CASE STUDY · IT PARK / CHILLER PLANT MONITORING & CONTROL

How Toshiba Bangalore's Chiller Plant Got a Brain It Never Had — in 7 Days

Toshiba's facility team in Bangalore had a working chiller plant — three chillers, three pumps, three valves — but no central window to watch it, no graphics to understand it, no way to control it remotely, and no staging logic to manage load automatically. EnSmart connected to their existing controller over Modbus, deployed Smart Nova above it, built live graphics, and gave the operator a single screen to monitor, control, and automatically stage the entire plant. Start to finish: one week.

Client: Toshiba — Bangalore Campus · Location: Bangalore, Karnataka · Platform: Smart Nova + Existing Controller · Year: 2025

At a Glance

3 Chillers Monitored & Controlled	**3** Pumps Integrated via Modbus	**3** Control Valves on Live Graphics
1 Wk Integration to Go-Live	**0** New Hardware — Controller Reused	**✓** Stage Up & Down via Smart Nova

The Plant Was Running. Nobody Could See It, and Nothing Was Thinking for It.

Ravi is the facility manager at Toshiba's Bangalore office. The chiller plant has been running for years. Three chillers cool the building. Three pumps push chilled water through the floors. Three valves balance the flow. There is a controller sitting in the panel room that talks to all of it.

But Ravi has no graphics screen, no trends, no energy report, and no way to start or stop equipment from his desk. Worse — nobody has told the plant what to do when the load changes. All three chillers run together whether the building is full or empty. Nobody stages them up when demand rises. Nobody stages them down when demand drops. The controller does not know how to do that.

Every morning Ravi walks to the plant room, reads the panel, and writes numbers in a register. If something trips at night, the guard calls him. He drives in. That is the system.

- **No graphical overview of the chiller plant**
  The operator had to physically walk to the panel room to check status — there was no screen showing what the plant was doing.
- **Live Modbus data with no software layer**
  The existing controller had live Modbus data but nothing to display it or act on it — the data simply sat unused inside the controller.
- **No remote on/off control**
  Every intervention — chillers, pumps, or valves — needed a physical visit to the panel room. There was no way to act from a desk.
- **No staging logic**
  All three chillers ran together regardless of actual cooling demand, wasting energy whether the building was full or empty.
- **No trend logs**
  When the facility head asked 'what was the chiller doing last Tuesday at 2 AM?', nobody could answer — there was no historical record.
- **No energy report**
  Monthly consumption was estimated, not measured — there was no data to baseline against or improve on.
- **Night-time faults meant a phone call and a drive**
  Any after-hours alarm meant the guard calling Ravi, who then had to drive in to diagnose and fix the issue in person.

> *"The controller already owned the hardware. EnSmart did not touch it. EnSmart placed Smart Nova above it, read its Modbus registers, and gave it a software brain it never had."*

This Was Not a New Installation. And the Controller Could Not Stage. That Was Exactly the Challenge.

- **Existing controller, not replaced.**
  The controller already owned the hardware. EnSmart did not touch it. EnSmart placed Smart Nova above it, read its Modbus registers, and gave it a software brain it never had.
- **Stage Up and Stage Down — added in Smart Nova.**
  The existing controller had no staging intelligence. Smart Nova added it entirely in the software layer. When cooling demand rises, Smart Nova stages up — bringing the next chiller and pump online automatically. When demand drops, Smart Nova stages down — shedding equipment in sequence to save energy. The controller just receives the command. All the thinking happens in Smart Nova.
- **Full graphics built from scratch.**
  Smart Nova rendered a live single-line graphic of the chiller plant — three chillers, three pumps, three valves, supply and return temperatures, valve positions, all moving in real time on one screen.
- **Monitor AND control from one screen.**
  Read-only was not enough. EnSmart mapped write registers so the operator could enable/disable chillers, start/stop pumps, and open/close valves directly from the graphics screen without touching the physical panel.
- **One week, start to finish.**
  Site survey, Modbus mapping, graphics design, Smart Nova staging logic, control wiring, testing, and handover — completed in seven working days.

- **CHW Enable and EN CHE Enable logic.**
  The control screen included dedicated enable/disable toggles for chilled water and chiller enable functions, giving the operator precise sequencing control alongside Smart Nova's automatic staging.

From First Site Visit to Live System — Seven Days

Day	Activity
Day 1	Site survey: existing controller identified, Modbus register map obtained from panel documentation, equipment list confirmed — 3 chillers, 3 pumps, 3 valves.
Day 2	Modbus communication established between Smart Nova and the existing controller, all registers verified live.
Day 3–4	Chiller plant graphics designed and built in Smart Nova — chillers, pumps, valves, piping, temperature points, status labels.
Day 5	Stage Up and Stage Down logic configured in Smart Nova, control write registers mapped and tested — CHW Enable, EN CHE Enable, individual equipment start/stop verified from screen.
Day 6	Energy report module configured, trend logging enabled, alarm thresholds set.
Day 7	Operator handover and training, staging logic demonstrated live, system signed off, Toshiba facility team live on Smart Nova.

What Changed After Go-Live

- **Chillers now stage automatically.**
  Before Smart Nova, all three chillers ran together day and night. Now Smart Nova stages them up when the building needs cooling and stages them down when it does not. Equipment runs only when it is needed. That is the single biggest change in how the plant operates.
- **Plant room visits dropped to near zero.**
  Ravi now opens his laptop, sees the chiller plant on one screen, and knows the status of all nine pieces of equipment in three seconds. The morning walk to the panel room is no longer the first task of the day.
- **Night faults handled without driving in.**
  When an alarm fires after hours, the on-call operator sees it on screen, identifies the faulted equipment from the graphic, and takes the first corrective action remotely — starting a standby pump or disabling a tripped chiller — before deciding whether a site visit is needed.
- **Historical trends now exist.**
  The question 'what was the chiller doing last Tuesday at 2 AM?' now has an answer. Trend data is logged continuously and available for review, fault diagnosis, and energy audits.
- **No capital expenditure on new hardware.**
  The existing controller was retained. The entire upgrade was Smart Nova, software, and integration. No panel replacement, no new DDC controller, no rewiring.
- **Energy report baseline established.**
  Monthly chiller plant energy data is now captured in Smart Nova's Energy Report module, giving the facility team a baseline to measure against for the first time.

Results and Value Delivered

Area	Before EnSmart	After EnSmart
Chiller Operation	All 3 chillers run together regardless of demand	Automatic Stage Up / Stage Down via Smart Nova
Visibility	No graphics — physical visit to check status	Live single-line graphic of full plant on one screen
Control	Physical panel visit for every intervention	Remote enable/disable, start/stop, open/close from screen
Night Faults	Guard calls operator — operator drives to site	Remote diagnosis and first action from on-call screen
Historical Data	No trend logs — no way to review past behaviour	Continuous trend logging for fault diagnosis and audits
Energy Reporting	Monthly consumption estimated, not measured	Energy Report module — measured baseline established
Hardware	Existing controller, no software layer above it	Same controller + Smart Nova software layer on top
Deployment	No BMS — manual operation throughout	Fully live in 1 week from first site visit

Frequently Asked Questions

Q: The existing controller has no staging logic. How does Smart Nova add it without touching the hardware?

A: Smart Nova sits above the controller in the software layer. It reads live data — temperatures, equipment status — over Modbus, makes the staging decision, and writes the start or stop command back to the controller over the same Modbus connection. The controller executes it. The intelligence stays in Smart Nova. No hardware change needed.

Q: The existing controller is from a different vendor. Does EnSmart replace it?

A: No. EnSmart connects to it over Modbus. The existing controller continues to own the field-level control logic. Smart Nova adds the software layer above it — staging, graphics, monitoring, remote control, trends, and energy reporting — without touching the hardware.

Q: What if the controller's Modbus register map is not documented?

A: EnSmart's commissioning team can scan live registers during site survey to reconstruct the map. In the Toshiba project the panel documentation was available, which accelerated the process. Most industrial controllers expose their registers through basic Modbus scanning tools.

Q: Can the operator accidentally override Smart Nova's staging logic?

A: The operator can manually intervene from the graphics screen at any time — that is by design. Smart Nova's staging logic resumes automatically once manual mode is released. The controller's hardware-level interlocks and safety sequences remain active throughout and cannot be bypassed by Smart Nova or the operator screen.

Q: Is this type of project replicable at other sites?

A: Yes. This is one of EnSmart's most common engagement types in India. Hundreds of buildings have functioning field controllers with no software layer and no staging logic above them. Smart Nova's integration-first approach means the project cost is a fraction of a full BMS replacement, and the timeline is measured in days, not months.

> *Most building operators in India are not running blind because they chose to. They are running blind because the software layer was never part of the original project scope, or the licence lapsed, or the integrator left and nobody followed up. Toshiba Bangalore had a well-maintained chiller plant. The controller was doing its job. What was missing was visibility and intelligence — a screen that showed what was happening, and a brain that decided what should happen next. Smart Nova provided both in one week, above the existing controller, without replacing a single piece of hardware.*

If the Controller Is Already There, the Brain Was Missing. Smart Nova Is the Brain.

EnSmart adds staging logic, live graphics, remote control, and energy reporting above your existing controller — no hardware replacement, live in days.

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