

REAL-TIME MANUFACTURING PROCESS MONITORING SYSTEM

UTTAPOL SMUTKUPT,
JUGGAPONG NATWICHAI AND PASKORN CHAMPRASERT



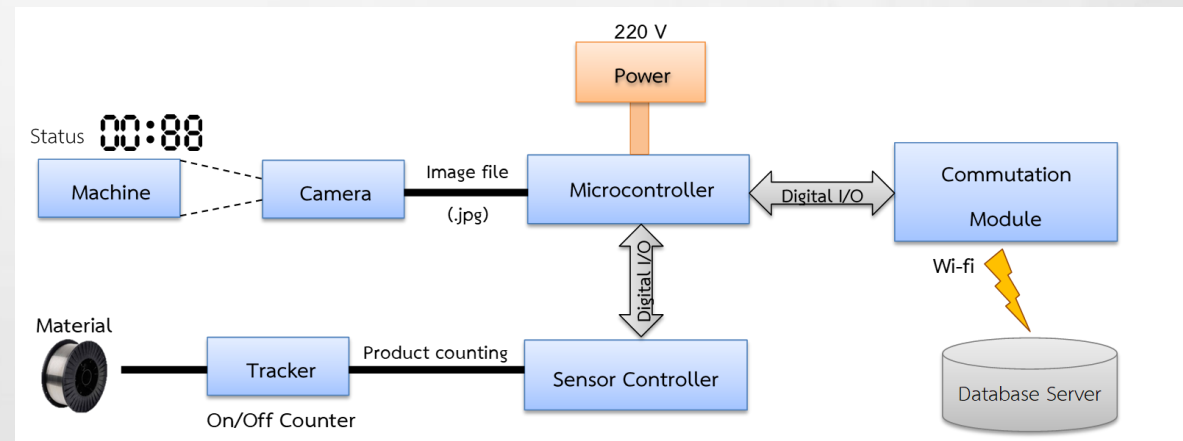
PROBLEMS

- **OLD FASHION MANUFACTURING SYSTEM**
- **READINESS OF MACHINES AND RELATED PROCESSES**
- **MIS-PLANNED RAW MATERIALS**
- **EXCESSIVE FAILED INSPECTION**
- **POOR-ESTIMATION IN INVENTORY INCLUDING RAW MATERIALS OR REQUIRED PARTS AS WELL AS STOCK MANAGEMENT**



PROPOSED SYSTEM

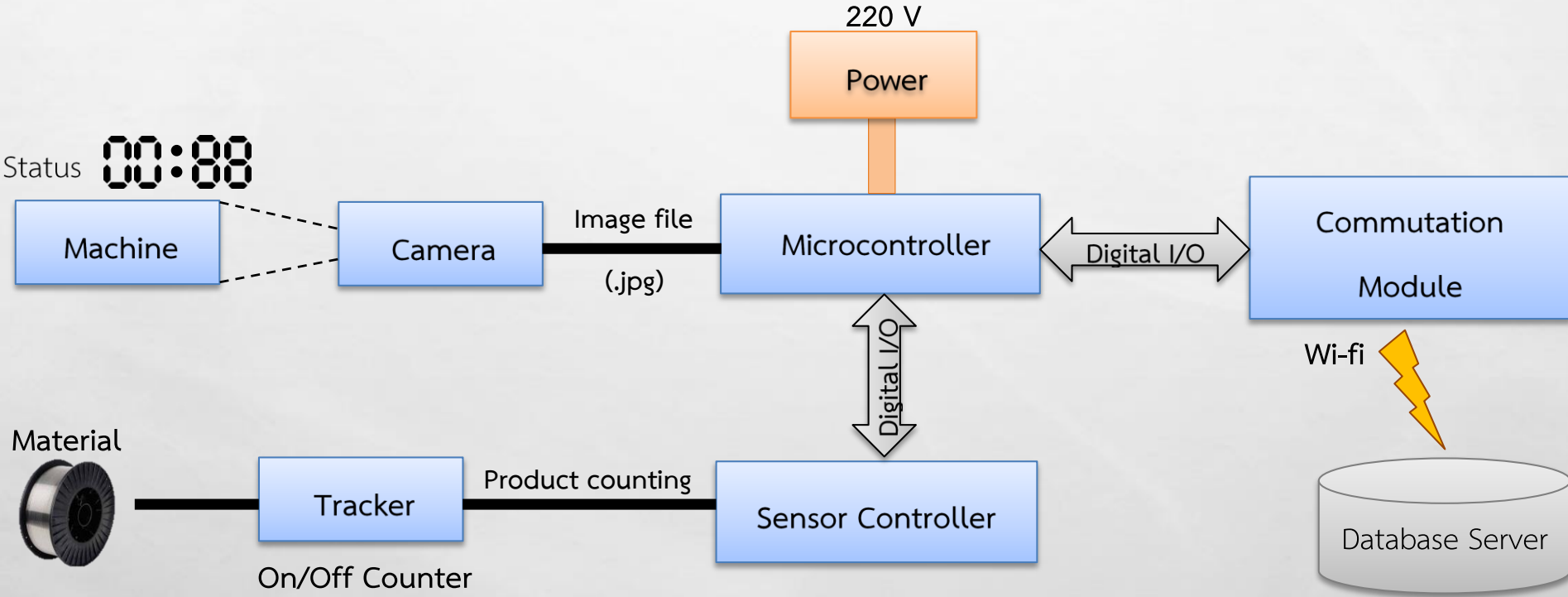
- ORIGINAL MACHINE
- AUTOMATIC DATA RETRIEVAL
- DATABASE
- MONITORING SYSTEM
- DASHBOARD



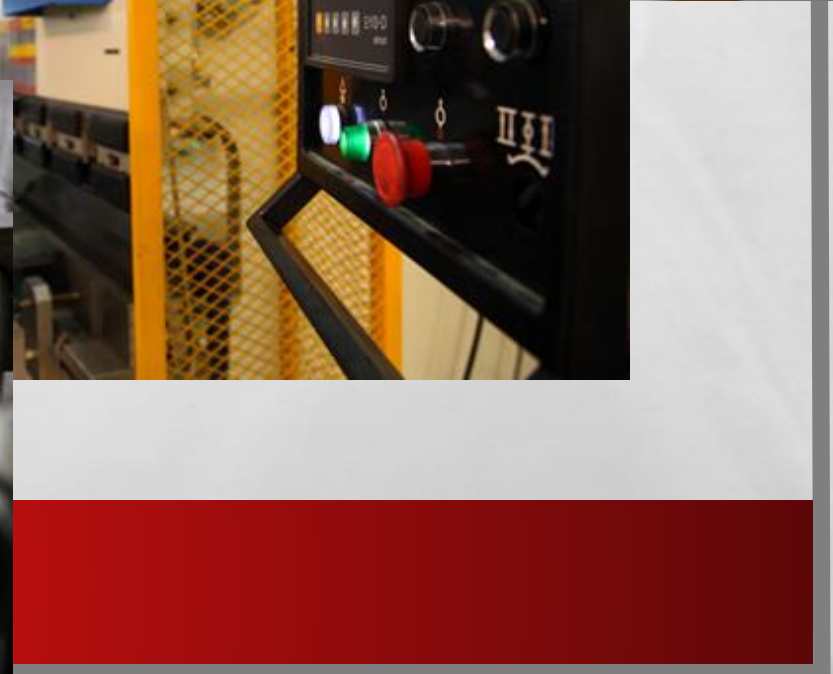
IOT

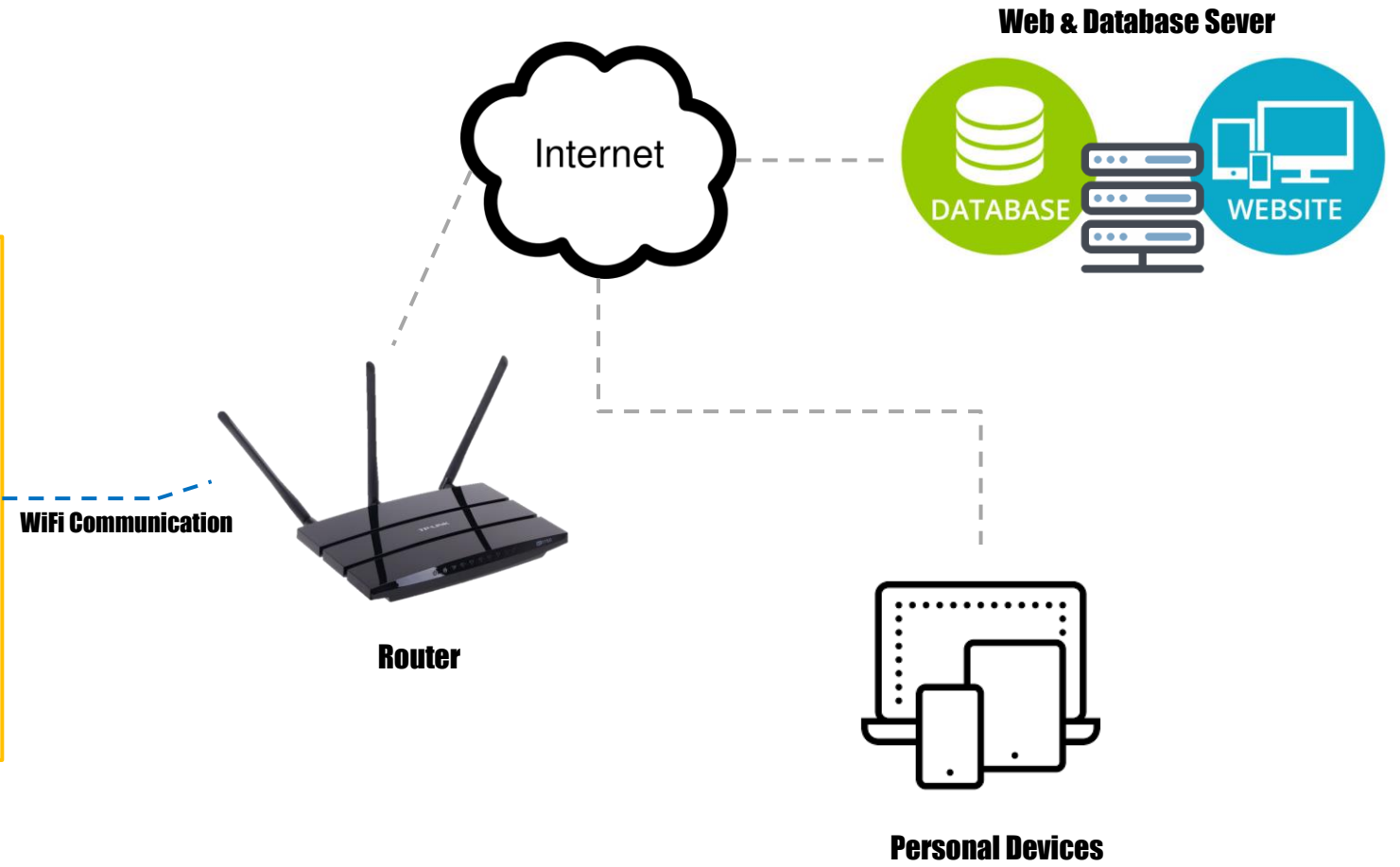
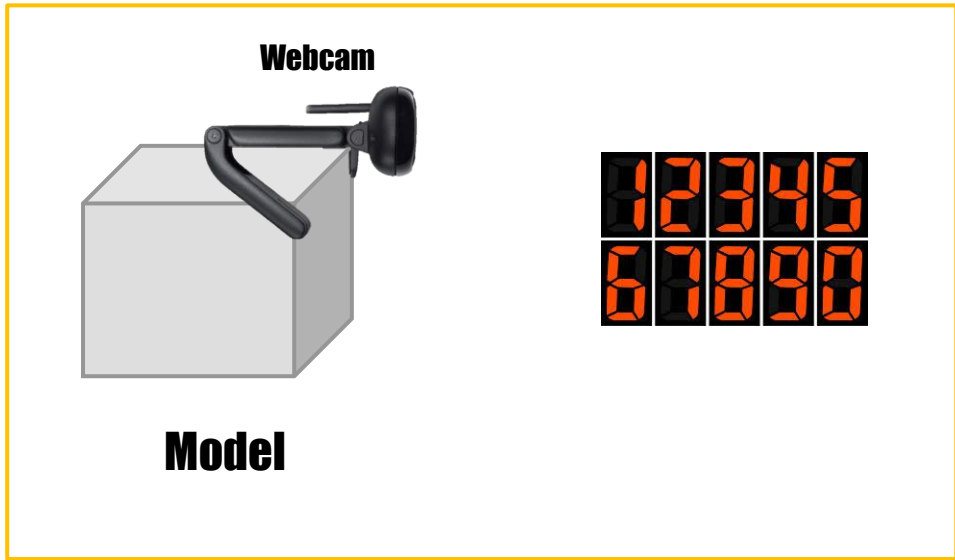
- **ALLOWS AN DEVICE TO COMMUNICATE TO ANOTHER DEVICE VIA THE INTERNET**
- **REALIZES THE SEAMLESS INTEGRATION OF VARIOUS MANUFACTURING DEVICES EQUIPPED WITH SENSING, IDENTIFICATION, PROCESSING, COMMUNICATION, ACTUATION, AND NETWORKING CAPABILITIES**
- **OPENS THE DOOR TO CREATE WHOLE NEW BUSINESS AND MARKET OPPORTUNITIES FOR MANUFACTURING.**
- **MAKES REAL INDUSTRIAL APPLICATIONS AND SMART MANUFACTURING**

REAL-TIME MONITORING SYSTEM



CASE STUDY





DESIGN MODEL

- **HARDWARE**
- **SOFTWARE**

Version 1



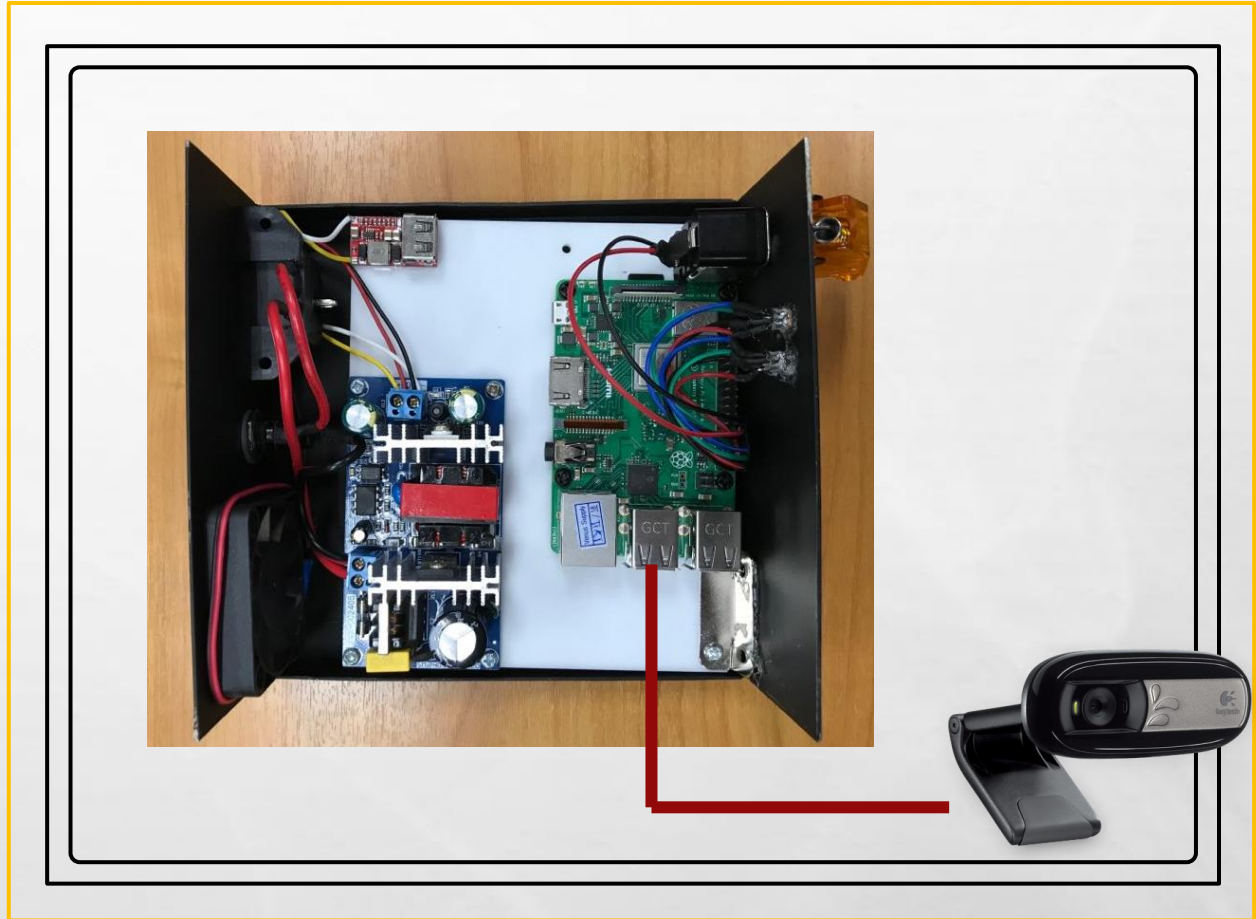
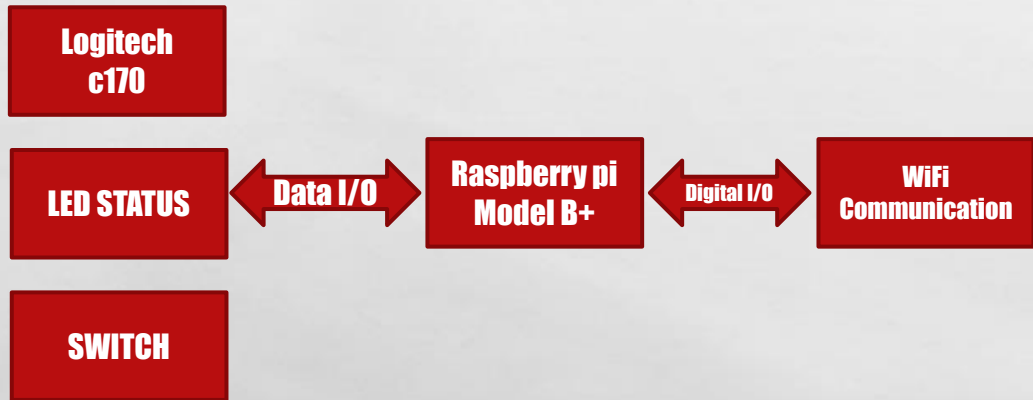
Version 2





Model

บล็อกไดอะแกรมของ Model





HARDWARE DEVICES

LOGITECH WEBCAM C170

- **PHOTO: 5MP**
- **VIDEO: VGA**

HARDWARE DEVICES

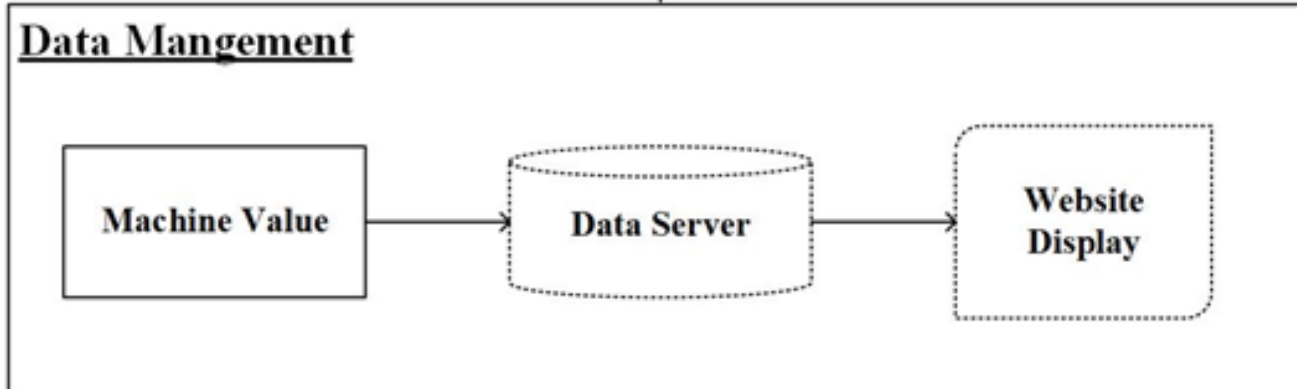
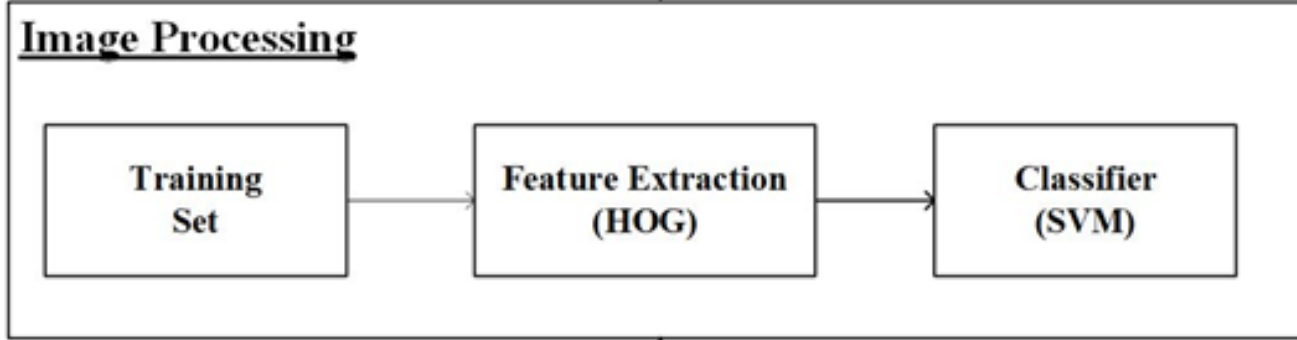
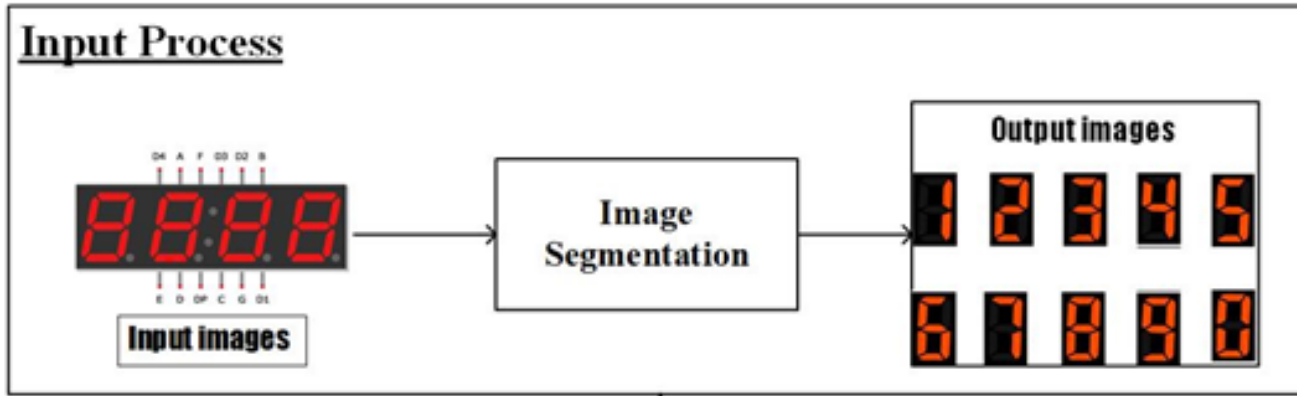
RASPBERRY PI MODEL B+

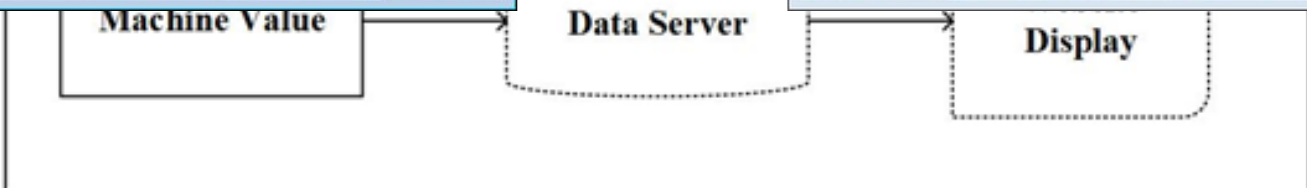
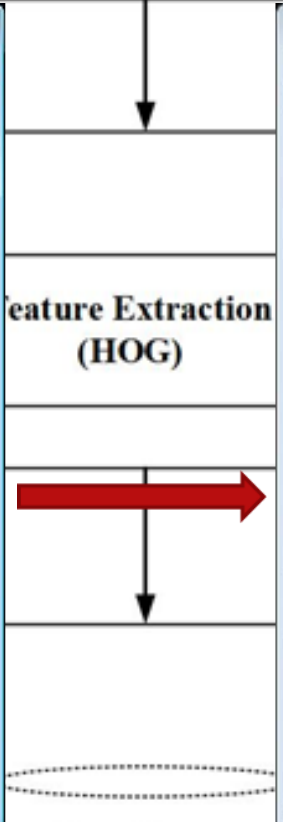
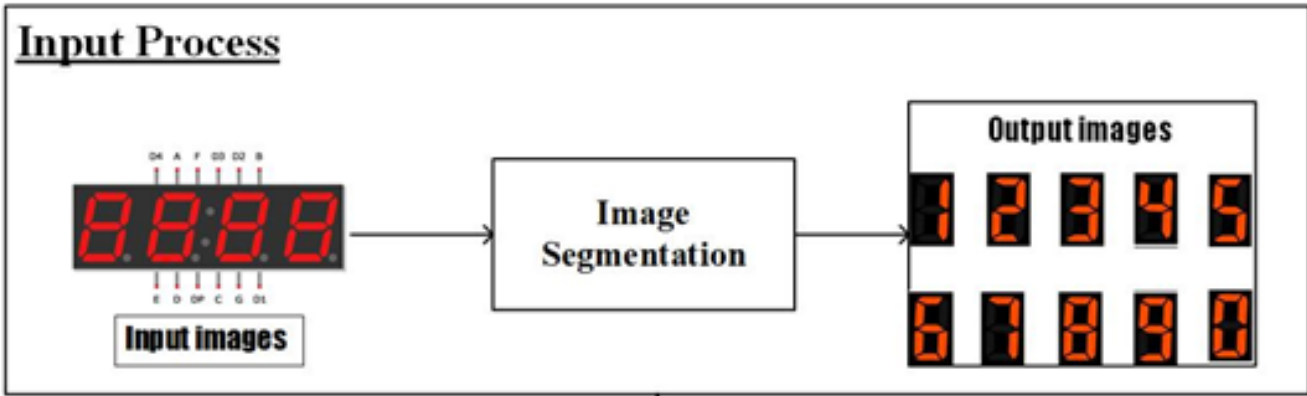
- **CORTEX-A53 64BIT SOC @1.4GHZ**
- **1GB LPDDR2 SDRAM**
- **2.4GHZ AND 5GHZ WIRELESS LAN**



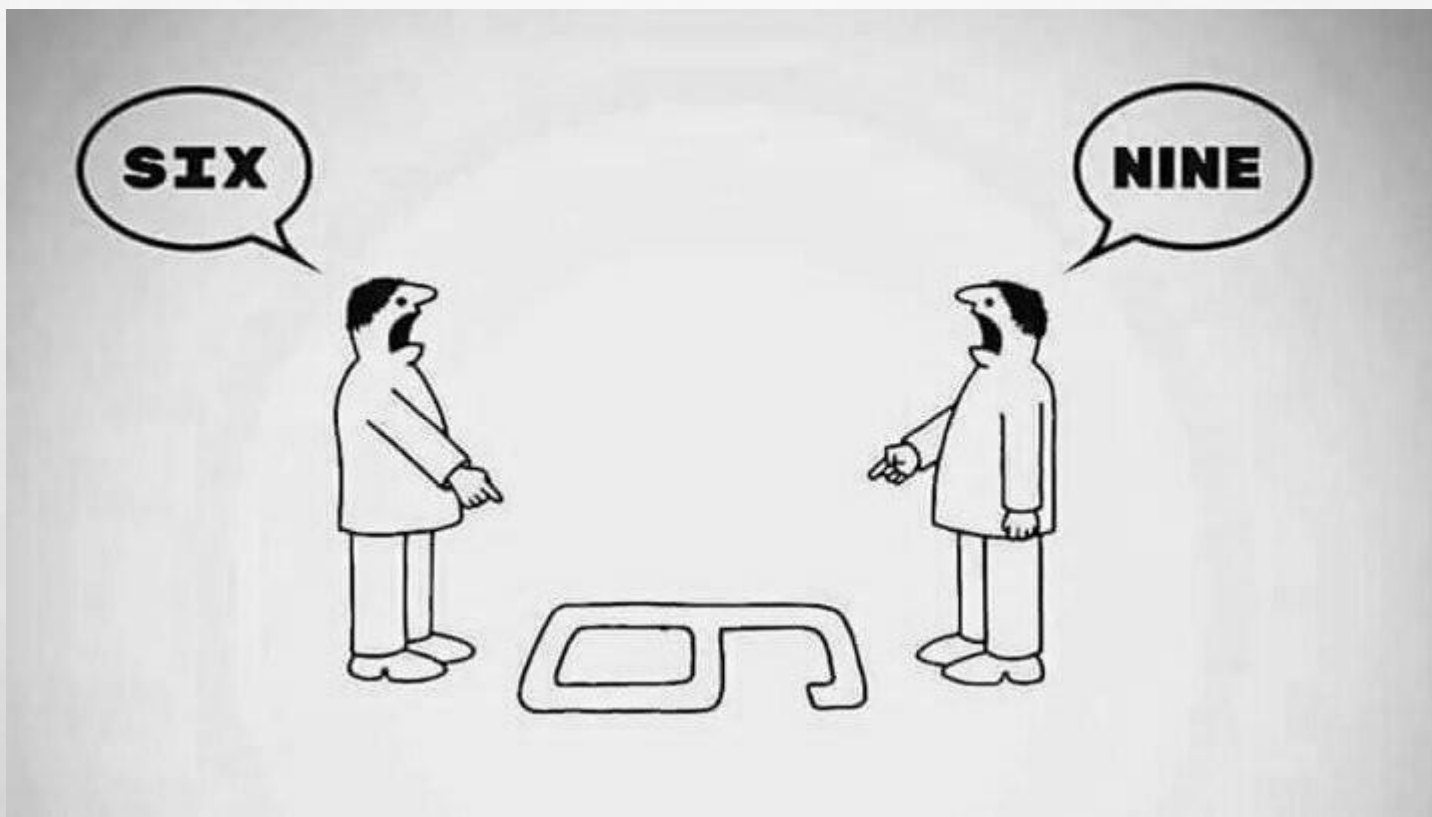
SOFTWARE

- **RASPBIAN: OS FOR RASPBERRY PI**
- **PYTHON: CONTROL CAMERA TO CAPTURE PICTURE AND TRANSFER THE DATA TO WEB SERVER**
- **OPENCV: INTERPRET PICTURE TO NUMERICAL DATA**
- **MYSQL: DATABASE**
- **PHP: CONNECT BETWEEN RASPBERRY PI MODEL B+ AND MYSQL**
- **BOOTSTRAP: WEBSITE**
- **DIGITAL OCEAN: WEB SERVER**



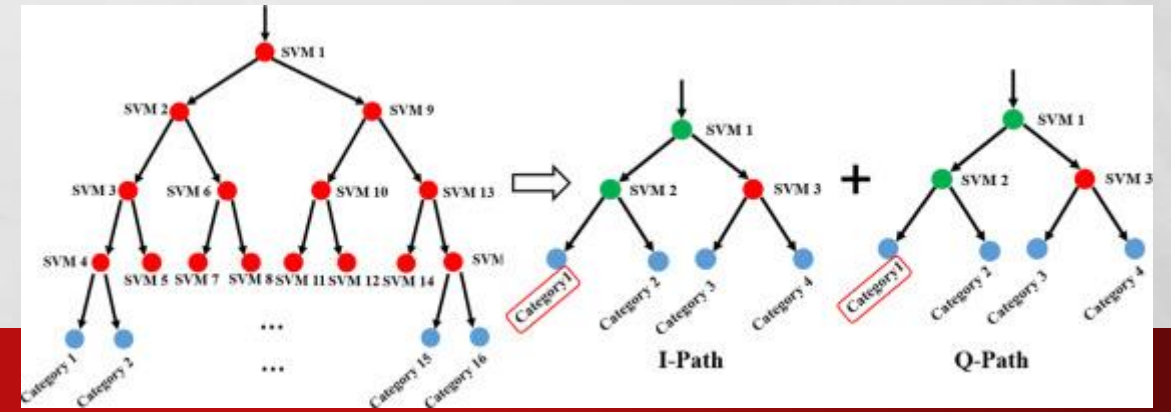
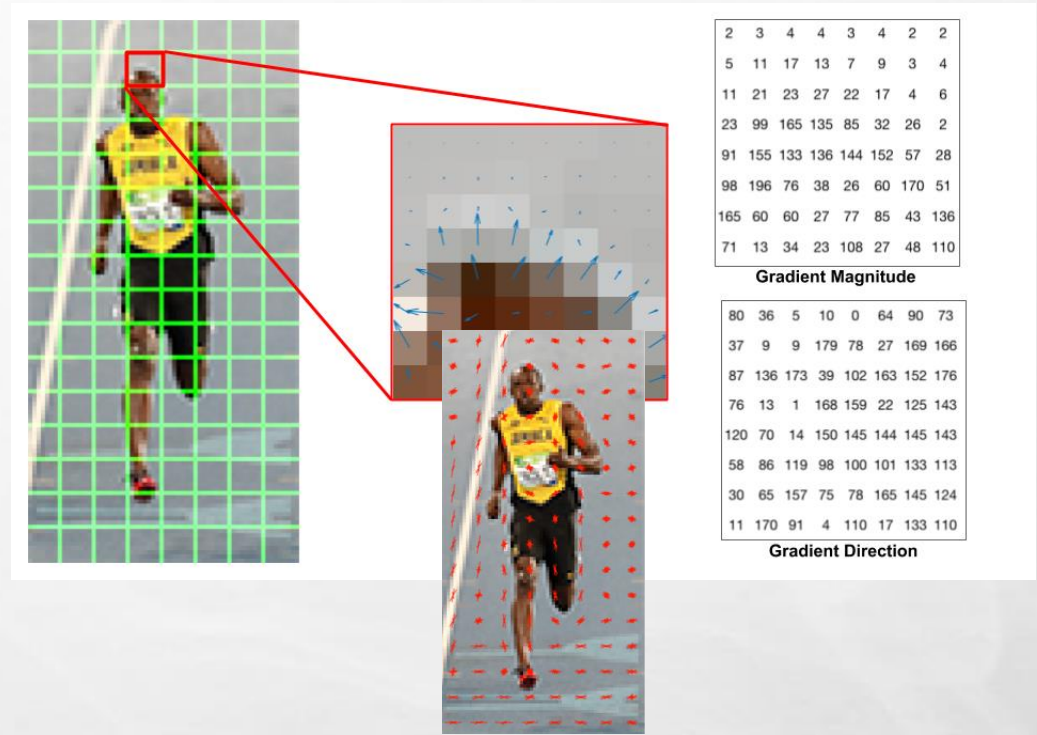


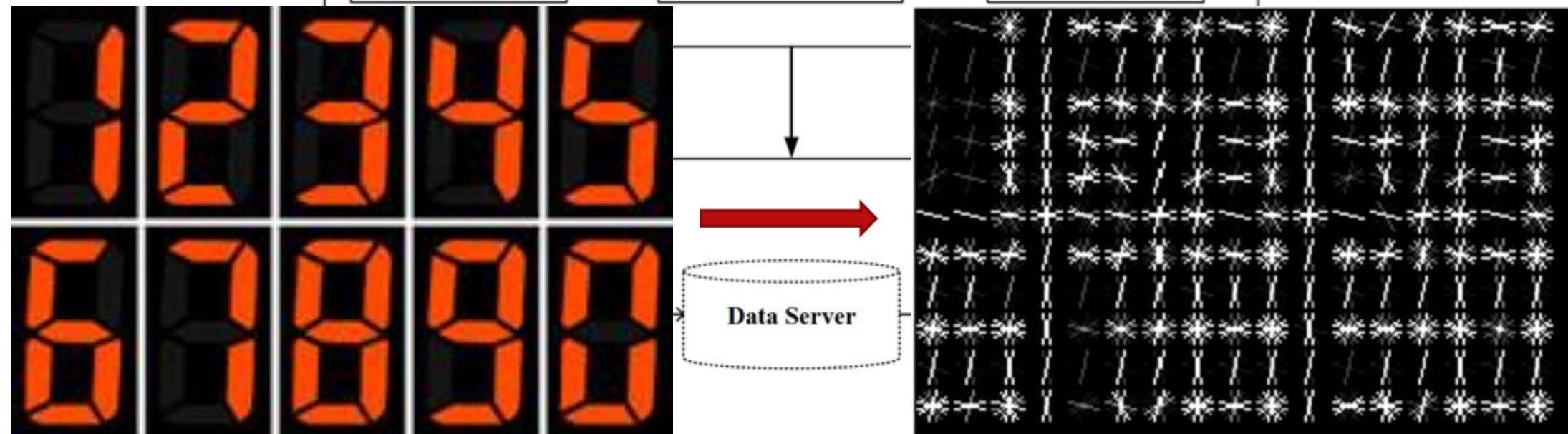
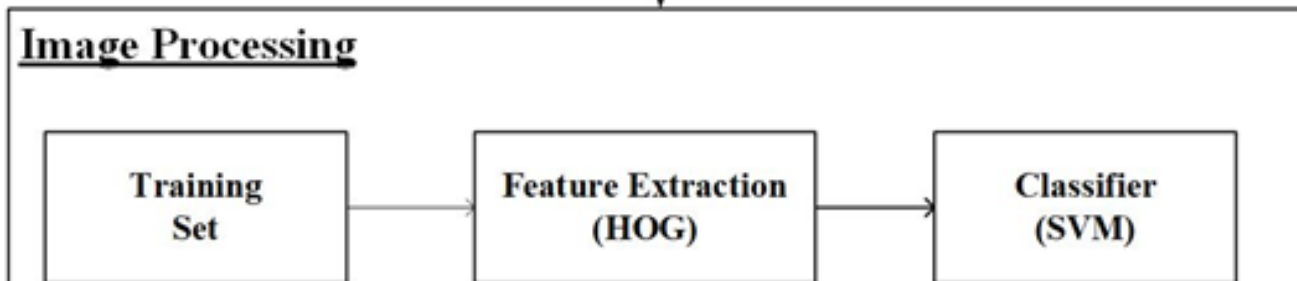
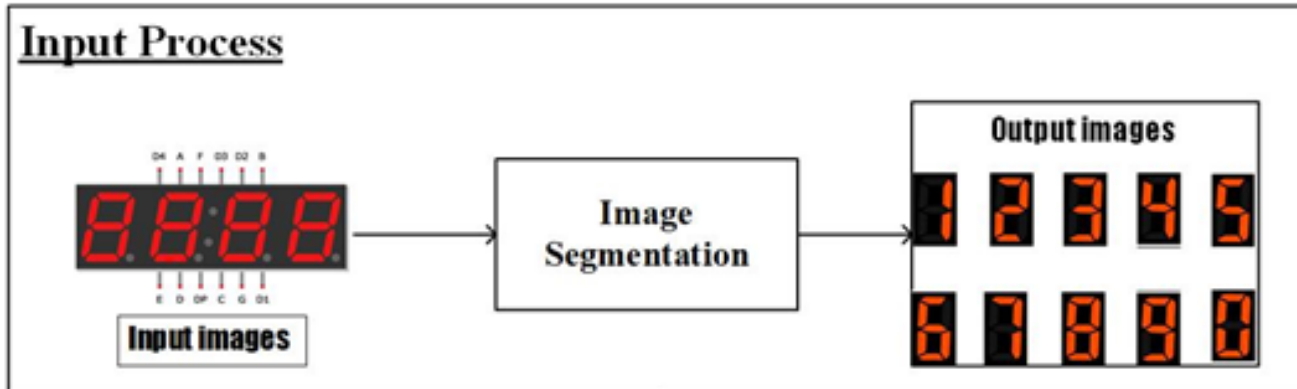
RECOGNITION



RECOGNITION

- HISTOGRAM OF ORIENTED GRADIENTS (HOG)
 - FEATURE EXTRACTION
- SUPPORT VECTOR MACHINE (SVM)
 - CLASSIFIER





SiamWire

Machine2

วันที่/เวลา ที่ เริ่ม	จำนวน เครื่อง	สถานะ เครื่อง	สถานะ	หน่วย	รวม หน่วย	ค่า ใช้	รวม ค่า	สถานะเครื่อง	เวลาที่ใช้รวม
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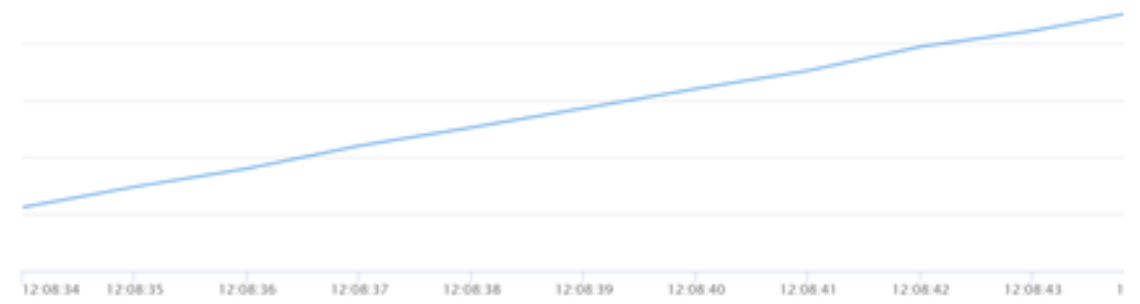
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กราฟแสดงประวัติงาน

วันที่ 1m 3m 6m YTD 1y All

วันที่ พ.ค. 31, 2019 86 พ.ค.



กราฟแสดงแรงดึง

วันที่ 1m 3m 6m YTD 1y All

วันที่ พ.ค. 31, 2019 86 พ.ค.



FINAL REPORT

[F05-01-H] Beaming Information

File Edit View Insert Format Data Tools Add-ons Help Last edit was made yesterday at 4:10 PM by anonymous

Work No. work1

Beaming Information

Setting time: May 1, 2019 01 to May 17, 2019 Time Hrs. Estimated time to be finished: Apr 30, 2019 Est. Hrs.

Winding process started (time/date): Actual finished time: Apr 30, 2019 Act. Hrs.

SWN Work No. work1 %WRRR = % MAX Stand No. Beaming M/C

Customer: ggggg Wire Supplier Name Type of Spool Type of Weave Type of Material Diameter Warp mesh Weft mesh Width Length Qty Bm.No. 3

PO No.: po2 1 2 Plain Dutch AISI 304L 9 inch 8 7 6 m. 5 m. 4 Pieces Net weight (kg)

Number of warp wire use for each Calculation for warp wire (No. of wire) Number of counter meter set up (No./m.)

Inside mesh Waste edge +Extra Total Spool Line Adjust Total Machine Stopped Wire separated Wire finished Weight / line (g)

Wire Mfg. No.: 4 5 Control Min Max Remark Beaming grade PIC MO checked Qty of Oil Oil applied

Wire Heat No.: 7 Tension 1 2 3 A B C Pass Not pass Qty of Oil Type of Oil

Total width (mm) Width of each line (mm) HZ 7 5 4 RPM 7 6

Wire receive from IQA Use for warp wire Scrap Balance Control Limit Tolerance (unit) Control value Min Max

Lot No. kg Qty kg Qty kg Qty kg Qty Width +- mm. + 2 - 3 2 8

Warp mesh +-mesh or +-% + - 8.0 8.0

Weft mesh +-mesh or +-% + - 7.0 7.0

Screening process (TS&EL 100 %)

Lot No.	Sample	Accepted	Rejected	PIC.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Appearance of wire by visual check

Lot No. Sample Accepted Rejected PIC.

1st reed 2nd reed 3rd reed 4th reed

Mesh Mesh Mesh Mesh Mesh

Width(mm) Width(mm) Width(mm) Width(mm)

OKURI Gear setting Threading at final reed 0.00 #01

การปรับ Tension จำนวน วนที่

การปรับหน้า

การปรับหน้า

ปรับหน้าที่ Roller 1-2 1= 2 2= 3

