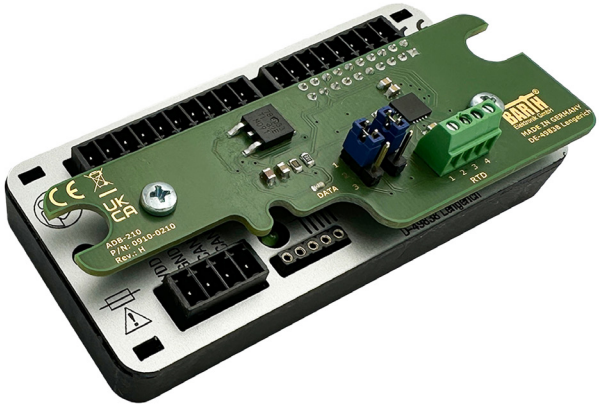
lococube®
addOn Bundle ADB-210
PT-1000 Temperature Probe

MANUAL



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SAFETY INSTRUCTIONS

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and the connected equipment. These notices are highlighted in the manual by a warning symbol and are marked as follows according to the level of danger:

Only qualified personnel should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground and to tag circuits, equipment and systems in accordance with established safety practices and standards.

Turn off the power supply before performing any wiring operations! Short circuits can be harmful, critical and can cause explosions and serious burns!

Please read this manual carefully and observe all safety instructions!

DESTINATED USE

This lococube® addOn Bundle is designed to be used as an easy-to-use solution for measuring temperature using a PT-1000 temperature probe.

DISCLAIMER

BARTH® assumes no liability for usage and functionality of the lococube® addOn Bundle in case of disregarding this manual. The strict accordance of this manual is important since the installation methods, peripheral connections, usage and maintenance can not be controlled by BARTH®. Therefore BARTH® assumes no liability for any claim.

1 Product Description

1.1 Product Features

- Plug & Play
- 4kΩ 0.1% reference resistor
- supports PT-1000 temperature probe
- No programming neccessary
- Data exchange via CAN
- Easy jumper configuration for 2, 3, and 4-Wire probes

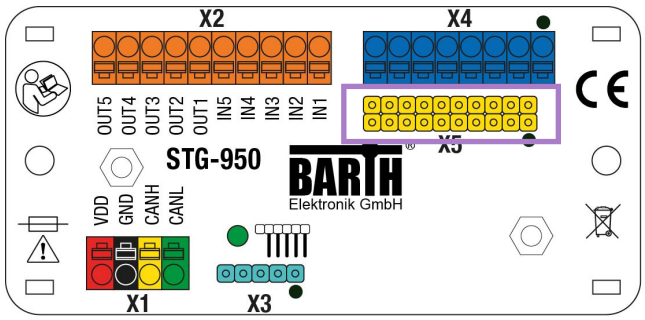
1.2 Delivery Content

- 1x lococube® addOn Board ADB-210
- 1x lococube® mini-PLC STG-950
- 1x PT1000 temperature probe
- 1x Connector for supply and CAN
- 1x Connector for I/O
- 1x Connector for AddOn Board interface

2 Get Started

2.1 Connecting the ADB-210

The lococube addOn Board is simply plugged into the X5 connector on the STG-950. It can be fastened onto the STG-950 using the two provided M4 screws.



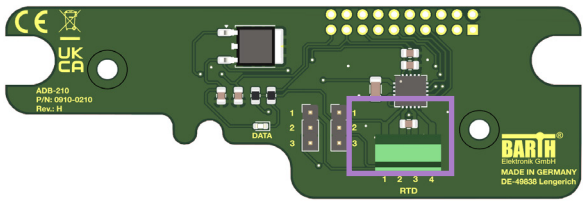
X5 Connector: addOn Board Interface

1	VDD	addOn Board pin 1: fused 100mA
2	GND	addOn Board pin 2: Function depends on addOn
3	PB10 / 13	addOn Board pin 3: USART3 TX / FDCAN2 TX
4	X4:1	addOn Board pin 4: Function depends on addOn
5	PC11 / PB12	addOn Board pin 5: USART 3 RX / FDCAN2 RX
6	X4:2	addOn Board pin 6: Function depends on AddOn
7	PB5	AddOn Board pin 7: SPI3 MOSI
8	X4:3	addOn Board pin 8: Function depends on addOn
9	PB4	AddOn Board pin 9: SPI3 MISO
10	X4:4	addOn Board pin 10: Function depends on addOn
11	PC10	AddOn Board pin 11: SPI3 SCK
12	X4:5	addOn Board pin 12: Function depends on addOn
13	PA3 / PB7	AddOn Board pin 13: ADC1 4 / I2C1 SDA
14	X4:6	addOn Board pin 14: Function depends on addOn
15	PC4 / PA15	addOn Board pin 15: ADC2 5 / I2C1 SCL
16	X4:7	addOn Board pin 16: Function depends on addOn
17	PB0 / PA4	addOn Board pin 17: ADC1 15 / DAC1 OUT1
18	X4:8	addOn Board pin 18: Function depends on addOn
19	+5V	addOn Board pin 19: fused 50mA
20	+3V	addOn Board pin 20: fused 50mA

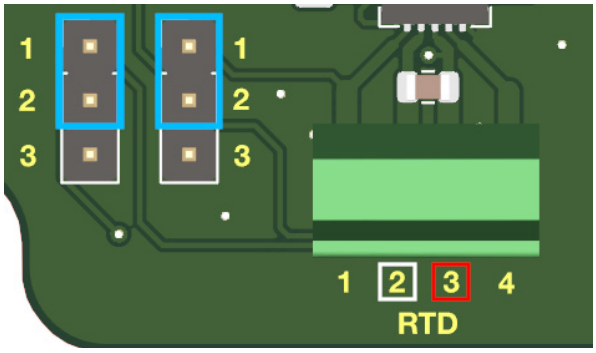
2.2 Connecting the PT-1000

Depending on the type of PT-1000 temperature probe, a specific connection and jumper configuration is required.

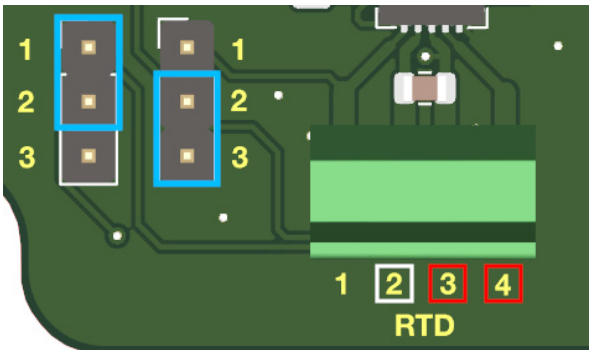
Please refer to the following graphical representations of the lococube® addOn Board ADB-210 connection and jumper interfaces to find out how to connect the different types of PT1000 temperature probes.



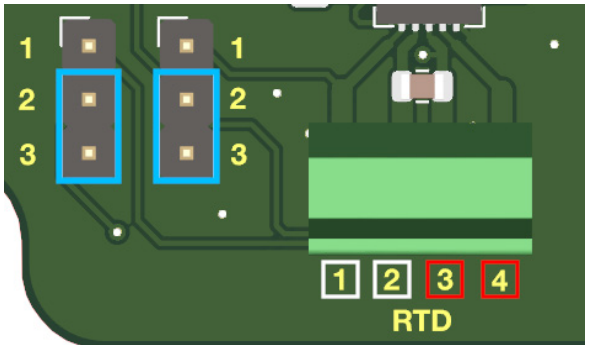
2.2.1 2-Wire



2.2.2 3-Wire



2.2.3 4-Wire



3 Setup and Usage

3.1 Programming Software

If program modifications are required, STM32CubeIDE is the recommended programming software.

1		**STM32CubeIDE** C/C++ development platform with featuring code generation and graphical pinout configuration. **You need** Connection Cable VK-46 **Software** STM32CubeIDE Program Package
2		**miCon-L *** Fast, easy, and intuitive programming by connecting function blocks. **You need** mini-PLC STG-800 Connection Cable VK-46 **Software** miCon-L Program Package

**A miCon-L project for an STG-800 is available and the temperature can be read out via the miCon-L program. This is intended as an example showcase. The STG-950 cannot be programmed with miCon-L.*

3.2 Configuration and Communication

3.2.1 FDCAN Messages

1	ID: 50Bh (default)	TX	DLC: 4 Byte	Sent by default
2	ID: 7FDh (DMA-15)	TX	DLC: 8 Byte	Sent by default
3	ID: 50Bh (default)	RX	DLC: 2 Byte	Changes ID of default CAN message

The first FDCAN message with the default ID **50Bh** starts sending as soon as the STG-950 is powered and has initialized. It can be commented out in the source if not needed. There are instruction in the source code on how to do that.

The second FDCAN message with the ID **7FDh** also starts sending as soon as the STG-950 is powered and has initalized. The two prevelant functions are marked in the source code and can be commented out to turn it off.

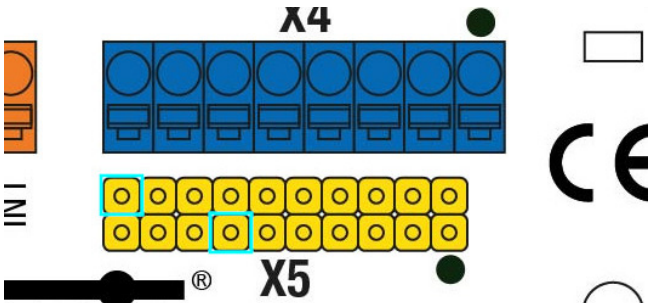
The third FDCAN message can be sent to the STG-950 to change the ID of the MAIN message. The ID of this message is always equal to the ID of the main message.

3.2.2 LED Blink Codes

1	Startup	ON for 2 seconds
2	Working correctly	500ms blinking
3	addOn Board not connected	Three 100ms second blinks with a 500ms pause
4	FDCAN ID changed	500ms pause then a short blink burst
5	FDCAN ID reset to default	4 short blink bursts with 200ms pause between each

3.2.3 Resetting Default CAN ID

The default FDCAN ID is resettable by bridging **Pin 13** and **Pin 20** until the blink code starts**.**



4 Appendix

4.1 Specifications

4.1.1 General

Hardware design	BARTH® lococube® AddOn Board form and design allows for the maximum amount of space, while still ensuring all interfaces on the STG-950 are visible and usable
Programming options	Open Source ‚C' Programming in conjunction with STG-950
Interfaces	CAN FD (Controller Area Network Flexible Data-Rate)
	I2C (Inter-Integrated Circuit)
	SPI (Serial Peripheral Interface)
	DAC (Digital to analog converter) <-> ADC (Analog to digital converter)
	USART (Universal Synchronous/ Asynchronous Receiver Transmitter)

4.1.2 Weight and Dimensions

Weight	10.9 g
Dimensions	93 x 32 x 23 mm (LxWxH)
Mounting	via two M4 screws

4.1.3 Environmental conditions

Operation temperature	-40 to +70 °C (IEC 60068-2-1/2)
Storage temperature	-40 to +70 °C (IEC 60068-2-1/2)
Air pressure (in operation)	500 to 1500 hPa
Shock resistance	min. 300 m/s² (IEC 60068-2-27)
Vibration resistance	min. 80 m/s² @ 10..100 Hz (IEC 60068-2-6)
Degree of protection	IP 20 (not evaluated by UL) (EN 50178, IEC 60529)
Free fall (packaged)	1500 mm (IEC 60068-2-32)

4.1.4 Ordering information

Ordering information addOn Bundle	lococube® AddOn-Bundle ADB-210 Art. No. 0910-0210 GTIN 4251329407490
Ordering information accessory	Connection Cable VK-46 (Graphical and open source programming) Art. No. 0091-0046 GTIN 4251329406226
	lococube® STG-800 Art. No. 0850-0800 GTIN 4251329401207

4.2 Disposal

If you wish to dispose of the product, ask your local recycling centre or dealer for details about how to do this in accordance with the applicable disposal regulations.

4.3 Conformity declaration

For the following designated product it is hereby confirmed, that the construction in that technical design brought by us in traffic corresponds to the standards specified below. In the event of any alternation which has not been approved by us being made to any device as designated below, this statement shall thereby be made invalid.

Description	lococube® AddOn Board
Type / Art. No.	ADB-210
Directive CE 2004/108/EG relating to-electromagnetic compatibility (EMC) CE	Applied norms: 2004/108/EG 2004/108/EC 2014/30/EU
RoHS Directive 2011/65EU	We herby declare that our product is compilant to the RoHS Directive on restriction of the use of certain hazardous substances in electrical and electronic appliances.
UKCA	BARTH Elektronik GmbH declares conformity of the product for which this manual is intended with the UKCA equivalents of the aforementioned CE regulations. We therefore deem the product to be in full compliance with UKCA regulations and take full legal responsibility for it. This declaration was issued on 30.11.2021.

BARTH® Elektronik GmbH
Lengerich, 19.12.2024

Dipl.-Ing. (FH) D. Barth, CEO