

# BlueBoxShow

BlueBox Show, free of charge and included in the BlueBox SDK, is the graphical testing and configuration tool that with just few clicks customizes the functions of any BlueBox RFID devices.

Please note that not all the functions included in this guide will be displayed in any BlueBox. The software itself will show only the parameters that are meant to be managed. This guide refers to BlueBox CX series, but can be used with any BlueBox device.



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**BLUEBOX**  
RFid System

# Lets start

## Main bar menu

**File:** load or save a configuration (functionality not yet implemented)

**Edit:** activate/deactivate «beep» on tag event. Open Engineering mode (only for soltec developers)

**Engineering Mode:** reserved for manufacturer

**Upgrade:** safely upgrade the firmware

**Demos:** spontaneous mode demo

**About:** shows information about firmware and hardware

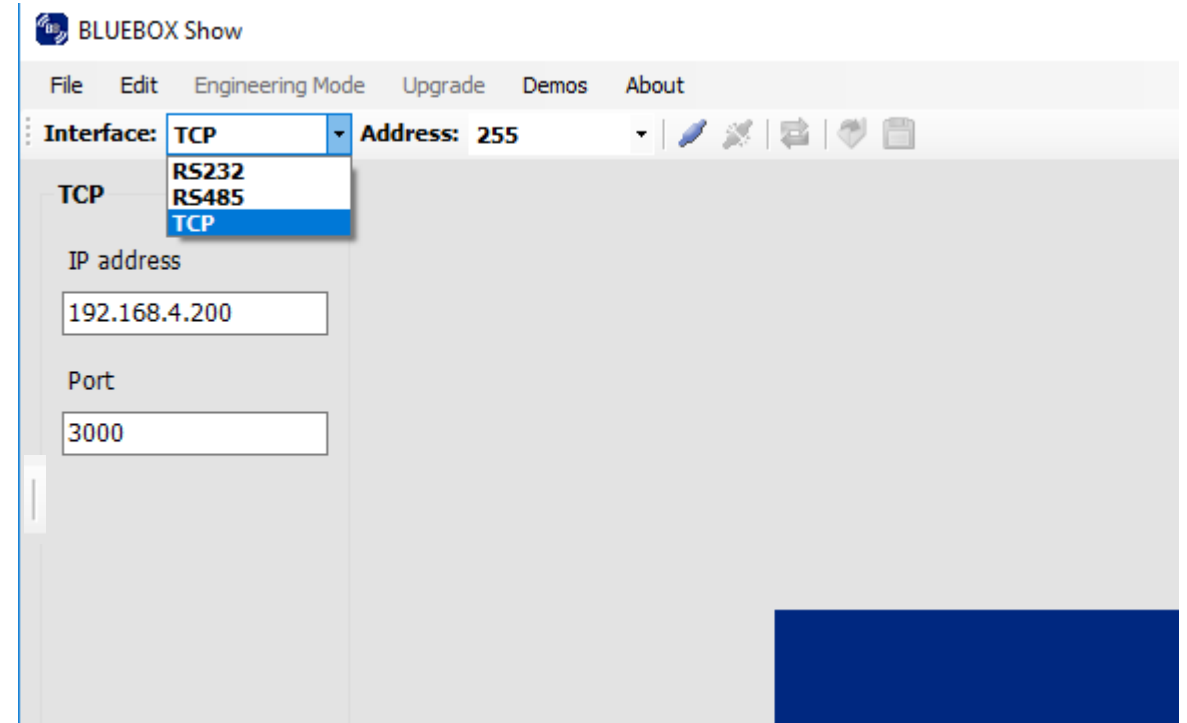
## Interface

In order to connect the device to the BlueBoxShow first of all it is necessary to choose the proper interface between Ethernet (TCP) or Serial (RS232 / RS485). For TCP connection the default IP address is 192.168.4.200 (Port 3000). For serial the defaults are baud rate 19200 bps, 8 data bits, 1 stop bit and no parity check. Indeed the correct serial port must be selected first.

## Address

Default is 255, but any number between 1-255 can be assigned to a device. This address will be checked on all interfaces, not only in an RS485 bus. Only when connecting with the USB service port of some Blueboxes, the address is ignored.

## Shortcut icons



# Configuration

Right after the connection the device version is shown in the highlighted blue panel (in the picture BLUEBOX CX UHF LONG RANGE DUAL CHANNEL)  
The Commands colon contains all the parameters controlled by the BlueBoxShow.

**Configuration:** This panel allows to set network Address node of the device, and the serial communication parameters.

**Filter Time:** it is used to avoid multiple detections of the same tag. The Filter time says the device to ignore the tag after the detection for the specified time.

**Buzzer activation on new tag event:** enables/disable the buzzer on tag detection

**Relay 1 activation on tag present:** activate the Relay1, the behaviour is controlled in the I/O configuration section.

**Reading antenna Information:** upon tag detection, enables/disables adding the antenna information together with the tag ID

**Tag type information:** upon tag detection, enables/disables adding the tag information together with the tag ID

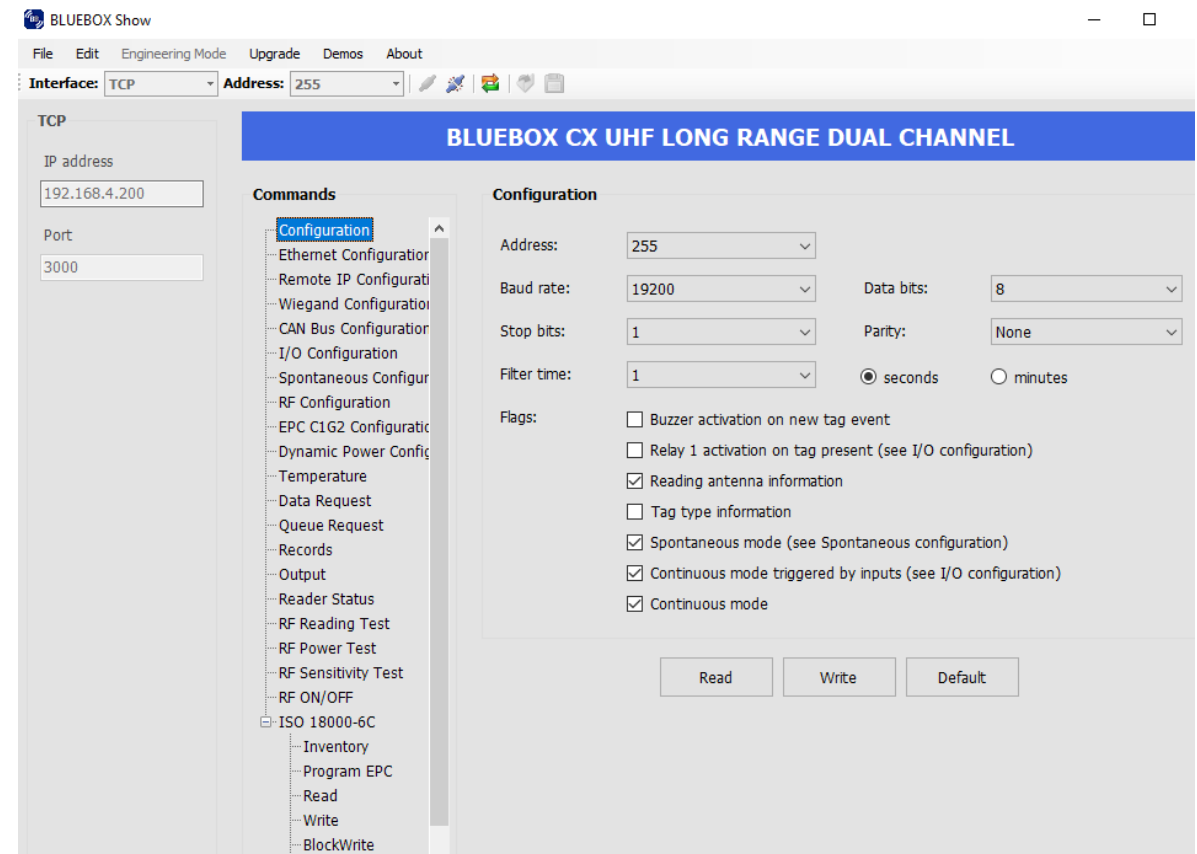
**Spontaneous mode:** enables/disables the Spontaneous mode

**Continuos mode triggered by inputs:** by enabling this option the continuos mode is controlled in the I/O configuration panel

**Continuos mode:** enables/disables the Continuos mode

Read Write Default

**Read:** reads the stored values, **Write:** saves the values in the memory (a reboot may be required) **Default:** calls the factory default values



# Ethernet configuration – Remote IP configuration

**Ethernet Configuration:** view/change the IP address, TCP Port, Subnet Mask and Gateway Address

File Edit Engineering Mode Upgrade Demos About

Interface: TCP Address: 255

**BLUEBOX CX UHF LONG RANGE DUAL CHANNEL**

**Commands**

- Configuration
- Ethernet Configuration**
- Remote IP Configuration
- Wiegand Configuration
- CAN Bus Configuration
- I/O Configuration
- Spontaneous Configuration
- RF Configuration
- EPC C1G2 Configuration
- Dynamic Power Configuration
- Temperature
- Data Request
- Queue Request

**Ethernet Configuration**

MAC Address: 40:D8:55:1A:1B:4D

IP Address: 192.168.4.200

TCP Port: 3000

Subnet Mask: 255.255.255.0

Gateway Address: 0.0.0.0

Read Write Default

**Remote IP Configuration:** it is possible to stream the readings to a remote server by specifying the IP address and the TCP listening Port

File Edit Engineering Mode Upgrade Demos About

Interface: TCP Address: 255

**BLUEBOX CX UHF LONG RANGE DUAL CHANNEL**

**Commands**

- Configuration
- Ethernet Configuration
- Remote IP Configuration**
- Wiegand Configuration
- CAN Bus Configuration
- I/O Configuration
- Spontaneous Configuration
- RF Configuration
- EPC C1G2 Configuration
- Dynamic Power Configuration
- Temperature
- Data Request
- Queue Request

**Remote IP Configuration**

Server IP address: 192.168.4.200

Server TCP port: 3000

Max connection timeout wait time: 1 sec min

Read Write Default

Read Write Default

**Read:** reads the stored values, **Write:** saves the values in the memory (a reboot may be required) **Default:** calls the factory default values

# Wiegand configuration – Can Bus configuration

**Wiegand Configuration:** set the Wiegand parameters (it applies only to Wiegand versions)

The screenshot shows the 'BLUEBOX CX UHF LONG RANGE DUAL CHANNEL' software interface. On the left, there's a sidebar with 'TCP' selected, showing 'IP address' as 192.168.4.200 and 'Port' as 3000. The main panel has a 'Commands' list on the left with 'Wiegand Configuration' highlighted. The right panel is titled 'Wiegand Configuration' and contains three dropdown menus: 'Protocol Data Format' set to 'Wiegand26', 'Interface Wave Pulse Width' set to '50 us', and 'Interface Wave Pulse Interval' set to '1 ms'. There's also a 'Start Address of the ID of the Tag' dropdown set to '0'. At the bottom right are 'Read', 'Write', and 'Default' buttons.

**Can Bus Configuration:** set the Can Bus parameters (it applies only to Can Bus versions)

The screenshot shows the same software interface but with 'CAN Bus Configuration' selected in the 'Commands' list. The 'CAN Bus Configuration' panel on the right contains two dropdown menus: 'CAN Bus Device Address' set to '0' and 'CAN Bus Baud Rate' set to '250 kbit/s'. The 'Read', 'Write', and 'Default' buttons are at the bottom right.

Three buttons labeled 'Read', 'Write', and 'Default' are displayed horizontally.

**Read:** reads the stored values, **Write:** saves the values in the memory (a reboot may be required) **Default:** calls the factory default values

# I/O Configuration – Spontaneous Configuration

**Input mode 1:** sets the behaviour when Input 1 is in ON or OFF state

**Input mode 2:** not yet implemented in the firmware

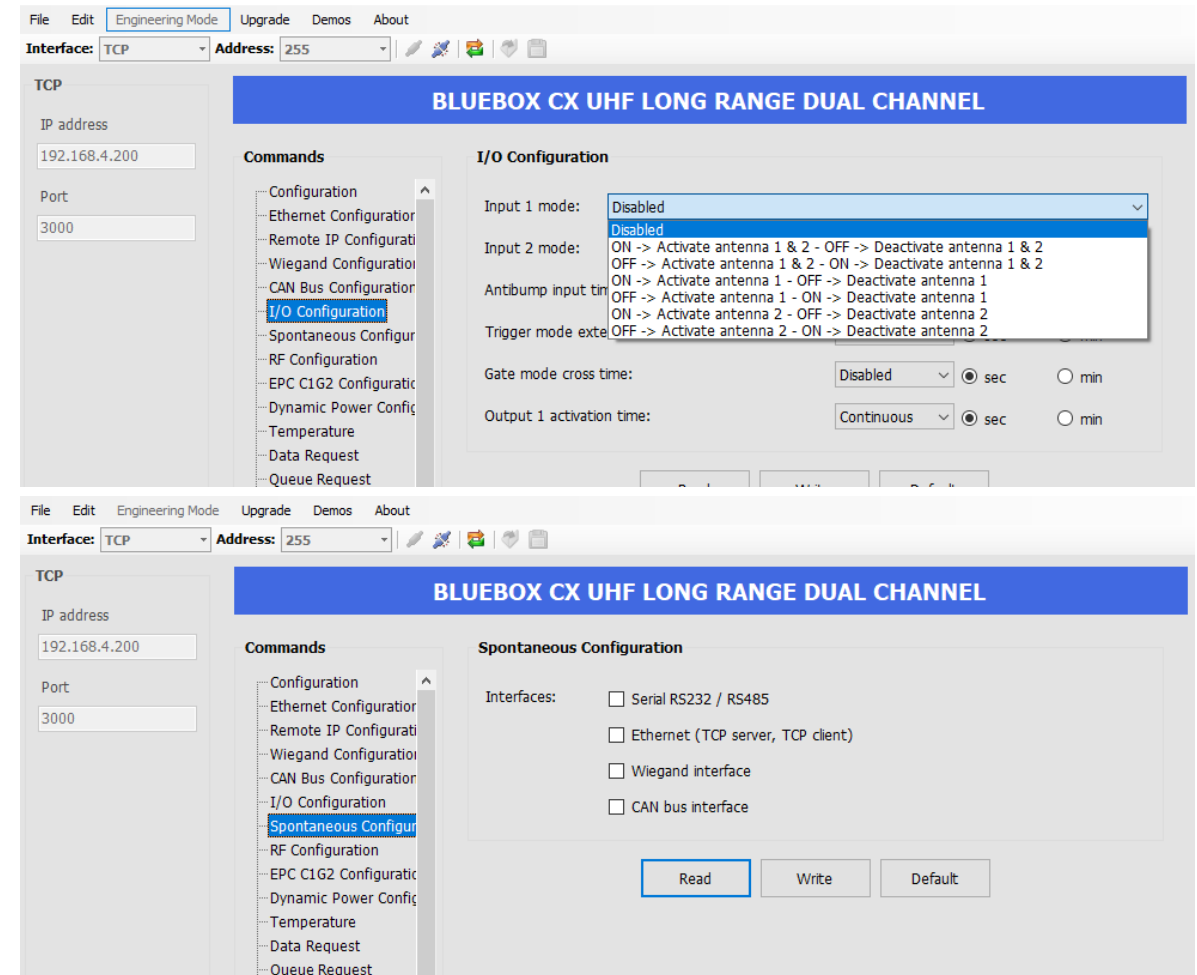
**Antibump input time:** sets the time to manage the antibump (default time is 50 msec)

**Trigger mode extend time:** extends the reaction time of the input

**Gate mode cross time:** when enabled the device, for the specified time, is set to identify the crossing gate direction

**Output 1 activation time:** sets the oper Relay time

**Interfaces:** it is possible to choose through the checkboxes, the interfaces where to send the spontaneous message to



**Read:** reads the stored values, **Write:** saves the values in the memory (a reboot may be required) **Default:** calls the factory default values

# RF Configuration

**RF geographical region:** Europe (ETSI) or North America (FCC)

**RF output power:** from 0dBm to the Max supported (27 for 500mW, 30 for 1W)

**RF input sensitivity:** the lower, the more tags are detected

**RF Channel:** it is possible to choose between 10 channels for ETSI and 50 for FCC.

Very useful to avoid interferences where more readers are working simultaneously

**Antennas:** the checkboxes control which antenna is active

**RF Channel max allocation time:** according to the application it is possible to specify the max allocation time of the specific channel

**RF Channel min pause time:** according to the application it is possible to specify the pause time of the specific channel

**RF chip standby mode:** puts the RF chip in standby

The screenshot shows the 'BLUEBOX CX UHF LONG RANGE DUAL CHANNEL' software interface. On the left, there's a 'TCP' section with 'Interface' set to 'TCP' and 'Address' set to '255'. Below this, 'IP address' is '192.168.4.200' and 'Port' is '3000'. A 'Commands' list on the left includes 'Configuration', 'Ethernet Configuration', 'Remote IP Configuration', 'Wiegand Configuration', 'CAN Bus Configuration', 'I/O Configuration', 'Spontaneous Configuration', 'RF Configuration' (highlighted), 'EPC C1G2 Configuration', 'Dynamic Power Configuration', 'Temperature', 'Data Request', 'Queue Request', 'Records', 'Output', 'Reader Status', 'RF Reading Test', 'RF Power Test', and 'RF Sensitivity Test'. The main 'RF Configuration' section on the right includes: 'RF geographical region' (set to 'Europe (ETSI compliant region)'), 'RF output power' (empty), 'RF input sensitivity' (empty), 'RF Channel' (set to 'Default'), 'Antennas' (with checkboxes for 'Antenna 1' and 'Antenna 2'), 'RF channel max allocation time' (set to 'ms\*10'), 'RF channel min pause time' (set to 'ms\*10'), and 'RF chip standby mode' (unchecked). At the bottom right are 'Read', 'Write', and 'Default' buttons.

**Read:** reads the stored values, **Write:** saves the values in the memory (a reboot may be required) **Default:** calls the factory default values

# EPC C1G2 Configuration

**Inventory mode:** **Fast** take the tag to the acknowledged mode, **Standard** to the Opened mode. The first is faster the second is more secure. **Multi** does anticollision procedure, **Single** no.

**T=>R link frequency:** defaults suggested, refer to the product manual.

**T=>R bit coding:** defaults suggested, refer to the product manual.

## Q tuning section

Q tells the reader informations about the number of tags that could be expected in the field according with the equation  $n=2^Q$  so, if the Q value is set to **0** and the Q algorithm to **fixed** the reader expects 1 tag in the field. When the Q algorithm is set to Dynamic, the reader changes automatically the values to match the actual scenario.

**Tags singulation search mode:** according to the EPC C1G2 specifications, an UHF tag when energized puts its state from A to B, when selected Dual Target the reader looks for tags that are in A and B state, when selected Single Target the reader looks for tags that are in the specified Target

**Session:** indicates which is the session managed by the reader. For further informations refers to EPC C1G2 specifications

**EPC size:** indicates the amount of EPC memory that will be used.

**ReadAfterDetect (RAD) info:** tells the reader what to read after the tag detection (TID, or custom)

**RAD Bank:** if Custom is selected then it is possible to specify which memory bank to read from, between EPC, TID or User

**RAD blocks:** when Custom is selected then it is possible to specify the number of blocks to read

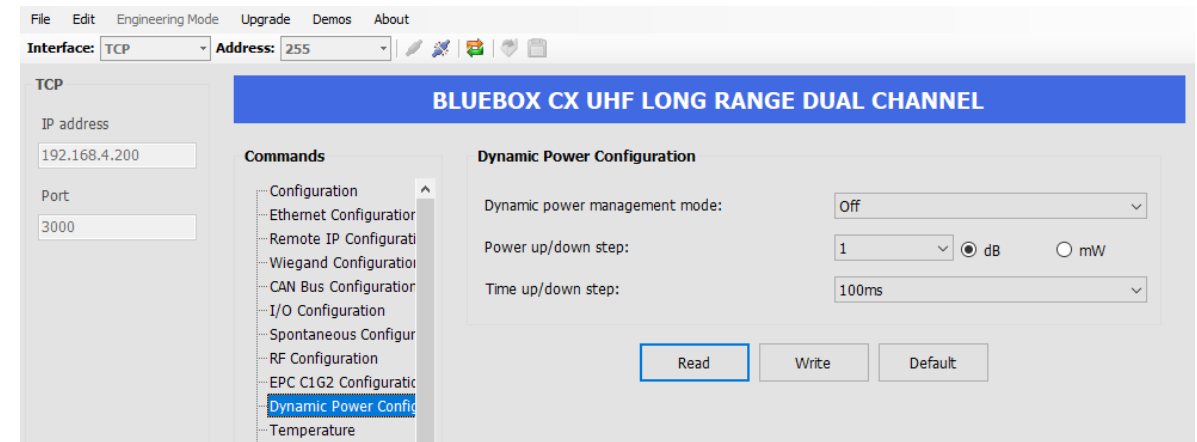
**ReadAfter Detect EPC info:** select The EPC bank info to include in the tag's ID in ReadAfterDetect mode



# Dynamic Power Configuration - Temperature

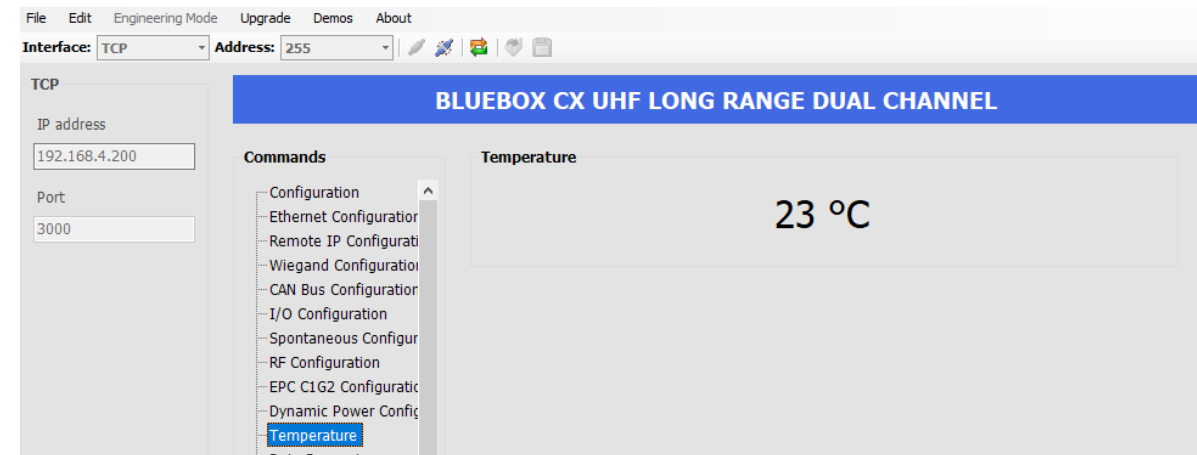
## Dynamic Power Configuration:

when set to 'on' the reader changes the power according to the specified parameters. While changing its power, it changes the shape of the lobe as well. This could increase the reading range of the device.



## Temperature

Internal Temperature of the device is shown.



**Read:** reads the stored values, **Write:** saves the values in the memory (a reboot may be required) **Default:** calls the factory default values

# Data request – Queue request

## Data Request:

when Request button is pressed the panel shows the tag in the reading range, if infinite request is flagged the reader keep searching until stopped.

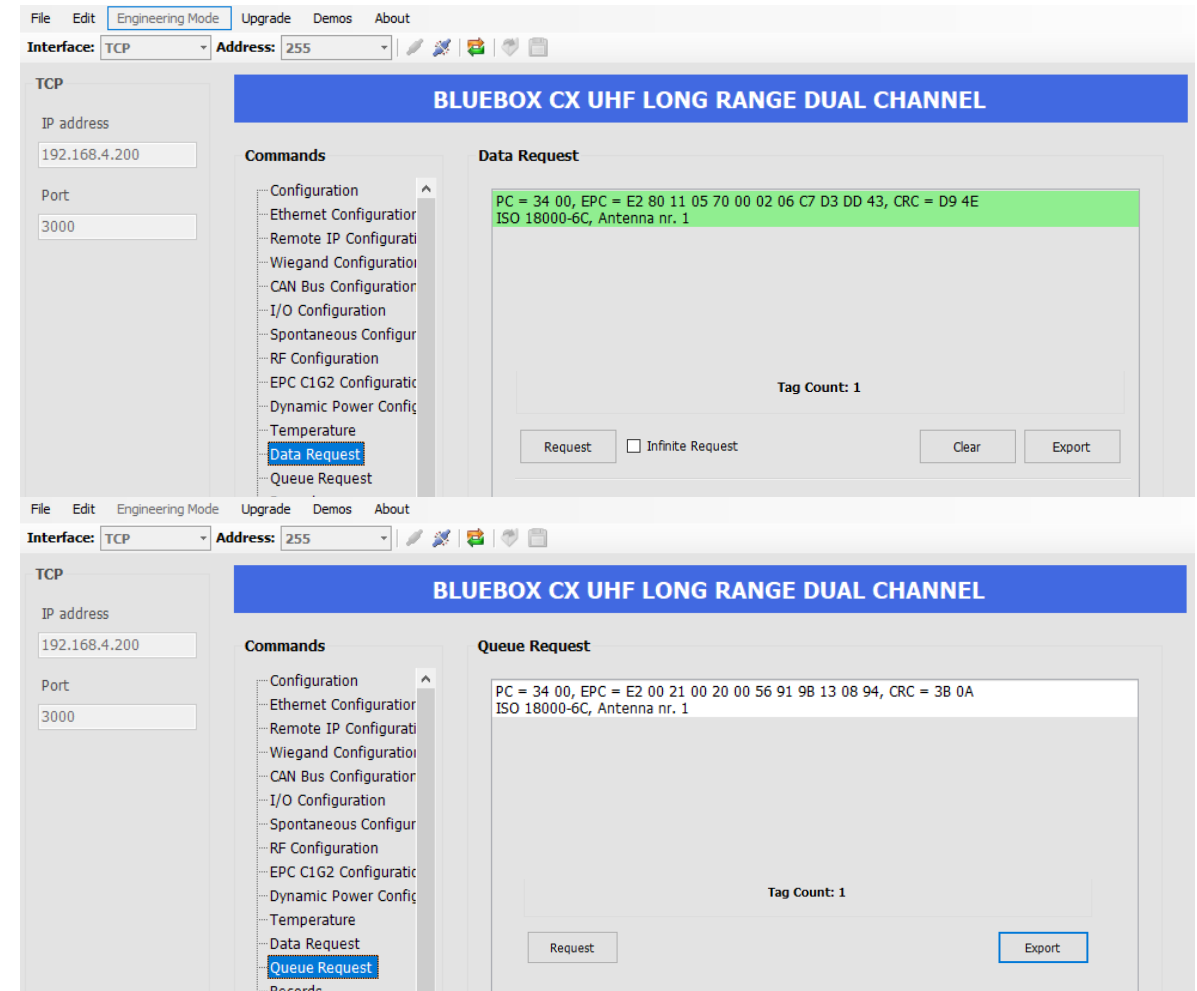
**Clear:** clears the panel.

**Export:** exports in .csv file the Data Request panel content.

## Queue Request:

when Request button is pressed the panel shows all the tags red by the device since the last request. Due to memory limit a total of approx 1000 readings are stored

**Export:** exports in .csv file the Queue Request panel content



# Records - Output

## Records:

In this panel are shown the stored readings (for BlueBox with Real Time Clock, time stamp is added)

**Number of:** returns the number of readings stored in the flash memory

**Read All:** reads the content of the memory

**Re-read:** updates and reads the content of the memory

**Reset All:** clears the flash memory and the panel

**Clear:** clears the panel only

**Export:** saves the content as .csv file

## Output:

Within this panel it is possible to test the output activating continuously or impulsively Relay1 and Relay2

The top screenshot shows the 'Records' panel of the BLUEBOX CX UHF LONG RANGE DUAL CHANNEL software. The interface includes a menu bar (File, Edit, Engineering Mode, Upgrade, Demos, About) and a sidebar with a list of commands. The 'Records' panel displays a table with the following data:

Type	Date/time	ID
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B
00	FF/FF/FFFF FF:FF:FF	023400E2002100200056919B1308943B

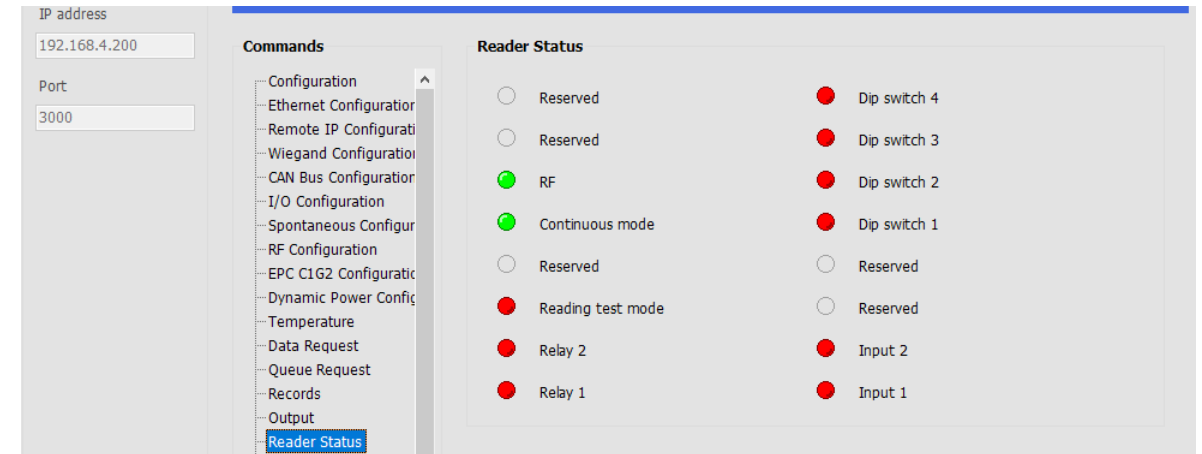
The bottom screenshot shows the 'Output' panel of the same software. The interface includes a menu bar (File, Edit, Engineering Mode, Upgrade, Demos, About) and a sidebar with a list of commands. The 'Output' panel displays the following controls:

- Output: Relay 1 (dropdown menu)
- Mode: Continuous (dropdown menu)
- Period: [Slider] sec (radio button on, radio button off)
- Set (button)

# Reader Status – Reading Test

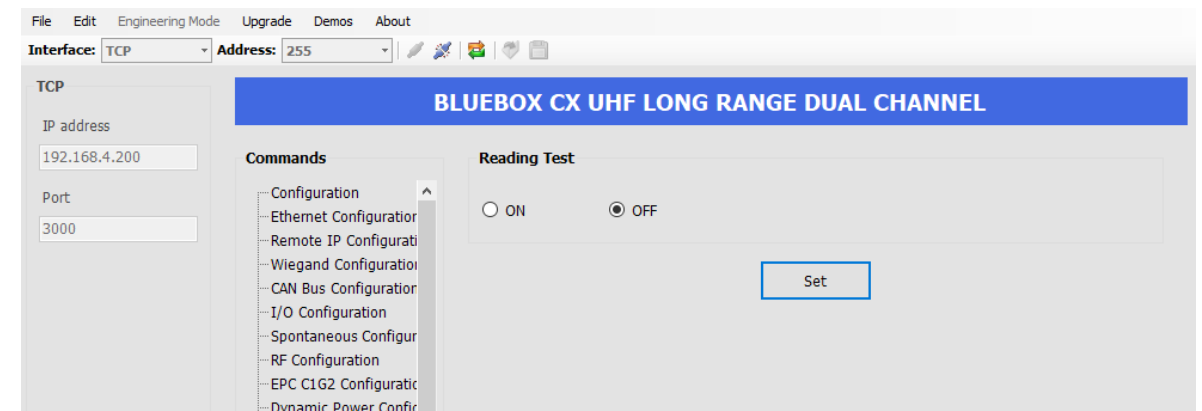
## Reader Status

panel that shows what's on and what's off in the BlueBox



## Reading Test:

when set to ON, the readers beeps continuously when a tag is in the field. This functionality is useful when testing reading ranges.



# RF Power Test – RF Sensitivity Test

## RF Power Test

This test Panel returns the RF Power

The screenshot shows the 'RF Power Test' panel. On the left, under 'TCP', the 'Interface' is set to 'TCP' and the 'Address' is '255'. Below this, the 'IP address' is '192.168.4.200' and the 'Port' is '3000'. A 'Commands' list is visible in the center, including options like 'Configuration', 'Ethernet Configuration', 'Remote IP Configurati', 'Wiegand Configuration', 'CAN Bus Configuration', 'I/O Configuration', 'Spontaneous Configur', 'RF Configuration', 'EPC C1G2 Configurati', 'Dynamic Power Config', 'Temperature', and 'Data Request'. The main panel is titled 'BLUEBOX CX UHF LONG RANGE DUAL CHANNEL'. It contains two dropdown menus: 'RF antenna:' set to 'Antenna 1' and 'RF channel:' set to '1 - 865.7 MHz'. The result 'RF power: 7 dBm' is displayed in large text. A 'Run' button is at the bottom right.

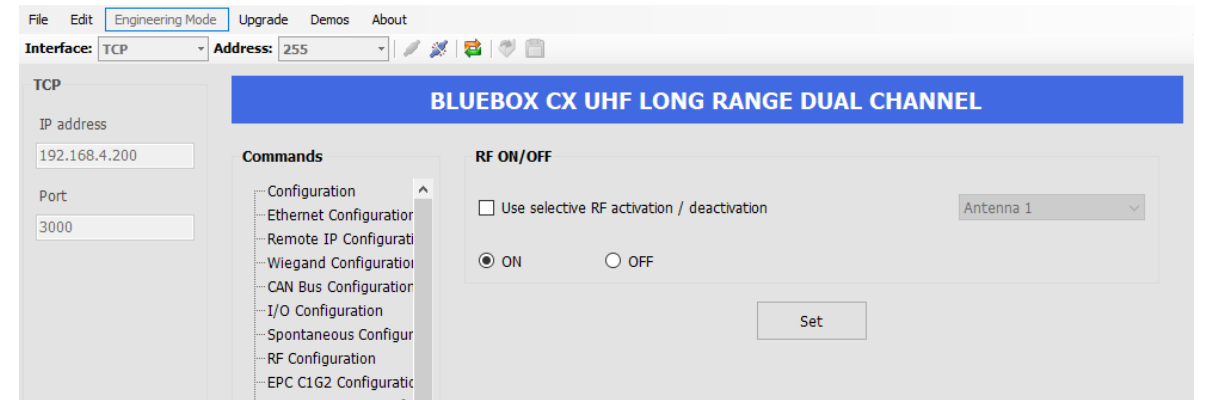
## RF Sensitivity Test

This test Panel returns the RF Sensitivity

The screenshot shows the 'RF Sensitivity Test' panel. The interface is identical to the RF Power Test panel, with 'Interface' set to 'TCP', 'Address' to '255', 'IP address' to '192.168.4.200', and 'Port' to '3000'. The 'Commands' list is the same. The main panel is titled 'BLUEBOX CX UHF LONG RANGE DUAL CHANNEL'. It contains two dropdown menus: 'RF antenna:' set to 'Antenna 1' and 'RF channel:' set to '1 - 865.7 MHz'. The result 'RF sensitivity: -59 dBm' is displayed in large text. A 'Run' button is at the bottom right.

# RF ON/OFF

For test and lab purpose only. It switches the RF power on the selected channel.



# Inventory – Program EPC

## Inventory:

When **Request** is pressed, each tag in the reading range appears in the panel. Additionally by flagging the **Get the RSSI of the transponders** it is also possible to have, for each tag, the indication of the **Receive Signal Strenght Indicator** that shows the signal strenght.

If Infinite Request is flagged the reader keeps looking for the TAGs in the field.

## Program EPC

In order to write the EPC area of a tag it is necessary to select a tag by pressing the magnifier Icon. Once selected, please fill in the blanks and press write.

The image displays two screenshots of the BLUEBOX CX UHF LONG RANGE DUAL CHANNEL software interface, showing the process of performing an inventory and programming a tag.

**Top Screenshot: Inventory Command**

- Interface:** TCP, **Address:** 255
- TCP Settings:** IP address: 192.168.4.141, Port: 3000
- Commands List:** ISO 18000-6C (selected), Inventory (selected), Read, Write, BlockWrite, Lock, Kill, Monza 4QT, Magnus S2, Magnus S3
- ISO 18000-6C - Inventory Panel:**
  - ☐ Get the RSSI of the transponders
  - Tag Count: 0
  - Buttons: Request, Infinite Request, Clear, Export

**Bottom Screenshot: Program EPC Command**

- Interface:** TCP, **Address:** 255
- TCP Settings:** IP address: 192.168.4.141, Port: 3000
- Commands List:** ISO 18000-6C (selected), Program EPC (selected), Read, Write, BlockWrite, Lock, Kill, Monza 4QT, Magnus S2, Magnus S3
- ISO 18000-6C - Program EPC Panel:**
  - ID:** [Empty field]
  - Password:** 00 00 00 00
  - Buttons: Write

# Read – Write

## Read

By pressing the magnifier, please choose between the tags within the reading range the one to operate with. Then from the scroll down menu select which memory bank read from, the starting address and the number of blocks. End the operation by pressing 'Read' so that the values will be displayed in the panel.

## Write

By pressing the magnifier choose between the tags within the reading range the one to operate with. Then from the scroll down menu select which memory bank write to, the starting address and the number of blocks. End the operation by pressing 'write' so that the values will be stored in the tag.

The screenshot shows the 'BLUEBOX CX UHF LONG RANGE DUAL CHANNEL' software interface. On the left, under 'TCP', the IP address is '192.168.4.141' and the Port is '3000'. The 'Commands' tree on the left has 'ISO 18000-6C' expanded, with 'Read' highlighted. The main panel is titled 'ISO 18000-6C - Read'. It contains fields for 'ID:' (with a magnifier icon), 'Password:' (set to '00 00 00 00'), 'Bank:' (set to 'Reserved'), 'Address:' (set to '0'), and 'Nr. Blocks:' (set to '1'). Below these is a section for 'Block nr. 0' with a large empty text area. At the bottom right is a 'Read' button.

The screenshot shows the same software interface but with the 'Write' command selected. The 'Commands' tree has 'Write' highlighted under 'ISO 18000-6C'. The main panel is titled 'ISO 18000-6C - Write'. It contains the same fields as the Read panel: 'ID:' (with a magnifier icon), 'Password:' (set to '00 00 00 00'), 'Bank:' (set to 'Reserved'), 'Address:' (set to '0'), and 'Nr. Blocks:' (set to '1'). Below these is a section for 'Block nr. 0' with a large empty text area. At the bottom right is a 'Write' button.



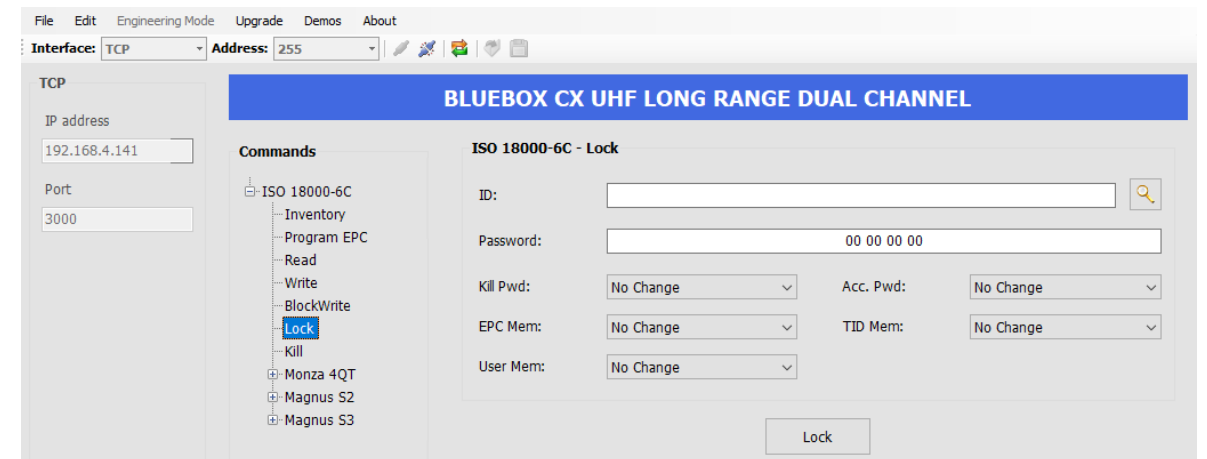
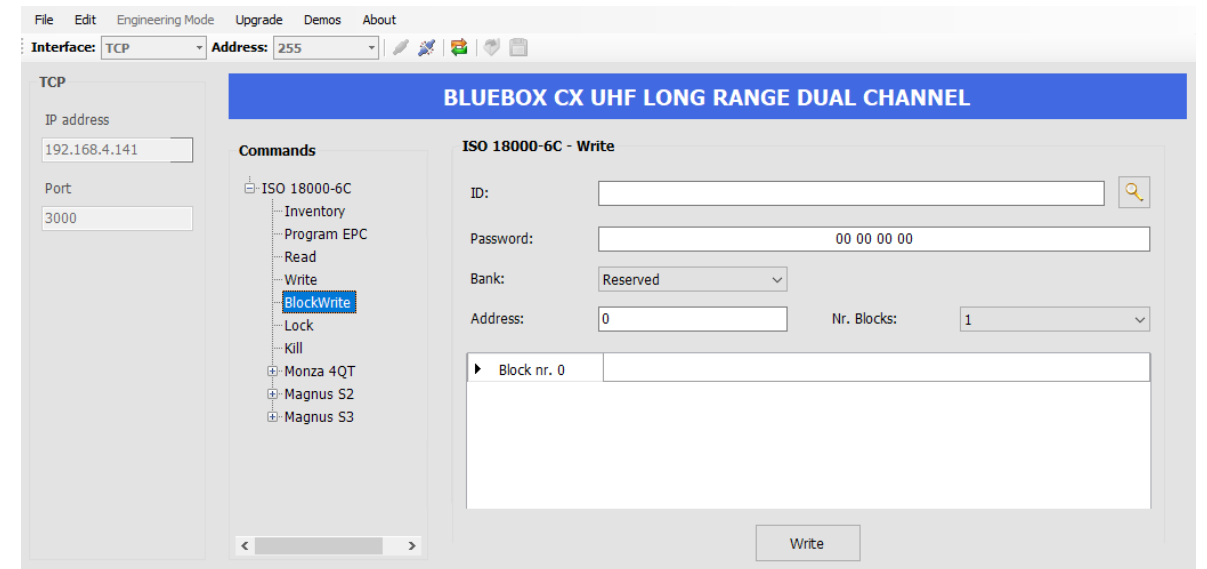
# Blockwrite – Lock

## Blockwrite

By pressing the magnifier choose between the tags within the reading range the one to operate with. Then from the scroll down menu select which memory bank write to, the starting address and the number of blocks. End the operation by pressing 'write' so that the values will be stored in the tag. While 'write' writes one block at a time, blockwrite writes all the blocks in one operation, so its faster, but it is not supported by all the tags.

## Lock

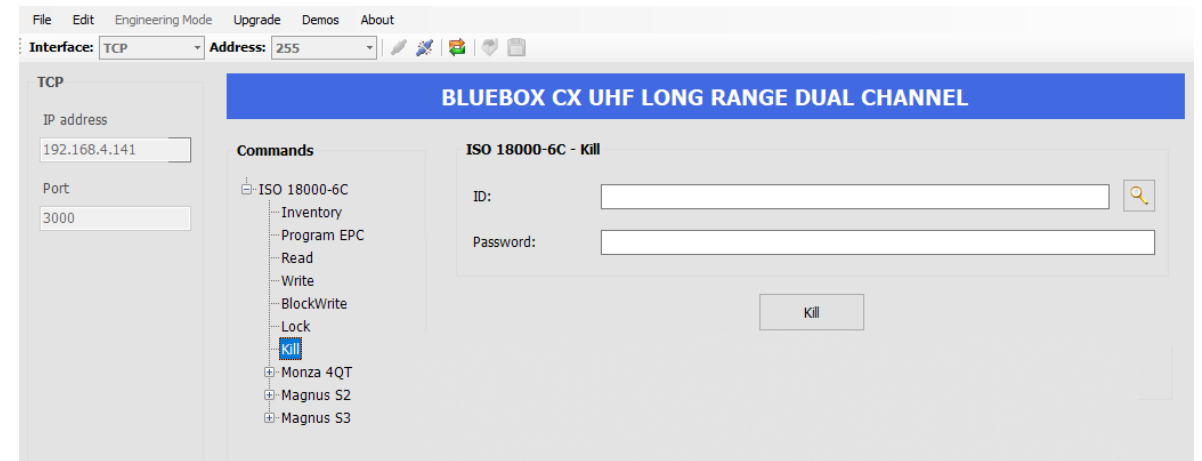
By pressing the magnifier, choose between the tags within the reading range the one to operate with. Then from the scroll down menu select which memory bank to lock. End the operation by pressing 'Lock'.



# Kill

## Kill

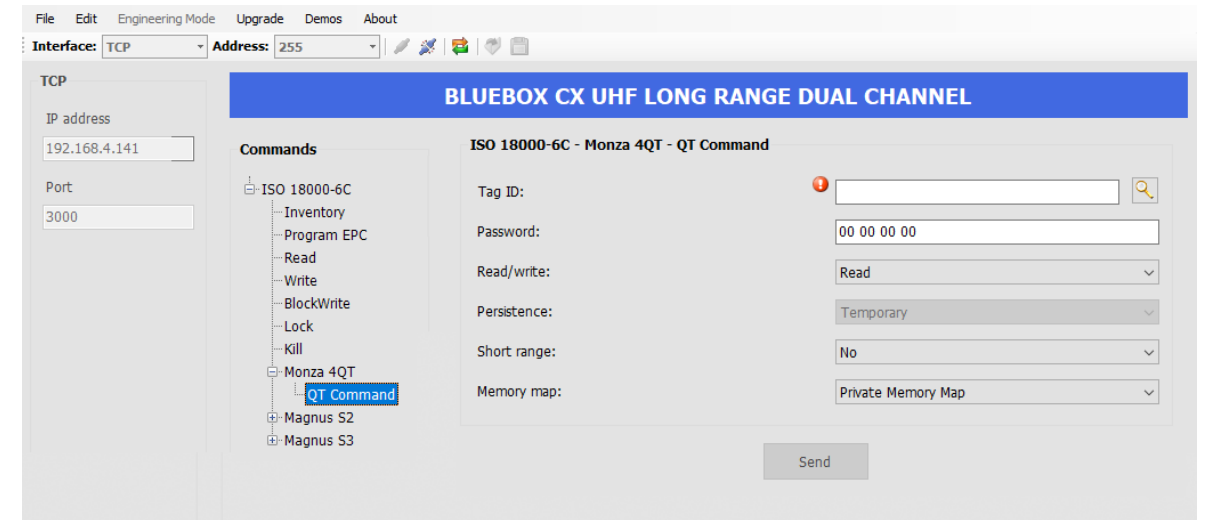
By pressing the magnifier, choose between the tags within the reading range the one to operate with. Then input the kill Password. End the operation by pressing 'Kill'.



# Monza 4QT

## Monza 4QT

Bluebox UHF CX series, manage the double memory profile of Impinj Monza QT chips. Please refer to the Monza 4QT manual.



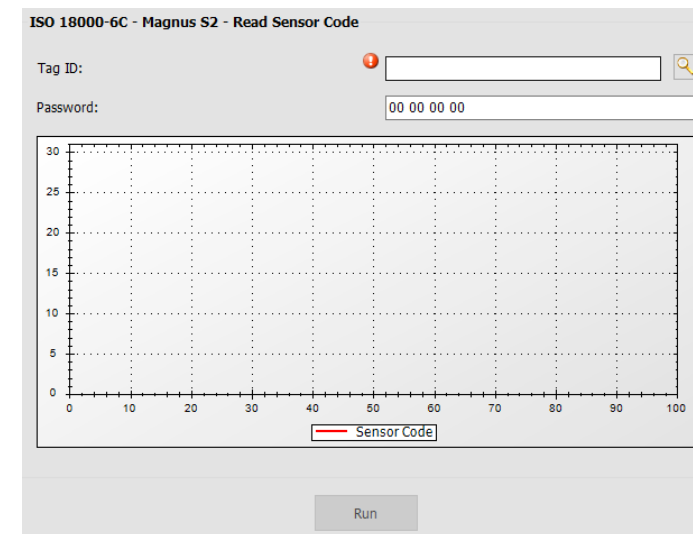
# Magnus S2

## Magnus S2

Bluebox UHF CX series, manage the RFMicron Magnus Sensor Tags. For further details please refer to the RFMicron Magnus Sensor Tags manual.

Press the magnifier in order to select the tag to operate with. From the scroll down menu it is possible to set reading criteria (up or under the threesold), the threesold. After pressing the sent button, the readings are graphically shown in the 'Read Sensor Code' menu.

The screenshot shows the 'BLUEBOX CX UHF LONG RANGE DUAL CHANNEL' software interface. On the left, under 'TCP', the 'IP address' is set to '192.168.4.141' and the 'Port' is '3000'. The 'Commands' tree on the left has 'Magnus S2' selected, with sub-options 'Read On-Chip RSSI' and 'Read Sensor Code'. The main panel is titled 'ISO 18000-6C - Magnus S2 - Read On-Chip RSSI'. It contains fields for 'Tag ID' (with a magnifier icon), 'Password' (set to '00 00 00 00'), 'On-Chip RSSI match criteria' (set to '<= threshold'), 'On-Chip RSSI match threshold' (set to '0'), and 'On-Chip RSSI value'. A 'Send' button is at the bottom right.



# Magnus S3

## Magnus S3

Bluebox UHF CX series, manage the RFMicron Magnus Sensor Tags. For further details please refer to the RFMicron Magnus Sensor Tags manual.

Press the magnifier in order to select the tag to operate with. From the scroll down menu it is possible to set reading criteria (up or under the threesold), the threesold. After pressing the sent button, the readings are graphically shown in the 'Read Sensor Code' and Read Temperature menus.

