Intel® NUC Case Study: RIWO engineering

Company Description
RIWO Engineering is specialized in industrial automation, process control and ICT (Information and Communication Technology). On a daily basis we work on projects for various customers within a wide range of countries. We offer solutions for several branches and various industries such as food, bio-energy, water purification, waste water treatment, automotive, horticulture, cattle feeding systems, laser solutions (welding, cutting, marking), etc.

We tailor solutions for each customer’s unique requirements. The diversity of our projects has allowed us to have a vast knowledge base and experience with industrializing. With focus on customer satisfaction, professionalism and customization RIWO Engineering strives to provide the best solution possible based on our customers’ unique vision.
Goals

We needed a hardware platform with routing functionality to be a gateway between our industrial automation solution at customer site and a central Riwo application for remote diagnosis, VPN functionality and, most of all, easy to use solution for our dealers.

Our goal is to offer dealers a solution that securely and simply accesses and manages their end customer installations, even behind firewalls. The solution should be easy to install and allow employees to use the solution based on plug and play. With the solution a service platform is needed for overview, historical logs, user management, policies and VPN functionality.

Riwo created this solution by our platform Rimote. Rimote is a cloud server application with a web interface for control and user interface. At customer site a Rimote box is trying to connect with the Rimote server. When the connection is established a secured bi-directional connection is initiated. Over this connection a basic command interface structure is offered. As a function of this structure a VPN can be tunneled over the secured connection. While developing Rimote we got involved in a case for regulating electrical energy based on the Rimote, an ideal platform for getting a professional and stable working solution. The market for electricity can be compared to a stock exchange. There is continuous coordination between the supply and purchase of electricity. The difference between the amount of electricity that is offered and the amount that is taken is called unbalance. If at some point too much electricity is offered one can make money by decreasing electricity supply to the grid. When too little electricity is offered on the grid one can make money by temporarily delivering more electricity.

Why is INTEL® NUC the ideal solution?

Size: Within our industry, sometimes centimeters of free space could make a huge difference on allowing any projects to be executed. In this case a four-by-four-inch motherboard and enclosed in a tiny case makes it the ideal device for small industrial storerooms.

Performance: Powered by Intel® 3rd Generation Core™ Processors, big on performance / featuring longer battery life and built-in security for deeper protection. In this way we will be able run our process Control Software and Rimote, and with no major effort move between applications with smart multi-tasking delivered by Intel® Hyper-Threading Technology.

Current situation

The commercial name of this product is unbalance regulator. The remote server is continuously running algorithms for calculation of the most optical set point for a specific electricity supplying installation. In our Rimote platform this module is called Energy Client Monitoring. At this moment we are running five biogas pilots. A Rimote box is installed at customer site as being the bridge between the plant and the unbalance regulator. The box is continuously transmitting actual plant measurements for feeding the algorithms while it is continuously receiving the most optimal set point.
Describe what you did with the INTEL® NUC:
Riwo integrated the INTEL® NUC in the Rimote boxes. Typically in this pilot the INTEL® NUC runs a Windows 7 OS with the Rimote Client Application (MS Visual Studio C#).
The INTEL® NUC communicates with an industrial PLC (Sigmatek). This PLC interfaces with industrial field busses and sensors that are necessary for well-functioning of the Unbalance Regulator.

We have to investigate and test the solution for:
- Cooling (fanless)
- The influence of ammonia on the INTEL® NUC
- Basic Remote functionality when the Windows OS or Rimote Application fails.
- Direct IO solutions like USB or mini PCI-E - On board second Ethernet interface possibility for WAN/LAN separation (now based on USB)

Results:
For the pilot our goals are met, but for stabilizing and serializing the product we have to investigate further on.

Conclusion:
Finally, Riwo engineering is enthusiastic about using the INTEL® NUC in this application; However, we would like to migrate to the INTEL® NUC Core i5 Vpro. We would like to have a product to integrate all the requested functionality into one platform and the INTEL® NUC Core i5 Vpro SKU (based on the extra features that could be offered within this product family) will be the product that ideally fits our usage model moving forward.