

# 2M



AUTOMATION LTD

# Chinaware Casting Machine

## Project Brief

Wedgwood is a name recognised instantly around the world. Josiah Wedgwood, the 'Father of English Potters', founded the company in 1759. He set the standard for high quality and continual innovation that has made Wedgwood an essential in the homes of today.

2M was called upon to upgrade the control system on a Lippert© Casting Machine that had not been used for 5 years. The Machine was to be shipped to Indonesia for casting an extended line of China and Earthen ware for Royal Doulton, a Wedgwood acquisition..

2M had to assess the requirements of the factory in Indonesia and compare them to that of their UK-equivalent. This assessment included determining the level of skills

and support needed to smoothly run production in a fast developing Asian country.

Indeed, although built in Europe for the UK market, the Lippert Machine could be

modified to become successfully operable in Asia.

After a month of installation and commissioning, the project was deemed a success.



### Key 2M Services Supplied:

- PLC Programming
- Barcode Printing
- Barcode Scanning
- Remote Access
- PID Software Development
- RS485 Field Network Configuration
- Product Database Management

### Key Components Used:

- Mitsubishi Q Series PLC
- Mitsubishi E900 Operator Panel
- SICK CLV Barcode Scanner
- Zebra 105SL Barcode Printer

## Design Philosophy

The Lippert Casting Machine was built to cast different types of Chinaware.

At the core of the control system design was a central PLC with Field networking to an Operator Panel, RS485 connection to about 6 remote pushbutton keypads with status LEDs, a RS232 connection to a barcode reader and a serial connection to a modem for remote diagnostics.

The machine was operator-controlled from the main panel using push buttons and the HMI. The Casting machine consisted of Casting Stations,

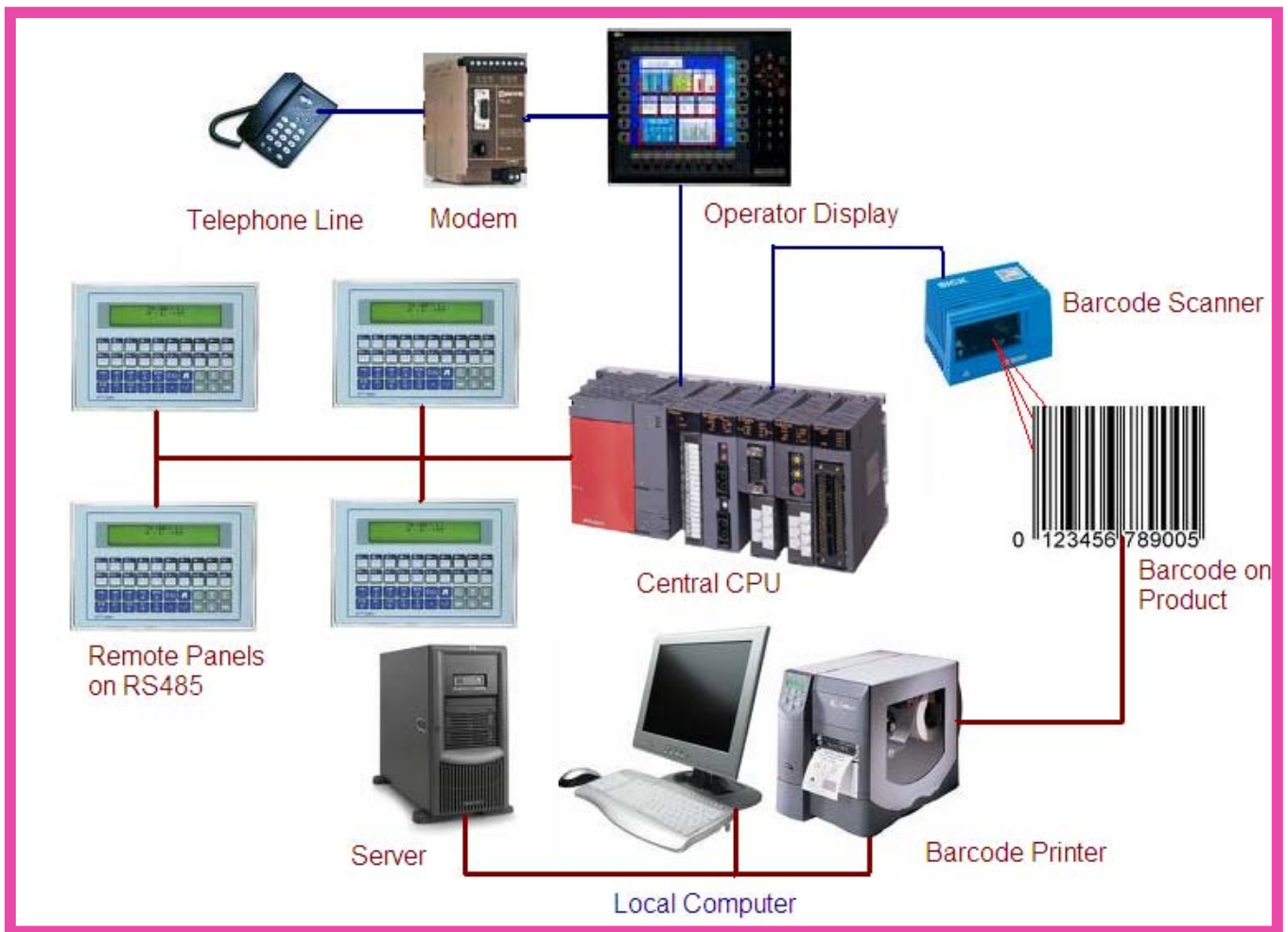
Mould Dryer, Mould Pouring Station, a Mould Reset Station and a Conveyor System. Each of these had their own local keypad for operator control.

Different moulds were identified by distinctive barcodes that were printed

from product information on a database. Operators could set different recipes for each product.

Furthermore, a modem was installed to allow support from anywhere in the world.





## Technical Risk Management

### Product Identification and Tracking

- The main aspect of the design was to have a robust product identification and tracking system and also to give the end-user the capability to modify the database for future changes in their product line. 2M designed a product database that the end-user could use, not just for their casting requirements but across the company too. Using Excel, it is now possible to modify information and easily upload it into the machine.

- It was imperative to correctly track the product through the different processes on the line. This was designed using PLC registration principles. The operators can now also modify the product position information manually. This makes it easier for them to recover from system faults.

*“ Through hard-earned experience in industrial software design, 2M has rationalised software design to render it reliable and to provide user-friendly operator interfaces. ”*

### Mould Temperature Control

- In creating a chinaware product, 2M discovered early in the project how critical the temperature of the product was to the overall process.

- The temperature was controlled with a series of heaters and fans with temperature probes scattered throughout the machine. The use of PID loops in the PLC helped to maintain the required temperatures accurately by opening and closing vents and switching the burner on and off. This ensured the actual temperature was always the same as the set-point.