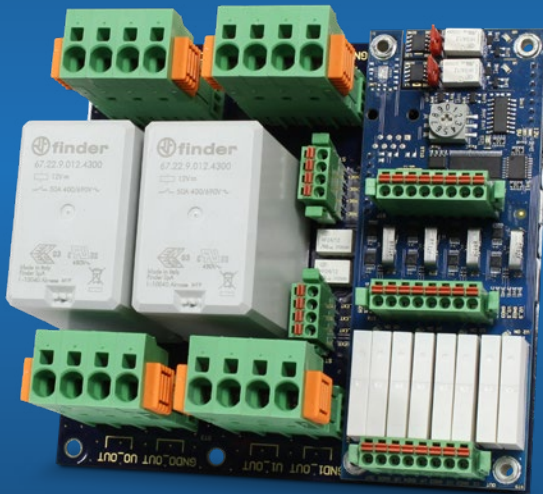




## Manual Rev. 1.0 EN



## **ADQ-SCU-PB-50 with ADQ-PB-ADDON1**

2 switchable high current paths with adjustment option  
4 switchable voltage / current measuring paths

## Imprint

Manual ADQ-SCU-PB-50 with ADQ-PB-ADDON1

Rev. 1.0

### Manufacturer and support

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All information contained in this manual has been compiled with the greatest care and to the best of our knowledge. Nevertheless, errors cannot be completely ruled out. Specifications and contents of this manual are subject to change without notice.

We are always grateful for notification of any errors.

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# 1. Introduction

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

- Does anything on the packaging indicate that anything 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. If in doubt, contact our technical service department.

Please read this manual carefully before installing the unit!

## 1.1 Scope of delivery

- ALLDAQ ADQ-SCU-PB-50 with counterplugs
- ALLDAQ ADQ-PB-ADDON1 with counterplugs

## 1.2 Safety instructions

### **Be sure to observe 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 vapours.
- Do not use the device in damp rooms and under no circumstances in potentially explosive areas.
- Repairs may only be carried out by trained, authorised personnel.
- Please observe the installation regulations and all relevant standards (including VDE standards) when commissioning the instrument, especially when operating with voltages greater 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.
- When handling the board, make sure that no static discharge can occur through the device. 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 resulting damage.**

## 1.3 Installation and assembly site

The ADQ-SCU-PB-50 is for industrial use and can only be used in combination with an ADQ-SCU-BB or ADQ-SCU-LC-BB. The ADQ-SCU-(LC-)BB offers two slots each.

The ADQ-SCU-PB-50 may only be used in dry rooms. The board is not suitable for use under adverse environmental conditions (e.g. outdoors). Ensure sufficient ventilation. Make sure that the connecting cables are securely attached. The installation must be carried out in such a way that the cables and plug connections are not under tension, otherwise they may become loose. Never install the board under electrical voltage.

## 1.4 Brief description

The ADQ-SCU-PB-50 serves as a carrier board for the ADQ-PB-ADDON1. The complete control of the board is located on the ADQ-PB-ADDON1.

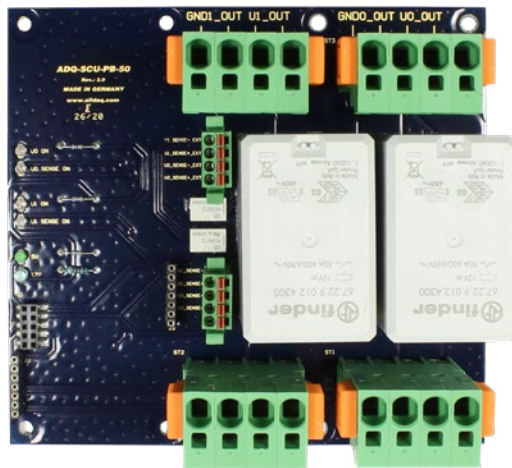
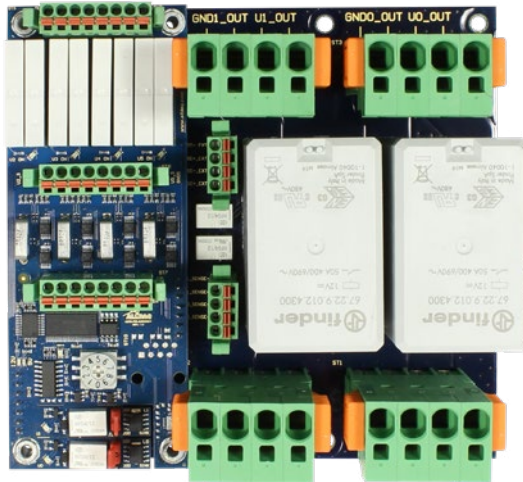
There are two switchable high current paths up to 50A and 100VDC. The corresponding sense connectors for the power supply can be switched either directly to the board or via the board to the DUT. To apply loads, these two paths have two independent current sinks (100 $\mu$ A/200 $\mu$ A) for in-system adjustment. A customer specific load is optional.

There are also four independent and switchable supply paths on which the voltage and current are measured (max.  $\pm$ 20.48VDC/6A).

## 1.5 System requirements

- PC system with a current Intel® or compatible processor based on the x86(-64) architecture
- ADQ-34x cPCI multifunction board
- One free slot on ADQ-SCU(-LC)
- Latest ALLDAQ driver system

## 2. Initial operation



## 2.1 Installation of the board

Please read the manual of the ADQ-SCU(-LC) regarding the installation of additional hardware components before installing the board.

The board should be handled with care to ensure that the device is not damaged by electrostatic discharge (ESD), mechanical stress or unauthorized current surges. Precautions should also be taken to avoid electric shock. Follow standard ESD protection measures.

### **Please note the following procedure:**

- Check if the carrier board is without power
- Make sure that no static discharge can occur through the board when the board is plugged in. At least one hand should be grounded to discharge static electricity.

## 2.2 Software installation

### **Installation on Windows**

In addition to the driver you will receive a software package that you can install on your computer. To do this, start the file ALLDAQDriverSetup32.exe on 32 bit systems or the file ALLDAQDriverSetup64.exe on 64 bit systems in the target directory of your download. After successful installation you will find the „ALLDAQ Manager“ in the info area of the task bar (usually in the lower right corner) or in the Windows start menu. Via the ALLDAQ Manager you have access to the Software Developer Kit (SDK), various utility programs and help files.

### **Test programs**

Simple test programs can be found in the ALLDAQ-SDK. There you will find a subfolder „Applications“ for the respective programming language with test programs for your ALLDAQ hardware. With the ALLDAQ Manager you can retrieve various information of the installed ALLDAQ hardware.

The ADQ-SCU-PB-50 and ADQ-PB-ADDON1 can be conveniently put into operation via the I2C Board Control Center.

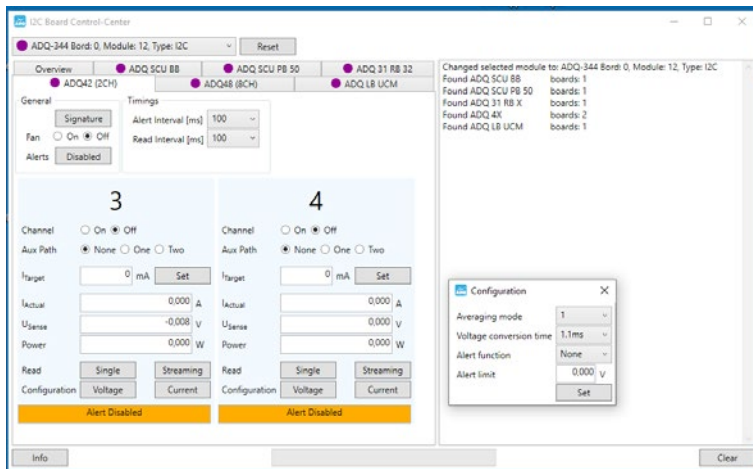


## 2.3 ALLDAQ manager

The ALLDAQ manager for Windows gives you a quick overview of the parameters of the ADQ driver system and provides central access to software tools and help files. You can find the ALLDAQ manager in the info area of the taskbar (usually in the lower right corner) or in the Windows start menu.

### Overview of ALLDAQ manager:

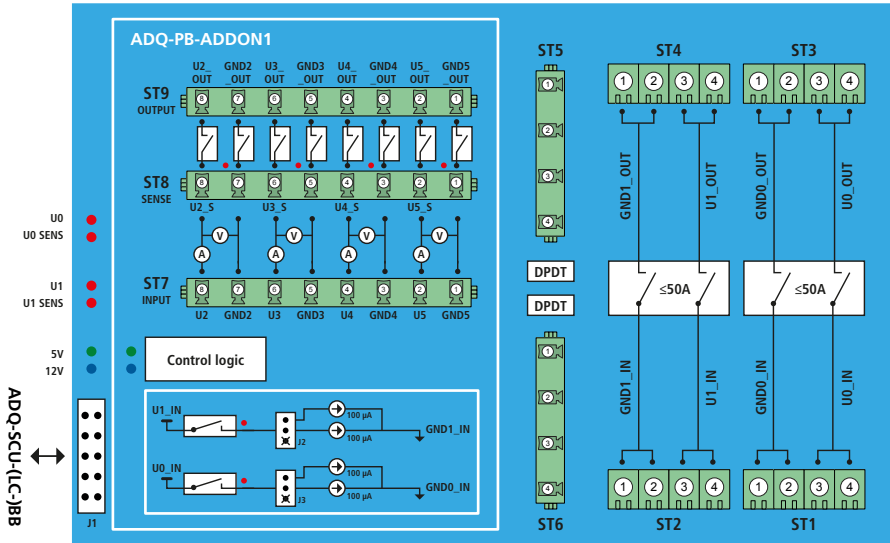
- Information about the installed ALLDAQ hardware at a glance
- XML export of the driver configuration for archiving and support
- Tool for interactive display of the pin assignment with the possibility of PDF generation
- Tool for user adjustment
- Convenient access to the Software Developer Kit (SDK) for high-level language programming with examples and simple test programs
- Quick access to help files



### 3. Function groups

#### 3.1 Block diagram

ADQ-SCU-PB-50



**LEDs**

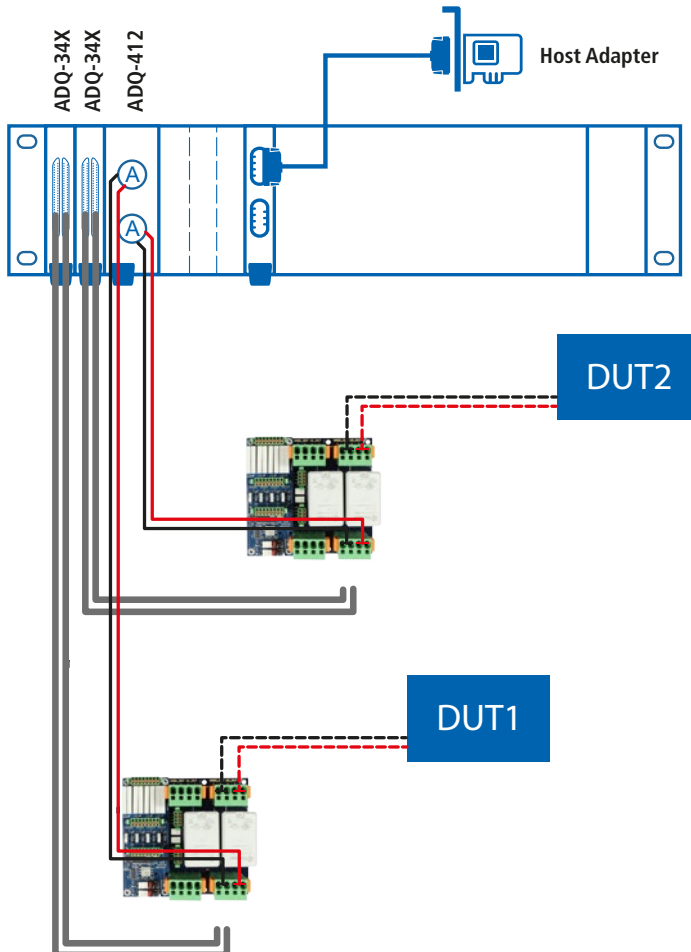
- Green = 5V supply
- Blue = 12V supply
- Red = Relay status

## 3.2 ADQ-SCU-PB-50

### High current paths

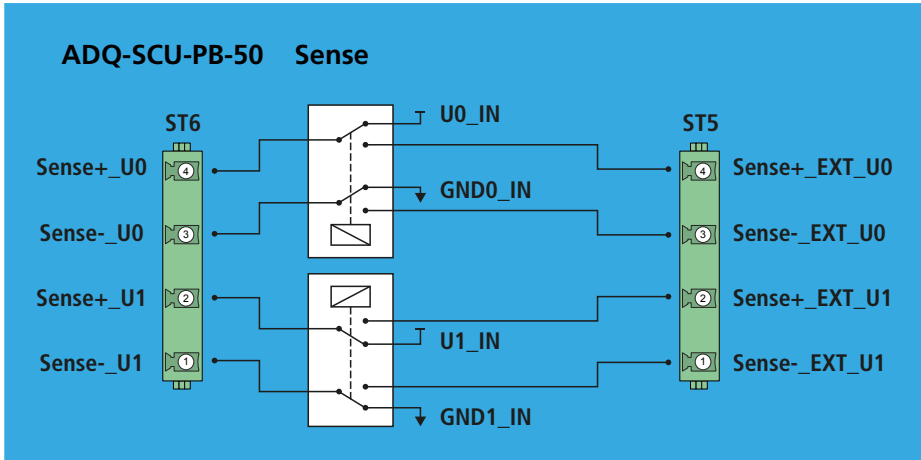
Up to 50A/100VDC loads can be applied to each of the two high current paths. These are optimally suited to supply the complete DUT. In combination with the ADQ-412 current measurement board, the complete current consumption from quiescent current to operating current can be measured dynamically.

**Please use both terminals per connection for currents above 40 amperes.**



## Sense

For high currents, the voltage loss between the power supply and the DUT due to cables and connectors should not be disregarded. For this reason, the ADQ-SCU-PB-50 module offers two possibilities to connect the sense line and switch it accordingly by the software. Either connect the sense line from the power supply directly to the supply voltage on the ADQ-SCU-PB-50 or continue directly to the DUT via the board.



## 3.3 ADQ-PB-ADDON1

### Rotary switch

Use the rotary switch to determine the address of the entire plug-in unit. Each address of the two plug-in boards per ADQ-SCU-(LC-)BB must be unique.

Position	Address (7 bit)
0	0x70
1	0x71
2	0x72
3	0x73
4	0x74
5	0x75
6	0x76
7	0x77
8	invalid*
9	invalid*

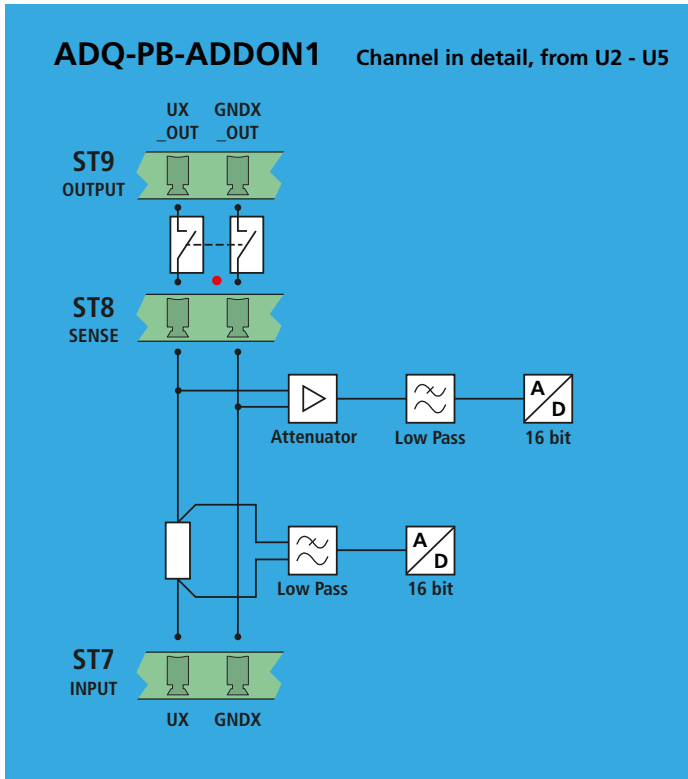
\* If invalid, a red ERROR LED lights up.

### In-system adjustment

On the ADQ-PB-ADDON1 there is a separate switchable high-precision current sink for each high-current path. This can be set to either 100uA or 200uA. This allows the adjustment of the current measuring unit (e.g. ADQ-412) for the quiescent current range to be easily and quickly integrated into a test sequence. Optionally, a two-pole connector can be fitted to connect application-specific loads for adjustment.

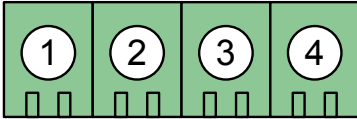
## Supply paths with power measurement

Up to four independent supply voltages (e.g. in the test rack) can be connected via the ADQ-PB-ADDON1. On each path, the voltage and current can be measured up to max.  $\pm 20.48\text{VDC}/6\text{A}$ . Each measurement is performed at 16 bit resolution and the acquired values can also be pre-processed (e.g. averaging) on-board.



## 4. Pin assignment

### 4.1 Phoenix contact 4-pin (ADQ-SCU-PB-50)

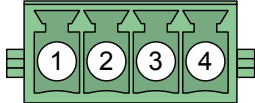


Plug type: SPC 5/4-STCL-7,65

**max. 40A per pin**

Pos	ST1 / ST2	ST3 / ST4
1	GNDX_IN	GNDX_OUT
2	GNDX_IN	GNDX_OUT
3	UX_IN	UX_OUT
4	UX_IN	UX_OUT

### 4.2 Würth 4-pin (ADQ-SCU-PB-50)

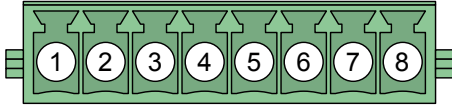


Plug type: 691304130004

**max. 1A per pin**

Pos	ST5	ST6
1	SENSE-_EXT_U1	SENSE-_U1
2	SENSE+_EXT_U1	SENSE+_U1
3	SENSE-_EXT_U0	SENSE-_U0
4	SENSE+_EXT_U0	SENSE+_U0

### 4.3 Würth 8-pin (ADQ-PB-ADDON1)



Plug type: 691304130008

**max. 6A per pin**

Pos	ST7	ST8	ST9
1	GND5	GND5	GND5_OUT
2	U5	U5_S	U5_OUT
3	GND4	GND4	GND4_OUT
4	U4	U4_S	U4_OUT
5	GND3	GND3	GND3_OUT
6	U3	U3_S	U3_OUT
7	GND2	GND2	GND2_OUT
8	U2	U2_S	U2_OUT



## 5. Annex

### 5.1 Specifications

#### 5.1.1 ADQ-PB-ADDON1

Element	Condition	Specifications
Channels		4 differential power measurement channels
Resolution / Sampling rate		16 bit / 7kHz
Shunt type		12mΩ Precision shunt
Current measuring ranges		± 6000mA (208μA - 1 LSB)
Voltage measuring ranges		± 20.48V (625μV - 1 LSB)
Channel Relay	Quantity / Type	8 Relay (SPDT) Type: Finder Series 34
	Contact material	silver/nickel
	Switching time	Response time max. 5 ms Release time max. 3 ms
	Switching cycles	min. 10.000.000 (mechanical)
	Switching current	max. 6 A / 36 VDC, here max. 5 A due to maximum current of power measurement via INA226
	Min. switching load	500mW (12V/10mA) must not be fallen below, whereby at 24V a minimum current of 21mA or at 10mA a minimum voltage of 50V should be given
	Status display	Red LED (per channel)
Current sink	Power supply range	2.5 - 40VDC
	Accuracy	typ. ± 0.25%, max. 1% (at -25 to 85°C)
	Temperature stability	± 25ppm / °C (at -25 to 85°C)

## 5.1.2 ADQ-SCU-PB-50

Element	Condition	Specifications
Channels		2 Channels
High Current Relays	Quantity/Type	2 relays (DPST), type: Finder series 67
	Contact material	AgSnO <sub>2</sub>
	Switching time	Response time max. 25 ms, Release time max. 5 ms
	Switching cycles	min. 1.000.000 (mechanical)
	Switching current	max. 50 A / 100VDC
	Min. switching load	1000mW (min. 10V / 10mA)
	Status display	Red LED (per channel)

## 5.1.3 General

Power supply	Operation	Only directly via ADQ-SCU-(LC-)BB
Power consumption	All relays energized	5V / max. 100mA 12V / max. 380mA
Temperature range	Operation	0..70 °C
Humidity	Operation	20%..55% (non-condensing)
Dimensions	ADQ-SCU-PB-50	135x125x65mm (LxWxH)
Certifications		EC Directive 2004/108/EC, Emission EN 55022, Interference immunity EN 50082-2, RoHS
Manufacturer warranty		36 months
Small signal relay	Quantity/Type	4 relays (DPDT), type: FTR
	Contact material	Gold / Silver / Nickel
	Switching time	Response time max. 3ms, Release time max. 3ms
	Switching cycles	min. 50.000.000 (mechanical)
	Switching current	max. 1 A / 30VDC
	Min. switching load	0.01mA with 10mVDC
	Status display	Red LED (per channel)

## 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:

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Division ALLDAQ  
Maistrasse 2, D-82110 Germering  
E-Mail: support@allda.com  
Phone: +49 (0)89 894 222 – 474  
Fax: +49 (0)89 894 222 – 33  
Internet: www.allda.com

## 5.3 Packaging ordinance

„Both manufacturers and distributors are basically 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](mailto:info@allnet.de).



## 5.4 Recycling advice and RoHS conformity

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





## 5.5 CE identification

The ADQ-SCU bears the CE marking. This device meets the requirements of the EU Directive 2004/108/EC, Directive on Electromagnetic Compatibility and Mutual Recognition of Conformity. Conformity with the above directive is confirmed by the CE mark on the device.

## 5.6 Warranty

Within the warranty period, we will 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](mailto:support@alldaq.com).



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