CASE STUDY · INDUSTRIAL / CHILLER AUTOMATION

Four Chillers. One Plant. Zero Automation. Here Is How That Changed in 14 Days.

How EnSmart's BACnet-Modbus Integration automated four chillers at Neemak Aluminium in Chennai — fully sequenced, fully monitored, zero manual operation — commissioned in 14 days.

Client: Neemak Aluminium · Location: Chennai, Tamil Nadu · Platform: EnSmart DDC + EnNode · Project: Chiller BMS Integration · Year: 2025

At a Glance

4	14	100%	0
Chillers Integrated	Days to Full Commissioning	Automated Sequencing	Manual Operation Required

The Challenge

Laxman is the Operations Manager at Neemak Aluminium in Chennai. He knows this plant inside out — the machines, the shifts, and the heat. Chennai has plenty of that.

But four chillers were running entirely on manual control. Every morning someone had to start them. Every evening someone had to stop them. If one chiller needed to hand over to another, a person had to make that call. If the wrong person was on shift, or someone forgot — cooling went out of sequence. In a metal processing plant, that is not just uncomfortable. That is a production problem.

- **All 4 chillers started, stopped, and sequenced by hand**
  Every single day. No schedule, no logic, no automation.
- **No central screen**
  Operators walked the floor to check what was running.
- **Sequencing knowledge lived in people's heads**
  When experienced operators left, the knowledge left with them.
- **No fault logging**
  Problems were found only after damage was already done.
- **Chiller controllers were isolated**
  No connection to any central system — four islands of control.

> *"Laxman saw the risk — four chillers, manual control, shift-dependent knowledge — and decided to fix it before it became a headline. EnSmart arrived. Fourteen days later, the chillers were running themselves."*

This Was Not a Simple On-Off Job — A Full Protocol Bridge

- **Two Protocols. One Panel. One Flow.**
  The field devices talked Modbus. The chillers had BACnet-native controllers. EnSmart's controller sat between them — reading Modbus values from the field, converting to BACnet, and sending commands to the chiller controllers. All inside one panel.
- **Sequence Logic Lives in the Chiller Controller.**
  The logic deciding which chiller starts first, when the next one comes on, and how they rotate — written directly into the BACnet-native chiller controller. Not in a laptop, not in a software layer. Inside the controller itself.
- **Values Go Up. Commands Come Down.**
  Two-lane road: values travel up from the field through Modbus, into EnSmart, converted to BACnet, into the chiller controller. Commands travel back down — from the chiller controller through BACnet, through EnSmart, out to the field. Bidirectional. Always in sync.
- **One Panel. Direct Wiring. Nothing Extra.**
  EnSmart DDC controller, IO modules, and EnNode gateway — all inside one panel. Field cables came straight in. No junction boxes in between. No extra hops.
- **14 Days on a Live Plant Site.**
  The EnSmart team arrived on a working plant floor. Machines running. People working. Panel up, wired, integrated, sequenced, tested, handed over — in 14 days.

The Architecture Behind the Automation

Layer	What EnSmart Does	Technology
Field Devices	Reads field signals — temperatures, pressures, flow — via Modbus RTU from all sensors	Modbus RTU/TCP
EnSmart DDC	Translates Modbus field values to BACnet objects; bridges both protocols in one panel	Modbus → BACnet
Chiller Controllers	Receives BACnet commands; runs sequencing logic stored inside the controller	BACnet IP/MSTP
Sequence Logic	Start/stop/rotation logic written directly into BACnet-native chiller controller	Native Controller Logic
EnNode Gateway	Protocol gateway functions; all housed in one panel with direct field wiring	EnSmart EnNode

14 Days. No Surprises. Here Is How It Went.

Day	Milestone
Day 1	Panel arrives on site in Chennai. All components inspected before work begins.
Day 2	Panel mounted in position. Field wiring started.
Day 3–4	IO module termination complete. Every field signal mapped and verified.
Day 5	Modbus devices commissioned. EnSmart controller reads live values from the field.
Day 6–7	Controller configured. Modbus to BACnet conversion set up and tested.
Day 8	BACnet link established with all four BACnet-native chiller controllers. Data flowing.
Day 9–10	Chiller sequence logic written and loaded into the BACnet-native chiller controller.
Day 11	Two-way communication verified. Values going up. Commands coming down. Both confirmed.
Day 12	Full system test. All four chillers run together under the new automated sequence.
Day 13	Laxman and the plant team walk through the system. Alarms, monitoring explained.
Day 14	Commissioning complete. System signed off. Handover done. Chillers running on their own.

What Laxman's Team Woke Up to on Day 15

- **Nobody Starts the Chillers Anymore**
  The system does it. Four chillers now start, stop, and rotate based on logic written into the controller. No person needs to make that call.
- **One Screen Tells the Whole Story**
  Chiller status. Running hours. Fault alerts. Laxman sees all four chillers from one place. He no longer walks the floor to find out what is happening.
- **Shift Change Is Not a Risk Anymore**
  Before, when an experienced operator went home, the knowledge went with him. Now the logic stays in the controller. It does not take breaks. It does not forget.
- **Faults Are Visible Before They Become Damage**
  If something is wrong, the system shows it. The team can act before a small problem becomes a production stoppage.
- **The Foundation Is Already Built**
  Energy monitoring, trending, additional equipment integration — all can now be added without starting from scratch. The panel and controller are already there.

Results and Value Delivered

Area	Before EnSmart	After EnSmart
Chiller Control	Manual start/stop/sequence every shift	Fully automated — zero manual operation
Monitoring	Walk-the-floor checks	Single screen: status, hours, faults
Sequencing Logic	In operators' heads — lost at shift change	Written into controller — always available
Fault Visibility	Found after damage	Visible on screen before production impact
Protocol Bridge	Modbus field devices disconnected from chillers	Modbus-to-BACnet bridge in one panel
Scalability	Manual process repeated for each change	Add energy monitoring or new equipment easily

> *Panel arrived Day 1. Chillers were running themselves on Day 14. What began as four manually operated machines became a fully automated, centrally monitored chiller plant — in two weeks.*

Ready to automate your chiller plant?

EnSmart deploys BACnet and Modbus integrations for industrial chiller plants. One panel. One team. Direct wiring from the field.

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