DFAB HOUSE
Factsheet Digital Living

As of May 2019, four people will inhabit the three-story DFAB HOUSE. The house, with around 200m^2 living space, will then serve as a platform for implementing new smart home solutions and for validating them in reality. Thanks to direct feedback from the users and specific measurement data from everyday use, the participating consortium of companies expects valuable information on the feasibility and acceptance of new solutions.

Manufacturer-independent smart home platform

The basis for the smart home experience at DFAB HOUSE is the multi-award-winning and manufacturer-independent smart home platform of the Swiss-German company digitalSTROM. The idea is simple: Smart luster terminals enable analog devices (such as lamps or blinds) to be digitized and to work sensibly with devices that are already networked via WLAN or LAN. For this purpose, digitalSTROM uses the two most future-proof and reliable infrastructures in the house: the power line and the IP network. The modular structure of the system and a simple plug & play also ensure maximum flexibility.

Partner: digitalSTROM

Voice control for complex processes

Language is one of the most natural, simple and direct forms of interaction between people. However, people no longer only talk to each other, but also control individual devices via voice – or, as in the case of DFAB HOUSE, the entire home. Through the interaction of digitalSTROM and an Amazon echo, it is possible to control complex processes and several devices simultaneously by voice command. A simply spoken sentence is sufficient to trigger a very specific sequence of actions. No matter whether you want to eat pizza or watch a movie: The wish only has to be expressed and DFAB HOUSE

automatically sets the corresponding devices – like an invisible butler – or starts the corresponding processes.

Partner: digitalSTROM

Intelligent energy management

DFAB HOUSE uses ABB automation and power distribution solutions. Part of the lighting system and the blinds are controlled via the KNX building automation system with ABB products. A measurement system from ABB monitors all circuits. An inverter from ABB feeds the generated solar energy into the grid. The building is equipped with ABB switches, line protection devices and sockets – with integrated USB connection. Data from KNX, current measurement and inverters flow into Empa's network in order to manage and optimize energy consumption at DFAB HOUSE and avoid peak loads. A universal ABB interface connects the building automation systems.

Partner: ABB

Installing, integrating and networking in the smart home

Hans K. Schibli AG integrated the systems and devices of the various manufacturers to create a functional smart home platform. Using the main system of digitalSTROM, Schibli integrated the surrounding systems of Sonos, V-ZUG, Securiton and many more. State-of-the-art household appliances such as hobs, ovens and dishwashers as well as basic lighting, shading and window control functions can all exchange operating data with each other and are optimally controlled.

Partner: Schibli

Automated shading

Real estate experts agree that in the future more energy will be used for cooling than for heating buildings. Automated blinds can help to minimize the energy required for this – if the automation is in line with the wishes of the users. Based on user data and feedback from residents at DFAB HOUSE, Schenker Storen has set itself the goal of optimizing the automatic shading functions and reducing the difference between the vision and reality of automated blinds.

Partner: Schenker Storen

Networked intrusion detection system

Securiton is testing the integration of the SecuriSafe intrusion detection system in innovative smart building services systems at DFAB HOUSE. Together with digitalSTROM, Securiton has developed a gateway that enables communication between SecuriSafe and digitalSTROM. The burglar alarm system is connected to various sensors that provide information about the presence of uninvited guests. In addition, networking with lamps and blinds is used to automatically simulate presence in the event of absence. When coming or going, the voice output informs about the status of the alarm system. The aim is to make operation more intuitive for residents in the future. Securiton is using DFAB HOUSE to test and implement a smart and secure burglar alarm system.

Partner: Securiton

Intelligent household appliances

DFAB HOUSE is equipped with communication-enabled household appliances from V-ZUG AG – including the Combair XSL oven, the Combi-Steamer Combi-Steam XSL, the Adora SL dishwasher and the new FullFlex GK11TIXFKZ induction hob – products, for which networking with V-ZUG-Home and WLAN module is already standard. Whether sending a notification at the end of a program, calling up status information, using the cooking assistant or the recipe database, transferring ingredients to the shopping list or settings directly to the appliance – the networked appliances make households even more comfortable, efficient and, above all, inspiring. The devices are integrated into digitalSTROM's smart home platform and the possibility of voice control and voice output is used.

Partner: V-ZUG

Web-based control of heating and cooling circuits

Thanks to its consistent digitization strategy, R. Nussbaum AG offers, among other things, BIM-capable planning data as well as industrial prefabrication and order picking. An automatic valve actuator serves as leak protection in the technical room of DFAB HOUSE and can be integrated into the building management system. Nussbaum is breaking new ground with the web-based control of heating and cooling circuits. Permanent flow and return flow measurements per circuit make this individual room system very temperature stable, adaptive and economical. With remote access via smartphone, it

keeps pace with the legal framework. The new decentralized water heating system based on heat pump technology also contributes to energy and cost efficiency.

Partner: Nussbaum

Learning water distribution

DFAB HOUSE is equipped with an innovative water distribution system: 3Eflow combines high-end mechanics and machine learning in one product and ensures energy and water savings of over 40%. The pipes are emptied using a valve when not in use. This prevents energy and water losses and stops the development of bacteria. 3Eflow has an adaptive control system, which, thanks to sensors, always knows when, where and at what temperature water is used. This data help to make boilers and water distribution systems more efficient. Eawag scientists are also investigating how 3Eflow can be implemented in a complex water system. For example, they are investigating at which points in the distribution network there is an increased hygiene risk and which energetic interactions are influenced by the implementation of 3Eflow in the system.

Partners: 3Eflow, Eawag

Heat recovery during showering

Two Joulia heat recovery systems are used in DFAB HOUSE. There is still a lot of energy in the draining shower wastewater. The warm wastewater is led through vertical copper pipes, which transfer the waste heat to the cold fresh water and preheat it by 15 degrees. This is then led to the shower mixer, where up to 42% less hot water has to be added. The heat exchangers are installed invisibly in a shower channel and offer a high level of comfort. Thanks to heat recovery, in addition to energy savings, the hot water components (boiler, heat generator output) can also be designed smaller, resulting in additional energy savings. In DFAB HOUSE, high-precision flow and temperature values are measured under real conditions in order to validate the laboratory values.

Partner: Joulia