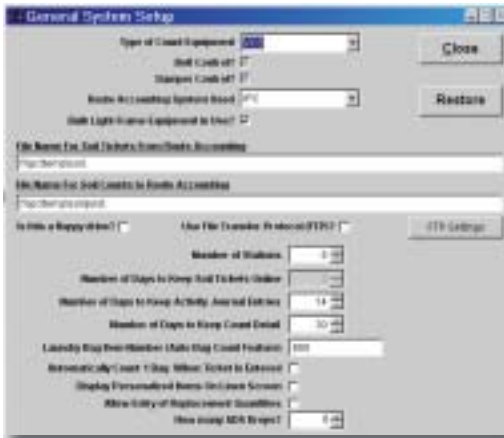


Communicating With

'Intelligent Across the Plant



Expect explosive growth in plant equipment linked via wireless networks

By Mike Frankeberger



A front view of counting tables.



The soil room is the entrance goods follow into the plant.

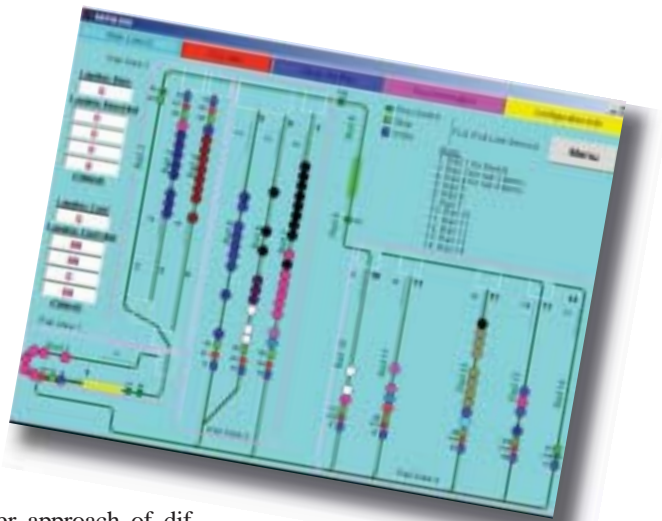
Key information is one of the most important and valuable management resources a company can have in its possession. Of course, information by itself has little value. And when you are swimming in information, but you do not know if it is correct and/or systems are not in place to absorb and use this data, it can be a curse rather than an asset. Too much information with too little validation causes confusion.

Bottleneck breakthrough

In visiting with our customers and friends as our teams travel and

visit plants throughout the year, we find a common request. It is a basic "how to" for better methods of gathering, sharing and using information, especially the information coming from the soil room. Because the soil room is the first process of a more complex set of processes, it is important to understand how soil room information can be used to improve equipment and plant performance, reduce payroll costs, improve employee issues, strengthen product quality and boost customer retention and overall profitability. Yes, that's a tall order. So please understand, a great deal of useful information starts in the soil room. A proper soil room design is much more about technology—and interfacing this technology throughout the

Machines'



plant and into current management software—than it is about simply handling the material and getting it to the washer.

Today, when designing the equipment for soil rooms, we spend a lot of time designing machine-to-machine communications. Why is this so important to today's information gathering? Machine to machine actually improves the way data is collected. This technology helps overcome bottlenecks by removing the bottle altogether. In its place we put a network of processes with machines taking charge of communicating where and when materials are needed.

Our ability to interface with the incoming soil-delivery system, soil room employees and the monorail or cart system—and to store and transport the goods to the wash aisle—are just a few of the issues at hand. Automated processes for loading the washers that

multi-tier approach of different soil room equipment, this allows us to reach greater efficiencies and reliability than at any time in the past. Our company is in the process of building hybrid systems with much greater production capabilities because we can integrate machine-to-machine communications and allow different pieces of equipment to work together as one.

The traditional method of relying on manual processes to gather information is expensive, and a daily or weekly batch uploading of production results is time consuming—and too late! Relaying real-time data back to the interconnected systems is a cost-effective way to implement strategic initiatives. With the big picture in mind, calculating returns shouldn't be difficult. Given the reduced labor, less



Communications from production and processing equipment will enhance other communications within the plant.



As TR operators build new plants or upgrade existing ones, it's important to consider machine-to-machine communications.

will optimize the wash machines' abilities are a major priority. Interfacing into the route-accounting system, inventory system and storage systems are just a few examples of how we can use the information gathered by our software and computer hardware today to improve a plant's profitability and information use.

Real-time production info

Examples of machine-to-machine communications include: weights that are calculated by the computer or load cells tied directly into the software that automatically trigger monorail and belt conveying transportation and storage devices. Coupled with a

rework and diminished changeover times, improvements from better scheduling can pay for the project many times over.

For equipment and software to perform to today's technology standards, we must look both before and after our specific process within the system and understand our responsibility in the plant's complete cycle. Because we are a technology-integration company, we understand the soil room process and we know the importance of this first processing step. Vendors and customers must understand the importance of the information gathered in their respective areas of expertise and work with the owners to enhance all downstream processes. ☞

Plant Resource Management

The soil room is the entrance that goods follow into your plant. It is important that the information about what is coming into the plant, its condition, where it came from and the total quantity, is gathered correctly and shared with the other machines and processes. We have spent a great deal of time and resources building software and controls that allow our systems to communicate with other systems in the plant. We calculate production in seconds and milliseconds—and we understand at times this information will need to be transmitted just that fast to “handshake” with other machines and technologies such as RFID, monorail software, washing equipment and storage software.

As TR operators building new plants and upgrading existing ones seek greater and more efficient automation, we would like to stress the importance of planning for machine-to-machine communications. A discussion of how these machines will be connected for communication purposes is required. Machine-to-machine technology enables the consistent dissemination of information—either instantly or on request. One of the key methods for gathering and using information today and in the future will be machine-to-machine communications. The idea that we can access information instantaneously without the involvement of an employee will quickly eliminate the barriers of distance, time and location that many of you now face.

The limits of what machine-to-machine technology can do for the success of your company will depend on the ability to harvest such information (derived from connecting devices, people and systems) “together” so managers can make decisions about key material flow, equipment efficiencies and employee-safety issues. Communications from department to department, operations to sales and sales to marketing can be influenced with proper communication from your production and processing equipment.

New Technologies

The challenge for managers and technologists lies in determining the easiest and most affordable way to seamlessly integrate across various equipment and data platforms, protocols and standards. Solutions built on technologies using open standards prevail—and will continue to prevail in the years to come. By adapting and integrating new technologies, decision makers can improve efficiency and profitability, while enhancing customer service. New infrastructures must be built as old ones are abandoned.

There are multiple key technologies enabling machine-to-machine technology. Below is a short list:

- Reliable, fast communications—both wired and wireless—using Ethernet
- TCP/IP devices capable of communicating both locally or globally over relatively inexpensive data lines
- Wireless communications that range from several miles to global
- Radio frequency identification (RFID) using short-range communications to send data for material in transit
- New sensor technology used to track non-RFID products

One of the key aspects of current technology is transformation.

That means changing the collective mindset about what information machines can deliver and what people can do with that information. This technology allows companies to retrieve and send data to and from their assets, giving machines, devices, appliances and other equipment the ability to share information with other information systems and the people who use them. There are practical technology solutions available to management for talking to machines and really listening—and even for responding to what they have to say. The biggest problems, of course, are getting the various vendors to share information on an open platform and upgrading older equipment and hooking it into the communications links.

It is only a matter of time before manufacturers and company management will adopt the use of intelligent machines for information sharing across the plant. Typically, a systems integrator is used to interface software applications so the data also can be integrated into other enterprise systems.

Networking

Getting the information to where it belongs sometimes can be as difficult as getting the information in the first place. Network problems are one of the greatest challenges facing technologists in the industrial market today. Some information can be gathered easily via established Ethernet connections. Energy management is an example of information that is somewhat straightforward and easily collected by using machine-to-machine technology and communications over Ethernet lines.

But many times the information required is mobile because many assets and the goods associated with them are on wheels or in transit. One of the technology issues that will proliferate in the near future is wireless network technology. The number of machines connected to wireless networks will increase more than 10 fold over the next four years, according to Datacomm Research Company, of St. Louis (see www.datacommresearch.com).

There are two basic uses for wireless technology in the world of controls:

1. Wireless links between sensors and data-collection points and
2. Wireless links between data collection points and control centers used by management to implement workflow, or assess work already completed.

One of the most promising segments now using wireless technology is remote-device management. Such systems offer better solutions to remotely access machines, and they offer greater collaboration with machine vendors for remote diagnosis and monitoring use, allowing for improved algorithms to predict machine servicing and usability. Many of the larger vendors use this approach today to support their customers.

Wireless equipment-management systems allow access to equipment runtime hours and location data. Such systems enable managers to be more competitive by allowing them to accurately monitor equipment usage data, to perform timely maintenance and to increase security and productivity.

Wireless connectivity will continue to grow because of several current trends: increasing use of mobile-phone service, the availability of low-cost radio devices, wireless service rate plans, band-

width scaled to the specific application and the emergence of powerful Internet-based tools.

Full-spectrum data management

As these digital transformations continue, more customer-oriented applications will emerge. Software applications will vary from plant to plant, but most will be based on similar fundamental building blocks. These components are device-level identity tagging (RFID), sensors (production tracking and piece counts), processors (PC on the plant floor and in some cases built into new equipment), communication protocols (TCP/IP and other Internet protocols) and the software application. How effectively these technologies can be applied will partly determine competitive advantage. With vast resources available to both the front- and back-management offices, simple items using a smart chip can be connected to a gateway device over a very low-cost connection. This gateway, in turn, completes the connection to the Internet and vast resources. This access to information is sure to help all of us stay better informed and enable us to make more accurate, efficient and timely business decisions than ever before.

It is important that management does not see this trend as simply communicating from machine to machine and from one process to the next. This is not individual technology deployment from each

vendor, but rather it is an initiative central to each business model. Management should be investing more time and money up front to clearly determine the technology's impact on business strategies and approach. The network approach enables you to improve the way data is collected and to enhance your ability to see across the full spectrum of services offered by your company.

The goals for integrating machine technologies are to drive efficiency and improve customer service. In both cases, the benefits more often reveal themselves in distribution and internal processing of the goods on the plant floor.

Getting the most out of your information system depends on the investment you are willing to make in application infrastructure. A company's existing application infrastructure will likely influence its decision on how much of this system should be built internally and how much will be outsourced.



Whatever options you choose, remember, designing a good system starts with a good systems integrator and a list of goals management wants to accomplish. **TR**

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