

**Parameter Programmer PG-65
Art. No. 0017-0065**

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:

	<p>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.</p>
	<p>Turn off the power supply before performing any wiring operations! Short circuits can be harmful, critical and can cause explosions and serious burns!</p>
	<p>Please read this manual carefully and observe all safety instructions!</p>

DESTINATED USE

The PG-65 is designed for universal measuring, controlling and regulating applications. It must not be used for life critical, medical or fail safe applications.

DISCLAIMER

BARTH Elektronik GmbH assumes no liability for usage and functionality of the PG-65 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 Elektronik GmbH. Therefore BARTH Elektronik GmbH assumes no liability for any claim.

EYE SAFETY INFORMATION

Standard	Classification
IEC/EN 60825-1 (2007-03), DIN EN 60825-1 (2008-05) "SAFETY OF LASER PRODUCTS - Part 1: equipment classification and requirements", simplified method	Class 1
IEC 62471 (2006), CIE S009 (2002) „Photobiological Safety of Lamps and Lamp Systems“	Exempt
DIRECTIVE 2006/25/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5th April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual directive within the meaning of article 16(1) of directive 89/391/EEC)	Exempt

1 Product description

The picture below shows the BARTH® Parameter Programmer PG-65 (Art. No. 0017-0065).



1.1 Features

- Easy Setup and Change of PLC Parameters
- Well suitable for Mini-PLC STG-8xx Series
- Excellent for Field Service Use
- Intuitive graphical Menu
- Communication via CAN or IrDA
- Open Source Interfaces
- Color Touch Display 2.4" 240x320p
- Internal Li-Ion Battery Operation
- USB Power Operation
- External Power Operation 7 to 32 VDC
- Rugged Design
- Aluminium Diecast Housing
- Engineered and manufactured in Germany

1.2 Applications

- Industrial / Building Automation
- Automotive and Maritime Technology
- Technical Education / University
- Test Systems

1.3 General description

The PG-65 Parameter Programmer has been designed for wireless communication with the BARTH® Mini-PLC STG-8xx series using IrDA or CAN interface to upload and download user-defined parameters.

The STG-8xx CAN and IrDA interfaces are Open Source programmable using the powerful KEIL® µVision® Software Suite.

The PG-65 features a 32 bit ARM® Cortex® microcontroller with three power options and needs no programming for operation with the BARTH® Mini-PLC STG-810 series.

An internal 3.7V Li-Ion battery allows several hours of field programming without the need of an external power supply. The USB mode supports operation from USB power or an external AC adaptor. As a third option the PG-65 can be supplied by the target application within a 7 to 32 VDC range.

The PG-65 is also available as customer-tailored OEM version within 8 weeks.

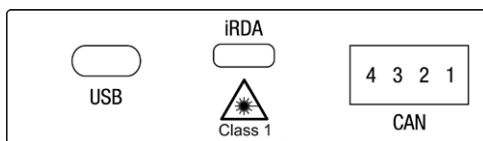
1.4 Delivery content

- BARTH® Parameter Programmer PG-65
- 4-pole Connector for Supply and CAN
- Charging Cable USB2.0A -> USB micro-B

2 Operation

2.1 General

The PG-65 Parameter Programmer is carried out as a handheld device integrated in a rugged aluminium diecast housing with a color touch TFT and frontside connectors. The connector layout of the PG-65 is shown in the picture below.



The micro-USB port (left) is reserved for charging or powering the PG-65 via USB or USB-specified 5VDC power adaptors and power banks.

The IrDA window (center) is used for Mini-PLC communication and must not be covered as a visible connection is mandatory for proper communication.










The 4-pole power supply/CAN connector (right) integrates both supply (7 to 32VDC) and CAN (CANH, CANL) terminals.

The following picture shows the main menu layout which appears after launching the PG-65.

Four buttons are available for active operations.






The following table explains the symbols of the main screen:

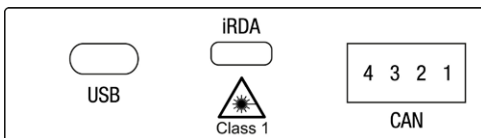
	PG-65 works in battery mode. Battery capacity is at high level.
	PG-65 works in battery mode. Battery capacity is at medium level.
	PG-65 works in battery mode. Battery capacity is at low level.
	PG-65 is connected to USB port or to an adaptor or power bank. Battery is in charge mode.
	PG-65 is connected to USB port or to an adaptor or power bank. Battery has been fully charged.
	Switch OFF the PG-65.
	Read parameter(s) from Mini-PLC.
	Store parameter(s) in Mini-PLC.
	Edit parameter(s).

2.2 CAN and power supply connection

The PG-65 is able to be powered by the internal 3.7V Li-Io battery, USB (5VDC) or an external power supply from 7 to 32 VDC. In case the PG-65 is external powered, take care to meet the following rules:

	Turn off the power supply before performing any wiring operations!
	False electrical connection, voltage reversal or disregarding the electrical specifications may cause irreversible damage of the PG-65! Use an external 1A fuse to protect the PG-65 against voltage reversal.
	The voltage at CANH or CANL must not exceed -32 or +32 VDC referred to ground (GND). Higher voltages may cause irreversible damage of the Mini-PLC!

The graphic below shows the PG-65 connector layout:



Power supply and CAN connector

1	+VDD	positive supply (+7 to 32 VDC)
2	GND	ground terminal (GND)
3	CANH	CAN high terminal
4	CANL	CAN low terminal

All terminals are carried out as plugable spring terminal connectors for a wire gauge of 0.25 to 1.5mm².

There is a 1k termination resistor integrated in the PG-65 to ensure proper operation in direct connection to a BARTH® Mini-PLC without using an additional termination resistor in your CAN network.

Please also refer to the appendix for detailed electrical specification of the CAN interface.









2.3 IrDA connection

In case the Mini-PLC should be connected via IrDA interface, please ensure a visible distance of 500mm at maximum between both devices.

The PG-65's IrDA interface is placed at the fronside of the programmer. The Mini-PLC's IrDA interface (small window) is placed near to model name lettering (e.g. ,STG-810'). Simply use the PG-65 like an IR remote control pointing at the Mini-PLC's IrDA interface.

2.4 Editing parameter(s)

To edit parameter(s) read out via CAN or IrDA from a Mini-PLC, please follow the steps below:

	Power ON the PG-65 and press this button to read the parameter(s) from the Mini-PLC's internal EEPROM. Wait until OK appears, then press OK.
	Edit the parameter(s) by pressing this button.
	Increasing the yellow-colored parameter or value.
	Decreasing the yellow-colored parameter or value.
	Escape from edit mode or menu.
	Confirm data or edit a parameter or value. Yellow-colored values are ready to be changed.
	Store parameter(s) into the Mini-PLC's internal EEPROM. Wait until OK appears, then press OK.
	Switch OFF the PG-65 or resume operation.

2.5 USB charging

The PG-65 Parameter programmer integrates a 3.7V Li-Io battery for mobile operation for several hours.

To charge the internal battery, please connect the PG-65 using the micro-USB cable to an USB port or 5VDC power adaptor/power bank.

2.6 Operation with KEIL® µVision®

To operate the PG-65 with a BARTH® Open Source Mini-PLC (e.g. STG-800 or STG-810) please refer to the product related manual. Any Open Source Mini-PLC featuring CAN or IrDA can be easily interfaced to the PG-65.

3 Appendix

3.1 Specifications

3.1.1 General

Hardware design	BARTH® Parameter Programmer with resistive touch display integrated in a rugged aluminium diecast housing.
Programming options	PG-65: factory preprogrammed Mini-PLC: Open Source, C-Programming, using the powerful KEIL® µVision® Software, free license
Interfaces	USB (charging only) CAN 2.0A/B IrDA/SIR

3.1.2 Power supply

Operating voltage	7 to 32 VDC
Current consumption	100 mA @ 12 VDC 55 mA @ 24 VDC 45 mA @ 32 VDC
Fusing	1 to 5 A max. (external) mandatory for voltage reversal protection
Voltage reversal protection	yes (combined with external fuse)
ESD/TVS protection	yes, integrated
Heat dissipation air (at full load)	normally < 1.5W
Internal battery	Li-Io 3.7V/600mAh
Operation Time	> 4 h (auto power off: 5 min)
Charging time	< 6 h via USB power 5VDC

3.1.3 Display

Technology	TFT (Thin-Film Transistor) Liquid Crystal Display Module
Size	2.4" Diagonal
Resolution	240 x 320 Pixels / 262K colors
Touch	4-wire Resistive Touch Panel
Backlight	LED white

3.1.4 Interfaces

CAN	CAN 2.0A/B: 11/29 bit ID, base frame format Baud rates: 50, 100, 125, 250, 500 kbit, 1Mbit Internal termination resistor: 1k (for direct connection to one Mini-PLC), meets or exceeds the requirements of applications ISO 11898-2, loss of ground protection from -32 V to +32 V, thermal shutdown protection
USB	1.0/2.0/3.0 (charging only)
IrDA (infrared)	SIR (9.6 kbit/s to 115.2 kbit/s) IrPHY (for factory use only)

3.1.5 Security features

Security Features	System and independent watchdog Fail safe oscillator Power on/down reset Supply voltage supervisor
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3.1.6 Program and data memory

Memory	5Mb Flash, 196k RAM
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3.1.7 Timebase (oscillator)

Primary Oscillator	Crystal quartz MEMS unit (precise ,micro-electro-mechanical system')
Nominal Frequency	16.000 MHz
Frequency tolerance	$\pm 50 \times 10^{-6}$
Frequency aging	$\pm 5 \times 10^{-6}$ / year max.

3.1.8 Electrical connection

Electrical Connection	pluggable spring terminal connectors 0.25 to 1.5 mm ² Manufacturer: Phoenix Contact Series: COMBICON Type: FMC1,5/4-ST-3,5(-BK)
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3.1.9 Electromagnetic compatibility (EMC)

Electrostatic discharge (ESD) at supply terminals	20 kV air discharge 30 kV contact discharge (IEC/EN 61 000-4-2, level 3)
Electromagnetic fields	Field strength 10 V/m (IEC/EN 61000-4-3)
CAN bus terminals (CANH, CANL to GND)	IEC 61000-4-2: Unpowered Contact Discharge ± 15000 V IEC 61000-4-2: Powered Contact Discharge ± 8000 V

3.1.10 Environmental conditions

Operation temperature	-10 to +55 °C (IEC 60068-2-1/2)
Storage temperature	-20 to +55 °C (IEC 60068-2-1/2)
Relative humidity	5 to 80% non-condensing (IEC 60068-2-30)
Air pressure (in operation)	500 to 1500 hPa
Shock resistance	min. 50 m/s ² (IEC 60068-2-27)
Vibration resistance	min. 10 m/s ² @ 10..100 Hz (IEC 60068-2-6)
Degree of protection	IP 20 (EN 50178, IEC 60529)
Free fall (packaged)	1000 mm (IEC 60068-2-32)

3.1.11 Weight and dimensions

Weight	220 g (without connectors)
Dimensions	115 x 85 x 25 mm (LxWxH)


3.1.12 Ordering information

Ordering information Programmer	Parameter Programmer PG-65 Art. No. 0017-0065 GTIN 4251329401283
Ordering information Mini-PLC	Mini-PLC STG-800 Art. No. 0850-0800 GTIN 4251329401207
	Mini-PLC STG-810 Art. No. 0850-0810 GTIN 4251329401320
	Mini-PLC STG-820 Art. No. 0850-0820 GTIN 4251329401382

3.2 Documents, videos and software


Detailed information, additional documents, application notes and videos relating to this product are downloadable from www.barth-elektronik.com

3.3 Disposal

	<p>If you wish to finally 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.</p>
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3.4 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	Parameter Programmer
Type	PG-65
Art. No.	0017-0065
Directive 2004/108/EG relating to- electromagnetic compatibility (EMC)	Applied norms: 2004/108/EG 2004/108/EC 2014/30/EU
	
RoHS Directive 2011/65EU	We hereby declare that our product is compliant to the RoHS Directive on restriction of the use of certain hazardous substances in electrical and electronic appliances.

BARTH[®] Elektronik GmbH
Lengerich, 17.01.2017

D. Barth

Dipl.-Ing. (FH) D. Barth
Managing Director