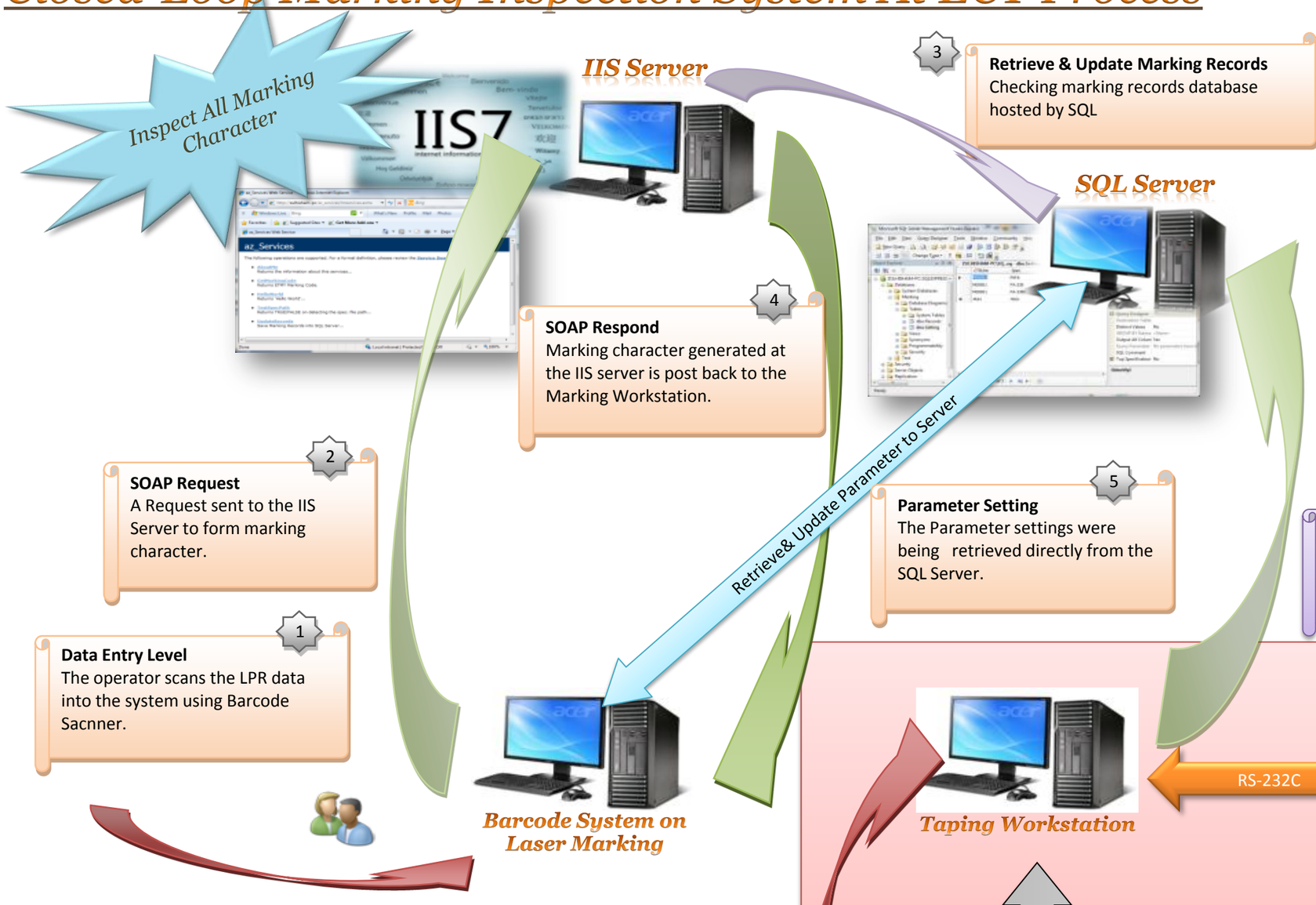
Closed-Loop Marking Inspection System At ECT Process



At Taping Process

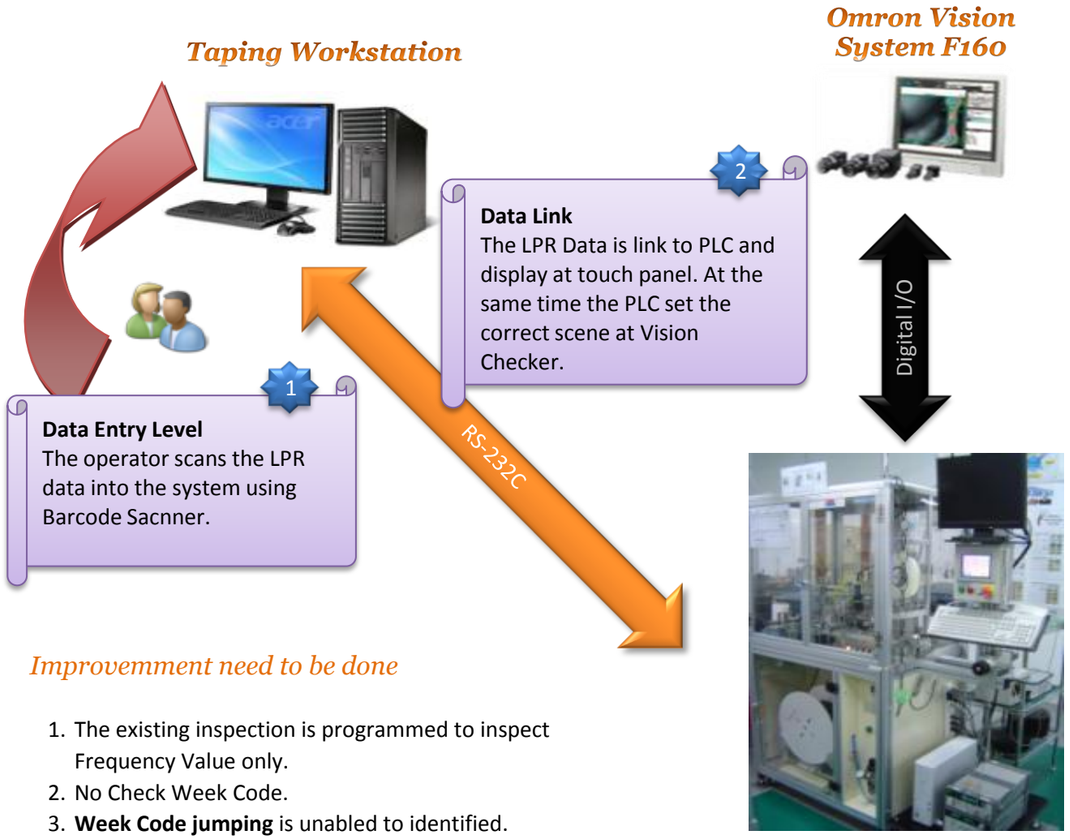
1. Operator enter Lot Data into the system using Barcode Scanner.
2. With refer to the Barcode Information, Taping work station check marking records at SQL Server.
3. Taping work station set appropriate scene at Vision System via RS-232 Communication.
4. Taping work station set 'Ready' bit indicating standby mode to Taping Machine.
5. During Auto Run, the Taping machine trigger the Taping work station for vision result via digital I/O.
6. Taping work station trigger Vision System through RS-232C. The Vision was return to the station for OK/NG judgement.
7. The judgement sent back to machine via DIO.

At Laser Marking Process

1. Operator enter Lot Data into the system using Barcode Scanner.
2. The Laser Marking Barcode System Request IIS Server for the Marking Character.
3. IIS Server Checking Marking Records SQL Server before generate new marking Character.
4. Upon a marking character is generated, it send the request back to the Marking Work Station.
5. The Marking System direct request to SQL server for appopriate marking profile. This because no program required to run on the Server side.
6. Upon marking start, the records was being updates through the IIS server to SQL.

Original Construction Of ECT 's Vision System

Propose



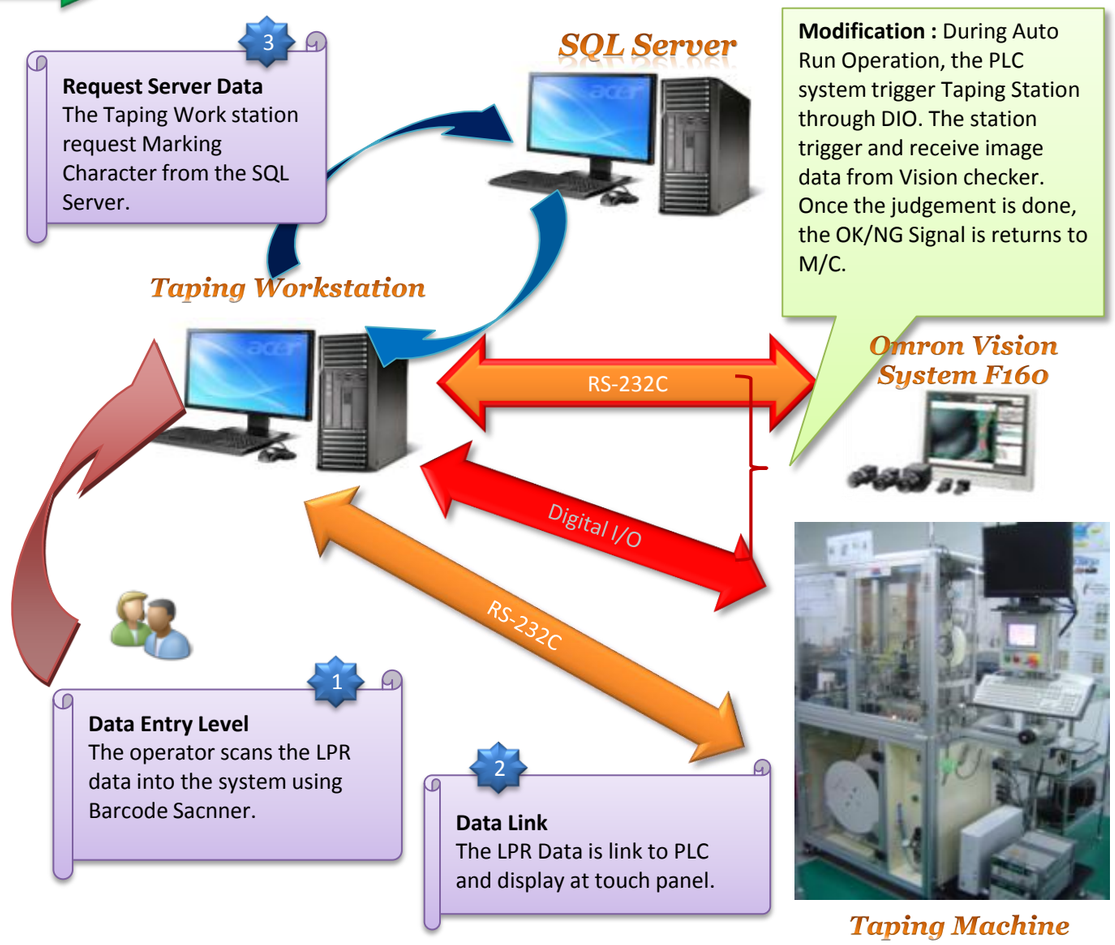
Improvemment need to be done

1. The existing inspection is programmed to inspect Frequency Value only.
2. No Check Week Code.
3. **Week Code jumping** is unabled to identified.

The Operation Cycle

1. At Data Entry Level, the Operator scan the LPR information into the system using Barcode Scanner.
2. The Taping work station link the Data with PLC system to display it at the Touch Panel and at the same time the PLC select a correct scene at the Vision Checker.
3. Once all the system are in Ready mode. The machine is ready for Auto Running operation.
4. The PLC will trigger the Vision system once the material is present at the Vision Station.
5. The Vision checker will inspection the Direction of the material as well as the frequency value. The inspection judgment will returns to the PLC system via Digital I/O signal.
6. When an 'NG' signal was received by the PLC system, the entire Auto Running operation is being interlock. And at the same time, the machine returns an alert.

Implemented Closed-Loop Marking Inspection System



Tasks need to be done with minimum investment

1. A windows service based application need to be constructed and running at the background of the Taping Work Station. This application capture I/O Signal from machine and trigger the Vision System.
2. The background application capture data from Data Entry Level through a text file generated by the Original Program. The data is used to retrieve Marking Character from the SQL server.
3. As such, the Original Taping program need to have minor modification in order to generate a text file to a specify location.
4. PLC Software not required any modification. The signal that set the scene at vision checker can be ignore due to no feedback signal (one way communication - dangerous if wire break).
5. Hard wiring.

> Required hardware : USB-DIO, USB-RS232c
> Tasks 1, 2 & 5 can be done by ETMY. Whereas, Tasks 3 need to consult with Machine Maker.
> The server that serving marking data is currently up and run.
> This concept had been implemented at MA Taping Machine (Windows Based System).