

Control Modernization for Legacy Static Starter Systems

Product Application Guide

TMdrive-LCI-DFE (Digital Front End)



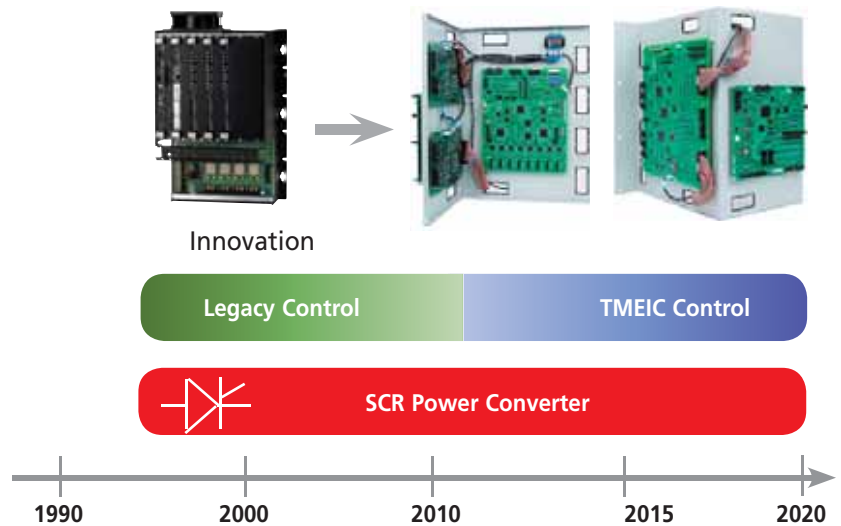
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The LCI-DFE Control Upgrade Provides Significant Top Line Benefits

Legacy LCI drives have provided reliable service for almost 25 years. To keep that record intact, TMEIC has developed a control upgrade for Legacy Gas Turbine Static Starter Systems, while preserving the existing power conversion hardware.

In addition to extending the product life, this modernization program provides significant functional enhancements plus a system condition and capability assessment of your static starter system.

Product Life Extension



Legacy LCI Control

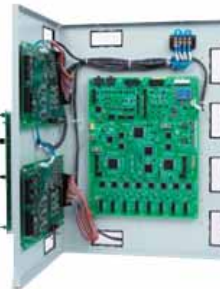


Older printed circuit backplane:

- Obsolete circuit boards
- Limited I/O capability



TMEIC LCI Control Upgrade



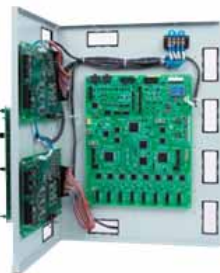
TMEIC Control Cards

- New-Hinge-Mounted Control Circuit Board Assembly to replace Innovation Series circuit board rack
- New I/O Modules, Gating/Feedback boards
- Interface boards to original SCR gating system
- New power supplies



Hardware dependent control:

- Limited sequencer
- Fixed block diagram regulator
- Terminal emulator
- Repeated voltage feedback offset nulling



Control Software Library

- Flexible sequencing logic
- Windows® based TMdrive®-Navigator
- Animated graphic displays
- Integrated trending window
- Common tool across all TMEIC drives
- Immune to voltage feedback offsets



Limited control and data interface:

- Local keypad control
- Meters



Knowledge Management

- Local touch screen interface panel
- EGD Communications with turbine control
- Drivers for LAN-type communication
- Commissioning and maintenance for quick turnaround and trouble shooting



Service options:

- Limited Field Engineers
- Local, limited diagnostic tools



Technical Support Options

- Current generation technology and connectivity for remote diagnostics means lower Mean Time To Repair (MTTR)
- TMEIC trained engineers that have decades of experience designing, testing, installing and commissioning.

At Bottom Line Cost Savings Through Value-Added System Services

Benefits of a TMEIC LCI Controller Upgrade

- Reduced number of circuit boards
- Color touch-screen Operator panel in control compartment door
- Extensive diagnostics and self-test capability
- External control interface through TMEIC TMdrive-Navigator Software
- Voltage Feedback offset nulling is eliminated

New Control at a Fraction of the Cost of a New Static Starter

Prior to the introduction of the TMEIC LCI Static Starter control upgrade, the only way to realize the benefits of current generation technology was through the purchase of a new starter system.

For installations where the power conversion and bridge interface hardware is not causing unplanned outages, even more value can be realized through a retrofit program. A TMEIC LCI control upgrade project can cost as little as 20% of a similarly rated static starter.

Total Project Cost Considerations Increase Savings

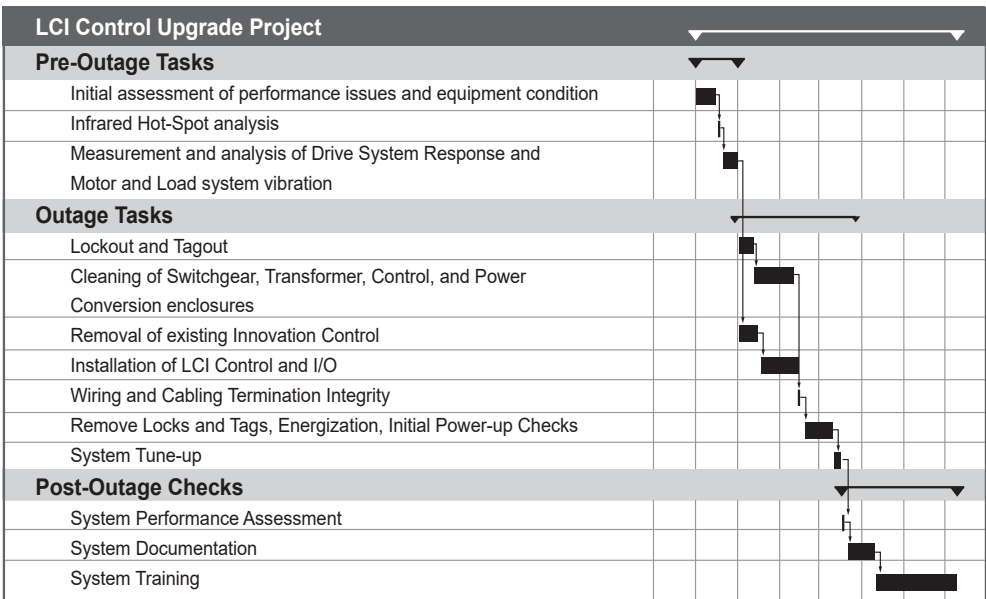
In addition to the purchase of new a starter, replacing a system involves:

- Demolition and Rigging
- Installation and Cabling
- Reconstruction and Commissioning

With these factors, plus the cost of downtime considered, the realized savings of an upgrade over a new installation are even greater.

Optional Engineering Assessment Provides Complete System Peace of Mind

The TMEIC LCI Assessment and Modernization Program provides drive system investment protection through well documented engineering procedures for assessment and preventive maintenance of switchgear, magnetics, controls, and power converters. Complete project management equals peace of mind.



Results:

- Extended Hardware Life
- Improved System Information
- Enhanced System Performance
- Increased Service Options
- System Condition Assessment

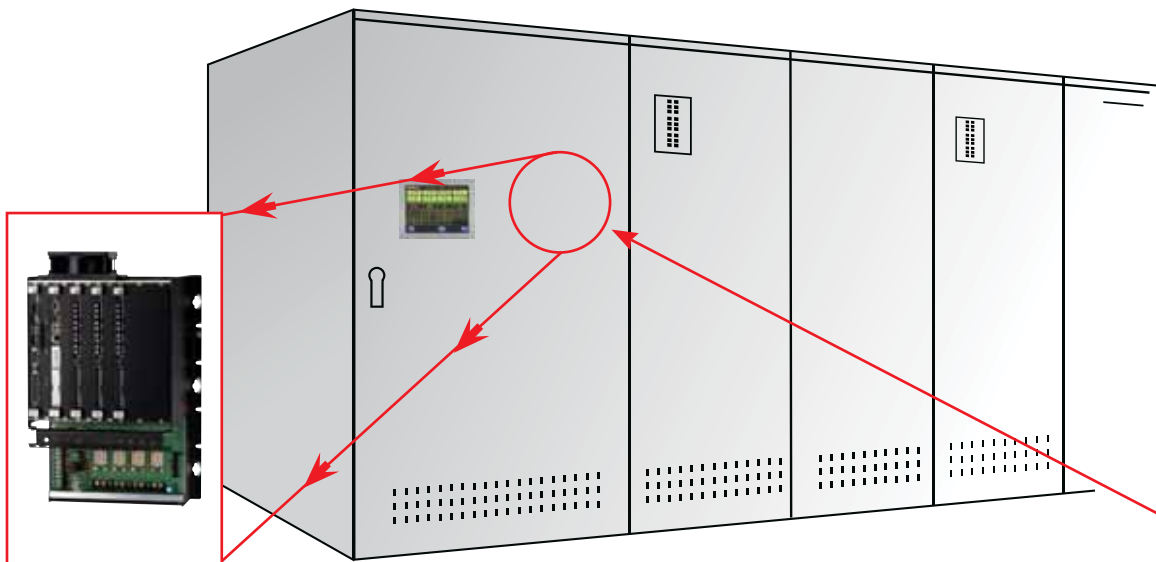
All within your regular outage schedule, with minimal risk, and low comparative cost.

The LCI Control Is Designed to Exceed All Specifications of the Legacy LCI Drive Systems

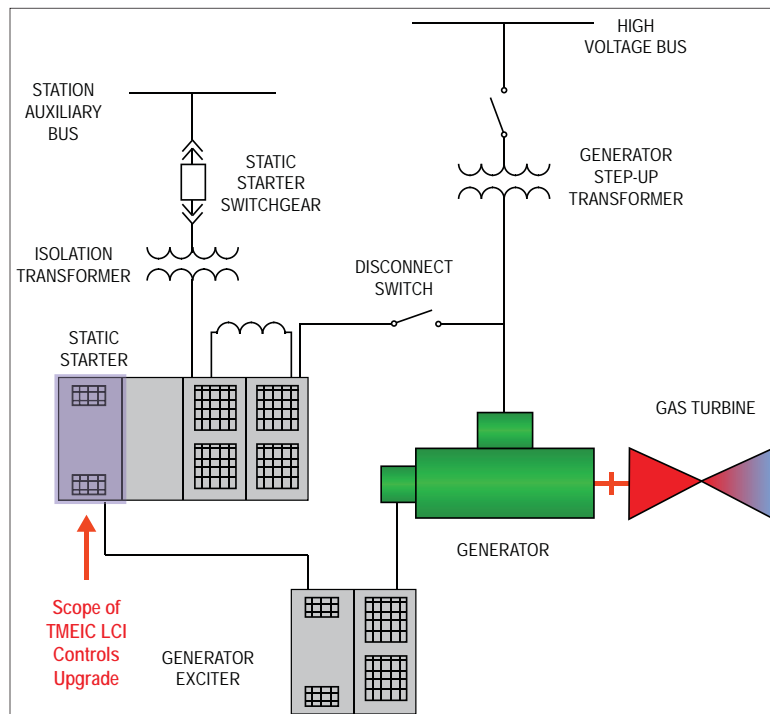
TMEIC has taken several steps to minimize risk to installed equipment:

- Additional Panel Real Estate is Minimized
- Utilizing a Proven Hardware / Software Combination to Lower Overall Project Risk
- Minimized Wiring Changes
- Distributed I/O Flexibility
- No Requirement for Voltage Feedback offset nulling

Existing Innovation Series LCI Static Starter controller is removed.



Obsolete control is removed.

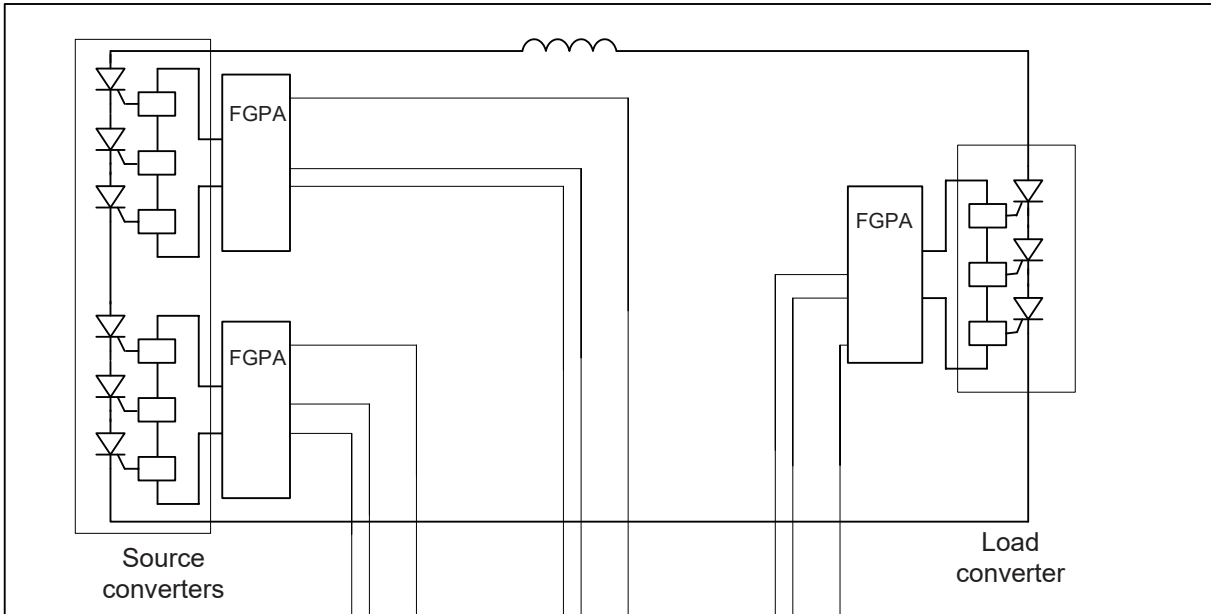


Replaced with new TMEIC controls.

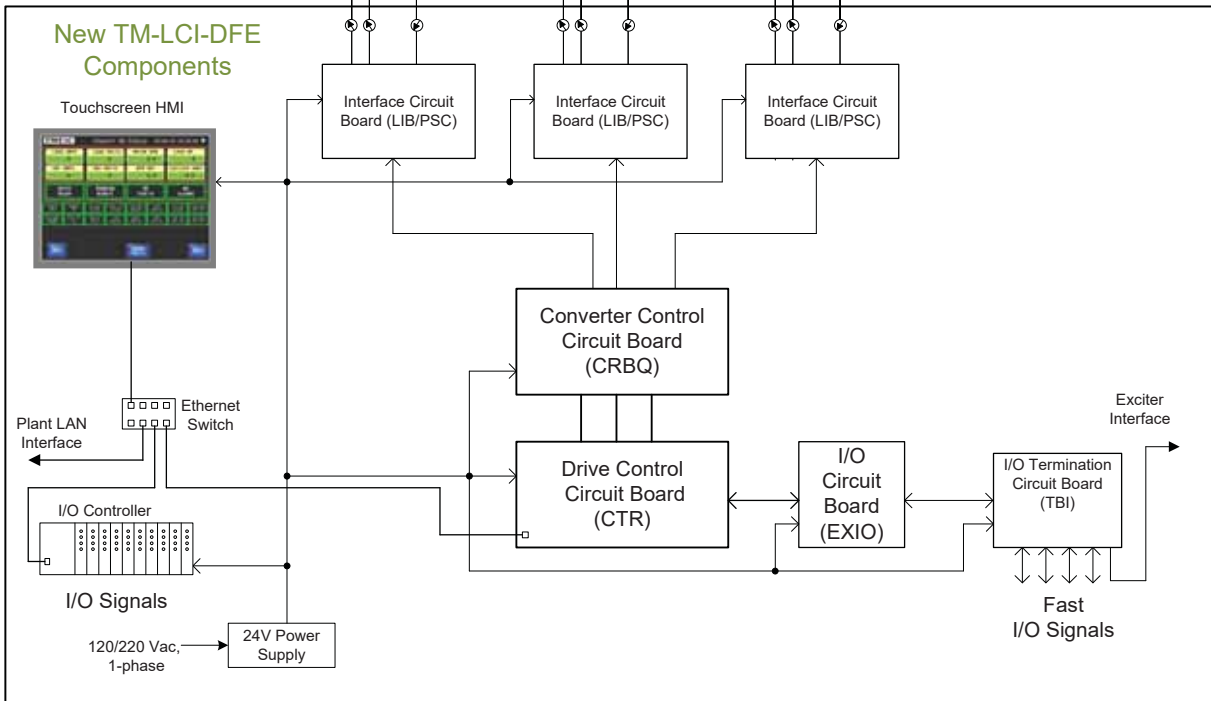
One-line diagram

Retained Components

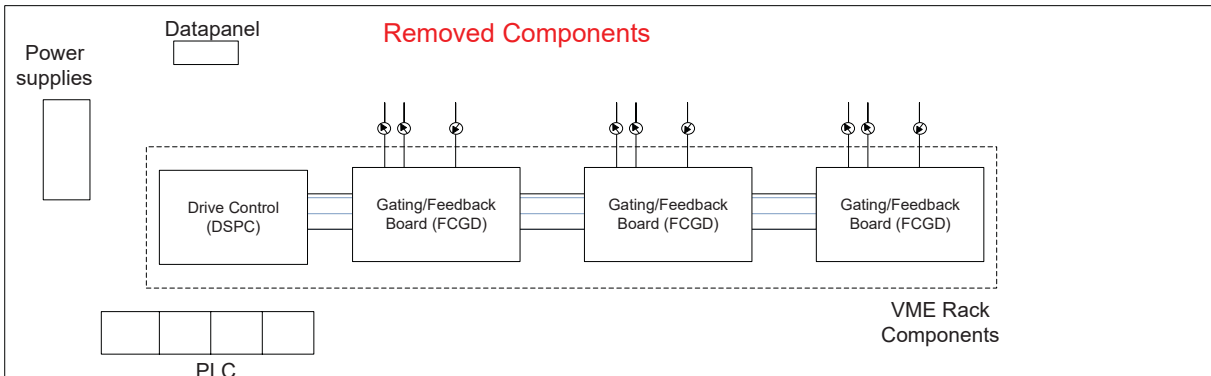
Typical LCI Power Converter



New TM-LCI-DFE Components

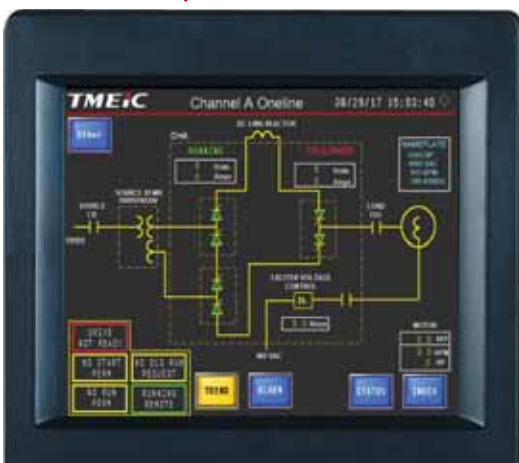
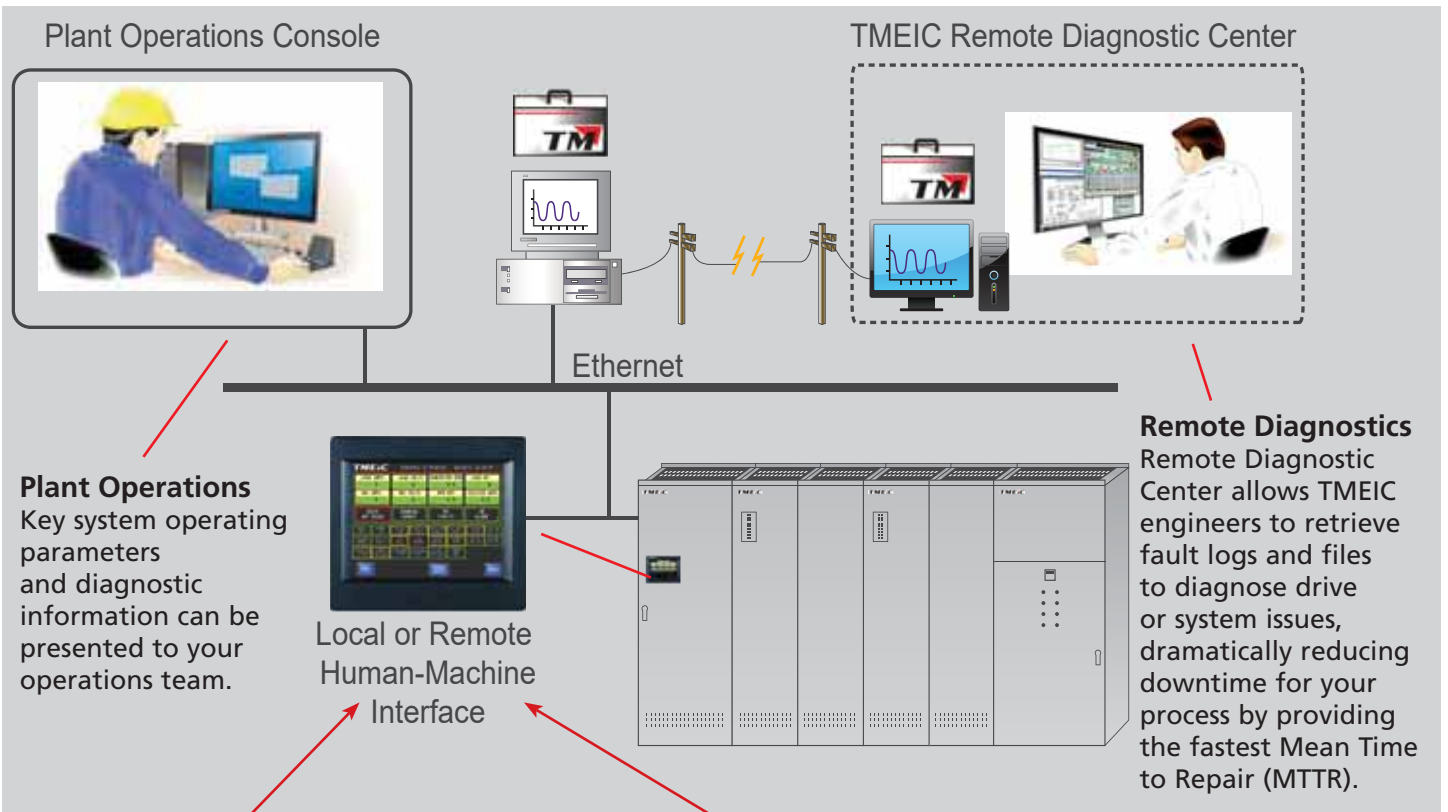


Removed Components



Knowledge Management Options Bring Productivity to Your Operation

Remote Connectivity Capability



System one-line screen



Status screen



Crow bar test



Main menu



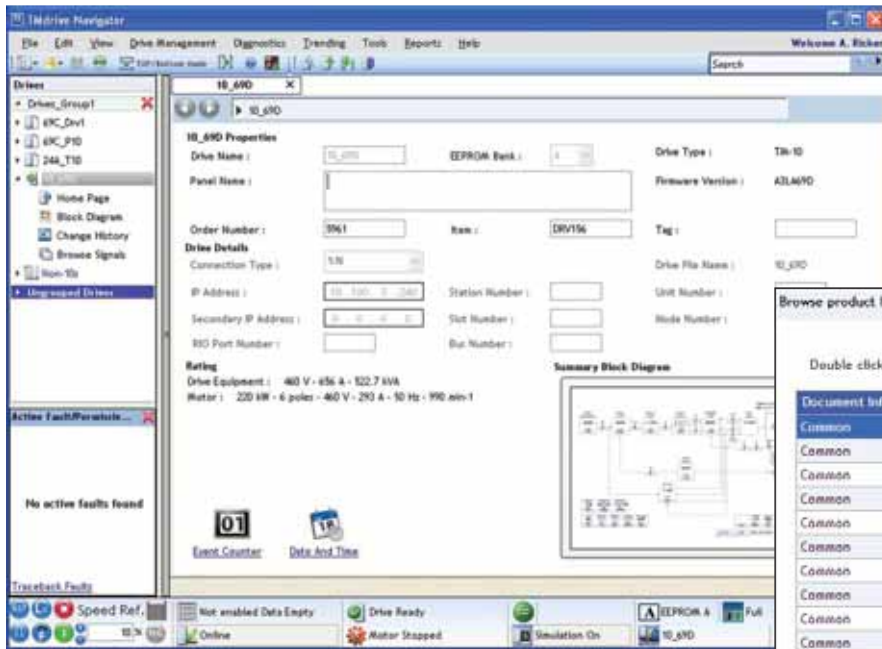
Cooling system

Process Optimization

Processes cannot be optimized without key information on how the process is currently performing.

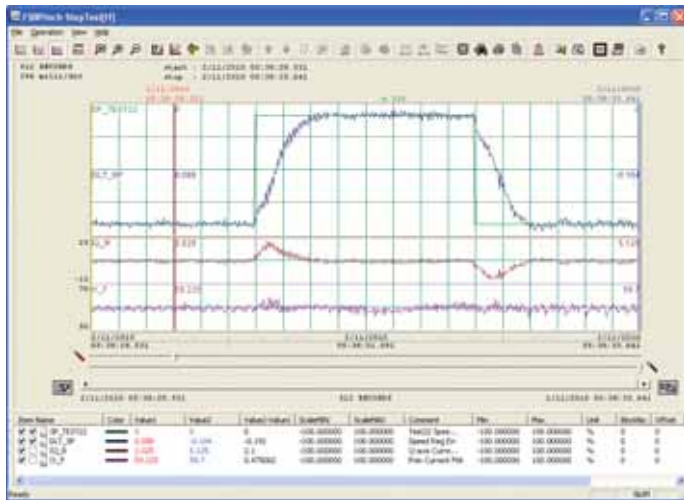
With the TMEIC LCI control upgrade and optional Human-Machine Interface, key operating drive parameters as well as system performance information are continuously available to plant operations for process optimization.

TMEIC Drive Navigator – A Tool for All of Your System Drive Products



The TMdrive-Navigator tool helps you maintain TMEIC drives yourself. Engineers and technicians are empowered to understand how the drive works and what the drive is doing. Any user can easily access current drive expertise and know-how.

Desktop-like search technology links topical signal lists, block diagrams, help files, product documentation, change history, and user notes. Windows techniques facilitate navigation within a drive and across the system. The status of all drives is always in view.



Live block diagrams provide a real-time graphical view of drive functions. Functions can be configured directly from the graphical view.

Product documentation is integrated right into the tool. Users can even capture their own notes to benefit future troubleshooting.

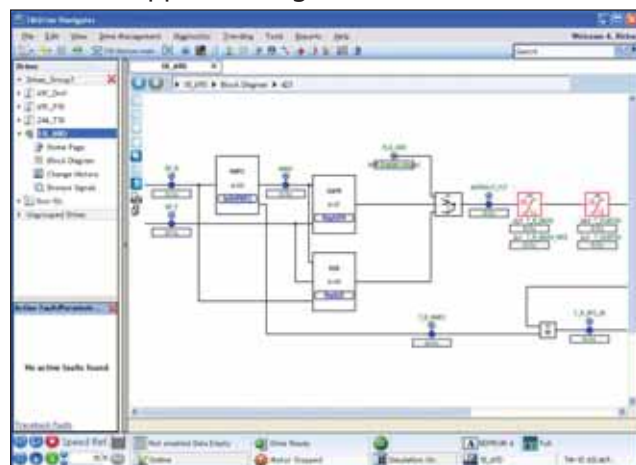
Compatible with:

- Windows XP, Vista, 7
- Windows Server 2003, 2008

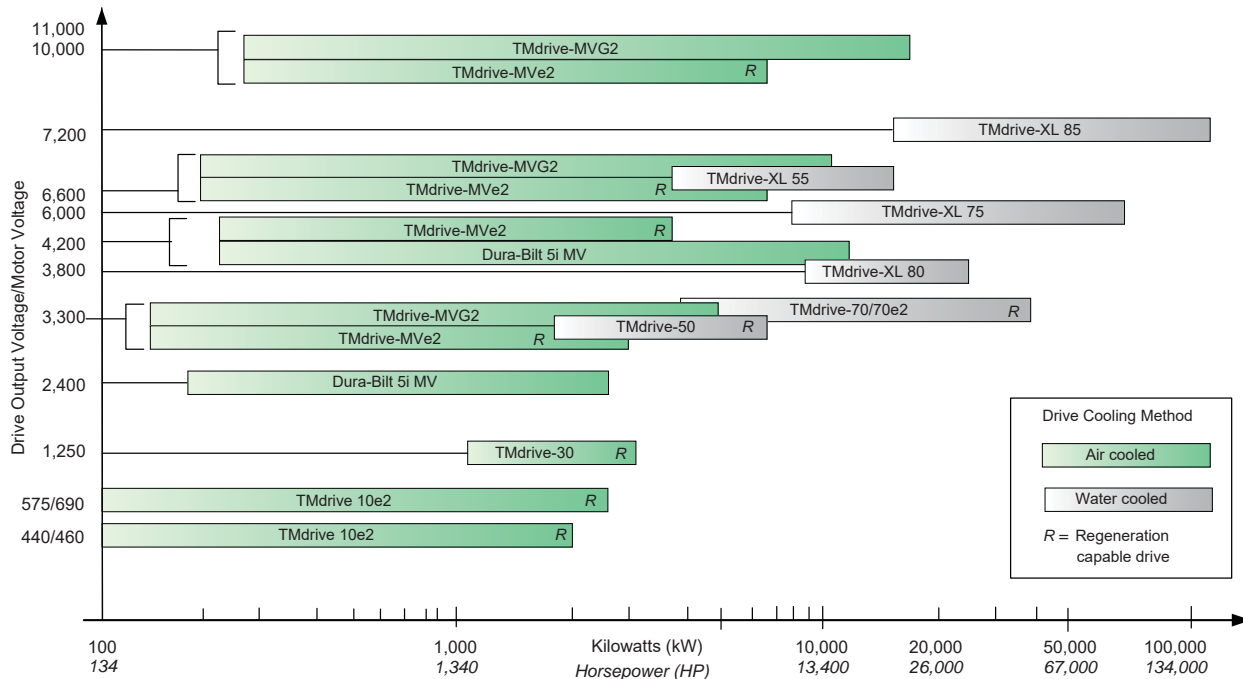
High speed data is automatically captured and saved in the event of a drive fault. Users can also capture high speed data based on their own trigger conditions or perform high resolution real-time trending.

Fault data can be automatically “pushed” to key users. The client-server architecture allows access to high performance data from remote locations – with the same resolution as if you were in the plant.

Wizards support tuning of drive functions.



TMEIC AC Drives Offer Complete Coverage



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