



## CENTRAL PLANT CONCEPT

# Chilled-Water Plant Optimization

Siemens Demand Flow for new and retrofit projects

Prepared by: Universal Controls Solution (UCS), Siemens Value Added Partner | david@uniconllc.net · 720-282-5099 · uniconllc.net

**THE OPPORTUNITY** Add a manufacturer-backed chilled-water optimization option to new-build and retrofit central-plant pursuits — without requiring an owner to replace an otherwise serviceable BACnet-capable BAS.

## Concept in one minute

UCS delivers Siemens Demand Flow as an optional central-plant optimization package for water-cooled chilled-water projects. The strategy coordinates the energy-consuming subsystems as one plant — chillers, chilled-water pumps, condenser-water pumps, cooling-tower fans and, where appropriate, air-side demand — instead of optimizing one component at the expense of another.

Siemens states that Demand Flow can be implemented on any BACnet-compatible building automation system, regardless of the equipment provider. For an existing plant, that can preserve the owner's serviceable BAS while adding the controls, instrumentation and plant sequence required by the project. For a new plant, the design team can plan those requirements early and avoid retrofit rework.

## Where it fits

- **New construction:** include optimization-ready instrumentation, energy metering, modulating devices, VFD interfaces and BACnet points during design and preconstruction.
- **Retrofit:** improve plant sequencing and total-system operation while retaining an existing BACnet-capable BAS when the site evaluation supports it.
- **Mechanical-contractor friendly:** UCS serves as the dedicated controls and integration partner while the mechanical contractor retains the mechanical scope, the client relationship and the service opportunity.

### Plant-wide optimization — one coordinated control strategy

|                                           |                                               |                                        |                                         |                                              |
|-------------------------------------------|-----------------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------------------|
| <b>Building load</b><br>Coils and airside | <b>CHW distribution</b><br>Variable flow / DP | <b>Chillers</b><br>Staging / setpoints | <b>Condenser loop</b><br>Pumps / valves | <b>Cooling towers</b><br>Fan speed / CW temp |
|-------------------------------------------|-----------------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------------------|

#### BACnet-capable BAS + Siemens Demand Flow

Inputs: temperature, pressure, flow/load and power | Outputs: staging, setpoints, speeds and valve commands

*Conceptual integration view — final architecture and responsibilities are project-specific.*

| GLOBAL INSTALLATIONS | TYPICAL ENERGY REDUCTION | MEASURED PERFORMANCE         |
|----------------------|--------------------------|------------------------------|
| <b>650+</b>          | <b>20–50%</b>            | <b>as low as 0.33 kW/ton</b> |

*Siemens-reported portfolio results. Actual performance and economics depend on plant configuration, field conditions, baseline, utility rates and project scope.*

## How the partnership works

| Mechanical contractor                                                                                                                                                                                                          | UCS                                                                                                                                                                                                                    | Siemens                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>Owns the client and mechanical-construction relationship</li><li>Leads equipment, piping, valve and installation scope</li><li>Coordinates startup, TAB and service transition</li></ul> | <ul style="list-style-type: none"><li>Screens fit and develops the BAS/instrumentation concept</li><li>Engineers controls, points, networks and integration</li><li>Programs, commissions, trends and trains</li></ul> | <ul style="list-style-type: none"><li>Provides Demand Flow technology and application guidance</li><li>Supports project-specific engineering and solution validation</li><li>Offers ongoing performance services where selected</li></ul> |

## A practical project pathway

- 01 Screen.** Review plant type, owner goals, BAS, equipment, available trend data and project timing.
- 02 Validate fit.** Confirm the water-cooled chilled-water application, BACnet integration path, controllable devices and data quality.
- 03 Develop the concept.** Define controls architecture, instrumentation and point list, mechanical interfaces, responsibilities, ROM scope and Siemens engagement.
- 04 Implement and commission.** Coordinate installation, programming, safeties, sequences, functional testing, trending and owner training.
- 05 Measure and sustain.** Establish the baseline and M&V approach and select ongoing performance monitoring or Smart Services when appropriate.

## Good opportunity indicators

- Water-cooled central chilled-water plant with meaningful annual runtime or utility demand exposure.
- BACnet-capable BAS, or a defined integration path to plant equipment and VFDs.
- Project early enough to plan accurate temperature, pressure, flow/load and power data plus required valves, drives and low-flow safeties.
- Low delta-T that has resisted previous fixes.
- Excess pumping, unstable staging or high kW/ton.
- Limited deliverable capacity on design days.
- Comfort or humidity issues, or avoidable equipment runtime.

### IMPORTANT SCOPE BOUNDARY

The supplied Siemens material and the claims in this brief apply to chilled-water central-plant optimization. On a combined chiller/boiler project, Demand Flow should be presented as the chilled-water optimization component; boiler/HHW staging, reset, pumping and metering can be evaluated as a separate, coordinated UCS/Siemens controls scope. Likewise, "BACnet-compatible" does not mean plug-and-play: a site evaluation determines required sensors, metering, valves, drives, controller, network/security provisions and programming changes.

## Recommended next step

Select one upcoming chilled-water central-plant project for a joint screen. UCS can return a fit/no-fit recommendation, preliminary controls and instrumentation considerations, a role split and the recommended path for Siemens application review.

**Universal Controls Solution** · David Jonas · david@uniconllc.net · 720-282-5099 · [uniconllc.net/chiller-plant-optimization.html](https://uniconllc.net/chiller-plant-optimization.html)