Baker Perkins

Technical Bulletin

Tweedy™ Mixer Control System Replacement

Of the hundreds of Tweedy™ Mixers supplied in the last 30 years, many are still in daily use. While these machines are mechanically sound, they have obsolete control systems that provide limited functionality, are difficult to fault-find and expensive to maintain. In many cases spare parts are no longer available.

Any Tweedy™ Mixer can be upgraded by retrofitting the latest control system that is based on industry standard off-the-shelf components. The new control system provides a more user-friendly operator interface, gives better consistency of the mixing process, and requires less maintenance.

Benefits

- Provides ongoing security of continuous production
- Replaces unsupported or obsolete control system components with standard, off-the-shelf components, eg PLC and HMI
- Provides latest technology for mixing process
- Ensures consistency of dough quality
- Maintains ingredient and process parameters
- Provides alarm system with enhanced diagnostics
- Reports mix conditions and ingredients used
- Gives password protection of recipe and engineering functions
- Simplifies maintenance via modular, structured PLC code
- Allows remote support via internet connection
- Provides schedule of maintenance activities

Applications

Mixers | T35 | T70 | T140 | T280 | 5500 | 6600 | 7700 | 170 | 220/275 | 340 | 385

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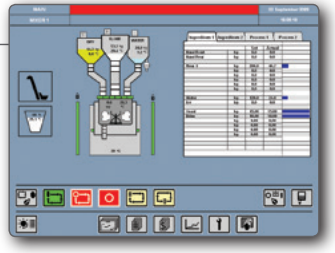
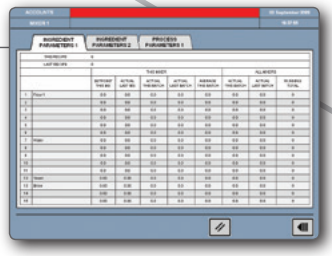
Tweedy™ Mixer Control System Features

Graphical Interface



- Clear and intuitive touch sensitive interface is easy to understand and use
- To minimise screen clutter buttons and other data are only shown when relevant
- Multi-level security controlled via screen logon or swipe card

Alarms



- Only primary alarms are displayed, enabling problem areas to be quickly located
- Secondary alarms are suppressed but visible on alarm history page
- Process alarms alert operators to variations that may affect the dough
- Alarm history available for assistance with maintenance
- Alarm limits can be adjusted to suit local operating conditions

Dynamic Recipe Management

- Changes made to recipes are implemented on the next stage rather than after a two-mix delay
- Benefits of a change to improve product quality or plant efficiency are seen instantly
- Changes can be made to any process parameter up until the point in the mix cycle where it is invoked

Maintenance Scheduling

- Gives a graphical representation of the status of maintenance activities
- Gives maintenance personel detailed instructions for work required
- Enhanced component life cycle management aids preventative maintenance scheduling

Plant Scheduling

A single schedule is executed by all the mixers on a plant rather than each mixer working to its own schedule

- Dynamically optimised to accommodate stoppages and maximise plant output
- Mixers are timed and co-ordinated to avoid shortages or delays in using mixed dough
- Entry of schedule into the system is simplified through centralised loading

Reporting

- Ingredient usage is aggregated, stored and displayed for all mixers on the plant
- Real-time and historical trending of key process parameters is available for operational problem solving and process improvement programmes
- All stored data is easily accessible by higher level systems
- An optional enhanced reporting system for remote PCs is also available

Tweedy™ Mixer Data Reporting System (Optional)

Reporting is the collection, storage, analysis and display of data generated by the mixer. Every mix, the mixer PLC collects 212 items of data relating to that mix, including the following:

- Dates and times of each step of the mix process
- Batch length and mix number
- Ingredient and process set points and actuals
- Ingredient temperatures
- Mixer speeds
- Whether the mixer is in Auto or Manual mode

In addition, the mixer logs every event that occurs. Events are recorded with the date and time of each, followed by the event number and event description, the recipe number running and who was logged in. This can be very useful for fault finding. The following event types will be recorded:

- Alarms and Alerts
- Pushbutton presses
- Recipe edit (include new and old value)
- Schedule edit (include new and old value)

Microsoft SQL Express is used for logging the data, and is installed on a single remote desktop PC. This PC also runs the Kepware IO server, to read the required tag data, and an OPC server to copy the data from Kepware to the SQL tables. This PC can hold the data from a number of mixers within a bakery.

Microsoft Reporting Services is used to provide custom reports. Reports are made available electronically via Ethernet and can be viewed in a web browser by anyone with access to the Reporting PC, or on the PC itself. Users can view, print or save the data in pdf, Excel or Word format. Data is stored for a minimum of 14 months before being archived by the customer or overwritten on a cyclic basis by the reporting system.

The following standard reports have been developed:

1 - Events Report
2 - Alarm Summary Report
3 - Ingredient Usage Report
4 - Ingredient Summary Report

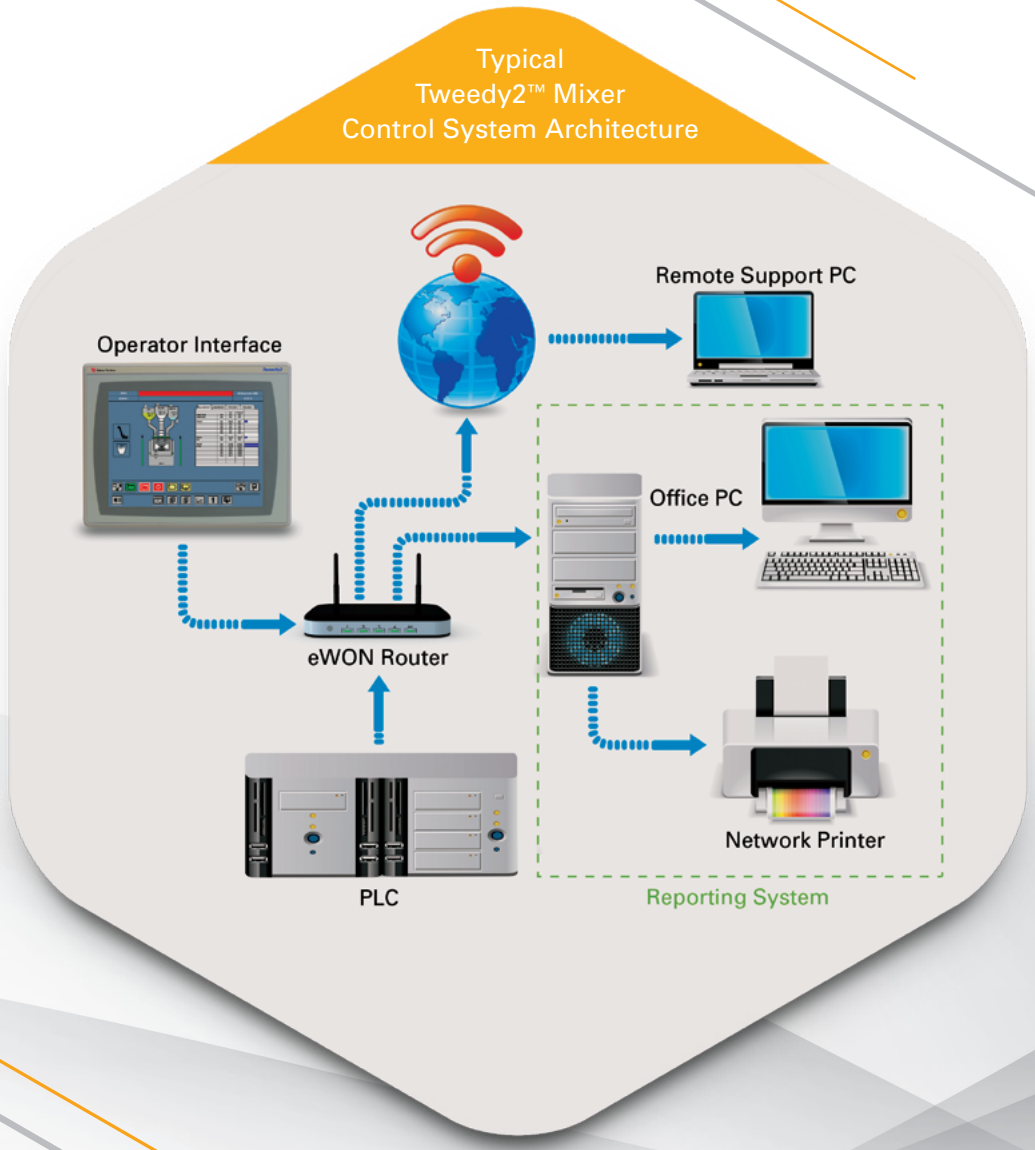
To generate the report, the user selects the report required and chooses from drop down boxes the mixer number and the dates and times for which the report is required followed by either the recipe numbers or the event types required (alarm, alert, pushbutton press, recipe edit or schedule edit).

Microsoft Reporting Services is a free tool from Microsoft, allowing custom reports to be easily developed for particular requirements, either by Baker Perkins or the customer. In addition, the user can run specific SQL queries directly on the database.

Tweedy™ Mixer Control System

Specification

- Pre-engineering site survey to identify full scope of requirements
- Design, manufacture and test of replacement control system
- Removal of redundant PLC from existing control panel and general clean-up
- Installation of pre-wired backplate with new PLC (option of new control panel)
- Connection of new PLC I/O to existing relays, contactors and switches
- Removal of redundant operator controls from panel door to rationalise controls to a minimum
- Installation of colour graphic operator interface with simple touch screen controls
- Testing, calibration and commissioning of new system
- Operator and engineer training
- Replacement PLCs and other hardware can be from Rockwell, Siemens, Mitsubishi or Omron



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