SpritControl®

Nozzle Reader with RFID r/w & BlueTooth
Earlier called BlueTank

Programming Manual Rev 5.0

Table of Contents Firmware Programming Manual

System Features

- The SCNReader has no switches and connectors.
- It is switched on by movement
- Switch OFF by software command or by time out.
- All functions of the **integrated RFID reader / writer** from CAEN, type R1270 Quark-Up are accessible transparent via the BlueTooth interface and not influenced by the reader firmware.
- https://www.caenrfid.com/en/products/r1270-quark-up/
- The **SCNReader firmware** offers hundreds of options for functionality and use of the reader. Switch On by shake or be reading angle, timeout scenarios, LED indication, Beeper, battery level control, etc.
- Customer specified firmware on request.

1 Introduction

This guide is for programmers wishing to communicate with the SpritControl® reader.

This document assumes that the battery is not discharged before any work or changes are carried out.

It defines the Power Management and the Commands set to communicate with the SpritControl® reader.

Communication between the SpritControl® reader and the host computer is via BlueTooth. The BlueTooth service opens a virtual communication port for the SpritControl® reader. This runs at 155.200 baud with 8 data bits, no parity, 1 stop bit and no handshake.

The SpritControl® reader consists of several internal modules: RFID decoder with antenna, BlueTooth module, battery holder with ATEX protection electronic and main processor board.

Some of the commands affect the fundamental operations of the SpritControl® reader and should be used with caution. It is possible to alter the configuration in such a way that the SpritControl® reader will not work anymore.

1.1 Reader Versions

This Programming Manual is valid for SpritControl® Nozzle Readers (SCNR).
The firmware is called SCNR (earlier called TagTrans)

1.2 System Requirements

Recommended Operating System:

- All systems which communicate with BlueTooth

Recommended BlueTooth Adapter

- BT USB Adapter Parani UD100
- BT-Serial Adapter Parani SD1000
- BT-Serial // USB Adapter SD1000U
- BT-Access Point / Gateway MSP1000
- ParaWIN software to manage connections (included with adapters)
- http://www.senanetworks.com/

1.3 Package List

- SpritControl Nozzle Reader with rubber mounting boot
- SD1000U BlueTooth Adapter
- Set of transponders, tags and smart labels

1.4 Hardware Preparation

1.4.1Enable the Battery

- Batteries are not included in the shipment.
- Please buy the batteries locally.
- The only allowed type is L91 Energizer Lithium Ion battery
- The battery is non rechargeable!
- https://data.energizer.com/pdfs/l91.pdf
- **Changing the battery** (it is a non-rechargeable battery!)
- Open with a T10 screwdriver the screw on the battery and electronic cabinet cover on the rear side of the reader.
- Remove the cover, take care of the O-ring seal.
- Insert L91 Lithium Ion batteries in the battery holder (NO OTHER TYPE)
- Fix the cover again, tightly, not to strong, with the O-ring the housing is IP68 watertight.

- After the batteries are inserted the green LED is ON (until timeout or switched off by software %off – command)

1.4.2 Mounting the SpritControl® reader to the nozzle

- The SpritControl® reader housing is fitting perfectly to the rubber mounting boot.
- See instructions from Alvern Media.
- https://alvernmedia.com/technical/installation-guide/
- Standard shipment is with Z200 for ELAFLEX ZVA 25 and Slimmline
- Other boots are available in different colors and for other nozzles like OPW.

1.4.3 Mounting the Transponder

- The transponder, tag or smart label should be fixed close to the filler neck.
- Examples see at http://www.spritcontrol.com/index.html

1.5 Software Set Up

Follow these instructions to set up the SpritControl® nozzle reader with a **BlueTooth *enabled*** PC running Windows.

First Startup
Move the reader with a gentle shake if in the firmware wakeup by shake is enabled (or over an angle of about 120° from vertical to down, if wakeup by angle is enabled) and the ***green LED*** will switch on to show that the system power is ON.

Status Indicator LED's
The reader is equipped with two LEDs to see the status of the reader.
The ***green LED*** is the **battery condition indicator**. To get the exact battery status, see settings: "get bat". If the battery is fully charged, the LED is ***green***. If this LED is ***orange***, the battery conditions are moderate to low. If the LED flashes some second ***red*** the battery must be changed. (not charged)
The ***blue LED*** indicates the **communication status**. It is ***blue*** after the BlueTooth connection is established. During a communication with the reader it blinks (depending on set up ***blue*** and ***red*** simultaneously.

Serial Port Settings:

Change the settings in your terminal program:
COM Port: according BlueTooth adapter
Baud rate: 115.200
Data: 8 bit
Parity: none
Stop: 1 bit
Flow control: none

Set up the connection to your host

Most easy you use ParaWIN together with the SD1000U BlueTooth adapter.
Start the ParaWIN software Installation CD is included in the adapter package) and set the parameters by selecting the COM port of the SD1000U USB adapter , select the BaudRate 9600 (later change to 115.200), and Parity None, StopBit 1.

Select "Connection" to search for the SCNReader which will prompt with **SpritControl®** firmware **SCNReader HW 2.2 SW 012.21** …

You can set the **Pin Code** (default pin = 1234, to change the pin or disable it see Settings / Commands), so the unit can be paired to the host (/ PC or BlueTooth adapter).

Instead of using ParaWIN and ParaniSena adapters you can use any BluTooth connection with external or internal adapters and BlueTooth stacks.
The BlueTooth software will set up a virtual COM-Port. Use this com-port to communicate between the SpritControl® Nozzle Reader and any terminal program like TeraTerm, or Hyperterminal, etc... As soon as the SCNReader is paired and the BlueTooth/serial connection is completed to a host, the ***blue LED*** will indicats that a proper communication is established.
Now the SpritControl® Nozzle Reader is connected.

It is possible to see and change settings of your SCNReader with easy to understand **%-Commands**, using a terminal program.
The *commands* for the SCNReader firmware settings always start with a **"%"**-character and need to be sent/confirmed by "*carriage return*", otherwise it is misunderstood as a reader-command and does not reach the microcontroller of the SCNReader.
To get a list of most important settings/commands and the firmware versions of the SpritControl® send ***"%help":***

In order to save **battery life** the unit will go to sleep (Sleep mode) after a period of being idle (Stand by Mode). The Stand by Mode is configurable. (timeout see settings: t1 – t3). The unit will wake up from Sleep Mode in Stand by Mode by shaking or by wakeup by angle.
If you do not move the unit or read tags or send commands, the SCNReader will switch off by timeout, depending on the setings of t1 – t3 e.g. after 60 seconds. It will change into Sleep Mode. To retrigger the SCNReader shake it or move it over the programmed angle. It restarts and reconnects to the host automatically, if BlueTooth stack is configured accordingly.

1.6 Reading a transpoder

Switch on the SCNReader by moving and check if the Blue LED has switched on (with a Beep)
The easiest way to read a tag is to use software from CAEN:

1. "CAEN RFID EasyController" Software" for Windows

Download this program from our support Website.
http://www.datatronic.eu/support/RFID_UHF/Easy_Controller_Software/Setup_1_6_0.zip
Got to: File – Connect – Connection Type RS232 Connection: select the virtual COM Port which was assigned from the BlueTooth stack or ParaWIN.

Start „Inventory"
Place the transponder near the SCNozzle Reader and you will see the EPC code of the transponder.
Many other settings and programming features are available.
For all details see the Technical Information Manual.
http://www.datatronic.eu/support/RFID_UHF/Easy_Controller_Software/EasyController_Technical_Information_Manual_rev01.pdf

The reader antenna has a linear polarization, therefore reading distances depend on orientation and alignement of the transponder.

2. Handy App "CAEN EasyController" Software for Android and IOS

Download this program from Play store

Support Manuals Software Firmware

- Programming Manual and Software Tools see Support Website:
- www.datatronic.eu/support/support_f.html

2 Power Management

The SpritControl® reader device is a battery powered unit. Once the battery is connected the SpritControl® reader is powered on and several operating modes are available.

In order to preserve battery life the unit will go to sleep (Sleep mode) after a period of being idle, the idle period is configurable. The unit can be woken up by moving or shaking.

In this section these operating modes are described.

2.1 Connection Status

Once the SpritControl® reader unit has power, by default, the unit tries to establish a BlueTooth connection with a host. There are three possible ways that the device can be powered on.

1. The battery is manually connected.
2. From sleep mode: perform manual waking up movement
3. Full enterprise or idle/standby mode: (by forcing a disconnection from the host)

2.1.1 Status Indicator (LED)

Under normal conditions, if the battery is not discharged, the battery condition indicator LED is **green** - If this LED is **orange**, the battery conditions are moderate to low. If the LED flashes **red** the battery must be changed.

2.1.2 Timer duration

A timer **PwrTmr** is loaded - after a RESET - with a default value of 180s (set **t1**). During this period the SpritControl® reader will attempt to establish a BlueTooth connection to a host. If the timer is zero, the SpritControl® reader changes into **sleep mode**. If a connection has been established the equipment changes into the **full enterprise mode**.
With the "waking movement" the **PwrTmr** is loaded with 60s (set **t2**).

2.1.3 Power Consumption

During the connection process only the BT-module is supplied with power. The RFID-Decoder-module remains inactive – power consumption is approx. **50 - 150 mA**.

2.2 Full enterprise mode

In the full enterprise mode, all modules are active.

The Communication between RFID-Decoder-module and host is now open. Each byte from the host is passed directly to the RFID-Decoder-module and/or vice versa i.e. from SpritControl® reader to the host..

Also the „%-commands"are accepted by SpritControl® reader - see section SpritControl® reader Commandss.

There are two possibilities to enter full enterprise mode:

1. From host-side connection.
2. From SpritControl® reader side: Wake up movement.

2.2.1 Status Indicator (LED)

The **battery condition indicator LED** is either **green** or **orange**. The second LED - the **connection indicator LED**, is **blue** when a connection to a host exists, also when a connection is established a 1 second audible sound is emitted. When data is **transmitted,** the connection indicator will briefly shine **violet**.

2.2.2 Timer duration

When a connection is established an additional timer **RdTmr** is loaded with 20s (set t3). If communication between host and RFID-Decoder-module takes place the **RdTmr** is reset to 20 sec and the **Pwrtmr** is reset to 60 sec.

If a manual wake up movement is done "the **RdTmr** is reset to 20 sec and the **Pwrtmr** is reset to 60 sec

If the timer RdTmr runs down, SpritControl® reader changes into the readiness mode. RdTmr value must always be smaller than PwrTmr.

2.2.3 Power Consumption

In **full enterprise mode** the power consumption is as all modules are active - approx. **200… 250 mA**.

2.3 Idle / Standby Mode

In this mode the host is connected, however the RFID-Decoder-module is deactivated. A feature of this mode is the **fast change into** the **full enterprise mode.** The SpritControl® reader uses less power than during the initial connection process. You into this mode:
The device must have previously been in **full enterprise mode**: The timer **RdTmr** runs down to zero and the unit switches to Idle mode..

2.3.1 Status Indicator (LED)

The **battery status indicator** LED shines **green** or **orange** and the **connecting indicator** LED **flashes blue** in standby mode.

2.3.2 Timer duration

If the timer **PwrTmr** runs down to zero the SpritControl® reader changes into the sleep mode and the connection to the host is interrupted. Either communication from the host or a “waking movement“ changes the SpritControl® reader back in full enterprise mode.

2.3.3 Power Consumption

By deactivating the RFID-Decoder-module and already having the connection between host and SpritControl® reader, in standby mode has the smallest power consumption compared to other modes - approx. **40… 100mA**.

2.4 Sleep Mode

In sleep mode power consumption is more or less switched off, only supply of the motion sensor is on.
There are two options to get into sleep mode:

1. In **full enterprise mode** the host can send the command „%off “(see section SpritControl® reader Commandss)
2. From **Idle/standby** mode the timer PwrTmr times out.

2.4.1 Status Indicator (LED)

Both the battery status indicator LED and the connecting indicator LED are off.

2.4.2 Timer duration.

As lang as no wake-up movement is done the SpritControl® reader remains in the sleep mode.

2.4.3 Power Consumption

In this mode there is practically no current flow, SpritControl® reader in this mode uses practically no power from the battery. However by the nature of the device there will over time, be power “leakage” and eventually the battery will become discharged.

3 SpritControl® reader - Commands

SpritControl® reader routes host-sided incoming characters to the RFID-Decoder -Module.
Changes and inquiries for the SpritControl® reader standard set up unit can be madeby a simple syntax.

3.1 General Syntax

The syntax begins with a ' %' - character and ends with a 'Return' (0Dh, 0Ah). The string should be smaller than 80h.

%command	*[para1 para2...] CrLF* {0Dh, **0Ah**}
e.g. %help	

3.1.1 Command „%help“

Shows a list of main Commands.

Input: **%help**	Output Commands list Output: *%SpritControl® reader HW 2.2 SW 0.12.4 HF 3AMS Build Time Apr 29 2010 11:48:13* *%get to ... get timeouts* *toff actual time until power off* *troff actual time until reader off* *t1 timeout power off* *t2 retrigger time power off* *t3 retrigger time reader off* *%set t1 xxxxx ... set timeout power off to xxxxx seconds* *%set t2 xxxxx ... set retrigger time power off to xxxxx seconds* *%set t3 xxxxx ... set retrigger time reader off to xxxxx seconds* *%set factdef [rf/tt/bt] ... set SpritControl® reader to factory default (ask support before!)* *%get bat/bth ... get battery level/thresholds* *%set pin xxxx ... set pin (max 16 digits)* *%set name xxxx ... add string to friendly name (max 32 digits)* *%get acon ... get state of auto connect* *%set acon on/off ... set auto connect on/off* *%del pair ... delete pairing* *%set msg on/off ... set message on/off* *%beep volume[0-3] frequency[10Hz] duration[0.1s] (optional)* *%blink help ... lists blink commands* *%get br ... get actual baudrate* *%set br xxx ... set baudrate to xxx* *47 -> 9600, 23 -> 19200, 11 -> 38400,* *7 -> 57600, 3 -> 115200* *%ax help ... lists 3axes motion sensor commands* *%off ... power down* *%list config … lists main settings of the SpritControl® reader* *&sendbt set … lists BlueTooth module settings and MAC address of the SpritControl® reader*

3.2 Commands Set

When the host sends a ' %' character, the normal data flow is interrupted. Each further character is stored in a Buffer (max. 254 characters), also a timer is activated and loaded with approx. 8 seconds. Each subsequent character initializes the timer with 8 seconds. If the timer times out this mode is interrupted and each stored character (inclusive ' %' - character) is transmitted to the RFID-Decoder-module.

If a CrLF (0Dh, 0Ah) is sent, before the timer timeout, the stored character string is treated as a command and the timer deactivates.

If the command is invalid the buffer will be deleted and the character string „%syntax error {CrLf}“ is sent to the host.

3.3 Hardware Commands

The firmware supports all hardware combinations, which can be adjusted with the internal command set.

3.3.1 Command „set rf“

This Command is used to select the RFID Decoder

%set rf 2	Communication UHF Module und SpritControl® reader

3.4 General Commands

3.4.1 Command „reset“

%reset	Reset SpritControl® reader
	Output: %reset\r\n

3.4.2 Command „set br usb“

Especially for SpritControl® reader with USB. (not in use, optional)

%set br usb	Set USB Baudrate

3.4.3 Command „set/get ID“

%set id	Set SpritControl® reader ID
	Output: %ok\r\n
%get id	Show SpritControl® reader ID
	Output: %”id”

3.4.4 “Command „set msg on/off”

%set msg on	Enable SpritControl® reader Messages
%set msg off	Disable SpritControl® reader Messages

3.4.5 Command „ver“

%ver	Show whole version
	Output: %SpritControl® reader HW 'ver_hw' SW 'ver_fw' ''LF''^''HF''^''UHF'' ''''^''3AMS'' ''''^''USB'' ''''^''AP'' Build Time 'build_time'\r\n

3.4.6 Command „ver bl“

%ver bl	Show Boot loader Version
	Output: %''0''^''1''\r\n

3.4.7 Command „ver fw“

%ver fw	Show Firmware Version
	Output: %'ver_fw'\r\n

3.4.8 Command „ver hw“

%ver hw	Show Hardware Version
	Output: %"2.1"^"2.2"\r\n

3.4.9 Command „bootloader“

%bootloader	Reset SpritControl® reader and go to bootloader mode
	Output: %bootloader\r\n

3.4.10 Command „beep“

%beep	Start acoustic signal

3.4.11 Command „blink“

%blink	Start blinking

3.4.12 Command „blink help“

%blink help	List all blink commands

3.4.13 Command „blink set count“

%blink set count	Set the number of blinking

3.4.14 Command „blink set speed“

%blink set speed	Set blinking speed

3.4.15 Command „blink set ths“

%blink set ths	Set threshold between ON and OFF time

3.4.16 Command „blink store count“

%blink store count	Set & store the number of blinking

3.4.17 Command „blink store speed“

%blink store speed	Set & store blinking speed

3.4.18 Command „blink store ths“

%blink store ths	Set & store threshold between ON and OFF time

3.5 Power-Management Commands

SpritControl® reader offers the possibility to adapt power consumption based on the respective application and physical requirements. This section describes all the required commands to enable various power management options.

3.5.1 Command „set t1/t2/t3“

This command changes the values, with which the timers **PwrTmr** and **RdTmr** are loaded, see section Power Management.

%set t1 *x*	Set Power Off Timeout on start-up, x is indicated in decimal and in seconds
%set t2 *x*	Set Power Off Timeout, x is indicated in decimal and in seconds
%set t3 *x*	Set Reader Off Timeout, x is indicated in decimal and in seconds

3.5.2 Command „get to“

Return the current state of the individual timers and the appropriate values back.

%get to	Show time out state
	Output: toff: 'Off Timer' troff: 'Reader Off Timer' t1: 't1' t2: 't2' t3: 't3'\r\n *toff: x troff: y t1: a t2: b t3: c* *x* time up to Sleep Mode - PwrTmr *y* time up to readiness mode - RdTmr *a,b,c* the appropriate value t1, t2, t3.

3.5.3 Command „get bat“

Return the current state from the battery.

%get bat	Show battery status
	Output: *%bat 'vbat'\r\n* The battery value is calculated then, as follows: U.bat = *x* * 0,0245 [V]

3.5.4 Command „get bth“

Return the battery thresholds.

%get bth	Show battery thresholds
	Output: *%bth* 'ths1' 'ths2' 'ths3'\r\n

3.5.5 Command „off“

SpritControl® reader changes immediately into sleep mode, the connection to the host is separated and SpritControl® reader can only manually “wake up“.

%off	
	Output: *%power off\r\n*

3.5.6 Command „off nowake“

Power off SpritControl® reader without WakeUp.

%off nowake	
	Output: *%power off\r\n*

3.6 BlueTooth Commands

The BlueTooth module provides the connection between the host and SpritControl® reader. It works independently and can be configured only over a direct connection to SpritControl® reader.

The coding for example can only be changed, if the BlueTooth connection to a host is established, once a connection is established it is possible to send the appropriate commands to the SpritControl® reader.

Any BlueTooth configuration changes remain until either changed by the user or the SpritControl® reader device is reset back to the factory settings at which point all changes to the BlueTooth module will be lost.

3.6.1 Command „set name“

This command allows the user to specify the name the SpritControl® reader will recognised as, when SpritControl® reader is registered in a BlueTooth network.

%set name *str*	*str* is a character string, which is transmitted to the BlueTooth module

If a name is not required a “Return” is sent down as the first indication instead of the character string

3.6.2 Command „set pin“

The connection between host and SpritControl® reader is secured with a PIN number, which is defaulted to “1234“. The following command allows the user to change the PIN

%set pin *str*	str is a character string, which is transmitted to the BlueTooth module

If a PIN number is not required or desirable, a ' CrLF' as the first character can be sent instead of a string and the user would not be prompted for the PIN during the BlueTooth connection process.

3.6.3 Command „set acon on / set acon off / get acon“

As soon as the SpritControl® reader is in the enterprise mode, the BlueTooth module tries, as a standard, to develop a connection sequentially. This command sets the “automatic connection”. It can be activated and/or deactivated.

%set acon on	Activates the automatic connection
%set acon off	Deactivates the automatic connection
%get acon	Returns the current condition

3.6.4 Command „sendbt“

%sendbt	Send iWRAP commands to WT11 Module
	Output: %ok\r\n

3.6.5 Command „del pair“

If SpritControl® reader is already connected with a host, the two are “paired”, i.e. that the addresses of the partner are stored. In order to break this paired connection, the following Commands can be used:

%del pair	Breaks the paired connection

3.6.6 Command „set factdef bt“

%set factdef bt	Set BT Module to factory default

3.7 UHF Module Command

Communication between UHF module and SpritControl® reader processor is serial. Sometimes it is necessary to adapt the communication settings.

3.7.1 Command „set/get br“

This command is used to setup the Baud rate of the SpritControl® reader. (not recommended at all!)

%set br *x*	*x* 3…115200 (standard) *x* 7…57600 *x* 11…38400 *x* 23…19200 *x* 47…9600
%get br	Returns the actual value Output: %br x

3.7.2 Command „get rf“

%get rf	Show Reader Device
	Output: %Reader = "UHF"\r\n

3.7.3 Command „poll [on/off]“

In order to ensure a continuous inquiry of the serial number of the UHF tags, SpritControl® reader sends a polling command to the UHF module. Since in the readiness enterprise mode the UHF module is not supplied with power, this command must be sent with each start of the full enterprise. In order to automate this procedure, this command allows optional selection of the parameters to be turned on or off.

%poll	Send Polling command
%poll on	Enable Polling Transponder on start-up
%poll off	Disable Polling Transponder on start-up Output: %OK\r\n Command was successfully dispatched %poll 1\r\n %poll 0\r\n *%no response* UHF-Module does not response

3.7.4 Command „set factdef rf“

%set factdef rf	Set RF Reader to factory default

3.7.5 Command „set factdef tt“

%set factdef tt	Restore SpritControl® reader to factory default

3.7.6 Command „get/set reverse“

%get reverse	Show current Reverse function
%set reverse	Set Reverse Functions for UID

3.8 Motion Sensor Commands

The 3-axes motion sensor determines movements or accelerations in every direction.

Basically 2 movement types can be detected automatically:

1. **"free fall":** e.g. **Pivot the SpritControl® reader** device from below to above or from top to bottom.
2. **"Punch or kick":** (simple or double) a **double "tap" of the SpritControl® reader** with the fingers within half a second
   or. e.g. **360 ° rotation around the longitudinal axis** within a tenth second

These movements may be combined with one of the following (events):

- **"Wake up the SpritControl® reader"**
- **"Reset all timer"**
- **"SpritControl® reader in sleep mode enabling"**
- **"Run of stored MultiBlock command"**

There are 2 different configuration modes:

"Active mode": scenario: a movement is detected and executes an action (event).

"WakeUp mode": scenario: a movement is detected and SpritControl® reader being awakened from sleep mode.

Note: All thresholds refer to the x-times acceleration of gravity g and can be between 0 and 15. A value of 1 corresponds to roughly 0.5 * g with a relative error of 15%.

3.8.1 Command „axr”

The sensor includes an 8 – bit register, this will be used to control its behaviour or to get acceleration data.
The register address consists of 7 bit.

With the command „%axr“ the register can be read out.

%axr	Read out Register
	Output: 'reg_adress'->'reg_value'\r\n

3.8.2 Command „axw”

With the command „%axw“ on the register can be written. (Attention: not recommended for users!)

%axw	Write on register
	Output: 'reg_adress'<-'reg_value'\r\n
	Failure Output: %ax error\r\n %ax error com\r\n

3.8.3 Command „ax init”

The sensor will be initialized.

%ax init	Initialization of the sensor
	Output: %ax ok\r\n

3.8.4 Command „ax stop”

The sensor will be switched off – Sleep Mode. (to reduce power consumption)

%ax stop	Sensor Stop
	Output: %ax ok\r\n

3.8.5 Command „ax help”

List all “3-axes motion sensor” commands.

%ax help	List sensor commands
	Output: 3axis motion sensor command list %ax config wakeup/active ... select wakeup/active config %ax get config ... show configuration %ax set event C X N ... select event n after x motion c=0 -> channel 1 c=1 -> channel 2 x=0 -> no n=0 -> no event/wake up x=1 -> free fall n=1 -> turn off SpritControl® reader x=2 -> click n=2 -> retrigger timer n=3 -> execute MultiBlock %ax filter [val] ... set high-pass filter [0..4] Free fall detect settings... %ax ff ths [val] ... set threshold 2..15 %ax ff [x/y/z][0/</>] ... start event if 0 -> ignore axe x/y/z > -> active if accel. of axe x/y/z is greater than ths < -> active if accel. of axe x/y/z is smaller than ths %ax ff dur [csec] ... set free fall duration 0..255csec Click detect settings... %ax clk [x/y/z][0/1/2/3] ... none/single/double/both clicks %ax clk ths [x/y/z] [val] ... set threshold 2..15 %ax clk tlim [msec] ... set time limit for one click 0..127msec %ax clk tlat [msec] ... set latency after click 0..255msec %ax clk twin [msec] ... set time window for two clicks 0..255msec %ax chk ... starts testing mode

3.8.6 Command „ax config wakeup”

With this command the SpritControl® reader will be transferred in the WakeUp Mode.

%ax config wakeup	Configuration Wakeup Mode
	No Output

3.8.7 Command „ax config active”

With this command the SpritControl® reader will be transferred in the active – configuration mode – default after every new start.

%ax config active	Configuration Active Mode
	No Output

3.8.8 Command „ax get config”

Shows the momentary configuration mode and list the corresponding configuration.

%ax get config	
	Output: Configuration mode: active Channel 1: retrigger timer if click Channel 2: no event/wake up if none High-pass filter cut-off freq.: 2Hz Free fall settings: Threshold: 2 Duration: 10 csec Axes: X> Y> Z> Click settings: Threshold: X=2 Y=2 Z=2 Time limit: 32 msec Time latency: 100 msec Time window: 100 msec Axes: X both, Y both, Z both

3.8.8.1 Example

Input:	
%ax config wakeup **%ax get config**	
	Output: Configuration mode: wakeup Channel 1: no event/wake up if click Channel 2: no event/wake up if none High-pass filter cut-off freq.: 2Hz Free fall settings: Threshold: 2 Duration: 10 csec Axes: X> Y> Z> Click settings: Threshold: X=2 Y=2 Z=2 Time limit: 32 msec Time latency: 100 msec Time window: 100 msec Axes: X both, Y both, Z both

3.8.9 Command „ax set event”

With this command automatic recognized movement are combined with any operation. Two different movements can recognize simultaneously. (Channel 1 / Channel 2)

%ax set event *a b c*

a … **0 or 1** -> 1. or 2. Movement recognition
b … **0 to 2** -> 0 = no movement, 1 = free fall, 2 = punch/kick
c … **0 to 3** -> 0 = wake up, 1 = timer reset, 2 = SpritControl® reader switch off, 3 = MultiBlock start

%ax set event	set Event Trigger (event <-> trigger)
	No Output

3.8.10 Command „ax filter”

The High pass filter will be set to filter out static acceleration. (e.g. Standard acceleration of gravity).

%ax set event *a*

b … **0 to 4** -> 0 = static, 1 = 0,25 Hz, 2 = 0,5 Hz, 3 = 1 Hz, 4 = 2 Hz

%ax filter	Set High pass filter
	No Output
	Failure Output: %ax error\r\n

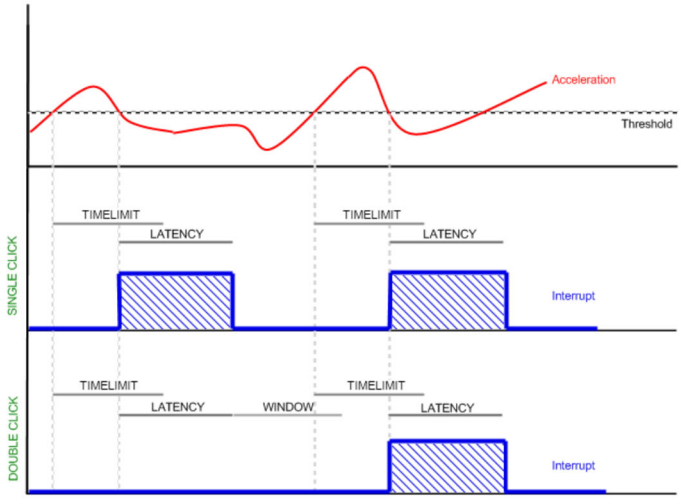
3.8.11 Command „ ax ff / ax ff ths / ax ff dur”

For the free fall axis, threshold and duration have to be set.

%ax ff	Axis – set the axis for free fall (greater or smaller than the threshold)
%ax ff ths	Threshold – set the threshold of the free fall
%ax ff dur	Duration – Set the duration within or without the threshold of the free fall.
	No Output
	Failure Output: %ax error\r\n

3.8.12 Command „ax clk / ax clk ths / ax clk tlat / ax clk tlim / ax clk twin“

The sensor can distinguish between two different sorts of punch / kick. – single or double.



The illustration shows one double kick and one single kick.

%ax clk	Set axis x, y or z
%ax clk ths	Set the threshold for x/y/z axis – every axis can defined individually
%ax clk tlat	Delay the action beyond the motion detection
%ax clk tlim	Set time limit for the punch /kick detection
%ax clk twin	Set maximum permissible time window for dual punch/kick
	No Output
	Failure Output: %ax error\r\n

3.8.13 Command „ax chk”

Switch to test mode – to check primarily the set motion detection. A deep signal is heard for the first motion detection and a high level for the second.
Additionally, all 120 milliseconds the current acceleration of the axes are showed. You can here e.g. the data emitted through a terminal program save to a file and process them further.

%ax chk	Change to test mode
	Output: %'Output for 3axis'\r

3.8.13.1 Example

%ax chk	
	Output: %3ax testing mode %type 'h' for help

3.8.14 Command „ax set default”

Setting the sensor to factory default.

%ax set default	Set Motion Sensor to factory default
	Output: %ax ok\r\n

4 Technical Support

Support Webpage: www.datatronic.eu/support/support_f.html

Contact Information

Support: Please send your questions by mail to wp@datatronic.eu.

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