

Ruukki® Roof Sensor

You know the roof will hold

Users Manual

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System overview

The Ruukki® Roof Sensor System is part of the Ruukki® Sensor Network concept monitoring the building envelope.

The purpose and aim of the Ruukki® Roof Sensor System is to measure and visualise the snow load on roofs constructed with Ruukki Load bearing sheets. The system provides valuable information for safety and management decisions concerning the building.

Because it is hard to estimate snow loads just by visual inspection, actual measurements are needed. As nothing else was previously available, someone had to climb on the roof and measure the snow load.

With the Ruukki® Roof Sensor System and appropriate information concerning the structural design and roofing materials, the snow load can be accurately measured without the need to climb on the roof. By comparing the measured snow load with the available weather information, it is also possible to estimate and put into place the actions needed to keep the situation under control.

By monitoring the roof with the Ruukki® Roof Sensor System, you prevent unnecessary service calls and roof inspections, the need to climb on the roof or remove snow unnecessarily, which may result in damage, further cost or even injury.

Operational cornerstones

THE SYSTEM HAS FOUR PREREQUISITES

1. In structural design, Ruukki's POIMU roof dimensioning program must be used
2. Ruukki's load bearing steel sheets must be correctly used (see www.ruukki.com)
3. Ruukki Roof Sensors must be correctly placed by the structural designer and appropriately fitted by the installer
4. The parameters must be appropriately defined in the Roof Sensor application, which is available via the POIMU software

If even one of these system prerequisites is missing or implemented carelessly, Ruukki cannot guarantee the operation or accuracy of the system. The usage of the system for other purposes has not been tested and the accuracy of operations thus cannot be guaranteed.

After installation, the Ruukki® Roof Sensor System and application are designed to give you extra peace in mind.

MORE INFORMATION ON THE SYSTEM

The Ruukki® Roof Sensor application works as a stand-alone system requiring few watts of electricity to operate. It can give local visual warnings without a web browser. More information can be received using a web browser via a Local Area Network (even without internet connections, separate contracts or monthly payments).

The simplest use of the system is based on warning lights placed in sensor points. The warning light, amber or red in colour, indicates the snow level on the roof.

The general status of the snow load, information from multiple measuring points and historical data can be viewed with most smartphones, tablets and desktop computers equipped with a modern browser capable of connecting to the Ruukki® Roof Sensor System. The application takes advantage of web-server technologies and provides a user interface via a web browser.

Thanks to the Ruukki® Roof Sensor application, the sensor measurements can be viewed, managed, tested and stored with the web browser interface. The measurement status is communicated in several ways and can be visualised for different users. The system stores historical data from the sensors, thus enabling sensor readings to be monitored over an extended period.

Information can be also redirected to other information systems by web technologies or most building automation systems by wire pairing it (open-closed switch circuit). This delivers information about warning situations (or enables the system to be tested).

For a larger roof area, several monitoring points can be designed, and several systems joined together with ease to form a larger area measuring network. The system can be further connected to other building automation systems and cloud-based status and backup systems if the necessary connections have been established to enable the Roof Sensor System to be used remotely.

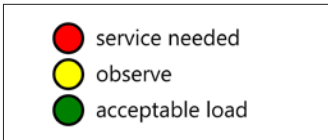
The Roof Sensor System is expandable to cover Bluetooth measuring sensors. The system is also part of the wider Sensor Network concept, designed to enable the building envelope to be monitored comprehensively to enable the investment in the building to be safeguarded. We welcome customers' feedback and monitoring and measurement requests at Ruukki.

Quick start guide

ROOF SNOW LOAD STATUS

There are visual light indicators at roof measuring points.

The Ruukki® Roof Sensor System provides information about snow load using the following coloured light indicators seen on the browser screen:



- Service needed: Red flashing light in the roof sensor (red traffic light in the Roof Sensor UI client display, additional BAS warning is switched on)
- Observe the situation: Amber rotating light in the roof sensor (amber traffic light in the Roof Sensor UI client display)
- Acceptable load: There is no visual light in the roof sensor (green traffic light in the Roof Sensor UI client display)

OBSERVE THE SITUATION – THE MEANING OF AMBER LIGHT

A slowly rotating and flashing amber light is shown on the roof when the snow load has reached the characteristic load level specified by the designer.

The situation is still safe and according the roof design, but snow should be removed from the roof if a severe snow fall is expected to continue for an extended period. Please inform the property's management company. You should also check the weather forecast for your area. Possible wire connections to building automation system will continue to be open and no warning messages are yet delivered.

SERVICE IS NEEDED – THE MEANING OF RED LIGHT

The red light is switched on when the snow load has reached 80% of the design value where the steel roof is reaching its limit of endurance. Further snowfall could cause permanent deformation of the roof and the situation could turn more serious and unsafe. Now it is time to remove the snow load from the roof!

Possible wire connections to building automation systems will be closed and warning messages are delivered.

HOW TO FIND INFORMATION AND CONNECT TO THE RUUKKI® ROOF SENSOR SYSTEM (LAN/WLAN)

1. From the available WLAN networks, select **RuukkiRoofSensor** (SSID)
2. If asked for a password, use **RuukkiRoofSensor** as a password
3. In your browser go to local address **ruukkiroofsensor/** (or **http://192.168.4.1**)

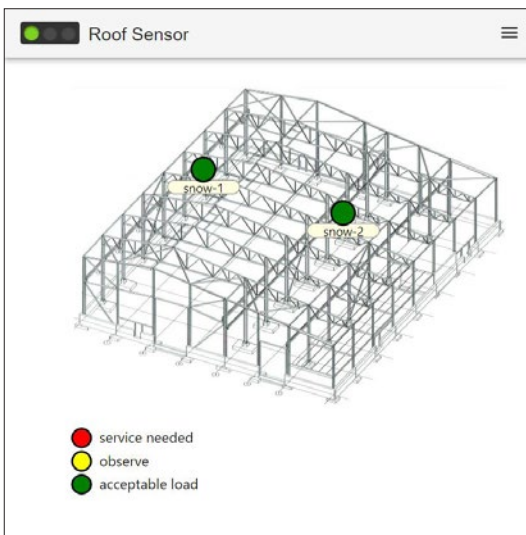
When arriving at <https://ruukkiroofsensor> (or <https://192.168.4.1>) to configure the Roof Sensor software settings, your browsers may give a warnings about an insecure access. However, it is safe to proceed.



Traffic lights on page header. In a small browser screens like mobile browsers other menu items are collapsed.

Traffic light replicates the highest load situation of any of the connected sensors. So even if just one of the many sensors the measurement is over pre-configured snow load level this traffic light replicates the snow load status. You can also navigate to Status page by clicking this traffic light.

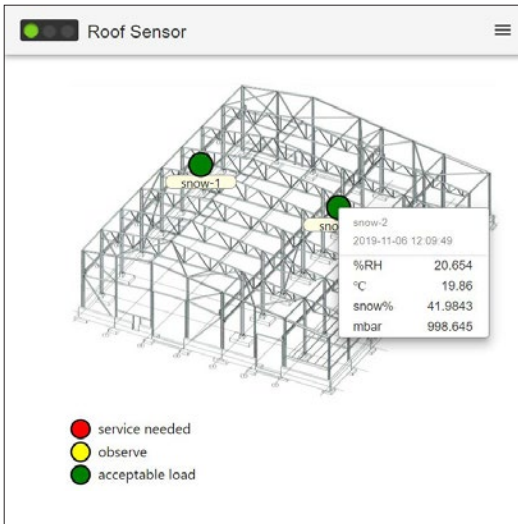
The status view gives more information about individual measuring points and their readings.



Example of user view: snow load sensor icons are round and numbered showing the status with green, yellow and red colors.

Other menu items are collapsed under selection icon in header. Color codes of snow load with explanation is seen under the background picture.

Background picture there is for reference of locating the sensors for user view to be more understandable. In this case a picture of supporting frame of building is used. Picture can be changed for example aerial picture of the building for understanding where sensors are located under the roof.



Getting the latest individual measurement numerically from main view is by clicking the individual sensor icon. You can hide the readings by clicking on background or another sensor. Possible rectangle icons at this main view are additional sensors like provided Bluetooth sensor (Ruuvi tag).

MENUS

From the menu, you can select Status, Chart, Overview and Configuration.



STATUS: Main view. You can get back on to main menu also just by clicking the "traffic light" in top header.



CHART: History data and trending – system for viewing and browsing of snow load and additional sensors data from database. Opens up in a new browser window.



OVERVIEW: Content of this document viewable from browser page



CONFIGURATION: Page for viewing sensor set sensor values. Provides access with password to setup and change background picture, sensor locations and sensor values for example.

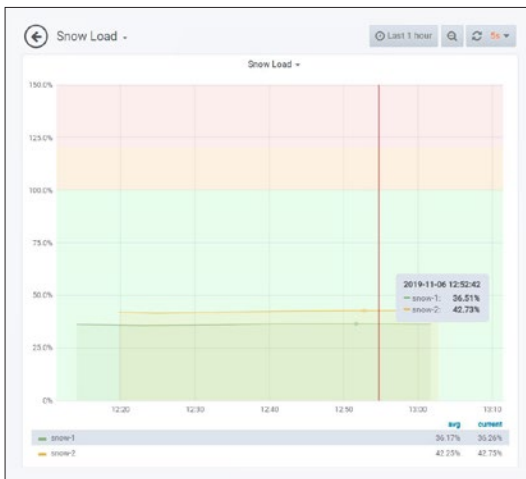
CHART



By clicking CHART icon it opens up in a new browser window (after 11/2019). Chart is showing a show load dashboard first.

You may adjust the timeline from top header items like 7 days view for example. If needed you can also isolate and select just one measurement view by clicking chart keys bellow (snow-1, snow-2,...) or adjust colors from key color icons. You may change the time period from top header and point and paint timeline for zooming and browsing in. If feeling lost in data you can select another dasboards from menu or just close the window getting back to Ruukki® Roof Sensor browser windows.

By clicking for example arrow in upper left corner beside "Snow Load" you can browse and view other sensor readings and available additional sensor dashboards or recently viewed dashboards. As example there is temperature, humidity and pressure sensor readings available from each snow load sensor location. Each dashboard from selection may be selected and viewed separately from Dashboard Title view. Editing is not permanent so feel safe to explore. In future updates you may save changes to visualization dasboards if logged in as administrator.



CONFIGURATION VIEW

Name	ε	Gauge Factor
snow-1	400	2.1
snow-2	400	2.1

Configuration menu.

You can have a knowledge of setup information also as a general viewer.

In order to manage software like configure and change various settings you need to use secured communication protocol HTTPS and a password. Changing sensor settings or calibration takes effect only if you comment about reason of the change. You may use this for short notes. Comments are saved with time stamp in database and they can be reviewed later on.

Software management

To install the software or make changes to the settings or user icons, you need to use a secured communication protocol HTTPS and password. Please note that different browsers may act differently and may give warnings about insecure access. It is however safe to proceed.

Possible software updates are also implemented here. Because the system works in Local Area Network, you probably need to download the update file on your browser ready for the update.

NOTE:

Change the password when the settings are changed for the first time. Please make note or memorize the new password so that you can manage and configure any changes. If you lose your password, it is lost likely forever. The system will continue to work, but you cannot make any changes without reinstalling the software.

You can only change the sensor configuration or calibrate the sensors if you record your reasons for wanting to make the change(s). The comment, and the date/time when it was made, is saved in the database and can be reviewed later. This feature can also be used to record other notes.

Additional measurements

The Ruukki® Roof Sensor System is enabling the Ruukki® Sensor Network concept, monitoring the building envelope and giving valuable information for the efficient use of the building and to enable the investment made in the building to be safeguarded.

For this there is in the box a Bluetooth measuring device (Ruuvi tag) that you can choose the monitoring target by yourself. By removing battery shield and tape the sensor in range will appear on the Ruukki® Roof sensor status page beside back-round image with a square icon.

Usage Example 1: Placing a tag on working level you can have information on specific working space temperature. You may compare floor level and roof level measurements. This gives your idea of vertical temperatures and air stratification on space.

Usage Example 2: Under monitored Ruukki roof you may have valuable assets or machines. You may have always wanted to monitor them with temperature, humidity or pressure. Now its easy. You may add similar tags as found one in the box from <https://shop.ruuvi.com/>

Additional measurements and their history data are added in dashboards for viewing (after 11/2019). If you have some monitoring and measurement needs of your building or using the building please feel encouraged to give feedback to Ruukki – we take your needs and ideas seriously.

We make steel-based products for walls and roofs, for both commercial buildings and private homes. We're a supplier of high-quality products, systems and solutions, developed sustainably and to live up to the highest demands on durability in harsh conditions.

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RUUKKI

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