

13.56 MHz RFID System



BLUEBOX Panel Reader HF NFC



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Safety Instructions / Warning - Read before start-up!

- The device may only be used for the intended purpose designed by the manufacturer. The operation manual should be conveniently kept available at all times for each user.
- Unauthorized changes and the use of spare parts and additional devices that have not been sold or recommended by the manufacturer may cause fire, electric shocks or injuries. Such unauthorized measures shall exclude any liability by the manufacturer.
- The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.
- Repairs may be executed by the manufacturer only.
- Only qualified personnel should carry out installation, operation, and maintenance procedures.
- Use of the device and its installation must be in accordance with national legal requirements and local electrical codes.
- When working on devices the valid safety regulations must be observed.



This manual applies to the following devices:

Description:

Read / write 13.56 MHz RFID device with integrated antenna. USB (Virtual COM + HID Keyboard) communication interface.

Order Number:

3223N



This manual is valid as of firmware version:

Order Number	Carrier	Front End
3223N	1.04	1.10

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1 Introduction

The **PANEL READER RFID HF NFC (Ø22)** hereinafter named **BLUEBOX** is a read/write 13.56 MHz RFID device that communicates with a 'host' system (typically a PC) through an USB interface. The **BLUEBOX** acts as a joint through a set of commands between the host system and a RFID tag (or transponder) present near the antenna. A software driver must be installed at the 'host' (PC) level to allow the USB connection of the **BLUEBOX** to appear as a serial port (COM). It is also possible to configure the **BLUEBOX** to send a message as an HID Keyboard with Italian layout (keyboard emulation).

Hereinafter the list of the supported O.S.

- Windows XP SP3 32/64 bit
- Windows Vista 32/64 bit
- Windows 7 32/64 bit
- Windows 8/8.1 32/64 bit
- Windows 10 32/64 bit

From a mechanical point of view, the **BLUEBOX** , easy to assemble, consists of four main components as shown:

- the antenna placed in the front element of the device with a diameter of Ø28 visible on the panel,
- the M22 ring nut for fixing the device on rear of the panel,
- the fixing support of the device, which is placed between the back of the panel and the fixing ring of the device itself,
- the device that connects to the antenna with strip coupling and is fixed to the support by means of 2 M3x6 screws.

2 Technical Specifications

This section provides details on the technical specifications of the **BLUEBOX**.

2.1 Electrical Features

This section provides details on the electrical features of the **BLUEBOX**.

Power Supply	5Vdc, USB Bus powered
Power Ratings	2.5W
Operating Frequency	13.56 MHz \pm 7 kHz
Antenna	Integrated
Supported Transponders	ISO 15693, ISO 14443A
Communication Interface	USB Virtual COM, USB HID Keyboard
Status Display	4 LEDs
Connections	USB Full-Speed 12Mbit/s

2.2 Mechanical Features

This section provides details on the mechanical features of the **BLUEBOX**.

Dimensions	Front: Ø28mm x 9mm Rear: 41 x 34.5 x 30.7 mm Panel thickness: 2.5 to 4 mm
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2.3 Environmental Conditions

This section provides details on the environmental conditions of the **BLUEBOX**.

Operating Temperature	-20°C ... +65°C
Storage Temperature	-40°C ... +85°C
Humidity	Up to 95%, non condensing

3 Operating Features

In 'continuous' mode the **BLUEBOX** is characterized by the coexistence of 2 'parallel' and asynchronous activities: the transponder identification and the communication with the 'host' system. The 'continuous' identification activity interacts with the communication activity through a buffer that contains the code of the last identified transponder or the 0 code that indicates the absence of a transponder. Due to synchronization and filtering reasons, the buffer is handled by a parameter defined as 'hold time' (to be set in the range of 0 ... 99 seconds, default value 1 second) and allows to extend 'artificially' the presence of the transponder after it leaves the antenna's influence area; this behavior is observable looking at the 'ANT' LED status that is 'on' indicating the presence of a transponder. Through the command 'data request' it is possible to get the data contained in the buffer.

The **BLUEBOX** handles also a 31 elements FIFO queue which is combined with a 'filter time' parameter (to be set in a range of 0 ... 99 seconds, default value 1 second) that prevents the queue saturation in case of a transponder 'continuous' presence. When a transponder is identified, the **BLUEBOX** compares it to the previous read transponder. If the transponder is different (it is defined as 'new'), its code will be inserted in the queue and the filter time will be started. Otherwise (the transponder is the same of the previous read one), the **BLUEBOX** verifies if the filter time is expired. In this case (the filter time is expired), the transponder is defined as 'new' and will be processed as described above, otherwise only the filter time will be rearmed. Through the command 'queue data request' and the relative 'ack', it is possible to get the data contained in the queue and unload it.

In 'continuous' mode the **BLUEBOX** can be configured to obtain the behavior of a 'spontaneous' reader that will send a message on the USB Virtual COM line. This feature is enabled (on) / disabled (off) by the solder jumper W2 or using a flag in the general configuration of the reader. It can be also configured to obtain the behavior of an HID Keyboard that will send a message as keyboard emulation. This feature is enabled (on) / disabled (off) by the solder jumper W3 or using a flag in the general configuration of the reader.

- If configured and available an host can receive the 'spontaneous' message through the USB Virtual COM line. The 'spontaneous' message is sent only once and no ACK/NAK reply message is implemented, see the protocol manual for details.
- If configured and available an host can receive the 'spontaneous' message through the USB HID Keyboard line. The 'spontaneous' message is sent only once.



BLUEBOX will hold onto a maximum of 20 tags when configured to use the 'spontaneous' message. Once the 20 tag limit is reached, the new tags will be discarded!



BLUEBOX will hold onto a maximum of 20 tags when configured to use the 'spontaneous' message. Once the 20 tag limit is reached, the new tags will be discarded!

The **BLUEBOX** allows the execution of 'on request' functions. During the execution of these functions, the 'continuous' identification activity will be suspended temporarily; the involved commands are relative to device configuration and tag read/write specific activities.

If not required, the 'continuous' identification activity can be disabled through a flag defined in the general parameters. In this case, the **BLUEBOX** will only execute the 'on request' commands already defined above.

3.1 General Parameters

This section provides details on the configurable general parameters of the **BLUEBOX**.

Parameter	Description	Range	Default
Device Address	Device address of the reader.	000 ... 255	255
Baud Rate	Communication baud rate on USB Virtual COM interface.	1200 2400 4800 9600 19200 38400 57600 115200	19200
Data Bits	Data bits on USB Virtual COM interface.	7 8	8
Stop Bits	Stop bits on USB Virtual COM interface.	1 2	1
Parity	Parity on USB Virtual COM interface.	None	None

Parameter	Description	Range	Default
		Even Odd	
Hold Time	Reading management hold time.	0 ... 99 seconds	1 sec
Filter Time	Tag queue management filter time.	0 ... 99 seconds 0 ... 99 minutes	1 sec
'Spontaneous' Mode	Spontaneous mode activation.	Disabled Enabled	Disabled
'Continuous Mode'	'Continuous mode' activation.	Disabled Enabled	Enabled

The general parameters are managed through the 'Read General Parameters' and 'Write General Parameters' commands as described in protocol technical manuals where the parameters 1...7 fields and default values are:

1	2	3	4	5	6	7
Device Address	Serial1	Serial2	Hold Time	0x00	Filter Time	Functional Flags
0xFF	0x48	0x10	0x01	0x00	0x01	0x00

Where:

Parameter	Description
Device Address	Device address of the reader (0x00 ... 0xFF).
Serial1	RS232/RS485 communication settings. <ul style="list-style-type: none"> High nibble: baud rate: <ul style="list-style-type: none"> 0x0: 1200 bps 0x1: 2400 bps 0x2: 4800 bps 0x3: 9600 bps 0x4: 19200 bps 0x5: 38400 bps 0x6: 57600 bps 0x7: 115200 bps Low nibble: data bits: <ul style="list-style-type: none"> 0x7: 7 bits 0x8: 8 bits


Parameter	Description																		
Serial2	RS232/RS485 communication settings. <ul style="list-style-type: none"> High nibble: stop bits: <ul style="list-style-type: none"> 0x1: 1 bits 0x2: 2 bits Low nibble: parity: <ul style="list-style-type: none"> 0x0: None 0x1: Even 0x2: Odd 																		
Hold Time	Reading management hold time: <ul style="list-style-type: none"> Decimal 0 ... 99 for time in seconds (0 ... 99 seconds) 																		
Filter Time	Reading management filter time: <ul style="list-style-type: none"> Decimal 0 ... 99 for time in seconds (0 ... 99 seconds) Decimal 100 ... 199 for time in minutes (0 ... 99 minutes) 																		
Flags	Flags. Single bits are dedicated to disable (0 value) or enable (1 value) functions: <table border="1"> <thead> <tr> <th>Bit</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Bit 7</td><td>Not used</td></tr> <tr> <td>Bit 6</td><td>Not used</td></tr> <tr> <td>Bit 5</td><td>Not used</td></tr> <tr> <td>Bit 4</td><td>Not used</td></tr> <tr> <td>Bit 3</td><td>'Spontaneous' mode</td></tr> <tr> <td>Bit 2</td><td>Not used</td></tr> <tr> <td>Bit 1</td><td>Not used</td></tr> <tr> <td>Bit 0</td><td>'Continuous' mode (0=enabled, 1=disabled).</td></tr> </tbody> </table>	Bit	Description	Bit 7	Not used	Bit 6	Not used	Bit 5	Not used	Bit 4	Not used	Bit 3	'Spontaneous' mode	Bit 2	Not used	Bit 1	Not used	Bit 0	'Continuous' mode (0=enabled, 1=disabled).
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Bit 7	Not used																		
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





3.2 Configuration Parameters

This section provides details on the configurable operational parameters of the **BLUEBOX**.

3.2.1 Keyboard Emulation

This section provides details on the configurable keyboard emulation parameters of the **BLUEBOX**.

Parameter	Description	Range	Default
Intrachar Time	The time between chars.  Note that this parameter become effective only after a reboot of the reader.	0 ... 990 ms in 10 ms step	20 ms

Parameter	Description	Range	Default
End of Message	The end char added to the tag's code message.  Note that this parameter become effective only after a reboot of the reader.	NUL CR TAB	NUL
Start of Text	The start text char added to the tag's code message.  Note that this parameter become effective only after a reboot of the reader.	See description	NUL
End of Text	The end text char added to the tag's code message.  Note that this parameter become effective only after a reboot of the reader.	See description	NUL
Encoding	The tag's code encoding.  Note that this parameter become effective only after a reboot of the reader.	Standard UID only Decimal D-10 Decimal D-18	Standard
Message Index	The start position index in the tag's code message.  Note that this parameter become effective only after a reboot of the reader.	0 ... 255	0
Message Length	The length of the tag's code message (0 means all the message starting from the index).  Note that this parameter become effective only after a reboot of the reader.	0 ... 255	0

The keyboard emulation parameters are stored in configuration page nr. 0x06 and are managed through the 'Read RAM/ROM Configuration Parameters' and 'Write RAM/ROM Configuration Parameters' commands as described in protocol technical manuals where the parameters 1...7 fields and default values are:

1	2	3	4	5	6	7
Intrachar Time	End of Message	Encoding	Start of Text	End of Text	Message Index	Message Length
0x02	0x00	0x00	0x00	0x00	0x00	0x00



Where:


Parameter	Description
Intrachar Time	Time between chars in the range 0 (0x00) ... 990 (0x63) ms with 10 ms steps.
End of Message	The end of message char added to the tag's code message: <ul style="list-style-type: none"> 0x00: NUL (no end char);

Parameter	Description
	<ul style="list-style-type: none"> 0x09: TAB (tabulation); 0x0D: CR (carriage return).
Encoding	<p>The tag's code encoding:</p> <ul style="list-style-type: none"> 0x00: Standard; 0x02: Decimal D-10; 0x03: UID only. 0x04: Decimal D-18.
Start of Text	The char added at the beginning of the tag's code message. It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no Start of Text char.
End of Text	The char added at the end of the tag's code message (before End of Message). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no End of Text char.
Message Index	The start position index in the tag's code message except of Start of Text, End of Text and End of Message chars.
Message Length	The length of the tag's code message except of Start of Text, End of Text and End of Message chars. Value 0 means all the tag's code message starting from Message Index to the end of message.

3.2.2 'Spontaneous' Message

This section provides details on the configurable 'spontaneous' message parameters of the **BLUEBOX**

Parameter	Description	Range	Default
Message on USB Virtual COM	<p>'Spontaneous' message on USB Virtual COM interface activation/deactivation.</p> <p> Note that this parameter become effective only after a reboot of the reader.</p>	Disabled Enabled	Enabled
Message on USB HID Keyboard	<p>'Spontaneous' message on USB HID Keyboard interface activation/deactivation.</p> <p> Note that this parameter become effective only after a reboot of the reader.</p>	Disabled Enabled	Enabled
Format	<p>The 'spontaneous' message format.</p> <ul style="list-style-type: none"> 0: Message is sent with BlueBox protocol rules; 1: Message is sent, without any control character, in dual char string form; 2: Message is sent like in option 1 but at the end CR will be appended; 3: Message is sent like in option 1 but at the end CR+LF will be appended. 	0 1 2 3 4 5 6 7 8	0

Parameter	Description	Range	Default
	<ul style="list-style-type: none"> 4: Message is sent, without any control character, in ASCII form. Non printable chars (0x20..0x7E) are replaced with '.' (0x2E). 5: Message is sent like in option 4 but at the end CR will be appended. 6: Message is sent like in option 4 but at the end CR+LF will be appended. 7: Message is sent like in option 1 with an STX char at the begin of the message. 8: Message is sent like in option 2 with an STX char at the begin of the message. 9: Message is sent like in option 3 with an STX char at the begin of the message. 10: Message is sent like in option 4 with an STX char at the begin of the message. 11: Message is sent like in option 5 with an STX char at the begin of the message. 12: Message is sent like in option 6 with an STX char at the begin of the message.  Note that this parameter become effective only after a reboot of the reader.	9 10 11 12	
Encoding	The 'spontaneous' message encoding.	None Decimal	None

The 'spontaneous' message parameters are stored in configuration page nr. 0x09 and are managed through the 'Read RAM/ROM Configuration Parameters' and 'Write RAM/ROM Configuration Parameters' commands as described in protocol technical manuals where the parameters 1...7 fields with default values are:

1	2	3	4	5	6	7
0x00	Interface	Format	Encoding	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00

Where:

Parameter	Description						
Interface	<p>The interface where to send the 'spontaneous' message activation/deactivation. Single bits are dedicated to enable (0 value) or disable (1 value) an interface:</p> <table> <tr> <th>Bit</th><th>Description</th></tr> <tr> <td>Bit 7</td><td>Not used</td></tr> <tr> <td>Bit 6</td><td>Not used</td></tr> </table>	Bit	Description	Bit 7	Not used	Bit 6	Not used
Bit	Description						
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Bit 6	Not used						

Parameter	Description												
	<table> <tr> <td>Bit 5</td><td>Not Used</td></tr> <tr> <td>Bit 4</td><td>Not Used</td></tr> <tr> <td>Bit 3</td><td>Not Used</td></tr> <tr> <td>Bit 2</td><td>USB HID keyboard</td></tr> <tr> <td>Bit 1</td><td>Not Used</td></tr> <tr> <td>Bit 0</td><td>USB Virtual COM</td></tr> </table>	Bit 5	Not Used	Bit 4	Not Used	Bit 3	Not Used	Bit 2	USB HID keyboard	Bit 1	Not Used	Bit 0	USB Virtual COM
Bit 5	Not Used												
Bit 4	Not Used												
Bit 3	Not Used												
Bit 2	USB HID keyboard												
Bit 1	Not Used												
Bit 0	USB Virtual COM												
Format	<p>The 'spontaneous' message format:</p> <ul style="list-style-type: none"> • 0x00: Message is sent with BlueBox protocol rules; • 0x01: Message is sent, without any control character, in dual char string form; • 0x02: Message is sent like in option 1 but at the end CR will be appended; • 0x03: Message is sent like in option 1 but at the end CR+LF will be appended. • 0x04: Message is sent, without any control character, in ASCII form. Non printable chars (0x20..0x7E) are replaced with '.' (0x2E). • 0x05: Message is sent like in option 4 but at the end CR will be appended. • 0x06: Message is sent like in option 4 but at the end CR+LF will be appended. • 0x07: Message is sent like in option 1 with an STX char at the begin of the message. • 0x08: Message is sent like in option 2 with an STX char at the begin of the message. • 0x09: Message is sent like in option 3 with an STX char at the begin of the message. • 0x0A: Message is sent like in option 4 with an STX char at the begin of the message. • 0x0B: Message is sent like in option 5 with an STX char at the begin of the message. • 0x0C: Message is sent like in option 6 with an STX char at the begin of the message. 												
Encoding	<p>The 'spontaneous' message encoding:</p> <ul style="list-style-type: none"> • 0x00: None; • 0x01: Decimal. 												

4 Keyboard Emulation

In 'continuous' mode, if the 'keyboard emulation' feature is set on (see dip switch settings in Hardware Settings paragraph and Operating Features), the **BLUEBOX** will send the following message on the USB HID keyboard line every time that it will find a 'new' tag.

4.1 Standard Coding

<starttext> <code s h> <code s+1 l> ... <code i h> <code i+1 l> ... <code n/2 h> <code n/2+1 l> <endtext> <endmessage>

Where:

<starttext>	The char added at the beginning of the tag's code message (Start of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no Start of Text char.
s	The start position (Message Index field in keyboard configuration).
i	s ... n/2 (n is the Message Length field in keyboard configuration).
<code i h> <code i l>	i-th byte of the UID of the identified tag. The 1st byte is the tag type as defined in BSW007xxxE. ASCII encoded byte.
<endtext>	The char added at the end of the tag's code message and before End of Message (End of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no End of Text char.
<endmessage>	The end of message char added to the tag's code message (End of Message field in keyboard configuration): <ul style="list-style-type: none"> • 0x00: NUL (no end char added); • 0x09: TAB (tabulation); • 0x0D: CR (carriage return).

4.2 UID Only Coding

**<starttext> <code s h> <code s+1 l> ... <code i h> <code i+1 l> ...
<code (n-1)/2 h> <code (n-1)/2+1 l> <endtext> <endmessage>**

Where:

<starttext>	The char added at the beginning of the tag's code message (Start of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no Start of Text char.
s	The start position (Message Index field in keyboard configuration).
i	s ... n/2 (n is the Message Length field in keyboard configuration).
<code i h> <code i l>	i-th byte of the UID of the identified tag. ASCII encoded byte.
<endtext>	The char added at the end of the tag's code message and before End of Message (End of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no End of Text char.
<endmessage>	The end of message char added to the tag's code message (End of Message field in keyboard configuration): <ul style="list-style-type: none"> • 0x00: NUL (no end char added); • 0x09: TAB (tabulation); • 0x0D: CR (carriage return).

o Decimal D-10 Coding

**<starttext> <code s>... <code i> ... <code n-1> <endtext>
<endmessage>**

Where:

<starttext>	The char added at the beginning of the tag's code message (Start of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no Start of Text char.
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s	The start position (Message Index field in keyboard configuration).
i	s ... n (n is the Message Length field in keyboard configuration).
<code i>	i-th char of the decimal conversion of the UID of the identified tag. The UID is trimmed right to 4 bytes and converted to 10 decimal digits 0 pad left.
<endtext>	The char added at the end of the tag's code message and before End of Message (End of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no End of Text char.
<endmessage>	The end of message char added to the tag's code message (End of Message field in keyboard configuration): <ul style="list-style-type: none"> • 0x00: NUL (no end char added); • 0x09: TAB (tabulation); • 0x0D: CR (carriage return).

4.3 Decimal D-18 Coding

**<starttext> <code s>... <code i> ... <code n-1> <endtext>
<endmessage>**

Where:

<starttext>	The char added at the beginning of the tag's code message (Start of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no Start of Text char.
s	The start position (Message Index field in keyboard configuration).
i	s ... n (n is the Message Length field in keyboard configuration).
<code i>	i-th char of the decimal conversion of the UID of the identified tag. The UID is trimmed right to 7 bytes and then converted as below: <ul style="list-style-type: none"> • Byte 0 -> 3 decimal digits 0 pad left. • Byte 1...2 -> 5 decimal digits 0 pad left.

	<ul style="list-style-type: none"> Byte 3..6 -> 10 decimal digits 0 pad left.
<endtext>	<p>The char added at the end of the tag's code message and before End of Message (End of Text field in keyboard configuration). It must be in the range 0x20...0x7D except values 0x27,0x3C,0x3E,0x60. Value 0x00 means no End of Text char.</p>
<endmessage>	<p>The end of message char added to the tag's code message (End of Message field in keyboard configuration):</p> <ul style="list-style-type: none"> 0x00: NUL (no end char added); 0x09: TAB (tabulation); 0x0D: CR (carriage return).

5 Installation

5.1 General Instructions

- When mounting several nearby adhere to the minimum distances between them.
- Installing a device in or on metal reduces the read and write distance.
- Keep the device away from direct sunlight, high humidity, extreme temperatures, and sources of electromagnetic interference. Any combination of these conditions might degrade performance or shorten the life of the device.
- Connect the device using a suitable cable as defined in electrical connections section.
- Power the device as defined in electrical connections section. The boot sequence begins in either case when power is supplied to the device. This sequence typically completes within 5 seconds. After the boot sequence finishes, the device accepts commands, not before. The LED on the device alerts you to the status as defined in status indications section.

5.2 Notes on Tag Mounting

- For installation in and on metal tags provided for this purpose must be used.
- The tag must be placed in the reading area of the device antenna. The angle of aperture and the operating distance must be adhered to.
- The orientation of the device antenna axis must correspond with the axis of the tag for best performance.

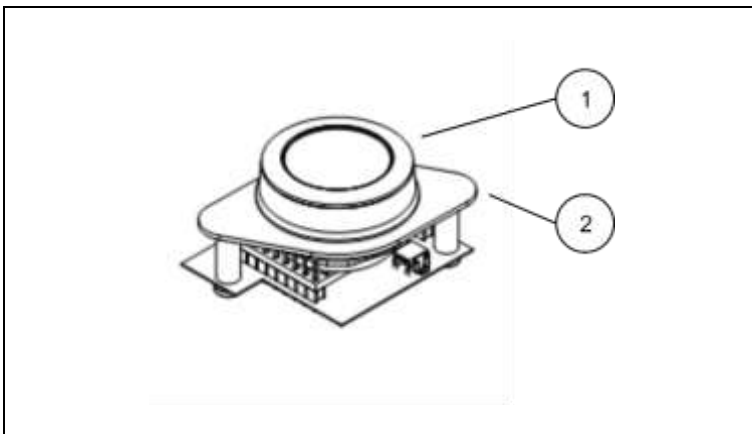
5.3 Avoiding Interference

The device generates a modulated electrical field with a frequency of 125 kHz. To avoid interference of the data communication no other devices generating interference emission in this frequency band must be operated in its vicinity. Such devices are for example frequency converters and switched-mode power supplies.



Respect the notes on installation in the event that several RFID 125kHz devices are operating simultaneously in the same area.

5.4 Mechanical Design



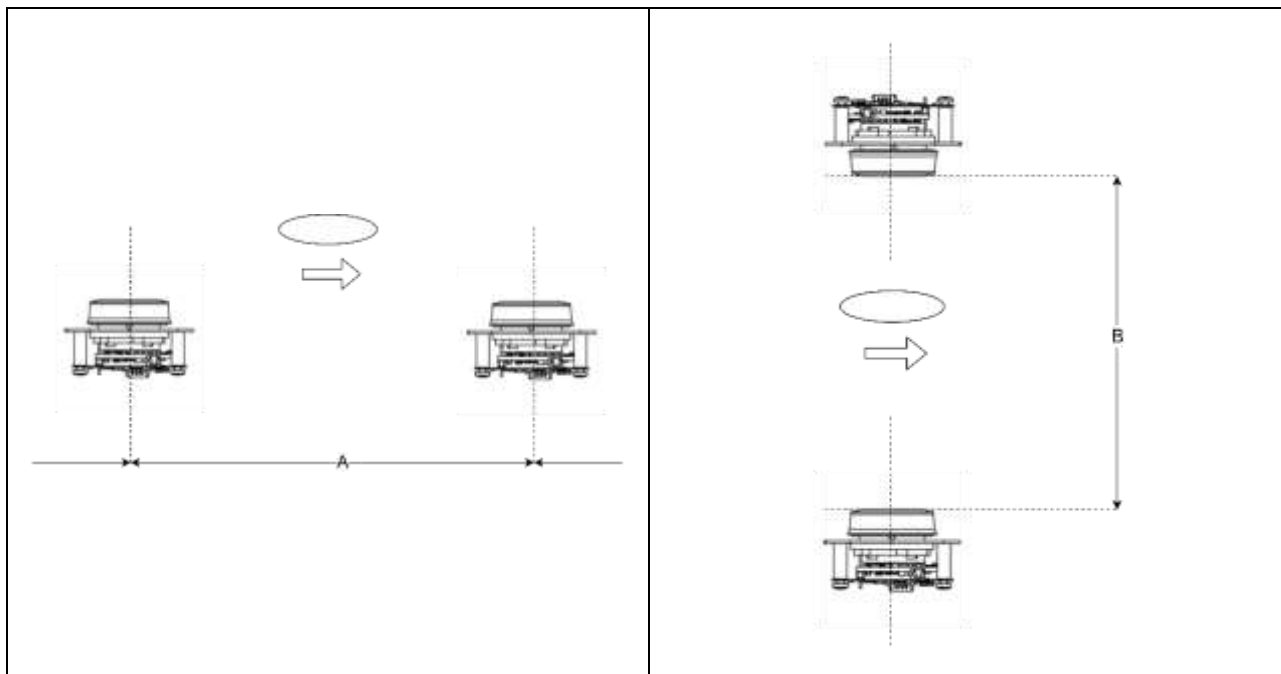
1. Sensing face (antenna)
2. Fixing bracket

5.5 Fixing

To correctly install the device, perform the following steps:

- Drill a Ø22 mm hole in the panel; remember that the panel must have a thickness between 2.5 and 4 mm, if shorter it is necessary to shim with appropriate washers placed between the panel itself and the fixing support of the device.
- Mount the antenna on the front of the panel by arranging the device fixing support and the ring on the back of the panel.
- Before tightening the ring nut, correctly align the fixing bracket of the device so as to match the antenna strip connection to the device.
- Fasten the device on the support using 2 M3x6 screws (supplied) after correctly and gently coupling with the antenna.
- Wire the device.

5.6 Mounting Distances



Operating Mode

Reading and writing

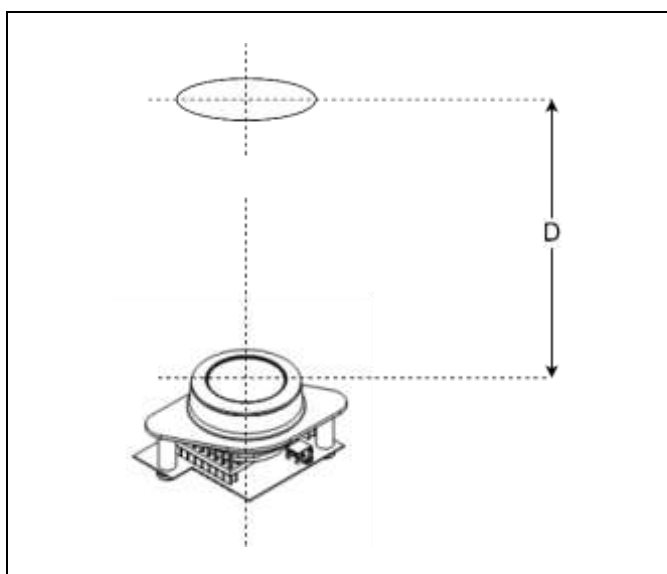
Distance Side (A)

> 400mm

Distance Front (B)

> 400mm

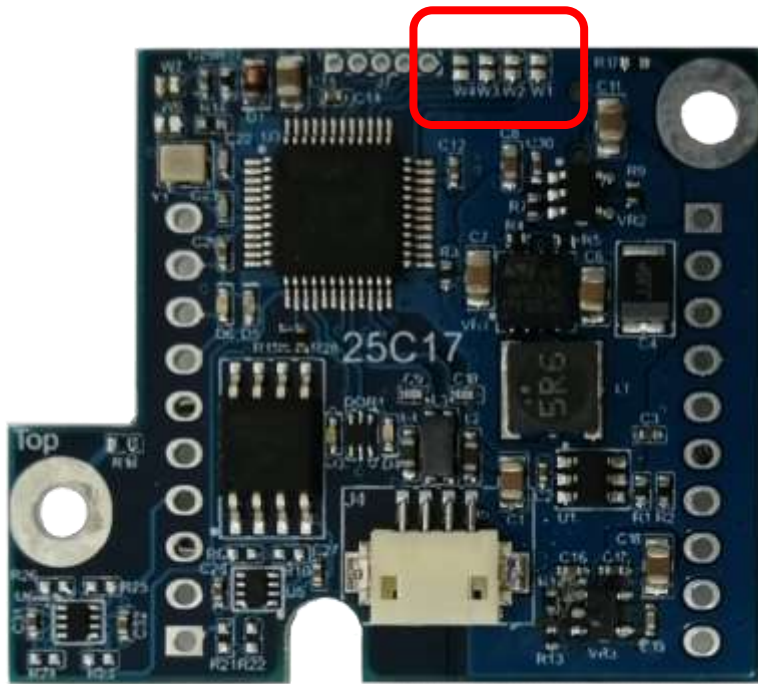
5.7 Positioning of the Tags



- Align the tag on the antenna central axis.
- See the tag datasheet for the distance D.

6 Hardware Settings

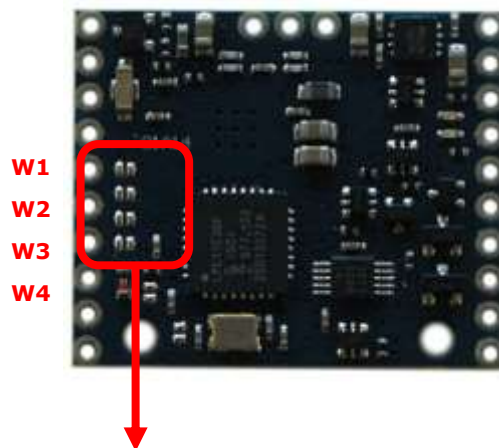
6.1 Main Board



Solder Jumpers

W1	On: force 255, 19200, 8, n, 1.
W2	On: enables 'spontaneous' mode on USB Virtual COM serial line.
W3	On: enables 'keyboard emulation' mode on HID Keyboard line.
W4	Not used.

6.2 RF Front-End



Solder Jumper

W1	Not used.
W2	Not used.
W3	Transponder type (see following table).
W4	Transponder type (see following table).

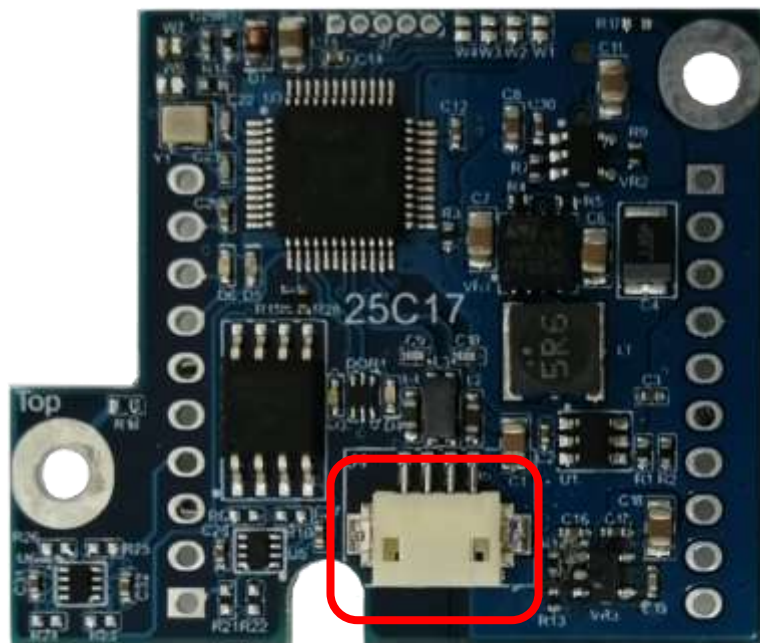
W3	W4	Description
Off	Off	ISO 15693 and ISO 14443A/B.
Off	On	ISO 14443A only.
On	Off	ISO 15693 only.
On	On	ISO 14443B only.

7 Electrical Connections



- The device must be connected by a skilled qualified person.

7.1 Wiring

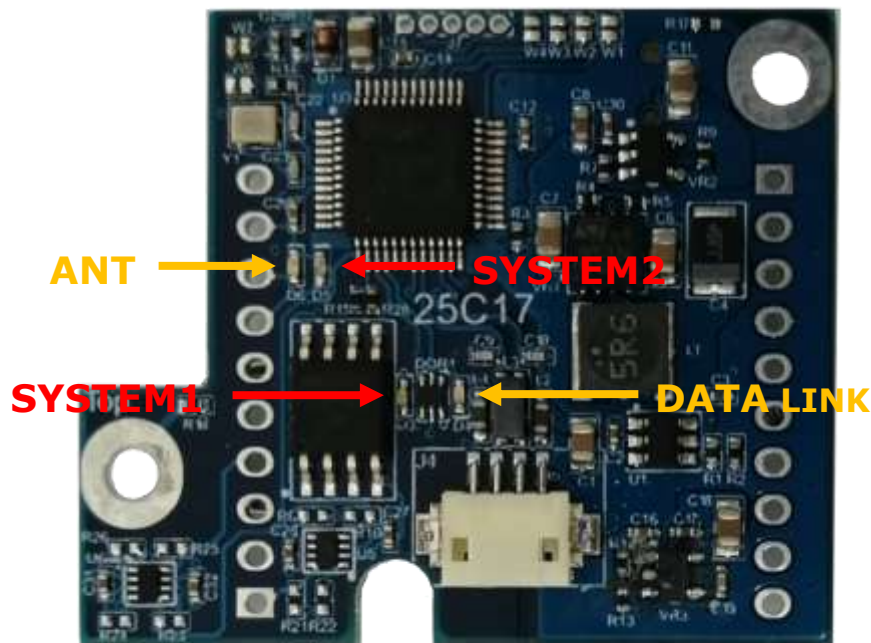


Pin 1

Pin	No	Min	Typical	Max	Description
USB V+	1	4.75Vdc	5Vdc	5.25Vdc	DC power supply (VBUS)
USB D-	2				USB Data - (D-)
USB D+	3				USB Data + (D+)
USB Gnd	4				DC power supply (GND)



An adapter cable (supplied) allows a standard USB connection (type A connector).










8 Status Indications:



The **BLUEBOX** uses four LEDs. The following tables provides the indicator states and flash rates.

State	Definition
On	The indicator is constantly on
Off	The indicator is constantly off
Fast Blinking	The indicator turns on and off with a frequency of 2 Hz: on for 250 ms, followed by off for 250 ms
Slow Blinking	The indicator turns on and off with a frequency of 1 Hz: on for 500 ms, followed by off for 500 ms
Flashing	The indicator turns on and off with variable frequency

LED	Color	State	Meaning
SYSTEM1	 (red)	On	<ul style="list-style-type: none"> System error. System initialization. Solder jumper W1 closed. System upgrade.
	 (off)	Off	<ul style="list-style-type: none"> Normal operation.

LED	Color	State	Meaning
			<ul style="list-style-type: none"> Power supply is missing. Hardware defect.
SYSTEM2	 (red)	On	<ul style="list-style-type: none"> RF front-end error. RF-front end initialization. RF front-end upgrade.
	 (off)	Off	<ul style="list-style-type: none"> Normal operation. Power supply is missing. Hardware defect.
ANT	 (yellow)	Fast Blinking	<ul style="list-style-type: none"> Antenna active, no tag detected in 'continuous' mode.
	 (yellow)	Slow Blinking	<ul style="list-style-type: none"> Antenna not active in 'continuous' mode. 'Continuous' mode disabled.
	 (yellow)	On	<ul style="list-style-type: none"> Antenna active, tag detected in 'continuous' mode. System initialization.
	 (off)	Off	<ul style="list-style-type: none"> Power supply is missing. Hardware defect. System upgrade.
DATA LINK	 (yellow)	Flashing	<ul style="list-style-type: none"> System is exchanging data with host.
	 (yellow)	On	<ul style="list-style-type: none"> System initialization.
	 (off)	Off	<ul style="list-style-type: none"> No data exchange with host. Power supply is missing. Hardware defect. System upgrade.

9 Antennas

The **BLUEBOX** is available with internal antenna directly integrated on the device cover.

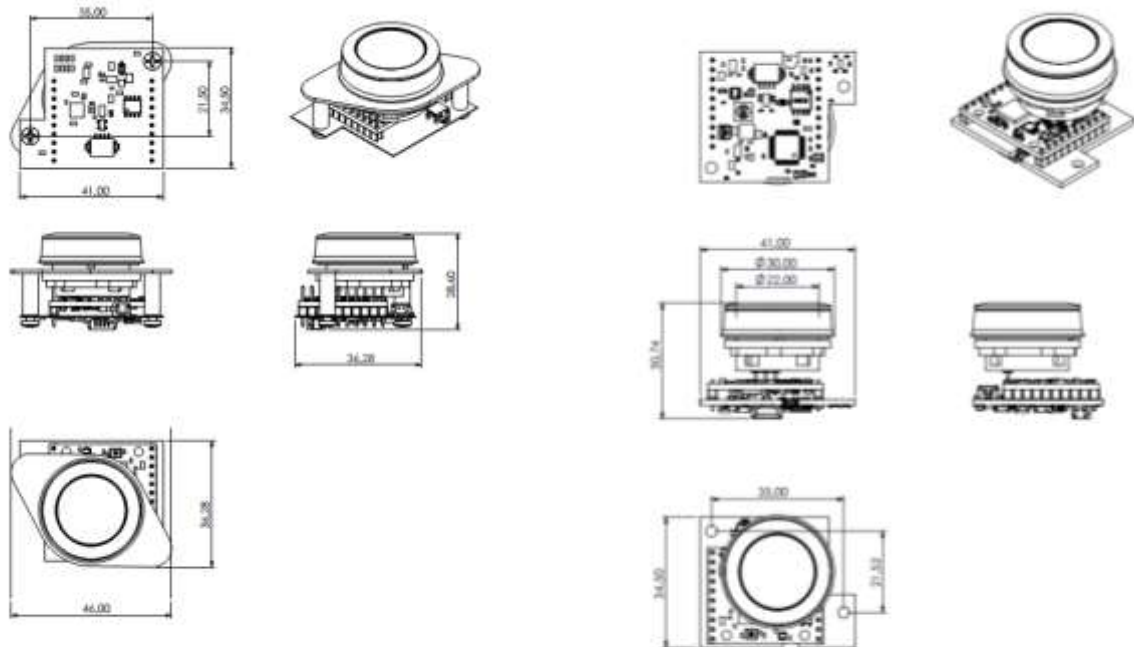
The read range of an RFID system always depends on various factors like antenna size, transponder size, transponder IC type, orientation between transponder and reader antenna, position of the transponder versus the reader antenna, noise environment, metallic environment, etc. Therefore all data about read ranges can only be typical values measured under laboratory conditions. In real live applications the read range may differ from the data mentioned in the datasheet.

10 Maintenance, Repair and Disposal

If used correctly, no maintenance and repair measures are necessary

- The device must only be repaired by the manufacturer.
- After use dispose of the device in an environmentally friendly way in accordance with the applicable national regulations.
- Keep the device free from soiling.

11 Mechanical dimensions



Dimensions in mm.

12 Document Revision History

Date	Revision	Description
25/10/18	1.00	First release.
15/04/19	1.01	<p>Updated the company name/logo and BLUEBOX logo.</p> <p>Updated the reader's firmware versions object of this manual.</p> <p>Minor changes and corrections in operating features and in the configuration parameters.</p> <p>Added configuration for the 'spontaneous' message format.</p> <p>Updated the .inf file with new release.</p>
20/10/20	1.02	<p>Update the device image in the first page.</p> <p>Updated the reader's firmware versions object of this manual.</p> <p>Changes in the operating features and general and configuration parameters.</p> <p>Added the STX + dual char string format setup selection (STX + dual char string, STX + dual char string + CR, STX + dual char string + CRLF) in spontaneous message configuration parameters.</p> <p>Added the STX + ASCII string format setup selection (STX + ASCII string, STX + ASCII string + CR, STX + ASCII string + CRLF) in spontaneous message configuration parameters.</p> <p>Added the message encoding selection (None, Decimal) in spontaneous message configuration parameters.</p> <p>Updated the installation section.</p> <p>Added safety informations in electrical connections section.</p> <p>Added the maintenance, repair and disposal section.</p> <p>Format and document fixes in all sections.</p>

A. .inf File

```

;-----
; Communication Device Class driver installation file
;
; Version 2.0.0.0 - 11/01/2019
; - New company name.
; - Removed FH1000 device.
;
;-----
[Version]
Signature="$Windows NT$"
Class=Ports
ClassGuid={4D36E978-E325-11CE-BFC1-08002BE10318}
Provider=%Kronotech%
DriverVer=11/01/2019,2.0.0.0
[Manufacturer]
%Kronotech%=DeviceList,ntamd64
[DeviceList]
%BLUEBOXCXUHF%=Reader, USB\VID_c251&PID_0001
%BLUEBOXCXEUHF%=Reader, USB\VID_c251&PID_0002
%BB2DESKTOPv2%=Reader, USB\VID_28AD&PID_0004&MI_00
%PANELREADER22%=Reader, USB\VID_c251&PID_0003&MI_00
[DeviceList.ntamd64]
%BLUEBOXCXUHF%=Reader, USB\VID_c251&PID_0001
%BLUEBOXCXEUHF%=Reader, USB\VID_c251&PID_0002
%BB2DESKTOPv2%=Reader, USB\VID_28AD&PID_0004&MI_00
%PANELREADER22%=Reader, USB\VID_c251&PID_0003&MI_00
;-----
; Installation
;-----
[Reader]
include=mdmcpq.inf

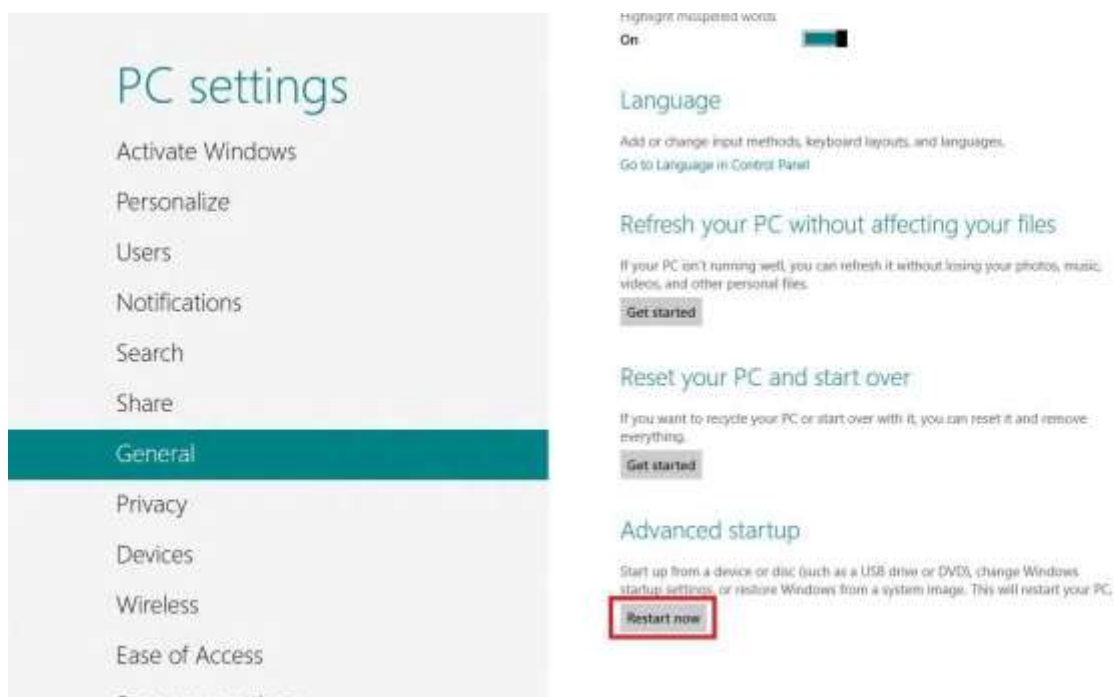
```

```
CopyFiles=FakeModemCopyFileSection
AddReg=Reader.AddReg
[Reader.AddReg]
HKR,,DevLoader,,*ntkern
HKR,,NTMPDriver,,usbser.sys
HKR,,EnumPropPages32,, "MsPorts.dll,SerialPortPropPageProvider"
[Reader.Services]
AddService=usbser, 0x00000002, DriverService
[DriverService]
DisplayName=%DRIVER.SVC%
ServiceType=1
StartType=3
ErrorControl=1
ServiceBinary=%12%\usbser.sys
;-----
; String Definitions
;-----
[Strings]
Kronotech = "Kronotech Srl"
DRIVER.SVC = "BLUEBOX USB VCom Driver"
BLUEBOXCXUHF = "BLUEBOX CX UHF USB VCom Port"
BLUEBOXCXEUHF= "BLUEBOX CX E UHF USB VCom Port"
BB2DESKTOPv2 = "BLUEBOX Gen2 DESKTOP USB VCom Port"
PANELREADER22= "BLUEBOX Panel Reader 22 USB VCom Port"
```

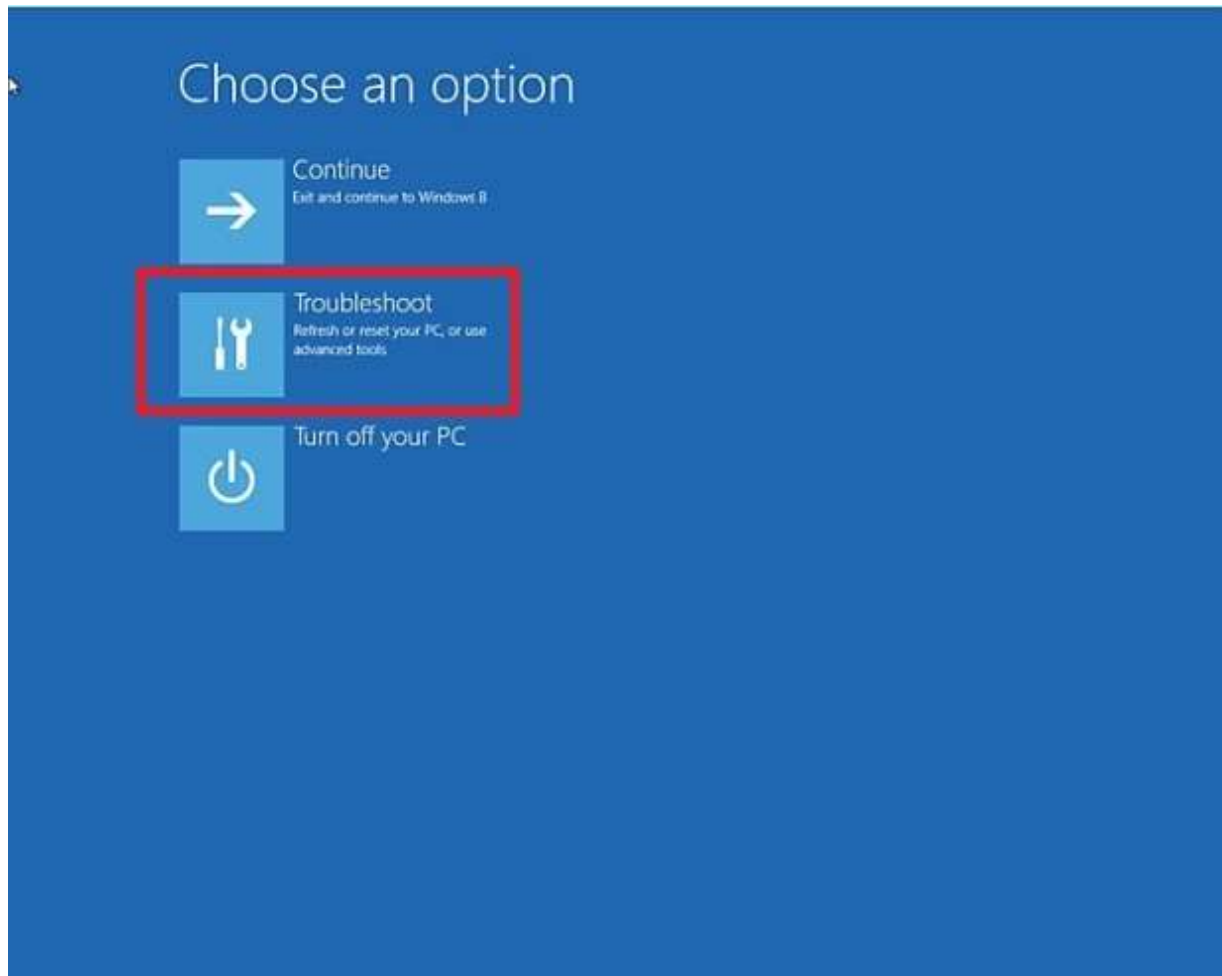

B. Driver Install on Windows 8 OS

Windows 8 does not allow installing drivers that are not signed by Microsoft. Below is described how to de-activate the driver signing check.

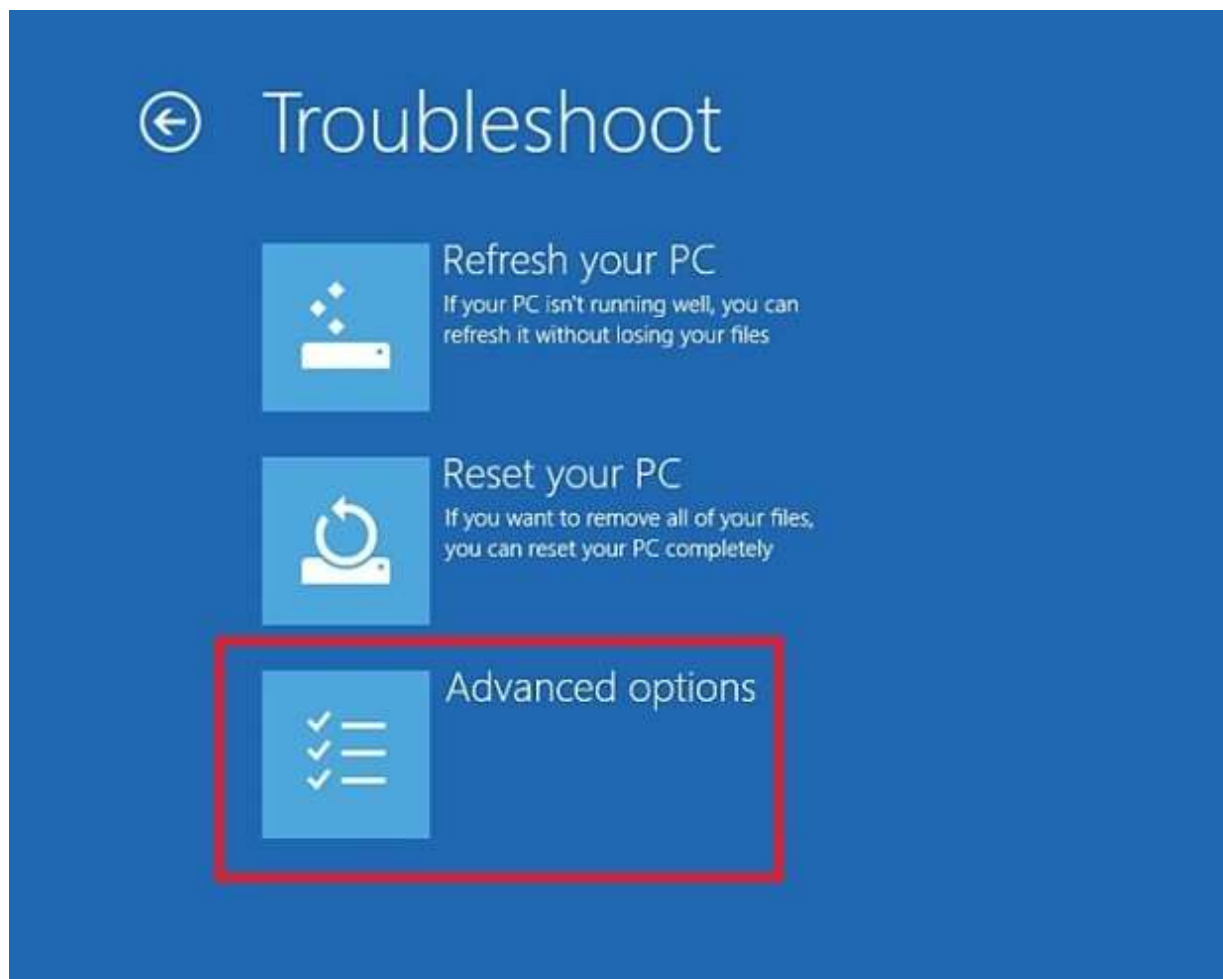
- 1) First, select "**Settings**" on the right side of your screen:
- 2) Select "**Change PC Settings**":
- 3) Navigate to "**General**" settings and then scroll down to "**Advanced Startup**". Click on "**Restart**":



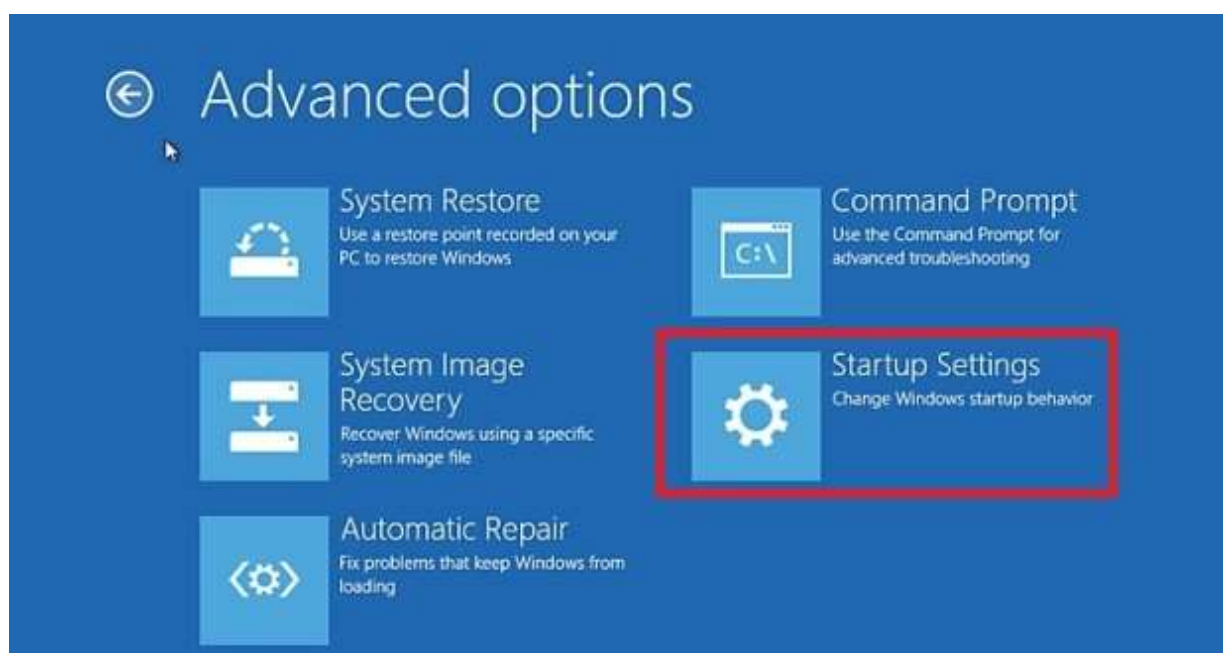
- 4) After that, Click on "**Troubleshoot**":



5) On the next screen, choose "**Advanced Options**":



6) Then click on "**Startup Settings**":



7) Then click on the "**Restart**" button:



8) After your computer reboots, another screen will appear where you will be asked to press a number to choose an option. So press **7** or **F7**:

Startup Settings

Press a number to choose from the options below:

Use number keys or functions keys F1-F9.

- 1) Enable debugging
- 2) Enable boot logging
- 3) Enable low-resolution video
- 4) Enable Safe Mode
- 5) Enable Safe Mode with Networking
- 6) Enable Safe Mode with Command Prompt
- 7) Disable driver signature enforcement
- 8) Disable early launch anti-malware protection
- 9) Disable automatic restart after failure

Press F10 for more options

Press Enter to return to your operating system

- 9) When you install the driver, this prompt will appear on screen. Select **"Install this driver software anyway"**:

