ClimaCheck integration of IoT Gateway – NX400 in existing monitoring systems

ClimaCheck *online* is the leading and most advanced analysing and early warning system for refrigeration, air-conditioning and heat pump systems on the market. Energy profiles and performance reports which are essential for energy optimisation are generated in real-time with ClimaCheck online.

The platform offers a complete thermodynamic analysis and evaluation of the process that gives information on performance of the whole system as well as all components in the process. These functions make it easy to identify when inefficiencies occur and where, functions that are necessary to plan service and fix problems before they cause failures.

ClimaCheck performance analysis is based on thermodynamics principles and offer complete and un-biased information on performance that is independent of manufacturers input. Thanks to the ClimaCheck method, it is possible to validate performance on a level that has been considered impossible with traditional field measurements.

ClimaCheck offer all the information required to monitor energy consumption and efficiency in real time.

This information includes essential information i.e.:
- EER/COP and System Efficiency Index
- Compressor efficiency
- Evaporator efficiency
- Condenser efficiency
- Effectiveness of controls
- Energy profiles
- Energy statistics with hourly resolution

The information is necessary to decrease operating cost and ensure highest possible reliability. Furthermore, the energy profiling and monitoring is perfect to establish baseline performance and the result of measures.

If a deviation is detected the system can be configured to send early warnings to ensure that problems are taken care of, and optimal operation is maintained. The unique information is presented to refrigeration/HVAC specialist in an easy-to-understand format that can be accessed from a PC or smartphone without any risk for the integrity of the IT-system of the plant.

The complete analyses can be accessed instantaneously by in-house staff as well as external experts if desired. This drastically decreases the cost to get expert advice to ensure best possible operation. In many plants it will decrease the number of visits required for troubleshooting as well as leak detection as ClimaCheck online can be configured for "indirect leak detection". ClimaCheck online is at the same time securely isolated from the controls or sensitive administrative networks of the plant.

Integration with BMS/Scada systems

Many modern BMS, SCADA and control systems, has many of the required data points for the ClimaCheck analysis. With the **ClimaCheck Gateway – NX400** it is easy to integrate in most third-party systems and start the analysis. As most of the data is available, the need to add sensors is minimal. Data is sent to ClimaCheck online and turned into actionable. Key parameters from the ClimaCheck analysis can be also be presented locally.

The **IoT Gateway – NX400** is a bridge between ClimaCheck Online server and a local BMS/SCADA system. It communicates with the BMS/SCADA systems over Modbus RTU/RS485 or Modbus TCP and internet connection with ClimaCheck Online server is over LAN, WLAN or GPRS with the built-in modem. A BMS/SCADA system can also communicate directly with the Online server with Http request.
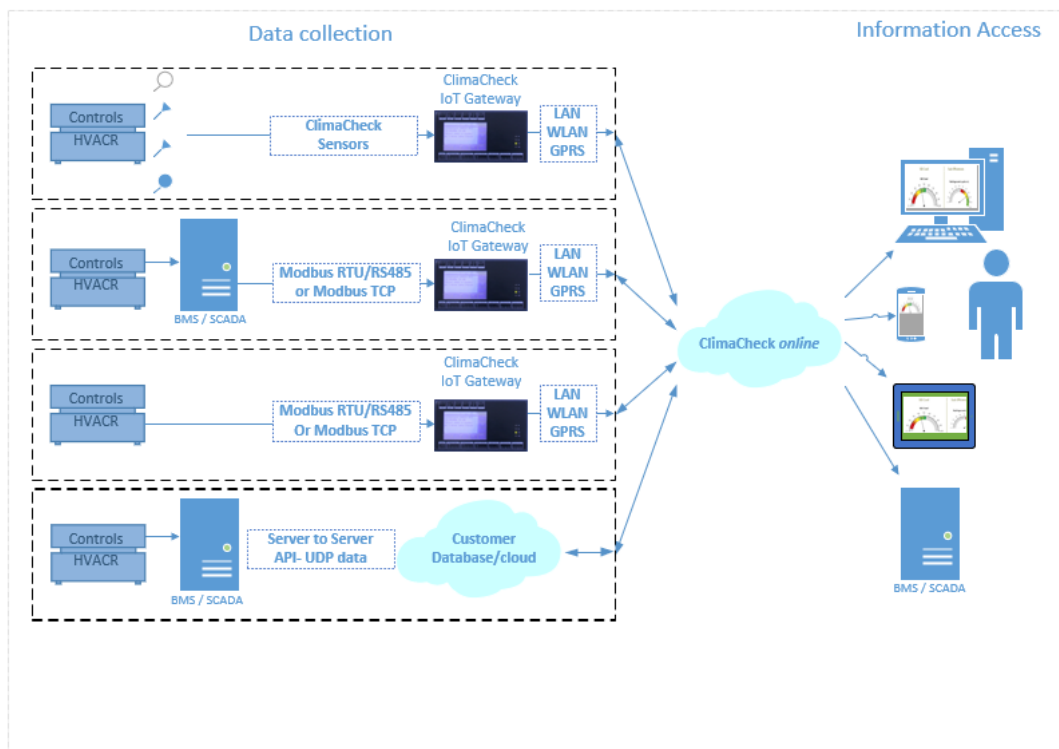
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Solutions for integrating ClimaCheck in BMS/SCADA systems

Stand-alone/TurnKey system - A complete ClimaCheck system including sensors, meters and I/O modules is installed. Data is sent to the ClimaCheck Online server where results are presented. Key values can also be sent back to the IoT Gateway and read by the local system with Modbus RTU/RS485 or Modbus TCP.

Integration with Modbus RTU/RS485 or Modbus TCP - The required data points are written by the BMS/SCADA system or directly from the control system in the IoT Gateway with Modbus RTU/RS485 or Modbus TCP. Data is sent to the ClimaCheck Online server where results are presented, key values can also be sent back to the IoT Gateway and read by local system.

The complete range of ClimaCheck I/O modules, sensors and meters are also available when BMS/SCADA system are missing required values.

Integration with Server to Server API - A BMS/SCADA system can communicate directly with the ClimaCheck Online server and send the data points as a string of UDP data. Results are presented on ClimaCheck Online and can also be fetched with a http-request by the BMS/SCADA system to display in local system.

Part No.	Description
100962	Stand-alone system in plastic housing including Modbus TCP/RTU Gateway NX400, Power Meter, pressure and temperature sensors.
600611	Modbus TCP/RTU Gateway NX400for DIN-mounting including documentation.
600612	Housing for Modbus TCP/RTU Gateway (600611) including 24V Power supply.
700610	Modbus Gateway configuration, First system on site
700611	Modbus Gateway configuration, following systems
700605	Server to server configuration, first system on site
700606	Server to server configuration, following systems
700600	Web service configuration, standard circuit
700601	Web service configuration, advanced circuit

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