

Feature

March 2020

MAKING SENSE OF SMART BUILDINGS

Over the last few years, talk of smart buildings has become commonplace. But what defines a smart building? Martin Schreiber, Product Manager at Sontay, explores the fundamental requirements for a smart building and the role of sensors in making them a reality.

What is smart and what is a smart building? According to the 2nd Technical Support Study on the Smart Readiness Indicator (SRI) For Buildings report*, the working-definition of the smartness of a building refers to *“the ability of a building or its systems to sense, interpret, communicate and actively respond in an efficient manner to changing conditions in relation to the operation of technical building systems or the external environment (including energy grids) and to demands from building occupants.”*

The key word that stands out for me in this explanation is ‘sense’. A smart building would be nothing without the variety of sensors that monitor and analyse environmental conditions on a day to day basis, then provide that information to the building control system. Sensors are constantly working, providing valuable data back to the control system but how can they help create smarter buildings?

The SRI study, which was commissioned by the European Commission services (DG ENERGY), outlined three core pillars that should be met if a building is to be considered smart:

- The ability to maintain energy efficiency performance and operation of the building through the adaptation of energy consumption.
- The ability to adapt its operation mode in response to the needs of the occupant, paying due attention to the availability of user-friendliness, maintaining healthy indoor climate conditions and an ability to report on energy use.
- The flexibility of a building's overall electricity demand, including its ability to enable participation in active and passive as well as implicit and explicit demand-response, in relation to the grid, for example, through flexibility and load shifting capacities.

Sensors can play a significant role in meeting both energy efficiency requirements and the needs of occupants. They measure, analyse and evaluate building performance data and make it available to the control system which, in turn, can enable more accurate decisions to be made about the operation of a building. This helps improve energy efficiency and can also have a huge impact on the comfort of occupants. For example, if the control system knows a room is empty it can turn off the air conditioning and save energy. However, if a meeting room is full and a sensor detects high CO2 levels, the ventilation system can be turned on to improve the wellbeing of occupants. This reliable gathering of useful and usable information is what makes a building smart.

Sensors themselves are also getting smarter. Sontay has recently launched a new generation of Smart Sensors that can offer full environmental sensing in one single device. This type of sensor can measure temperature, RH, CO2, CO, air quality, light level and occupancy and even offer user interface options, such as, set point, fan speed and momentary switches. The result is a faster, more efficient installation where the amount of cabling is cut back and controller IO requirements are also reduced. Whereas traditional sensors may require up to seven cable inputs into the controller, a Sontay Smart Sensor will only require one simple cable connection to perform with the equivalent functionality.

By installing just one sensor, system integrators and building owners can dramatically reduce installation time and simplify the configuration process. The new Smart Sensors have one analogue and one digital input, which can be user configured to suit a broad range of applications, such as 0-10V, thermistor, VFC or pulse counting inputs. A unique feature of the new sensor platform is the option to order them with up to three analogue outputs and two digital Triac outputs. The output options are capable of operating local control equipment such as fans, actuators, heaters, humidifiers etc. directly from the sensor. Any sensor or user interface values can be mapped to the output or they can be freely programmed and written to via the network. The embedded and configurable fail-safe method makes the local control save to use even in case of loss of network or communication. All this can be configured via the BACnet or Modbus without the need for any additional configuration tool.

Implementing a control system equipped with smart sensing technology, brings systems integrators, facilities managers and building end-users significant benefits. They can help improve installation and engineering efficiency as well as deliver improved energy management, facilitate better building operation and ensure comfortable conditions for occupants. The three pillars from SRI offer a useful starting point to understand smart buildings. And, the smarter the sensors then the easier it will be for these goals to be achieved.

-ends-

786 words

*https://smartreadinessindicator.eu/sites/smartreadinessindicator.eu/files/sri_summary_2nd_interim_report.pdf