on full scale)**	- 4.1		- 1.9	%
Accuracy 1 kHz till 10 kHz	**Abs. (based on full scale)**	- 2.3		- 0.1	%
Accuracy 10 kHz till 20 kHz	**Abs. (based on full scale)**	- 6.6		- 4.4	%
Temperature dependency		- 1110		+ 116	ppm/K
Galvanic isolation		**no; but some sensors are galvanic isolated**			
Settling time			72 **4)**	115 **5)**	s
Cable break detection		**yes**			
Cable short detection		**yes**			

Channel 3 to 6:

Chart 13 Input channel 3 to 6 (CH3, CH4, CH5, CH6)

Specifications at TA=25ºC; Test conditions U$_S$ = 24V DC (rated Voltage);

unless otherwise noted;   1) not allowed; 2) overshoot is leading to demolition; 3) only allowed for appropriate IEPE-sensors 4) with connected sensors by Power-Up; 5) Pulling an pushing the sensors under voltage; 6) damping at 40 kHz see filter characteristic

Measurement input	Paramter	min.	typ.	max.	unit
Input voltage (DC)	**Rated voltage**	- 0.75		+ 0.75	V
Quiescent point (DC) of the sensors		8		12	V
Constant DC current feed		4	5.2	7	mA
DC - Input resistance		330			kΩ
Input frequency		0.005		20 **6)**	kHz
Coupling inputs			**AC**		
Cross talk attenuation (CTA)	**Channel to channel @ f = 1kHz;**		-73		dB
Signal to noise ratio (SNR)			-70		dB
Sampling rate	**each channel**		192		kSPS
Down sampling rate	**to parameterize with "X-Tools"** **4 / 8 / 16 / 24 / 32 / 48 / 96** kSPS	4		96	kSPS
Accuracy 100 Hz till 1 kHz	**Abs. (based on full scale)**	- 0.7		+ 0.7	%
Accuracy 1 kHz till 20 kHz	**Abs. (based on full scale)**	-1.1		+ 0.3	%
Temperature dependency		- 125		+ 83	ppm/K
Galvanic isolation			**no; but some sensors are galvanic isolated**		
Settling Time			**10 4)**	**10 5)**	s
Cable break detection			**yes**		
Cable short detection			**yes**		

Channel 6:

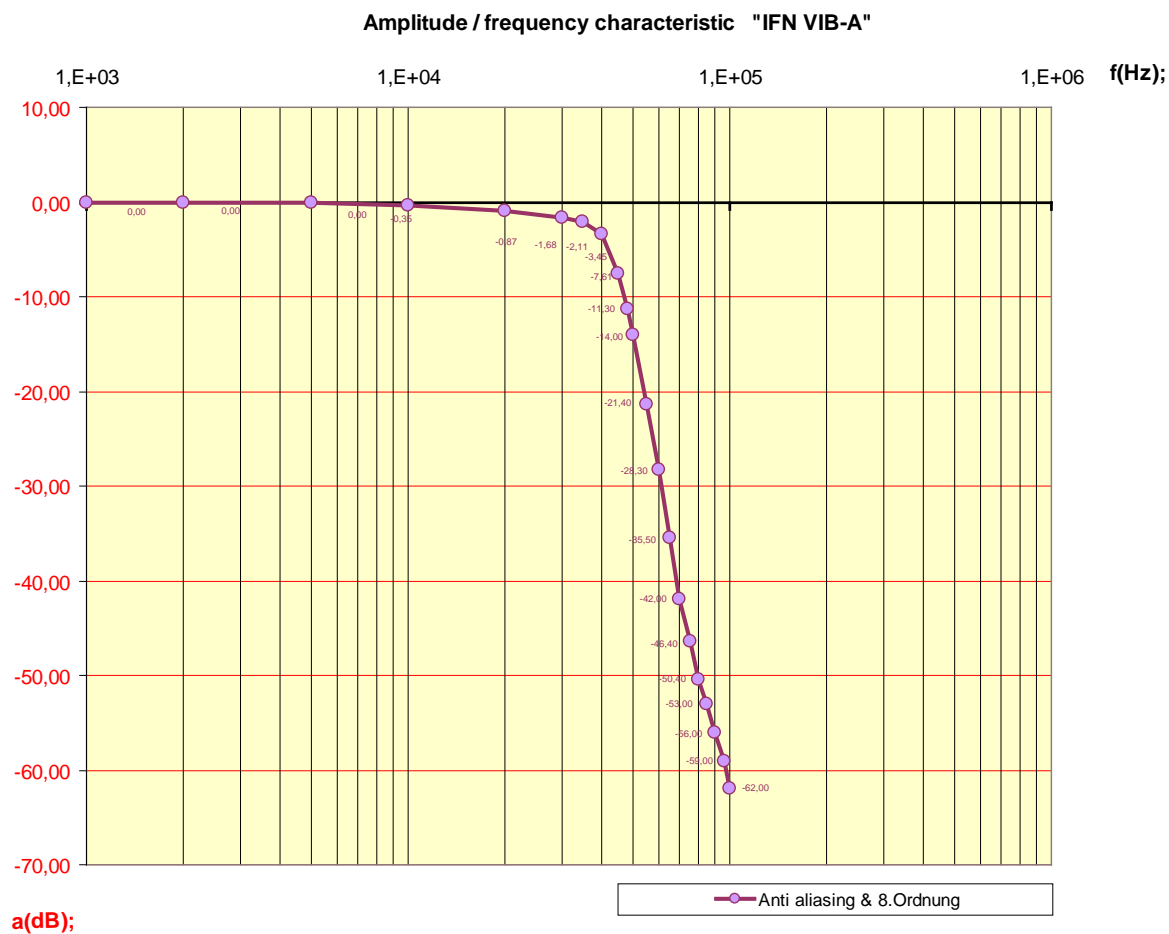Chart 14 Input channel 6 (CH6)

Specifications at TA=25ºC; Test conditions U$_S$ = 24V DC (rated Voltage); unless otherwise noted; **1)** not allowed; **2)** overshoot is leading to demolition; **3)** only allowed for appropriate IEPE-sensors **4)** with connected sensors by Power-Up; **5)** Pulling an pushing the sensors under voltage					
Measurement input	**Parameter**	**min.**	**typ.**	**max.**	**unit**
Input voltage (DC)	**Rated voltage**			± 30	V
Input resistance		50			kΩ
Input frequency		0 (DC)		1	kHz
Coupling inputs		**DC**			
Cross talk attenuation (CTA)	**Channel to channel @ f = 1kHz;**		-78		dB
Signal to noise ratio (SNR)			-69		dB
Sampling rate	**each channel**		192		kSPS
Down sampling rate	**to parameterize with "X-Tools"** **4 / 8 / 16 / 24 / 32 / 48 / 96** kSPS	4		96	kSPS
Accuracy	**Abs. (based on full scale)**			± 1	%
Temperature dependency		- 125		+ 83	ppm/K
Galvanic isolation		**no**			
Rise time	**from 10% to 90% of rated voltage**		16		us
Cable break detection		**no**			
Cable short detection		**no**			

6.2.4 Filter characteristic Channel (CH1…CH6)

Amplitude / frequency characteristic "IFN VIB-A"

a(dB);

6.2.5 Functional earth (SHIELD)

Chart 15 Functional earth "SHIELD"

Functional earth (SHIELD)	Parameter	min.	typ.	max.	Unit
Connection	Screw with detent clip		M4		
Cable recommended	cross section	2.5			mm^2
Shield resistance	Main electronic to SHIELD		1000		kΩ
Shield capacitance	Main electronic to SHIELD		30		nF

6.2.6 Environmental conditions

Chart 16 Environmental conditions

Environmental conditions	Parameter	min.	typ.	max.	Unit
Ambient temperature	operating	-40		+65	°C
	storage and transport	-40		+85	°C
Humidity	t = +28…32°C;			95	%
Atmospheric pressure		80		110	kPa
Degree of protection		**IP67**			
Height of construction over zero		**< 2000 m**			

6.2.7 Construction assembly

Chart 17 Construction assembly

Construction assembly	
Case	Aluminium
Dimensions with plug (H x W x D) in mm	210 x 86 x 87 (without mounting)
	210 x 86 x 96 (DIN rail mounting)
	243 x 86 x 97 (mounting angle)
Mounting	Standard: DIN rail (DIN EN 60715TH35-15) Optional: Mounting angle (Order Number in chapter 7.1)
Minimum distances: (front, top, bottom) in mm	80, 25, 25

6.2.8 Approval

Chart 18 Approval

Approval	Mark	
Declaration of conformity	CE	
ATEX approval	Ex	II 3G Ex nA IIC T4 Gc DEK 14 ATEX 0084 X
IECEx approval	IECEx DEK 14.0040 X	
EAC certification	EAC	
KC certification	KC	
RCM certification		

6.3 Use of the CMS4000 in Zone 2 potentially explosive atmospheres

See product information Deployment of the modules in zone 2 potentially explosive atmospheres (http://support.automation.siemens.com/WW/view/en/104933030).

7 Appendix

7.1 Order Numbers

Product	Order Number (MLFB)
SIPLUS CMS4000 IFN VIB-A	6AT8000-1BB00-4XA0
SIPLUS CMS4000 IFN VIB-A Operating Instructions	Download see chapter 7.3
SIPLUS CMS4000 X-Tools - Standard Edition	6AT8000-0AB00-1BA0
SIPLUS CMS4000 X-Tools - Professional Edition	6AT8000-0AB00-2BA0
SIPLUS CMS4000 „IFN Mounting Set" for installation with mounting angle	6AT8000-2BB00-0XB0
SIPLUS CMS4000 „Coping Set" (10 caps)	6AT8000-2BB00-0XA0
Cable	
Add-on Set contains IEEE1394 connection cable and power cord connection with the same length. IFN ADD0020 (Length 20 cm) IFN ADD0100 (Length 100 cm) IFN ADD0200 (Length 200 cm) IFN ADD0450 (Length 450 cm)	 6AT8000-2AB50-1AA2 6AT8000-2AB50-1AB0 6AT8000-2AB50-1AC0 6AT8000-2AB50-1AE5
IEEE1394 IFN/PC cable Length 40 cm Length 200 cm Length 450 cm	 6AT8000-2AB20-1AB0 6AT8000-2AB20-1AC0 6AT8000-2AB20-1AE5
IEEE1394 IFN/MCN cable Length 30 cm	 6AT8000-2AB20-2AA2
Sensor-signal cable Length 200 cm Length 500 cm Length 1000 cm	 6AT8000-2AB40-1AA2 6AT8000-2AB40-1AA5 6AT8000-2AB40-1AB0
24 V Power cable Length 200 cm Length 500 cm Length 1000 cm	 6AT8000-2AB30-1AA2 6AT8000-2AB30-1AA5 6AT8000-2AB30-1AB0
RPN/PC-Kabel Length 30 cm – 6/6pole Length 100 cm – 6/6pole Length 200 cm – 6/6pole Length 450 cm – 6/6pole Length 450 cm – 4/6pole	 6AT8000-2AA00-1AA3 6AT8000-2AA00-1AB0 6AT8000-2AA00-1AC0 6AT8000-2AA00-1AE5 6AT8000-2AA10-1AE5

Further information is available from your local Siemens office and from the homepage
www.siemens.com/siplus-cms.

7.2   Dimensional Drawing

7.3 Service & Support in the Internet

In addition to our documentation pool we offer our complete knowledge base 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".

7.4 List of Abbreviations

Abbreviation	Item
CH	Channel
CMS	Condition Monitoring System
IEEE	Institute of Electrical and Electronics Engineers
IFN	Interface Node
PD	Power Down
MCN11	Media Converter Node
TIA	Totally Integrated Automation