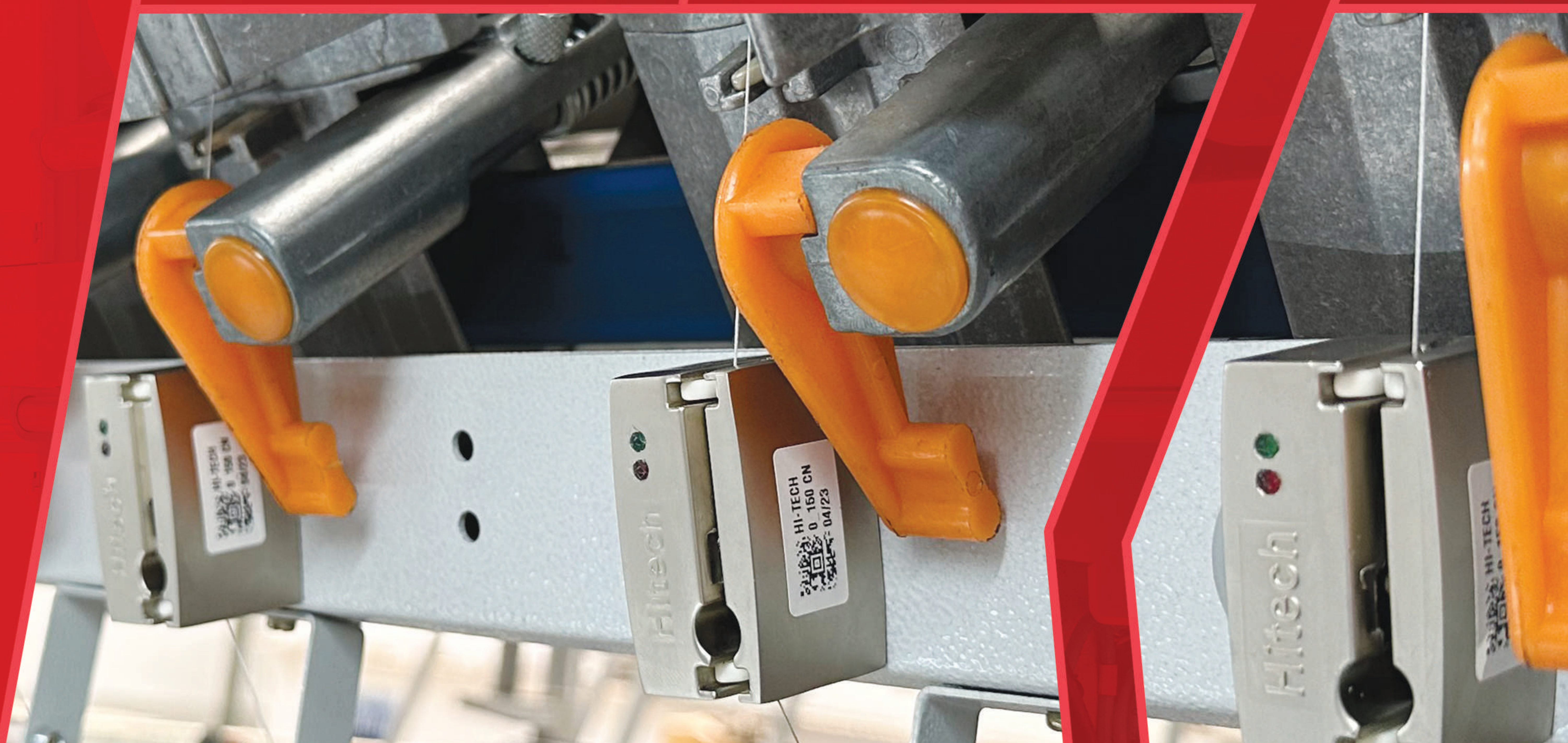




YARN TENSION MONITORING SYSTEM

Vision of our Founder

K.C.Patel (1955-2007)

Customers should be able to produce
"Perfect Yarn" (using Hitech Products and Solutions)

He always believed in the idea of **"Self reliant nation"**
and set the base of a deep tech company.

Even today, his vision is a guiding light at Hitech
and many individuals who had a chance to
work with him."

In 1993, Hitech developed Online Yarn Tension
Monitoring System (YTMS)

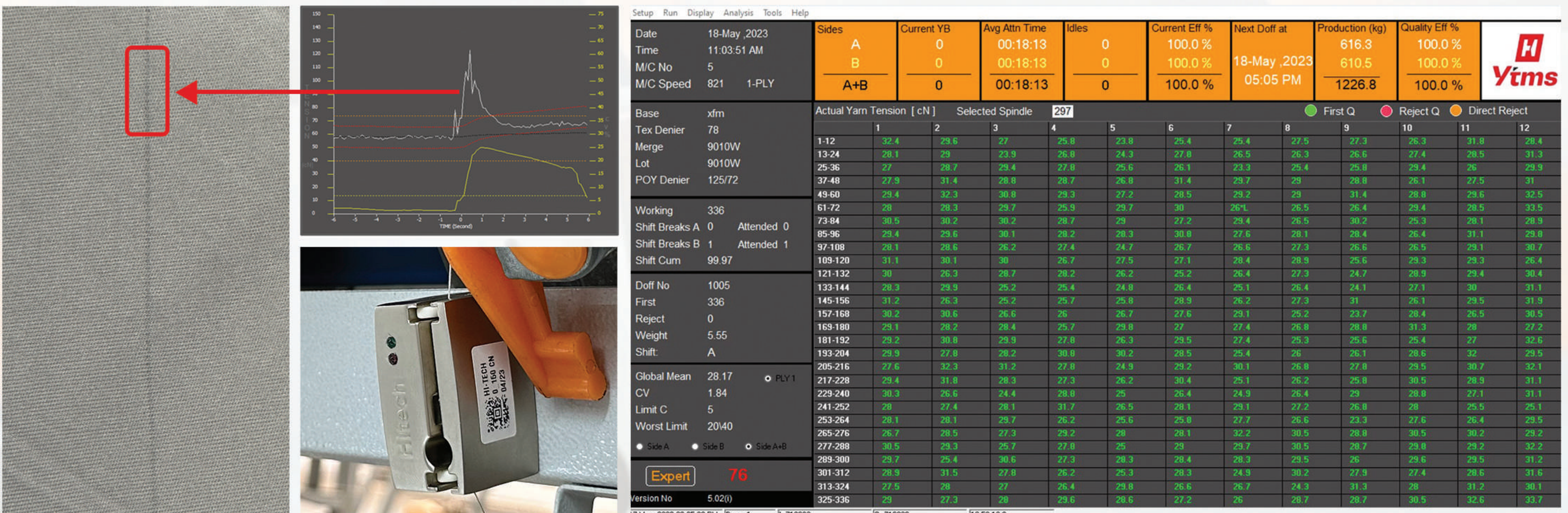
2,00,000 +
NCD sold

1300+
YTMS
installed

4,50,000 +
Tension
sensor
installed

Slight variation in T2 tension may results in dyeing and other quality related problems, **The YTMS System can take care of these problems through**

- ✓ Continuous monitoring of T2 tension (100 readings/second).
- ✓ Recording of Tension variation, CV%, and drifts using various monitoring limits.
- ✓ Down gradation of faulty packages by number and type of fault events.
- ✓ Alarms and cutter activation option for Faulty positions.
- ✓ Error analysis of stored events.
- ✓ Detect surge speed and optimize process parameters.
- ✓ Documented raw material faults to provide feedback to spinning

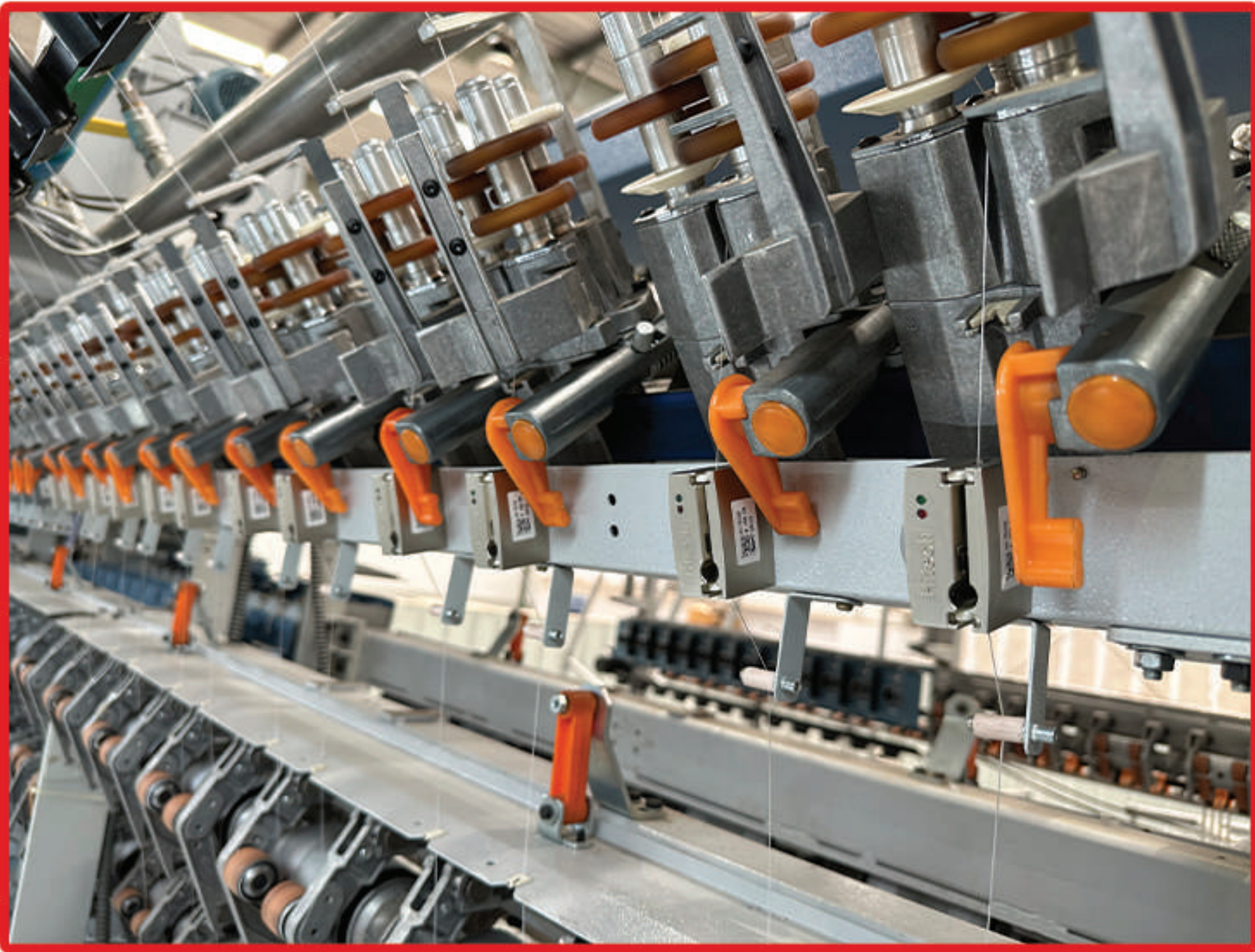


Current limitations

Method	Check Entire Package	Automatic Checking	Cheking Stage	Effectiveness
Manual Tension checking	No	No	At Line	Low
Tube Knitting & Dying	No	No	Off Line	Medium
Checker	No	No	Off Line	Medium
YTMS	Yes	Yes	On-Line	High

Concept of Online Tension monitoring system

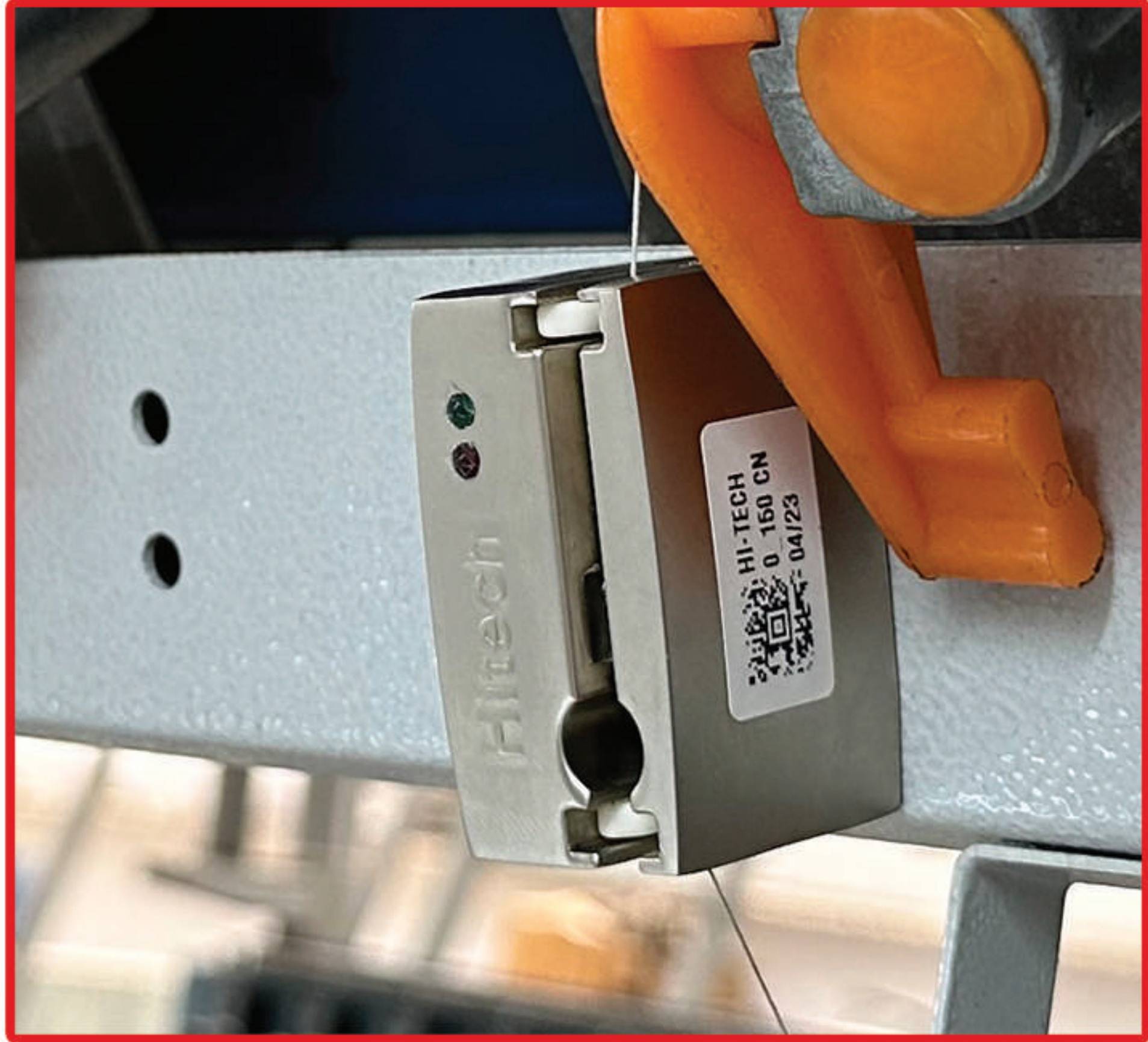
- ✔ YTMS (Yarn Tension Monitoring system) continuously monitors yarn quality by monitoring **T2 tension**.
- ✔ This is achieved by installing a high accuracy tension sensor in T2 zone.
- ✔ System electronics and YTMS software process these data to records tension variations and peaks which exceeds control limits.



Sensor working principle

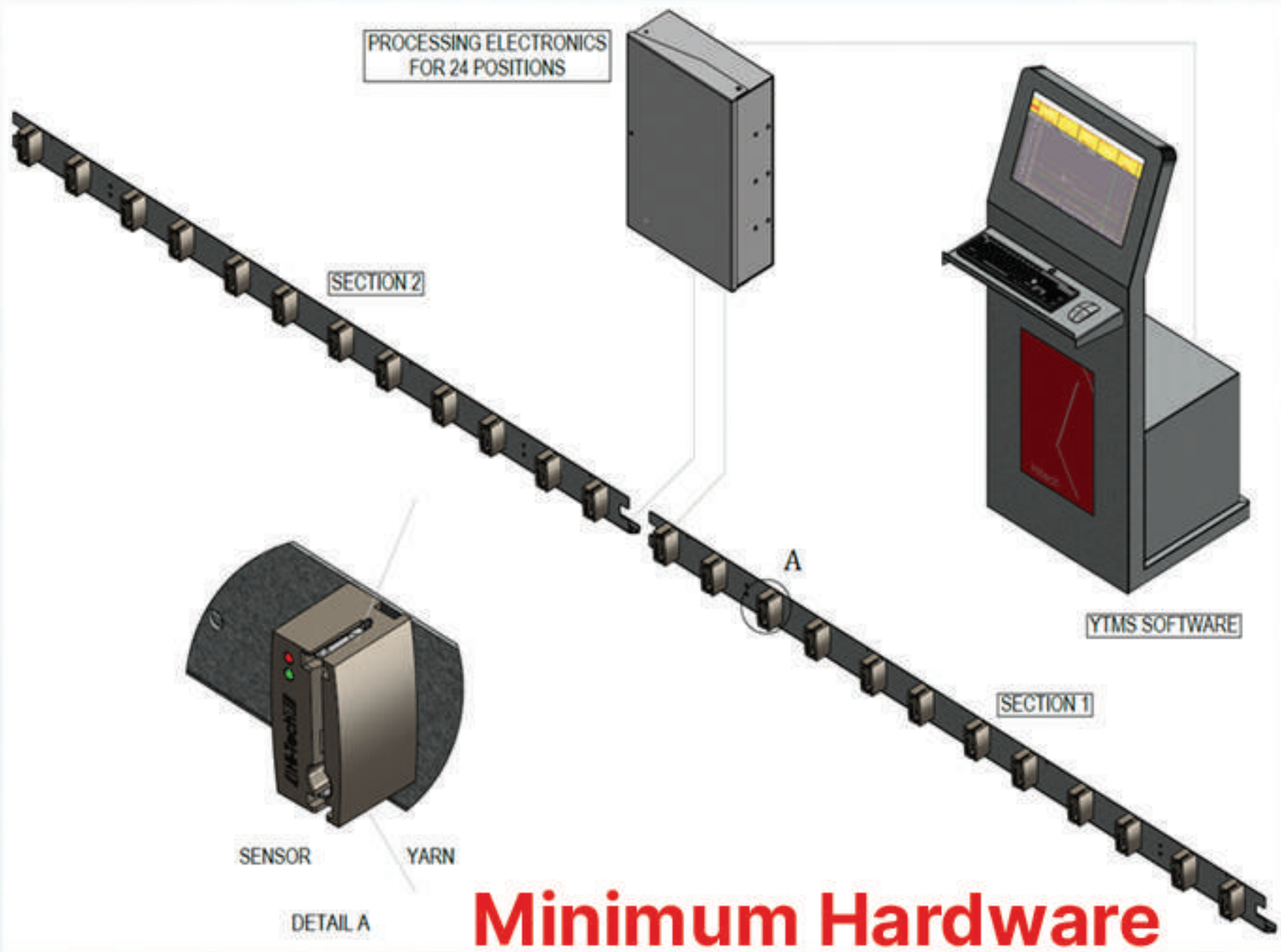
- ✔ Yarn tension deflects a high-quality spring element. This deflection is accurately measured using hall effect technology for further processing.
- ✔ The sensors are designed to operate in harsh industrial environment and are having very high long term stability and accuracy.

Parameter	Minimum	Maximum	UOM
Working principle	Hall effect		Technology
Measuring range	0	150	cN
Operating Temp	5	70	Deg C
Supply voltage	18	24	vdc
Output voltage	0.3	10.3	vdc
Current	20	35	mA



Guide material is 99.7% alumina, diamond-polished to 0.2-0.35 micron suitable to most yarn types

YTMS Hardware



Minimum Hardware

System highlights

- ✔ One controller card to perform all operations for 24 positions.
- ✔ Scan rate 100hz.
- ✔ Robust single chip ethernet architecture.
- ✔ Isolated mounting for easy maintenance.
- ✔ Optically isolated and fault tolerant IOs.
- ✔ Failure rate <0.0001%.

YTMS Home Screen

Setup Run Display Analysis Tools Help

Date	05-Jun ,2022		Sides A B A+B	Current YB 11 14 25	Avg Attn Time 02:25:54 01:00:59 01:34:12	Idles 0 0 0	Current Eff % 91.7 % 89.4 % 90.5 %	Doff At 05:50:34	Production (kg) 47.1 43.5 90.7	Quality Eff % 98.5 % 99.2 % 98.9 %	Status				
Time	22:52:52														
M/C No	68														
M/C Speed	705	1-PLY													
Base			Actual Yarn Tension [cN] Selected Spindle 47 First Q Reject Q Direct Reject												
Tex Denier	150			1	2	3	4	5	6	7	8	9	10	11	12
Merge	K3108168		1-12	48.7	YB	45.2	54.2	48.6	49.7	48	43.2	48.3	46.5	46.8	52.2
Lot	DN680492 ik		13-24	44	45.8	46.7	43.1	44.3	47	44	40.9	46.2	47.3	45.6	45.3
POY Denier	250/144		25-36	49.2	47.5	47.5	48.1	47.9	51.1	49	46.8	52.9	46.7	44.7	47
			37-48	55.6	48.8	49.7	49.4	49.1	44.2	49.7	48.6	41.2	48	37.8	43.7
Working	239		49-60	47.3	46.1	45.4	49.7	47	45.3	47.3	51.5	44.5	52.2	52.1	50.9
Shift Breaks A	9	Attended 0	61-72	51.9	45.8	52.3	53.6	55.7	51.3	52.7	56.7	47	YB	48.1	43.5
Shift Breaks B	14	Attended 2	73-84	49	49.6	YB	45.1	52.8	YB	YB	45.3	YB	YB	48.7	45.8
Shift Cum	94.57		85-96	48	48.7	49.4	YB	53.5*H	48.9	44.1	48	47.9	47.6	48.9	51.2
			97-108	47.3	50.7	61.6	49.5	54.3	YB	50	YB	55.2	50.4	53.3	48.1
Doff No	479		109-120	51	54.8	46.2	54	53.3*L	55.2	47.4	54.3	52.7	48	YB	49
First	261		121-132	44.3	42.9	47.4	44.6	43.2	48.9	49.3	54.9	41.5	50	52.3	52.3
Reject	2		133-144	48.5	46.9	YB	51.6	45	45.9	48.8	41.3	39.8	44.5	YB	48.3
Weight	5.45		145-156	44.8	47.1	46.6	48.8	49.7	47.2	45.7	51.8	47.9	49.7	43.8	43
Shift:	B		157-168	45.2	41	50.2	48.4	50.9	45.4	49.1	47.3	45.8*H	47.6	52.1	50.4
			169-180	46.4	47.2	44.6	48.8	49.1	49.4	53.7	48.2	48.9	50.6	47.3	50.9
Global Mean	48.11	PLY 1	181-192	46.3	50.4	49.8	50.6	46.8	49.4	50	45	45.3	45.2	42	49.9
CV	1.47		193-204	50.4	48.6	48.2	46.9	47.8	43.6	44.3	48.2	44.2	49.8	44.4	47.4
Limit C	10		205-216	44.5	42.3	51.6	YB	YB	52.7	YB	YB	49.1	YB	48.2	44.5
Worst Limit	35\65		217-228	46	50	47.9	49.5	51.9	49.5	YB	48.9	51.6	49.6	41.5	44.3
		Side A Side B Side A+B	229-240	39.1	YB	YB	42.7	39.9	41.3	39.9	46.8	43.1	44.5	41.6	43.3
			241-252	49.3	49.1	52.2	42.3	51.2	55.3	YB	48.9	56.2	53.7	54.9	45.2
			253-264	48.1	49.9	YB	54.8	58.1	57.2	YB	YB	51.9	51.9	51.3	46.6
Expert 1250															
03-Jun, 2022 01:28:17 PM Days=11 I=2066754 O=2066754 9:24:36.3															

YTMS Quality Parameters

YTMS software can capture tension variation using following parameters

Error Analysis Parameter

PLY 1

Floating Limit B	8	[+/- cN]	Transient	Grade B	1	Global	1	CV	N/A
Floating Limit C	10	[+/- cN]	Grade C	1	1	1	N/A		
Time limit for Transient Error	1.6	<0.2-2.0> [Sec]	Fault Counter	1	1	30			
Time limit for Global Error	2.1	<2.0-6.0> [Sec]	Yarn Break Threshold	11	[cN]	Time Limit for Yarn Break	4	<1-50.0 > [Sec]	
Worst Lower Limit	25	[cN]	Mean Drift Threshold	10	[cN]	Period for Long Mean	30	<6-3000 > [Sec]	
Worst Upper Limit	60	[cN]	Period for Group Error	30	<30-600 > [Sec]	Events for Group Error	3	<3-100 > [events]	
Worst Limit Exceeding	30	sec(s)	☒ Enable CV based rejection						
Max CV limit	5	[%]							
Period for CV Error	6	<2.0-12.0 > [Sec]							

OK

Cancel

Help

- ✓ Inter package Mean Tracking
- ✓ Mean Drift Detection (configurable period)
- ✓ Floating mean tracking
- ✓ Global & transient events. (configurable period)
- ✓ CV events.
- ✓ Peak Event recognition
- ✓ Group Error Detection
- ✓ Zero Defect position Display for producing Most premium yarns

YTMS Reports

- ✓ Side Wise Breaks displays
- ✓ Provision to Mark Idle positions.
- ✓ Reliable BPT/ BPH figures.
- ✓ Accurate Down time break up.
- ✓ Shift Wise / Doff Wise Reports.
- ✓ Detailed Package Report for accurate bobbin tracking.
- ✓ Graphical Reports for Quick comparison.

Date

05-Jun-2022

Time

22:54:10

M/C No

68

M/C Speed

705 1-PLY

Sides

A

B

A+B

Current YB

12

14

26

Avg Attn Time

02:12:51

01:02:16

01:31:40

Idles

0

0

0

Current Eff %

90.9 %

89.4 %

90.2 %

Dot At

05:50:34

Production (kg)

48.7

45.2

94

Quality Eff %

98.5 %

99.2 %

98.9 %

Status

Side A

Side B

Side (A+B)

Side A vs B

Custom 1

Custom 2

Clr

Shift Analysis

Period 25-May-22 to 30-May-22

Start Date

Shift

Weight

Mech Eff

Qual Eff

Breaks

Refrs

Break/Hour

Rejects

Quat Cuts

Idle Time

Rej %/Hr

Fullpacks

Totalpacks

Full %/Hr

OilLoss

25-05-2022 08:00:05

A

2097

97.22 %

98.86 %

50

54

23.84

417

7

0

88.100

0.14 %

3

393

1.00 %

00:00

25-05-2022 08:00:05

B

2087

96.74 %

99.95 %

37

35

17.73

308

10

1

103.250

0.45 %

1

747

0.17 %

00:00

25-05-2022 08:00:05

Summary

4184

96.98 %

99.71 %

87

89

20.79

363

17

1

191.350

0.29 %

4

1140

0.46 %

00:00

26-05-2022 08:00:05

A

2120

98.25 %

99.31 %

32

34

15.69

267

13

0

95.320

0.63 %

3

373

0.99 %

00:00

26-05-2022 08:00:05

B

2094

97.05 %

99.78 %

34

34

15.34

282

14

0

93.220

2.32 %

2

719

0.34 %

00:00

26-05-2022 08:00:05

Summary

4214

97.65 %

99.50 %

66

69

15.56

276

27

0

143.540

1.50 %

5

1092

0.56 %

00:00

27-05-2022 08:00:05

A

2112

97.03 %

98.22 %

61

64

28.88

508

14

0

63.300

1.78 %

0

432

0.00 %

00:00

27-05-2022 08:00:05

B

2091

95.98 %

99.17 %

62

56

31.87

550

8

1

127.220

0.83 %

386

795

75.49 %

00:00

27-05-2022 08:00:05

Summary

4183

96.50 %

98.69 %

127

120

30.36

529

22

1

192.540

1.31 %

386

1217

47.49 %

00:00

28-05-2022 08:00:05

A

2094

98.62 %

99.91 %

62

61

23.75

517

12

3

107.100

0.82 %

218

434

63.54 %

00:00

28-05-2022 08:00:05

B

2090

96.85 %

98.81 %

51

51

24.4

425

19

1

98.360

1.82 %

341

748

67.54 %

00:00

28-05-2022 08:00:05

Summary

4184

96.79 %

98.68 %

113

112

27.07

471

31

4

205.470

1.32 %

559

1162

73.13 %

00:00

29-05-2022 08:00:05

A

2099

97.29 %

96.56 %

53

47

25.25

442

12

0

85.490

3.44 %

155

408

57.89 %

00:00

29-05-2022 08:00:05

B

2083

95.92 %

97.66 %

49

38

23.68

408

28

1

129.140

2.34 %

312

702

62.44 %

00:00

29-05-2022 08:00:05

Summary

4168

96.61 %

97.10 %

102

85

24.47

425

40

1

215.030

2.90 %

467

1110

60.65 %

00:00

Spende No

Start Date Time

End Date Time

Length

Quality

Run Time (mins)

Package Weight (T)

T

G

C

V

1

26-05-2022 09:57:11

26-05-2022 14:45:50

Short

Zero D

289

3414

0

0

0

0

0

2

26-05-2022 14:46:12

26-05-2022 14:46:23

Short

Zero D

0

2

0

0

0

0

0

3

26-05-2022 14:48:19

26-05-2022 22:48:17

Over

Zero D

456

5561

0

0

0

0

0

0

4

26-05-2022 22:48:50

27-05-2022 06:47:31

Over

First Q

479

5662

1

0

1

1

1

1

5

26-05-2022 22:48:55

27-05-2022 06:47:31

Over

First Q

479

5661

0

0

0

0

0

0

6

26-05-2022 14:48:24

26-05-2022 22:48:17

Over

Zero D

456

5511

0

0

0

0

0

0

7

26-05-2022 06:47:59

26-05-2022 14:45:50

Over

Zero D

478

5652

0

0

0

0

0

0

8

26-05-2022 06:47:59

26-05-2022 14:45:50

Over

Zero D

478

5652

0

0

0

0

0

0

9

26-05-2022 14:48:24

27-05-2022 22:48:17

Over

Zero D

456

5511

0

0

0

0

0

0

10

26-05-2022 22:48:50

27-05-2022 06:47:31

Over

Zero D

479

5662

0

0

0

0

0

0

11

26-05-2022 22:49:01

27-05-2022 06:46:52

Over

Zero D

478

5652

0

0

0

0

0

0

12

26-05-2022 14:48:30

27-05-2022 22:47:44

Over

Zero D

455

5503

0

0

0

0

0

0

13

26-05-2022 06:47:59

26-05-2022 14:46:18

Over

Zero D

478

5658

0

0

0

0

0

0

14

26-05-2022 06:48:04

26-05-2022 14:46:18

Over

Zero D

479

5657

0

0

0

0

0

0

Quality Data

Production Data

Quality packs

Quality Kg

Production packs

Production KG

Pack Quality

Packs

Packs (kg)

kg %

Zero Defect

906

3306.4

78.21 %

First Quality

159

738.7

18.45 %

Second Quality

6

25

0.01 %

Reject Quality

6

25

0.01 %

Direct Recd Qty

21

109.7

0.25 %

Total

1092

4329.8

Total Reject

3.34 %

First

18.45 %

ZeroD

78.21 %

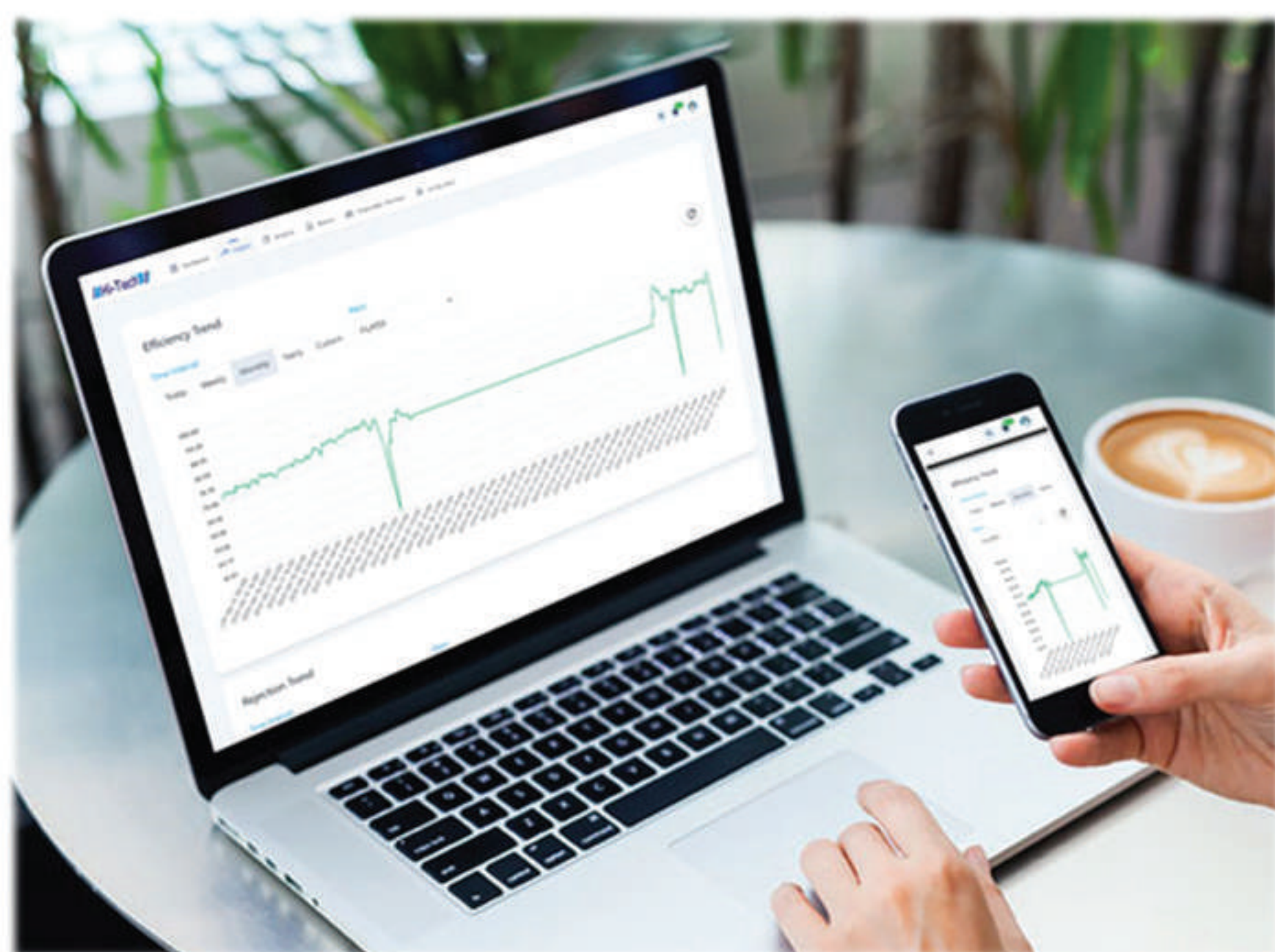
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06-06-2022

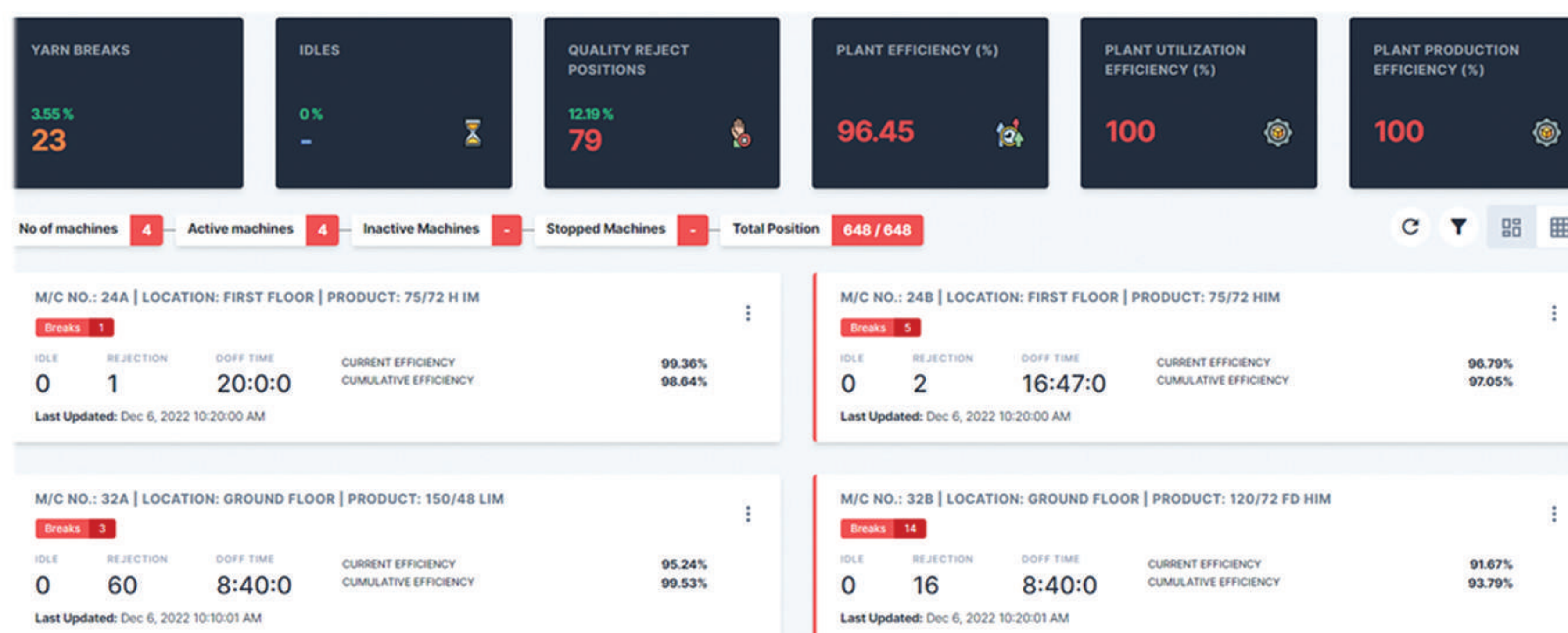
06-06-2022

06-06-2022

Centralized Production & Quality Monitoring System

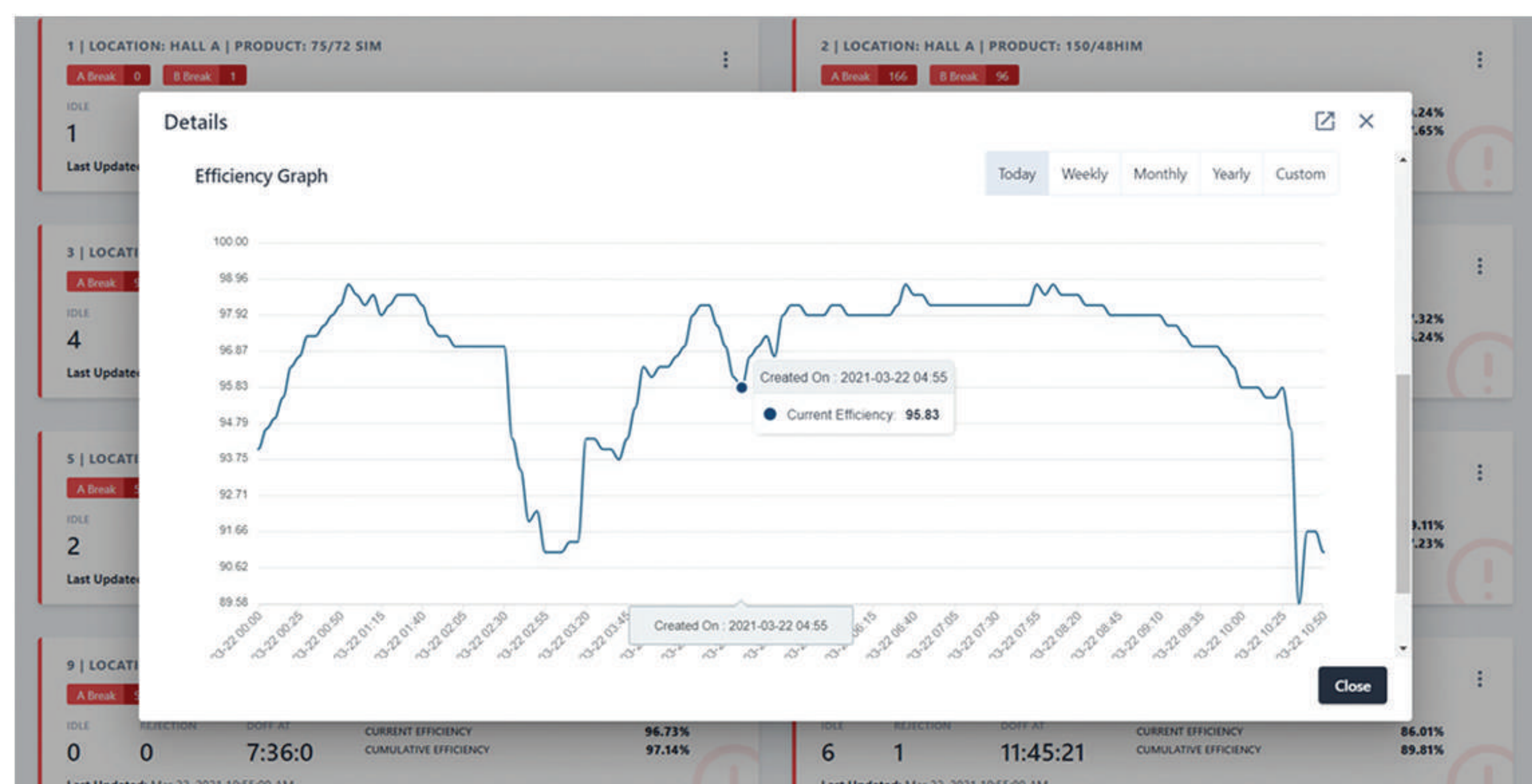


- ✓ Cloud PQMS is an essential tool for remote monitoring of single machine or a group of machines.
- ✓ All this information is available through a secure cloud network on internet-enabled PCs and mobile devices.



Plant and Machine efficiency trend

Industry's most informative cloud service



- ✓ Programmable email alerts
- ✓ Updated plant over view
- ✓ Detailed graphical view of various data like efficiency, rejection and idle/machine

Other products: Doffmatic
Auto Doffing system for manual type DTY and ATY Machines.

- **STORAGE FOR ONE PACKAGE**
- **STORAGE FOR TWO PAPER TUBES**
- **SHORT PACKAGE ISOLATION**
- **"QUICK DETACH" FEATURE REDUCES MAINTENANCE DOWNTIME.**
- **"COST EFFECTIVE SERVICE AND MAINTENANCE"**



Our Strength, **Your Advantage**

- ✓ 1100 + Active system.
- ✓ Made in India
- ✓ System uses latest in hardware and software Technology for robust performance.
- ✓ YTMS is Well accepted by variety of Quality conscious users world wide.
- ✓ Sensors uses mil grade raw material for reliable performance in harsh environment.
- ✓ Sensor failure < 0.001% / PA
- ✓ Reliable Sensor readings for Tighter Quality tolerance.



CREATING VALUES THROUGH INGENIOUS TECHNOLOGIES

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