

Workshops at CLIMA 2019

Workshop n. 2

Power of the Cloud

Monday, 27 May, 10:30 - 13:00,

Meeting Room TBC

Workshop organizer(s)

Belimo AUTOMATION AG



Additional information at:

www.belimo.com

Presenters

Chair(s)

Dr. Marc Thuillard

Belimo AUTOMATION AG

Speakers

Dipl. Ing. Marc Steiner

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Dipl. Ing. Forest Reider

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Scope

a) Introduction

Over the past 20 years, technology has evolved at an astounding rate. The amount of silicon required to perform a set of processing operations has shrunk to such sizes that even our mobile phones are capable of huge throughput. The cost of computing has followed the decreasing size, laying the groundwork for today's internet of things (IoT). After the turn of the millennium, the cheap availability of processors made its mark on the building automation industry by making its way down to individual components. This caused an increase in the functionality at the device level, and local component control became highly tuned by the manufactures, experts in their domain. In turn, components were more easily integrated into building systems while providing increased functionality. The processing capacity was an integral component to connect different devices into networks of "things". Along with computing power, many of these little computers were also able to communicate through the standard IP infrastructure. The unprecedented number of computers and devices eventually led to the development of IP v6 to increase the number addresses for internet "things" because 4.3 billion is a crowded space. With the

processing and communication foundation in place, the past several years have seen the rise of various cloud infrastructures within the building technology industry, and is beginning to penetrate down to the component level.

At the last CLIMA conference in Aalborg, we introduced the Energy Valve, a performance device capable of monitoring and optimizing energy efficiency thanks to the integrated ultrasonic flow sensor, two temperature sensors, and advanced logic. The flow control will reject any pressure fluctuation. The Delta-T Manager is capable of improving the system temperature difference over the heat exchanger to combat delta-T degradation, a well-documented problem with many systems. Need to check something? Log onto the integrated web page, and see the relevant information.

In this workshop, we will show how the Energy Valve has evolved to leverage the Belimo Cloud. Introduced in 2017, the Belimo Cloud brings building transparency the next level by providing easy access to information in a central location. With state of the art security standards and an openly documented interface, customers can access their data from anywhere. We will explore the opportunities offered by the cloud, and look into what the future holds by showing research into augmented reality (AR) at Belimo. Let us start by discussing how the cloud can benefit commissioning and operation of a plant.

b) Commissioning

A future, cloud supported, commissioning workflow will be simpler and more reliable than today. System integrators will enter and upload all configurations at their office to the cloud system. Installers can easily configure an actuator or room unit using their smartphones and near field communication (NFC). NFC means device configuration is possible before power is connected.

During commissioning, the cloud can support tests and validation. Quick verification that devices have been configured is simple. Running a test and generating a report is equally simple. System integrators can focus more of their attention on the system level.

c) Advanced monitoring and optimization

Beyond commissioning, the cloud lays the foundation for greater transparency. The increased computation power available to servers can easily aggregate multiple sources of information to accomplish various tasks. Report generation, dashboards, and real time fault detection with intelligent diagnostics are several examples of services that are greatly improved with access the right information.

1. Report generation can periodically collect important information from your devices to provide an overview of any issues. Naturally, device specific reports are also produced.
2. Customers can track thermal energy flows in their buildings quickly and easily. Simply upload a floorplan and place your energy monitoring devices via drag-and-drop.
3. Using data analytics, we can infer root causes of undesired behaviours to provide meaningful diagnostics. Combining data from multiple devices can further improve fault detection by reducing "false positives", and validate the diagnosis of root causes originating beyond a single device's sensing capacity.

d) IoT is powering Augmented Reality

We would like to explore how the cloud and augmented reality can come together to create exciting new possibilities. Augmented reality is a technology that can use modern devices with cameras to overlay information on a scene or object. Today AR is available on every modern smartphone and tablet making this technology very interesting. If you have a smartphone with you, you are "augmented reality ready". As simple as that. In this workshop, we will present a few live demonstrations showing the power of AR.

During the planning phase, system integrators can create, store, and administer entire commissioning processes digitally that are accessible through to the cloud. The technician on the building site may use AR as a display interface to access cloud information, for example installation instructions or installation errors, in real time. This reduces time and save costs.

Augmented reality also improves remote services. In the example of a maintenance service response, an on-site technician can leverage AR video chats. The customer support is able to provide information precisely, not only via voice and video, but also via sketching directly onto the location aware video stream. This reduces time and saves costs.

e) Outlook

The power of the cloud will be increasingly important when devices have access to information from other HVAC components independent of the manufacture's specificities. This means that the exchange of key information between different manufacture's products needs to be easy. Effort to support open cloud interfaces is key to making buildings perform to the full satisfaction of the occupants.

Audience

This workshop is suitable for consultants, system integrators, mechanical contractors, building owners and operators, facility contractors and building automation professionals as well as for professors and students from relevant universities.

Expected results

Visitors will learn about the present and future role of technology in the building automation industry from the perspective of Belimo's research department.