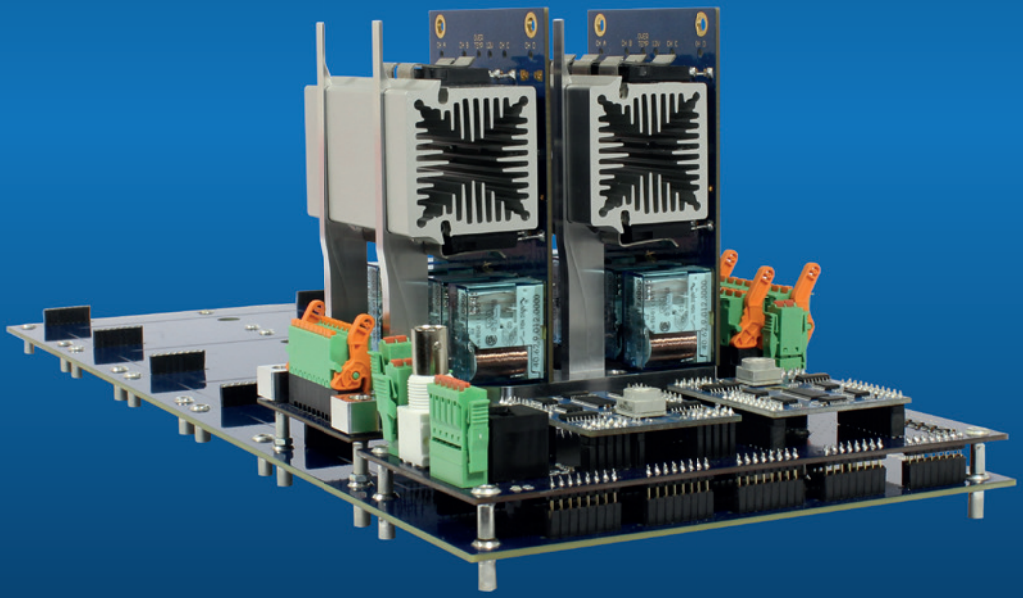
ALLDAQ

Competence in Measurement

Manual Rev. 1.0 EN



ADQ-LB System

Imprint

Manual ADQ-LB System Rev. 1.0

ALLNET® GmbH Computersysteme
Division ALLDAQ
Maistrasse 2
D-82110 Germering

Support
E-Mail: support@alldaq.com
Phone: +49 (0)89 894 222 – 474
Fax: +49 (0)89 894 222 – 33
Internet: www.alldaq.com/support

Content

1. Introduction

Please check the packaging and contents for damage and completeness before use. Should any defects occur, please inform us immediately.

- Does anything on the packaging indicate that something was damaged during transport?
- Are there any signs of use on the device?

Under no circumstances may you operate the device if it is damaged. In case of doubt, contact our technical customer service.

Please read - before installing the device - this manual carefully!

1.1 Scope of delivery (depending on expansion stage)

- ALLDAQ Backplane ADQ-LB-BP for ADQ-LB-UCM and ADQ-LB-BM
- ALLDAQ ADQ-LB-UCM control unit with ADQ-LINK
- ALLDAQ ADQ-LB-BM carrier board for ADQ-LB-LM modules
- ALLDAQ ADQ-LB-LM (load module)
- ALLDAQ ADQ-LB-MB for mechanical mounting of the ADQ-LB-LM modules on ADQ-LB-BM carrier board (optional)

1.2 Safety instructions

Please note the following instructions:

- Never expose the device to direct sunlight during operation.
- Never operate the device near heat sources.
- Protect the device from moisture, dust, liquids and vapors.
- Do not use the device in damp rooms and under no circumstances in explosive areas.
- Repairs may only be carried out by trained, authorized personnel.
- Please observe the installation regulations and all relevant standards (including VDE standards) when commissioning the device, especially when operating with voltages higher than 42 V.
- We recommend to always connect unused inputs to the corresponding reference ground to avoid crosstalk between the input channels.
- Always disconnect your field wiring from the voltage source before you make or break cable connections to the card.
- Make sure that no static discharge can occur through the device when handling the board. Follow standard ESD protection measures.
- Never connect the devices to live parts, especially not to mains voltage.
- Precautions to avoid unpredictable misuse must be taken by the user.

ALLNET® GmbH Computersysteme is not liable for improper use and the resulting damage.

1.3 Installation and assembly site

The ADQ-LB system is intended for installation in measuring and test systems by qualified personnel. The relevant installation regulations and standards must be observed.

The ADQ-LB system may only be used in dry rooms. Ensure sufficient heat dissipation. Ensure that the connecting cables are securely attached. The installation must be carried out in such a way that the cables are not under tension, otherwise they may become loose.

Please also make sure that the cables are not bent or laid in too tight bending radii. If cable ties or the like are used to fix the cable, they must not be pulled too much to avoid internal short circuits in the cable. We cannot accept any liability for damage and failures caused by this.

1.4 Brief description

The signal conditioning unit ALLDAQ ADQ-LB-System was developed for use in the field of industrial automation in order to apply an appropriate resistive load to the DUT in automated measurement and test systems (e.g. load of audio amplifiers). The ADQ-LB system is controlled by the ADQ-LINK bus. For this purpose ALLDAQ offers preconfigured ADQ-LB-LM modules. Other loads are possible on request.

Important features:

- Load for analog signals of different levels
- Load for analog signals at up to 200W/channel
- Modular design (up to 32 channels, individually switchable load channels depending on the expansion stage)
- Automatic fan control
- Emergency shutdown of the individual loads in case of overheating of the load resistors independently of software control
- Status indicators for power, relay, emergency shutdown and fan
- Optimized for operation with the ADQ-SCU or ADQ-SCU-LC
- Can also be used as stand-alone (simple control via ADQ-153)
- API for easy integration into your application
- Easy control via the ALLDAQ driver system
- Customer-specific extensions via plug-in modules
- Easy control via ADQ-LINK

To fully exploit the potential of the ADQ-LB system, a combination with the ALLDAQ signal conditioning unit ADQ-SCU/LC and the multifunction measurement card ADQ-348 is recommended.

1.5 System requirements

Hardware

- PC system with a current Intel® or compatible processor based on the x86(-64) architecture
- Optional ALLDAQ driver

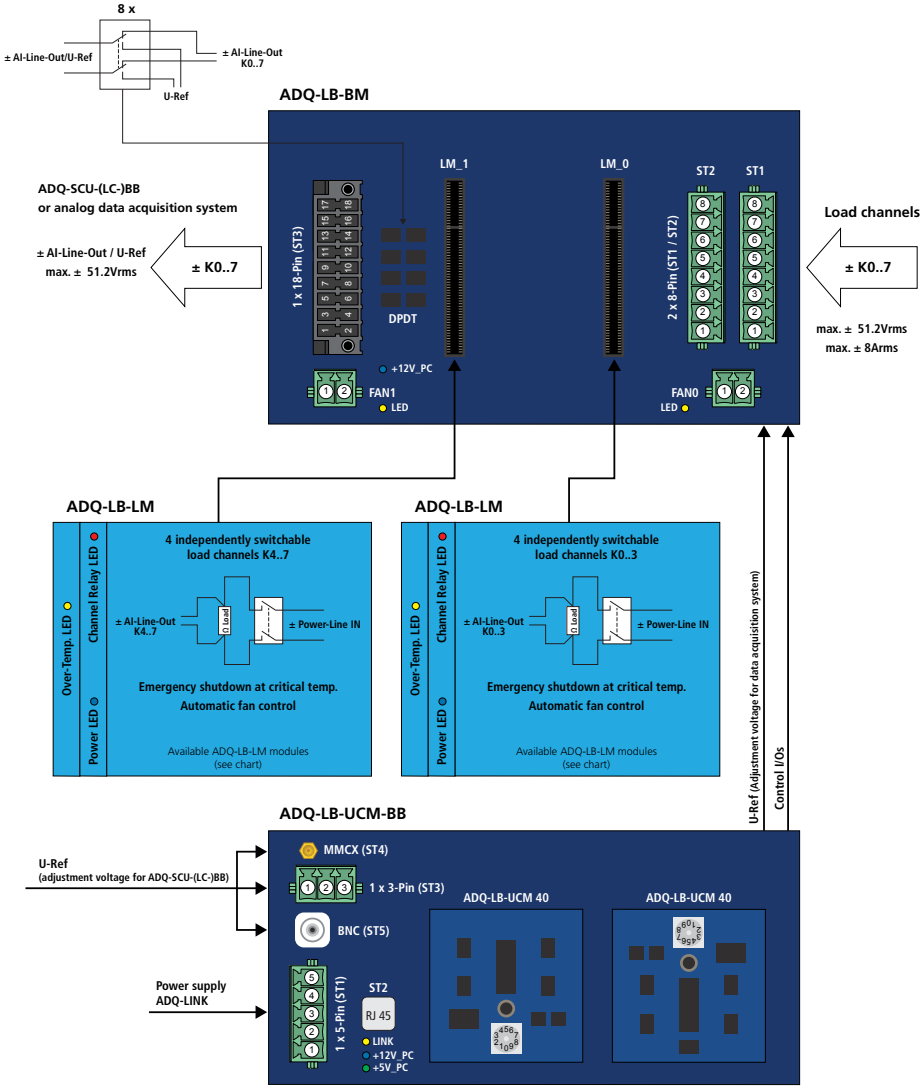
Software

On the ALLDAQ homepage you will find drivers for Windows 10/8.1/8/7 (32 and 64 bit) as well as a function library (API) with code examples for high-level language programming.

Please refer to the corresponding help file adqSDK.chm. Details on programming can also be found in the help file adqDriver.chm, which can be accessed via the „ALLDAQ Manager" in the info area of the taskbar (usually in the lower right corner) or the Windows start menu.

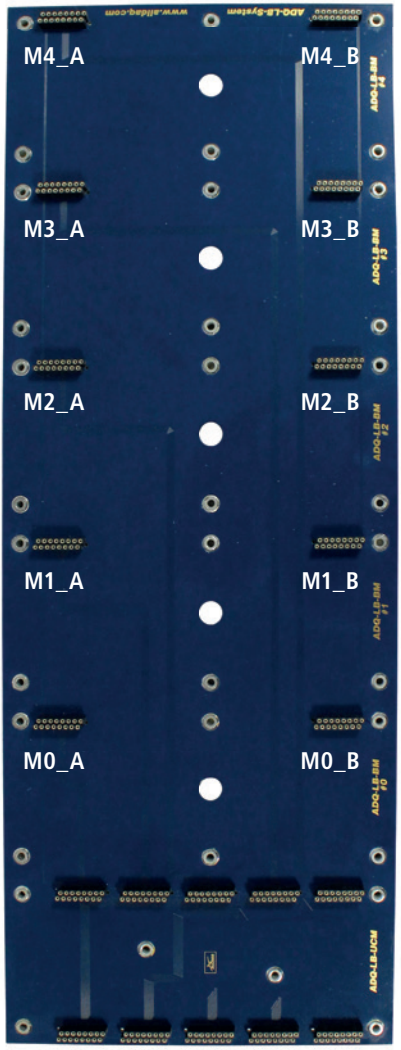
2. Overview of the system

2.1 Block diagram



2.2 ADQ-LB-BP

ADQ-LB-BP Backplane



If you do not equip all ADQ-LB-BM, you can use the free openCollector OUT 0..15 switching outputs (default at delivery) (see chart).

Pin	M0 … M4	
	A	B
1	12V	12V
2	12V	12V
3	GND	GND
4	GND	GND
5	openCollector OUT_0	openCollector OUT_8
6	openCollector OUT_1	openCollector OUT_9
7	openCollector OUT_2	openCollector OUT_10
8	openCollector OUT_3	openCollector OUT_11
9	openCollector OUT_4	openCollector OUT_12
10	openCollector OUT_5	openCollector OUT_13
11	openCollector OUT_6	openCollector OUT_14
12	openCollector OUT_7	openCollector OUT_15
13	GND	GND
14	U Ref_N	LM1_ID
15	U Ref_P	LM0_ID
16	GND	reserved do not connect

If you need TTL IN/OUT instead of the openCollector switching outputs, please contact us. In the ALLDAQ driver you will find the corresponding API functions.

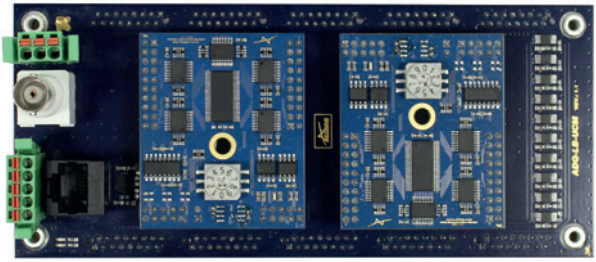
5x ADQ-LB-BM
Carrier module for ADQ-LB-LM modules

1x ADQ-LB-UCM

2.3 ADQ-LB-UCM

Possibility to feed in reference signals (U-Ref) in order to calibrate or adjust the connected measuring system. Automated recognition of the installed load modules (ADQ-LB-LM on the carrier module ADQ-LB-BM); check for presence and detection of the installed resistance values.

ADQ-LINK connection



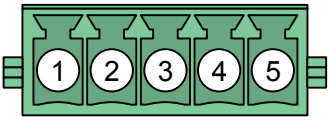
2.3.1 Connector designation and assignment

Special functions (ST1) and (ST2)

This connector can be used to control the ADQ-LB-UCM via the ADQ-LINK.

ADQ-LINK (point to point):

- Overvoltage protection of cables up to ± 60 V / ADQ devices can be placed up to 100 m (twisted cable)
- IEC Level 4 ESD ± 8 kV and EFT ± 5 kV
- Status-LED (yellow), if connection to a remote device is available



Würth 5-pin (691305130005)
Mating connector (691305130005)

Pin	ST1	Note
1	+ADQ-LINK	Differential BUS
2	GND_PC	PC ground
3	+5V_PC	Power supply from PC power supply unit
4	-ADQ-LINK	Differential BUS
5	+12V_PC	Power supply from PC power supply unit

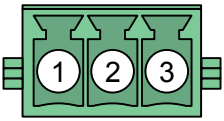
Note: Route ADQ link via simple twisted pair cable.

RJ-45 Pin assignment

Pin	ST2	Note
1	NC	
2	NC	
3	NC	
4	NC	
5	GND_PC	PC ground
6	GND_PC	PC ground
7	-ADQ-LINK	Differential BUS
8	+ADQ-LINK	Differential BUS

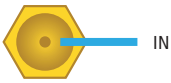
U-Ref (ST3), (ST4) and (ST5)

The adjustment voltage for ADQ-SCU-(LC-)BB) can be fed in via this connector.



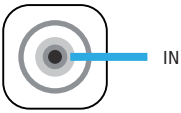
Würth 3-pin (691305130003)
Mating connector (691305130003)

Pin	ST3	Note
1	GND_PC	PC ground
2	U-Ref (P)	+U-Ref
3	U-Ref (N)	-U-Ref



MMCX

Pin	ST4	Note
1	U-Ref (P)	IN
2	U-Ref (N)	OUT

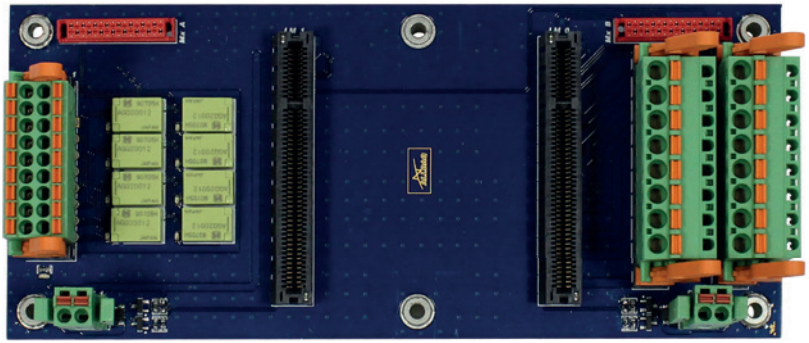


BNC

Pin	ST5	Note
1	U-Ref (P)	IN
2	U-Ref (N)	OUT

2.4 ADQ-LB-BM

Support module for the ADQ-LB-LM modules.

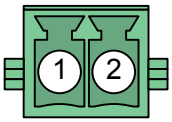


ADQ-LB-MH

Module holder for ADQ-LB-LM.

2.4.1 Connector designation and assignment

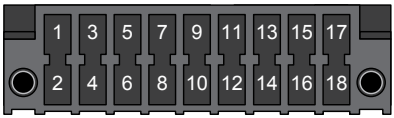
Fan connector (FAN0) and (FAN1)



Würth 2-pin (691305130002)
Mating connector (691305130002)

Pin	FANO/FAN1	Note
1	+12V_PC	Power supply from PC power supply unit
2	Switching output (GND_PC)	Type: Open Collector negative pole from a 12VDC fan (Imax. 0.5A)

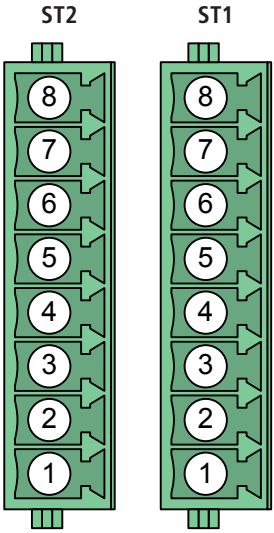
± AI-Line-Out / U-Ref (ST3)



Type: Phoenix Contact (1711100)
Mating connector (1790551)

Pin	ST3	Note
1	-K7	± AI-Line-Out / U-Ref
2	+K7	± AI-Line-Out / U-Ref
3	-K6	± AI-Line-Out / U-Ref
4	+K6	± AI-Line-Out / U-Ref
5	-K5	± AI-Line-Out / U-Ref
6	+K5	± AI-Line-Out / U-Ref
7	-K4	± AI-Line-Out / U-Ref
8	+K4	± AI-Line-Out / U-Ref
9	-K3	± AI-Line-Out / U-Ref
10	+K3	± AI-Line-Out / U-Ref
11	-K2	± AI-Line-Out / U-Ref
12	+K2	± AI-Line-Out / U-Ref
13	-K1	± AI-Line-Out / U-Ref
14	+K1	± AI-Line-Out / U-Ref
15	-K0	± AI-Line-Out / U-Ref
16	+K0	± AI-Line-Out / U-Ref
17	AGND	Analog reference ground for data acquisition system (e.g. ADQ-SCU/LC)
18	AGND	Analog reference ground for data acquisition system (e.g. ADQ-SCU/LC)

Load Channel Connections (ST1) and (ST2)

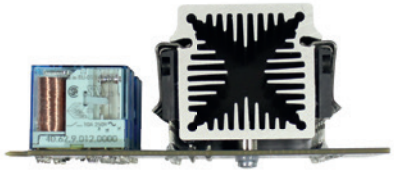


Type: Phoenix Contact (1792795)
Mating connector (1792575)

Pin	ST2	ST1
8	+K0	-K0
7	+K1	-K1
6	+K2	-K2
5	+K3	-K3
4	+K4	-K4
3	+K5	-K5
2	+K6	-K6
1	+K7	-K7

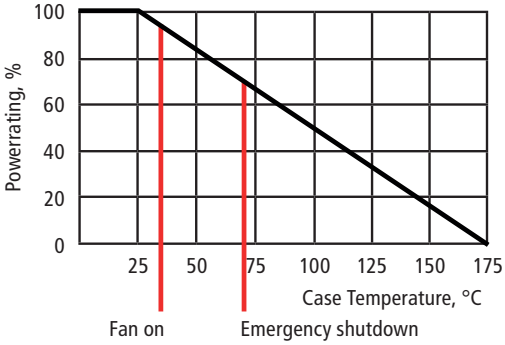
2.5 ADQ-LB-LM

Load modules with the corresponding load resistances (see table)



ID (U)	Art.-Nr.	CH_0 (4)	CH_1 (5)	CH_2 (6)	CH_3 (7)
6	183233	2R/100W	2R/100W	2R/100W	2R/100W
3	180736	4R/100W	4R/100W	4R/100W	4R/100W
9	180734	8R/100W	8R/100W	8R/100W	8R/100W
1,5	189210	10R/100W	10R/100W	10R/100W	10R/100W
4,5	189211	16R/100W	16R/100W	16R/100W	16R/100W
7,5	180737	2R/200W	2R/200W	2R/200W	2R/200W
10,5	180618	4R/200W	4R/200W	4R/200W	4R/200W
0,75	180406	8R/200W	8R/200W	8R/200W	8R/200W
2,25	180619	10R/200W	10R/200W	10R/200W	10R/200W
3,75	189212	16R/200W	16R/200W	16R/200W	16R/200W
5,25	180620	8R/200W	8R/200W	10R/200W	2R/200W

Customer-specific configuration of the load resistors possible. Please contact our sales department.



Derating Using Case Temperature (T_C):
All Power and associated overload ratings are derating based upon case temperature using the derating curve.

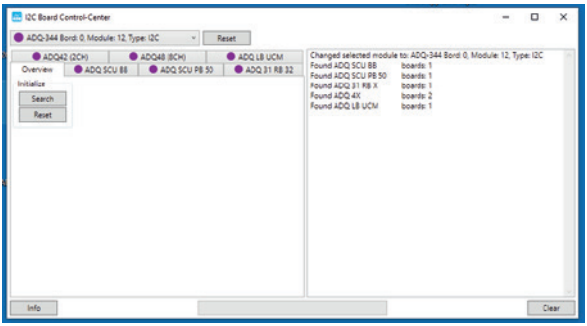
Temporary overload rating after a cold start: 1.5 x channel power (max. 4 sec.)

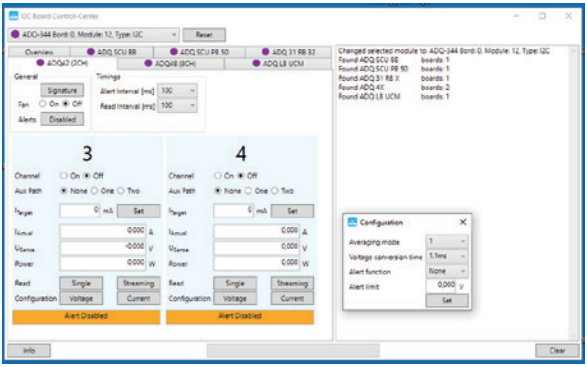
Fan for ADQ-LB-LM modules

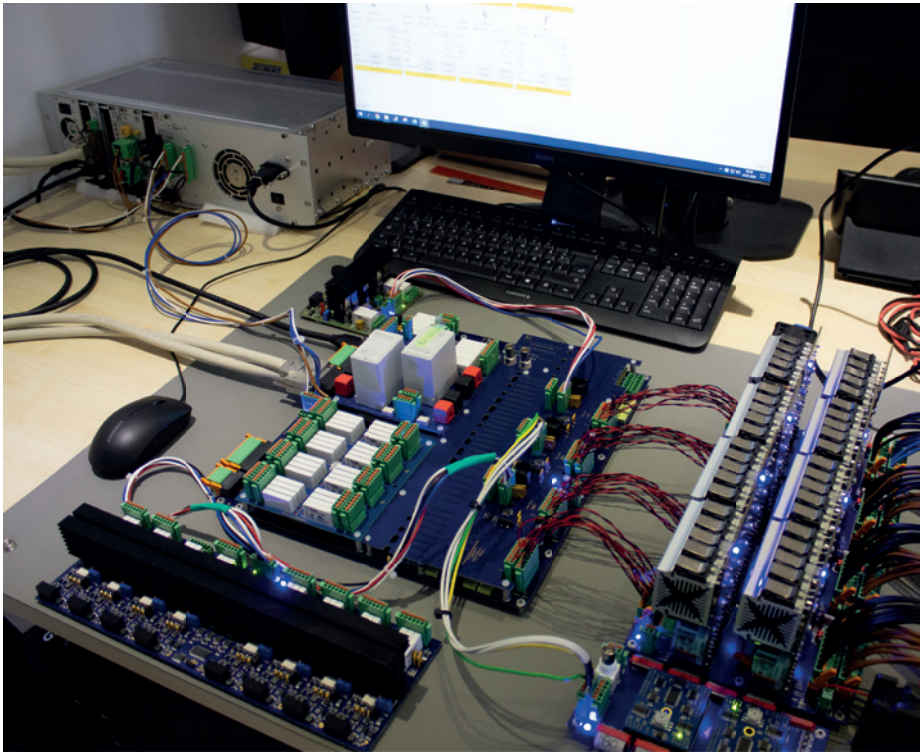
Fan for ADQ-LB-LM modules (Art. No. 189126)

3. ALLDAQ I2C Board Control Center

To learn how to use the ADQ-LB system, there is the I2C Board Control Center in the ALLDAQ-Launcher under Tools.







4. Specifications

Conditions: TA = 25°C unless otherwise specified; warm-up time: 30 minutes.

Element	Condition	Specification
Supply	ST1	+5 V / +12 V Supply via Würth connector from PC power supply unit
Quiescent current consumption ADQ-LB-System full extension	No relay energized	+5 V: max. 50 mA +12 V: max. 100 mA
Power consumption ADQ-LB-System full extension	ADQ-LB-BM All relays energized	+5 V: max. 128 mA +12 V: max. 80 mA
	ADQ-LB-LM All relays energized	+5 V: max. 130 mA +12 V: max. 490mA
Status displays LED UCM module	Power 5V	Green
	Power 12V	Blue
Custom Relay Driver	12 V	0.5 A per channel
Temperature range	Operation	0..60 °C (standard)
Humidity	Operation	20%..55% (non-condensing)
Dimensions (W x D x H)	ADQ-LB-BP	465 x 170 x 20 mm
	ADQ-LB-UCM	71 x 166 x 50 mm
	ADQ-LB-BM	115 x 76 x 49 mm
	Total amount	145 mm
Manufacturer warranty incl. load modules		36 months

ADQ-LB-BM carrier board

Element	Condition	Specification
Type		FTR-B3CA()Z standard
Quantity	AI part	up to 8 relays in the AI signal path
Type of contact		2-pin changeover contact (DPDT)
contact material		silver/nickel with gold plating
Contact resistance	1 A / 6 VDC	max. 75 mΩ at 1 A/6 VDC
Switching time	Response time	max. 3 ms
	Relapse time	max. 3 ms
Switching cycles	Mechanical	min. 50 000 000
Switching output (FAN0/1)	Collector output	Imax. 0.5A
Status indicators LED	U-Ref relay	Red
	Automatic fan	Yellow
Ground reference	GND PC	

ADQ-LB-LM module

Element	Condition	Specification
Quantity/Type		2 change over relay (DPDT), Type: Finder series 40.62
Contact material		AgNi
Switching time	Response time	max. 12 ms
	Switching cycles	max. 4 ms
Electrical lifetime	mechanical	min. 10 000 000
Min. switching load		min. 100 x 10^3
Max. continuous current/	mW (V/mA)	300mW (5V/5mA) must not fall below
Max. inrush current	DC	10/20A
Max. switching load	AC	2500VA
Pulsrating	Temporary overload after a cold start	1.5 x channel power (max. 4 sec.)
Status indicators LED	Channel relay	Red
	Connection	Blue
	Emergency shutdown	Yellow
Connection	Edge connector	

5. Annex

5.1 Accessoires

ADQ products

- ADQ-63 (Art. No. 188372), control box ADQ-LINK-Bus
- ADQ-153 (Art. No. 185076), control box USB to ADQ-LINK bus
- ADQ-62 (Part No. 185077), ADQ-LINK distributor (STAR)
- ALLDAQ ADQ-LB-MH (Art. No. 189126), for mechanical mounting of the ADQ-LB-LM modules on the ADQ-LB-BM carrier board
- Fan for ADQ-LB-LM modules (Art. No. 189126)

5.2 Manufacturer and support

ALLNET® is a registered trademark of ALLNET® GmbH Computersysteme. For questions, problems and for product information of any kind please contact the manufacturer directly:

ALLNET® GmbH Computersysteme
Division ALLDAQ
Maistrasse 2, D-82110 Germering

E-mail: support@alldaq.com
Phone: +49 (0)89 894 222 – 474
Fax: +49 (0)89 894 222 – 33
Internet: www.alldaq.com

5.3 Packaging ordinance

„In principle, manufacturers and distributors are obliged to ensure that sales packaging is taken back from the final consumer after use and is reused or recycled. (according to § 4 sentence 1 of the packaging ordinance). If you as a customer have problems with the disposal of packaging and shipping materials, please write an e-mail to info@allnet.de.

5.4 Recycling advice and RoHS conformity

The ADQ-LB system bears the CE mark.
This device meets the requirements of the EU Directive 2004/108/EC, Directive on electromagnetic compatibility and mutual recognition of their conformity. Conformity with the above directive is confirmed by the CE mark on the device.

ALLNET® products are manufactured RoHs compliant (RoHS = Restriction of the use of certain hazardous substances).

5.5 CE identification

The ADQ-LB system bears the CE mark.
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5.6 Warranty

Within the warranty period, we eliminate manufacturing and material defects free of charge. You will find the warranty conditions valid for your country on the homepage of your distributor. If you have any questions or problems concerning the application, you can reach us during our normal opening hours at the following telephone number +49 (0)89 894 222 - 474 or by e-mail to: support@alldaq.com.

ALLNET® GmbH Computersysteme
Division ALLDAQ
Maistrasse 2, D-82110 Germering
E-mail: support@alldaq.com
Phone: +49 (0)89 894 222 – 474
Fax: +49 (0)89 894 222 – 33
Internet: www.alldaq.com