

# S1000 AM Deactivator

AM LABELS DEACTIVATOR

(S1000\_AM\_REV\_2.2)

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## INSTALLATION AND SERVICE

This setup and service guide describes how to tune service and troubleshoot S1000 AM deactivator that works on frequency 58.2 kHz.

## S1000 SINGLE ANTENNA DEACTIVATOR FEATURES

- High Deactivation Throughput Operation
- Easy Installation - Plug and Play
- Remote Calibration and Diagnostics Capabilities
- Adjustable Sound Alarm
- RGB LED Optically Diffused Visual Alarm
- Can Use Different Types of Deactivation Pads

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## 1. OPERATION GUIDELINES



**CAUTION!** Before operating this device, all operating technicians should study this manual and device technical data to understand and follow the safety instructions. Keep these instructions with the device for further reference. If you have any questions, contact your device representative or distributor.



**WARNING!** Do not open S1000 AM control unit while connected to main power.

**RISK OF ELECTRIC SHOCK!**



**CAUTION!** When connecting or disconnecting deactivation pad make sure transmitter is switched off or power to S1000 AM control unit is off.

## 2. BASIC INFORMATION

The device provides contactless AM sticker label deactivation with detection feature. S1000 AM control unit deactivate labels above the surface of the deactivation pad with high deactivation throughput. The control unit provides enhanced wireless synchronization feature for economic installation. The operation of deactivation is controlled by two available designs of external switches (key unit or iButton). The deactivator serves as a detection and deactivation device for AM sticker labels in stores.

## 3. INSTALLATION REQUIREMENTS

### S1000 AM CONTROL UNIT COMES COMPILED IN PACKAGE WITH FOLLOWING CONTENT

- Single antenna S1000 AM control unit
- Callidus deactivation pad
- PSU Cord

### FOR ADVANCED SETUP YOU WILL NEED

- Laptop with Windows® XP, Windows® Vista, Windows® 7 or Windows® 10 operating system software
- HW key (USB Dongle) including USB and interconnection cables
- Installed service configurator software (SmartEAS Configurator)

## DEACTIVATION PAD PLACEMENT

- Installation of deactivation pad may requires cutting a hole into the desk; before you cut the hole determine which way the deactivator's LED will face. Typically, the LED faces away from the sales associate.
- Do not install the deactivator pad over a metal surface. Deactivator field is influenced by metal and cause reduction of deactivator performance.
- Make sure that interconnection cable can reach the control unit (standardly is 1,4m / 4.6ft. long).

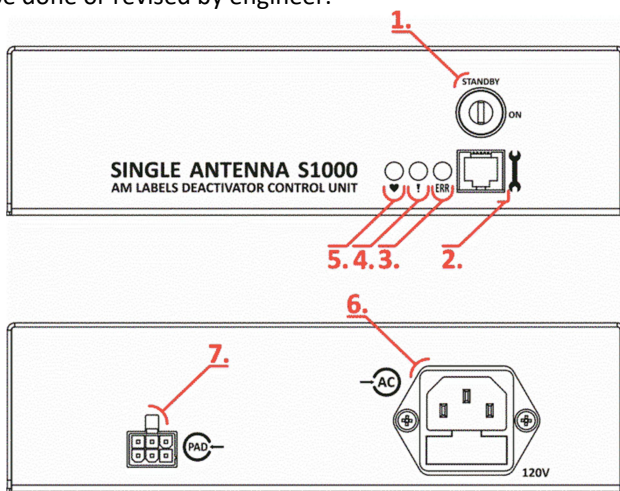
### 4. MOUNTING THE DEACTIVATOR



**CAUTION!** Device must be connected to the power mains with overcurrent protection in the switchboard of the store (parameters are marked below).



Power socket for deactivator must be easily accessible to disconnect it when some failure comes. Connecting of device and verifying of grounding terminal must be done or revised by engineer.



Pic. 1 – Description of S1000 deactivator control unit

**1. KEY LOCK** - Key lock switch in between the standby mode and operational mode. Deactivation, synchronization and receiving are disabled in standby mode but deactivator is still running! Use this as prevention against unauthorized deactivation from customers.

- When you power up the S1000 AM control unit, device makes an audible signal which depends on mode that is currently set. One short beep stands for standby mode, three quick beeps stands for operational mode.

- When you power up the S1000 AM control unit, it will light up green and orange status LEDs (with green LED quickly flashing) for 5 seconds. If after 5 seconds stays only slow flashing green LED device is in operational mode, otherwise device stays in standby mode.
- Key lock has two positions that are figured by green and red marks. Red is standby mode, green is operational mode.



#### **AUTO ENVIRONMENT SYNCHRONIZATION WITH OTHER AM SYSTEM -**

*Example:*

a) Key lock has another function:

1. When you power up the S1000 AM deactivator control unit with key in operational mode position (green mark on the lock or position all the way right) you have 5 seconds to perform sequence that start automatic synchronization.
2. Sequence is as follows: After power up the deactivator, turn the key from operational mode position to standby mode position and back.
3. S1000 deactivator make sound signal that confirm or disprove the synchronization.
4. Successful synchronization – three short beep
5. Unsuccessful synchronization – five long beep



**NOTE:** For successful automatic synchronization is necessary enough signal that system positively recognizes TX pulse from other AM system. Unsuccessful synchronization is in most cases caused by large distance of deactivator from other AM system. Maximal recommended distance is 1,8m / 6 ft.

**2. SETUP** - RS-232 interface in TTL levels which allows you direct connection of S1000 control unit with computer via twisted "phone" cable or remote maintenance via internet connection.

**3. ERR** - Shows fatal error (memory error, capacitor does not charge). Device needs service repair!

**4. Δ** - Persistent light of orange LED shows some problem or adaptation, but deactivator can still works. Contact your device representative or distributor for more information.

**5. ⊞** - Heart beat LED. Slow flashing shows normal operational mode - device is ready for deactivation. Quick flashing shows that device make settings change (quick adaptation = system adaptation to the interference from environment).

**6. AC INLET** – 120 or 230V AC. In standby mode is consumption about 20mA / 4W. When device performs deactivation, consumption is momentarily about 300mA / 50W.

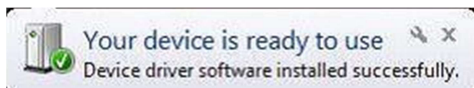
**7. ANTENNA** - Connector for deactivation pad.

## 5. SOFTWARE DESCRIPTION

Single antenna S1000 control unit is configured and tuned completely by software. The latest version of SmartEAS Configurator should be installed before connecting to the device. Single antenna S1000 control unit is connected to the PC/laptop with a USB Dongle which is required for security purposes only or with eComm via internet connection.

### 5.1 USB DONGLE CONNECTION

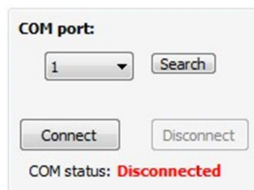
USB Dongle is connected to the 6-pin RS232 serial connector on the S1000 control unit and then to an available USB port on the PC/laptop. USB Dongle is only for use by installers and technicians. Only 1 USB Dongle is needed for each technician. It is not left at the store with the system.



Pic. 2 - Successful install and photo of USB Dongle

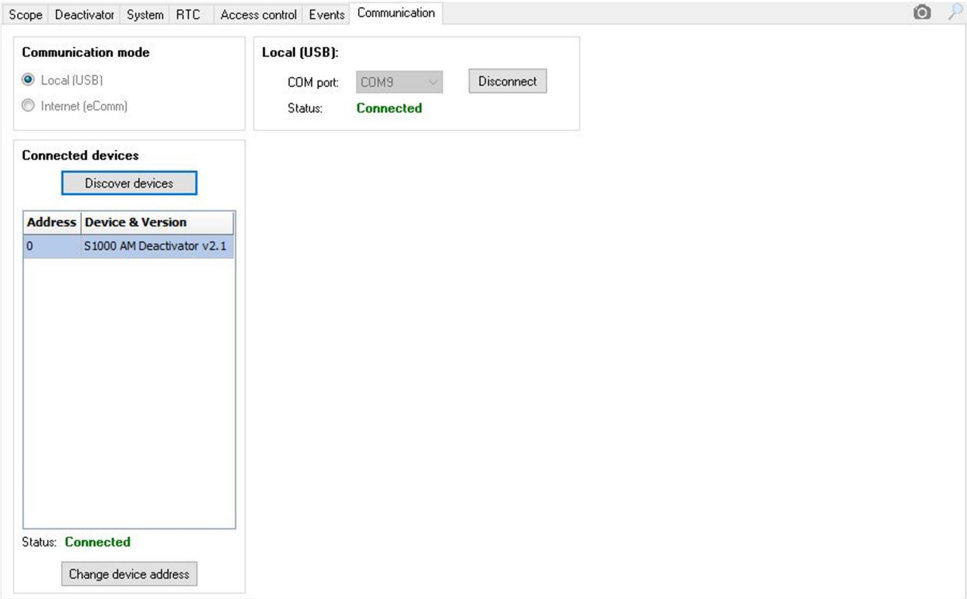
USB Dongle must be connected and device must be powered ON before the SmartEAS Configurator can be opened and a connection made to the system. Before opening the software, wait until the PC indicates that “new hardware is installed and is ready for use.” This will be especially important when using a new USB Dongle or new software version.

Connect through the correct Local (USB) “COM port”. Once connected, click “Search devices” and select your device from the list below or enter its address. When the “eComm status:” displays green “Connected” more options will appear.



## 6. SMARTEAS SETTINGS APPLICATION

### 6.1 COMMUNICATION



Pic. 3 – Communication window

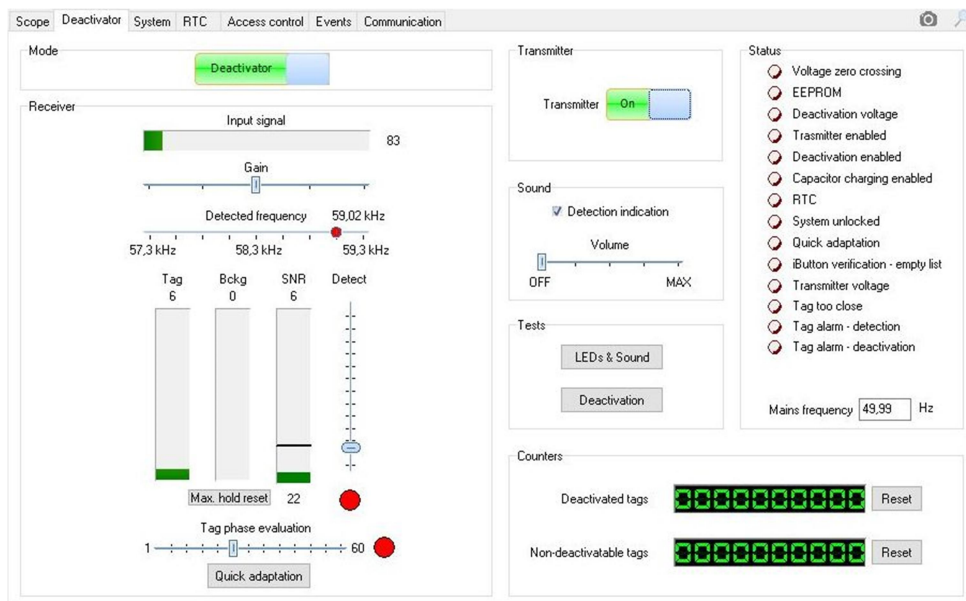
**Communication mode** - Choose the type of communication, either locally or remotely through the internet.

**Local (USB)** - Allows to select the correct COM port manually with scroll bar. Make sure that you disconnect the device before unplugging it to avoid freezing of the computer and/or loss of data.

**Internet (eComm)** - Use login details that you obtain from your device representative or distributor.

**Connected devices** - Use this list for browsing in case of more connected devices which should be differentiate by addresses.

## 6.2 DEACTIVATOR



Pic. 4 – Deactivator window



**NOTE:** After you change some parameters (Transmitter, Gain, Quick adaptation button), it starts quick adaptation, and status will switch to the standby mode for about 5 seconds. During this time is deactivation disabled.



**CAUTION!** Do not place anti-theft labels near deactivation pad when it is quick adaptation in progress!

Deactivator window allows you to make all main settings for regular function of device.

**Mode** – you can select between Deactivator and Tag checker. If you select Deactivator, system will detect and deactivate labels. If you select Tag checker, system will only detect labels without deactivation.

**Transmitter** – Can be select ON or OFF. Normal mode is Transmitter ON. If select OFF, system will not transmit but receiver is still ON.



**Sound** - Detection indication is provided by quickening beeps as the anti-theft tag/label getting closer to the deactivation pad. Volume sets sound level for all audible alarm that device makes.



**NOTE:** If you disable “Detection indication”, device will make sound only when deactivation happen. To mute even this sound click on OFF volume.

**Status** - Shows statuses of the deactivator and the software functions, mainly for factory testing and checking for the errors. Green color of status means that the function runs correctly. Red status means that deactivator is not able to operate or some functions are disabled.



**NOTE:** Description below means that the statuses are in red.

- Voltage zero crossing - Device do not detect zero-crossing from the mains power. It means fatal error and el. board must be changed.
- EEPROM - Memory error.
- Deactivation voltage - Capacitor does not charge properly.
- Transmitter enabled - Shows that transmitter is disabled on connected deactivation pad.
- Deactivation enabled - Shows that deactivation is disabled on connected deactivation pad.
- Capacitor charging enabled - Shows that capacitor does not charge. Deactivation is not possible.
- RTC - Shows error for RTC.
- System unlocked - Shows that system is in standby mode. Deactivation is not possible.
- Quick adaptation - Shows running quick adaptation on connected deactivation pad.
- iButton verification - empty list - iButton function is not allowed for this device. If this status occurs, go to Access control window and switch to key control type.
- Transmitter voltage - Shows transmitter voltage error.
- Tag too close – any tag is very close to deactivation pads and signal is in the memory
- Tag alarm - detection – system detect tag and signal is over detection threshold
- Tag alarm – deactivation – system detect tag and signal is over deactivation threshold

**Receiver** - Input signal displays all input signals coming to the receiver for coil (inside the deactivation pad) apart. The number is without units. Gain amplifies all input signals. Increasing it will make the detection better but the amount of interference will also rise.

Tag and Bckg signals shows detected signals from anti-theft tag/label in the top index and signals from environment in the bottom index on coil in deactivation pad. Quick adaptation button allows the system to scan the environment.



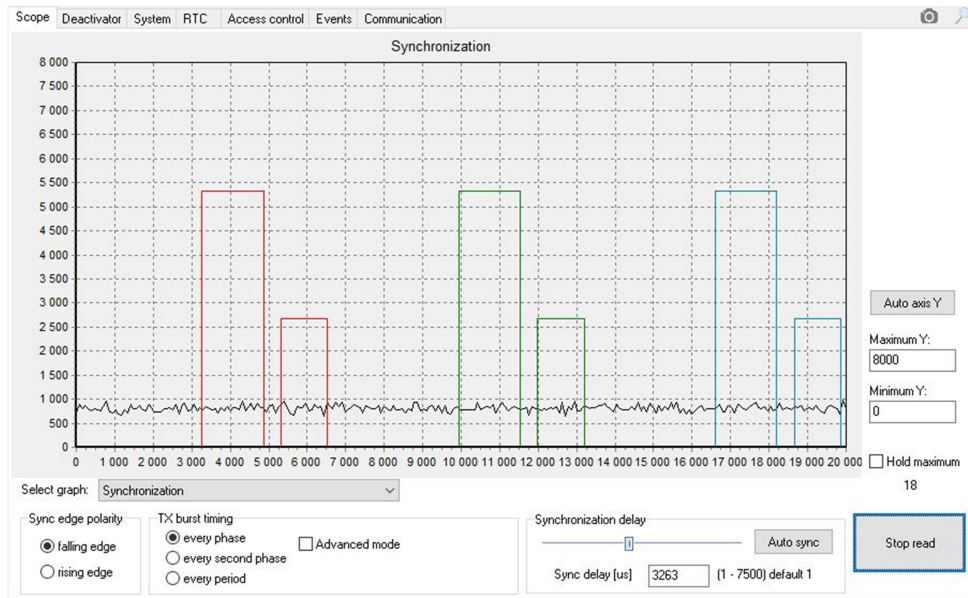
**NOTE:** Do not place anti-theft tag/labels near the system when it is scanning the environment.

**4. Tests** - Test buttons for verification. Deactivation test will not be count as successful deactivation in “Counters”.

**5. Counters** - Simple counter for all successful deactivations. Non-deactivatable tags will be count after number of failed attempts. That number is set in System window.

## 6.3 SCOPE

Scope screen is used for viewing all signals in the environment (interference, other systems, etc.). The colored rectangles represent your system in different phases (red - first phase, green - second phase, blue - third phase). The bigger on the left stands for TX burst and the smaller in the right side stands for RX window. It is only a time representation so the height is not important. The black data represents surrounding environment. Other AM systems will be represented by pulses. By giving your system a time delay of transmission that starts from zero-crossing, it can be synchronized to any other system so that both systems are pulsing at the same time.



Pic. 5 – Scope window

**1. Synchronization** - Line synchronization means that moment of transmission is synchronized by the mains frequency by the moment of line zero-crossing in selected polarity (rising, falling). You can see some other signals that are used for development and testing. You will need only Synchronization graph for proper function.

**2. Sync edge polarity** - Changes the edge polarity (falling or rising). The polarity should be changed if the first red pulse from another AM system starts behind zero. Since you cannot put a negative value into "Delay of phase" this will move the pulse over by half a period.

**3. TX burst timing** - Time distance between separate TX bursts.

**4. Auto sync** - Button will only become available when the system detects other transmitting AM devices in the area. Clicking on it will automatically synchronize the TX bursts delay.

**5. Sync delay** - Time that elapses between zero crossing of the ac line and start of TX burst; remember that it is necessary to set the signal so that it will not interfere with other signals in the area.

**6. Minimum Y, Maximum Y** - Sets the displayed range of the signal on Y axis so that it can be zoomed in or out if necessary.

**7. Read data** - Click for continuous signal report.

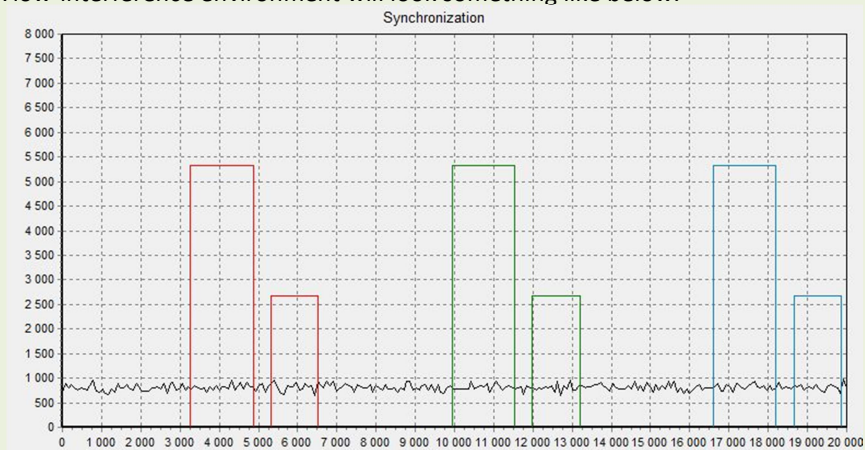
**8. Hold max** - Keeps the highest signals, so the signal will rise to its maximum level over time.



#### **SYNCHRONIZATION WITH OTHER AM SYSTEM - Example:**

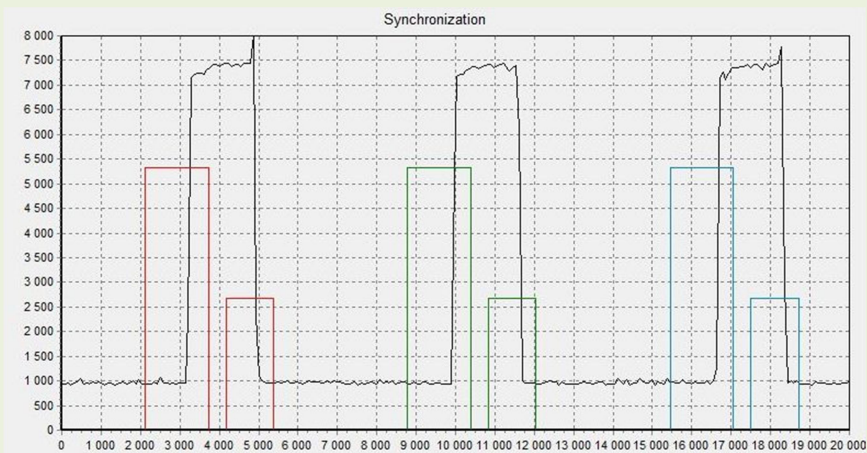
a) In synchronization graph:

1. Click on "Read data" button and check "Hold maximum".
2. Let the system scan the environment for about 1 minute.
3. Evaluate the red signal. This is all of the interference in the environment.
4. A low-interference environment will look something like below.

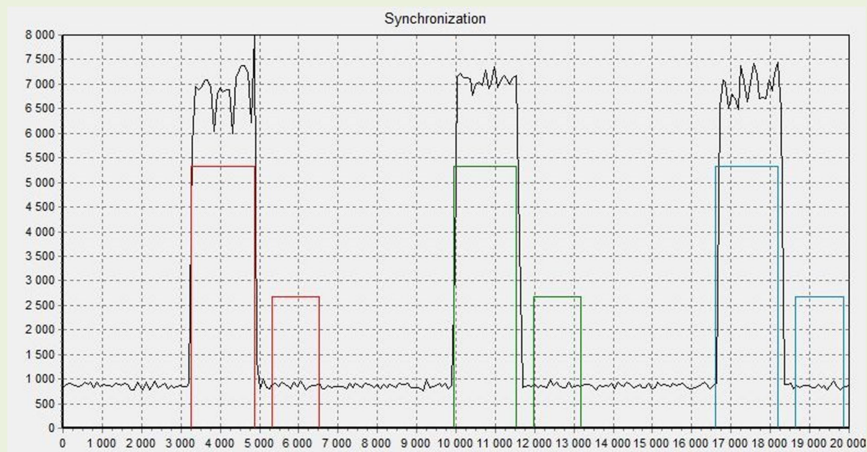


**Fig. 6 – Clear environment without nearby AM system**

5. If there are unsynchronized AM systems nearby, the signal may look like Pic. 7. Another AM system or deactivator control unit will be represented by repeating pulses. The farther away the other system is, the smaller the pulses will be, but the systems can affect each other up to 50m away in some cases, resulting in false alarms and poor detection of both systems. The pulses may be combined with electrical noise, so it is important to evaluate the signal closely.



Pic. 7 – Poorly synchronized AM systems



Pic. 8 - Properly synchronized AM systems

6. As with all types of AM systems, it is 100% necessary to synchronize them with surrounding systems for proper functionality of all systems.
7. The left bigger rectangle represents time when S1000 deactivator control unit transmits a pulse.
8. The right rectangle represents receiving time of S1000 deactivator control unit.
9. Most AM systems will show repeat pulses approximately every 6700  $\mu\text{sec}$  for 50Hz. The X-axis represents the time in  $\mu\text{sec}$ !
10. If the first pulse is starts behind the zero point, change "Sync edge polarity".
11. You can synchronize the systems by dragging the slider of synchronization delay
12. The "Auto sync" button can be used if enough data is available for the system to calculate the correct time delay automatically.
13. Pic. 8 shows properly synchronized systems.



**NOTE:** If installing more than one S1000 deactivator controller unit in the same location, turn on and synchronize the systems one by one!

## 6.4 EVENTS

You can list all changes that happened on S1000 deactivator (Power ON/OFF; Deactivation; Non-deactivation tag; Key, iButton change; HW status; Settings). Every record is differentiated by accurate date and time taken from RTC of S1000 deactivator.



**NOTE:** It is important always click on "Download events" button if you want to display the most recent data.

1. **Events in memory** - Shows actual count of all events stored in memory.
2. **Download events** - Above the button you can choose the count of events that will be shown.
3. **Select device Hardware ID** - Choose the device Hardware ID from which you want display the data. When you open the "Events" window, it is always selected currently connected S1000 deactivator.
4. **Show data** - Click the button and display table with data based on the requirements above.
5. **Event type** - Select type of data that you want to display. You can choose exact type or all of them.

DateTime	Type	Data1	Data2
2020-05-12 11:55:00	Tag too close	1s	
2020-05-12 11:55:00	[0x25] Detected tag	5	0
2020-05-12 11:45:00	[0x25] Detected tag	2	0
2020-05-12 11:20:00	Deactivation	1	0
2020-05-12 11:05:00	Deactivation	1	0
2020-05-12 11:00:00	Deactivation	1	0
2020-05-12 10:15:24	HW reset - user	1	
2020-05-12 09:22:24	RTC synchronization		
2020-05-12 09:21:46	Power ON		
2020-05-12 09:17:22	Power OFF		

Pic. 9 - Screenshot of Events window

- Power ON/OFF - Displays event that deactivator was connected/disconnected from mains power.
- Deactivation - Display events that were successfully deactivated labels on respective pads. Events are displayed overall in 5 minutes interval.
- Non-deactivation tag - Display events that were detected non-deactivated tag on respective pads. As previous, events are displayed overall in 5 minutes interval.
- Key, iButton change - Displays event that key/iButton was used for switch into the standby or operational mode.
- HW status - Displays event that was hardware status changed.
- Settings - Displays event that was Settings changed.

**6. Calendar** - Select the exact date or date period that you want to display. You can choose the date in displayed calendar, or you can type the date manually (keep preset format dd/mm/yyyy).

## 6.5 SYSTEM

Scope Deactivator System RTC Access control Events Communication

Firmware version v2.1 (11/2017)  
Hardware ID 000000526124  
Library version 0032DD (1.0)

Deactivation event [0] Batch  
RX window length [4] Short default "Short"

Detection prealarm 1 (1 - 3) default 1  
Deactivation prealarm 1 (1 - 3) default 1

TX - RX delay 450 us (200 - 600) default 450

Deactivation attempts [18] Twice

Reset to defaults

Pic. 10 - Screenshot of System window

System parameters are for factory testing and modifications only. It is not recommended to change these values without the advice of manufacturer.



**NOTE:** Only the most important system parameters can be changed. The rest of the values are protected against the rewriting as incompetent manipulation may cause substantial changes in the device functionality. Further descriptions of other parameters consult with your device representative or distributor.

- 1. Firmware version** - Shows the current version of the system and serves as important information for any possible future upgrades.
- 2. Hardware ID** - Every el. board has a unique number which can be used by the manufacturer to check all the information he needs about the board or for identification of data in "Events" window.
- 3. Deactivation event** – Gives how is deactivation marker set in events. Single every second or in the batch in 5 minutes interval
- 4. RX window length** - Displays time during which is signal from receiver sampled, the so-called "tag window". Standard width is 2,2ms. In case of problems with other producer system synchronization you can use shortest tag.



5. **Detection prealarm** - Gives number of times that must be label/tag detected for trigger the alarm.
6. **Deactivation prealarm** - Gives number of times that must be label/tag detected for deactivation to trigger the alarm.
7. **TX - RX delay** – distance between end of transmission and start of receiving
8. **Deactivation attempts** – Number of deactivation attempts during one deactivation
9. **Reset to defaults** - Click for default factory settings.

## 6.6 RTC

RTC is a clock in the board (integrated circuit) that keeps track of the current time. Correct time is necessary for events.

Scope Deactivator System **RTC** Access control Events Communication

RTC time: 12.5.2020 14:11:51 Tuesday

PC time: 12.5.2020 14:11:50 Tuesday

Time zone: UTC+02:00

Synchronize with PC

RTC calibration (second per day) 0

+10s -10s

Use DST (Daylight Saving Time) Off

Pic. 11 - RTC

**RTC time** – actual time of deactivator

**PC time** – actual time of your computer/laptop

**Time zone** – your time zone, you need to select your correct time zone.

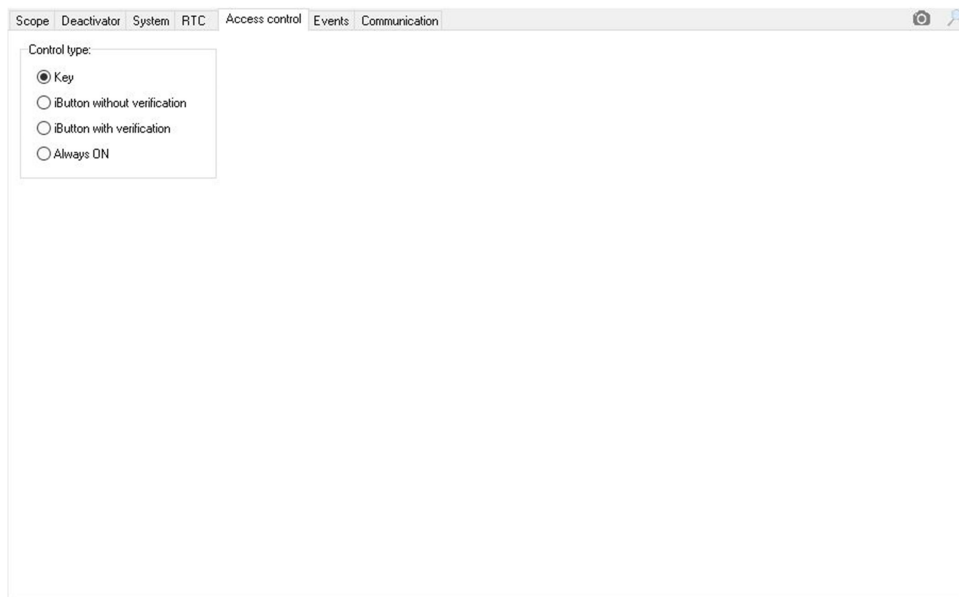
**Synchronize with PC** – will synchronize Deactivator time with computer time.

**RTC calibration** – when time of deactivator is different after month or more of working, you can calibrate RTC time of deactivator. Select difference per day.

**Use DST** – if in your country is Daylight Saving time possible, you can switch ON this option and select, in what time/date is DST active.



## 6.7 ACCESS CONTROL



Pic. 12 – Access control

For control of deactivation, there is option, how to access to the deactivator. It can be possible to control deactivation with simple KEY at the front of the control unit. Simply switch to the STANDBY mode or to the ON mode.

Another solution is possible with iButton. You can control deactivation with iButton with or without verification. With verification you need to have this iButton in the memory of the deactivator for switch between ON or Standby mode.

Deactivator can be also switch to the ALWAYS ON mode and KEYS or iButton will not have any affect – Deactivator will be still running.

## 7. DECLARATION

### 7.1 EQUIPMENT MODIFICATION CAUTION

Equipment changes or modifications not expressly approved by manufacturer, the party responsible for FCC &/or CE compliance, could void the user's authority to operate the equipment and could create a hazardous condition.

### 7.2 LIMITATION OF LIABILITY

Circumstances may arise where because of a default on manufacturer part or other liability is, you are entitled to recover damages from manufacturer. In each such instance, regardless of the basis on which you are entitled to claim damages from manufacturer, manufacturer is liable for no more than damages for bodily injury (including death) and damage to real property and tangible personal property; or any other actual and direct damages resulted from omission or failure of performing legal duties under this Warranty Statement, up to the listed contract price of each product. Manufacturer will only be responsible for or indemnify your loss, damages or claims based in contract, tort or infringement under this Warranty Statement. This limit also applies to manufacturer's suppliers and its reseller. It is the maximum for which manufacturer, its suppliers, and your reseller are collectively responsible.

*UNDER NO CIRCUMSTANCES IS MANUFACTURER LIABLE FOR ANY OF THE FOLLOWING: (1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES; (2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR (3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF MANUFACTURER, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY.*

## 8. REGULATORY INFORMATION

### 8.1 FCC AND IC COMPLIANCE STATEMENT

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### 8.2 FCC INFORMATION TO THE USER



**WARNING:** This equipment has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction's manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

It is suggested that the user use only shielded and grounded cables to ensure compliance with FCC Rules.