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FFblue

Instruction Manual

Part number: FFblue

1. Installation

To properly install the FFblue in your PC, please follow the instructions detailed in the next sections. This manual only includes the hardware installation. How to use the software is described in the "FFblue API Interface Description".

1.1. Hard- and Software installation

For the Installation of FFblue no special software is necessary. Microsoft® Windows and Windows Mobile have already implemented a Bluetooth interface. This Bluetooth interface has to be enabled and then you can search for available devices.

Now Microsoft® Windows or Windows Mobile will detect the FFblue-xxxxx (xxxx → unique serial number) and then it will ask for authentification key. This key is "1234" and is also printed on the backside of the FFblue modem.
After a successful installation the Bluetooth logo colour changes to green and the “Traffic” LED (on the FFblue) to blue.

When the software communicates with the FFblue via the established Bluetooth channel, the Traffic status LED is blinking blue.

2. Safety Informations

Read the entire User Manual before using the FFblue. The FFblue is an intrinsic safe apparatus to communicate from Fieldbus Foundation to a handheld computer via Bluetooth. Fully observe all instruction and warnings contained in this sheet.

Prior to Use
Check the integrity of the FFblue as the safety of the FFblue may be void by any of the following:

- external damage to the housing
- damage to insulation of the test leads
- exposure to voltages exceeding the specified parameters
- incorrect storage of the unit
- damage sustained in transit
- correct certification is illegible

Safety Advice for Use in Hazardous Areas:

- Applying more than 24 volts to the input terminals invalidates the FFblue's Ex approval and may result in permanent damage to the unit so it can no longer be used in hazardous areas.
- If the FFblue is used on Fieldbus circuits with a voltage more than 24V the Ex approval of this device is void. In that case clearly mark the FFblue that this device must not be used on intrinsic safe circuits furthermore.
- Never use the FFblue with the case open. Opening the case violates the Ex Approval.
- Make sure the battery compartment is closed before you use the FFblue.
- Do not remove or install batteries within Ex hazardous areas
- Use only approved batteries. The use of any other battery will invalidate the Ex approval and present a safety risk.

3. Hardware and Software Description

3.1. Technical Data

• Unit:	FFblue Foundation Fieldbus to Bluetooth interface
• CPU:	Renesas M16C (16Bit architecture)
• Memory:	470 KB RAM; 384 KB Flash
• Supported Bluetooth rates:	up to 115 kbit/sec.
• Connector assignment:	assembled cable with hooks, length 1m, AWG20, 0,5mm2
• Battery supply:	2x AA DURACELL® MN1500, alkaline primary cell, LR6.
• Fieldbus:	to be connected to Foundation Fieldbus circuits acc. to EN 61158-2:2003 Restrictions apply for the use on intrinsic safe circuits nominal current from Fieldbus 13mA
• Bluetooth:	class 2 modul, Bluetooth V2.0 module FCCID: QOQWT12 Industry Canada ID: 5123A-BGTWT12A

range 10m (open air)
Bluetooth Identifier: B03005

- Enclosure: 120mm x 65mm x 23 mm, IP20, case material ABS
- Ambient conditions: Operating temperature: -20°C up to 55°C
  (limited by the battery temperature range)
  Storage temperature: -20°C up to 70°C
  Relative humidity < 90% (non-condensing)
  Batteries should be stored between 10°C and 25°C with relative humidity not exceeding 65% to maximize shelf life.

3.2. Specifications

The FFblue may be connected to Foundation Fieldbus with the following electrical data.

- Input Voltage: 9 to 24V DC only for connection to certified intrinsic safe fieldbus circuits
  nominal current: 13mA during normal use
  27mA during firmware update

  Maximum values. (see chapter ATEX EC type examination certificate)
  type of protection Intrinsic Safety Ex ia IIC
  U_i = 24 VDC
  I_i = 250 mA
  C_i negligible low
  L_i = 10µH

  type of protection Intrinsic Safety Ex ia IIB
  U_i = 17,5 VDC
  I_i = 380 mA
  C_i negligible low
  L_i = 10µH

  Suitable to be connected to a FISCO system (EN 60079-27)

- Input Voltage: 9 to 32V DC only for use in non hazardous areas Foundation Field bus. See Safety Informations for details.

3.3. FF H1 Fieldbus Interface

With 2-wired cable and the terminal connectors the fieldbus links can be connected. The FF-H1 interfaces comply with type 114 of the FF physical layer profile, which is characterized by

- standard power signalling and voltage mode
- intrinsic safety

The fieldbus cables are direct assembled to the FFblue and can not be interchanged.

3.4. Display Elements

Symbol	Indication of Display Element
	Off
	Permanent on
	Flashing
	Flashing, slow (0.5 Hz)
	Flashing, fast (>1 Hz)

Indication of Display Elements

The FFblue interface module has LEDs (status green and red, traffic blue and red) to indicate the operating state or an error situation.

Operating State	LED "Status"	LED "Traffic"	Description
Power ON	red	red	To indicate start of FFblue
Flash CRC error, SW Exception	red	red	No run able firmware is available or a fatal error situation is detected in the FFblue module firmware.
Bluetooth controller in Power Down Mode.	green	red	This state is assumed after 5 minutes if no Bluetooth connection is available in order to save battery. It is necessary to power cycle the FFblue module to enable the Bluetooth controller again.
Battery state ok Bluetooth ON but no connection	green		Bluetooth module is switched on, wait for serial connection
Battery state ok Bluetooth active (connected)	green	blue	serial connection with FFblue module is established, but no traffic
Battery state ok Bluetooth traffic	green	blue	Serial connection with FFblue module is established, serial messages are transferred. Note that the traffic LED is switched on not for half of the blink interval but only for 20% in order to save Bluetooth battery.
Acting as H1 Linkmaster	green (0.5 Hz)	according to Bluetooth connection state	Indicates that device is in token ring, but not as LAS and battery state is okay. The traffic LED is displayed as indicated above when battery state is ok.
Acting as H1	green	according to Bluetooth	Indicates that device is in token ring, acts as LAS and battery state is okay. The traffic LED is displayed as indicated above

LAS	(5 Hz)	connection state	when battery state is ok.
Battery low, Bluetooth controller in Power Down Mode	 red (1 Hz)	 red	Operation would be possible, but powercycle is necessary to switch on Bluetooth module
Battery low, Bluetooth ON but no connection	 red (1 Hz)		Bluetooth module is switched on, wait for serial connection
Battery low, Bluetooth active (connected)	 red (1 Hz)	 blue	Serial connection with FFblue module is established, but no traffic
Battery low, Bluetooth traffic	 red (1 Hz)	 blue (1 Hz)	H1 Bus status will not be shown because the information about the battery status is more important.
Battery empty	 red		Bluetooth interface cannot be used

3.5. Supported Services

A general documentation of the programming interface of the FFblue API interfaces is available from Softing.

The main use case will be a direct host access to the H1 Bus. The appropriate services were supported.

3.6. Usage

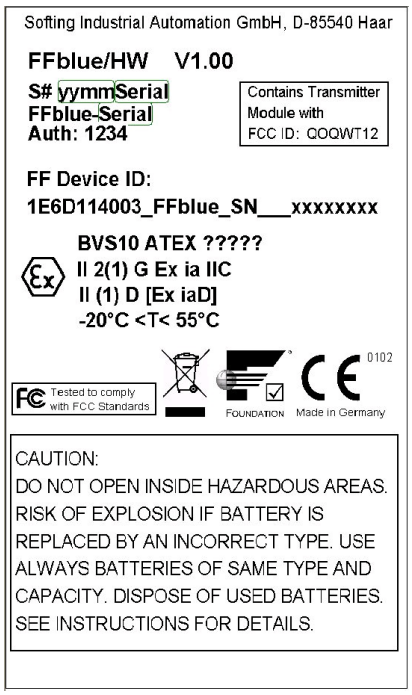
The battery voltage is supervised by the FFblue after connecting to the Fieldbus. A low battery warning is signalled by the Status LED. It is good practice to do a battery check prior to work. For this purpose you may connect the fieldbus hooks of the FFblue to a 9V DC battery, wait approx. 10s until the battery check is performed and battery status is signalled.

- Replace the batteries as soon as low battery is signalled by the Status LED
- Always replace both batteries at the same time, with new and equal types. In different states of discharge there is a risk of voltage reversal with progressive risk of leakage or rupture.
- Discharged batteries should be removed from the equipment to prevent possible damage.

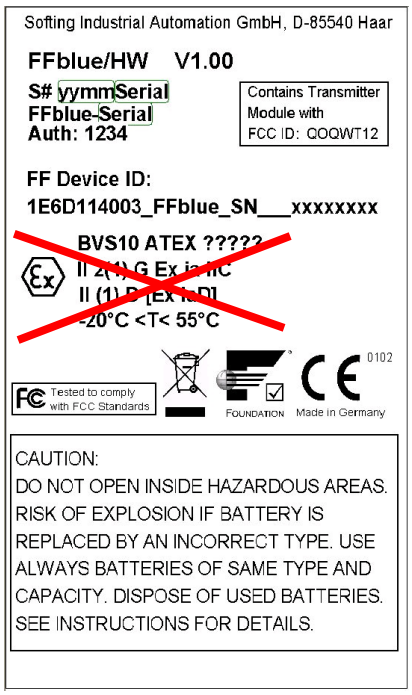
Only batteries specified in the section 3.1. Technical Data may be used for the certified FFblue. For the **solely** use on **non** intrinsic safe circuits and outside hazardous areas batteries of other manufacturers as well as rechargeable batteries may be used. Rechargeable batteries do have less capacity and a different load behaviour which leads to a reduced uptime of the FFblue.

3.7. Marking

The FFblue is marked as follows.
If the FFblue is connected to non intrinsic safe circuits as described in the chapter "Safety Informations" the Ex approval for this FFblue is void. The FFblue must be clearly marked by the user. Clearly cross the Ex approval section on the label.



for use on intrinsic safe fieldbus



Ex Approval Void !
Do not use on intrinsic safe fieldbus

3.8. Maintenance and Usage

The battery voltage is supervised by the FFblue after connecting to the Fieldbus. A low battery warning is signalled by the Status LED. It is good practice to do a battery check prior to work. For this purpose you may connect the fieldbus hooks of the FFblue to a 9V DC battery, wait approx. 10s until the battery check is performed and battery status is signalled.

- Replace the batteries as soon as low battery is signalled by the Status LED
- Always replace both batteries at the same time, with new and equal types. In different states of discharge there is a risk of voltage reversal with progressive risk of leakage or rupture.
- Discharged batteries should be removed from the equipment to prevent possible damage.

3.8.1. Cleaning

Periodically wipe the case with a damp cloth. Do not use abrasives or solvents.

3.8.2. Replacing Batteries

Only approved batteries shall be used in hazardous areas. The use of any other battery will invalidate the Ex approval and present a safety risk.

Do not remove or install batteries and do not open the battery compartment within Ex hazardous areas.

Do not use batteries of different type or different capacity and always use fresh batteries.

To replace the batteries:

1. Disconnect the FFblue from the fieldbus.
2. Unscrew the battery door on the back of the FFblue
3. Lift off the door
4. Remove the batteries
5. Insert the replacement batteries with correct polarity, as marked on the bottom of the battery compartment
6. Install the battery door again. Make sure it is securely in place
7. Screw the battery door close.

3.8.3. Replaceable Parts

The FFblue does not contain any serviceable parts.

The function of the device needs no regular adjustment. No maintenance is required apart the batteries. If failures of the device are observed, disconnect the device from the fieldbus. Electronic components are not to be maintained on customer site. If necessary please send this device for repair back to the manufacturer.

No modifications or repair on the device are allowed.

4. ATEX and CE Information

This device complies with the requirements of

EC directive 2004/108/EC "Electromagnetic Compatibility" (EMC directive).

EC directive 94/9/EC "ATEX"

EC directive 1999/5/EC "R&TTE"

EC directive 2002/95/EC "RoHS"

The product meets the following requirements:

- Emission: EN55022:2006 + A1:2007 Class B
  EN55011:2007 + A2:2007 Class B
  EN61000-6-3:2007
  EN61000-6-4:2007
- Immunity: EN61000-6-2:2001
- Safety: EN60950-1:2006 + A11:2009

4.1. Declaration of Conformance

EG- Konformitätserklärung
EC – Declaration of Conformity

Wir / *We,*
Softing Industrial Automation GmbH
Richard-Reitzner-Allee 6
D-85540 Haar (Germany)

erklären hiermit, dass das Produkt / *declare that the product*

Modell / *Model:*

FFblue
Bluetooth™ Interface for FF H1

mit den Anforderungen folgender Richtlinien übereinstimmt
- EMV Richtlinie 2004/108/EG
- R&TTE Richtlinie 99/5/EG
- ATEX Richtlinie 94/9/EG.

complies with the requirements of the following directives
- *EMC directive 2004/108/EC*
- *R&TTE directive 99/5/EC*
- *ATEX directive 94/9/EC*

Angewandte harmonisierte Normen: / *Harmonised standards applied:*

- EN 55022:2006 + A1:2007
- EN 55011:2007 + A2:2007
- EN 61000-6-4:2007
- EN 61000-6-2:2005

- EN 300328 V1.7.1 (2006-10)
- EN 301489-1 V1.8.1 (2008-04)
- EN 301489-17 V2.1.1 (2009-05)
- EN 60950-1:2006 + A11:2009
  + National Deviations of USA and Canada in conjunction with IEC6950-1:2005

- EN 60079-0:2006
- EN 60079-11:2007
- EN 60079-27:2006
- EN 61241-11:2006

Haar, 19.01.2011

Achim Liebl
Geschäftsführer / *CEO*

4.2. ATEX EC type examination certificate

DEKRA

Translation

(1) # EC-Type Examination Certificate

(2) **- Directive 94/9/EC -**
Equipment and protective systems intended for use in potentially explosive atmospheres

(3) **BVS 10 ATEX E 137**

(4) **Equipment:** **Communication interface type FFblue/HW**

(5) **Manufacturer:** **Softing Industrial Automation GmbH**

(6) **Address:** **85540 Haar, Germany**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this type examination certificate.

(8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in the test and assessment report BVS PP 10.2253 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2006	General requirements
EN 60079-11:2007	Intrinsic Safety 'i'
EN 60079-27:2006	Fieldbus systems FISCO
EN 61241-11:2006	Intrinsic Safety 'iD'

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 2 (1) G Ex ia IIC T4
II (1) D [Ex iaD]

DEKRA EXAM GmbH
Bochum, dated 26. Oktober 2010

Signed: Simanski
Certification body

Signed: Dr. Eickhoff
Special services unit

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(13) Appendix to

(14) # EC-Type Examination Certificate

BVS 10 ATEX E 137

(15) 15.1 Subject and type

Communication interface type FFblue/HW

15.2 Description

The communication interface serves the purpose of transferring signals from an intrinsically safe (IS) fieldbus (e.g. PROFIBUS PA, Fieldbus Foundation) via a Bluetooth module.

The communication interface is intended for use as a field device according to FISCO (EN 60079-27); it can be connected to all fieldbus type circuits that comply with FISCO. The communication interface meets the requirements for equipment of category 2G. The IS fieldbus circuit can end in either dust or gas explosive atmospheres.

The communication interface consists of a plastic enclosure which accommodates batteries for supplying the equipment with electricity as well as an electronic circuit with both a Bluetooth module and an interface module of type FBK-2/HW#*** (PTB 09 ATEX 2002 U).

15.3 Parameters

15.3.1	Battery voltage		DC	3	V
15.3.2	Fieldbus circuit (lead)				
15.3.2.1	For type of protection Ex ia IIB				
	Only to be connected to certified intrinsically safe circuits				
	Maximum values				
	Voltage	Ui	DC	17.5	V
	Current	Ii		380	mA
	Effective internal capacitance	Ci	negligible		
	Effective internal inductance	Li		10	µH
15.3.2.2	For type of protection Ex ia IIC				
	Only to be connected to certified intrinsically safe circuits				
	Maximum values				
	Voltage	Ui	DC	24	V
	Current	Ii		250	mA
	Effective internal capacitance	Ci	negligible		
	Effective internal inductance	Li		10	µH
15.3.3	Signal output Bluetooth module				
	Power	Po	<	1.6	W
15.3.4	Ambient temperature range	Ta	-20 °C up to +55 °C		

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BVS 10 ATEX E 137

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	Maximum values				
	Voltage	Ui	DC	24	V
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4.3. Bluetooth, RF certification

The FFblue shall be used with Bluetooth only in the following countries

- EU
- USA
- Kanada

Notes for the use in the US:

This device contains a transmitter with FCC-ID: QOQWT12

Note

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- Operation is subject to the following two conditions:
- This device may not cause interference and
- This device must accept any interference, including interference that may cause undesired operation of the device.

Notes for the use in Canada:

This device contains a transmitter with ID: 5123A-BGTWT12A

5. Service

The FFblue does not contain any user serviceable parts. All adjustments and/or repairs have to be performed at the factory. If the FFblue needs to be serviced, return it to Softing.

For additional questions regarding installation or use of the FFblue please contact:

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