AMS42-LAN16fx

5B Amplifier Measurement System (LAN)

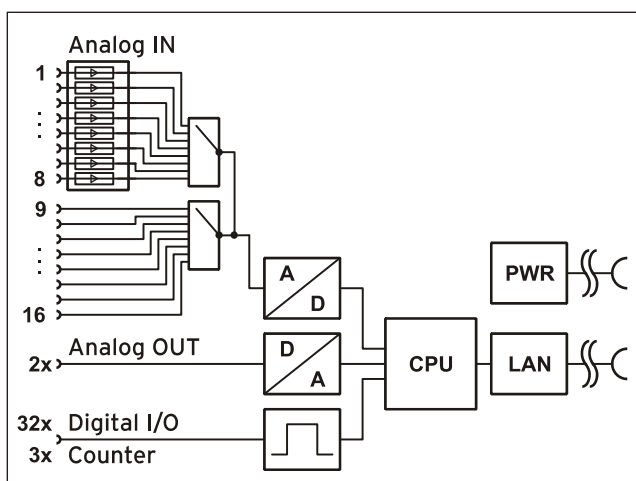## All-In-One Measurement System. Compact. DAQ via LAN.

The AMS42-LAN16fx, a complete solution: amplifier technology and data acquisition. A high-quality network data acquisition system is already integrated. Available in a robust aluminum housing as a mobile tabletop unit with skid-proof, tip-up feet.

Modular Concept. Equip Individually. Be Flexible.

The AMS device is equipped with cassettes, on which the required 5B measuring amplifiers are mounted. The variety of available 5B modules allows for the optimum adaptation of the AMS42-LAN16fx to any special measuring task.
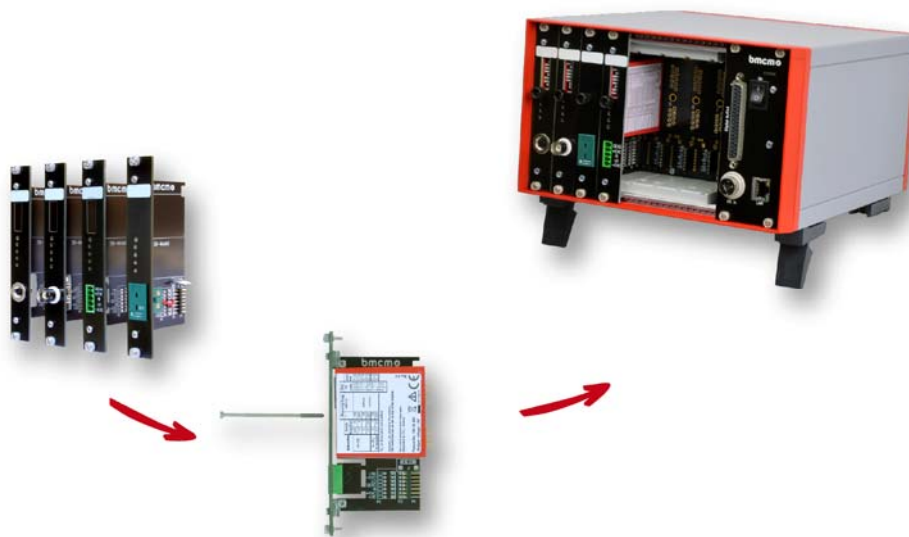
Choose Connector. Mount 5B Amplifier. Done.

The available plug-in cassettes have different connectors at the front panel. The suitable cassette can be chosen depending on the sensor or signal to be connected. Now the 5B module only has to be fixed on the cassette and be integrated in the AMS system.

Clearly Safe.

The galvanic isolation provided by the 5B modules allows interference-free operation and protects DAQ system and PC against high potentials.

16 Analog IN. 2 Analog OUT.

Signals are connected at 8 amplifier inputs with 16 bit resolution and 250kHz total sampling rate. Additional 8 analog inputs and 2 analog outputs are available directly and without amplification at a D-Sub 37 female.

32 Digital I/O. 3 Counters.

Digital states are recorded or set at 16 digital inputs and outputs each. The direction of the two 16-bit ports is set via software. Pulses, frequency, position, and pulse time can be measured with three 32-bit counters.

Networked. Distributed. Remote. Synchronized, if you Like.

The LAN technology of the AMS42-LAN16fx allows for measurement applications across great distances. Data are transmitted via network from arbitrarily many measuring points to a server PC. Signals of several devices can be synchronized with each other. The TCP/IP protocol stands for reliable data transmission - even via the internet.

Open for Everyone.

The amplifier measurement system is supported by Windows® XP/7/8 as well as Mac OS X, Free BSD, and Linux. The complete software for installation and programming of the AMS42-LAN16fx is included. The device is supported by the DAQ and analysis software NextView®4.

Functional diagram

1 Installation

1.1 Assembly

a) Equip the AMS42-LAN16fx with the plug-in cassettes (see chapter 6.2) carrying the required 5B modules.

b) Carefully push the cassette along the guide bars of the relevant slot until the 7-way pin connector of the cassette and the pins of the 5B module are plugged into the corresponding connectors on the AMS backplane.

c) If using the option *AMS-EXT8* for the AMS42-LAN16fx (see chapter 6.4), the additional cassettes 9..16 are mounted at the back of the device.

d) For a tight installation, fix the front panel at both ends with screws to the housing. Bridge unneeded slots by a blank panel (*AMS-K-BLANK*) to protect the device against outside influences.

1.2 Software Installation and Start-up Procedure

a) Connect an external power unit to the 3-pin DIN coupling for 12-40V power supply (use a supply cable with a cross sectional area >1mm^2) and turn on the AMS42-LAN16fx by pressing the switch to "1" (ON) (see chapter 2.1 and 2.3).

b) Connect the AMS device to the network (LAN) which is intended to communicate with a PC or data acquisition server (see chapter 2.4).

c) If necessary, further software components to be used with the device can be installed now, as described in chapter 4.

d) Eight analog input signals can be connected at the specific connector of the respective AMS cassette panel. The other analog channels as well as digital lines are available directly and without amplification at 37-pin D-Sub female connectors (see chapter 2.5 and 2.6).
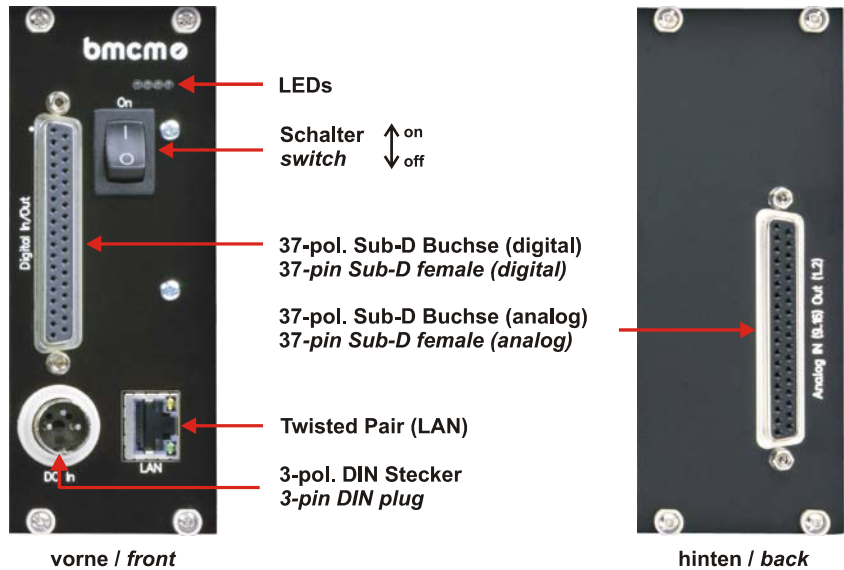

- **To change the cassettes, the power of the AMS device must be turned off!**
- **If the AMS system is operated standalone, additional grounding to enhance shielding is recommended but not mandatory.**

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2   Connections and Assignments

All available connectors and operating elements of the AMS42-LAN16fx are accessible on the right-hand side of the device front and back.

2.1   Switch

The AMS42-LAN16fx is turned on (press "1") and off (press "0") with the switch at the front side.

LEDs

Schalter   ↑ on
switch   ↓ off

37-pol. Sub-D Buchse (digital)
37-*pin Sub-D female (digital)*

37-pol. Sub-D Buchse (analog)
37-*pin Sub-D female (analog)*

Twisted Pair (LAN)

3-pol. DIN Stecker
*3-pin DIN plug*

vorne / *front* **hinten / *back***

2.2   LEDs

The four LEDs indicate the supply of the LAN measuring system and the integrated DAQ module (supplied by the PC with 5V), or signalize when commands are sent to the PC.

2.3   Power Supply

The AMS device is supplied with power (12..40V) via the 3-pin DIN plug. A power supply unit *ZU-PW40W* (24V, 1.67A DC) is optionally available.

Pin	Assignment
1	n. c.
2	ground (GND)
3	12-40V DC

GND

12..40V DC

Erde (PE)/
earth (PE)

🛑
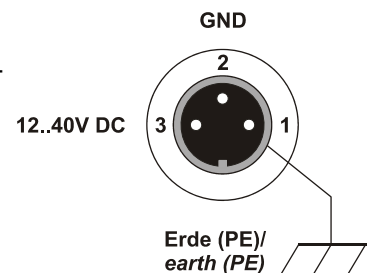
Connect the shield of the power supply with earth (PE).

2.4   Network

The PC/data acquisition server and the AMS42-LAN16fx communicate via LAN realized with a Twisted Pair connection (RJ45, 100Mbit). Due to automatic MDI/MDIX, using a crossover cable is not necessary. A Twisted Pair cable is available as accessory (*ZUKA-TP*).

If the two LEDs in the LAN connector are flashing, data are transmitted.

🛑

Firewall software installed on the PC might interfere with the operation of the AMS42-LAN16fx. In this case, please contact your network administrator.

2.5 Analog Channels

2.5.1 Measuring Amplifier Inputs

Eight analog signals can be connected to the amplifier inputs available at the respective connectors of the cassette panels. Their assignment is illustrated in the data sheet of the *AMS-K* cassettes (see chapter 6.2).

Additional 8 amplifiers inputs can be added with the option *AMS-EXT8* (see chapter 6.4) at the back of the device.

Depending on the application, the shield of the analog input cables can be applied to ground or 0V. Be sure to connect at one end of the cable only. Run the signal ground separately if possible. Lay input cable separately if possible.

Measurements can be effected on various potentials. The potential deviations, however, should not exceed 60V DC (according to VDE Association of German Electrical Engineers).
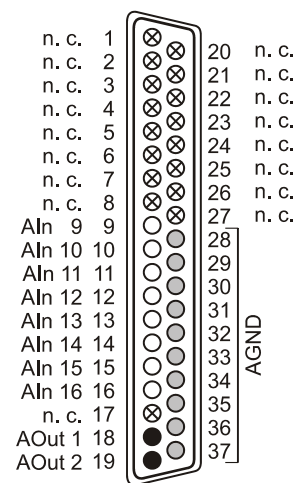
2.5.2 Analog Outputs and Other Analog Inputs

The 37-pin D-Sub female connector at the back of the device is designed for the direct and non-amplified connection of the remaining analog inputs 9..16 and the analog outputs 1+2.

The input range ($\pm10V$, $\pm5V$, $\pm2V$, $\pm1V$) is set via software (e.g. in **NextView®4**), the output range is $\pm10V$, the resolution is 16 bit respectively.

n. c.	1
n. c.	2
n. c.	3
n. c.	4
n. c.	5
n. c.	6
n. c.	7
n. c.	8
AIn 9	9
AIn 10	10
AIn 11	11
AIn 12	12
AIn 13	13
AIn 14	14
AIn 15	15
AIn 16	16
n. c.	17
AOut 1	18
AOut 2	19

20	n. c.
21	n. c.
22	n. c.
23	n. c.
24	n. c.
25	n. c.
26	n. c.
27	n. c.
28	
29	
30	
31	
32	AGND
33	
34	
35	
36	
37	

○ AIn = Analogeingang / *analog input*
● AOut = Analogausgang / *analog output*
◉ AGND = analoge Masse / *analog ground*
⊗ n. c. = nicht verbunden / *not connected*

Pin	Assignment		Pin	Assignment
1..8	n. c.		15	AIn 15
9	AIn 9		16	AIn 16
10	AIn 10		17	n. c.
11	AIn 11		18	AOut 1
12	AIn 12		19	AOut 2
13	AIn 13		20..27	n. c.
14	AIn 14		28..37	AGND

The max. potentials to ground must not exceed $\pm12V$. Any channel overload may influence measurements of other channels and may lead to wrong values.

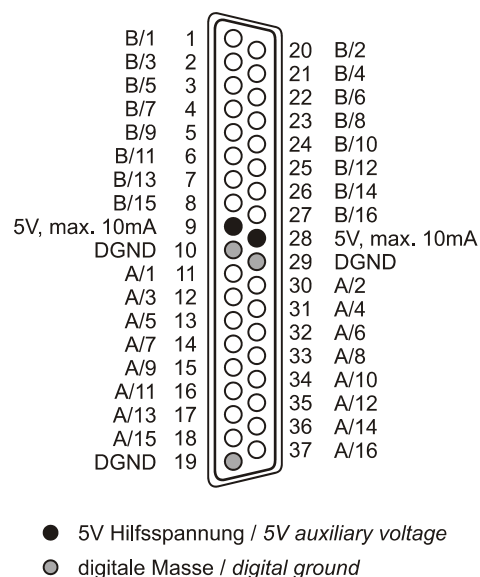## 2.6 Digital Channels and Counters

The AMS42-LAN16fx features two digital ports with 16 inputs or outputs each. The lines are bidirectional and set in groups of eight. Additionally integrated are three counters (quadrature decoders) for pulse, frequency, position, or pulse time measurement.

With the option *AMS-DIG8* (see chapter 6.4), 8 inputs and outputs each can be used as galvanically isolated optocoupler inputs and relay outputs available at the back of the device.

2.6.1 Digital Assignment

All lines are led to the 37-pin D-Sub female connector at the device front. The pin assignment is as follows:

D-Sub 37 (Digital In/Out)	Assignment (Port/Bit)	D-Sub 37 (Digital In/Out)	Assignment (Port/Bit)
11	A/1	1	B/1
30	A/2	20	B/2
12	A/3	2	B/3
31	A/4	21	B/4
13	A/5	3	B/5
32	A/6	22	B/6
14	A/7	4	B/7
33	A/8	23	B/8
15	A/9	5	B/9
34	A/10	24	B/10
16	A/11	6	B/11
35	A/12	25	B/12
17	A/13	7	B/13
36	A/14	26	B/14
18	A/15	8	B/15
37	A/16	27	B/16
10, 19, 29	DGND	9, 28	5V, max. 10mA

B/1 1 — 20 B/2
B/3 2 — 21 B/4
B/5 3 — 22 B/6
B/7 4 — 23 B/8
B/9 5 — 24 B/10
B/11 6 — 25 B/12
B/13 7 — 26 B/14
B/15 8 — 27 B/16
5V, max. 10mA 9 — 28 5V, max. 10mA
DGND 10 — 29 DGND
A/1 11 — 30 A/2
A/3 12 — 31 A/4
A/5 13 — 32 A/6
A/7 14 — 33 A/8
A/9 15 — 34 A/10
A/11 16 — 35 A/12
A/13 17 — 36 A/14
A/15 18 — 37 A/16
DGND 19

● 5V Hilfsspannung / *5V auxiliary voltage*

○ digitale Masse / *digital ground*

- **The digital inputs and outputs are protected by serial resistors. Input voltages beyond the permitted voltage range of 0V..5V can damage the device.**
- **By default, port A is set to input, port B to output.**
- **Digital inputs are always read synchronously in time together with the analog inputs.**
- **Make sure the digital outputs of the device do not drive against the outputs of your signals.**

2.6.2 5V Auxiliary Voltage

The AMS42-LAN16fx provides an auxiliary voltage (e.g. for sensor supply) at pin 9, 28 of the D-Sub37 female. The 5V DC output (max. 10mA) is protected by a fuse (multifuse). In case of overload, it is sufficient to interrupt the power supply (turn off PC or disconnect the consumer load). After app. 1 min., the multifuse will be regenerated.

2.6.3 Counters with Pulse Time Measurement

The AMS42-LAN16fx features three 32-bit counters allowing the connection of incremental encoders. The counter inputs (A, B, and Reset) can be assigned to any digital lines of the two digital ports (configure by software).
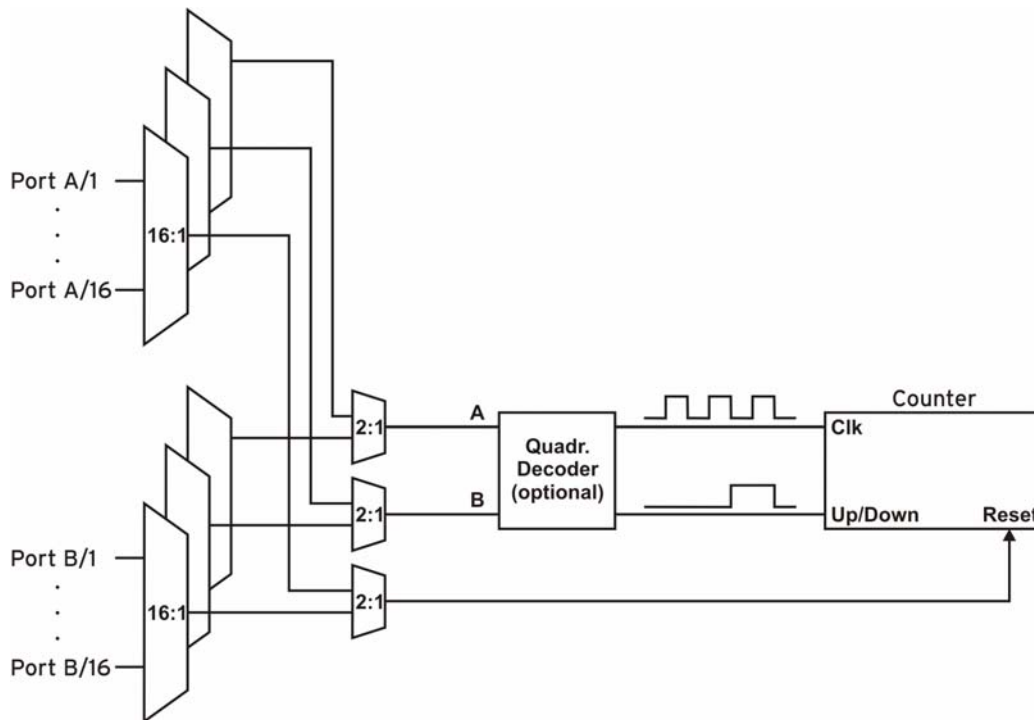
The AMS42-LAN16fx counts the number of incoming pulses (max. 16MHz) sampled at the connection of signal A. If the maximum counting range is reached, the counter will be reset to the minimum value of the counting range. If the external counter reset is connected, the counter can be reset at any time.

In comparison to a counter, the quadrature decoder used to connect an incremental encoder considers the counting direction by decoding a second phase-shifted signal.

To activate the counting function, the respective digital lines of the AMS42-LAN16fx must be assigned to the counter via software.

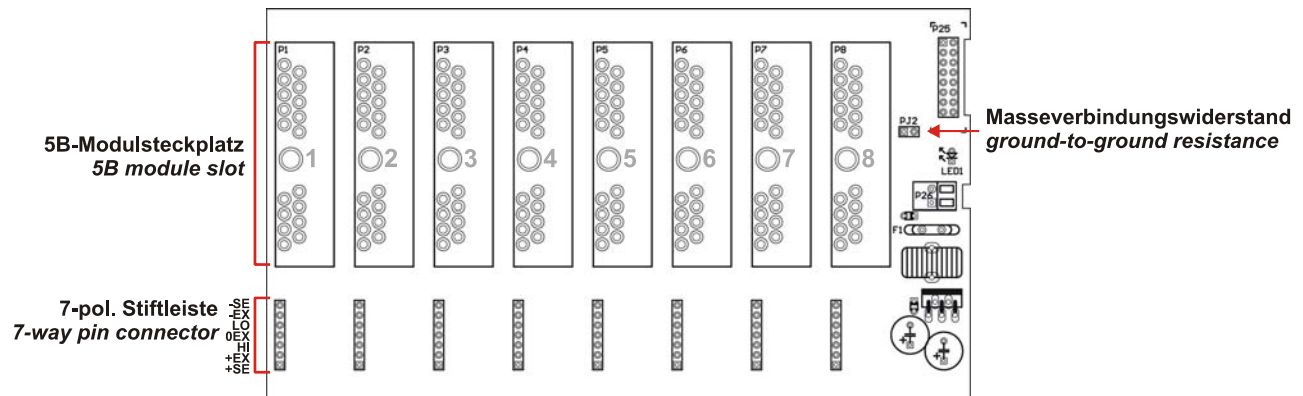| Function	Description	Max. Pulse Frequ.	Connection	Dig. Pins Used	Counting Range
Counter	count ↑	16MHz	Signal A	1	$0..2^{32}-1$
Up/Down counter	count ↑↓	16MHz	Signal A, Signal B	2	$-2^{31} .. 2^{31}-1$
Incremental encoder	count ↑↓	16MHz	Signal A, Signal B	2	$-2^{31} .. 2^{31}-1$
Pulse time measurement	measure time betw. 2 edges	16MHz	Signal A	1	-

❗

Please refer to the relevant documentation of your product for further information about connecting your incremental encoder.

3 AMS Backplane

The AMS-backplane provides 8 slots for 5B modules and the *AMS-K* plug-in cassettes (see chapter 6.2) carrying the 5B modules. If the AMS42-LAN16fx is used with the optional add-on *AMS-EXT8* (see chapter 6.4), eight slots each are available at the front and at the back of the device.

5B-Modulsteckplatz
5B module slot

7-pol. Stiftleiste
7-way pin connector

Masseverbindungswiderstand
ground-to-ground resistance

3.1 Ground-to-Ground Resistance

Ideally, the output ground is not electrically connected with the power supply ground. If, however, a connection to ground is necessary (e.g. to use the output switch in the 5B module), the 2-pin jumper (see fig. above) must be closed.

In the case of electrically connected systems (e.g. PC), this jumper represents a high-resistance bridge (1kΩ) and may generate a hum loop!

3.2 Module Pin Assignment

The pin assignment on the right shows the top view of the module backplane (see chapter 3).

The pin assignment corresponds to the 5B modules of Analog Devices®, BURR BROWN® etc. However, an additional 0EX pin has been introduced, which is particularly suitable for ungrounded shielding. This is a specific assignment of BMC Messsysteme GmbH. This pin is not connected in modules of other manufacturers.



```
n. c.  25      24  n. c.
n. c.  23      22  READ /EN
n. c.  21      20  Vout
I/O COM 19     18  n. c.
+5V    17      16  POWER COM

0 EX   7        8  n. c.
LO     5        6  HI
-EX    3        4  +EX
-SE    1        2  +SE
```
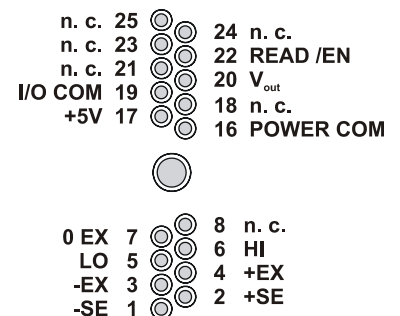
3.3 Fuse

The fusing of the AMS backplane (see chapter 3) is effected on the backplane with one reversible semiconductor fuse. In case of overload it turns off. To make the fuse work effectively again, first remove the cause for overload before disconnecting the power supply of the AMS42-LAN16fx.

3.4 Connection for AMS Cassettes

The cassettes are connected to the AMS backplane (see chapter 3) via 7-way pin connectors leading the input signals connected at the cassette panel to the backplane. The assignment of the 7-way female connector on the board is illustrated in the figure on the right-hand side.

```
-SE  - 7
-EX  - 6
LO   - 5
0EX  - 4
HI   - 3
+EX  - 2
+SE  - 1
```
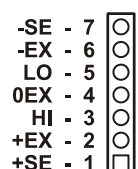
4 Software Installation and Configuration

All software and documentation available for the AMS42-LAN16fx are integrated on the "Software Collection" CD included with delivery. When inserting the CD, a CD starter opens automatically (otherwise: start `openhtml.exe`).

Change to the product page of the AMS42-LAN16fx by selecting the entry "Products" in the CD starter and then the hardware ("AMS42-LAN16fx") listed under the interface "LAN".

AMS42-LAN16fx

For detailed information about installing or operating the software, please see the corresponding manuals. The Adobe Acrobat Reader is required to open the documentation in PDF format.

You can run the installation directly from CD. If your browser prevents this, first save the setup program to hard disc before running it separately.

Software	Software product	Notes	Documentation
Configura-tion	LAN-ADMIN	free software for the configuration of bmcm LAN data acquisition systems	UM-LAN-ADMIN (user manual)
Program-ming	STR-LIBADX	ActiveX control for hardware independent pro-gramming	IG-LIBADX (installation / programming manual)
	STR-LIBADX-EX	example programs for LIBADX ActiveX control	-
	SDK-LIBAD	SDK with example programs for C/C++ on Windows®, Mac OS X, FreeBSD, Linux	UM-LIBAD4 (installation / programming manual)
Operating program	NV4.6	measuring software NextView®4 available in the Standalone versions: - Lite: "slim" version with basic functions - Pro: full version with complete functional range - Analysis: version for the analysis of stored measuring data NextView®4 can be used for free as a fully func-tional 30-day trial version. After purchasing the software, all projects, measurement files, and settings can still be used.	DS-NV4 (data sheet) UM-NV4 (user manual) "First steps" in the NextView®4 demo project (displayed when first starting the software)

4.1 Configuration with LAN-AD16f Administration Utility

Network settings, firmware version and connection quality of the AMS42-LAN16fx can be tested or changed with the configuration software "LAN-AD16f Administration Utility".

The data acquisition unit integrated in the AMS42-LAN16fx is a LAN-AD16fx. It is displayed by software as "LAN-Base". The user manual UM-LAN-ADMIN describes in detail how to use the configuration software.

4.1.1 Installation

The installation program for the configuration software LAN-AD16f Administration Utility is included on the AMS42-LAN16fx product page of the "Software Collection" CD. During installation, you will be prompted to choose the desired program group, to open the LAN-AD16f Administration Utility via the Windows® Start menu, and the directory path, in which the software is to be installed.

If using default settings, the entry "LAN-AD16f Administration Utility" will be available under "Programs" in the Windows® Start menu after installation.

4.1.2 Operation

In the left window of the program screen, all DAQ systems with a working network connection to the PC are listed displaying their serial number (turn on device!). The AMS42-LAN16fx is displayed as "LAN-Base".

In the condition as supplied to the customer, the device automatically self-assigns an IP address.

Select a network DAQ system to show the parameters of this device in the TABs on the right.

Settings can be modified by clicking the "Options" button.
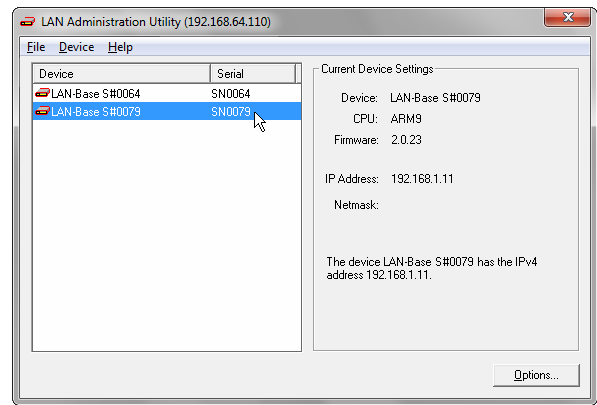
We strongly recommend using the automatically assigned configuration. Manual changes should only be done by a network administrator.

4.1.3 Notes about TCP/IP

Each participant of the network has his own IP address consisting of four groups of numbers. To guarantee that a data package arrives at the correct address, this IP address must have been given out only once.

Each IP address contains the network number identifying the net your PC belongs to. Please make sure the PC and the AMS42-LAN16fx are in the same net, i.e. they have the same network number, to be able to communicate with each other.

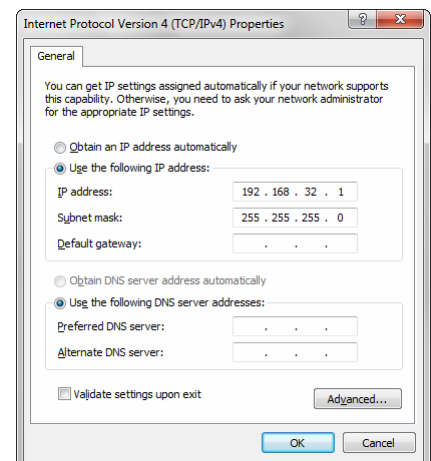### 4.1.4 Example Configuration for the Manual Input of the Network Settings

If there is only the PC and the DAQ system in your network (network number **192.168.32.0**), you can use the following configuration. The IP address currently set in the PC is shown in the title bar of the LAN-AD16f Administration Utility:

Configuration	Value
IP address PC (see chapter 4.1.5)	**192.168.32.1**
IP address AMS42-LAN16fx	**192.168.32.2**
network mask	**255.255.255.0**

4.1.5 Assign IP Address to the PC

The IP address of the PC and the netmask is entered via the Control Panel of the PC in the dialog "Internet Protocol (TCP/IP) Properties". Step by step click the following entries:

Windows® 7	Windows® 8	Windows® XP
✓ Start	✓ right-click screen corner bottom left	✓ Start
✓ Control Panel	✓ Control Panel	✓ Control Panel
✓ Network and Internet	✓ Network and Internet	✓ dialog "Network Connections"
✓ Network and Sharing Center	✓ Network and Sharing Center	✓ Local Area Connection
✓ Connections: Local Area Connection	✓ Connections: Ethernet	✓ button "Properties" (in TAB "General")
✓ button "Properties"	✓ button "Properties"	✓ item "Internet Protocol (TCP/IP)" (in TAB "General")
✓ item "Internet Protocol Version 4 (TCP/IPv4)"	✓ item "Internet Protocol Version 4 (TCP/IPv4)"	✓ button "Properties"
✓ button "Properties"	✓ button "Properties"	✓ TAB "General"
✓ TAB "General"	✓ TAB "General"	

4.2 Programming

Programming the AMS42-LAN16fx (installed as "LAN-Base") with Visual Basic®, Delphi®, Visual C++™ under Windows® XP/7/8 is possible with the hardware independent STR-LIBADX. It is available on the AMS42-LAN16fx product page of the "Software Collection" CD. After installation, the ActiveX control must be loaded into the respective programming environment.

- **Visual Basic®**: menu "Project / Components", entry "LIBADX Object Library 4.0"
- **Delphi®**:   menu "Components / Import ActiveX", entry "LIBADX Object Library 4.0"

If you select the entry STR-LIBADX-EX listed directly under the installation program of the corresponding ActiveX control, you can install example programs (with source code) demonstrating how to apply the ActiveX control.

Programming the AMS42-LAN16fx (installed as "LAN-Base") under Mac OS X and Unix (FreeBSD, Linux) with C/C++ is done by means of the LIBAD4 programming interface.

The SDK-LIBAD for the respective operating system (also Windows®) is included on the product page of the AMS42-LAN16fx. For further information about how to integrate the SDK in the programming environment, please see the corresponding programming manual UM-LIBAD4.

4.3 Using AMS42-LAN16fx with NextView®4

Install the fully functional trial of the professional software NextView®4 for data acquisition and processing to directly test the features and functions of the AMS42-LAN16fx (installed as "LAN-Base").

The setup program NV4.6 is available on the product page of the card. When first starting the software, request a license number with the option "Request 30 days free trial version" being checked and select your DAQ system (LAN-Base) in the following dialog "Device Setup".

The data sheet and the start project of NextView®4 contain first instructions about how to install and operate the program. For detailed information, an online help is provided.

The trial is valid for 30 days after requesting the license number. If a license is not purchased within this period, the functional range of NextView®4 will be considerably cut down!

5 Synchronization

In NextView®4 (see chapter 4.3), AMS42-LAN16fx devices can do measurement time-synchronously in relation to real-time. The frequency of the sample clock is adjusted by means of a configured NTP server.

Settings for time-synchronous measurements are done in the LAN-AD16f Administration Utility (see chapter 4.1) as well as in NextView®4 and are described in the user manual UM-LAN-ADMIN.

6 Supplementary Products for the AMS42-LAN16fx

6.1 5B Modules (MA Line)

The 5B measuring amplifiers from bmcm allow for the professional signal adjustment to a data acquisition system.

The amplifier output is ±5V or 0..5V. Most of the modules are electrically isolating and provide sensor supply.

The following 5B modules from bmcm are available:

Product	Description
MA-UNI	universal amplifier with galvanic isolation for U, I, R, thermocouple, strain gauge, LVDT
MA-UI	multi-range amplifier with galvanic isolation for U, I
MA-U	voltage measuring amplifier with galvanic isolation, 50kHz bandwidth
MA-P09/12/15	power supply modules ±9V/ ±12V/±15V

6.2 Plug-in Cassettes (AMS-K Line)

The amplifier system can individually be equipped with 8 plug-in cassettes (or 16 with option *AMS-EXT8*, see chapter 6.3).

Each cassette is equipped with the relevant 5B module and suitable input connector.

The suitable input connector on the front panel guarantees for the relevant connection to be available when exchanging the cassette.

The following cassettes are available:

| Product	Description
AMS-K-BIN5	cassette with panel and 5-pin Binder female connector (712 series)
AMS-K-BLANK	blank panel
AMS-K-BNC	cassette with front panel and BNC female connector
AMS-K-CO5	cassette with front panel and 5-pin terminal connector
AMS-K-THK	cassette with front panel and thermocouple socket (type K)

6.3 AMS-HANDLE2

For mobile use, the AMS42-LAN16fx can be equipped with two stable metal handles at the housing frame (*AMS-HANDLE2*).
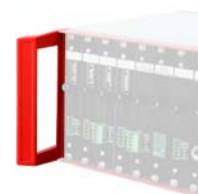
6.4 AMS-EXT8, AMS-DIG8

With the add-on option *AMS-EXT8*, the analog inputs 9..16 are available as amplifier inputs, and eight opto-isolated digital inputs and eight relay outputs with the option *AMS-DIG8*.

These channels are accessible at the back of the amplifier measurement system and not at the 37-pin D-Sub females of the device anymore (see chapter 2.5.2 and 2.6.1).
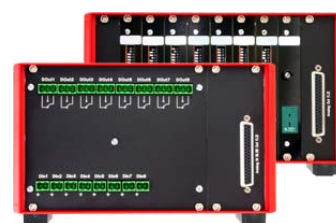
7 Important Notes for Using the AMS42-LAN16fx

- The device is only suitable for extra-low voltages - please observe the relevant regulations! Only use the device with housing closed. ESD voltages at open lines may cause malfunction.
- Only use an electrical isolated power supply unit (with CE).
- For cleaning only use non-solvent detergents. The product is designed to be maintenance-free.
- For calibration purposes, the device must be returned to BMC Messsysteme GmbH.
- For reasons relating to CE use shielded cables. Connect the shield to ground at one end only. Close open inputs if possible. ESD voltages on lines may cause malfunction during operation.
- When mounting the cassettes, a connection between power supply ground and chassis of the device is made via the module screw.
- The Gain is adjusted to even values. Therefore only 64000 (with 16 bit) values of the full range of the converter are used. As a result, the measuring ranges are effectively slightly larger (e.g. ±5.12V) than the indicated measuring ranges, providing for the advantage that overranges can be recognized.
- The device must not be used for safety-relevant tasks. With the use of the product, the customer becomes manufacturer by law and is therefore fully responsible for the proper installation and use of the product. In the case of improper use and/or unauthorized interference, our warranty ceases and any warranty claim is excluded.

Do not dispose of the product in the domestic waste or at any waste collection places. It has to be either duly disposed according to the WEEE directive or can be returned to bmcm at your own expense.

8 Technical Data (typical at 20°C, after 5min., +24V supply)

• Analog Channels

Inputs (Measuring range):	8 amplifier inputs (±5V), 8 single-ended, non-amplified inputs (±10V, ±5V, ±2V, ±1V)		
Measuring range // Noise:	±10V // ±5 LSB	±5V // ±7 LSB	±2V // ±8 LSB	±1V // ±8 LSB
Sampling rate // Resolution:	max. 250kHz total sampling rate* // 16 bit		
Abs. accuracy // Memory depth:	±2.5mV // only depending on the size of the hard disk of the server PC		
Surge protection:	±35V (when turned on), ±20V (when turned off), max. ±20mA in total of all input channels!		
Input resistance // Input capacity:	1MΩ (with PC turned off: 1kΩ) // 5pF		
Zero shift // Gain drop:	±50ppm/°C // ±50ppm/°C		
Frequency accuracy // Frequency drift:	max. ±100ppm // max. ±50ppm/°C		
Outputs // Output range // Output current:	2 voltage outputs (16 bit) // ±10V // max. 1mA		
Galv. isolation (to PC // to each other):	all analog channels electrically isolated to the PC // amplifier inputs: depends on the 5B modules used		

* The total sampling rate is the sum of the sampling rates of the individual used channels (e.g. if 5 channels are scanned with 1kHz, the total sampling rate adds up to 5kHz).
The values for accuracy always relate to the respective measuring range. Errors might add at worst.

• Digital Channels

Channels // Level:	16 Digital IN, 16 Digital OUT // CMOS/TTL compatible (low: 0V..0.7V; high: 3V..5V)
Counter:	19-bit counter, up/down counter or incremental encoder; connect at digital pins
Resistance R_i // Output current:	Digital IN: 10kΩ, Digital OUT: 1kΩ // 0.5mA

• General Data

Power supply:	+12..40V DC, ±5%, min 3W, max. 20W (depends on number of 5B modules used) at 3-pin DIN plug
Analog connections:	amplifier inputs: different connectors (Phoenix, Binder, BNC, Thermo) on the front panels of the cassettes; other analog channels at a 37-pin D-Sub female at the device back
Digital connections:	all channels at a 37-pin D-Sub female at the device front
LAN connection:	Twisted Pair RJ45 connector, 100Mbit
CE standards:	EN61000-6-1, EN61000-6-3, EN61010-1; for decl. of conformity (PDF)
ElektroG // ear registration:	RoHS and WEEE compliant // WEEE Reg.-No. DE75472248
Max. permissible potentials // Protection:	**60V DC acc. to VDE**, max. 1kV ESD on open lines // IP20
Temperature ranges // Relative humidity:	operating temp. -25..50°C, storage temp. -25..70°C // 0-90% (not condensing)
Dimensions (W x H x D):	23,5cm x 13,2cm x 25,6cm
Delivery:	device, "Software Collection" CD, description
Available accessories:	plug-in cassettes with front panels and different connectors of the AMS-K series, 8-channel extension AMS-EXT8 for add. 8 amplifier inputs, extension AMS-DIG8 for 8 optocoupler inputs and 8 relay outputs, D-Sub plug ZU37ST, 3-pin DIN socket ZU3DIN, gender changer ZU37SS, connecting cables ZUKA37SB/SS (D-Sub), ZUKA-TP (Twisted Pair), desktop power supply ZU-PW40W (24V, 1.67A DC), carrying handle AMS-HANDLE2
Warranty:	2 years from date of purchase at bmcm, claims for damages resulting from improper use excluded

• Software

Software on CD (included):	ActiveX Controls LIBADX (hardware independent) for programming on Windows® XP/7/8; LIBAD4 SDK for C/C++ programming on Windows® XP/7/8, Mac OS X, FreeBSD, Linux; trial version of the measuring software NextView®4 to test and operate the hardware; configuration software LAN-Admin
NextView®4 (optional):	professional software (versions: Professional, Lite) for the acquisition and analysis of measurement data on Windows® XP/7/8