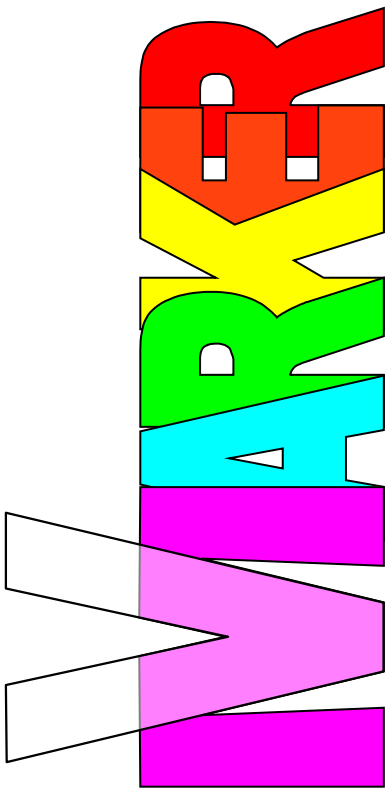
Interactive Whiteboard

MANUAL (EN)

MANUEL (FR)

HANDLEIDING (NL)



version: Thursday 16 February 2017

1 General

This manual is based on the Vmarker sensor II with firmware version 8 and VmarkerUtility software version 3.0. When using a different firmware or VmarkerUtility, it is possible that the explanation does not match the situation.

You can e-mail any suggestions for improving this manual to: ludwig@vmarker.org.

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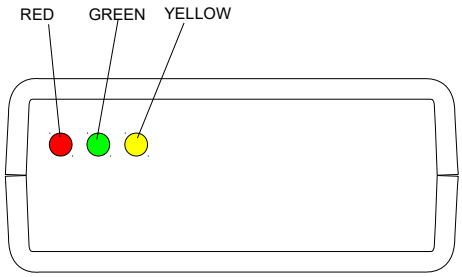
2 Vmarker Sensor II

2.1 General

2.1.1 Front-side of the Vmarker sensor

You can recognize the front-side by the IR-filter: the dark-red nearly black shiny surface with three coloured LED's. Behind this filter the IR-sensors are positioned. You have to point this side in the direction of the projected image.

The most important sensor is positioned in the middle behind the IR-filter.



Pay attention that you do not damage this filter: scratches on the IR-filter can disturb the proper functioning of the Vmarker sensor. You can clean the IR-filter with a dry lint-free cloth.

The 3 colored LED's on the front indicate the status of the Vmarker sensor.

The red LED, indicates the state of the USB-connection.

The green LED, indicates the state of the calibration.

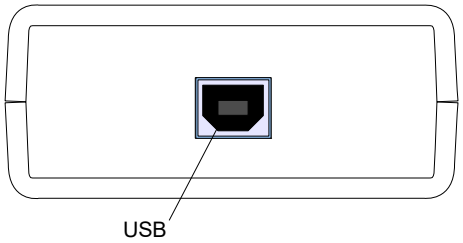
In normal operation mode the yellow LED indicates the sensing of an IR-dot. When the Vmarker sensor is in calibration mode, the yellow LED indicates which corner has to be identified.

The following table summarizes the possible states of the LEDs and the meaning.

RED LED	GREEN LED	YELLOW LED	
off	X	X	No connection to the computer or computer is switched off.
blinking	X	X	Connected to the computer, but USB is not yet configured.
on	-	-	Connected to the computer, USB is running.
on	off	X	The sensor is not calibrated.
on	1x blinking	X	The Vmarker sensor is in calibration mode, the first corner, top-left of the projected image must be identified with an IR pen.
on	2x blinking	X	The Vmarker sensor is in calibration mode, the second corner, top-right has to be identified.
on	3x blinking	X	The Vmarker sensor is in calibration mode, the third corner, bottom-right has to be identified.
on	4x blinking	X	The Vmarker sensor is in calibration mode, the fourth corner, bottom-left has to be identified.
on	on	off	The Vmarker sensor is calibrated
on	on	on	The Vmarker sensor is calibrated, and detects an IR-dot
blinking	blinking	blinking	The Vmarker sensor is in firmware update modus.

2.1.2 The back-side of the Vmarker sensor

On the back-side of the Vmarker sensor is an USB port type B.



With a standard USB A-B cable you can connect the Vmarker sensor with a standard USB port on you computer. Note that the maximum length of 5m must not be exceeded.

If you want to use longer cable, you have to use an USB active extension cable.

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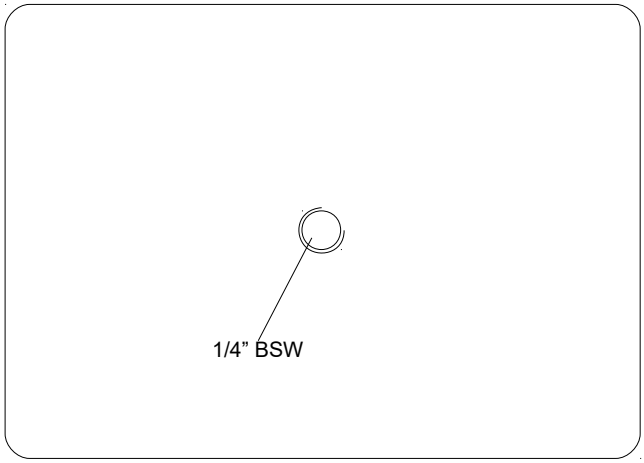
2.1.3 The bottom-side of the Vmarker sensor

The bottom of the Vmarker sensor has a threaded hole. The common thread is 1 / 4 "BSW this is used for camera mounts.

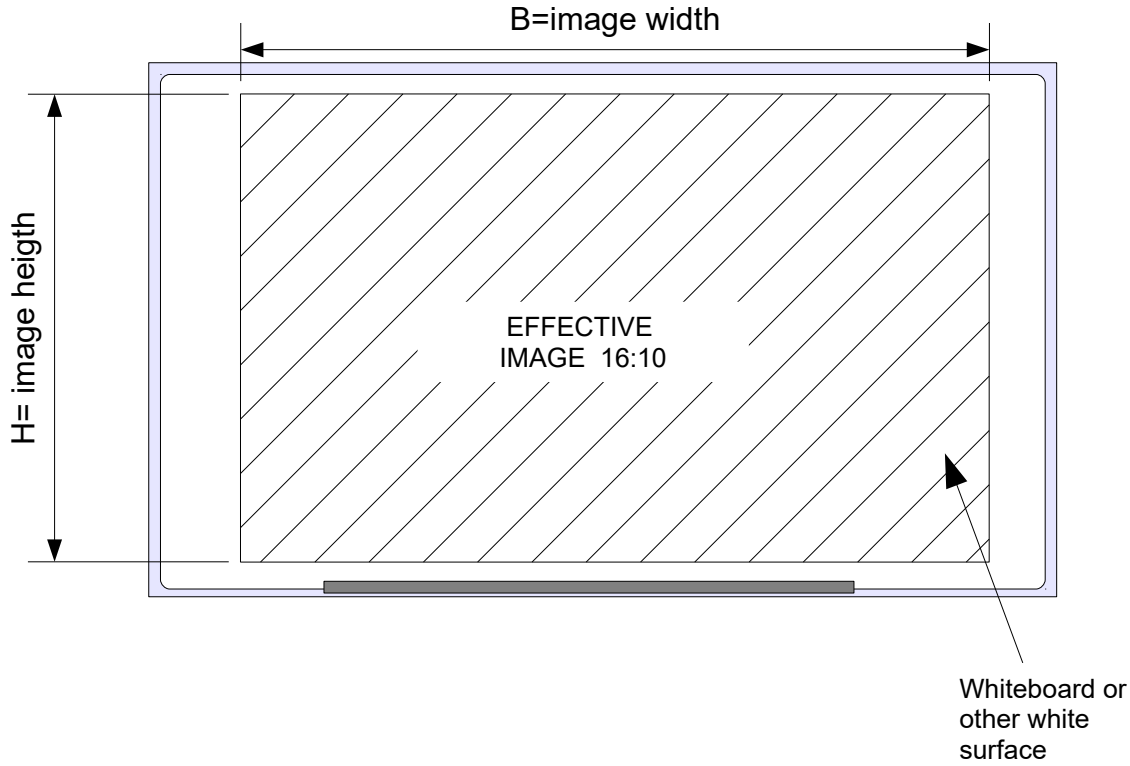


2.2 Arrangement of the Vmarker sensor

> ⚠ ATTENTION: make use of the correct tools and follow the appropriate safety guidelines when installing the Vmarker sensor to the ceiling.

The arrangement of the Vmarker sensor depends on the position of the projected image. Nevertheless we want to give you some recommendations.

A good aspect ratio of a projector is 16:10 (1280x800). Given the accessibility of the screen for an average person, with such projector the effective image is about 1.92 meter wide and 1.2 meters high.



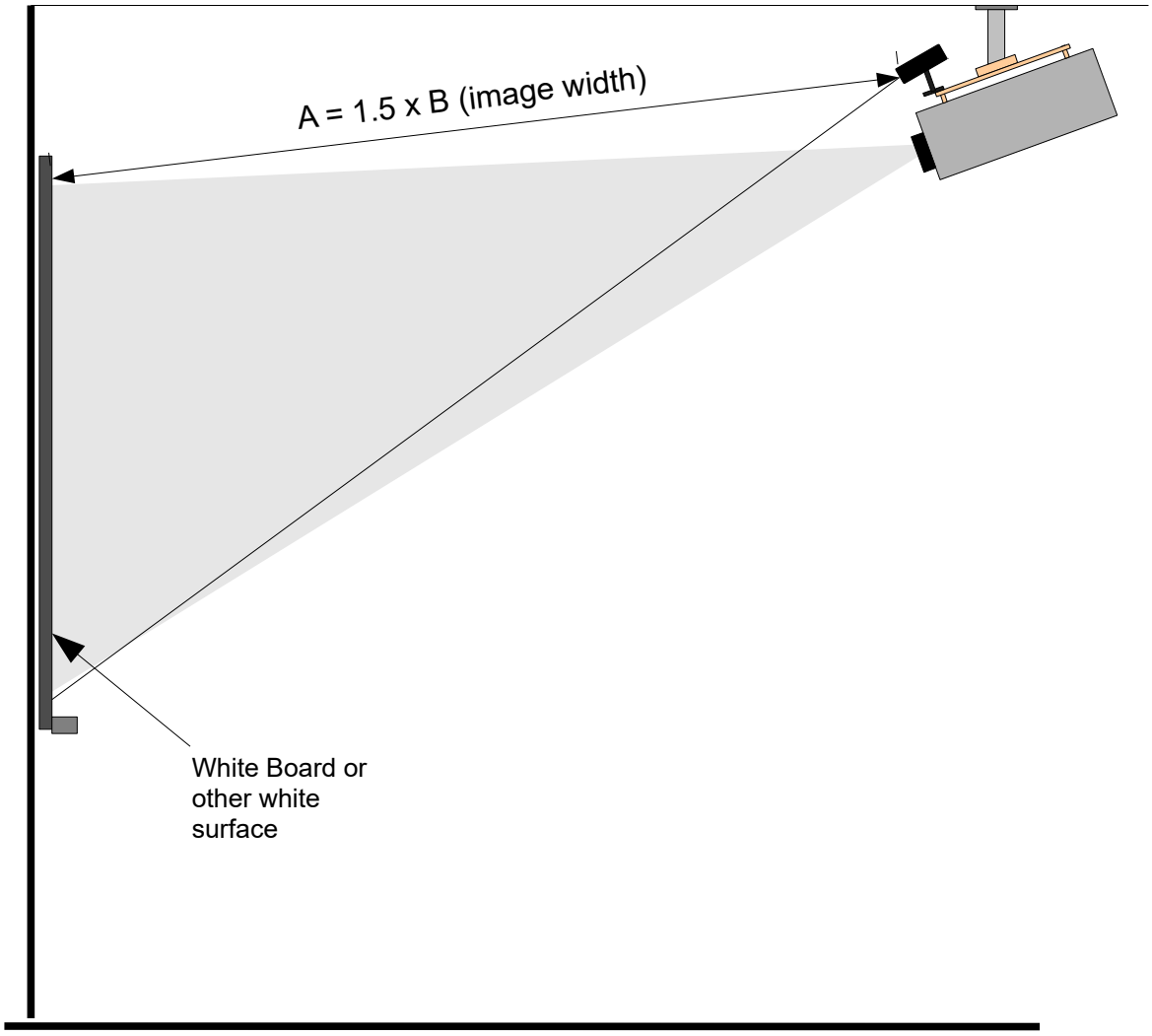
The optimal distance (A) from the Vmarker sensor to the image is approximately 1.5 times the width (B) of the image.

Attention also read 2.2.6.About the projection surface and 2.2.7.Environment You will find some important information that affects the setup of the Vmarker sensor.

2.2.1 Setup of the Vmarker sensor when using a ceiling mount

You get the best results with the Vmarker sensor by mounting the Vmarker sensor to the ceiling like the projector itself. In most cases the Vmarker sensor will be positioned between the projection screen and the projector, just outside the projector beam. This depends on the type of projector.

The shortest distance (A) between the projection screen and the Vmarker sensor has to be 1.5 times the width of the projected image (B).



These values are guidelines for the optimal conditions, the settings of the Vmarker sensor are optimized for this setup.

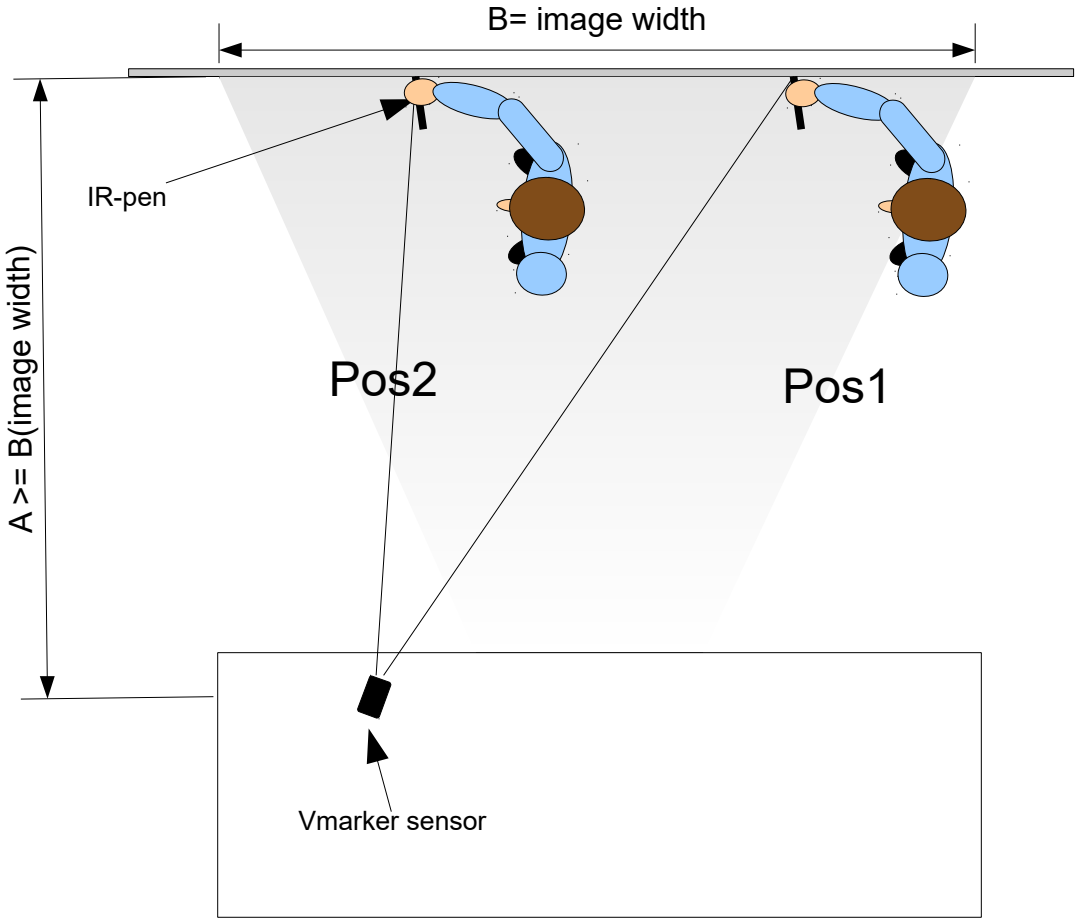
On the '**Settings**' page of the VmarkerUtility you can observe the coordinates of the IR-pen in the section '**Sensor status**'. When you move the IR-pen across the projected screen you should always get values for Object X-position, Object Y-position and Object size. If this is not the case you have to re-align the Vmarker sensor. Particular the corners of the image are important to be able to calibrate the Vmarker sensor.

With help of the **Sensor alignment** in VmarkerUtility you can easily align the Vmarker sensor in most circumstances.

2.2.2 Setup of the Vmarker sensor using a tripod

The guidelines for the Vmarker sensor setup with a tripod are similar to the ceiling mount. You just have to adapt to the situation, mostly the tripod is standing on a table.

The choice of the location of the Vmarker sensor is important to be able to use the IR-pen more comfortably. Important is that the Vmarker sensor is able to 'see' the IR-LED while writing.

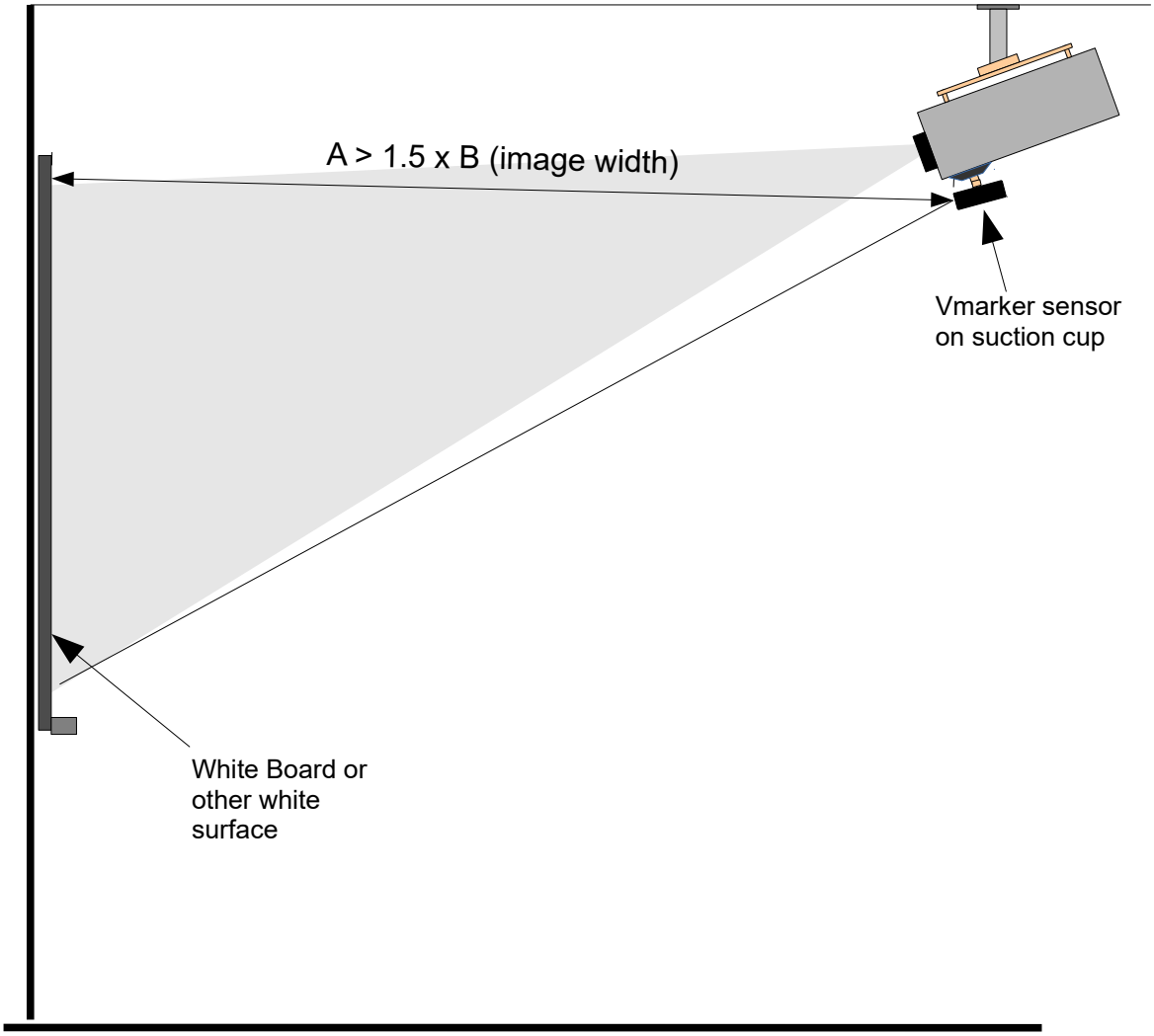


In stead of placing the sensor in the middle of the projected image, you can move the sensor either to the left or to the right side of the center. The left side if you are right handed, the right side if you are left-handed.

2.2.3 Setup of the Vmarker sensor using a special suction cup

It is also possible to stick it to the projector using a special suction cup. This is very easy, but not every projector is suited.

The projector has to have a smooth surface where you can stick the suction cup on. Also the projection distance of the projector is more important, a short-throw projector is not suited.



Like in the other configurations the distance(A) between the projection screen and the Vmarker sensor has to be at least 1.5 times the width of the projected image (B). In this arrangement this means the projector is also at this distance.

2.2.4 Setup of the Vmarker sensor in a “rear projection” configuration

With rear-projection, the projector is positioned behind the screen. The projected image is visible through the screen. In such an arrangement the Vmarker sensor can also be positioned behind the screen.
This is because the IR light from the IR pen, like the light from the projection, also shines through the screen.
The disadvantage of such an arrangement is that you need extra space behind the screen. This may be reduced by using mirrors, etc.

2.2.5 Other setups

Basically, the Vmarker sensor works almost from any angle. You have to ensure that the projected image is within range of the Vmarker sensor.

The use of extreme angle is possible but is strongly depending on the projection surface that is used. Also the angle of the IR-pen to the surface will have a greater influence.

In such case one can change a few settings of the Vmarker sensor to optimize to this situation.

When using extreme angles also take into account that the accuracy will be reduced.
Ideally, you should try to use the entire range of the sensor that has a ratio of 1:1. You can see the usage of the sensor after calibration on the Calibration page in the VmarkerUtility.

2.2.6 About the projection surface

It is possible to use the Vmarker sensor on many different projection surfaces. Every surface that reflects the IR-light of the IR-pen can be used. But of course some are better then other.

Contrary to what one would expect, highly reflective surfaces are not the best choice. A matte white surface is basically better than a glossy white surface. The reflection on a glossy surface is very high and the angle of the IR pen to the surface is more important. A wrong angle of the IR-pen is missed by the Vmarker sensor. Therefore, a more matte surface, in which case the reflection is diffuse, is better. The angle of the pen to the plane becomes less important.

One of the best surfaces to use for your IWB would be a wall, simply painted in white.

2.2.7 Environment

The Vmarker sensor responds to infrared light. Avoid any other source of infra-red light in the range of the Vmarker sensor. The largest source of infra-red light is the sun. Direct sunlight or reflection of sunlight directly into the Vmarker sensor or on the projected image, will affect correct functioning of the Vmarker sensor. It is even possible that the mouse-cursor moves seemingly randomly.
Other sources of far infra-red light in their spectrum can also be disruptive. In such case, much depends on the situation.

2.3 How to connect the Vmarker sensor

After you've setup the Vmarker sensor, connect the Vmarker with the included USB cable to an available USB port on your computer. The computer will initialize the USB-communication. During this time the red LED on the front of the Vmarker sensor will blink.

The first time you connect a Vmarker sensor to the computer it may take a while before the computer selected the necessary drivers. This all happens automatically, the operating system itself will choose the appropriate standard drivers, so you do not need to install these.

When the USB-communication is initialized the red LED will be lit continuously.

Be sure to use an USB 2.0 active extension-cable when extending the USB-cable. The maximum length of a normal USB-cable is 5 meters.

2.4 Calibration of the Vmarker sensor

The Vmarker sensor has to know the exact position of the projected image to be able to control the mouse pointer of the computer with the IR-pen. So the sensor has to be calibrated. In normal use you only have to calibrate once.

Once calibrated you only need to re-calibrate when the position or orientation of the vmarker sensor towards the projected image is changed or when the size of the projected image is changed.

The calibration is stored in de sensor so even when you change the computer you do not have to calibrate.

2.5 Pairing of the Vmarker pen II

When Vmarker Sensor II and Vmarker pen II are purchased together they are paired, meaning the Vmarker sensor will only react to that particular Vmarker pen on a particular radio Channel.

With help of the VmarkerUtility software it is possible to change channel or to connect an other Vmarker pen II to the Vmarker sensor II. Only one Vmarker pen II can be paired to the Vmarker sensor II at a time.

3 VmarkerUtility software

3.1 General

Once the Vmarker sensor is setup you do not need the VmarkerUtility to be able to use the Vmarker IWB solution.

The VmarkerUtility is used to help choose the best position to set up the Vmarker sensor, to change some settings and to calibrate the sensor. After using the program you can close this. Eventually you have to save the settings to the Vmarker sensor after you changed something.

3.2 VmarkerUtility: installation

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3.2.1 Windows

You can download the windows version of the program from the website at:
http://www.vmarker.org/VmarkerUtilityWin.zip

When you have downloaded the program, unzip the files in a folder. Then run the program by double click *VmarkerUtility*.

The program will not install, it runs directly. So removing the folder with the program, removes the program completely.

3.2.2 Linux

You can download the linux version of the program from the website at:
http://www.vmarker.org/VmarkerUtilityLinux.zip

When you have downloaded the program, unzip the files in a folder.

The first time you want to run the VmarkerUtility you will have to install some UdevRules to ensure the VmarkerUtility has access to the Vmarker sensor. This can be done by executing: *installUdevRules.sh* in a terminal window.

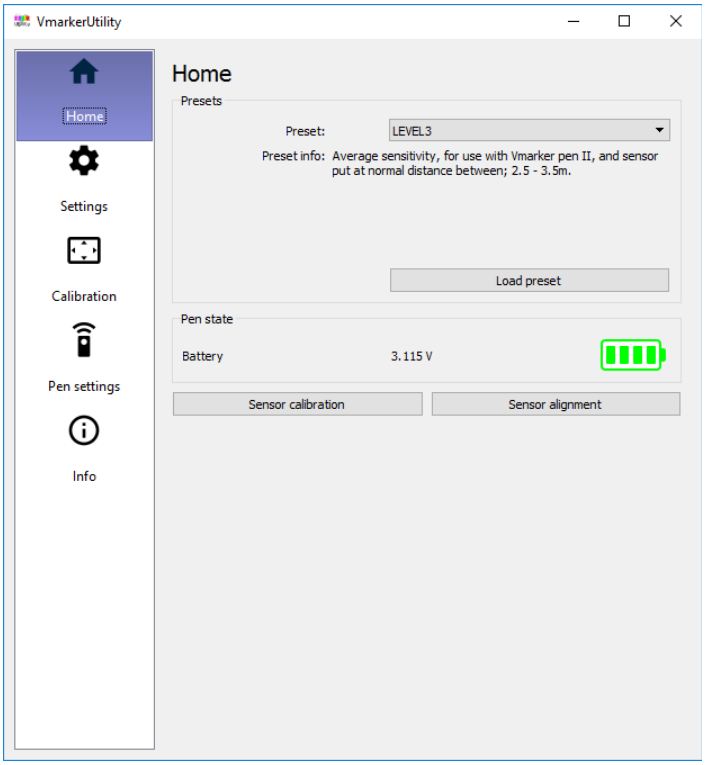
After this you can run the VmarkerUtility by executing *startUtility.sh*.

The program will not install, it runs directly. So removing the folder with the program, removes the program completely.

3.3 VmarkerUtility general

When you start the VmarkerUtility the applications starts on the ‘Home’-tab

You can change tabs by the toolbar on the left-hand-side.



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3.3.1 VmarkerUtility: Home

On the Home-tab of the application you can find all you need for daily usage.

3.3.1.1 Presets

With presets you can determin the sensitivity of the Vmarker sensor. The’re 8 levels of sensitivity pre-programmed. Standard LEVEL3 is selected. You can select a different level where LEVEL0 is the preset with lowest sensitivity and LEVEL7 is the highest. When you have chosen a particular preset you have to activate it with the ‘load preset’ button.

On Preset info you can some indication of when this preset could be used. This is only an indication.

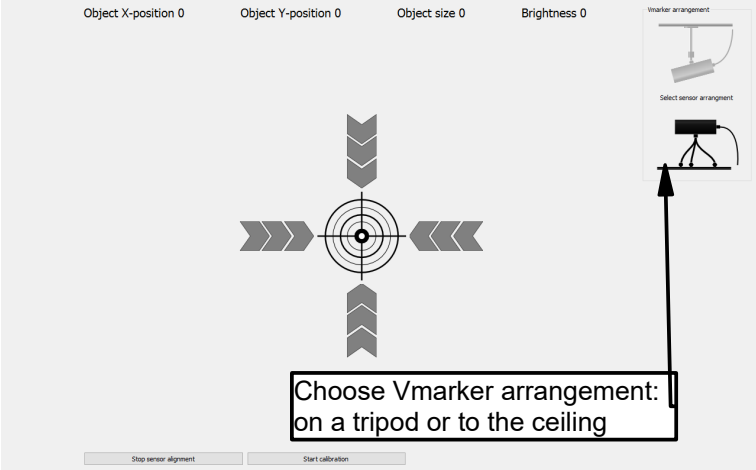
It is still possible to tweak the sensor settings on the Settings-page. When the settings on the Settings page do not correspond with any of the 8 presets, the preset-selection is blanked.

3.3.1.2 Pen state

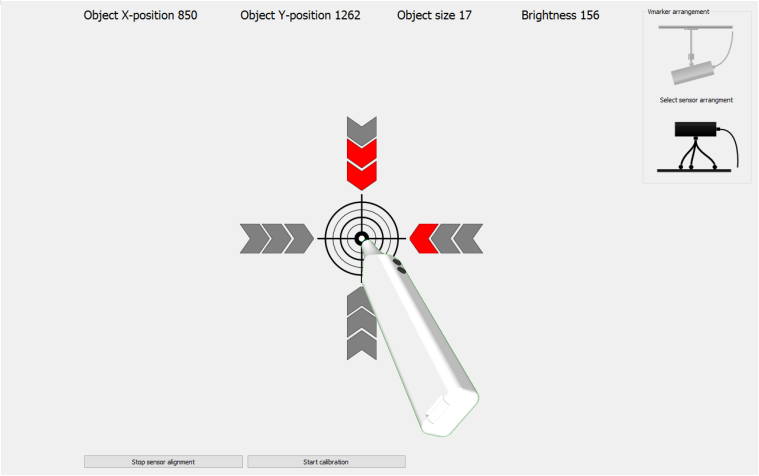
Under *Pen state* you get an indication of the battery condition of the Vmarker pen II. You can read the battery voltage in volts and you get a graphic indication whether the battery is good or bad.

3.3.1.3 Sensor alignment

Pressing the 'Sensor alignment' button will bring up the Sensor alignment screen. This window fills the screen completely.



First you have to choose the Vmarker sensor arrangement. By default the orientation on a tripod is selected. If the Vmarker sensor is mounted up-side-down choose the corresponding drawing.

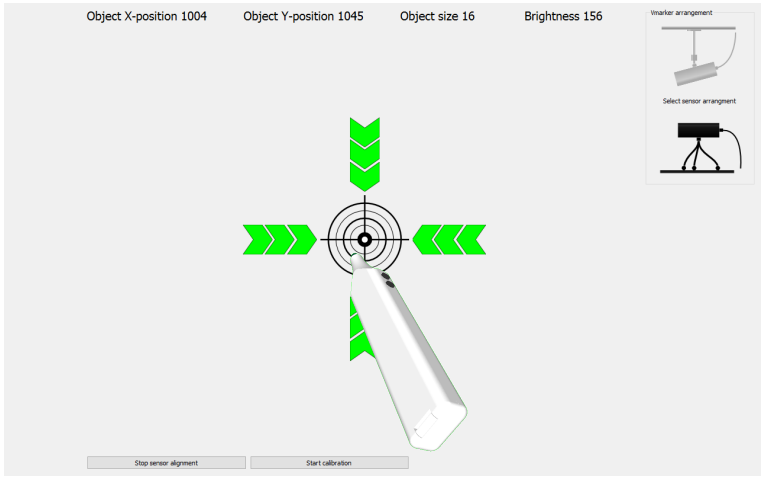


When the appropriate arrangement is chosen. You have to point the center-mark with an IR-pen. When you press the tip or the button of the IR-pen, the arrows at the center-mark will change color in according to the deviation of the Vmarker sensor.

You will have to turn the Vmarker sensor in the direction of the red arrows. The number of arrows corresponds with the magnitude of the deviation.

After you have turned the Vmarker sensor you will have to point the center-mark again. Again you can check the deviation When the deviation is within limits the corresponding arrows will color green.

The middle of the sensor is now aligned to the middle of the screen.



The correct alignment of the Vmarker sensor is no guarantee to be able to calibrate the Vmarker sensor. To ensure calibration of the Vmarker sensor is possible, all four corners of the projected image have to be within range of the Vmarker sensor. It is possible to check this by pointing an IR-pen at the corners of the projection and to check the coordinates.

If one of the corners is not visible you can turn the Vmarker sensor so the corner becomes visible. When it is not possible to turn the Vmarker sensor to get all corners within range, the distance of the Vmarker sensor to the image has to be increased.

If the Vmarker sensor is placed out of center, like suggested in 2.2.2, it is possible the alignment tool will not help you to find the best arrangement of the Vmarker sensor. You always can check the coordinates to see if the complete projection is within range of the Vmarker sensor.

3.3.1.4 Sensor calibration

You can press ‘Sensor calibration’ from the sensor alignment screen, from the Home or from the Calibration tab of the application.

Like with the sensor alignment a special Sensor calibration screen is shown. This screen overlays the computer screen completely, making it easy to calibrate the Vmarker sensor correctly.

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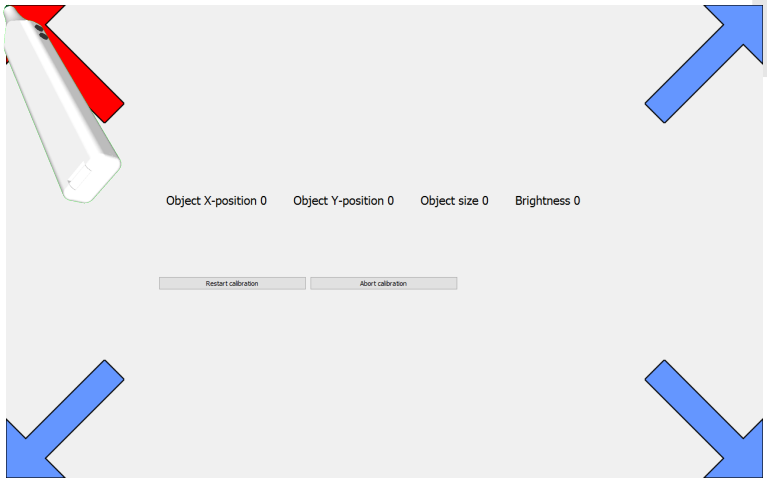
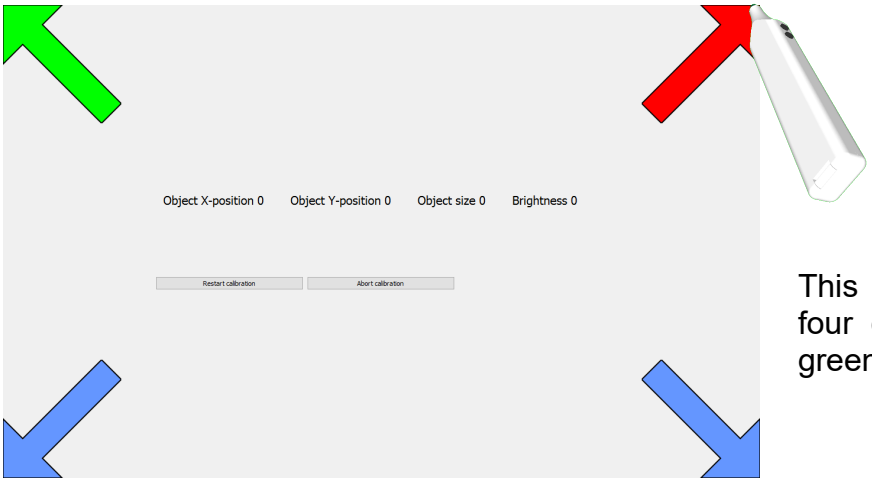
The red-arrow indicates which point to calibrate.

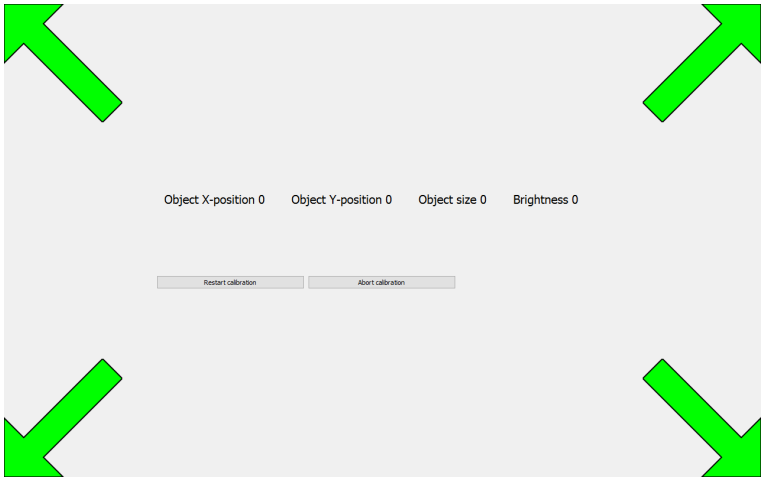
Point the IR-pen to the point of this arrow and press the tip or the button for about 1 second. If the Vmarker sensor has captured the point. The arrow will color green and the next corner will have a red arrow.





This has to be repeated for the four corners until all arrows are green.

When all four corners are calibrated, all arrows are coloured green and shortly after the application will return to the application window.



During the calibration process it is possible to restart the calibration to start from the beginning by pressing 'Restart calibration'.

Only when the calibration process is completed the new calibration data will be written to the Vmarker sensor.

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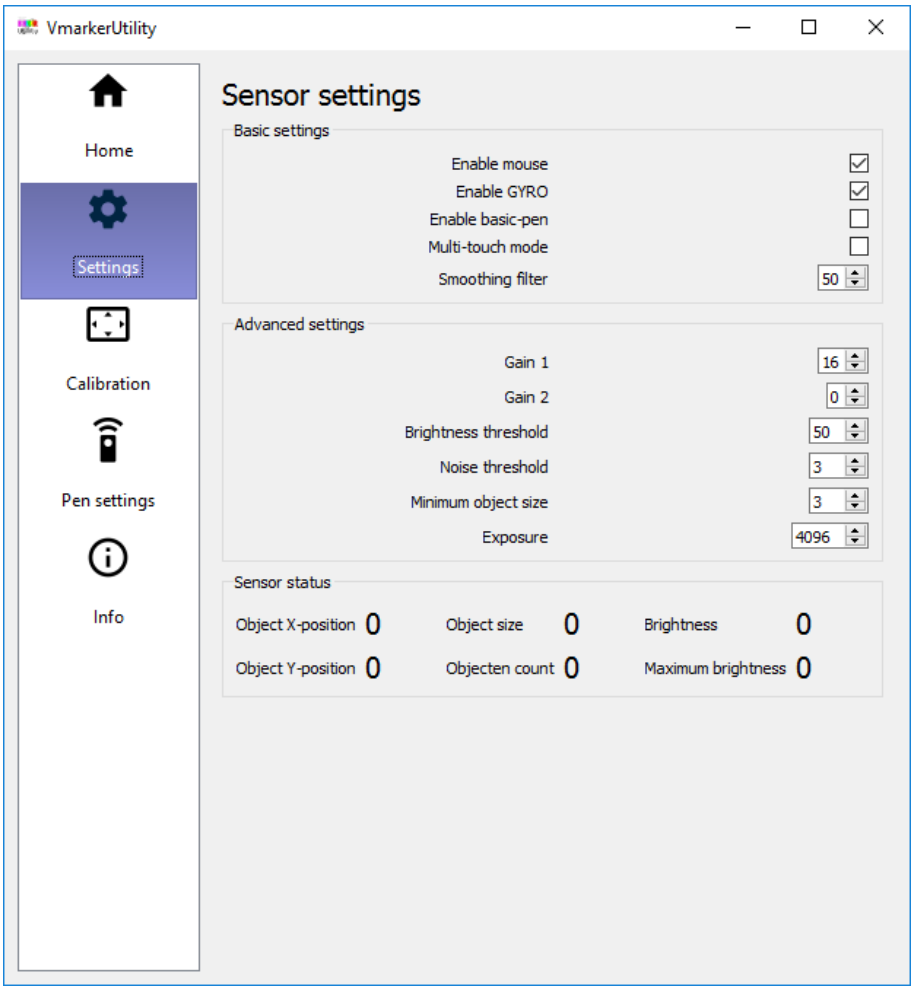
3.3.2 VmarkerUtility: Settings

In the Setting tab it is possible to change some settings of the Vmarker sensor II.



3.3.2.1 Basic settings

In the Basic settings section there are several settings which influence the behaviour of the Vmarker Interactive Whiteboard:

Enable mouse: Unchecking this check-box disables the mouse function. When unchecked, the Vmarker sensor will ignore IR-dots on the projection surface. However when IR-dots are detected the coordinates are shown. You can disable the mouse when you want to test and optimise some settings without actually control the computer with the IR-pen.

Enable GYRO: Unchecking this check-box disables the mouse control from a distance. When unchecked, the Vmarker sensor will ignore any movement (GYRO) from the Vmarker pen II. When enabled it is possible to move the cursor from a distance, also read: 4.1.3.2.How to use the Vmarker pen from a distance

Enable basic pen: When enabled also regular IR-pens are recognised. Standard this is unchecked to ensure the Vmarker sensor II only react to Vmarker pen II, interfering of other IR-sources is suppressed.
To be able to use non-Vmarker IR-pens, this option has to be unchecked.

Multi-touch mode: With Multi-touch mode checked it is possible to use multiple pens simultaneously, given the software and the OS support this. Currently only Windows 7 and higher support multi touch. .
Since the Vmarker sensor II only can be connected to 1 vmarker pen II you have to check 'Enable basic pen' to and use multiple regular IR-pens

Smoothing filter: With the smoothing filter it is possible to smooth out the drawing movement. Smoothing will delay drawing. The highest value gives the smoothest result but also the biggest delay.
The default value is 50.

3.3.2.2 Advanced settings

Gain 1: With the gain settings you can amplify the sensor-image. Values between 0-16 are valid. 'The greater the values, the more it will see'. The standard value is 16.

Gain 2: Like Gain 1 with this settings you can amplify the sensor-image. Values between 0-3 are valid. 'The greater the values, the more it will see'. Normally this value is 0. (TOTAL GAIN = GAIN1 x GAIN2)

Brightness threshold: With this setting you can adjust the threshold-level of the brightness, pixels above this level are validaded. When you have a weak IR-dot you should decrease the value and thus lowering the threshold level to have more valid pixels. When you have a good and clear IR-dot increase this value, to filter out weaker IR-sources.
The standard value is 50.

Noise threshold: With this setting it is possible to determine the threshold-level for the pixel brightness to be dark. Pixels darker then brightness threshold – noise threshold are dark pixels and will be ignored.
The standard value is 3

Minimum object size: With Minimum object size you set the minimum size (pixels) of object to be valid, objects with lesser pixels then this setting will be ignored.
The standard value is 3.
Attention objects larger then 50 will be ignored.

Exposure: With Exposure time it is possible to set the exposure time of the sensor. With increasing this value the sensor is more sensitive: more pixels are brighter and are validated as object to take into account..

Beware these settings all influence each-other, it can be difficult to find an optimal combination. Before changing these values write down the initial values. After optimizing these values you should recalibrate the Vmarker with these settings as it also influences positioning.

3.3.2.3 Sensor status

In the section *Sensor status* you can read the **object X-position** and **object Y-position** of the first detected object. **Object size** shows the size of the detected IR-dot.

Object count how many IR-dots are detected.

Brightness shows the average pixel brightness of the detected object.

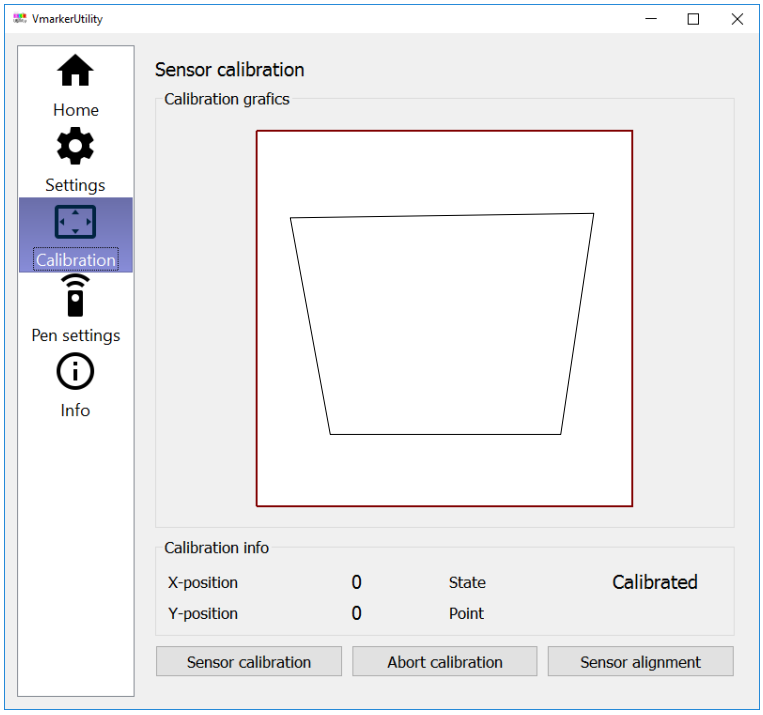
Maximum brightness shows the maximum pixel brightness of the detected object.

When changing settings you get the best performance when the Object size of the detected IR-dot is around 15.

The brightness should be less then about 150. The maximum brightness less then 255.

3.3.3 VmarkerUtility: Calibration

The Calibration-tab shows the result of the calibration in a graphical manner.

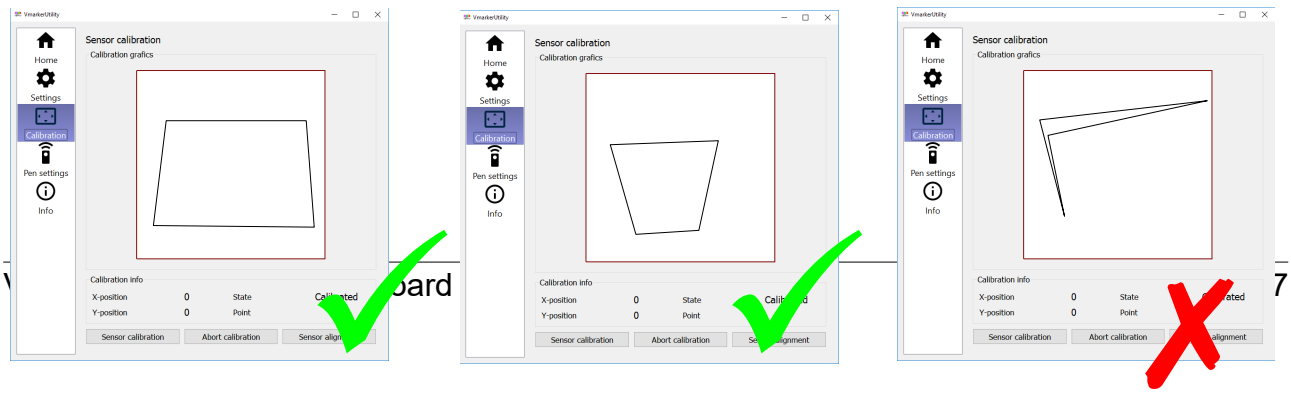


3.3.3.1 Calibration graphics

The section Calibration graphics shows the current calibration in a quadrilateral figure.

The exact form is determined by the position of the sensor.

Some example how it can look like:



The first, most left, could be the result after calibration of a Vmarker sensor placed on a table. The second could be a ceiling mounted Vmarker sensor, somewhat further away, but acceptable.

With the third sensor there is something wrong with the calibration. The sensor obviously has to be recalibrated. Check if the sensor is configured correctly, check for interfering IR-sources?

The calibration data is persistently stored in the Vmarker sensor itself. So even when the Vmarker sensor is disconnected and has no power, the calibration information is kept. Only when the position of the Vmarker sensor towards the projected image is changed a recalibration is required.

Even when you connect a different computer to the Vmarker sensor and the projector a calibration is not required, given the size, aspect ratio and position of the projected image stays the same.

3.3.3.2 Calibration info

You can see the some info, the state shows if the sensor calibrated.

If for some reason the calibration screen is disappeard but the calibration process is still running then you can see this here. The state ‘Calibration running’ shows the calibration is still active. Point shows witch corner to point to.

With ‘Abort calibration you can stop the calibration process and return to the last calibration data.

3.3.3.3 Sensor calibration

Starts the calibration see 3.3.1.4.Sensor calibration

3.3.3.4 Abort calibration

With Abort calibration it is possible to abort the calibration process.

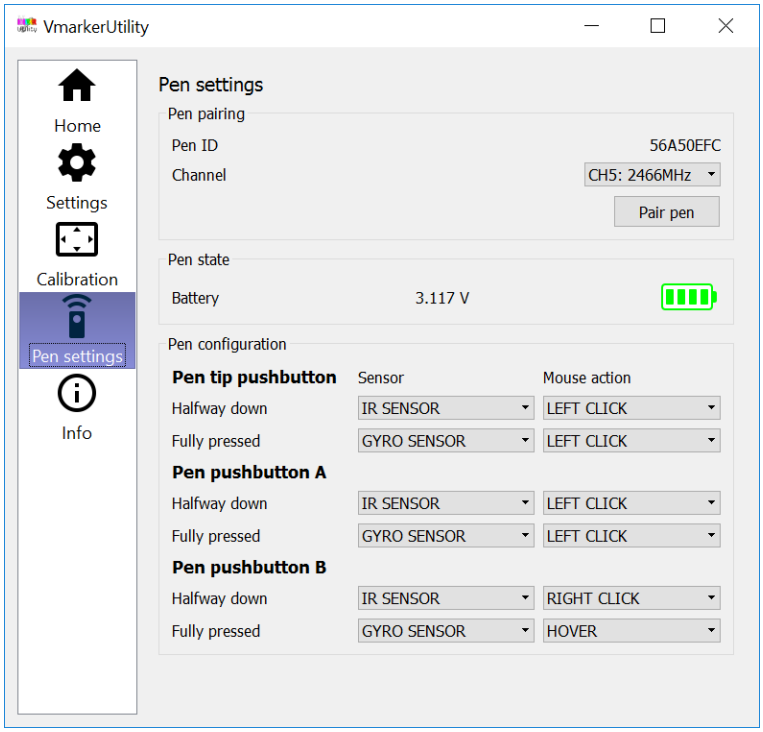
The previous calibration data will stay active.

3.3.3.5 Sensor alignment

Tool to setup the vmarker sensor before calibration. See 3.3.1.3.Sensor alignment for detailed information

3.3.4 VmarkerUtility: Pen settings

On the Pen settings tab you can configure the behaviour of the Vmarker pen II.



3.3.4.1 Pen pairing

In the section ‘Pen pairing’ you can find information about the Vmarker pen II which is connected to the sensor.

Pen ID, shows the unique id of the Vmarker pen II which is connected. The Vmarker sensor II only will react to this Vmarker pen II.

Channel shows the selected channel which is used to connect the Vmarker II pen. You can select a different Channel if you suspect the channel is already used by neighbour Vmarker sensors.

With the ‘Pair pen’ button you can connect a Vmarker pen II to the sensor. After the pressing the button, the sensor listens for about 30 seconds for a Vmarker pen II. On the Vmarker pen II you have to press both button A and B fully and hold. When the sensor has found the Vmarker pen it stops searching and the pen is set to the same channel. You should get an update on the battery info. From now the Vmarker sensor II will respond to the Vmark pen II.

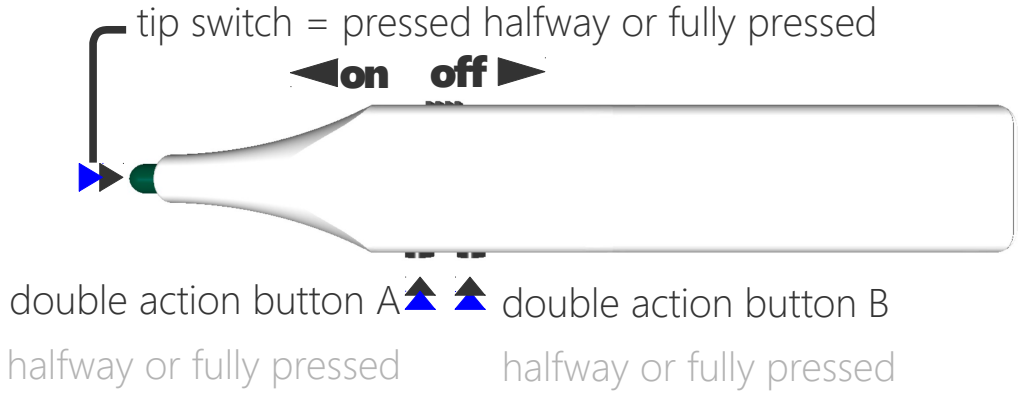
3.3.4.2 Pen state

Here you can see the battery information.

3.3.4.3 Pen configuration

In this section you can select the behaviour of the pen.

Besides the on/off switch the pen has 3 push buttons. Each button has to positions; halfway and fully pressed.



It is possible to use the Vmarker sensor II and Vmarker pen II combination in two different ways:

1. By means of IR light, the pen emits IR-light through the tip this is reflected to a surface (whiteboard) when nearby (<1cm). The IR camera of the sensor 'sees' the IR-dot and calculates the position the cursor has to be. (Sensor= IR SENSOR)
2. By means of GYRO/acceleration sensor in the pen. The movement of the pen is translated to movement of the cursor. (Sensor= GYRO SENSOR)

On the computer this can result in 3 different mouse behaviours:

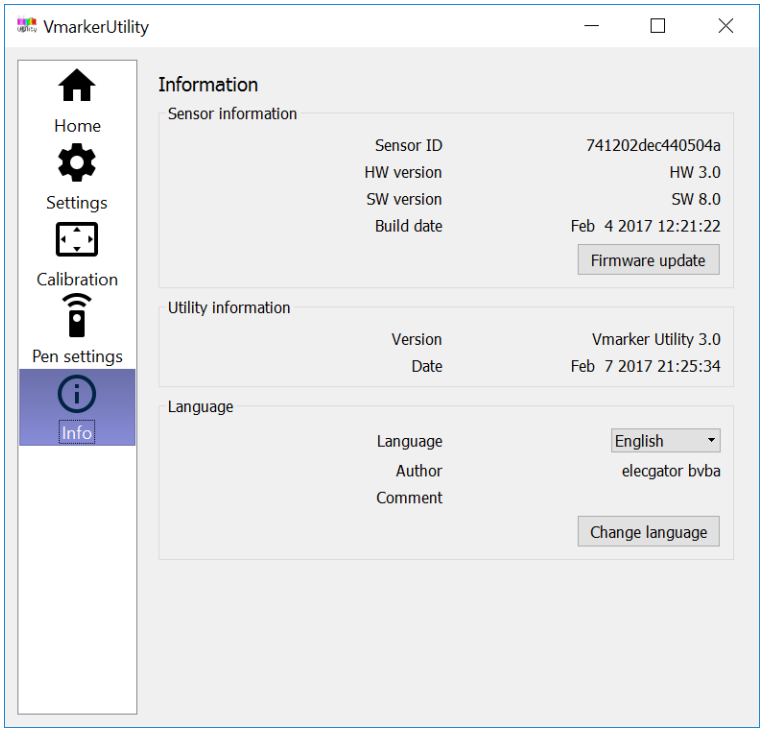
1. Left-mouse-click while moving. (Mouse action = LEFT CLICK)
2. Right-mouse-click while moving. (Mouse action = RIGHT CLICK)
3. no-mouse click while moving. (Mouse action = HOVER)

So for the each switch position you can select which sensor mode to use and link it with a particular mouse action.

The standard settings are:

	Sensor mode	Mouse action
Tip button halfway pressed	IR SENSOR	LEFT CLICK
Tip button fully pressed	IR SENSOR	LEFT CLICK
Button A halfway pressed	IR SENSOR	LEFT CLICK
Button A fully pressed	GYRO SENSOR	LEFT CLICK
Button B halfway pressed	IR SENSOR	RIGHT CLICK
Button B fully pressed	GYRO SENSOR	HOVER

3.3.5 VmarkerUtility: Info



3.3.5.1 Sensor information

In the section 'Sensor information' :

Sensor ID: the unique ID of the sensor.

HW version: the hardware version of the Vmarker IR-Sensor USB. HW 3.0 is the most current version.

SW version: the firmware version of the Vmarker sensor. Check this before you deside to upgrade the firmware of the Vmarker sensor. The latest firmware version is available from the website.

Build date: The build date of the firmware.

With the ‘Firmware update’ button you can upload new firmware when available.

3.3.5.2 Utility information

Version: the version of Vmarker Utility. The current version for the Vmarker sensor II is 3.0.

Date: The build date of the utility.

3.3.5.3 Language

Here you can select a different Language. Select the desired language en press the change Language to activate the selected language.

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4 Vmarker pen

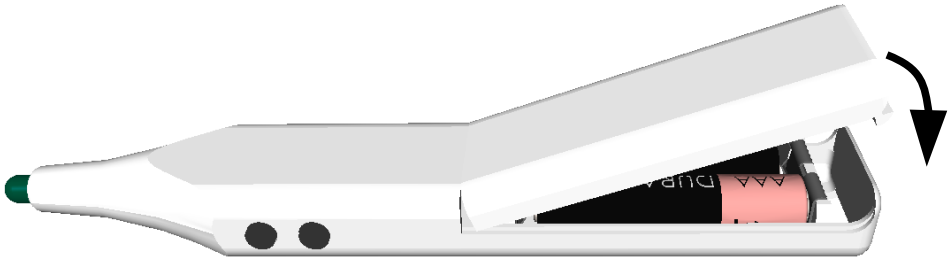
To get the most out of the Vmarker Interactive Whiteboard solution special IR-pens are developed. The Vmarker IR-pens all have extra logic embedded making it possible to have extra functionality.

4.1 General information

The Vmarker pen requires 2 AAA batteries. It is possible to use rechargeable batteries.

4.2 How to place the batteries

The Vmarker pen holds 2 AAA batteries. Place the batteries as indicated inside the battery compartment.

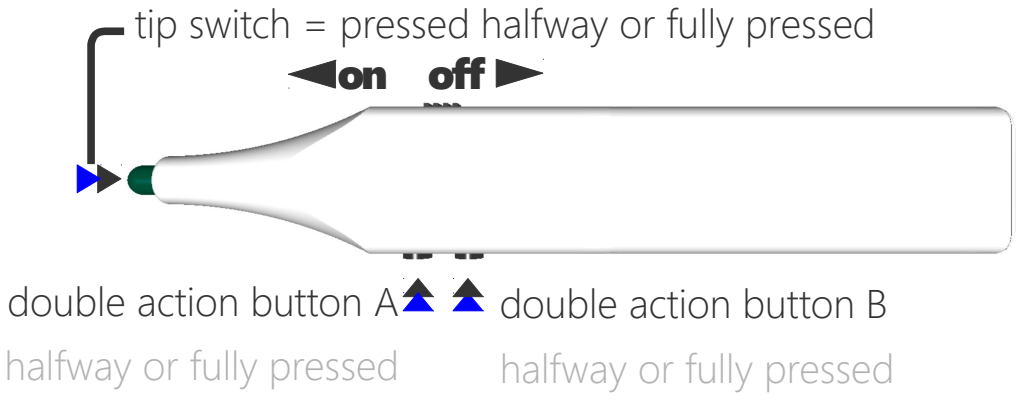


And close the battery compartment like shown in the picture.

4.3 Vmarker pen: operation

The new Vmarker pen has a power switch, 2 **double action push buttons** on the side, and a **double action** tip.

The Vmarker pen is switched on by sliding the power switch to the tip of the pen. By sliding the switch to the back, the pen is switched off.



The tip and the push-buttons have two positions when pushing them. If you press the button/tip until the first resistance, you activate the primary action. If you press beyond that first resistance the secondary action is activated.

By default the following actions are set for the different button actions:

For the tip switch: the primary action and the secondary action both use the IR-sensor to position the cursor and generate a left-mouse-click.

The double action button A pressed halfway, uses the IR-sensor to position the cursor and generates a left-mouse-click. When fully pressed the Gyro-sensor is used to position the cursor and also a left-mouse-click is generated.

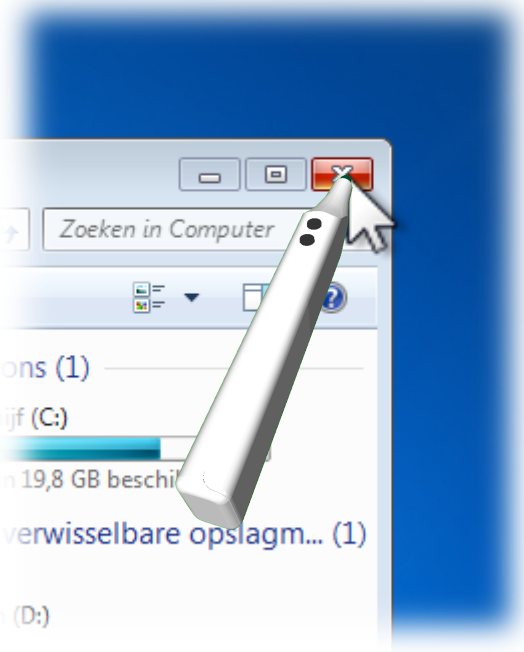
When pressing the double action button B halfway the IR-sensor is used to position the cursor now it generates a right-mouse-click. When fully pressed the Gyro-sensor is used to position the cursor and the cursor hovers without lef or right-mouse-click.

It is possible to choose which sensor to use and which mouse action to generate for each of the different button actions.

4.3.1 How to use the Vmarker pen on the whiteboard surface

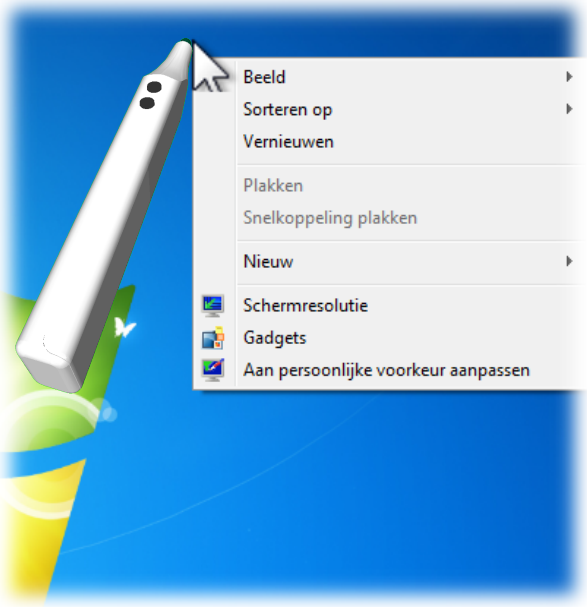
To be able to interact with the projected computers screen on the whiteboard accurately it is important to calibrate the Vmarker sensor.

When the default pen settings are used. Use of the Vmarker pen on the whiteboard surface is very easy. You can interact with the computer by touching the whiteboard surface with the tip of the Vmarker pen. You will see the mouse cursor jumping to the tip of the Vmarker pen and a left-click action will be executed on that location.



You can do the same with use of the buttons on the side of the Vmarker pen. In case you use the buttons you do not have to touch the surface.

When you want to perform a left-click just press the push-button most near to the tip. Push until to the first resistance to have the primary action.
The mouse-cursor will jump to the tip of the Vmarker pen and a lef-click action will be executed at that location.



When you press the second button (until the first resistance to have the primary action), the mouse-cursor will jump to the tip of the Vmarker pen. Releasing the button will show the right-click-menu just like with the right-mouse-button.

Of course it is possible to move the pen over the surface while holding the buttons, to drag and drop or to draw a line...

4.3.2 How to use the Vmarker pen from a distance

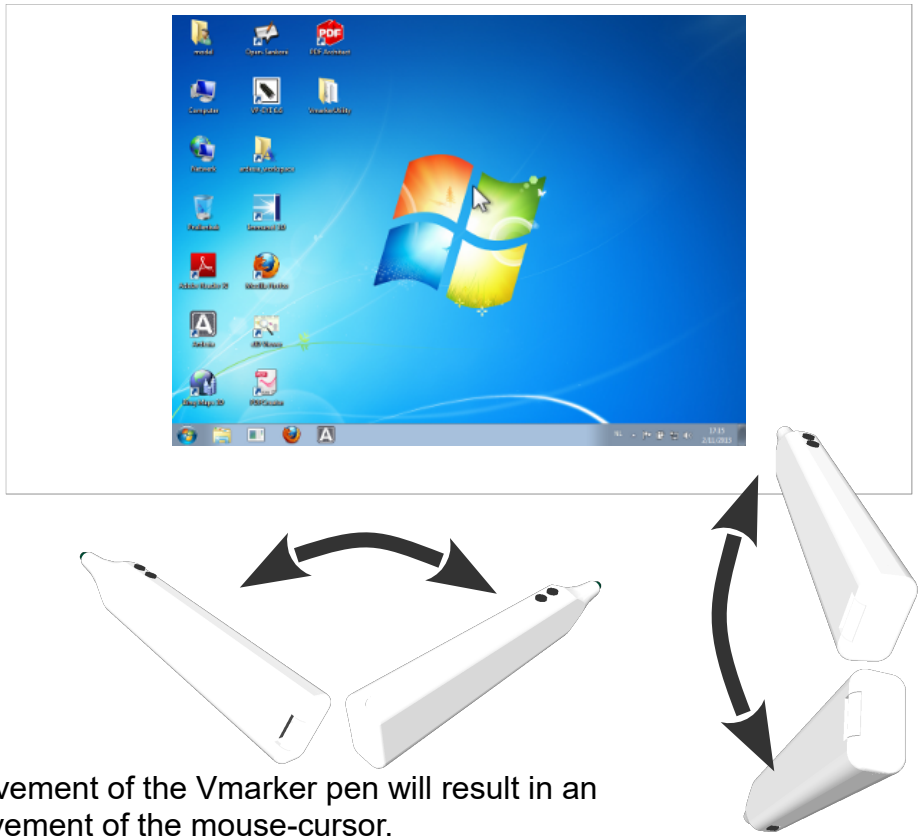
It is possible to use the Vmarker pen from a distance, not in the direct line-of-sight of the Vmarker sensor by using the GYRO SENSOR of the Vmarker pen II.

You can activate these sensor by using the button accordanly the configuration. With the standard settings the GYRO sensor is used when fully pressing button A or button B.

Standard fully pressing button A correspond to left-mouse-click while moving.

Fully pressing button B corresponds with movement of the mouse without any mouse action: hover:

When activating the gyro, the mouse cursor on the screen will 'follow' the movement of the Vmarker pen.



Horizontal movement of the Vmarker pen will result in an horizontal movement of the mouse-cursor.

Vertical movement of the Vmarker pen will result in a vertical movement of the mouse-cursor.

5 Trouble shooting

5.1 No connection with the computer

5.1.1 The red LED of the Vmarker sensor is not lit

Possible causes are:

- The computer is off
- The USB cable is not plugged into the computer or Vmarker, check the connections
- The USB cable is defective, try an other USB-cable
- The used USB extension-cable is defective, test the Vmarker sensor without the extension cable
- The USB-port from the computer is defective, test with another USB-port, or another computer

5.1.2 The red LED of the Vmarker sensor keeps blinking

Normally the red LED will be lit continuously, the first time you connect the Vmarker its possible it takes longer. After some time the LED has to be lit continuously.

Possible causes when it keeps blinking are:

- The computer hasn't installed the correct driver yet. Although the Vmarker uses the standard driver it is possible the OS tries to download an updated driver from the internet. Depending on the speed of the internet-connection this may take a while. At the end the standard driver will be installed.
- The computer is not fully booted, wait until the computer is started, or restart the computer if necessary.
- The computer has some problems with the USB-communication, a conflict with a driver, USB is not properly installed. Test the Vmarker sensor with a different computer to exclude a defect of the Vmarker sensor itself.
- The OS does not support a USB-mouse. The Vmarker IR-sensor USB is tested on Windows XP, Windows 7, Windows Vista, Linux Ubuntu 32 and 64bit,... Please report other working or failing OS-es to us.
- The USB-cable is defective, test the Vmarker sensor with an other USB-cable.
- The used USB extension cable is defective or is not properly installed. Test the Vmarker sensor without extension-cable.

5.2 The calibration process of the Vmarker sensor fails

When the calibration of the Vmarker sensor fails, or is very hard to complete successfully, there may be several reasons:

5.2.1 The Vmarker sensor still has old firmware

De Vmarker sensor continuously is being improved. Also the calibration process is possibly improved in a later firmware version. You can download the latest firmware version of the Vmarker sensor from the website: http://www.vmarker.org.

5.2.2 A particular corner is not accepted and gives problems

Possible causes are:

- Be sure there is nothing between the IR-LED of the IR-pen and the Vmarker sensor,
- Not all corners of the projected image are within the range of the Vmarker sensor, you can check this with use of the VmarkerUtility software.
- The angle of the IR-pen to the projection surface is not good, try to adjust the angle of the IR-pen to the surface. This can be a problem when a high gloss projection surface is used.
- The IR-dot is larger then 50, increase the distance of the Vmarker sensor towards the projected image. (You can check size with the VmarkerUtility software.)
- The IR-pen is not working properly see also 5.5
- You can make the sensor more sensitive by selecting a preset with a higher number.

5.2.3 The calibration process seems to skip points

When calibrating, points are skipped. Or the Vmarker sensor seams to calibrate it self without using the IR-pen. This causes the calibration to fail.

Possible causes are:

- Besure you only press the button or the tip of the IR-pen only to mark the corner.
- There is another IR-source in the range of the Vmarker sensor, see 5.4
- The Vmarker sensor still has old firmware, see 5.2.1
- You can make the sensor less sensitive selecting a preset with a lower number.

5.3 The Vmarker sensor does not response to the IR-pen

The Vmarker sensor does not or not always response to the IR-pen. If you do not find a cause you can use the VmarkerUtility program to check the proper function of the IR-pen. The 'Settings' let you view the coordinates and the size of the IR-dot:

Possible causes are:

- The Vmarker sensor is not connected, the red LED is off or blinks, see 5.1
- The IR-pen does not work properly, see 5.5
- The mouse function of the Vmarker sensor is switched off. The Vmarker sensor II has a setting to enable/disable the mouse function. This can be manipulated with the VmarkerUtility software.
- The Vmarker sensor is not yet calibrated or is in calibration mode. The green LED is blinking. Calibrate the Vmarker sensor first.
- The Vmarker is not sensitive enough for this situation. You can adjust Light conditions making the sensor more sensitive, selecting a preset with a higher numebr.

5.4 The Vmarker sensor interacts without using an IR-pen

Of course the Vmarker sensor should only react on the IR-pen. If the Vmarker sensor interacts without using an IR-pen, there probably is an other IR-source in the range of the Vmarker sensor. Be sure to remove every other possible IR-source out of the range of the Vmarker sensor. Possible causes are:

- There is sunlight on the projected image. Be sure there is no sunlight on the projected image, also not by reflection through a window of an other building..
- There is sunlight on the Vmarker sensor itself. Be sure there is not sunlight shining on the Vmarker sensor, also not by reflection..
- There is sunlight on objects that are visible in the range of the Vmarker sensor. Be sure there is no sunlight on objects in the range of the Vmarker sensor, or remove these objects.
- There is an other IR-source in the range of the Vmarker sensor, some lighting have a large part of infrared light in its spectrum. Switch of these light sources.
- The blinds preventing sunlight to shine on the projected image are insufficient. If you have to darken a window to prevent sunlight shining on the projected image be sure it is sufficient. Some blinds are not good enough. Not all windows have to be darkened, only the windows preventing the sun to shine on the projected image. Don't forget about the reflection of sunlight.
- The Vmarker is to sensitive for this situation. You can adjust Light conditions by selecting a preset with a lower number.

5.5 The IR-pen does not function properly

The Vmarker sensor II does not react to the IR-pen. It is possible the IR-pen does not function properly. Check if the Vmarker works with an other IR-pen if you have one. You can also check if the IR-LED of the IR-pen functions. You can check this by looking in the IR_LED when activating. You should see a fair red shine in the IR-LED. If not there are

several possible causes.

Possible causes are:

- The IR-pen is switched off.
- The Vmarker pen II is not paired to the Vmarker sensor II.
- The batteries are wrongly placed, check the polarity of the batteries.
- The batteries are empty, replace the batteries.
- The angle of the IR-pen to the projection surface is not good, try to adjust the angle of the IR-pen to the surface.
- Be sure there is nothing between the IR-LED of the IR-pen and the Vmarker sensor

6 Specifications

6.1 Vmarker sensor II (HW Version 3.0 from 1-1-2017)

- CPU: ARM Cortex M3 72Mhz, 128kB flash, 20kB RAM
- IR-sensor 850nm, dot-recognition up to 16 dots
- RF-tranceiver 2.4GHz 8 channel
- 3 LEDs indication
- Connection: USB 2.0 (USB-B port, 5V <125mA)

With firmware 8:

- output 2048x2048 @200 fps
- left click, right click
- multi touch support 4 points
- USB: absolute HID, relative HID and control HID

6.2 Vmarker pen II

- CPU: ARM Cortex M0+ 48Mhz, 64kB flash & 16 kB RAM
- Build in 3-axis acceleration-sensor, 3-axis magneto-sensor and a 3-axis Gyro
- 3 double action micro-switches. 2 on the side, 1 in the tip
- IR-LED (current controlled)
- RF-tranceiver 2.4GHz 8 channel
- Power: 2 x AAA-batteries(rechargeable)
- On/off switch

7 Safety instructions

7.1 GENERAL

This product is NOT a toy. Only to be used under adult supervision.

This product is meant to be used in an Interactive White Board Setup. Please read the manual completely before using this product.

You can download the operations manual from the website: http://www.vmarker.org.

7.2 MAINTENANCE:

Clean only with a dry cloth. Do not use cleaning solvents or abrasives.

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7.3 BATTERY PRECAUTIONS

⚠WARNING:

Leakage of battery fluid can cause personal injury as well as damage to your IR-pen. If battery leakage occurs, thoroughly wash the affected skin and clothes. Keep battery fluid away from your eyes and mouth. Leaking batteries may make popping sounds.

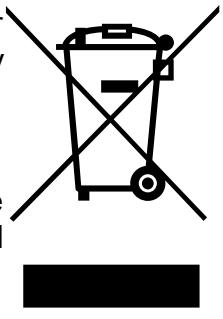
To avoid battery leakage:

- Do not mix used and new batteries (replace all batteries at the same time).
- Do not mix battery types and do not mix different brands of batteries.
- Do not leave batteries in the IR-pen for long periods of non-use.
- Do not recharge alkaline or non-rechargeable batteries.
- Do not put the batteries in backwards. Make sure that the positive (+) and negative (-) ends are facing in the correct directions. Insert the negative end first. When removing batteries, remove the positive end first.
- Do not use damaged, deformed or leaking batteries.
- Do not expose batteries to heat or dispose of batteries in a fire.

7.4 DISPOSAL

⚠ATTENTION:

At the end of this product's life, please do not dispose this product in your general household waste. Instead, please dispose the product separately in accordance with your local recycling laws and regulations.



Batteries have to be removed from the IR-pen before disposing the unit.

Discarding batteries in your general household waste can be harmful to the environment. When disposing the batteries, follow appropriate local guidelines and regulations.