

One and a half days of work in only **two hours**

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After implementing the SIMATIC Compact Field Unit from Siemens, both installation and troubleshooting have become significantly easier for Aalborg Forsyning. Eight inputs and outputs, eight field device connections and a direct connection to the controller save costs as well as equipment.

Even for a Dane from North Jutland, it is impossible to hide the enthusiasm; since Aalborg Forsyning, the municipal utility of Aalborg in North Jutland, bought their first SIMATIC Compact Field Units (CFU) for the district heating supply pumping stations a year ago, many hours have been saved on installation and troubleshooting. And because it was not necessary to purchase any further hardware, costs have not increased either.

The CFU is a smart I/O box for connecting field devices. Aalborg Forsyning first saw the SIMATIC CFU at the Hannover Fair and was immediately convinced that this was exactly the equipment they needed.

“Before, we used a DP/PA link in connection with 'AFD boxes'*. This setup used up a lot of space on the panels and we had high costs for equipment”, reports Brian Elgaard Eriksen, employee in the mains operations department at Aalborg Forsyning.

As soon as the first units were unpacked, there was great enthusiasm.

“The very first thing we noticed was the rugged housing, which is optimal for our operation conditions. It is German quality after all – it is ready to use and looks proper. It is simply great,” he says.

But as we all know, designs aren't everything. At Aalborg Forsyning, what really matters is all the equipment and items that are being replaced by the CFU and all the working hours that can be saved.



*AFD = Active Field Distributor

No more long distances

Aalborg Forsyning operates over 60 pumping stations for supplying district heating to the city. Only 5-6 values are measured in some of the smaller pumping stations, for example using pressure transmitters, temperature transmitters and flowmeters; however, up to 100 values are measured in the largest stations. All in all, it adds up to more than 40,000 measured values.

Without the CFU, sub-panels and so-called AFD boxes need to be placed close to every pump – meaning lots of equipment and associated wiring in the pump room. Now the components are connected directly to the CFU and only one cable needs to be laid to the main panel in the technical facilities room. In addition, connecting the components is significantly easier.

“The next station we are going to set up has approx. 40 measured values. I think this will take me two hours, whereas normally it would take a



day and a half. The CFU is connected to PROFINET, so I need to assign a device name to it. Once you have done it a couple of times, this is very straightforward, and then the CFU itself detects which field devices are connected and assigns them a unique address. Before, I had to run back and forth to assign an address to each node individually. Some of our pumping stations are 100

meters long, so I save a lot of time when I don't have to continuously walk long distances,” explains Brian Elgaard Eriksen.

Addresses field devices autonomously

Each CFU has eight digital inputs/outputs that can be freely configured. In addition to this, it has eight digital fieldbus inputs (PROFIBUS PA). Here the connection is even easier as the CFU automatically assigns an address to the PA field devices when they are connected. Siemens calls this concept plug-and-produce. Aalborg Forsyning uses the CFU digital inputs/outputs for process interruptions, valve indications and switching operations, among other things.

“Before, we had all the analog signals in one enclosure and all the digital ones in another enclosure somewhere else. This meant that we had to create two cable routes and two outgoing supplies. Now we have a huge advantage, as we save on cable routes and therefore on many working hours in this way – and cable routes don't come cheap either, so we also save a lot on materials,” he explains.

LEDs help to locate faults

The easier connection also means that it is simple and quick to replace devices or components in the event of a fault, even without an engineering system. This situation has not occurred yet at Aalborg Forsyning, but they have already gained initial experience in locating faults.

The signals enter the SCADA system and can be read out, for example via an iPad at the pumping stations. The operator can also receive notifications on all faults in this way. But actually, it is a small and simple detail that makes all the difference. Above each CFU input and output there is a small LED that turns either green or red when a device is connected.

"If we receive a call from the control room informing us that something is wrong, we are able to locate the fault very quickly. We have placed the CFUs on stands, so if an LED starts flashing red, we can very quickly see exactly where the fault is and what is wrong," says Brian Elgaard Eriksen.

Important step towards digitalization

Using the CFUs, Aalborg Forsyning has initially benefited from savings on materials and working hours. However, the CFUs may also lead to further improvements in the longer term because, as the CFUs are used as an intermediate station for all measuring sensors, all devices and components will be integrated into the network, which facilitates data collection.

"All measurements are used as data basis in our model calculations, and the better the data basis,

the better the model calculations. We can see if our pumps are worn, if a pump is consuming more power and whether its flow rate is decreasing. Our engineers can use this data, for example, when designing future pipes and calculating the necessary pump performance," he explains.

Based on their experiences from the first year, Aalborg Forsyning has already decided that they will use SIMATIC Compact Field Units in the planned large pumping station near Reno Nord. The technology will also be used at the new super hospital and at a planned large ground storage reservoir.

"This box is so perfect for us that you could almost think that we invented it," says Brian Elgaard Eriksen.



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