

# The Science of Irrigation

ITT Flowtronex uses InduSoft to go green on the golf course.



- By operating pumps only on an as-needed basis, ITT Flowtronex uses InduSoft software to help customers visualize and manage their energy costs. “Better results, with less energy and less water...”
- ITT Flowtronex using InduSoft software created an expandable system of templates that would enable them to meet each customer’s unique needs.
- InduSoft was chosen, in part, because of the 100’s of built-in drivers. InduSoft takes full advantage of Ethernet and TCP/IP, enhancing the ITT Flowtronex radio-equipped, Internet-enabled solution.

*ITT Flowtronex using InduSoft software uses browser-based remote monitoring and control of networked water quality and handling equipment. Powerful graphical trending and data logging features allow adjustments to be made with confidence.*

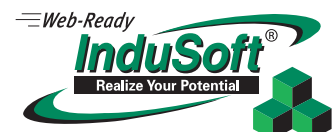
## Background

According the U.S. Geological Survey about 70% of the earth’s surface is covered by liquid water, approximately 326 million cubic miles—but only .07% of that is fresh water. Fortunately, there is much more fresh ground water on planet Earth, approximately 2.6 million cubic miles, but that’s still less than 1% of the global water supply.

And unfortunately, increasing urbanization is making the available fresh water supply even scarcer. According to William Hawkins, Electrical Engineering Manager at ITT Flowtronex, that reality is putting pressure on city managers and those charged with ensuring a clean, adequate water supply:

“Despite the decline in quality and availability of source water, operators must ensure an adequate supply that meets specified quality requirements. The intelligent application of technology is the best solution to assist water managers with meeting these daily requirements.”

And that’s what InduSoft is helping ITT Flowtronex do—apply technology to the diminishing availability of quality drinking and irrigation water.



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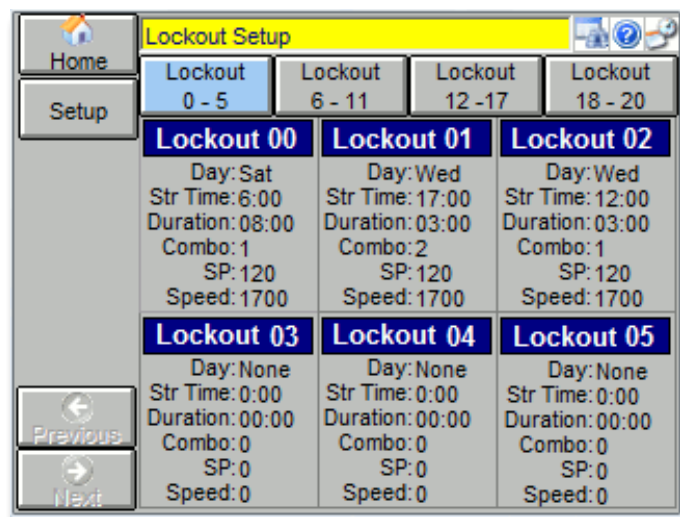
### The Challenge

Founded in 1974 as Pumping Systems, Incorporated, Flowtronex began as a top rate producer of some of the Golf Industry's first prefabricated water pumping systems. Today, it's a division of ITT Corporation and is a multi-industry company with leading positions and advanced technologies in the markets it serves.

And although they serve these other industries, such as municipal water delivery systems, their bread-and-butter market remains high-end golf courses. In fact they are the largest golf course irrigation and delivery company in the industry. Located in Dallas, Texas, ITT Flowtronex insists on deploying the latest technology to ensure a competitive edge and maintain their market lead.

Today, maintaining that lead can be a tall order. Not only do operators have to deal with scarcer water supplies that tend to be of diminished quality, energy prices are at record levels, which does much more than simply increase the general cost of doing business.

Water delivery systems rely on electricity to power the Variable Frequency Drives (VFDs) that run the water pumps. Although very efficient, these motors do use electrical power, which is only going to get more expensive. Also, water delivery systems require a large number of VFDs, and the cost for energy—even when it was cheap—has always been something that concerned managers.



*Simplified lockout setup for 21 individual pumps allows running at off-peak power rates and when conditions are the best for watering.*

While the high cost of energy isn't unique to ITT Flowtronex customers, ITT Flowtronex sees the challenge as an opportunity to distinguish themselves from the competition. They have positioned their offering, Master Control Architecture (MCA), as a superior water delivery system that helps customers manage their energy costs.

But to do that they needed a system that would enable them to enable field communication on a continuous basis. They needed to give operators and managers a way to monitor and understand when water was needed and where and to ensure that data was transmitted where it needed to be and when.

Golf course superintendents also needed to understand their water usage more precisely and compare that information to known water requirements, which are driven by variables such as golf course size, turf species, and environmental conditions. Powerful reporting capabilities were needed to make corrections as weather patterns and seasons changed so that adjustments and corrections could be made when necessary.

ITT Flowtronex also needed a system that was customizable—a sort of template that contained all the basic building blocks that would enable extensible construction in accordance with each customer's unique need. This requirement was driven by market demand, which was at one time met by the operators and managers themselves.

According to Hawkins "There are a lot of home-grown systems out there. When a new system was needed managers would hire engineers to cobble together systems from multiple vendors. They would purchase a PLC and either use the proprietary PLC programming language or something like Visual Basic to create the Human Machine Interface (HMI). As you can imagine designing something new each time is expensive to design, deploy, and maintain."

What the market was really lacking was a vendor that could provide one-stop-shopping, and a complete, uniform solution that would be less expensive and drastically reduce the amount of time and effort to deploy and maintain.

## The Solution

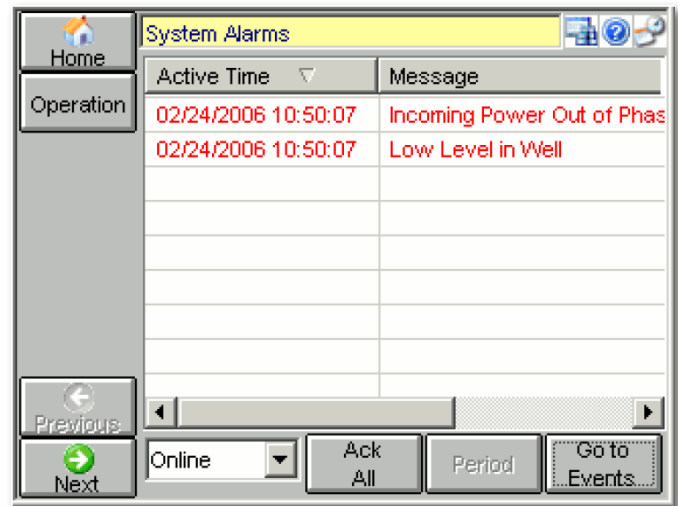
The MCA offering from ITT Flowtronex solved all these problems through the sophisticated integration of multiple technologies. MCA is a radio-equipped, Internet-enabled solution that comprises an HMI/SCADA system and communications network. The system uses two basic components: a Wago PLC and InduSoft Web Studio.

The PLC provides the system control and InduSoft provides the HMI. The Wago PLC was chosen because it supports two industry standards, an International Electrotechnical Commission (IEC) PLC programming language and the Modbus/TCP protocol. The previous PLC used a proprietary programming language for both the PLC configuration and the HMI. The Wago PLC enabled ITT Flowtronex to ensure that they were not locked into any particular hardware or software combination.

The Modbus/TCP protocol support also made certain they could communicate directly from the HMI of choice without relying on a secondary protocol such as OPC—offering a potential performance boost. That fact made InduSoft Web Studio the natural choice for an HMI.

ITT Flowtronex looked at several HMI/SCADA options, but they were all either proprietary systems or very costly. Of the available choices ITT Flowtronex evaluated, Hawkins commented “We needed an open system. We didn’t want to get locked into a particular brand for either the software or the hardware. InduSoft was initially considered because it offered more than 160 drivers, including Modbus/TCP—but we quickly realized two additional attributes that made InduSoft Web Studio unbeatable: the InduSoft interface was cost effective and it was extremely easy to use.”

Most of the HMIs are installed in remote locations where no person is physically monitoring the screen. Remote monitoring, troubleshooting and set-point adjustments are done via “web thin clients” over the network. “We also incorporated radio capabilities to assist with automation. We can set pressure set-points, chlorine levels, turbidity levels, and any necessary adjustments can be automatically radioed to the appropriate device.” Even with all these capabilities, however, ITT Flowtronex didn’t stop there.



*System alarms provide clear information and quick resolution of any issue.*

They took full advantage of InduSoft’s powerful logging and reporting capabilities. Events are captured and stored along with trends and alarms. And because InduSoft supports Windows CE (the de-facto embedded operating system) customers have the choice of using less expensive stationary diskless (immune to vibration) touch screen panel PCs as well as mobile computing devices. The latter capability means that the appropriate individual can receive alarms and make adjustments regardless of their physical location. Furthermore, InduSoft provides the ONLY HMI in the market today that can provide all the features ITT Flowtronex needs under Windows CE: Remote Management, feature-rich Web Thin Clients, integration to remote SQL Relational Databases, Online and History of Alarms, Events, Trends, and Process Data, Scheduler, Online configuration, Email notification, XML-based reports, and much more.

ITT Flowtronex was also looking for unsurpassed technical support, which InduSoft deftly provided. Because ITT Flowtronex wanted a solution they could replicate, they wanted to be sure that they really thought things through from beginning to end before design or development of the MCA began. InduSoft went to work with ITT Flowtronex from the outset to make sure that the result was exactly what they needed.

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InduSoft even assisted with the MCA specification. InduSoft engineers worked hand-in-hand with ITT Flowtronex engineers to understand all the challenges ahead of them and to help them understand the best way to go about meeting those challenges.

Fabio Terezinho, Product Manager, InduSoft explained the InduSoft support commitment this way: “You can have the best tools and the most competitive pricing, but the real value of any offering is the end result from the customer’s perspective. In other words, did it really meet the customer’s need and solve the customer’s problem. It was really important to assist ITT Flowtronex both before and after the sale to make sure they were able to develop the exact system they envisioned and to make sure they could extend and customize that solution with minimal effort.”

And that support commitment really paid off for ITT Flowtronex. Their ultimate goal was to ensure their competitive advantage, and the InduSoft/Wago combination came through in spades. At the end of the day they had a sophisticated architecture for enabling the efficient deployment of effective irrigation systems—something light-years ahead of the competition.

### The Result

ITT Flowtronex is now in the process of deploying their new MCA offering to all of their existing customers, and things are going so well that they are a hairsbreadth from full deployment. In fact, they are now 90% capable of upgrading 80% of their systems.

As the largest irrigation and delivery company in the industry, ITT Flowtronex is positioning the MCA as the model for how irrigation and delivery should be done. “Before we developed MCA, everything required human intervention and person-to-person communication to get anything done, which is very labor intensive and very expensive. It also introduces the opportunity for human error and miscommunication” says Hawkins.



*Remote-based server password authentication ensures only the right users have access to make changes or updates.*

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“Now all those processes are automated. VFDs are automatically adjusted as needed or turned off when unneeded, drought sensitive turf can be automatically watered at only the needed levels—and it doesn’t take an army of people to get things done. Better results with less energy and less water, and it can all be monitored remotely or en route.”

Best of all, the system configuration, integration, and deployment can all be done by a single vendor. Nobody else in the industry even comes close to the level of service ITT Flowtronex can now offer. The final word from William Hawkins is this:

“Thanks to InduSoft, we’re now taking responsibility for quality water availability from source to discharge, and that’s something in which we take a great deal of pride.”

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**For more information contact your local distributor or InduSoft directly at [info@indusoft.com](mailto:info@indusoft.com) or 877-INDUSOFT (877-463-8763) or 512-349-0334.**

