Document No.:

Title: User Guide for Andon board

Lịch sử thay đổi/ Rev Control

Bản *Rev*	Ngày *Date*	Trang thay đổi *Page of change*	Nội dung thay đổi *Changed*	Biên soạn *Author*
A			*New Release*	

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Problem

Production output relies on highly manual tracking:

- Time-consuming and human error.
- Difficulty in real-time monitoring.
- Delayed corrective actions.
- A manual approach limits transparency.

Scope

In Scope:

- Built in SHPT (F5 and F3)
- Real-Time Production Data Display
- Hourly Performance Monitoring
- Downtime and Waste Time Tracking
- User training and explaining

Out of Scope:

- Production planning and scheduling transparency
- Workforce coordination
- Immediate response execution

Key date

- 31/Oct/2024: Complete prototype in F3
- Feb/2025: apply for all rotor, stator, and battery lines
- Jun/2025: Scale up for all connected lines.
- Dec/2025: Complete for 42 lines in Console

Value Proposition

- **Real-Time Visibility**: Provides accurate, up-to-date production data for immediate insights.
- **For PRD,PM, QC:** Improve issues awareness, enables proactive responses, reducing downtime and keeping production on track.
- **For manager:** Data reliability, automates data collection, ensuring accuracy and consistency for trustworthy production tracking.

Risk of Doing Nothing

Without visibility into line status, quality, and production progress, line leaders will:

- Wasting time on report manual and missing early signs of risk.
- Lack of data-driven insights leads to slower response issues.
- Increasing operational costs.

Project objective

Build an ANDON board for production to visualize output and status of each line.

- **Increase Line Visibility**: Provide quick access to the status of production lines and the shop floor.
- **Promote Data-Driven Decisions**: Enable informed, timely decisions with real-time production data.
- **Support QA control NG rate real-time actual:** Continuously track defect rates and quality metrics to enable early issue detection.

Metrics

Baseline Metrics:

- Manually update production progress.
- Manually updated UPH
- Manually change line status.
- EoL NG rate NOT visualized.

Target Metrics:

- Automatically update production progress: **100% lines**
- Automatically updated UPH: **100% lines**
- Automatically change line status: **100% lines**
- EOL NG rate visualized: **70% lines**

Executive sponsor	Business owner	Project leader	Project partner
BH, HK, Hiep N	*Linh H*	*Michael P*	QC, PRD, PM, AUT

User Guide for Andon Board

Hardware devices

Andon board | Connection diagram

Android box configured with Andon Application

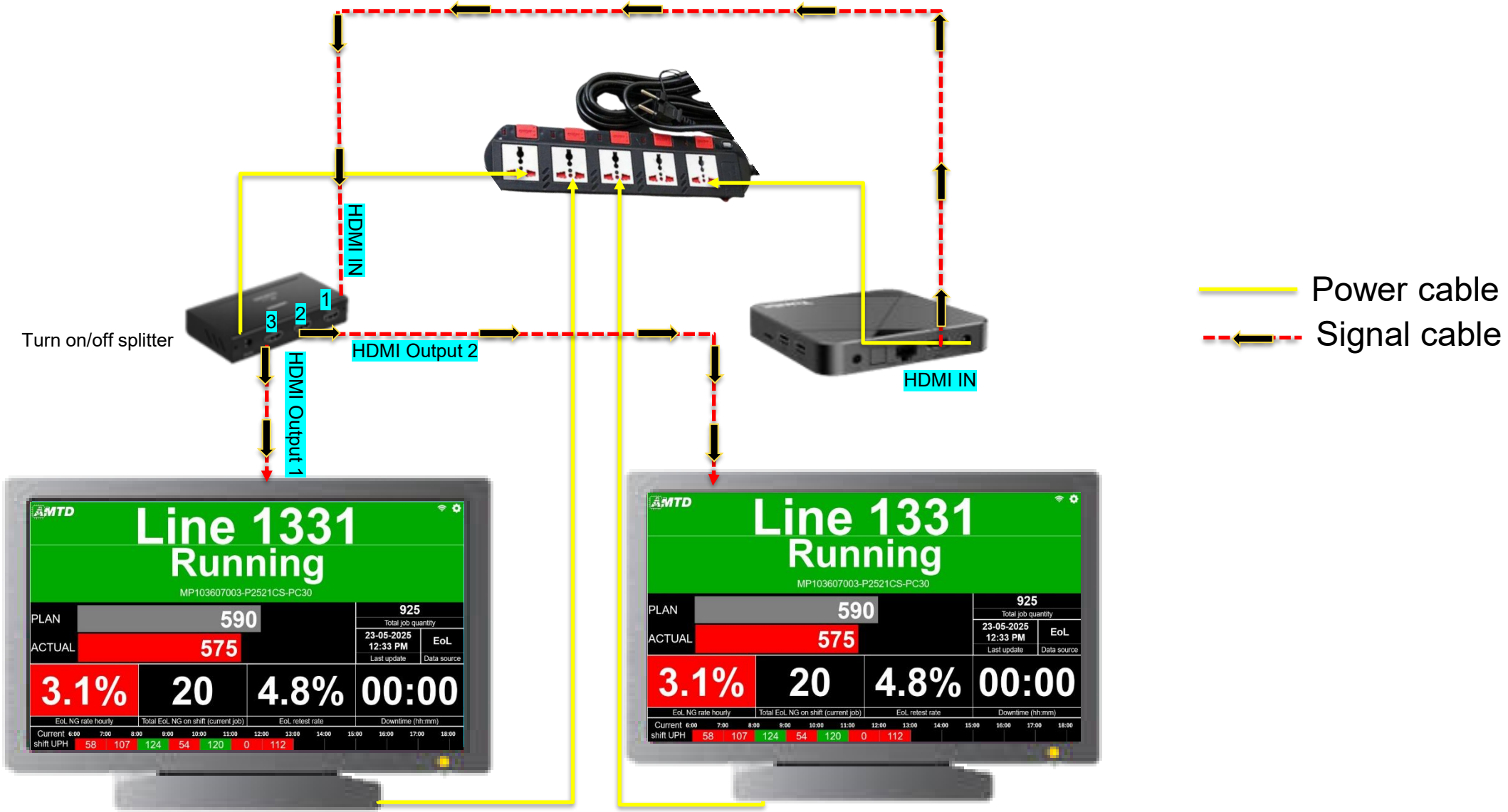
Splitter

HDMI

Adapter 5V of Android box

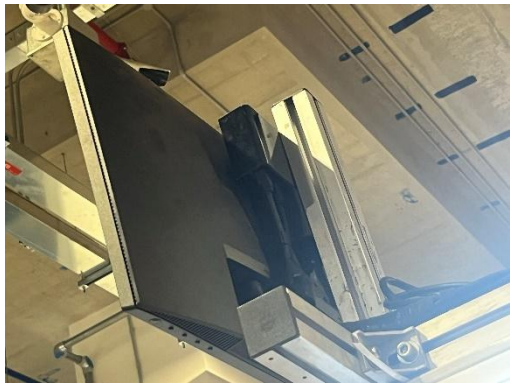
Adapter 5V of Splitter

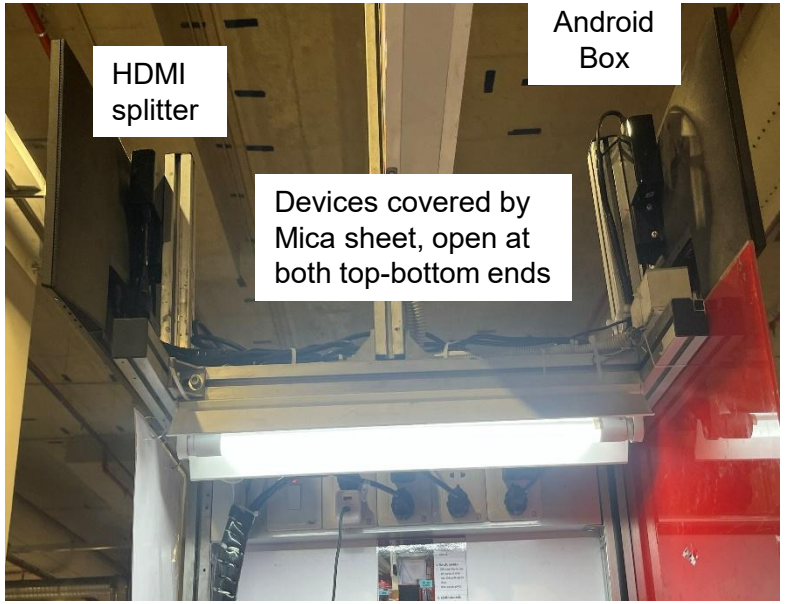
power socket



Monitor Setup for Andon board

Andon board |Hardware in the line



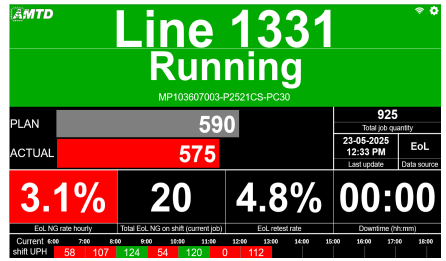


User Guide for Andon Board

eFactory, EAM system

Traceforward system

ANDON system



1 Visualize information on production line

2 Shopfloor status visualization for management

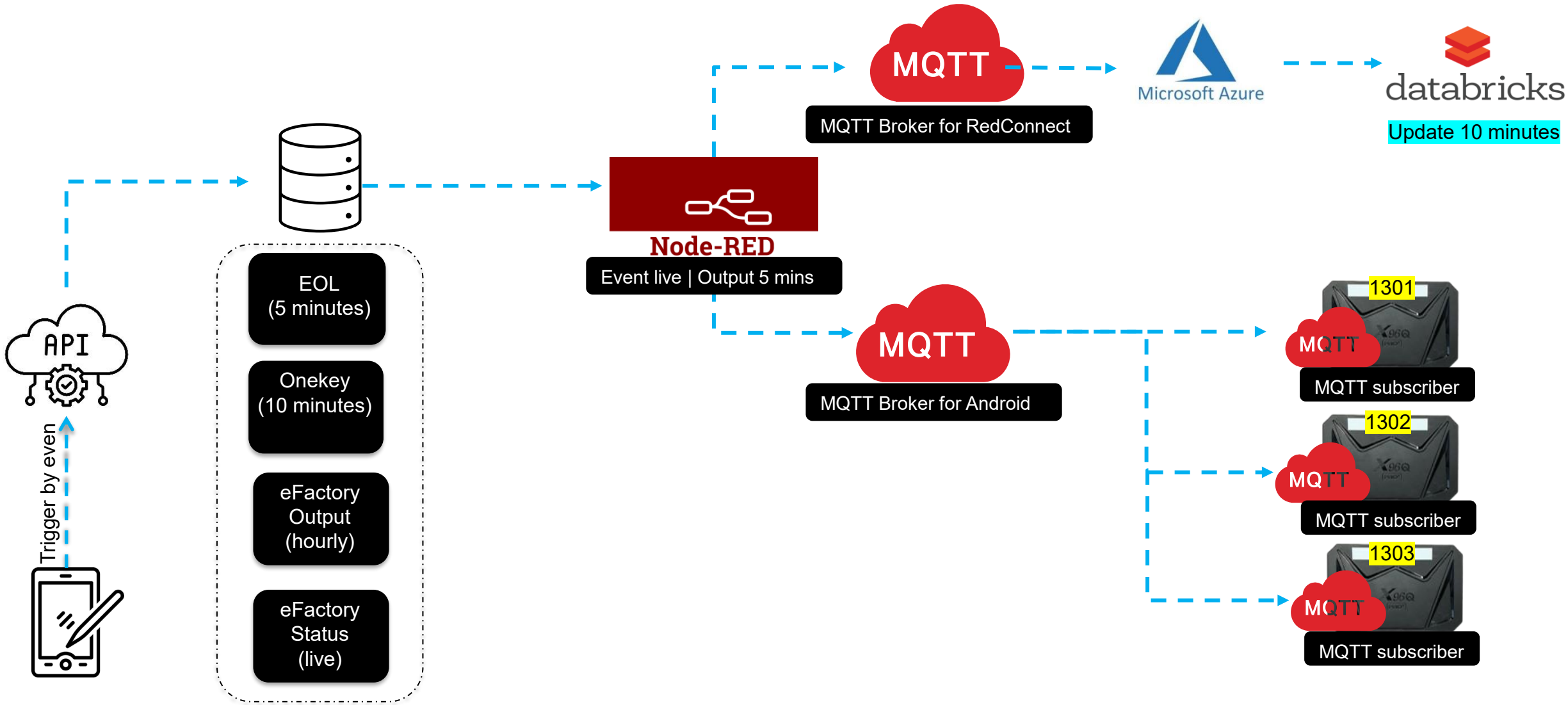
3 Run escalation plan when Line down.

4 Run Change Over for reporting in Databricks

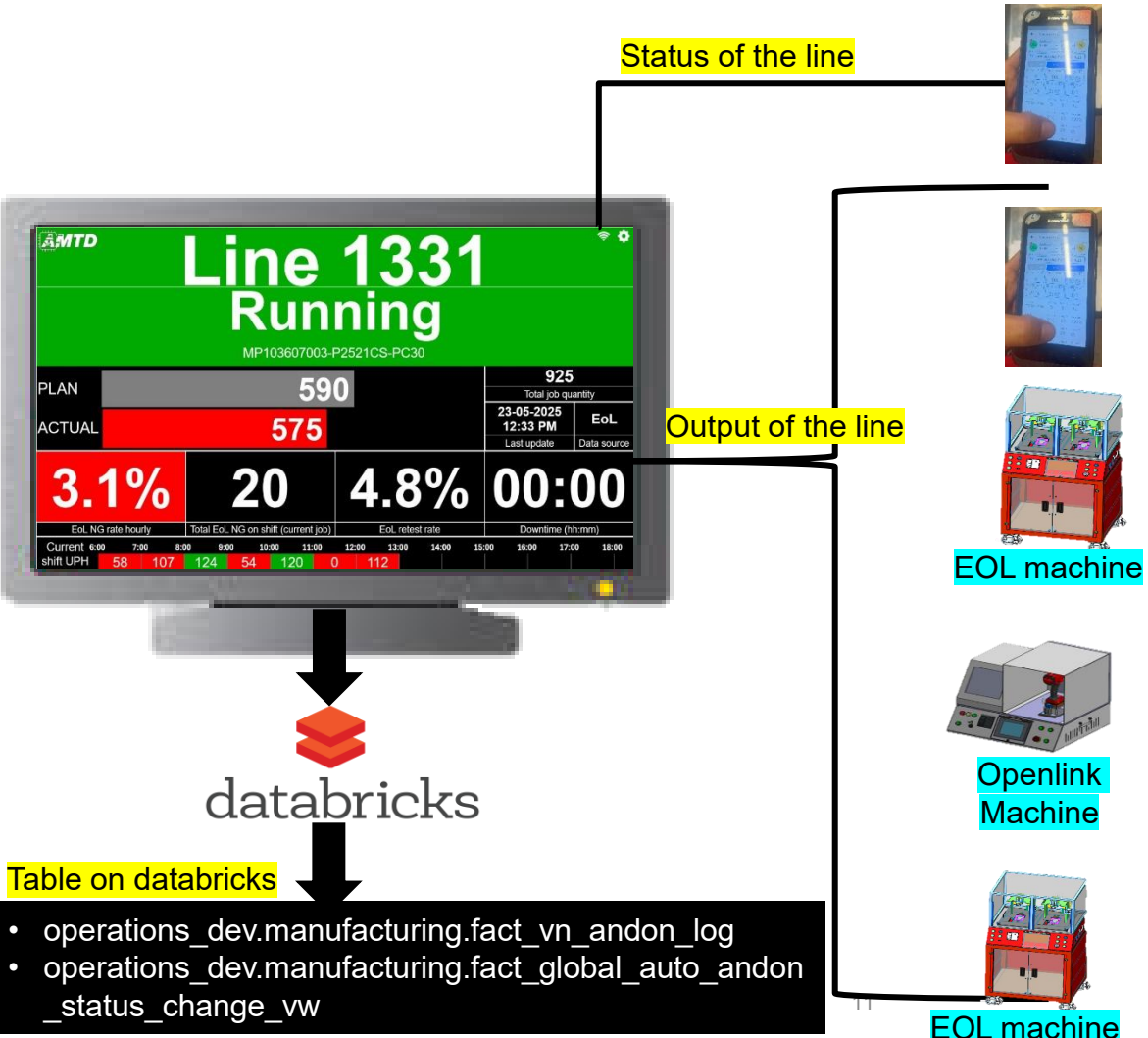
databricks

5 Run analytics for reporting in Databricks

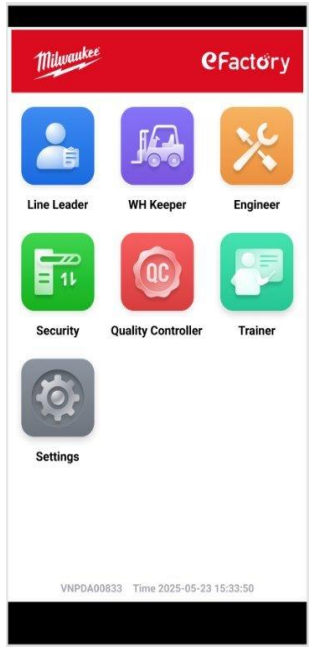
Andon board |Hardware in the line

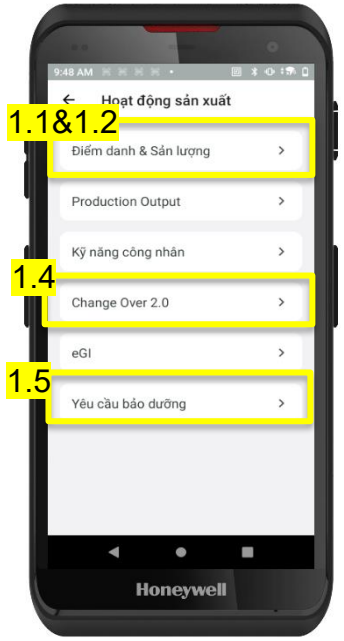


1. Visualize information on the production line

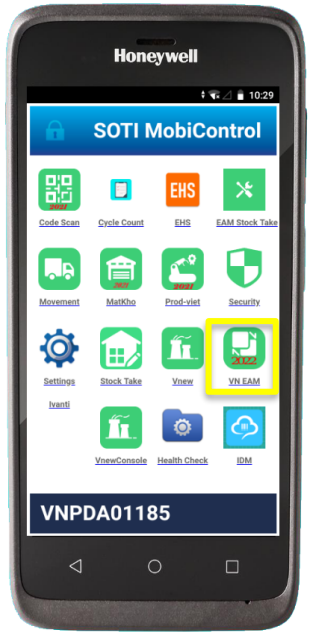


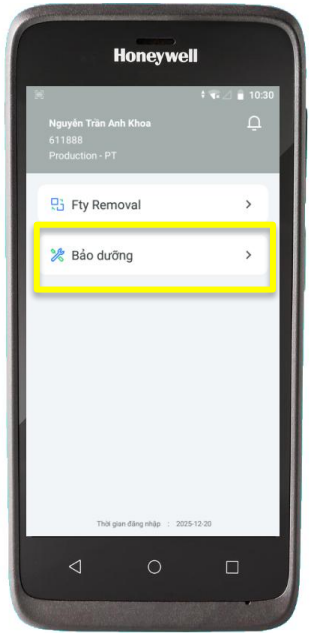
Function	Table	Detail
Status of line line	E_FACTORY_STATUS_CHANGED	Running, No Plan, Change Over, Line down, Abnormal, NPD
Output of Console line (data source “eFactory”)	E_FACTORY_OUTPUT_CHANGED	Output hourly input by Line leader
Output of Console line (data source “EOL”)	DATA_TRANSACTION	Counting output by EOL machine, Traceforward project
Output of Console line (data source “Onekey”)	PRODUCTION_SERIAL_EVENT	Counting output by the Openlink machine
Output of Packing line (data source “Onekey”)	PRODUCTION_SERIAL_EVENT	Counting output by the EOL machine
NG tool, NG rate	DATA_TRANSACTION	Counting tool fail

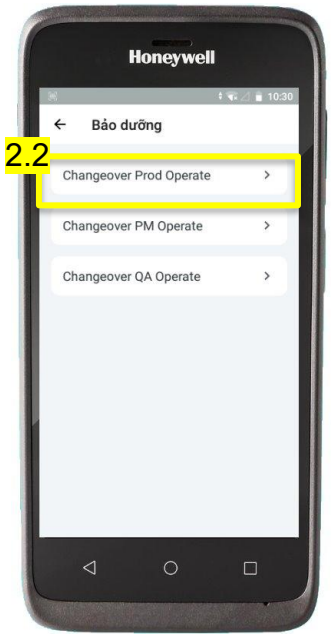




Line Leader app





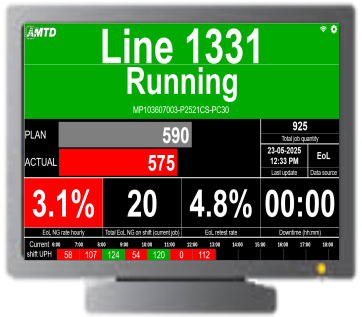


EAM

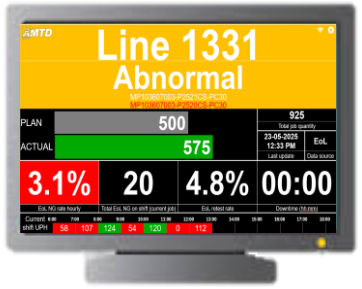
No.	Functions	Remarks
1.1	**Clock in& Clock out**	scan in and out people in each job
1.2	**Output manually**	Input hourly output for the job
1.3	**eAndon**	Escalation when the line is line down or abnormal
1.4	**Change Over**	Prod request change model 'A' to model 'B'
1.5	**Repair machine**	Call PM to come to the line to fix the machine

No.	Functions	Remarks
1.1	**Repair machine**	Receive the request for repair of the Production
1.2	**Change Over**	Receive the request for the change model A to B

Clock in & Clock out

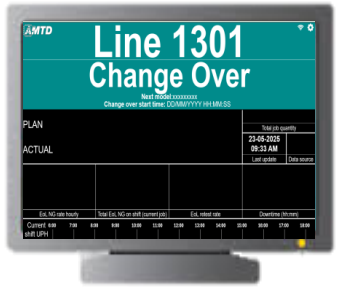


eAndon



EAM

Change Over



Event ID	Remark	Function
1	Prod Job Start	Clock in & out
2	Prod Job End	Clock in & out
3	Prod Submit Work Request	EAM
4	PM Receive Work Request	EAM
5	PM Complete Work Request	EAM
6	Prod Close Work Request	EAM
10	Prod Submit Change over	Change Over
11	PM Receive Change over	Change Over
12	PM Complete Change over	Change Over
13	Prod Cancel Change over	Change Over
14	QA Confirm Change over	Change Over
15	Prod Confirm done Change over	Change Over
20	eANDON Linedown Submit	eAndon
21	eANDON Linedown Close	eAndon
22	eANDON Abnormal Submit	eAndon
23	eANDON Abnormal Close	eAndon

All statuses get all from IT: Running, No Plan, NPD, Change Over, Line down, Abnormal

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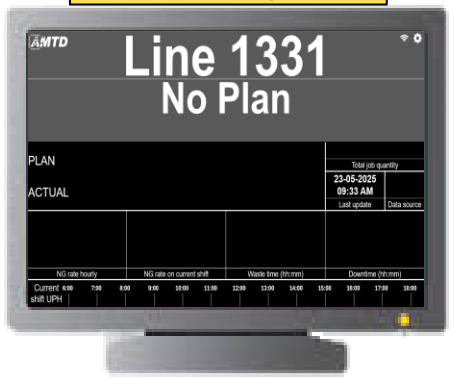
Andon board |Clock in & Clock out

Start the job A

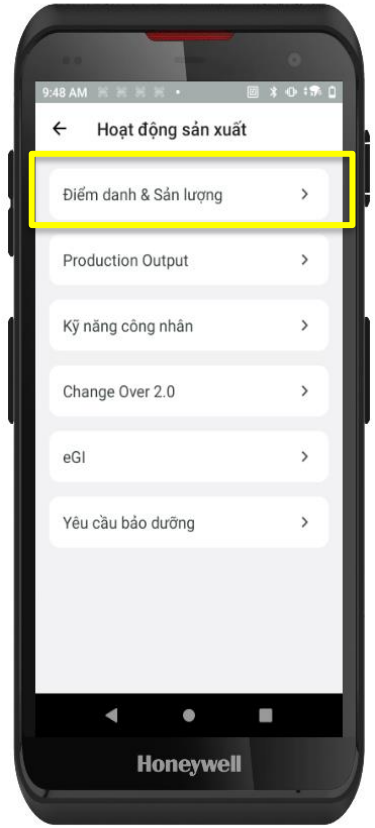
Close the job A



Start the job B

Close the job B

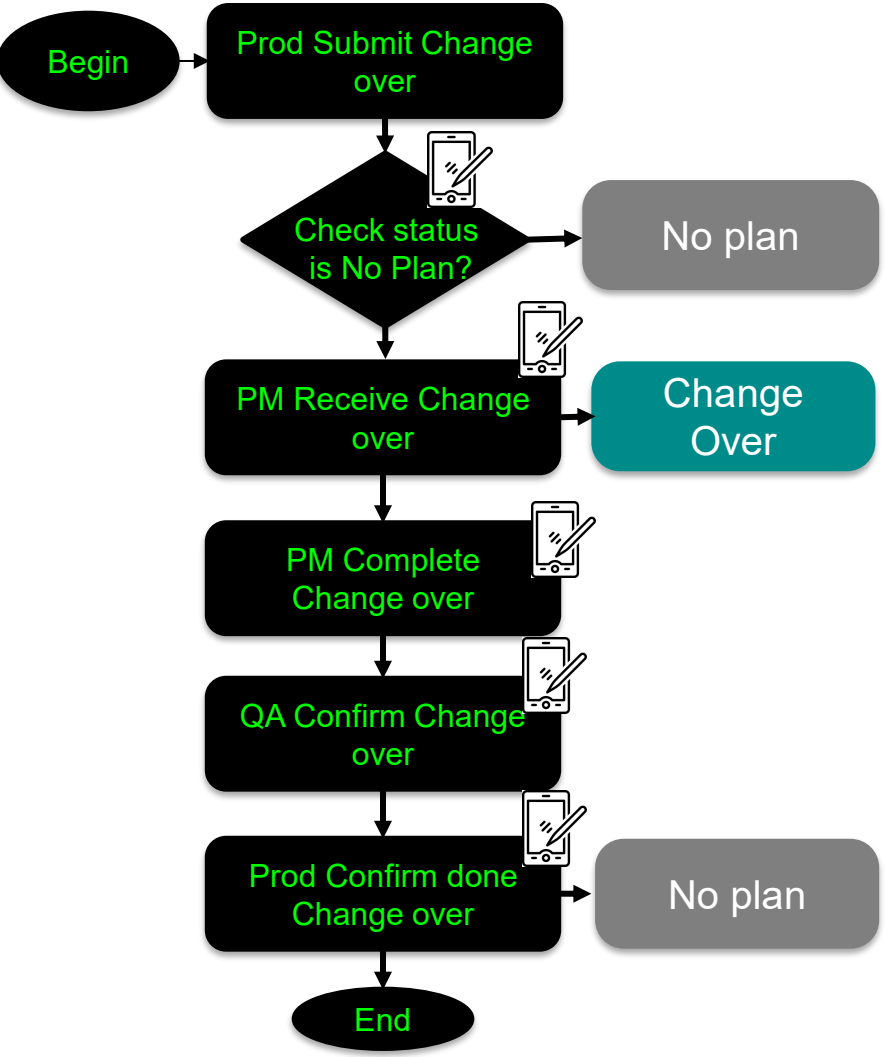
NPD: the job starts with excepted MP, RW

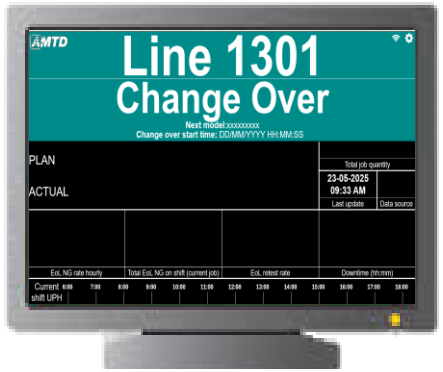


PDA device: scan in & out labor

Must **close the job** when you completely produced the job in each shift. If not closed, the line is **still running/NPD**

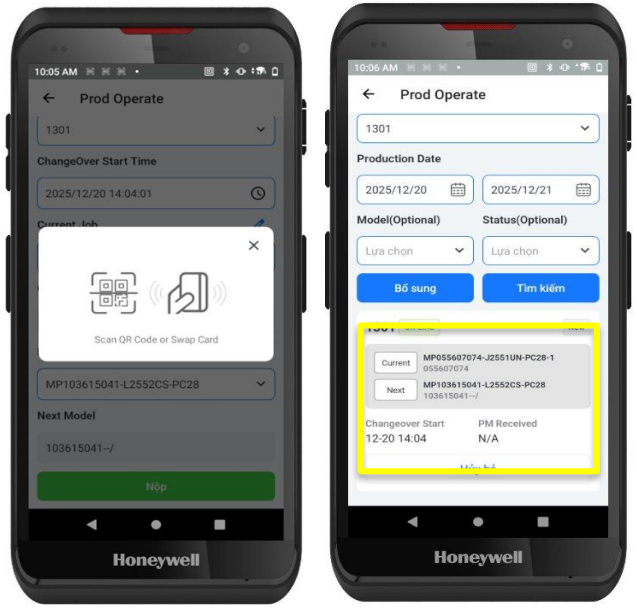
Andon board |Change Over





Change Over

Request Change-over to PDA devices



Alert to MS team

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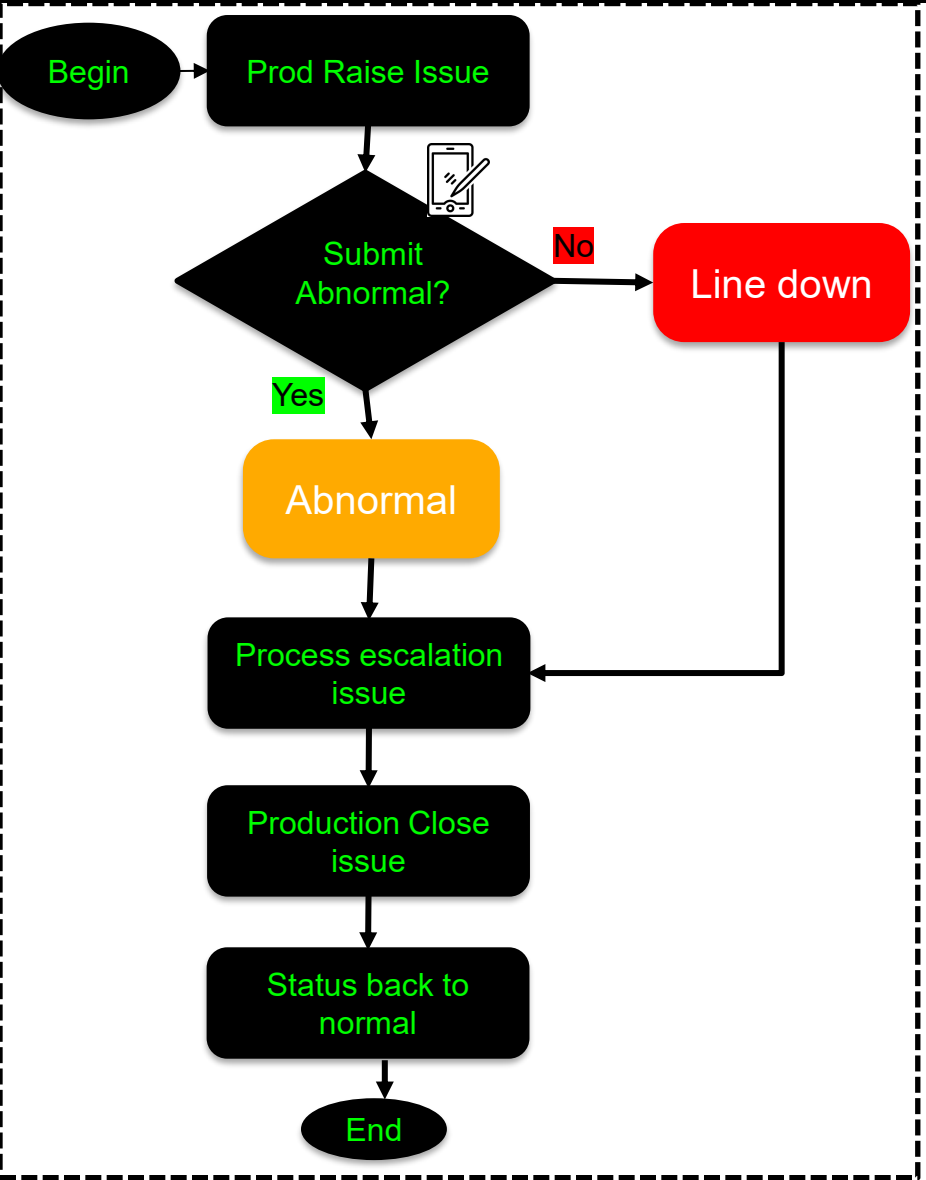
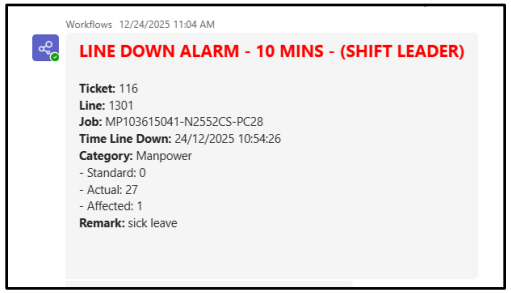
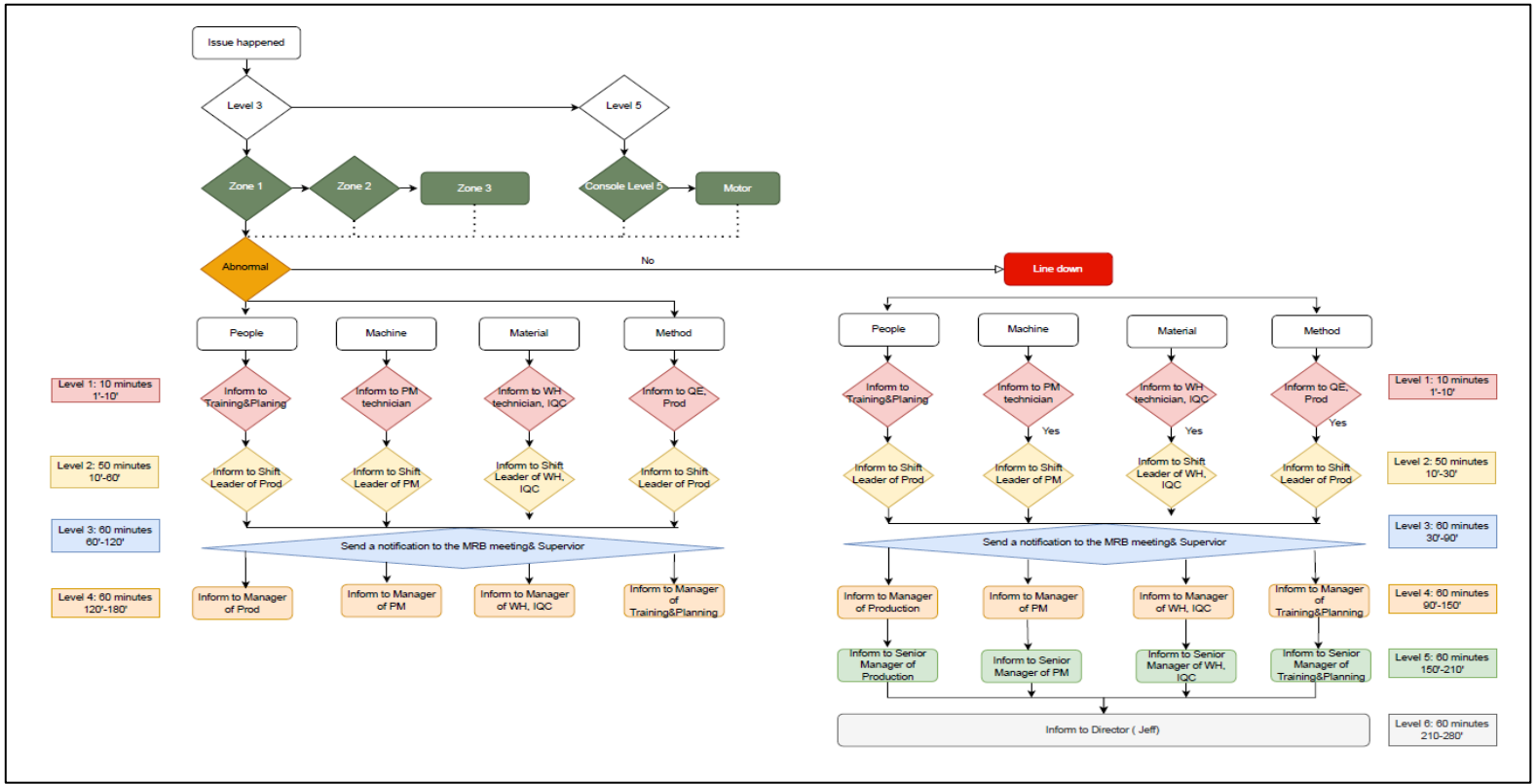
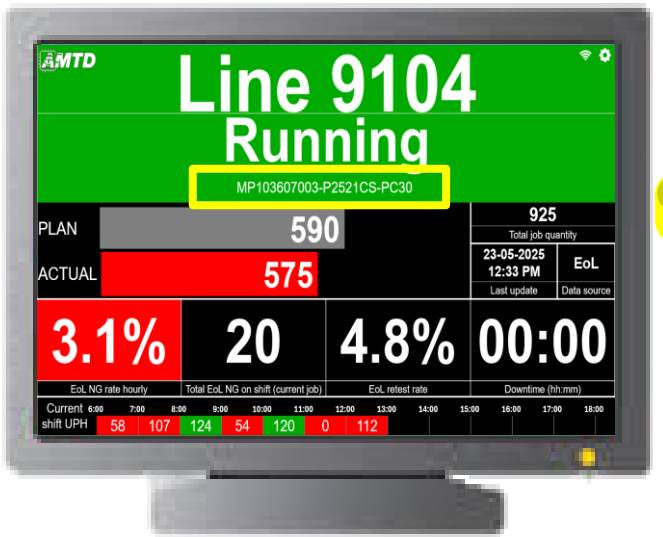
Andon board | eAndon



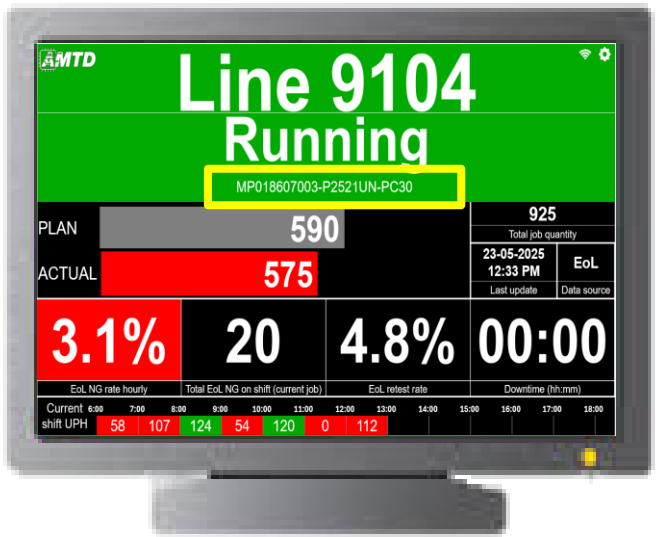
Andon board







Swap in
1 minute



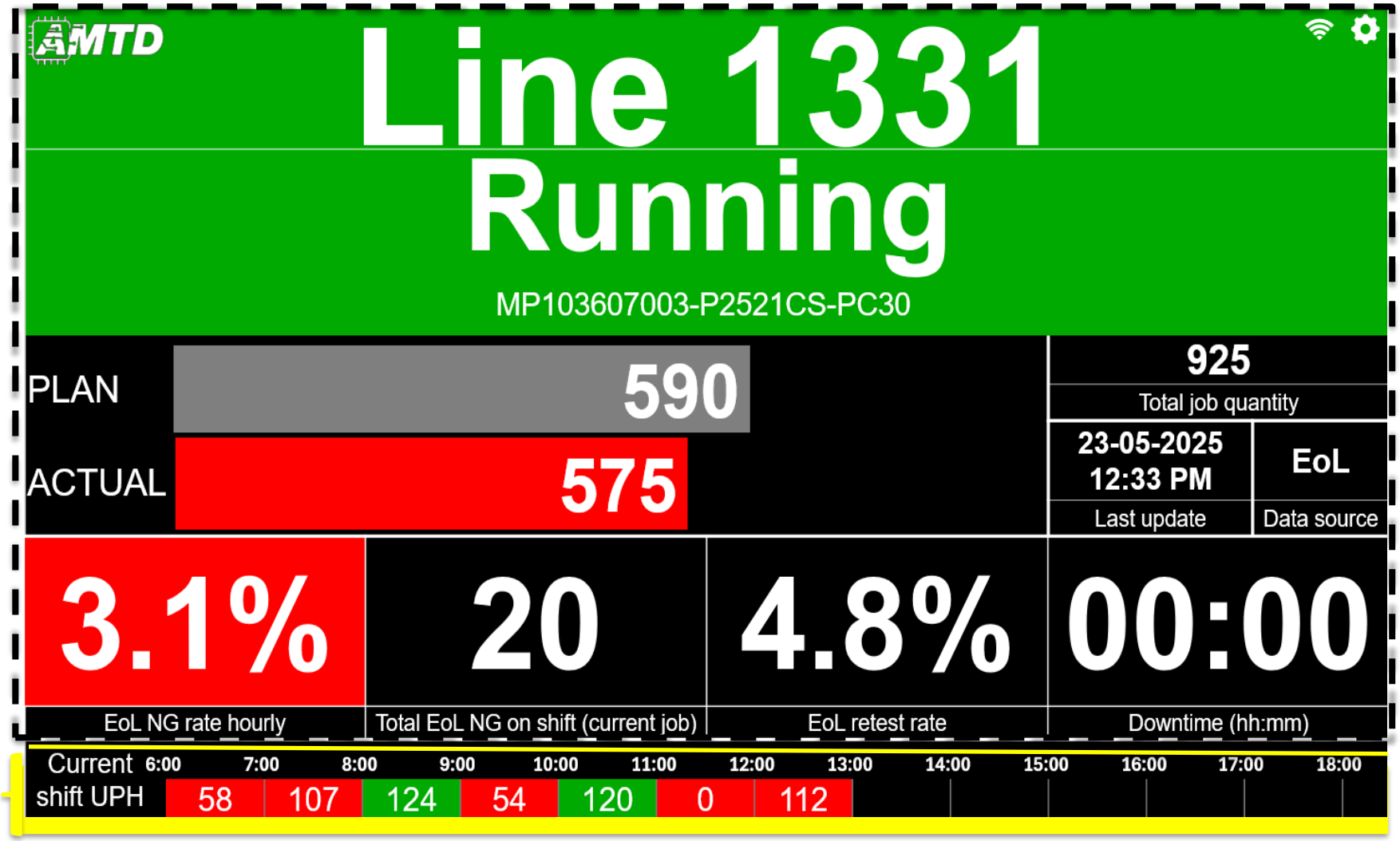
- Console assembly
- Packaging
- Stato
- Rotor

At the 3rd and 5th-floor PDA consoles, please scan job and scan labor for each job. Use lines **13xx/15xx** for Console assembly and **13xxB/15xxB** for Packaging.

Job Symbols

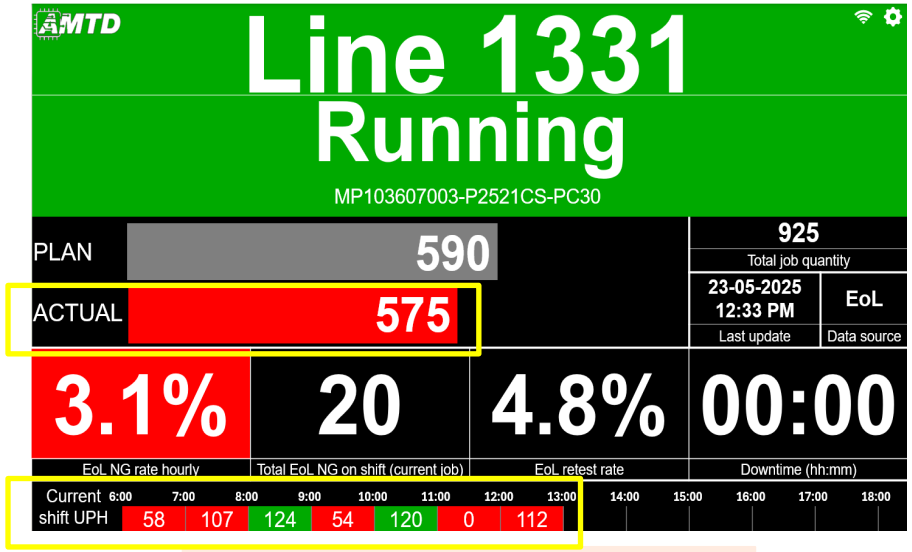
- **BP**: Battery
- **CL**: Clean line
- **WI**: Clean line
- **CS**: Console
- **UN**: Packaging
- **LE**: Injection
- **MR**: Motor Rotor
- **MS**: Motor Stato
- **SD**: Super Dip
- **SP**: Service Part
- **TL**: Tank line
- **SW**: Switch line

Current job

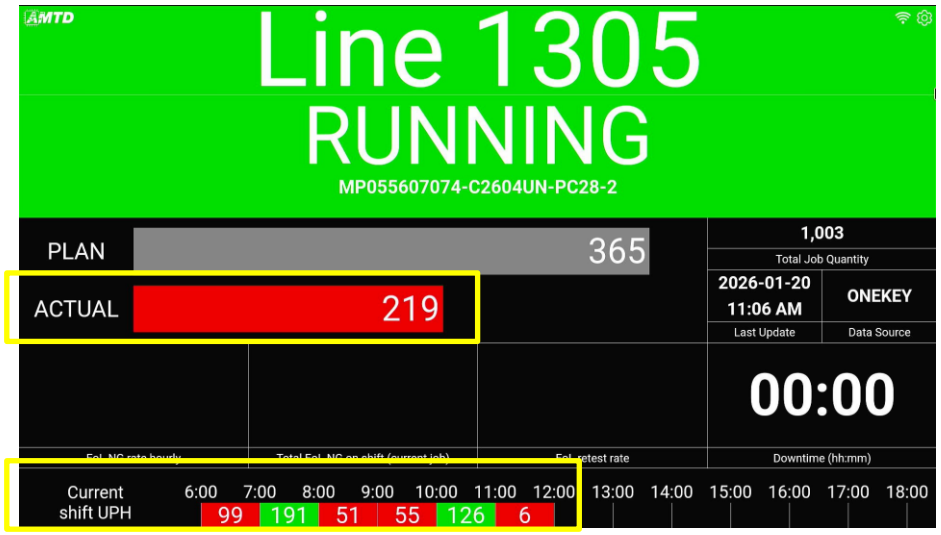


All output of the shift by hour

Understanding the Discrepancy: Actual Output vs. Cumulative Hourly Output



The line running with 1 job in the shift



The line running with 2 jobs in the shift

Actual = Sum current shift UPH
575 = 58+ 107+ 124+ 54+120+112

Actual < Sum current shift UPH
219 < 99+191+51+55+126+6=522

Data source | Console assembly

Line leader starts job on PDA devices (Running)

EOL machine with tool id or Dummy-QR

No

Yes

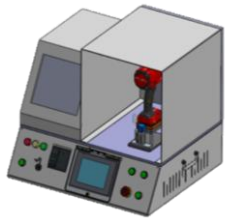
EOL machine

Update every 5 mins

Openlink machine with write MPBID

No

Yes



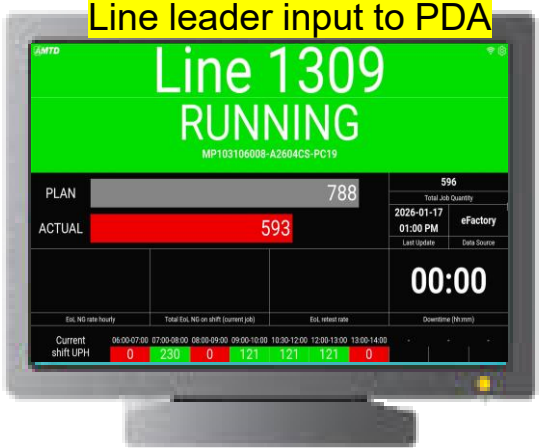
Openlink Machine

Update every 15 mins

Get data from the line leader's input

PDA device

Line leader input to PDA

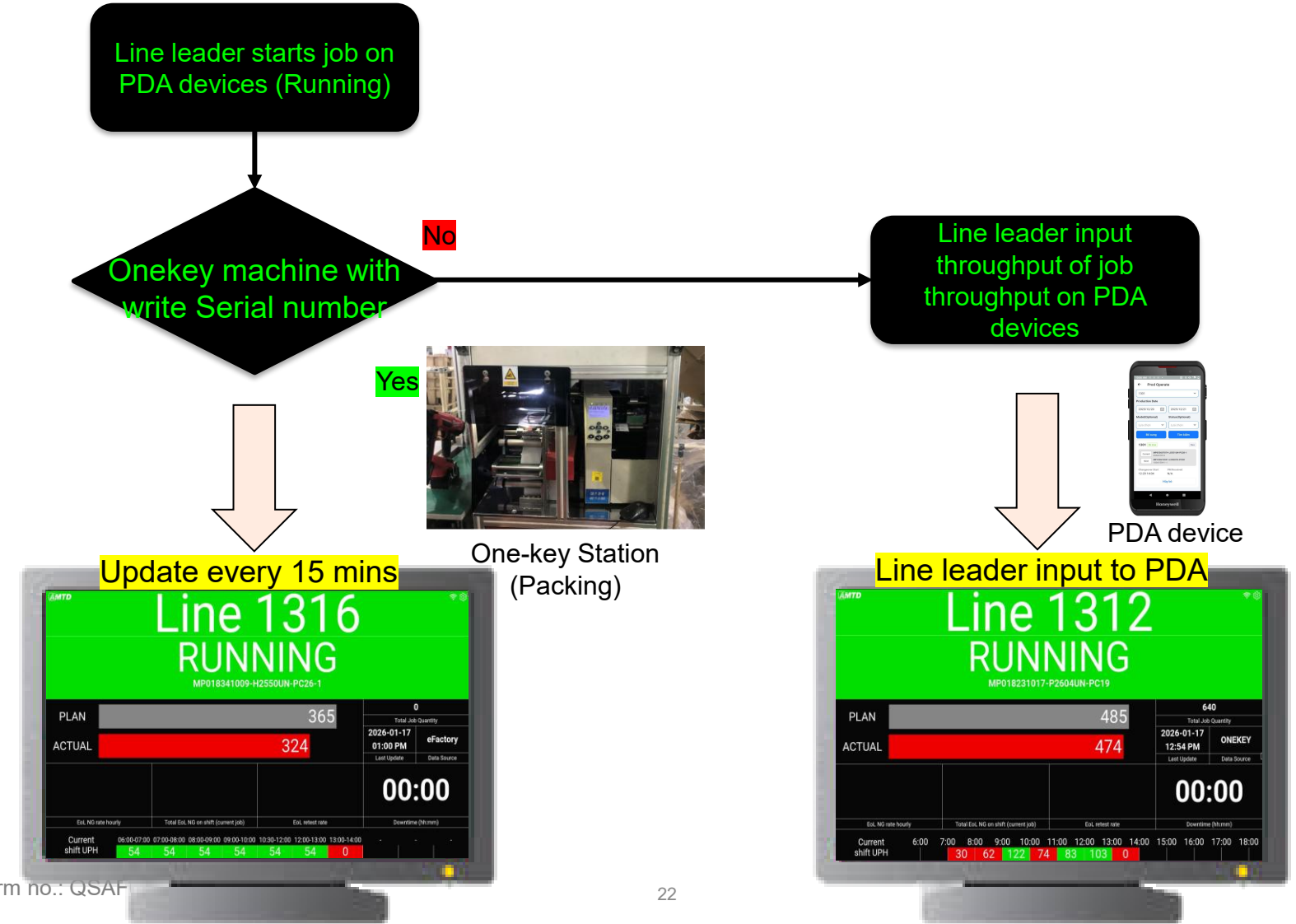


The refresh timing and data source for Andon display will vary base don the level of equipment connectivity for that line and model.

Data Actual Methodology

- **EOL Machine:** counting by **Tool-ID** (or Dummy-QR if Tool-ID is unavailable).
- **OpenLink Machine:** counting by **MPBID**.
- **PDA System:** Manual input by **Line Leaders**.

Data source | Packaging



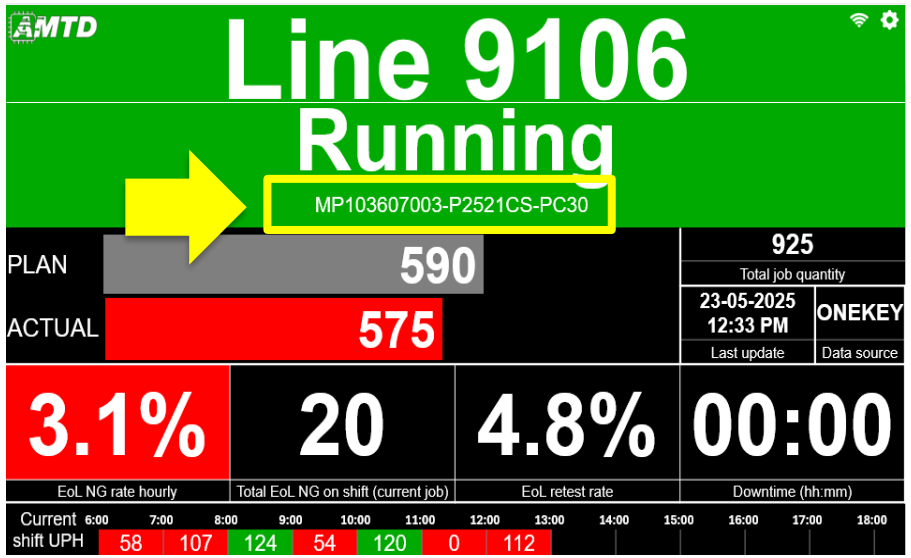
The refresh timing and data source for Andon display will vary based on the level of equipment connectivity for that line and model.

Data Actual Methodology

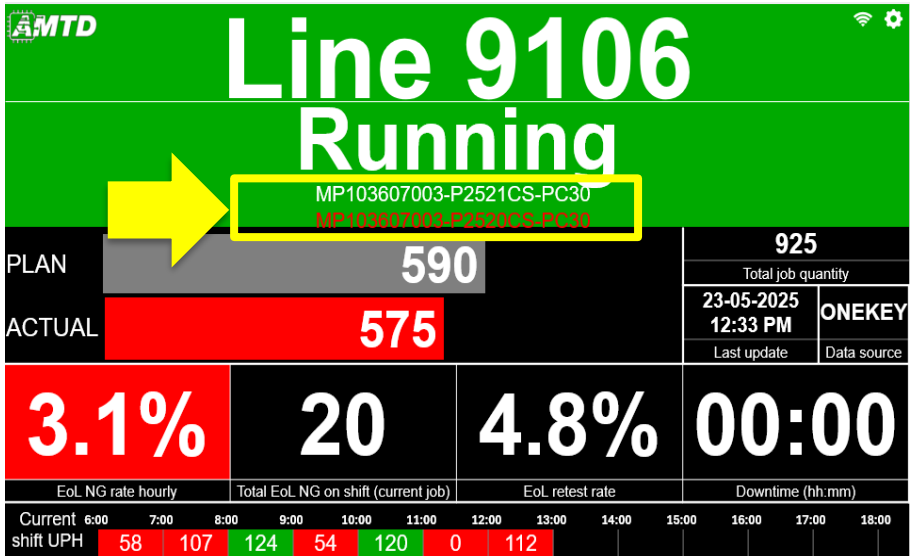
- **Onekey Machine:** counting by Serial number
- **PDA System:** Manual input by **Line Leaders**.

Data source

Decoding Display Discrepancies: Why are multiple job statuses shown?



Line leader select Job PDA **same** Job from Machine (EOL, Openlink, Onekey)



Line leader select Job PDA **Difference** Job from Machine (EOL, Openlink, Onekey)

- **Case 1: Data Match** If the PDA job matches the Machine job, the system displays a **single consolidated entry**.
- **Case 2: Data Mismatch** If the PDA job differs from the Machine job, the **display splits** into two rows:
  - **Machine Job:** Displayed in **White**.
  - **PDA Job:** Displayed in **Red**.

Note: In this case, the system **will not increment the plan count**.

Count Formula

1. Plan Calculation

- Manual Start: From the moment the PDA is started, the Plan automatically increases based on UPH.
- Calculation Logic: For example, if Standard UPH = 120 (equivalent to 2 tools/minute), after 5 minutes, the system will display Plan = 10.

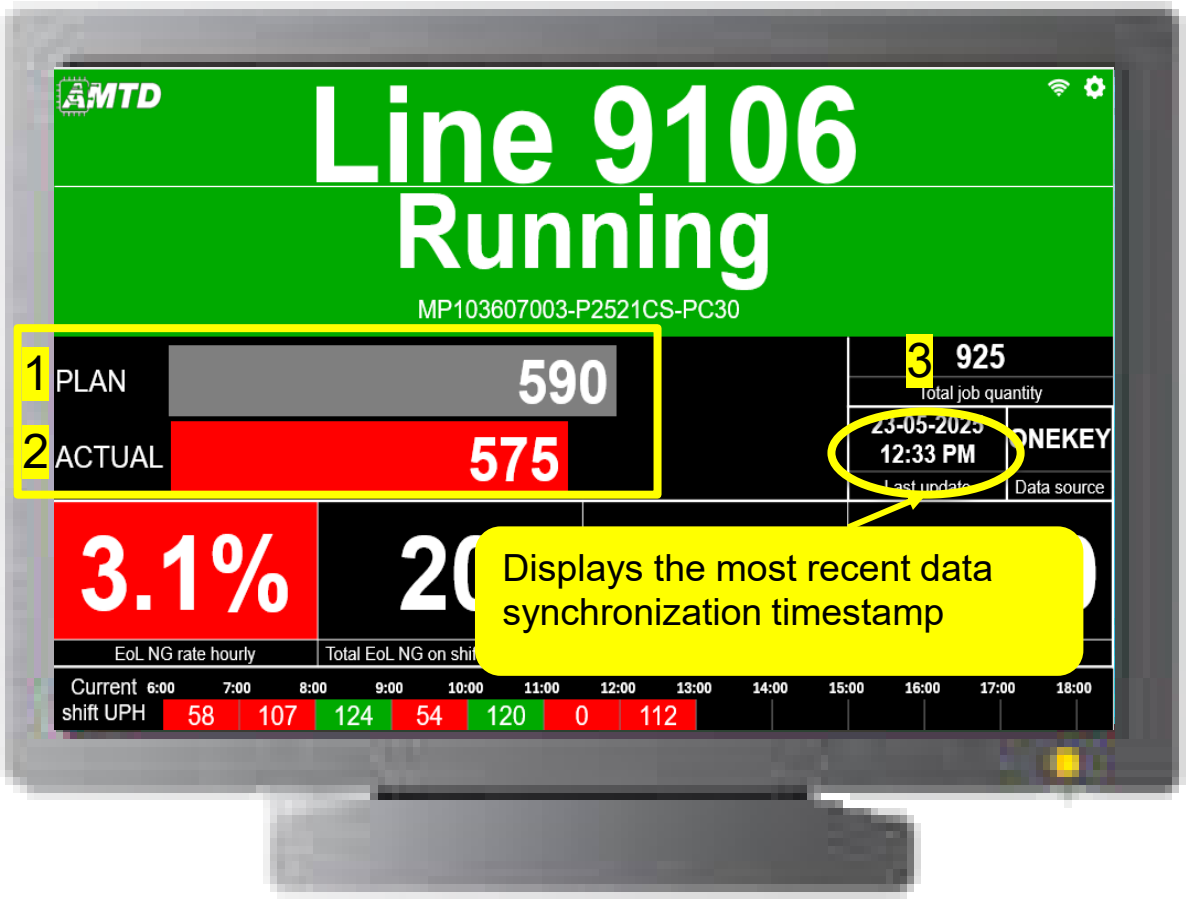
2. Actual Output Calculation

The system aggregates data from three primary sources with different update frequencies:

- EoL Machine: Data is refreshed every 5 minutes.
- Openlink Machine: Data is refreshed every 15 minutes.
- PDA: Manual data entry by the Line Leader.

3. Total job quantity

Total job quantity is planned by PMC for this shift (not including all quantity of the job.



Count Formula

4. EOL NG Rate Hourly

$$\mathrm{NG/ACTUAL} = \frac{\text{NG Quantity}}{\text{Actual Output}} \times 100\%$$

5. Total EoL NG shift (current job)

The total quantity of defective products recorded for the job currently in production.

6. EoL Retest Rate

The ratio of the number of retests performed over the total number of tests conducted.

7. Downtime

Total accumulated downtime for the job currently in production.

8. Current shift UPH

Total units per hour. If two jobs run within the same hour, it will display the combined output of both.