APPLICATION NOTE

CAS DATALOGGERS

MSR145 Data Loggers Help Identify Cause Of Moisture Damage

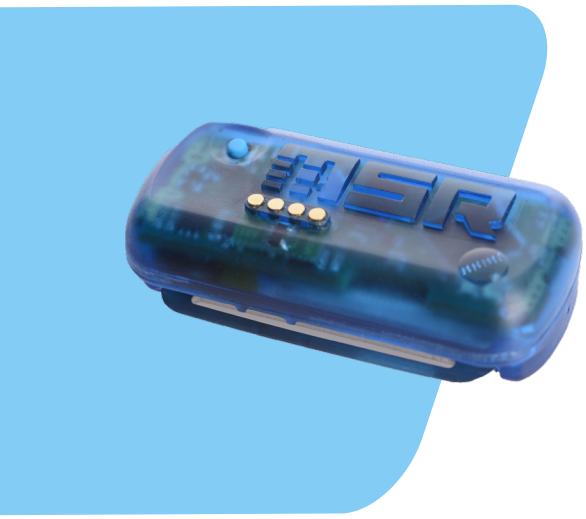
Damage to buildings caused by moisture is a serious issue that can be very costly. Moisture damage does not only occur in old buildings, but also very frequently in newer construction. Prior to repairing this damage, a detailed investigation of the causes must be conducted to identify the root cause. In many cases, cost-effective miniature data loggers can help record important building environment-related parameters over long periods of time and thus provide a basis for a substantiated damage analysis.

The causes for damage as a result of moisture and, subsequently, mold growth or accumulation of water, can be complex: a defective or improperly installed roof, cracks in the masonry, or damaged sealing elements at the various roof and wall penetrations. Thermal bridges caused by incorrect execution of construction work can also result in condensation, both visible and hidden, resulting in extensive damage. However, incorrect user behavior, such as a heating and ventilation routine that is not adapted to the building's characteristics, can also be a cause of damage. If, for instance, an extremely well-insulated, well-sealed house is insufficiently ventilated or incorrectly heated, an excessively damp indoor climate may develop, promoting the growth of mold or causing condensation damage.

The Importance Of Investigating The Cause Of Moisture

In order to uncover such problems and subsequently remedy them expertly, a de

tailed building analysis must be performed by trained specialists. Bau-& Energieberatung Reto Niedermann GmbH, a building and energy consultancy based in Unterentfelden, Switzerland, works in this field; its experts specialize in building physics as well as construction design and energy planning. The firm prepares surveyors' reports and provides detailed information to remedy moisture damage expertly. As virtually all associated remedial action can be very complex and thus very expensive, a well-founded investigation of the root causes is an absolute requirement. In addition to expert knowledge, complemented by practical experience, information collected using electronic data logging equipment contributes a great deal to ensuring that the required diagnostic work can be carried out accurately, in a well-founded manner, cost-effectively and quickly, and that it can be documented in detail.



In this context, the MSR145 mini data loggers manufactured by MSR Electronics GmbH are very useful. The loggers use their internal sensors to record temperature, relative humidity, air pressure, acceleration, and light intensity; when investigating building physics, the temperature, air pressure, and humidity data is of critical importance. However, recording acceleration values can also be helpful if it has to be established, for example, whether the loggers have been moved from one place to another. The measurements can be taken with an extremely high degree of accuracy over long periods of time. To this end, these miniature devices are capable of recording more than two million measured values, or with an optional microSD card, over one billion measured values. All data can be quickly transferred to a computer using the USB port or microSD card. Subsequently, it can be examined using the Analysis software supplied by MSR, with split-second resolution. These data loggers can also be supplied with analog inputs for very specific measuring tasks, for instance, in order to connect special external sensors for analyzing the air, measuring conductivity, or detecting moisture.

Diagnostic measures, intended to analyze the user behavior of residents, must be carried out during everyday life while minimizing disturbance to the occupants. In this respect, the miniaturized design of these compact data recording devices is particularly beneficial as they can be placed virtually anywhere while remaining inconspicuous.

Data Loggers Aid Accurate Diagnostics

In the experience of Bau-& Energieberatung Reto Niedermann GmbH, moisture damage analyses would not be possible at all without these small data loggers. After all, determining whether the user behavior is responsible for the damage to the building can only be done by means of long-term measurements of the indoor climate values. In the specific case, the temperature and humidity data of the outdoor and room air is recorded, as well as the acceleration values in the interior, in order to ascertain whether the data logger was moved to a different location by the user during the measurement period. Depending on the premises, the loggers are either positioned free-standing or attached with Velcro or adhesive tape. Then, for approximately two to four weeks, the loggers remain in the measuring sites of the building to be investigated.

Upon completion of the series of measurements, the experts download the recorded data and, using the MSR PC software, are able to determine the exact indoor climate data at any point in time and draw the relevant conclusions, which provide the basis for the required proposals for remedial action. As the company has realized, detailed moisture damage analyses in such an accurate manner have only become possible by using these loggers. The examinations undertaken based on this logger data carry more weight due to the underlying measuring accuracy and are more meaningful than previously conducted examinations using traditional measurement tools. Furthermore, by using the software, examinations can be documented optimally, which, for instance, is of fundamental importance when preparing surveyors' reports.

All in all, these miniature data loggers can contribute significantly to conducting

damage analyses relating to building physics in a quick, accurate, and cost-optimized manner. However, these loggers are also useful in numerous other areas of application, such as transportation, machine and system monitoring, aeronautics, automotive engineering, or security tasks, and they are extremely successfully employed by many companies in these fields.

This Application Note has been adapted from an article written by MSR Electronics GmbH. MSR is the manufacturer of the MSR145, their versatile universal data logger for environmental measurements.

For more information on the MSR145, 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.