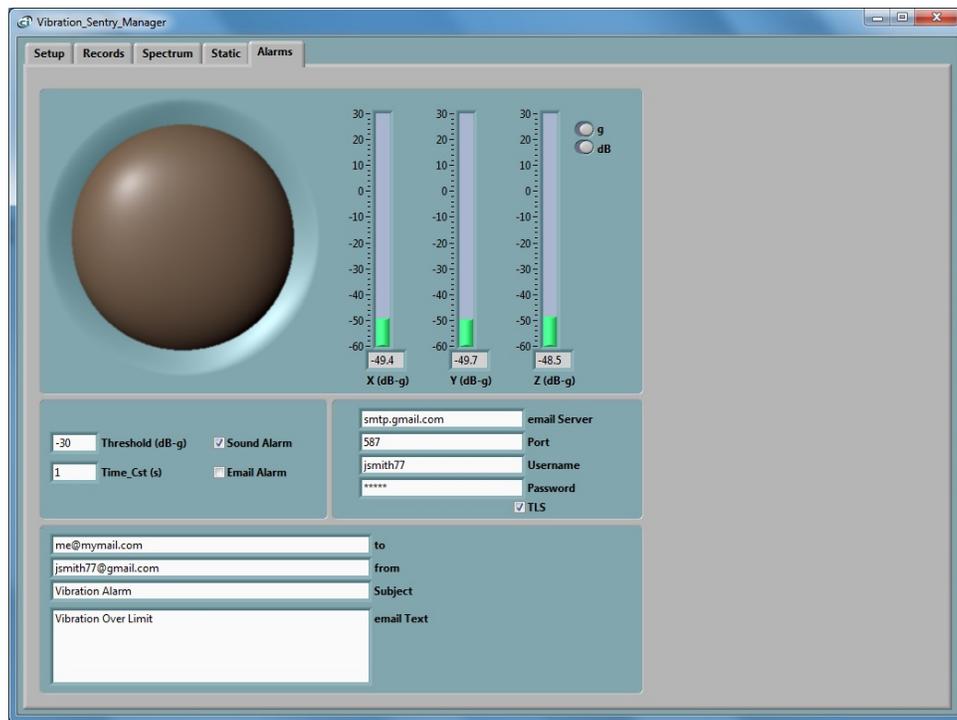




Convergence  
Instruments

# RT-Platforms

## Email Alarms



March 25 2014

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## 1 Introduction

The *RT-Platform Instruments (Vibration Sentry RT and Noise Sentry RT)* now have software that can detect alarms and even send alarm-emails to recipients. This application note explains the ins and outs of these alarm features and how to set them up.

## 2 PC-Connection and Monitoring Application

It is important to understand that these new alarm and email features are functions of the software managing the instrument, not of the instrument itself. So in order to work the instrument must be connected to a PC, and the PC must be running one of the applications offering these features. In order for the email to work, the PC must also be connected to the internet of course.

As of now there are three applications that offer alarm and email features:

- **Noise Sentry RT Manager** Used with *Noise Sentry RT*. It offers visual and email alarm when the sound level exceeds a preset threshold.
- **NSRT\_Big\_Display** Used with the *Noise Sentry RT*. It adds an email alarm to the visual alarm displayed when the sound level exceeds a preset threshold.
- **Vibration Sentry RT Manager** Used with the *Vibration Sentry RT*. It offers an audible, visual and email alarm when the RMS vibration level exceeds a preset threshold.

## 3 Alarm Triggers

On both the *Noise Sentry RT* and the *Vibration Sentry RT* the alarms are triggered when the instantaneous RMS level exceeds a preset threshold. The RMS level is obviously the value of choice for the *Noise Sentry RT* but for the *Vibration Sentry RT*, which can measure other parameters such as inclination or acceleration signal, it means that the alarm can only be triggered on a subset of what the instrument can measure. A further limitation for the *Vibration Sentry RT* is that the same threshold is used on all three axes.

The *Noise Sentry RT* can only measure RMS levels, so it does not need a special configuration in order to work with alarms. The *Vibration Sentry RT* however needs to be setup in the following way to work properly with alarms.

### 3.1 *Vibration Sentry RT* Configuration

The *Vibration Sentry RT* is very flexible in what it can measure. Therefore in order to work with alarms it needs the following settings:

- **High-Pass Filter** In order to properly measure RMS levels the high-pass filter needs to be set. Otherwise the DC component from the earth's gravity will bias the measured RMS levels. The cutoff can be chosen as a function of the sampling frequency and the bandwidth of interest (how much low frequency needs to be removed from the signals). A cutoff around 1 Hz is usually a good choice.
- **Sampling Frequency** The choice of sampling frequency is completely application-dependent. For ground-tremor applications, where alarms are often needed, it helps to choose a low sampling frequency in the 100 Hz range, because that lowers the instrument's noise.

- Time Constant**

The instrument's time constant is best adjusted at 100ms or longer. The application detects alarms by monitoring the instantaneous RMS level that the instrument measures. The application reads the instrument 10 times per second at the fastest, so if a time constant shorter than 100ms is chosen there is a risk of missing very short transients.



**Figure 1**

[Figure 1](#) shows a typical *Vibration Sentry RT* setup to work with alarms in the context of ground-tremors. Note the low sampling frequency, and the presence of the high-pass filter with a 1 Hz cutoff. The instrument's time-constant is set at 155 ms, which is long enough for even a short transient to not be missed. All other settings have no impact on the operation of alarms.

## 4 Alarm Types

There are three main types of alarms:

- Visual Alarms
- Auditory Alarms
- Email Alarms

Auditory alarms are not used in applications involving the *Noise Sentry RT* because it would feedback into the instrument. Also the whole point of using the instrument is usually to make sure the noise level stays low, and an audible alarm would be counter-productive.

All alarms except the visual alarm can be defeated. For instance [Figure 2](#) shows the alarm setup of the *Vibration Sentry RT Manager* application, where *Sound Alarm* is enabled, but *Email Alarm* is disabled.

## 5 Alarm Timing

The audible and visual alarms always last for a minimum of three seconds. If the alarm condition is maintained (RMS level is above the threshold) then both alarms will stay active.

In order to avoid filling-up a user's mailbox in case of a maintained alarm condition, the email alarms are only triggered when the alarm has been inactive for at least 1 minute. So when an RMS level exceeds the set threshold and is maintained, an initial email will be sent when the alarm first triggers. A new alarm will only be sent after the level falls back to the inactive level, is maintained for at least 1 minute and rises back up to above the threshold.

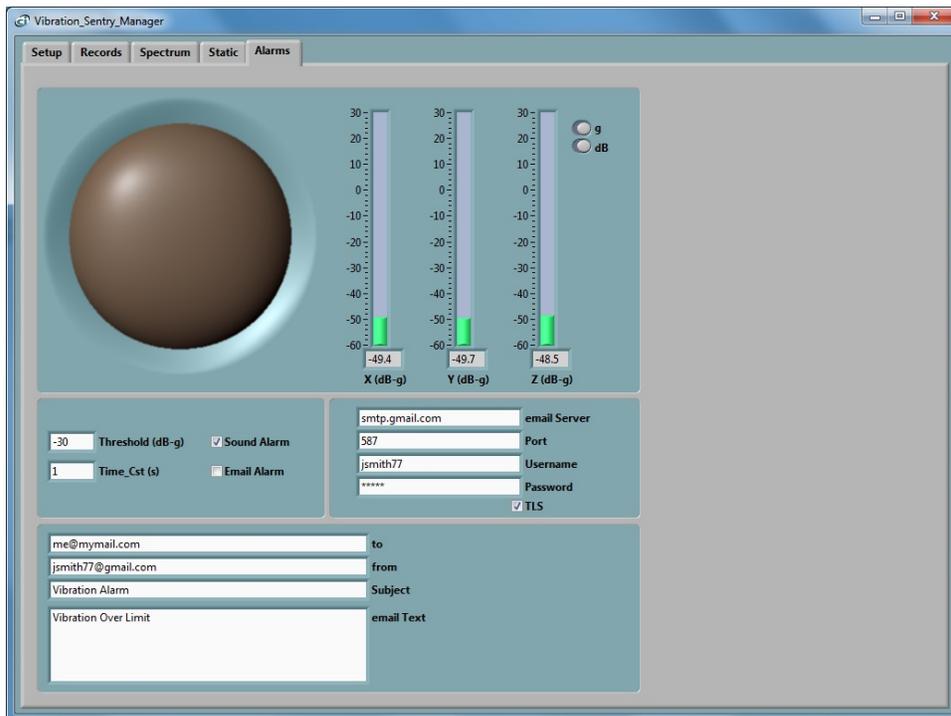


Figure 2

## 6 Time Constants

The alarms trigger only on the instantaneous value of the measured RMS level. However in some applications it is useful to filter-out short transients and only trigger when the RMS level is maintained above the threshold for some time. In order to do that, the *Time-Constant* of the alarm needs to be adjusted to a value adequate for the application.

It is worth noting that, contrary to the time constant that is adjusted as part of the instrument settings (see section 3.1), that "alarm time constant" is implemented at the level of the application, not at the level of the instrument. Therefore it does not affect the data that the instrument may be recording.

For instance Figure 2 shows a *Time\_Cst* of 1 second.

## 7 Email Setup

In order for email alarms to work, the PC that runs the application must of course be connected to the internet. It must be able to connect to an outgoing email server and account. That is usually the email account of your internet service provider, or an email service account, such as *Gmail*.

Emails are sent using the SMTP protocol. The email setup is not always easy. You should know and understand the settings that your outgoing email server requires.

The complete email setup is similar to the configuration of any email application. It includes the following:

- **Email server** The internet name of the outgoing email server.
- **Port number** The TCP port number of the email service. This is usually:
  - **25** for an “open” (no security) account.
  - **465** for SSL security
  - **587** for TLS security
- **User-name** The account name
- **Password** The account password (leave blank for an “open” (no security) account).
- **TLS** The security setting. This is the only secure mode supported. Uncheck for an “open” (no security) account.

In addition to these settings, the email alarms settings let you set:

- **One or Several Recipients** The recipient line (*to* line in Figure 2) can hold more than one recipient. Multiple recipient addresses must be separated by space, tab, return or semi-colon.
- **The sender’s address**
- **The subject line**
- **The email text** In addition to the text written in the *email-Text* box, the email text will contain the *User-Name* attributed to the instrument (if one has been set) and the time and date. This way if multiple instruments are being monitored, the user can determine which of those triggered the alarm by looking at the user name on the first line of the email.

The application by default shows the settings for a fictitious secure *Gmail* account (see Figure 2). These settings of course need to be changed to reflect the user’s own email account settings.

## 8 Sending Alarms While Recording

There is nothing that precludes the instrument from being recording and at the same time monitoring and sending alarms. This way, long after an alarm has been sent, the instrument’s data can be downloaded to determine how loud the event that triggered the alarm was.