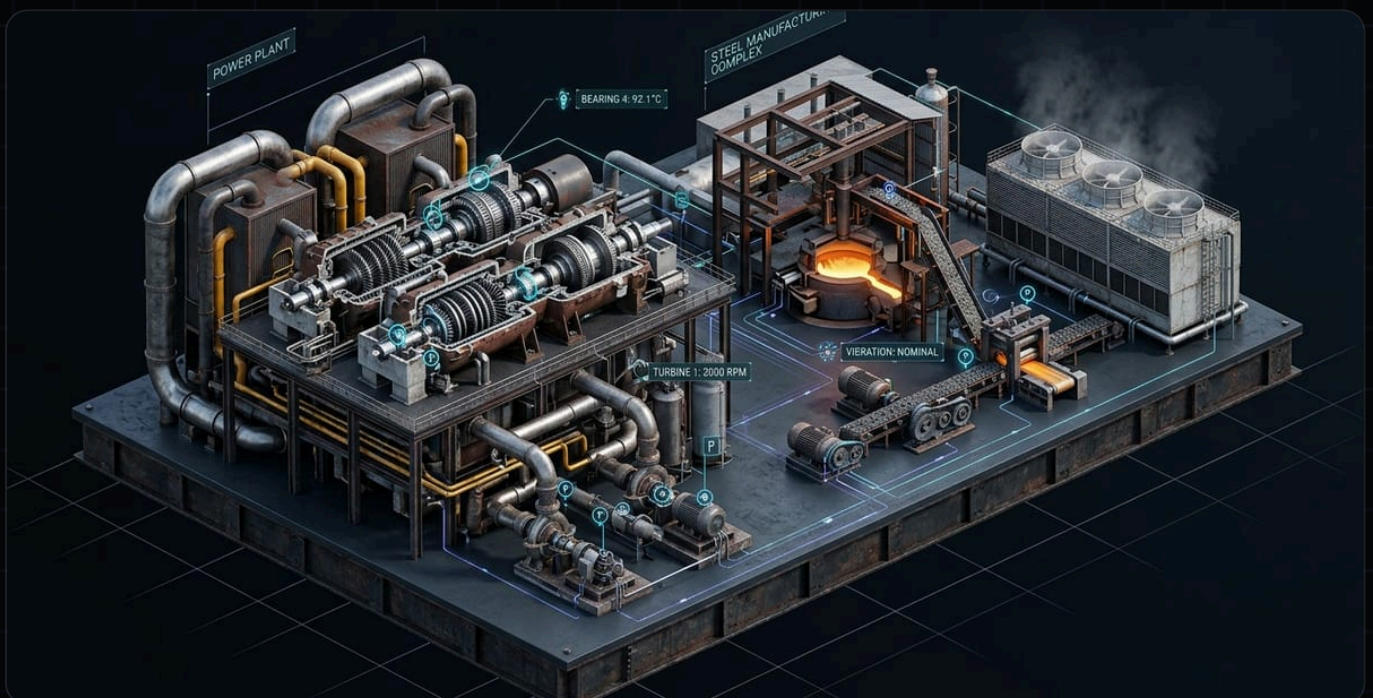


THE VEXRON USER GUIDE

From your first machine to your first **planned repair**.

How to connect Vexron to your plant, read machine health, act on early warnings, track downtime in rupees and keep your data safe. Plain words, one step at a time.



1 • CONNECT

Link your PLCs, SCADA and sensors.

2 • WATCH

Read health scores and vibration zones.

3 • ACT

Turn early warnings into planned jobs.

4 • SAVE

Track downtime and power in rupees.

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HOW TO READ THIS GUIDE

Sections 1 to 3 cover setup, which the Cybs Innovations team does with you. Sections 4 to 11 are for daily use. Some screens may change as the product grows. Charts, readings and messages in this guide are samples. Want to try first? The live demo at cybsinnovations.com/vexron runs on sample data.

Before you start

Vexron is software. It works with what your plant already has. Gather these five things before setup.

WHAT YOU NEED

WHY, AND HOW TO CHECK

A list of critical machines

The machines where an unplanned stop really hurts: main drives, ID fans, kiln drives, compressors, pumps, gearboxes. Section 2 helps you pick.

Your data sources

Which PLCs, SCADA tags and sensors already measure vibration, temperature, power or current on those machines. Your automation engineer will know.

PLC details

The make and model (Siemens S7, Allen-Bradley, Modbus devices, OPC-UA servers) and their network addresses.

A place for the gateway

Space in an electrical or control panel, with power and a network link to the PLCs.

Where the AI and dashboard run

A GPU PC or server in the plant, or the cloud. Your team opens the dashboard as a web app or a Windows desktop app.

Words used in this guide

- **Edge gateway:** a small device in your panel that reads your PLCs and sensors. It runs Vexron Edge OS.
- **Tag:** one value a PLC or SCADA system reports, like a motor temperature.
- **VMI-1:** our AI model that learns each machine's normal pattern and flags faults.
- **Health score:** one number that sums up how a machine is doing.
- **ISO zone:** A, B, C or D, from the ISO 10816 / ISO 20816 vibration standards.
- **OEE:** how well a machine runs: availability, performance and quality.

TIP

Pricing is per plant, after a short look at your machines and data sources. That look is a good time to get this list ready.

02

SETUP

Pick your first machines

Do not start with the whole plant. Start with the few machines where an unplanned stop really hurts. Prove the alerts against a baseline, then expand.

Ask three questions about each machine

COST

If it stops, does the line or the kiln stop? What does one hour cost?

HISTORY

Has it failed before? Bearings, gearboxes and fans that failed once often fail again.

DATA

Does it already report vibration, heat or current? If not, a sensor can be added.

Good first machines, by industry

INDUSTRY	MACHINES TO START WITH
Cement and mining	Preheater ID fans, cooler fans, kiln drives, mill gearboxes
Steel and metals	Caster and rolling mill drives, gearboxes, fans and pumps
Power plants	Turbines, boiler feed pumps and fans
Auto components	Presses, CNC machines, compressors and chillers
Chemical and fertilizer	Compressors and centrifugal pumps
Refractories and ceramics	Presses, pan mixers, tunnel kiln ID fans

TIP

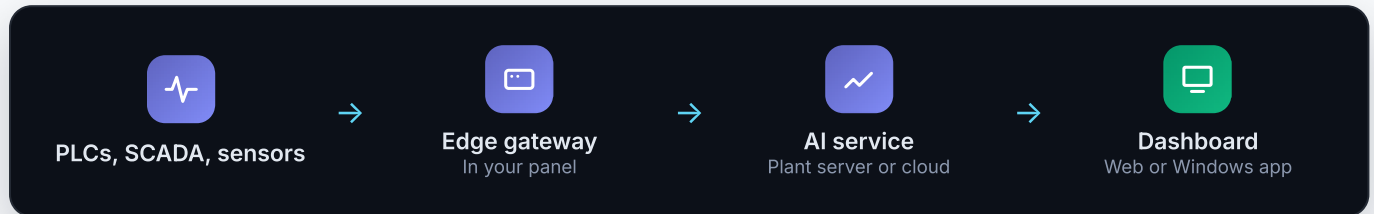
Put a rupee figure on one hour of lost production for each machine. The free downtime cost calculator at cybsinnovations.com/tools/downtime-cost-calculator helps. It shows where to start, and later it shows what Vexron is worth.

03

SETUP

Connect your machine data

The edge gateway reads your PLCs and sensors and sends the data on. No new control system and no middleware.



Steps

- 1 Mount the gateway** in an electrical or control panel near the machines. It runs on an industrial PC, a single-board computer, an NVIDIA Jetson or a small ESP32 board.
- 2 Link it to your PLCs.** Supported: Modbus TCP and RTU (RS-485), Siemens S7-300, S7-400, S7-1200 and S7-1500, OPC-UA with encryption, and Rockwell ControlLogix and CompactLogix over EtherNet/IP.
- 3 Pick the tags** for each machine: vibration, temperature, power or current.
- 4 Check the field console.** It is a local web page on the gateway that works without internet. It shows gateway health, live PLC tags and data waiting in the buffer.
- 5 Add a sensor where one is missing.** If a critical machine has no vibration sensor, one can be added through the Vexron platform.
- 6 Let Vexron learn.** VMI-1 needs time to learn each machine's normal pattern before its alerts mean much.

KEEP IN MIND

The gateway reads data. It does not take over control, and your trip circuits stay as they are.

04

DAILY USE

Find your way around

Open the Vexron dashboard in your browser or the Windows desktop app. The same screens serve the control room, the maintenance team and managers.



Illustration of a plant-wide view.

Plant view, 3D and 2D

Every machine on one screen, as plant diagrams and a 3D model of the line. Start here each shift to spot anything out of the ordinary.

Machine page

Open a machine to see its health score, live readings, vibration trend and ISO zone, and any alerts.

Alerts

Warnings from VMI-1 and your own rules, each with the signal behind it. See section 6.

Loss and OEE hub

Downtime cost and idle power in rupees, next to OEE. See section 9.

A SIMPLE DAILY HABIT

Morning: check the plant view and any new alerts. Mid-shift: open the machines that changed. End of day: confirm or reject the alerts you checked.

Read vibration numbers

The gateway works out four vibration numbers for each reading and places it in an ISO zone. Here is what each one tells you.

NUMBER	IN PLAIN WORDS
RMS velocity (mm/s)	The overall shaking of the machine. This is the number ISO zones use. A steady rise is the most common early sign.
Peak acceleration	The sharpest jolts. It reacts to short impacts, like a damaged bearing race.
Crest factor	Peak compared with average. A rising crest factor means impacts are growing, often early bearing damage.
Kurtosis	How "spiky" the signal is. Clean running is smooth; spikes point to impacts and wear.

ISO 10816 / ISO 20816 zones

A

Vibration of a newly commissioned machine.

B

Acceptable for unrestricted long-term running.

C

Unsatisfactory for long-term running. Plan action.

D

Severe enough to cause damage.

The zone limits depend on machine size and how it is mounted. Look up a reading with the free tool at cybsinnovations.com/tools/vibration-threshold.

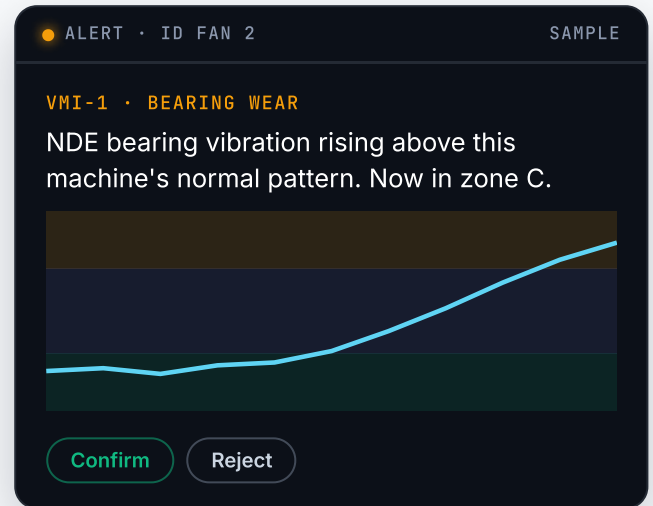
TREND BEATS ONE READING

A machine sitting in zone B for a year is fine. A machine moving from low B to high B in two weeks needs a look, even before it reaches C. That change is what VMI-1 watches for.

Act on an early warning

VMI-1 flags bearing wear, misalignment, imbalance and looseness, often days to weeks before failure. Here is what to do when an alert comes in.

- 1 **Read the alert.** It names the machine, the likely fault and shows the signal behind it.
- 2 **Open the trend.** Look at how fast it is rising and which ISO zone it is in.
- 3 **Check the machine.** Send a technician to listen, feel for heat and check mountings and lubrication.
- 4 **Confirm or reject the alert.** Your feedback helps the models learn your machines.
- 5 **Plan the repair** for the next planned stop, and order spares at the normal lead time.
- 6 **After the repair,** check the trend drops back to its normal level.



What each fault usually means on site

FAULT	COMMON CAUSES TO CHECK
Bearing wear	Lubrication, contamination, the bearing's age and load
Misalignment	Coupling alignment between motor and driven machine, after any recent work
Imbalance	Build-up or wear on fan blades and impellers
Looseness	Foundation bolts, base plates and bearing housing fixings

NEVER IGNORE A FAST RISE

If a reading jumps into zone D or keeps climbing fast, treat it as urgent and follow your plant's safety rules. Vexron warns. Your protection system protects.

Health scores, forecasts and spares

Some wear is slow. Forecasting shows where a machine is heading, so you can plan weeks ahead, not hours.

Health score

Each machine gets one health score built from its readings. Sort machines by score to see which need attention first.

Forecasts and remaining life

The AI service runs VMI-1 alongside open forecasting models such as Amazon's Chronos-Bolt and Google's TimesFM. They trend slow wear and estimate the remaining life of wearing parts.



Use forecasts to plan

- 1 **Check the forecast** for each critical machine once a week.
- 2 **Match it to your shutdown plan.** If a part may not last to the next planned stop, move the job earlier.
- 3 **Order spares in time.** Buy through your usual supplier at the normal lead time, without rush freight.
- 4 **Keep fewer "just in case" spares** for parts whose trend you can see.

TIP

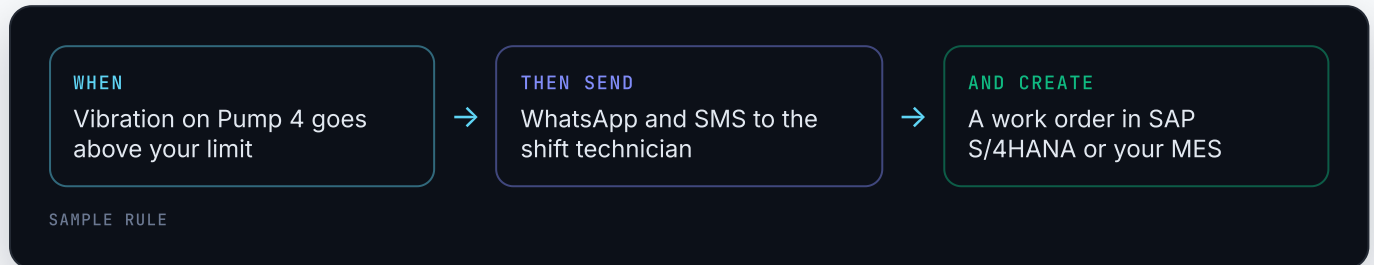
Share the weekly forecast with your stores and purchase team. It turns a breakdown spend into a planned order.

08

DAILY USE

Alert rules and work orders

Build rules with drag and drop. A rule turns a sensor trigger into a message or a job, so a warning reaches the right person.



Steps

- 1 **Pick the trigger:** a machine and a reading, such as vibration or temperature crossing a limit.
- 2 **Pick the action:** an SMS, a WhatsApp message, an MQTT event, or an entry in SAP S/4HANA or your MES.
- 3 **Pick who gets it.** Send it to the person who can act, not to everyone.
- 4 **Save and test** the rule, and check the message arrives.

Rules that work

- **Use ISO zones for limits.** A move into zone C is a clear, agreed trigger.
- **One rule, one job.** Separate rules for "warn the technician" and "tell the manager" keep things clear.
- **Keep VMI-1 alerts on.** Your own limits catch high readings. VMI-1 catches the early change before them.
- **Review rules monthly.** Drop rules nobody acts on, so the ones that matter stand out.

Downtime cost and OEE

Every stop is counted in rupees, so maintenance and finance work from the same number.

STOPS

Money lost while a machine is down, planned or not.

IDLE RUNNING

Power used while a machine runs but makes nothing.

MICRO-STOPPAGES

Short stops that are easy to miss but add up over a month.

OEE in one line

$$\text{Availability} \times \text{Performance} \times \text{Quality} = \text{OEE}$$

- **Availability:** how much of the planned time the machine actually ran.
- **Performance:** how fast it ran compared with its ideal speed.
- **Quality:** how much of the output was good.

Test a plan with the what-if calculator

- 1 **Pick a machine** and a change you are thinking about, like an extra planned stop or a new spare on the shelf.
- 2 **Compare the cost** of the plan with the downtime it may save.
- 3 **Take the result** to your finance team before you spend.

TIP

Bring the loss numbers to your monthly review. A machine with high downtime cost and a falling health score is your next project.

Energy, carbon and the assistant

Cut power waste

Idle motors

Find motors running with no load, and switch them off or change the schedule.

Time-of-day tariffs

Plan heavy loads for cheaper tariff hours where your process allows.

Peak demand

Keep an eye on peak demand so you avoid going over your contract limit.

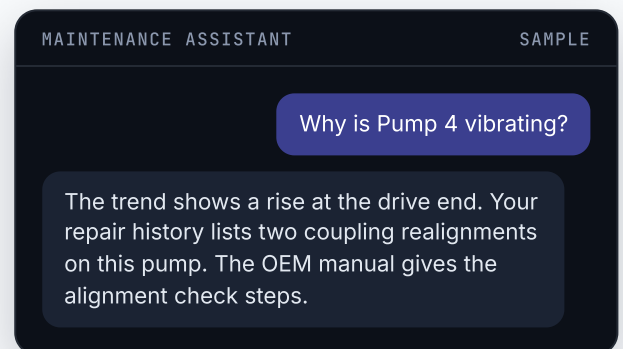
Carbon records

Vexron keeps Scope 1 and Scope 2 emissions records from your plant energy data. Exporters who report to EU buyers can use them in their reports.

Ask the maintenance assistant

A chat assistant for engineers on the shop floor. Its answers come from your own documents.

- 1 Add your documents:** OEM manuals, drawings and repair history.
- 2 Ask in plain words,** like "Why is Pump 4 vibrating?" or "What is the torque for this coupling?"
- 3 Check the answer** against the source before you act on it.



TIP

The more repair history you add, the more useful the answers get. Ask technicians to log what they found and fixed after every job.

Network drops, security and safety

When the network goes down

The gateway keeps collecting. It stores 100,000+ readings in a local buffer and sends them in time order once the link is back. You do not lose the trend. Check the field console to see how much data is waiting.

Security

ENCRYPTED LINKS

TLS 1.3 between Vexron parts, and OPC-UA with Basic256Sha256 encryption.

ROLE-BASED ACCESS

Give each person access to what they need, and no more.

AUDIT TRAIL

A record of user logins and changes, so you can see who changed what.

WHERE IT RUNS

The AI service can run on a GPU PC or server in your plant, or in the cloud.

SAFETY: WHAT VEXRON IS NOT

Vexron monitors machines and predicts faults. It is not an API 670 machinery protection system. Keep your existing protection relays and trip circuits in place, and keep following your plant's safety rules.

Good habits

- Remove access for people who leave, the same day.
- Keep the gateway panel locked, like any other control panel.
- Review the audit trail after any unexpected change to rules or tags.

Fix common problems

Try these first. If it still does not work, write to us.

PROBLEM	WHAT TO TRY
No data from a machine	Open the field console. Check the gateway sees the PLC, the network cable and the PLC address. Check the tag is still mapped after any PLC program change.
Data shows gaps	Check the field console for buffered data. After a network drop, readings arrive in time order once the link is back.
A machine shows no alerts at all	VMI-1 may still be learning that machine's normal pattern. Check the tags are reporting and the readings change with load.
Too many alerts	Reject the wrong ones so the models learn. Check your own rule limits. Use ISO zones rather than very tight fixed limits.
An alert came too late	Check the machine has the right sensor for the fault. Some faults grow fast. Talk to us about adding a vibration sensor.
Messages do not arrive	Check the rule is on and the phone number or WhatsApp contact is correct. Test the rule again.
Work orders do not appear in SAP or MES	Check the link to SAP S/4HANA or your MES is set up and the rule's action points to it.
Rupee figures look wrong	Check the cost per hour and power tariff set for that machine or line.

Still stuck?

Email us with the plant, the machine, the time and what you see. A screenshot helps.

info@cybsinnovations.com

Quick reference

Your routine

- **Every shift:** check the plant view and new alerts.
- **Every day:** confirm or reject the alerts you checked.
- **Every week:** review forecasts and order spares.
- **Every month:** review downtime cost, OEE and rules.

When an alert comes in

- Read the alert and the signal behind it.
- Check the trend and the ISO zone.
- Send a technician to check.
- Confirm or reject it.
- Plan the repair on the next stop.

ISO zones

- **A:** new machine level
- **B:** fine for long-term running
- **C:** plan action
- **D:** can cause damage

First-month checklist

- ☐ First critical machines connected
- ☐ Field console checked on site
- ☐ Rupee cost per hour set per machine
- ☐ Alert rules sent to the right people
- ☐ OEM manuals added to the assistant
- ☐ User access set by role

Your machines talk. Vexron listens.

Questions or need help? Write to info@cybsinnovations.com. Videos in English and Hindi, and the live demo, at cybsinnovations.com/vexron.

