

CABLE MANUFACTURING

Stranding Machine Monitoring in Cable Manufacturing: Case Study

Making productive stranding and hidden losses visible across 18 monitored machines.



Cable-production equipment in a continuous manufacturing environment.

18

Monitored stranding machines

2 shifts

Modeled operating schedule

**Mixed
generations**

Machine generations

THE CHALLENGE

Where was productive time being lost?

Scheduled machine time could include setup, reel and material waiting, idle periods, short interruptions and downtime.

THE SOLUTION

One view of the existing machine fleet

Novo AI's external retrofit sensors create a common machine-state layer. WatchMen makes productive stranding and hidden losses comparable across the monitored scope.

RESULTS AT A GLANCE**+10,522.8 h**

Additional productive capacity

Approximate annual 18-machine estimate

+29.23%

Productivity improvement

Customer-reported result

-43.75%

Less idle time

Modeled relative reduction

Quality remained the acceptance criterion. Higher productive stranding counted as an improvement only when cable output remained within specification.

Figures combine the customer-reported +29.23% productivity result with clearly labeled model calculations. pp = percentage points.

THE PRODUCTION CHALLENGE

A running strander can still hide lost capacity

Stranding is a continuous process, but setup, reel and material waiting, brief interruptions and downtime can still consume scheduled machine time. Product construction, material and pitch also change the production context.

57.6 min

Idle time per machine / shift

Modeled baseline

50.4 min

Reel & material waiting per shift

Modeled baseline

19.2 min

Microstop time per machine / shift

Modeled baseline

The case-study model uses two 8-hour shifts across 250 production days: 4,000 scheduled hours per machine and 72,000 hours across the 18 monitored machines.

What became visible

Production question	Before monitoring	With WatchMen
Is the stranding machine productively running?	Local observation / existing machine status	Validated machine-state timeline
Where did scheduled time go?	Losses reconstructed later	Productive, setup, idle and downtime periods
How much time went to reel changes and setup?	Difficult to compare consistently	Comparable event durations and trends
What about short interruptions?	Microstops were easy to miss	Continuous visibility and history
Why did an order take longer?	Order context without physical timeline	Order context plus machine behavior
When should the team react?	Retrospective review	Configurable deviation alerts

Improve the process

When the target is realistic, investigate waiting, setup, reel readiness, microstops and machine behavior.

Check the planning assumption

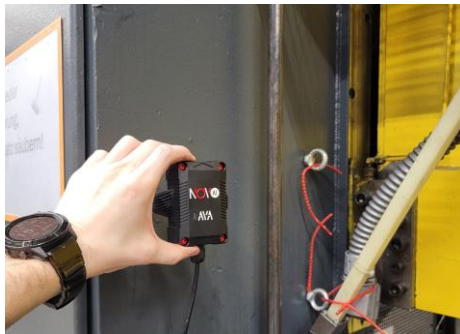
When cable construction, material or quality limits performance, review the planned value and production master data.

Read the model correctly: the +29.23% productivity improvement is the supplied project result. The productive-time and loss tables translate that result into a consistent capacity scenario.

IMPLEMENTATION

One monitoring layer across the pilot fleet

External Novo AI sensors create a common machine-state layer without basic PLC access. Edge processing and WatchMen make productive stranding, idle periods and recurring interruptions visible across existing equipment.



Novo AI retrofit sensor on existing cable-production equipment.

Approx. 15 min

Installation benchmark per machine

No basic PLC or machine-control intervention.
 $18 \times 15 \text{ min} = 270 \text{ min} / 4.5 \text{ h}$ cumulative sensor-mounting time.
 This is not 4.5 hours of production downtime.

01

Sense

External sensors capture physical machine behavior.

02

Interpret

Edge processing and validation support state detection.

03

Add context

WatchMen links machine states with order and production context.

From installation to operational use

Stage	Project milestone
Day 0	Sensors installed on the 18 monitored machines.
Days 1–3	Signal collection and initial classification.
Weeks 1–2	State validation and baseline definition.
Months 1–2	Loss reviews, improvement routines and onboarding.
Month 3	Evaluate results against the project baseline.

The implementation path below is illustrative. The approximately 15-minute installation value is a generic Novo AI benchmark; customer-specific learning and onboarding dates were not supplied.

18-machine monitored scope

All 18 stranding machines are included in the monitored scope. Exact machine build years are not verified.

FINDINGS AND ACTIONS

Turn the timeline into a production response

Monitoring supplies the machine evidence. The production team can then focus on the largest recurring losses and verify whether process changes release usable stranding capacity.

01 Reduce hidden idle time

Modeled idle time falls from 480 to 270 hours per machine/year, releasing 210 hours per machine.

Response: Improve material readiness, next-order preparation and response to extended waiting.

02 Shorten setup and reel-related waiting

Setup/changeover falls from 500 to 390 hours and material/reel waiting from 420 to 300 hours per machine/year in the model.

Response: Prepare reels, material and setup tasks before the machine becomes available.

03 Make recurring microstops actionable

Modeled microstop time falls from 160 to 132 hours per machine/year, a 17.50% reduction.

Response: Investigate repeated short interruptions and verify the same indicators after action.

04 Reduce downtime and improve planning

Downtime falls from 240 to 190 hours per machine/year in the model.

Response: Link machine events to order context so planning assumptions and process losses can be separated.

Use comparable production conditions

Compare machines and orders with cable construction, material, pitch, reel configuration and quality requirements in view. More runtime alone does not establish better production.

A REPEATABLE IMPROVEMENT CYCLE

1 Measure

Record machine states.

2 Investigate

Review events and causes.

3 Act

Change the relevant process.

4 Verify

Compare the same metrics.

RESULTS

More scheduled time became productive

+10,522.8 h

Productive capacity per year

Approximate annual 18-machine estimate

The model estimates additional productive stranding capacity across the 18 monitored machines after reducing nonproductive time. This is annualized capacity, not a full year of directly observed extra output.

Loss category	Before	After	Time released
Idle / waiting	8,640 h	4,860 h	3,780 h
Reel / material waiting	7,560 h	5,400 h	2,160 h
Setup / changeover	9,000 h	7,020 h	1,980 h
Downtime	4,320 h	3,420 h	900 h
Microstops	2,880 h	2,376 h	504 h
Other / supporting losses	3,600 h	2,401.2 h	1,198.8 h
Total capacity released			10,522.8 h

The +10,522.8 h annual gain comes from lower modeled losses across the same 72,000 scheduled machine-hours. The categories below are parts of the same released capacity and must not be added again.

Where the additional productive capacity comes from

MODELED ANNUAL LOSS REDUCTION / 18 MONITORED MACHINES

The table shows how the modeled capacity gain is distributed across recurring loss categories.

Per machine / 8-hour shift	Before	After
Idle time	57.6 min	32.4 min
Reel / material waiting	50.4 min	36.0 min
Setup / changeover	60.0 min	46.8 min
Microstop time	19.2 min	15.84 min

Released loss hours and additional productive capacity describe the same time. The total equals the +10,522.8 h annual capacity estimate.

Keep the measures distinct

Productivity, productive-time share, OEE, order duration and cable output describe different outcomes. The loss reductions above explain where modeled capacity is released; they are not separate benefits to add on top.

pp = percentage points. Calculation basis and KPI interpretation are summarized on page 6.

APPLYING THE FINDINGS

What to review in your own cable production

Repeated losses become actionable when machine behavior, order expectations and production context are reviewed together. Prepare these inputs for a practical pilot review.

Bring to a pilot review	Why it matters
Machine and cable-product groups	Compare technically similar orders before interpreting performance.
Product-specific targets	Check what stranding performance is realistic for each cable construction.
Quality acceptance criteria	Define the technical requirements that productivity improvements must respect.
Order / ERP context	Connect planned machine, order duration and expected production context.
Shift and stop-reason context	Separate waiting, setup, reel changes, maintenance and faults when investigating a loss.

What the sensor can tell you

When physical machine behavior changed, when productive stranding stopped and whether a pattern recurred.

What needs context

Why the event happened. Order data, material/reel context, operator input and investigation provide the organizational cause.

A useful daily review

Start with the largest recurring losses. Check the affected order and material context, agree an action, then compare the same indicators after the change.

CALCULATION BASIS AND KPI INTERPRETATION

Project inputs: 18 monitored machines and a customer-reported 29.23% productivity increase. **Operating model:** 2 × 8-hour shifts × 250 days = 4,000 scheduled hours per machine, or 72,000 monitored-scope hours. **A 50.0% productive baseline × 1.2923 gives 64.615% after improvement. The annual gain is 72,000 × 14.615% = 10,522.8 hours.**

Annual hours and individual loss reductions are illustrative model outputs. OEE, productive-time share, cable output and order duration are separate KPIs. Capacity gains and reduced losses represent the same released machine time.

See what your stranding machines actually deliver

Discuss your machine groups, recurring losses and a suitable pilot with Novo AI.

[Request a WatchMen demo →](#)