

Ethernet Reader Hitag-S

This low frequency RFID reader is an easy-to use device that is compliant with the HITAG S - 125 kHz tags. It is also available as read-only version.

Providing a reading distance of 5 cm and accurate collected tag data, It can be used in a wide range of applications such as logistic systems, express parcel management, production access control, authentication, Prepaid Parking, Ticketing, Time and Attendance and Admission Control etc.

Experience Readers can be connected by using the Ethernet interface. By using Ethernet connectivity, the desktop reader can be driven by an external server and does not need to interface to the local computer on the desk.

Technical characteristics	
Interface	Ethernet 10/100 base protocol compatible
Power supply	12 Vdc \pm 10 %
Current consumption	max 450 mA
White list	No
Supported transporters	125 kHz
Reading range	Standard 5 cm with ISO 7816 sized card
Input	1 input (reset button)
Output	1 relay: Common R-C Normal open R-NO
Signals	4 RGB LEDs (not dimmable LEDs)
Buzzer	Yes
Dimensions	12.5 × 7 × 2.5 cm
Housing Material	ABS
Operating temperature	0 °C to +50 °C

Connections

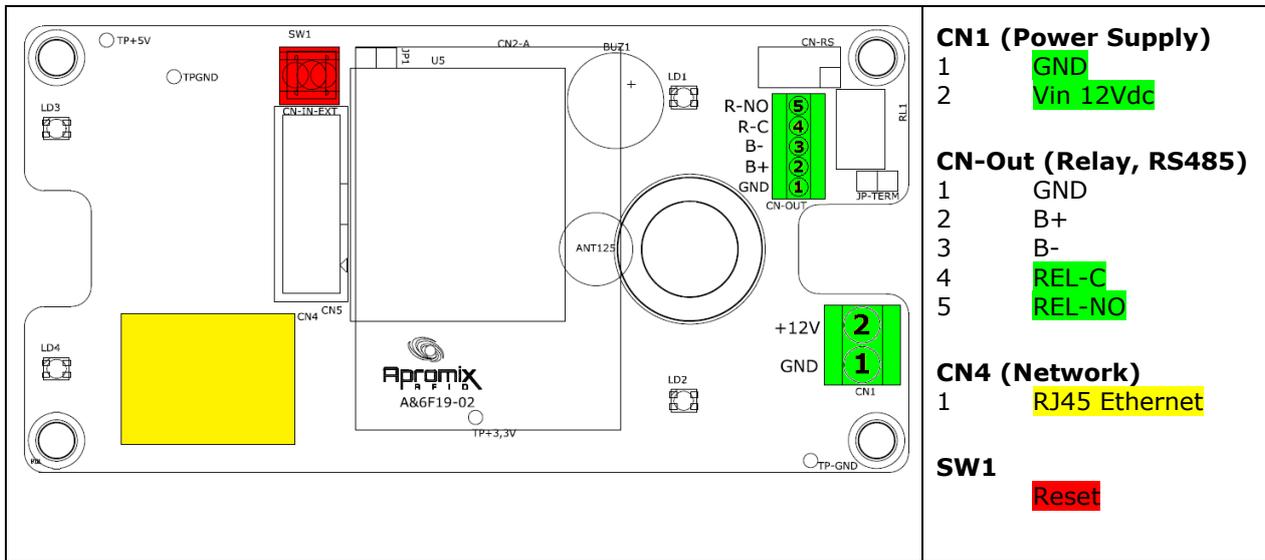


Fig.1: Position of Parts

Note: On CN-Out the connectors GND, B+ and B- are for the assembly variant with RS485. So, with this Ethernet version: DO NOT CONNECT!

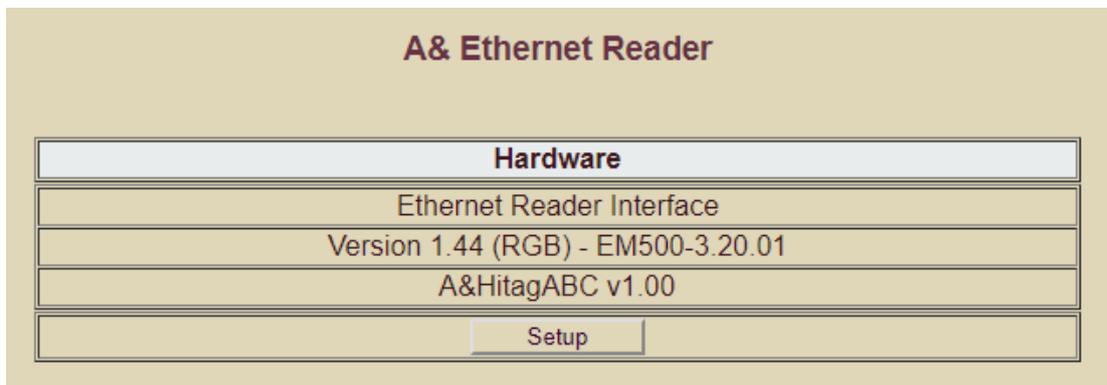
Setup

The reader setting interface is provided as a Webpage that can be visualized by any standard browser (such as Vivaldi, Opera, Firefox, Internet Explorer or Microsoft Verge). The default IP address is **192.168.1.2**

Rest to Factory Default Settings

If you have changed the default IP address and have forgotten it, you will need to reset the device to factory default settings in order to use the default IP address. Press and hold reset button until the LEDs turn to white to restore the default IP address. Then release the reset button.

The first setting interface shows reader description and version



Click on Setup button to visualize the device parameters. These settings allow you to change network, server and reader options.

Configuration

Network	
Address	192.168.1.2
Netmask	255.255.0.0
Gateway	192.168.1.254
Incoming	
Port	10001
UID encoding	
Read block	<input checked="" type="checkbox"/> Enable
Key
Block	00
First Char	09
Last Char	24
Server	
Sending Type	Code ▼
Address	192.168.0.29
Port	10100
Save	
Index	

UID encoding>

- Read block:** In order to configure the reader to read a block, you have to check Read block box
- Key:** key to use for the authentication
- Block:** 2 numeric optional digits that indicates which block it has to read. Valid values from 0 to 15 includes.
- First Char:** 2 digit numeric string that defines the position of the first digit to send.
- Last Char:** 2 digit numeric string that defines the position of the last digit to send.

The **Server>Sending Type** option is defined by the following values:

1. "Nothing"
2. "Code" send the code*
3. "Code+CRLF" send the code* + CRLF(CRLF:asci 0x0D 0x0A)
4. "Vidimatore" (send the message in http format)
5. "Slave" (send the message in xml format)
6. "PIPE data control" (send the message based upon the A&CONTABC Ethernet protocol)

*The *code* can contain only the uid(8 characters) or uid(8 characters) +block(32 characters) data. More details about *UID encoding* can be found in the "HITAG S" specifics documentation.

If you choice to send the *code* or the *code +CRLF*, you have to insert the server IP address and the port where the data will be send.

Server	
Sending Type	Code+CRLF
Address	192.168.0.29
Port	10100
Save	
Index	

NOTE: The Experience Ethernet device can be also used as **Desktop Reader(Vidimatore)** or as a **Slave device**.

Structure of the data sending

When *Sending type=code* the Server Address and Server Port will received:

only uid

ED33622C

uid+block data

ED33622CABB8BF21DDABB8BF21DDABB8BF21DDAA

As Desktop Reader (Sending Type=Vidimatore)
The sending procedure imposes a structure on data (standard http)

Example - Structure of the data sending (only uid):

```
POST /cgi-bin/eth_vidimatore.cgi HTTP/1.0
User-Agent: AproVidima/1.0.0
Accept: */*
Content-Type: application/x-www-form-urlencoded
Content-Length: 91
```

```
login=admin&hash=81dc9bdb52d04dc20036dbd8313ed055&IdVidimatore=1&az
ione=A&UIDBadge=ED33622C
```

Example - Structure of the data sending (uid+block data):

```
POST /cgi-bin/eth_vidimatore.cgi HTTP/1.0
User-Agent: AproVidima/1.0.0
Accept: */*
Content-Type: application/x-www-form-urlencoded
Content-Length: 123
```

```
login=admin&hash=81dc9bdb52d04dc20036dbd8313ed055&IdVidimatore=1&az
ione=A&UIDBadge=ED33622CABB8BF21DDABB8BF21DDABB8BF21DDAA
```

Green: uid (8 characters)
Pink: block data (32 characters)

Components Manager

Experience Ethernet has 1 delay relay, 1 buzzer and 4 RGB LEDs. Time delay relay, time buzzer and colour LEDs settings can be changed using a web browser by typing the address of the terminal into the address bar (e.g. <http://192.168.0.xxx/cmd.html>).

If you get the following screen you should change the *Server>Sending Type* option to "Vidimatore"



If you have chosen "Code" or "Code+CRLF" as *Sending Type* you can test the reader transmission by using the **Socket Demo Tool** application. The **Socket Demo Tool** application listening on a specified port, accept the incoming packets and processing them. The **Socket Demo Tool** can also send an outgoing message to an specified server across a precise port.



Manually input the parameters and press the Go button to test the functionalities.

Tips and tricks: Access to the configuration page has to be protected by a firewall, to protect the device from unauthorized access or tampering.

When a user makes a request to a URL (e.g. <http://192.168.0.xxx/cmd.html>), that's protected by a firewall, the security system is activated. The job of the firewall is to determine whether or not the user needs to be authenticated, and if he does, to send a response back to the user initiating the authentication process.

The personalization of delay time relay, buzzer time and LEDs colour makes this device a powerful and flexible solution for different needs of automation.

A&6F19 - Tibbo EM500 interface

Cont Hitag A/B/C

Reader / Writer Ethernet
Version 1.44

Communication Protocol

Syntaxes

In this document all control characters are written in bold-style (ex. **STX** corresponds on booting in serial to the value 02 hex). The constant alphanumerical strings are indicated between quotation marks (ex. "3"). The variable parameters are concluded between the characters < e >, the signification of the parameters will be specified after the description of each command.

Structure of the commands

The commands and the answers are embedded between the commands **STX** and **ETX**. Next to **STX** command it is one digit to indicates the data type:

- "0" for polling command
- "1" for selecting command
- "2" for the answer of polling command.

The commands are delimited for the "|" pipe character.

The string is completed with a check sum character called **BCC** written after **ETX**. The **BCC** is calculated executing the "XOR" of all the characters between **STX** and **ETX** included.

Ex.	STX <COMANDO> "0" <DATI1> <DATI2> ETX BCC
	STX Start Of Transmission - ASCII 02h
	ETX End Of Text - ASCII 03
	BCC Block Check Character, It composed by XORing each byte of the frame including
	STX and ETX .

General

The device normally works with a master-slave philosophy: it means that it only answers to the master's command. Only in particular case it starts the communication: it sends a message in order to communicate an event or an anomaly and it wait an ACKNOWLEDGMENT from the master

The master (computer or A&6082 device) can operate in two ways:

- Send a selecting command
- Send a polling request

Description of standard operating mode

The device use an "action" oriented RF-ID reading logic, it means that it discriminates (according to a given time from setup) between fast read 'A' and extended read 'B'. It also can send a 'C' event to communicate the leaving of tag from the reading area.

An input pin or a specific command becomes possible to enable or disable the RF-ID reading. An output pin can switch on a LED during the reading action.

Trough the <AOUT> command you can define the time (T) that permit to distinguish between action A and action B.

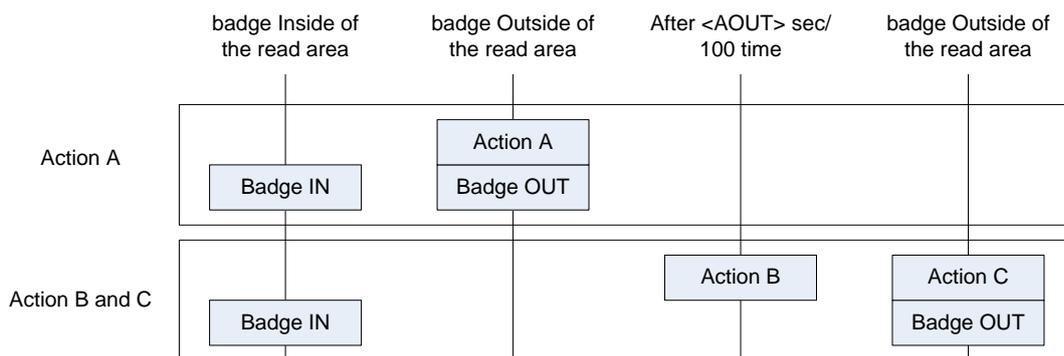
Based on this parameter, the terminal can send the following events.

Table 1: Enter event badge

	Badge IN	Action A	Action B	Action C	Badge OUT
Value	0x01	0x02	0x04	0x08	0x10
Az. A (T=0)	Badge IN	Badge IN		Badge OUT	Badge OUT
Az. A (T>0)	Badge IN	Badge OUT			Badge OUT
Az. B	Badge IN		After <AOUT>	Badge OUT	Badge OUT

On a single message can be included multiple states, as described in the section below.

Event lit when <AOUT> > "00000"



Event lit when <AOUT> = "00000"



Selecting Commands

Feedback to selecting commands

If the command is correct the electronic board responds with the following syntax:

STX "OK" ETX BCC

Otherwise it answer:

STX <code> ["|" <param>] ETX BCC where

<code>	error type:
"1"	command does not exist
"2"	data format error
"3"	command wrong, syntax error
"4"	Time-out
"5"	wrong BCC
"6"	write error EEPROM
...	

If the message analysis detects an error, the "0" character changes to indicate the error, the new value will be related with the found error. The error message will be send if **STX** and **ETX** have been correctly received.

If there is not a feedback from the terminal when the timeout period elapsed, the master has to resend the command.

Available Commands:

Base setup

This command set the operating base parameters of the device. They are immediately stored in E²PROM memory and immediately made valid

Setup is send with a fixed length string made as follows:

STX "0" "A" <AOUT> "|" <RF_ON> "|" <MOD> ["|" <NBLOCK> "|" <PWD> ["|" <START> "|" <END>]] ETX BCC
where

"0"	(hex 31) selecting command
"A"	(hex 41) that defines the command 'set setup'.
<AOUT>	5 digit numeric string (from 00000 to 29999) that defines the time between A and B action. if <AOUT> is "00000" the action A triggers when the tag be inside the read area.
<RF_ON>	Numeric characters that defines the RFID state at power on. "0" RF-ID deactivated at power on "1" RF-ID activated at power on
<MOD>	numeric digit that indicates the send operating mode. "0" ABC standard "1" MULTITAG mode (consult <i>events</i> section) "2" OCA mode (consult <i>events</i> section) "3" TAG13 mode (consult <i>events</i> section)
<NBLOCK>	1 numeric optional digit that indicates which block it has to read. Valid values from 0 to 15 includes. If it is absent no block will be read.
<PWD>	8 digits alphanumeric string that defines the password to read. Mandatory if <NBLOCK> is present. It have not be added if <NBLOCK> is not present..
<START>	2 digit numeric string that defines the position of the first digit to send.
<END>	2 digit numeric string that defines the position of the last digit to send.

Note. <START> AND <END> commands made possible to send an specific section of the string read. The string read can contain only the UID or UID + block data. (see "Automatic block read" section)

<START> has to be lower or equal to <END>.

If <START> and <END> are not indicated, it will send all the string read

Note: if <MOD> is different to "0", the characters quantity between <START> and <END> can not be higher to 10. If it is lower then it will add zeros to the left side.

If a valid setup is received the device answer with RESULT="0"

Timeout for answer must be at least 200 msec.

Note. BY shorting the microprocessor pins 22 and 23 it sets the MULTITAG mode.
BY shorting the microprocessor pins 22, 23 and 24 it sets the OCA mode.
BY shorting the microprocessor pins pin 22 and 24 it sets the TAG13 mode.

Base Setup Request

STX "1" "a" ETX BCC where

"1" (hex 31) polling command
"a" (hex. 61) character that define the command 'get setup'

If the polling is received correctly the device answer as follow:

Standard operating mode

STX ADDF ADDP "2" "a" "|" <AOUT> "|" <RF_ON> "|" <MOD> ETX BCC o
STX ADDF ADDP "2" "a" "|" <AOUT> "|" <RF_ON> "|" <MOD> "|" <NBLOCK> "|" <PWD> ETX BCC o
STX ADDF ADDP "2" "a" "|" <AOUT> "|" <RF_ON> "|" <MOD> "|" <NBLOCK> "|" <PWD> "|" <START> "|" <END>
ETX BCC

Timeout for answer must be at least 100 msec.

Logical Reset

This command permit to reboot the device, it must be sent after "Set Serial Setup" command to make changes effect
Since the command reboot the device there is no answer for this command

STX "0" "C" ETX BCC where

"C" (hex. 43) Character that defines the command 'Logical Reset '

Enable/Disable Antenna

This command is sent to enable or disable the RF-ID Antenna.

STX "0" "D" "|" <STATO> ETX BCC

"D" Character that defines the command 'Set antenna'. (hex 44)
<STATO> numeric character that defines the antenna mode
"0" disable RF-ID module
"1" enable RF-ID module

Timeout for answer must be at least 100 msec.

Antenna Status Request

STX "1" "d" ETX BCC where

"d" Character that defines the command 'Get antenna'. (hex 64)

If the polling is received correctly the device answer as follow:

STX "2" "d" "|" <ANT> ETX BCC where

<ANT> Character '0' or '1'. That describes the radio frequency type of the device.

Timeout for answer must be at least 100 msec.

Badge Request

This command is used to request if there is a badge is inside the reading area.

STX "1" "e" ETX BCC where
 "e" character that defines the command 'Get Badge'.(hex 65)

If the polling is received correctly the device answer as follow:

STX "2" "e" "|" <TIPO> "|" <AZIONE> "|" <CODICE> ETX BCC where

<TIPO> defines the type of badge:
 "N" No badge. <AZIONE> and <CODICE> are omitted.
 "P" Proximity. <AZIONE> will have the following values:
 if <AOUT> > "00000"
 Badge IN if the elapsed time is lower than <AOUT>
 Action B if the elapsed time is equal to <AOUT>
 if <AOUT> = "00000"
 Action A

<CODICE> Code read
 If the setup has been enabled to read a block, the uid of the tag will be concatenated to the block data. In this case, if the authentication is successful the code will have 40 hexadecimal characters (8 for the UID and 32 for data). Otherwise, if the reading of a block is not enabled, the code will contain only the uid (8 hexadecimal characters)

Some hardware versions have an input pin, which can enable or disable the RF-ID reading

Timeout for answer must be at least 100 msec.

The message can be sent at the initiative of the device in case of standard mode operation. See the Events section below.

Software Version Request

STX "1" "f" ETX BCC where
 "f" character that define the command 'software version' (hex. 66)

If the polling is received correctly the device answer as follow:

STX "2" "f" "|" <VVVVVVVVVVVVVVVV> ETX BCC

The values <VV..VV> represent a 16 digit alphanumeric string (now "A&Contabc v.3.00"). "v.3.00" is the firmware version

Timeout for answer must be at least 100 msec.

Read Block

Trough this command it is possible read a specific block inside the card by using an explicit password.

STX "1" "h" "|" <PWD> "|" <N_BLOCK> ETX BCC dove
 "h" character that define the command 'Reading Block'(hex. 48)
 <PWD> 8 hexadecimal digits which defines the key to use for the authentication.
 <N_BLOCK> 2 numeric digit which defines the block number to read. Valid values: from 0 to 15.

If the polling is received correctly the device answer as follow:

STX "2" "h" "|" <DATA> ETX BCC where DATA is the block read content. In case of error reading Data will content 32 characters ? (hex. 3F). If there is not any tag in the reading area Data will contained 'N', to indicate 'Action disable'

Write Block

Thanks to this command it is possible write a block by using an explicit password.
Warning! With this command you can change also data and permissions relating to different access right blocks.

STX "0" "J" "|" <PWD> "|" <N_BLOCK> "|" <DATA> ETX BCC where

"J"	character that define the command 'Writing Block' (hex. 49).
<PWD>	8 hexadecimal digits which defines the key to use for the authentication
<N_BLOCK>	2 numeric digit which defines the block number to write. Valid values from 0 to 15.
<DATA>	32 hexadecimal digits with the content to write on N_BLOCK.

Timeout for answer must be at least 100 msec.

Set Output

Through this command it is possible managed the output.

STX "0" "K" "|" <TREL> "|" <TBUZ> ["|" <COLOR> "|" <TLED>] ETX BCC where

"K"	character that defines the command 'set output' (hex. 4B).																
<TREL>	3 numeric digits which define the One-Shot Timer Relay or the pulse time for the one-shot contacts. Valid values from "001" to "900", the "000" value disable the output, the "901" value swap its logical status, the "999" value enable the relay. The values from "902" to "998" do not change the relay state.																
<TBUZ>	3 digits which define the One-Shot Timer buzzer. Valid values from "001" to "900", the "000" value disable the output, the "901" value swap its logical status, the "999" values enable the buzzer. The values from "902" to "998" do not change the buzzer state.																
<COLOR>	RGB color value. Each colour can be "0" or "1"																
	<table> <tr><td>"000"</td><td>OFF</td></tr> <tr><td>"001"</td><td>blue</td></tr> <tr><td>"010"</td><td>green</td></tr> <tr><td>"011"</td><td>cyan</td></tr> <tr><td>"100"</td><td>red</td></tr> <tr><td>"101"</td><td>violet</td></tr> <tr><td>"110"</td><td>yellow</td></tr> <tr><td>"111"</td><td>white</td></tr> </table>	"000"	OFF	"001"	blue	"010"	green	"011"	cyan	"100"	red	"101"	violet	"110"	yellow	"111"	white
"000"	OFF																
"001"	blue																
"010"	green																
"011"	cyan																
"100"	red																
"101"	violet																
"110"	yellow																
"111"	white																
<TLED>	3 digits which define the One-Shot Timer LEDs. Valid values from "001" to "900", the "000" value disable the output, the "901" value swap its logical state, the "999" value enable the LED. The values from "902" to "998" do not change the LEDs state.																

Timeout for answer must be at least 100 msec.

Get Output

STX "1" "k" ETX BCC where

"k"	character that define the command 'Get output' (hex. 6B) .
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If the polling is received correctly the device answer as follow:

STX "2" "k" "|" <REL> "|" <BUZ> "|" <LED_R> "|" <LED_G> "|" <LED_B> ETX BCC

The characters have the following meaning:

<REL>	"0"	disable relay
	"1"	enable relay
<BUZ>	"0"	disable Buzzer
	"1"	enable Buzzer
<LED_x>	"0"	disable LED (3 RGB component)
	"1"	enabled LED (3 RGB component)

Timeout for answer must be at least 100 msec.

Set Output, Short-Term Version

The command sent must be composed of 6 or 12 characters:
or

RRRBBB
RRRBBBLLLLTTT

- <RRR> Relay activation time (tenths of seconds)
- <BBB> Buzzer activation time (tenths of seconds)
- <LLL> RGB colour. Each colour can be "0" or "1"
 - "000" OFF
 - "001" blue
 - "010" green
 - "011" cyan
 - "100" red
 - "101" violet
 - "110" yellow
 - "111" white
- <TTT> Time to Go to LED Lighting (tenths of seconds)

Set Output, Short-Term Version

In addition the command set can be composed also of 7 or 13 characters with the same values of the previous 6 and 12 with the addition of a "L" char at the beginning of the string: LRRRBBB

Or LRRRBBBLLLLTTT

- <L> = "L" means that the
- <RRR> Relay activation time
- <BBB> Buzzer activation time
- <LLL> Time to Go to LED Lighting
are expressed in seconds

Events

Read Badge

The device can send this Event without receive any request and by respecting setup parameters, for reporting a read event.

Standard operating mode:

STX "2" "e" "|" <TIPO> "|" <AZIONE> "|" <CODICE> ETX BCC where

<TIPO>	type of tag "P" Proximity
<AZIONE>	type of reading: Action BADGE IN, A, B, C, BADGE OUT, ERROR READING BLOCK (20 hex characters- described at the beginning of this document), plus 30 hex value.
<CODICE>	the code of the tag read. If the setup has been enabled to read a block, the UID of the tag will be concatenated to the block data. In this case, if the authentication is successful the code will have 40 hexadecimal characters (8 for the UID and 32 for data). Otherwise, if the reading of a block is not enabled, the code will contain only the UID (8 hexadecimal characters)

It will send only the content between <START> and <END> commands

MULTITAG operating mode

STX "2" "e" "|" <CODICE> ETX BCC where

<CODICE>	Indicates the code of the tag read. It is composed by 10 hexadecimal characters, it depends of <START> and <END> parameters, it will add zeros on the left side if necessary.
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In order to implement this mode please follow the algorithm below.

Swap a couple of digits at a time from the 10 characters of the read code. Each character represents a half-byte; For each half-byte it swap the bit weight, to obtain the final code.

Example:

Tag read *D5 48 2C 6A 1E*.

Swap a couple of digits: *5D 84 C2 A6 E1*

For each half-byte swap the bit weight: *AB 12 34 56 78 (Apromix code)*

The event will be repeated 1 time every 50 msec while the tag be present in the read area.

OCA operating mode

STX "2" "e" "|" <CODICE> ETX BCC where

<CODICE>	code of the tag read. It is 5 byte. If the value with <START> and <END> parameters are lower it will add zeros on the left side. Example: 0xAB 0x12 0x34 0x56 0x78 represents the AB12345678 code (Apromix code)
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TAG13 operating mode:

STX "2" "e" "|" <CODICE> ETX BCC where

<CODICE>	13 decimal digits. It is calculated by transforming the MULTITAG code in decimal code. The MULTITAG code 9000C3F203 becomes the decimal code 0618488132099.
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The Event will be sent once when the tag enters in the read area.

LED Signals

On Standard operating mode, when the antenna is active one red LED will be ON. The Red LED will OFF when the antenna turns inactive. The green LED indicates the read Event.

In other situations the red LED is not managed.