

*Proposal of IoT system for AH Brake
Made for AH Brake (Thailand) Co., Ltd.*

TOMAS TECH CO., LTD.

Proposal Overview

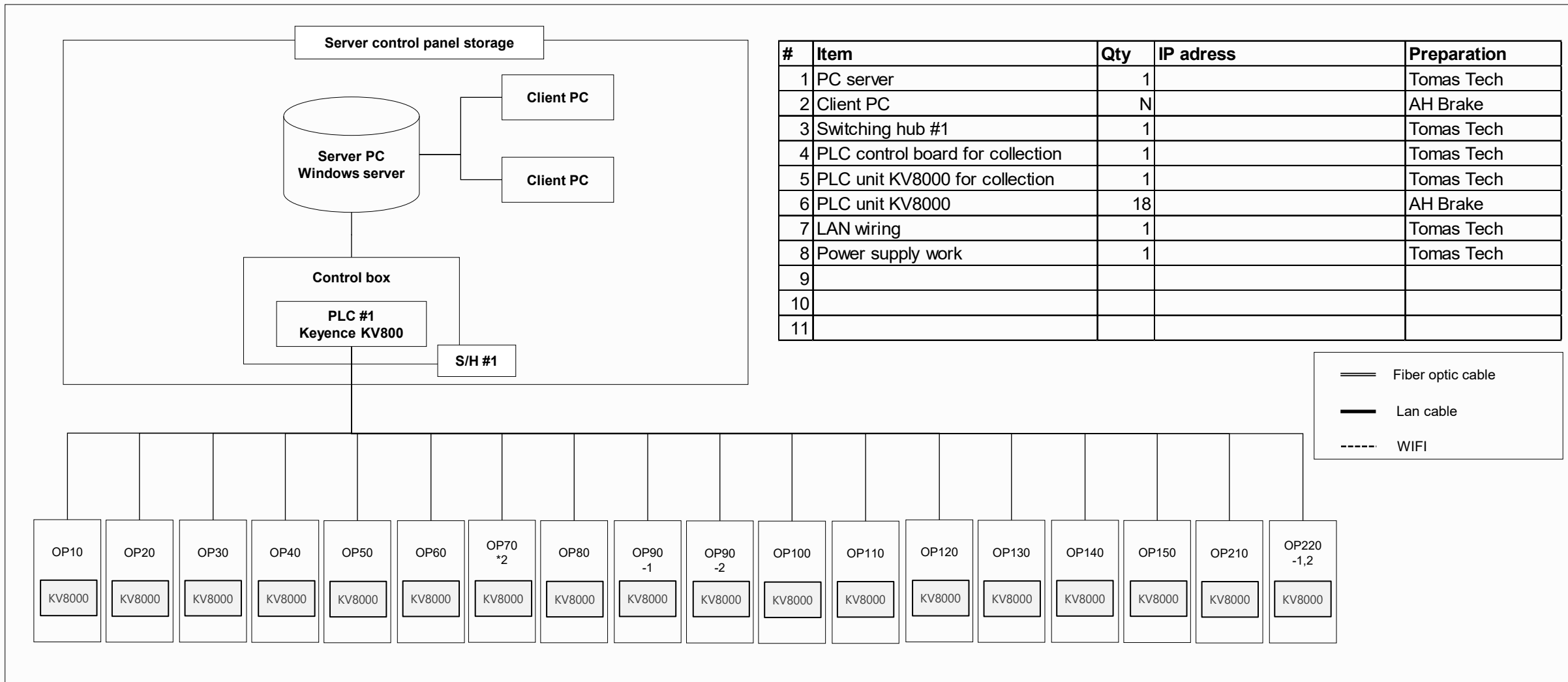
| Proposal Overview

AH Brake (Thailand) Co., Ltd様へのIoT system のご提案をします。
本システムを活用することで、「作業の見える化による、稼働率の向上」を実現をします。

システム導入のメリット

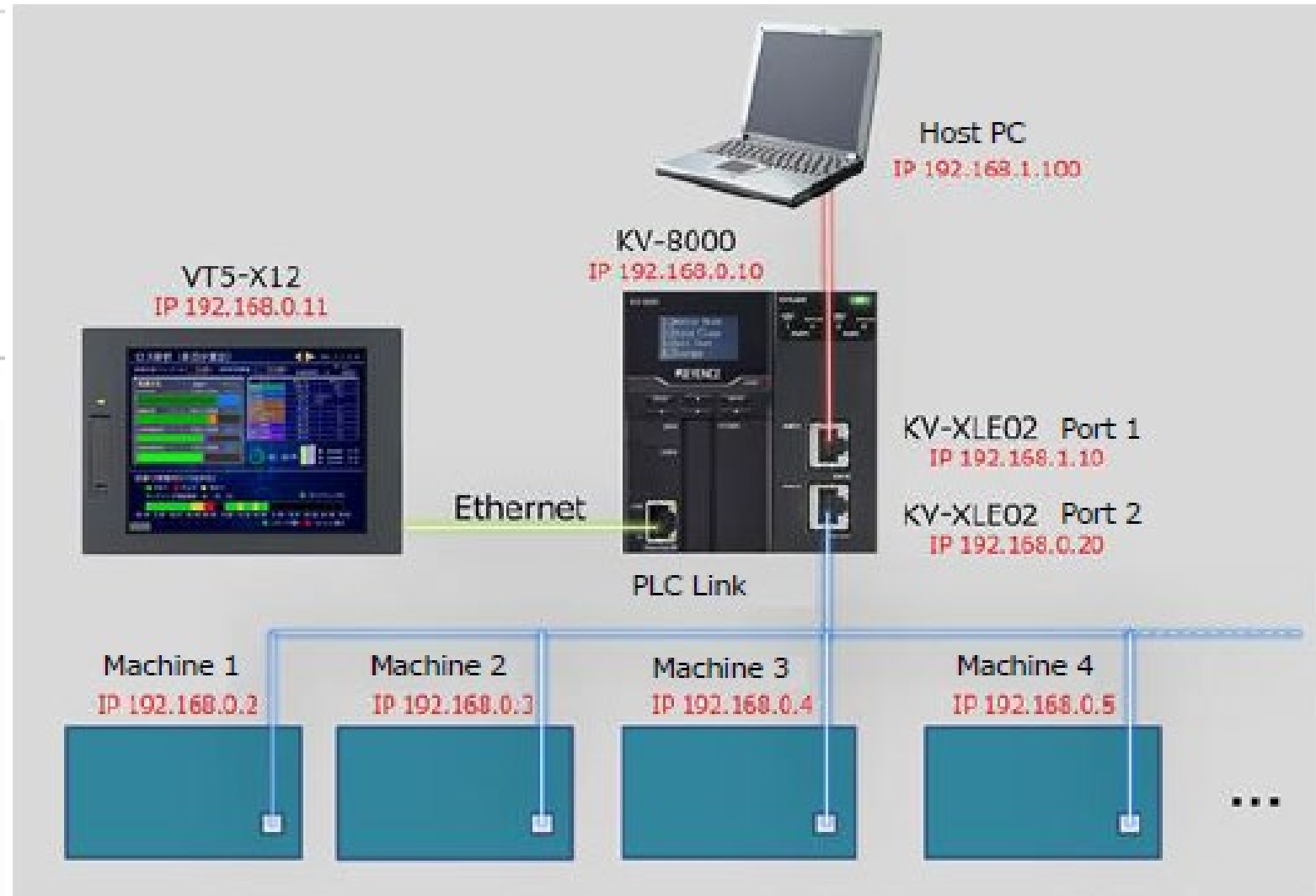
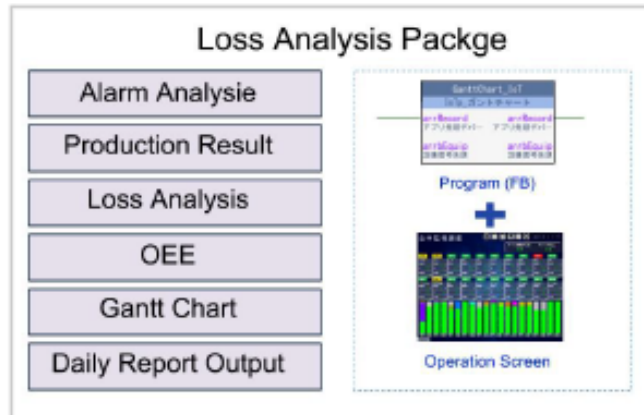
1. 各設備より工程の稼働状況を記録することができるため、「**作業の見える化**」を実現することができます。
2. 設備停止時間、および設備エラーメッセージをマスタPLC内に蓄積することで、データの参照が可能となる。設備稼働状況などCSV出力機能で、レポート出力が可能となるため、データ分析による「**稼働率の向上**」「**作業の見える化**」が実現できます。

Proposal Overview



Proposal details

| Proposal details | Overview



| Proposal details | Collected data

Gantt chart

• Data collected from equipment

Signal name	Data size	explanation
green	1 bit	Specify the equipment signal used in the Gantt chart. When this signal is ON, the Gantt chart is displayed in green (in operation).
yellow	1 bit	Specify the equipment signal used in the Gantt chart. When this signal is ON, the Gantt chart will be displayed in yellow (warning).
red	1 bit	Specify the equipment signal used in the Gantt chart. When this signal is ON, the Gantt chart is displayed in red (stopped).

Alarm analysis

• Data collected from equipment

Signal name	Data size	explanation
silence	1 bit	Assign a signal to mute the buzzer that sounds when an alarm occurs. If there is no mute signal, assign an alarm reset signal, etc.
restoration	1 bit	Turns ON after alarm processing is completed. If there is no recovery signal, assign an automatic operation signal, etc.
discharge	1 bit	Turns ON when the product is discharged.
alarm	1 bit	Allocate up to 1000 alarm signals to be used in the alarm/pareto chart.

| Proposal details | Collected data

Production results

• Data collected from equipment

Signal name	Data size	explanation
in operation	1 bit	If the discharge signal turns ON while the operating signal is ON, the production result is counted up by one. It is used in common for production results by time period and production results by product type.
discharge	1 bit	It is used in common for production results by time zone and production results by product type. Specify the discharge signal that turns ON after one cycle is completed. If there is no discharge signal, a cycle end signal can be substituted.
Number of 1 cycle	1 word	Number of workpieces ejected in one cycle (“1” except for multiple workpieces)
Number of defects per cycle	1 word	Number of NG workpieces ejected in one cycle (“1” except for multiple workpieces)Enter only when defects are discharged. If only non-defective products are discharged, the value is set to 0.

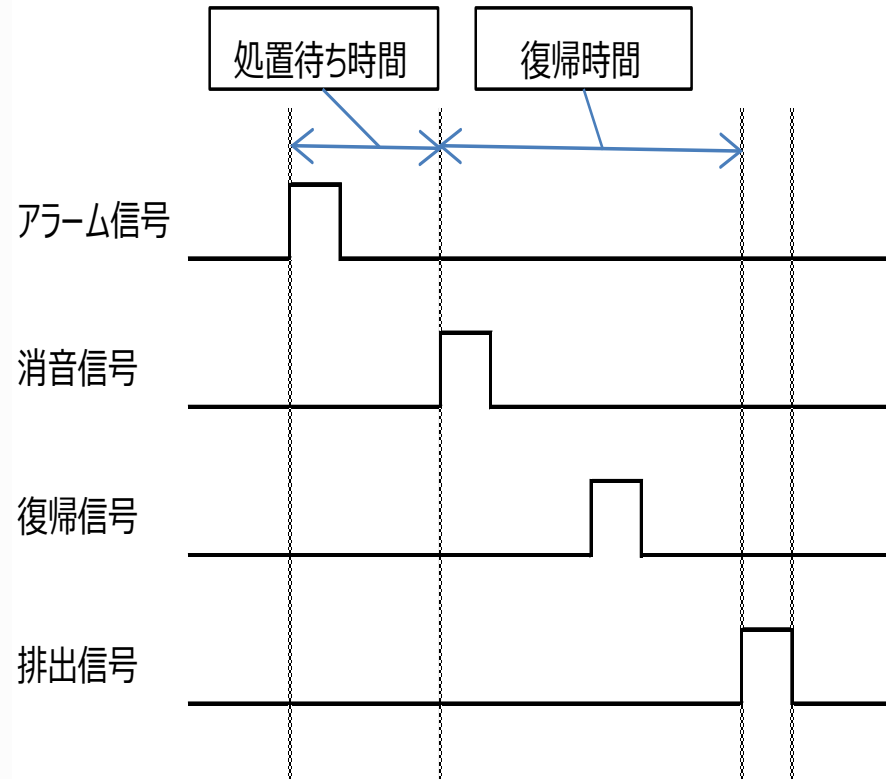
Proposal details | Collected data

Loss analysis/OEE

• Data collected from equipment

Signal name	Data size	explanation
discharge	1 bit	Specify a signal to turn ON when a good product is completed. Assign payout signals, judgment signals, etc. It is used as a signal when classifying operating time and speed reduction time. Measure the time from when the discharge signal turns ON until the next time the discharge signal turns ON. If it is shorter than the equipment planning takt time set on the touch panel of the "Loss Analysis Package", it is classified as "operating time", and if it is longer than the "speed reduction time". For example, if the equipment planning takt time is set to 10 seconds and the time from when the non-defective product signal turns ON to the next ON is 14 seconds, 4 seconds will be added to the "speed reduction time" and 10 seconds will be added to the "operating time". will be
in operation	1 bit	Turns ON while the equipment is in operation. Allocate automatic operation signals, etc. It is used as a signal to classify operation time, speed reduction time, and process failure time.
stopped	1 bit	Turns ON while the equipment is stopped. It is used as a signal for classifying short stop time and failure time. The ON time of the stop signal is measured, and if it is less than the failure time threshold set on the touch panel of the "loss analysis package", it is classified as "short stop", and if it is more than the threshold, it is classified as "failure".
Signals 1-10	1 bit	Assign signals 1 to 10 that turn ON while the loss you want to measure is occurring. In the reference program of "Loss Analysis Package", the signal in () is turned ON. It is not necessary to assign all signals. Allocate the signals you want to use as loss analysis items.*Each signal should be interlocked so that they are not input to the loss analysis package at the same time.

| Proposal details | Collected data



If the signal of the equipment is a signal (pulse signal) that turns ON only for one scan, there is a possibility of missing data depending on the communication cycle.

Be sure to allocate a signal that stays ON for a period longer than the communication cycle.

[Signal allocation]

Signal 1: setup/adjustment display only

Signal 2: startup display only

Signal 3: Wait for previous process

Signal 4: Wait for post-process

Signal 5: Planned stop Display only

Signal 6: Rest Display only

Signal 7: Other time other than allocation

Signal 8: Quality check

Signal 9: Change lens

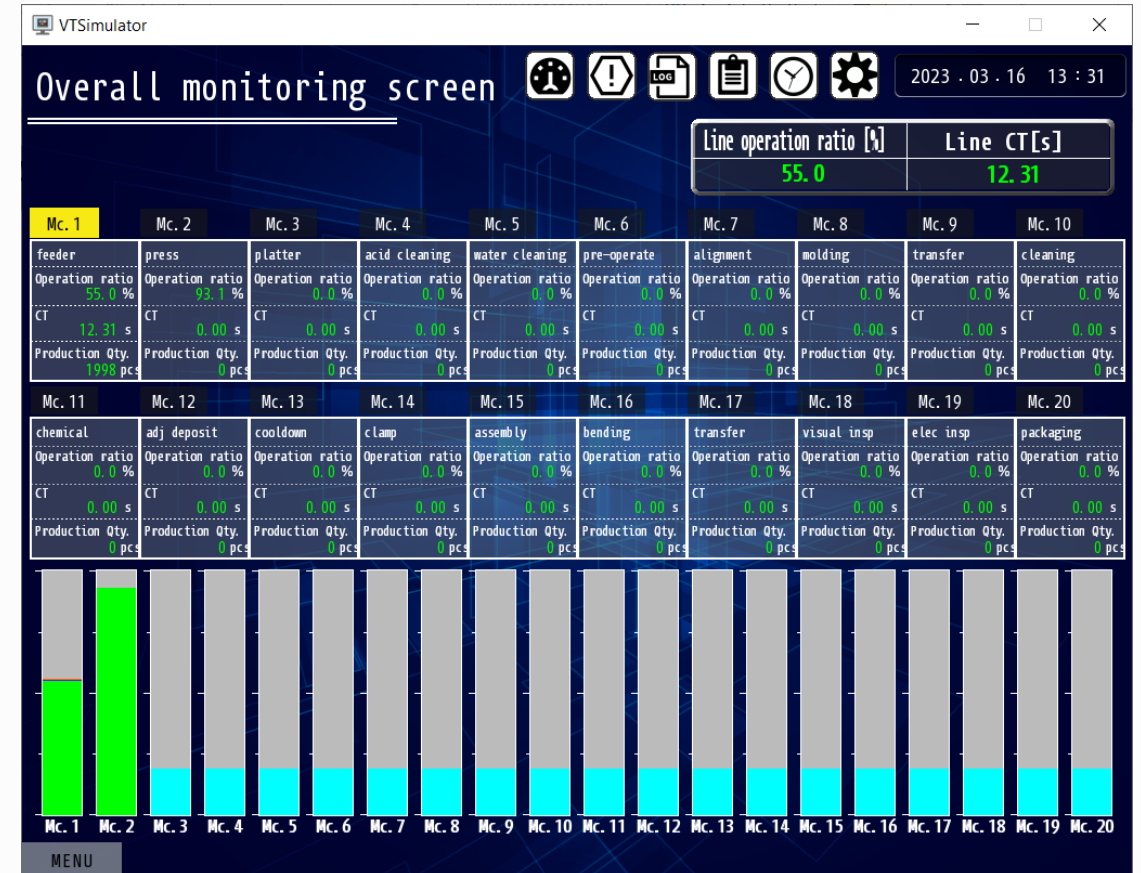
Signal 10: Speed decrease time automatic allocation

Proposal details | Screen image

Gantt Chart



Overall monitoring screen

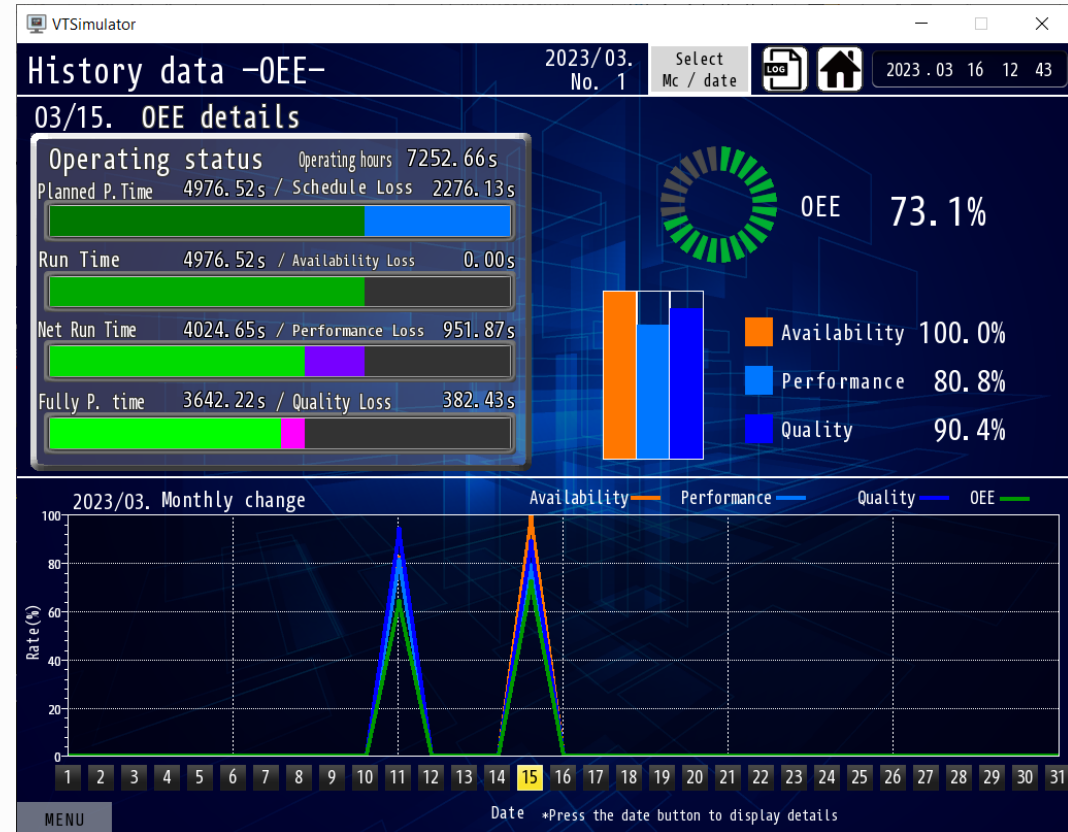


Proposal details | Screen image

Loss Analysis

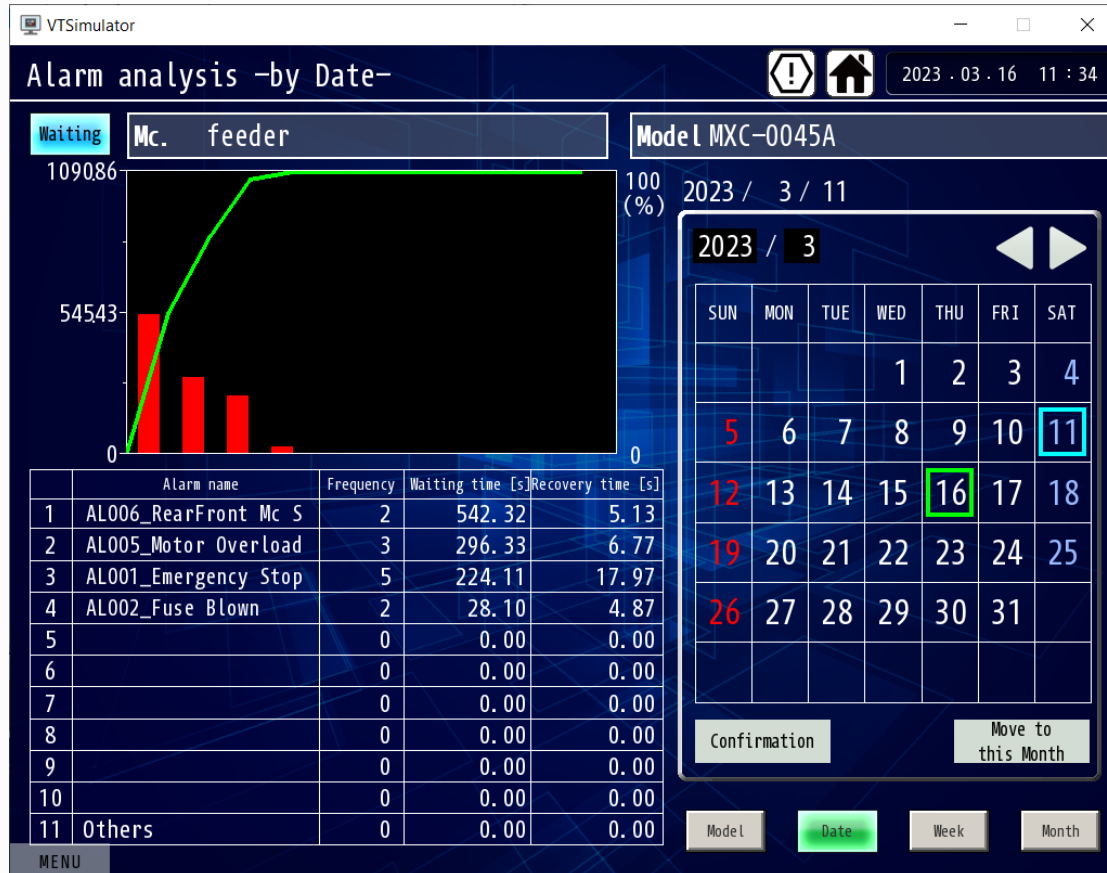


OEE

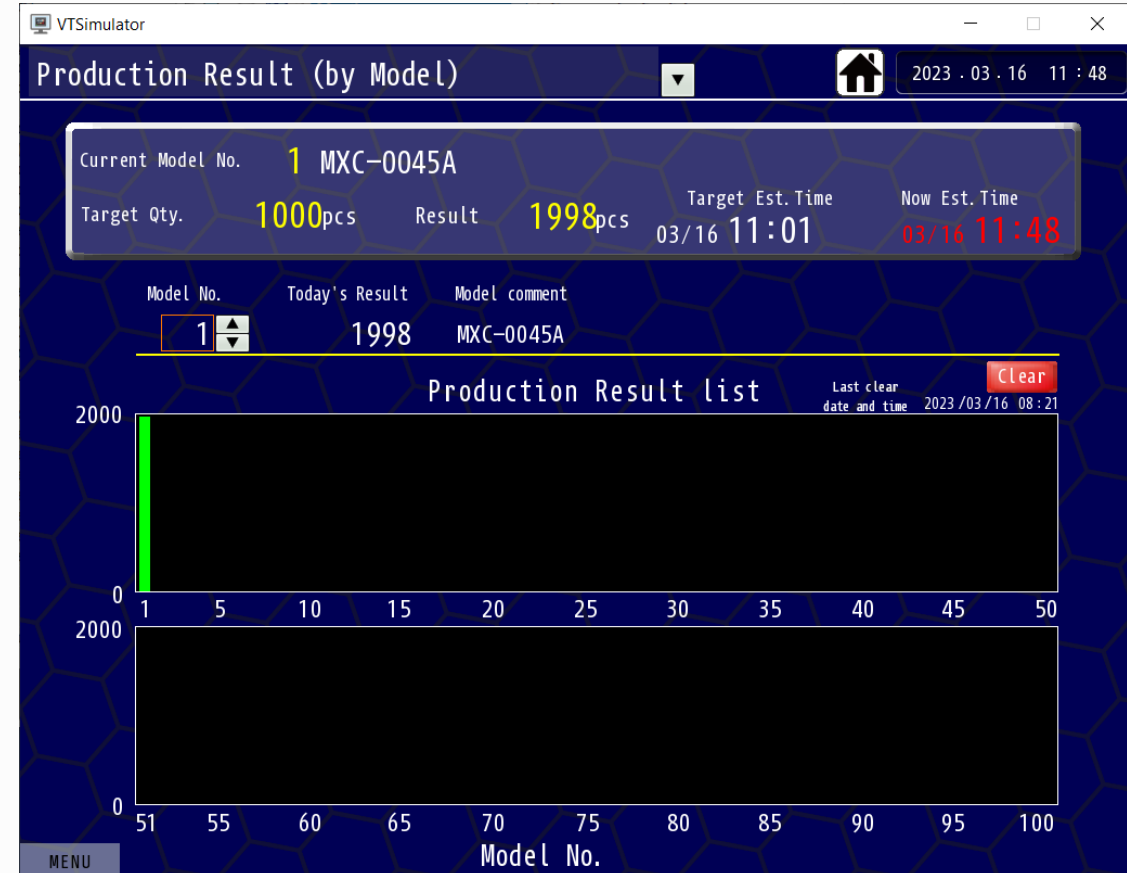


| Proposal details | Screen image

Alarm Analysis



Production Result Analysis

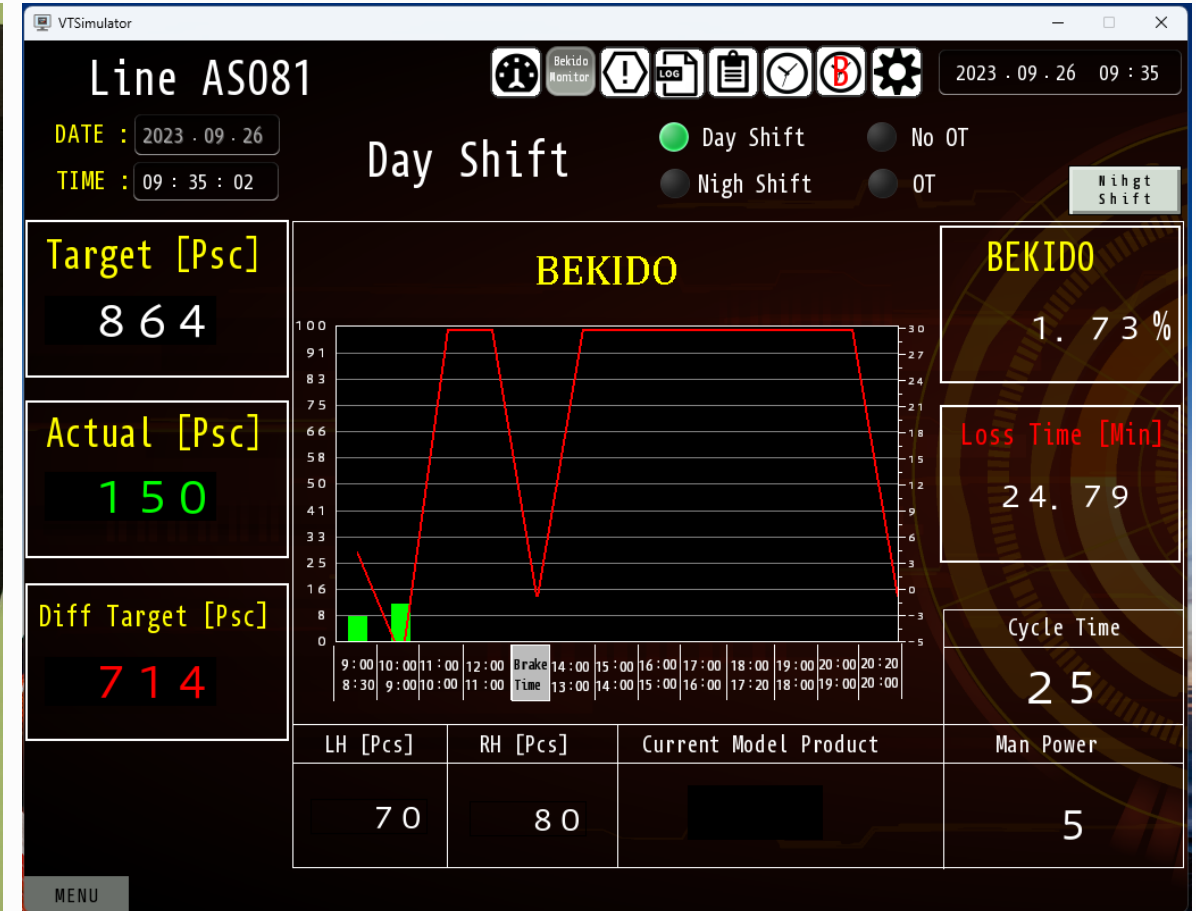


Proposal details | Screen image

BEKIDO using Japan factory



BEKIDO screen image



Proposal Summary

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| System maintenance

#	ソフトウェア保守		Standard / Option
1	運用サポート・復旧支援	サポート窓口を開設し、電話・メールによる運用サポート、ソフトウェア障害時の復旧支援を実施します	Standard*1
2	バージョンアップ版ソフトウェア提供	ソフトウェアの機能改善等を行った場合にバージョンアップ版を提供します。最新OSに対応した最新ソフトウェアを無償提供します。サーバー更新時のソフト購入費が不要になり、お客様のライフサイクルコストを低減できます。	Standard*1
#	ソフトウェア再セットアップ		
1	ソフトウェア再セットアップ	サーバー故障修理後、ソフトウェアの再セットアップが必要な場合に、復元作業を実施します。（在庫データの修復はソフトウェア再セットアップには含まれません）	Standard*1

*1) 契約初年度はシステム購入料金でサービス提供。2年目以降は1年単位での契約

*2) 弊社よりハードウェアをご購入いただいた場合のみサービス提供

| Change history

Version	Amendments	Modification date
Rev01	First edition	25-Jan-2024

Appendix

| Proposal details | PC rack image



| Appendix | DELL EMC PowerEdge T550



DELL EMC PowerEdge T550

1 x Intel Xeon Silver 4310T 2.3G, 10C/20T, 10.4GT/s, 15M Cache, Turbo, HT (105W) DDR4-2666

16GB (1x 16GB) RDIMM, 3200MT/s, Dual Rank

2 x 2TB 7.2K RPM NLSAS 12Gbps 512n 3.5in Hot-Plug Hard Drive

PERC H755 with front load bracket Support RAID 0, 1, 5, 6, 10, 50, 60

Chassis with up to 8, 3.5in Hot Plug Hard Drives, Riser Config1, 1 CPU + 1 GPU Riser, TPM 2.0 V3

Broadcom 57416 Dual Port 10GbE BASE-T Adapter, OCP NIC 3.0 DVD+/-RW, SATA, Internal

Dual, Hot-plug, Redundant Power Supply (1+1), 800W

iDRAC9 Datacenter 15G with OpenManage Enterprise Advanced

| Appendix | APC Smart-UPS 750VA LCD 230V with SmartConnect



APC Smart-UPS 750VA LCD 230V with SmartConnect

Output Connections : (6) IEC 320 C13 (Battery Backup), (2) IEC Jumpers (Battery Backup)

Topology : Line Interactive

Waveform type : Sine wave

Max Configurable Power (Watts) : **500Watts / 750VA**

Input Connections : IEC-320 C14

Control panel : **Multi-function LCD status and control console**

Interface Port(s) : SmartSlot, USB

Warranty : 3 Year Warranty Onsite Swap by Schneider Electric (Thailand)

| Appendix | Monitor 19.5" ACER EH200Qbi (TN, VGA, HDMI) 60Hz



Monitor 19.5" ACER EH200Qbi (TN, VGA, HDMI) 60Hz

- ACER EH200Qbi จอขนาด 19.5" ความละเอียด 1366 x 768
- BlueLight Shield technology เทคโนโลยีที่ลดการปล่อยแสงสีฟ้า เพื่อช่วยรักษาดวงตาของคุณ
- Acer Flicker-less technology ช่วยลดการกะพริบของหน้าจอ คุณสามารถทำงานและเล่นได้ยาวนานขึ้น
- Acer ComfyView display ลดปริมาณของแสงที่สะท้อนบนจอภาพของคุณ เพื่อการรับชมที่สบายตายิ่งขึ้นในสภาพแวดล้อมที่หลากหลาย
- มีพอร์ตเชื่อมต่อ VGA และ HDMI
- รองรับการจัดตั้งกับขาแขวนติดผนัง

ประกัน 3:3:6 ①



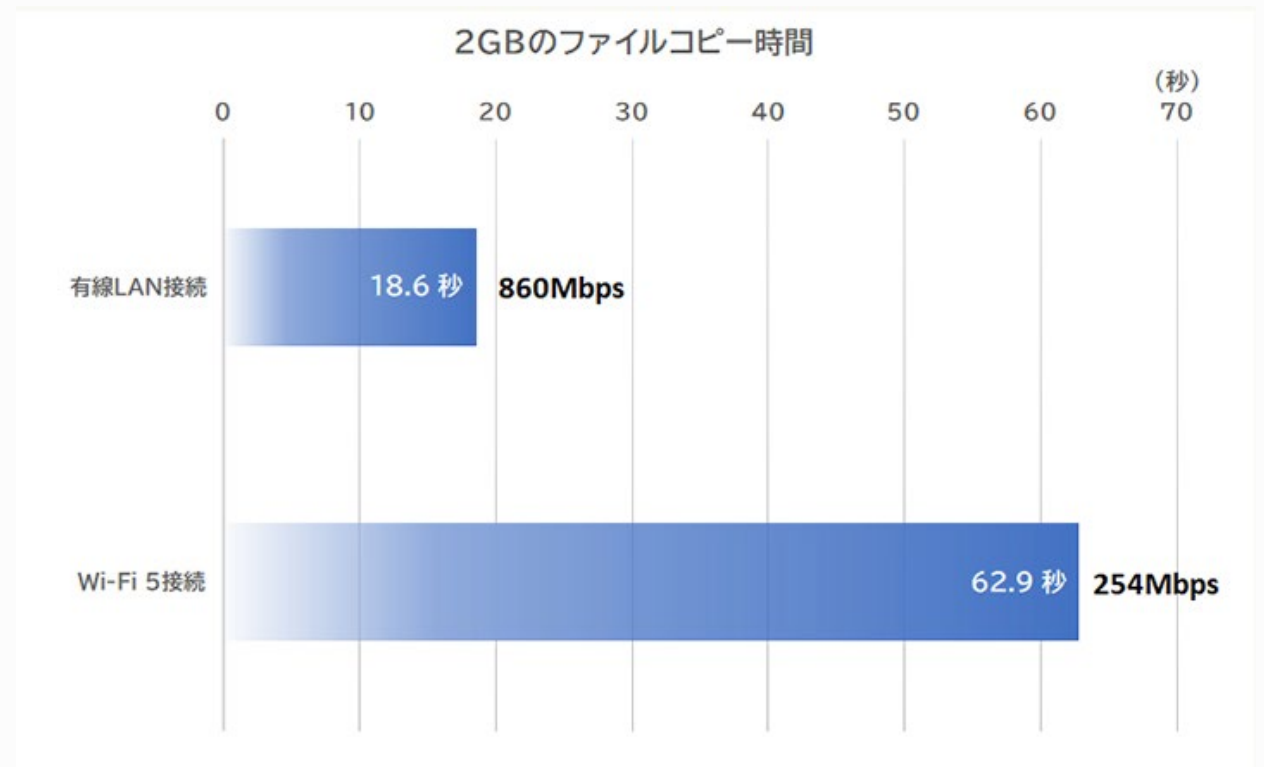
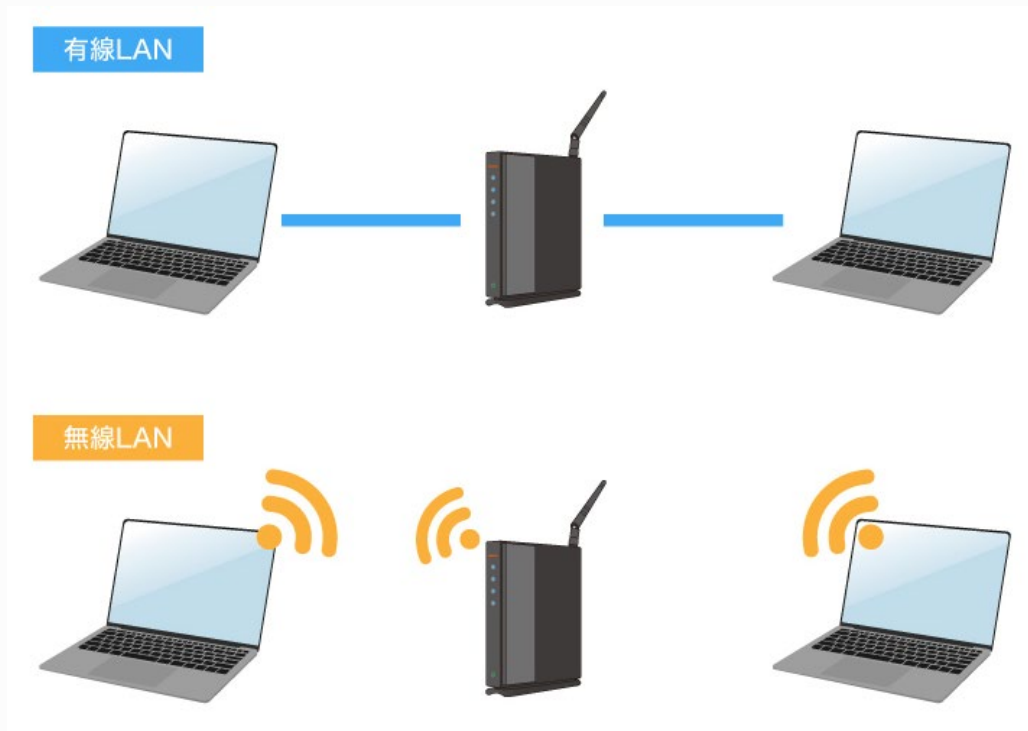
| Appendix | Communication speed between WIFI and LAN

In the case of priority LAN, the average communication speed is 860 Mbps.

In the case of WIFI, the average communication speed is 250 Mbps.

When transferring 2GB of data, it takes 18.6 seconds for LAN and 62.9 seconds for WIFI.

WIFI is also affected by communication efficiency, so obstacles can slow it down even further.



| Appendix | Network traffic

The specifications of the switching hub and LAN cable are as follows.

* 「Mbps」 （メガビーピーエス）は1秒間に送受信可能なデータ量を表す単位。数値が大きいほど、通信速度が速くなる。

ServerとClient PCの通信方法は、FTPによる通信を想定している。

Server側に定期ジョブを用意、Meiji cardの最新版をClient PCに配布、およびWebカメラで撮影をした写真をClient PCから、サーバーPCに保管をする。

【ケース1】

通信速度：1Gbps

回線速度(通信速度/使用台数)：1Gbps / 132 units = 7.5 Mbps

データサイズ：1MB

転送時間(伝送効率100%)：1.1 sec 7.5Mbps

転送時間(伝送効率 80%)：1.4 sec 6.0Mbps

転送時間(伝送効率 50%)：2.2 sec 3.75Mbps

【ケース2】

通信速度：1Gbps

回線速度(通信速度/使用台数)：1Gbps / 66 units = 15 Mbps

データサイズ：2MB

転送時間(伝送効率100%)：0.6 sec 15Mbps

転送時間(伝送効率 80%)：0.7 sec 12Mbps

転送時間(伝送効率 50%)：1.1 sec 7.5Mbps