

# TSI Link™ Correlation Analysis



Workbook Guide (US)

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## Overview

The Correlation Analysis workbook for TSI Link™ Report Creator analyzes relationships between measured environmental data and other quantitative parameters of interest. Environmental data measurements are imported directly from TSI® instruments. Quantitative parameters of interest can be any numerical measure that is manually entered into the worksheets.

The quantitative parameters generally fall into two classes.

1. **Independent Parameter that might impact one or more dependent environmental measurements.**  
Examples include:

Independent Parameter	Dependent Measurement(s)
Air Change Rate (ACH)	PM 2.5, CO <sub>2</sub> , VOC, ...
Number of occupants in a room	CO <sub>2</sub>
Outdoor ozone level	Indoor ozone level
Manufactured Product throughput	VOC, Formaldehyde, ...

2. **Dependent Parameter that might be impacted by the surrounding environment.** Examples include:

Independent Measurement(s)	Dependent Parameter
CO <sub>2</sub>	Student test scores
RH, Particle Count	Product defect rates
VOC, CO <sub>2</sub> , RH, Formaldehyde, ...	Number of occupant health complaints
Noise Level	Customer survey ratings

The worksheets in this workbook support correlation of both classes of parameters.

The correlation analysis tool can help you with a wide range of problem investigations and improvement programs. These worksheets substantially automate the correlation process helping to ensure accurate analysis and allowing you to focus on the analysis.

A correlation may offer a strong clue of causality. But keep in mind that sometimes another independent variable may be influencing both the environmental data and your measured parameter. They may then strongly correlate, but not have a causal relationship.

Check out the [Report Creator Product Page](#) for the full list of guides and videos including: setting up an account, installing the application, using the study manager, using the layout view, customizing report creator templates, etc. This guide builds upon those guides, it not duplicate all of the content.

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## Workbook Templates

The table below lists the worksheets available in the Correlation Analysis workbook.

Worksheet Template	Supported Measurements	Supported Instruments	Examples of Applications
<b>PM &amp; VOC Correlation</b>	VOC (ppb) PM 2.5 (ug/m <sup>3</sup> ) NC 0.3 – 0.5 um NC 0.5 – 1.0 um NC 1.0 – 2.5 um NC 2.5 – 4.0 um NC 4.0 – 10 um	OmniTrak™ Q-Trak™ XP	Comparing performance with different Air Quality conditions Measuring the impact of different manufacturing configurations on air quality.
<b>Configurable Report</b>	The Configurable Report workbook allows you to select up to 3 measurements in a study from a large list of more than 65. This configuration is made at the bottom of the Cover worksheet. See the Configurable Report section for more detail.	OmniTrak™ modules DustTrak™ Q-Trak™ XP Casella™ 620 AM520 A100	How noise or Air Quality varies with attendance. Impact of HVAC settings on noise and air quality.

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## Worksheet Operation

The worksheet templates in this workbook have a similar structure. This section outlines the basic operating steps for all of them.

### Step 1 Select a Worksheet

The Correlation Analysis Workbook is one of many that are available. An overview of the workbooks available is on the Report Creator product page. The overview of worksheets in the prior section provides guidance on the Correlation Analysis Worksheets.

## Selecting Configurable Report Name and Parameters

The worksheets discussed above import specific measurement data. But the TSI® instrument portfolio can generate a wide range of measurements. It would be impractical to create templates for all possible permutations. The *Configurable Report* provides a way for you to define a correlation analysis for any three measurements you like.

49	Custom Template Configuration		
50	Template Name	Test Scores vs Air Quality	
51			
52	Parameters		
53	Choice 1	PM2.5	
54	Choice 2	CO2	
55	Choice 3	Ozone	
56			

The configuration is performed at the bottom of

the *Cover sheet*. You can give the Configurable Report a unique name, if desired. Then select up to three measurements. In the example below, we select three sound level measurements to check performance of an acoustic barrier.

Save the workbook template and open **Report Creator**. You will see your name appear in the worksheet selection list.

## Step 2 Cover Sheet

This workbook contains a very simple Cover sheet that can be customized to suit your needs. See the *Customizing Report Creator Templates to learn how*. Other sheets can be added to your workbook, if desired.

The bottom of the Cover sheet includes a configuration tool for the **Configurable Report**. This report is discussed below. If the Cover sheet is deleted from the workbook, the Configurable Report will not be functional

## Step 3 Enter Demographic Information

After you have created a blank worksheet, you can enter whatever demographic information you want into your report header.

You can rename the studies if you want. The most important information to add is the quantitative variable you wish to analyze, the data in the second column of the table. In the example below, the user wishes to assess air quality impact as the air exchange rate is varied.

## Step 4 Import Study Data

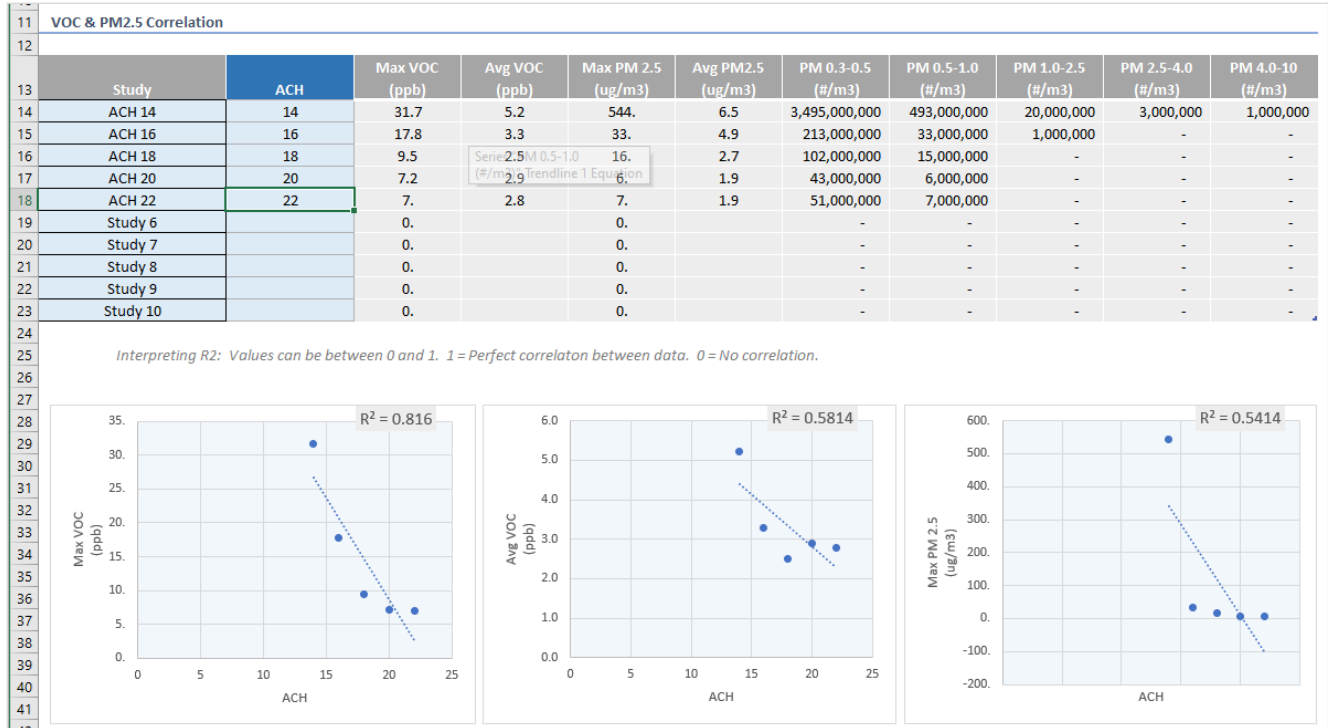
Import the environmental data using [Study Manager](#) or *File Import*. Make sure the study names match the labels you added above. Swap them if necessary. When ready, click **Add Data** to import data into the worksheet. When the device measurement data files are loaded – typically via the – a basic statistical summary table is populated. In the example, the maximum, average, and minimum values for PM number concentration are displayed. Many dependent external variables such as test scores or complaints would be manually entered or copied over.

## Step 5 Analyze Data

The **Test Results** section includes a data summary table that calculates the key statistics. A correlation chart is also created for each statistic.

In the example below, the user sees that air quality significantly improves as the ACH is increased to around 16. But beyond that, only marginal improvements are observed. The user might conclude that the optimal ACH balance for air quality and energy efficiency is 16. If additional IAQ improvement is required, another mitigation such as supplemental filtration may be the best approach.

[The Layout View](#) provides the ability to compare both studies spatially. Metrics can be shown on a photo, diagram, map, or any image. This may compliment a correlation analysis.



## Step 6 Complete the Assessment

To complete the report, you can add recommendations under the **Conclusions** section.

The print layout for this sheet does not include the measurement data in the blue tables at the bottom of the sheet. They will not appear in a PDF export either.



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