CAS DATALOGGERS

The Importance of Piano Humidity Control

Local Business Protects Heirloom Pianos

CAS DataLoggers provided the piano humidity control solution to Jim and Mary Kelly of Fur Elise Piano Service in Pawleys Island, SC. Fur Elise provides tuning, repair, and action regulation for all makes and models of pianos including heirloom Steinway, Knabe, Baldwin and Mason & Hamlin grand pianos. Jim has a Certificate in Piano Technology from North Bennet Street School in Boston, advanced training on Yamaha, Petrof, Nordiska pianos, and polyester finish repair training. Jim has tuned and worked on pianos owned by concert pianists, churches, schools, universities, symphonies, choruses and many residential clients. In 2011 he tuned a Steinway Concert Grand for an outdoor concert by 'Pianist to the Presidents,' David Osborne. Jim comments, "It is maintained like Air Force One and held up really well despite being under a tent and enduring a torrential downpour".

The Piano Vs Environmental Conditions

As a Certified Dampp-Chaser installer and member of the Palmetto Chapter of Piano Technicians Guild, Jim is using data loggers to monitor the temperature and humidity of pianos on the South Carolina coast. "As a professional piano technician I see first-hand the harmful effects that poor environmental conditions can have on an instrument.

Some of the finest pianos ever built in the U.S. are from the 1920's and when I visit I try to get customers to do the right thing by them. A piano is a major investment, so if you don't maintain it, it's like neglecting your car—damage will start to set in. I've seen some fine pianos literally go to waste."

The Piano Technicians Guild recommends that owners tune their pianos twice a year at minimum. Without maintenance, the instruments develop issues with their strings, keys, soundboards, and more. Jim explains, "Often people move their pianos from other parts of the country here to South Carolina, but they don't account for our high humidity and temperature. Many clients travel or in the case of churches they only use the piano on the weekend. AC units may malfunction, or the thermostat can be set too high. Storms can cause power outage for days or weeks. I just had a customer with a musty odor around her Steinway upright. When I pulled the bottom board off to inspect it, the back was covered in white mildew. Sure enough, the AC people came and found clogged drains—it happens all the time."

Humidity Control

It can cost $40,000-50,000 or even more to replace a vintage piano, and some of these instruments are invaluable given their storied history and craftsmanship. "High temperatures can do damage, but humidity is the real threat here. 80% of a piano is wood with many steel, felt, leather, and cloth components affected by moisture. Soundboards which act as the amplifiers in a piano are one of the largest wooden surface areas prone to moisture changes. Soundboard replacement can cost hundreds to many thousands of dollars including the skilled labor.

Generally, 40 to 55% RH is recognized as a safe range for pianos. Low relative humidity can also cause damage such as broken glue joints, but high humidity causes the most damage. It is also detrimental to have deep cycling with high temperatures and high humidity followed by cold temperatures and lower humidity. This is a condition often seen in churches and schools as they manage AC costs. In Jim's business, mold is a constant threat: "In the Low Country of SC, mold and high humidity go hand in hand."

INSTALLATION

While searching for a monitoring device, Jim heard about CAS DataLoggers online. "I started getting requests from people who needed to see their piano's condition while they were gone, so I decided to try using data loggers as an experiment. I always bring a gauge with me to monitor conditions while I'm there, but I wanted to show them the whole picture, not just a snapshot." He didn't want a high-cost system for his business, so he requested a portable solution that had good accuracy, memory and software for data presentation.

CAS DataLoggers provided Fur Elise with 2 [EasyLog LCD Temperature/Humidity Data Loggers](#) to match his unique application's needs of piano humidity control. The EasyLog's high contrast LCD display shows current temperature and humidity levels with its two-and-a-half-digit display. Using its internal sensor, this standalone datalogger records and stores over 16,000 temperature and humidity readings within a -35° to +80°C (-31° to +176°F) and 0-100% RH measurement range.

Usage

Their built-in USB interface makes it easy to connect to a PC for quick setup and to download all the data. Buttons on the device cycle between the current, maximum and minimum stored temperatures. Each data logger gives its status indication at all times via bright red, green and orange LEDs and comes with a replaceable internal lithium battery to power logging for up to a year. Additionally, the loggers have good protection against dust and moisture, rated to an IP67 standard.

Now during every service visit, Jim places a datalogger on the top of the piano. The logger then monitors the temperature and humidity conditions surrounding the instruments. He can set logging rates anywhere from every 10 seconds to 12 hours and then set a start time for the loggers to begin recording. "I just leave them to record for long periods and it's no hassle. Maybe their AC system fails at 2am, but this way I can get the data and let them know." Jim sets his loggers to take a reading once an hour which is an ideal rate for monitoring over a 6-month period, for example over the length of an entire concert tour schedule. When doing more short-term monitoring over a 2-week period or so, Jim can set the loggers to record more often and zero in on conditions. If more in-depth monitoring is needed, Jim can just place another logger underneath to compare to the one on top, using Velcro to place it on the soundboard or fix it to an underside beam.

Generally, a high of 50% RH is considered safe for pianos, and the logger alarms reflect this. "I usually set my alarms a little higher…in reality up to 55% isn't a problem, but I want to alarm anything above that." Likewise, temperatures over 80°F are cause for concern, so the high alarm limits simultaneously watch for these conditions and show them with a red LED.

When Jim returns for his follow-up visit, he can put the logger in his laptop, save the file and run the graphics software to review the results. Using a mobile printer, he can print the results to show the client and place the graphs in his service records. Alternatively, he can just take the data loggers home and view the data by plugging them into his office PC for upload. Later he can send the chart as an email attachment with a detailed analysis. Since the loggers are reprogrammable, he simply deletes the data on the loggers to make them ready for reuse with his piano humidity control application.

Software

 The free EasyLog downloadable software allows users to set their own preferences which include naming the loggers, recording in Celsius or Fahrenheit, setting sampling rates and high/low alarms.

Easy to install and use, the control software runs under Windows 10, 8, 7, 2000, XP, and Vista. Users can also set immediate/delayed/push-to-start logging and then graph, print and export data to other applications for quick organization.

Jim explains, "The software is great and the help guide explains the programming and alarm settings–everything you'd need. The graphs show all types of great information. In one case I'm handling, it's obvious that they have a huge year-round high humidity issue. Even in the winter the humidity is in the high 40's, so the keys are hanging up. Well now they don't have to just take my word for it! The data is easy to view and show people what I've been talking about. The graphs make my case for me every time."

Benefits

With its low cost and light weight, EasyLog was ideal for this environmental monitoring application. Jim got the data loggers and software for about $200, and that also included our free technical support. The combination of their low price and low maintenance was a good fit for his business—now even these valuable pianos are continually monitored by our inexpensive dataloggers.

"CAS DataLoggers has helped me assemble accurate data that is crucial in convincing my customers that they need to take better care of their pianos. My loggers show everything that's going on in a home or building when I produce the printouts. For example, with many of my clients, I've got a really good picture of their conditions last winter, and now I can record and display data to pinpoint the real risk to these instruments. If I see data I can't explain, I show the owner—maybe their furnace was out or their system was installed improperly. This saves us both a lot of time and money. I am trying to get another client to upgrade an older piano de-humidification system on her Steinway L 5'11" grand formerly owned by a concert pianist in Southern California's dry humidity. To help make my case I'll use my dataloggers to have her see for herself what is going on—that's the real advantage of using them."

Jim is now considering a wireless system for the future, and for this setup CAS DataLoggers would provide T&D Wireless Temperature and Humidity Data Loggers and a T&D Wireless Base Station to automatically collect and send the environmental data. "The loggers are working great and I intend to purchase additional equipment. I have several clients who live about 50 miles away from my home, so I would like to be able to do some remote monitoring of the conditions surrounding the instruments. That way I could be instantly aware of a high humidity situation when a piano is unattended. There's an island home where the power occasionally goes out; that's the first place I would use a wireless data logger. Depending on the results of data logging we may recommend special piano humidity control equipment, woolen string covers, fabric undercovers, or even moving the piano. The technology gives us options."

For more information on **EasyLog LCD Temperature/Humidity Data Loggers**, piano humidity control or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or **www.DataLoggerInc.com**.