Weight conveyor with corrugate printer

Background

The final process on each production machine is to load the manufactured goods in to corrugate box. The project was planned to check the correct number of items have in box and print important details such as manufacturing date.

Problems of Existing Process

- Each final package had to be inspected one by one using man power.
- Packaging details had to be done before the packaging process.
- It took longer to test one package at a time.
- During the final quality inspection, the number of the items in package had to be check separately.

Goals of the project

- Reduce the time of inspection.
- Increase package item accuracy.
- Reduce second maintain process.
- Increase productivity.

Project description

To achieve these goals, a convoyor was designed to test the weight. In this case, the packaging device first detects the package after it has been removed and commands a new sensor to start the operation of the new machine. The load cell is then weighted with the aid of a load cell. It is then rejected by the machine itself if it does not have the required weight. If the specified weight is in the package, the relevant details are printed on a printer and the final package is discarded. Here SCADA system also provides the ability to store and analyze data.

Main Component in this Project (for one unit)

Figure 1:assembling process

- 3-photoelectric
- 2-induction motor
- 2-VFD
- Haiwell PLC of model NO T16S2T
- HMI panel
- Load cell & module
- Inject printer
- Printer display
- Solenoid valve
- Pneumatic cylinder
- Emergency switch

Assembling

Assembling process was done with other supporting equipment such as tools and face transition equipment. Done assembling number of 4 unit.

Wiring Process

The panel box wiring required for all four units was done. MCB, 16A double pole protector GV2ME21 MCB protection devices were used for the protection of the devices were used for the protection of devices. The panel box was designed so that the relevant wires could be labeled and identified. Show in figure 42, 43.

Figure 3:panel box of weight conveyor

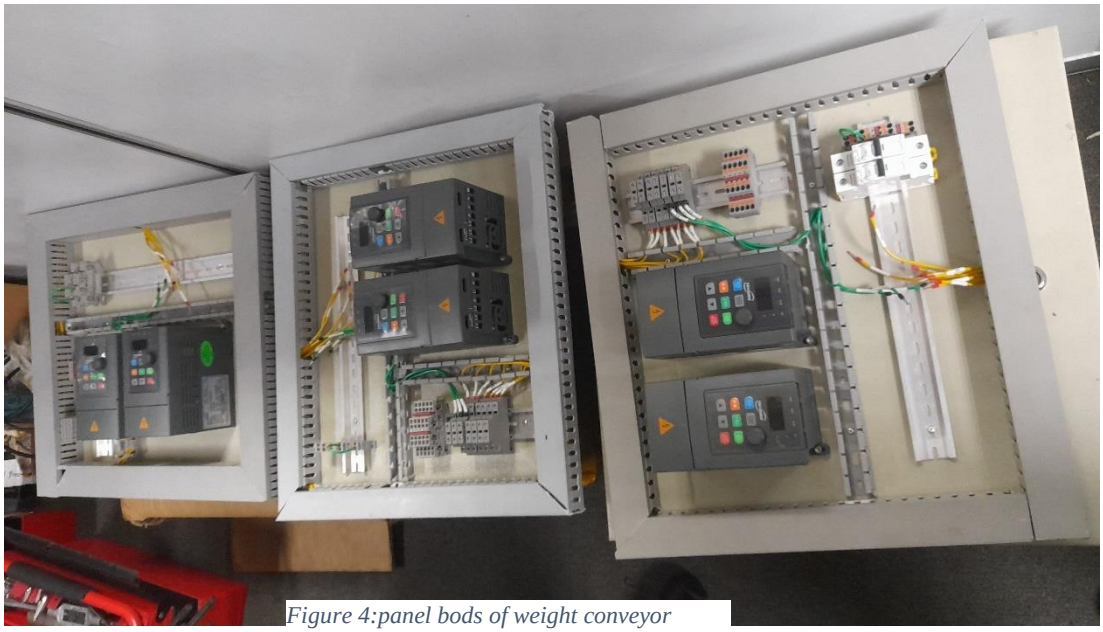


Figure 4:panel bods of weight conveyor

PLC program

PLC program was don with main program and three sub programs. PLC program was written on Haiwell PLC software using ladder logic.

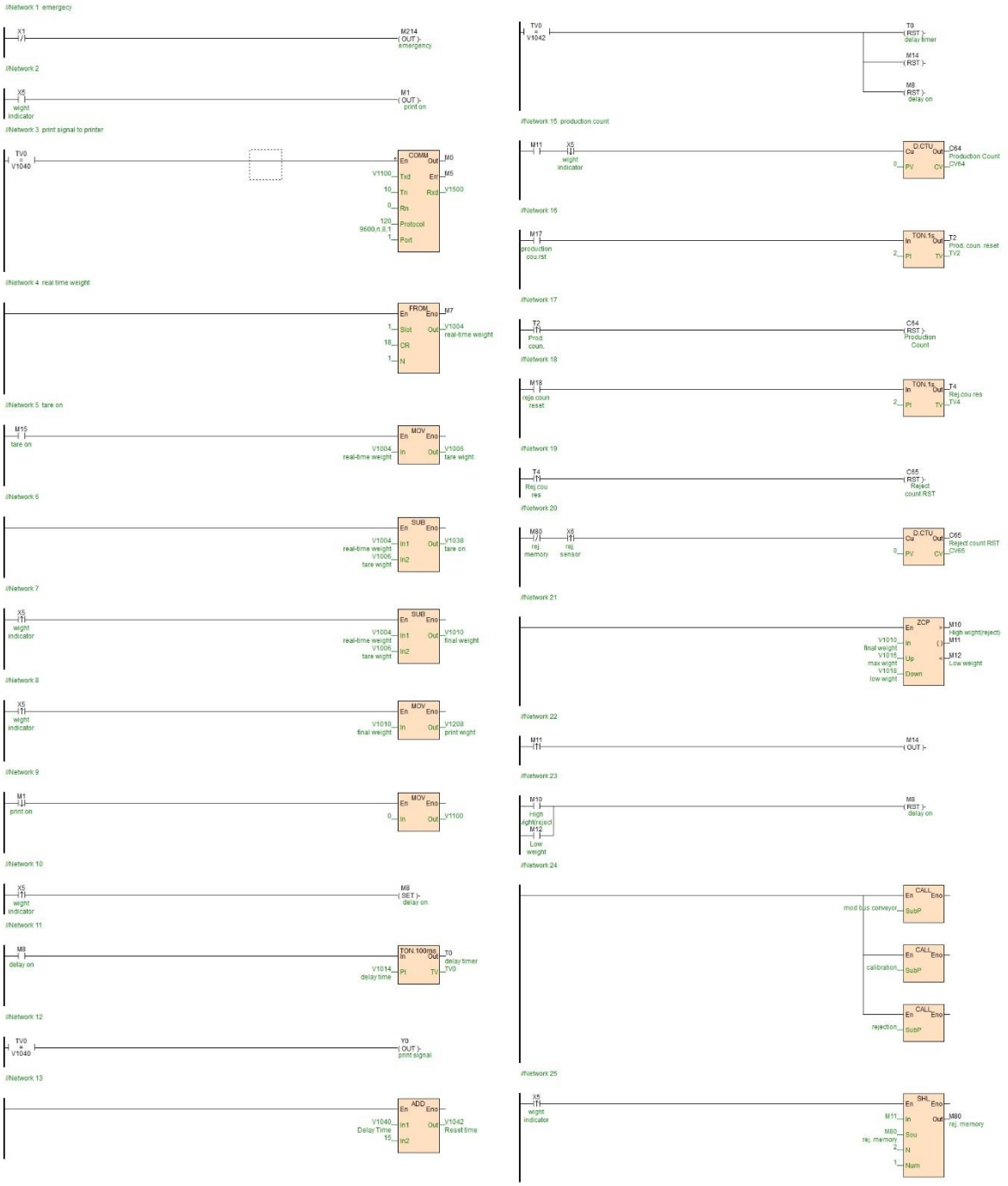
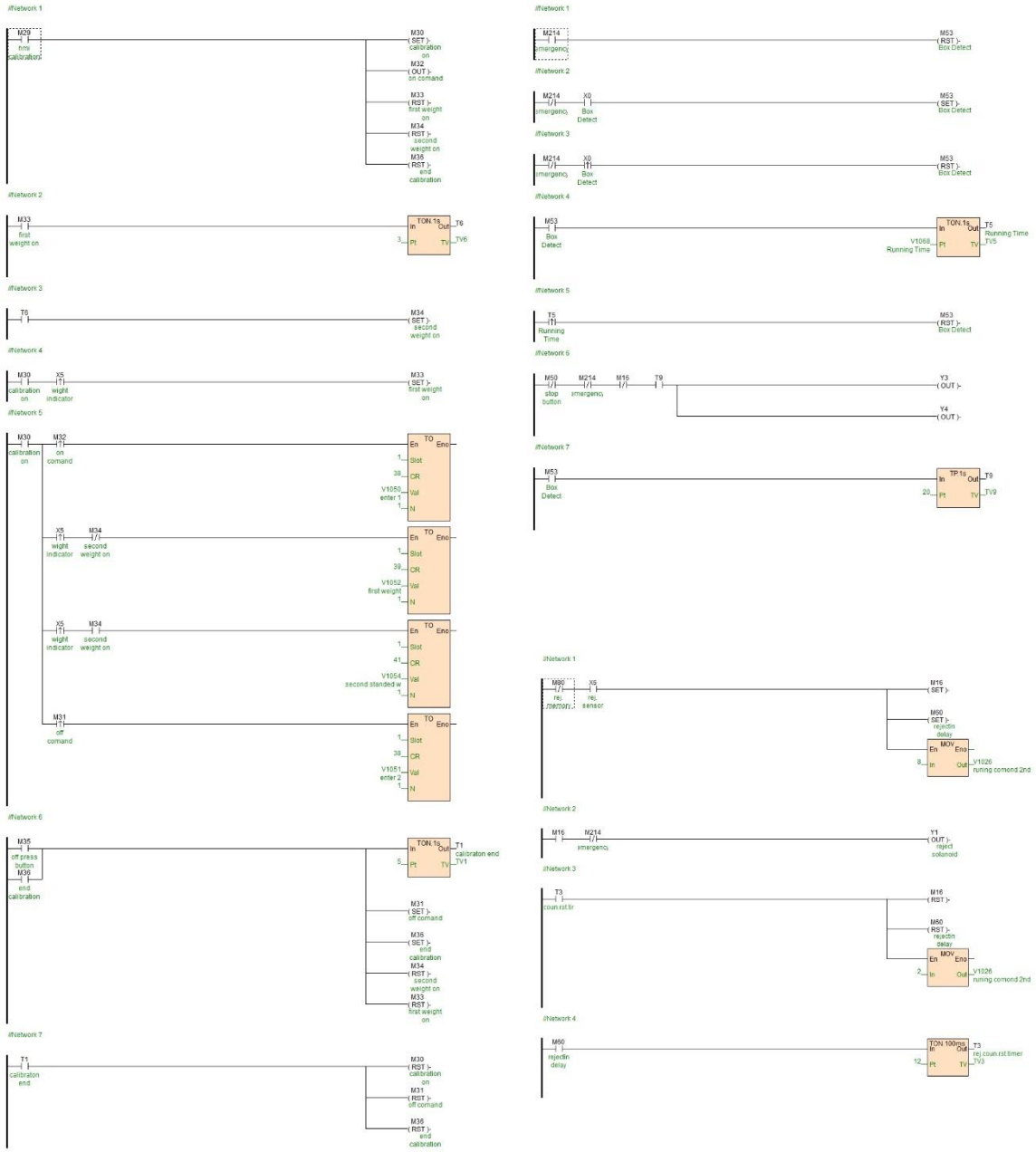


Figure 5:PLC main program



HMI program and SCADA

The SCACA was set up using an HMI to control and monitor the machine. Here the existing load, the required load and the printable load are displayed as shown on the screen, Show in figure 49. Also, a separate panel was set up to provide different weights for different products, Show in figure 50. A separate board was also set up for calibration, Show in figure 51.

Figure 7:main SCADA display

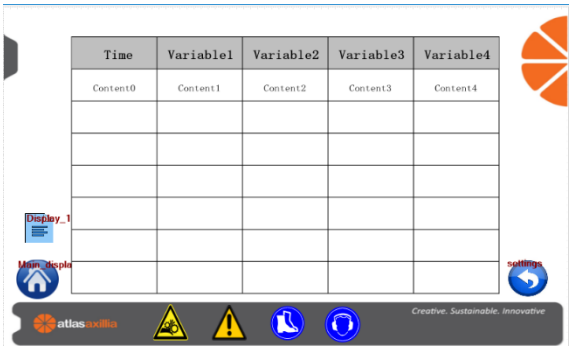


Figure 6:2nd SCADA display

Figure 8:calibration SCADA display

Final output

One unit of processing has already been added to one production machine in the company, show in figure 52. It is currently at an active level. The other three units are positioned after the layout change in the plant.

Figure 9:unit install at production line