

Control Modernization for Legacy LCI Motor Drive Systems TMdrive-LCI DFE (Digital Front End)

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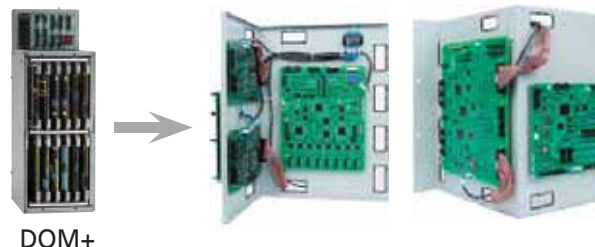
The LCI DFE Control Upgrade Provides Significant Top Line Benefits

DIRECTO-MATIC

Legacy LCI drives have provided reliable service for almost 25 years. To keep that record intact, TMEIC has developed a control upgrade for DIRECTO-MATIC (DOM+) drives, while preserving the existing power bridge.

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

Product Life Extension



DOM+

Legacy (DOM+) Control

TMEIC Control



SCR Power Converter

1980 1990 2000 2010 2015

Legacy LCI DOM+ Control (prior to 1997)

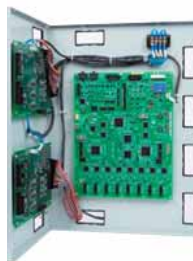


Older wire-wrapped backplane system or newer printed circuit backplane:

- Obsolete circuit boards
- Limited I/O capability



TMEIC LCI Control Upgrade



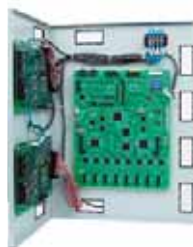
TMEIC Standard Control Cards

- 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



Control Software Library

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



Limited control and data interface:

- Local control push buttons
- Printer
- Meters
- One serial interface



Knowledge Management

- Local touch screen interface panel
- Multiple RS-232™ and Ethernet™ ports
- Drivers for LAN-type communication
- Optional custom HMI Screens and remote location



Service options:

- DIRECTO-MATIC trained Field Engineers
- Local, limited diagnostic tools



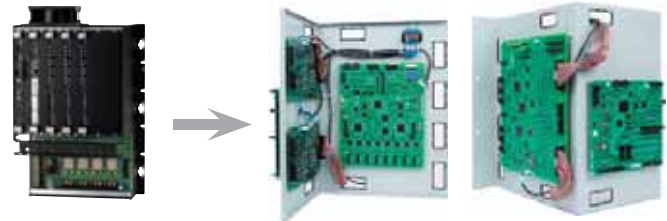
Technical Support Options

- Current generation technology and connectivity fore remote diagnostics means lower Elapsed Time To Repair (MTTR)

In addition to DOM+ upgrade, TMEIC has also developed a control upgrade for Legacy Innovation Control while preserving the power bridge.

This control has also reached obsolescence and procuring parts and service is difficult.

Product Life Extension



Legacy LCI Innovation Control (after 1997)

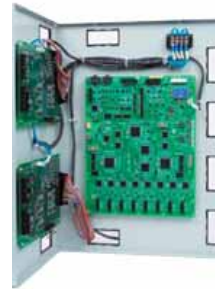


Older printed circuit backplane:

- Obsolete circuit boards
- Limited I/O capability



TMEIC LCI Control Upgrade



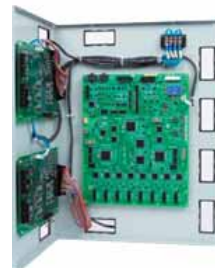
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Limited control and data interface:

- 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.

Add Bottom Line Cost Savings Through Value-Added System Services

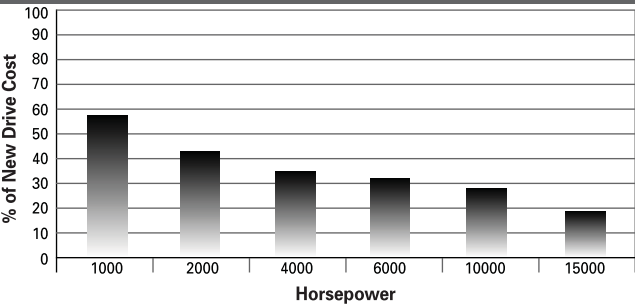
Benefits of a TMEIC LCI Drive Controller Upgrade

- Reduced number of circuit boards
- Boards shared with other TMEIC AC drives
- Color touch-screen Operator panel in control compartment door
- Extensive diagnostics and self-test capability
- External control interface through TMEIC TMdrive-Navigator Software

New Control at a Fraction of the Cost of a New Drive

Prior to the introduction of the TMEIC LCI control upgrade, the only way to realize the benefits of current generation technology was through the purchase of a new drive 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 replacement drive.



Total Project Cost Considerations Increase Savings

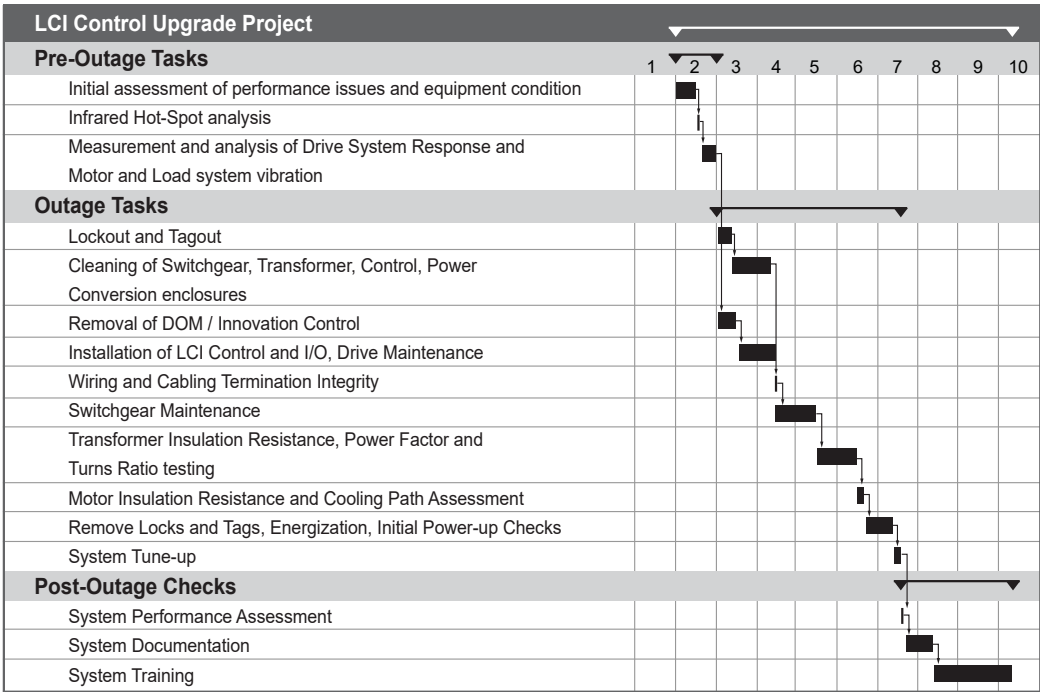
In addition to the purchase of new drive equipment, replacing a drive system involves:

- 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, power converters, and motors. Complete project management equals peace of mind.



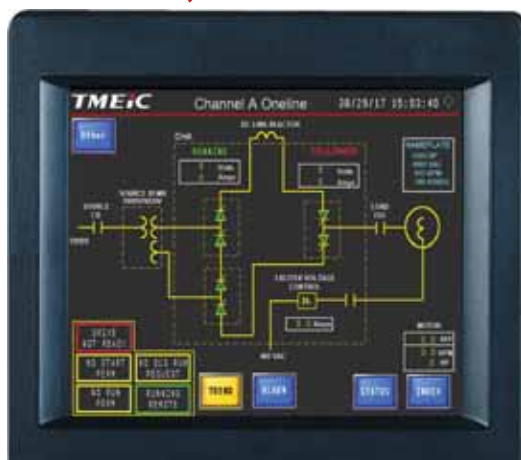
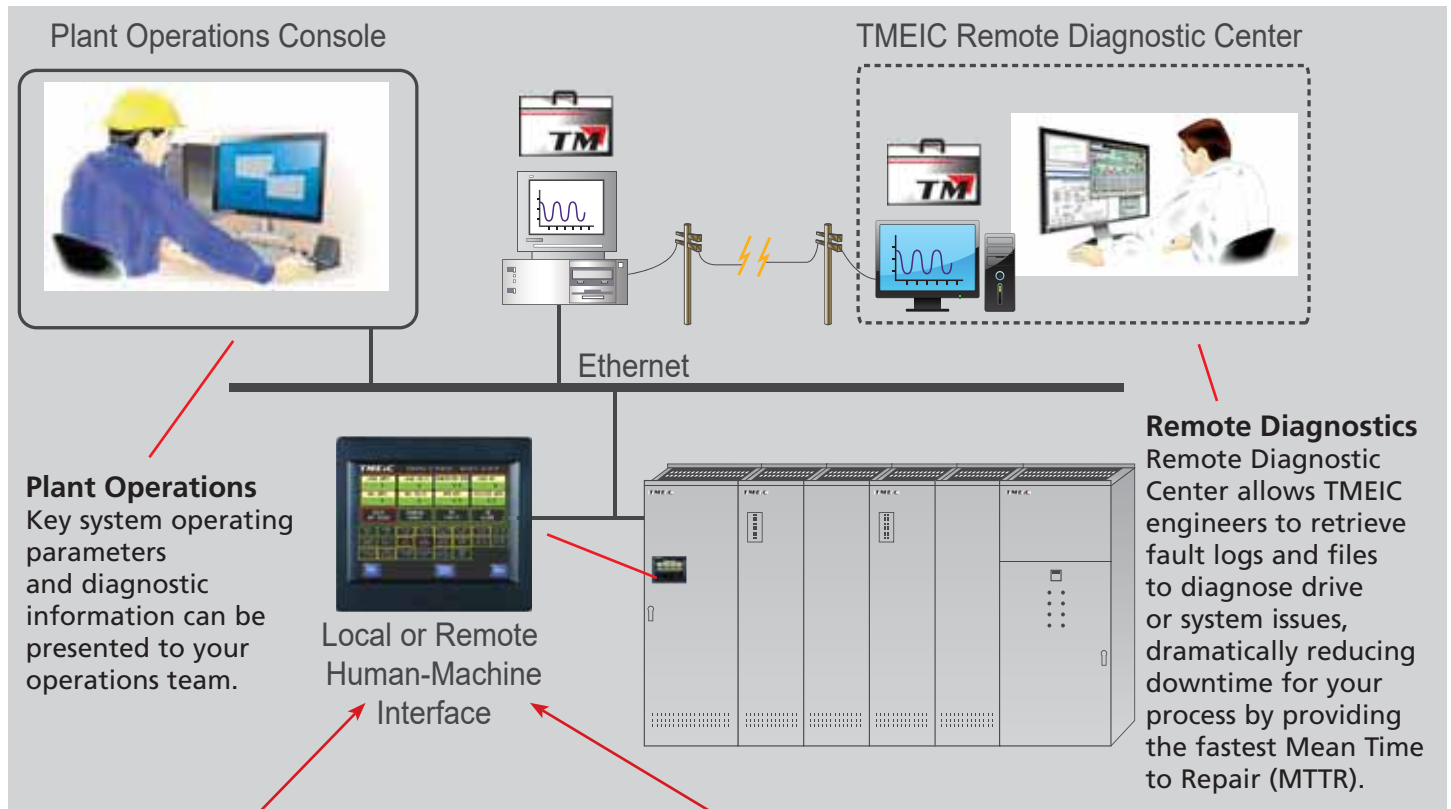
- Results:**
- Extended Hardware Life
 - Improved System Information
 - Enhanced System Performance
 - Increased Service Options
 - System Condition Assessment

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

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.

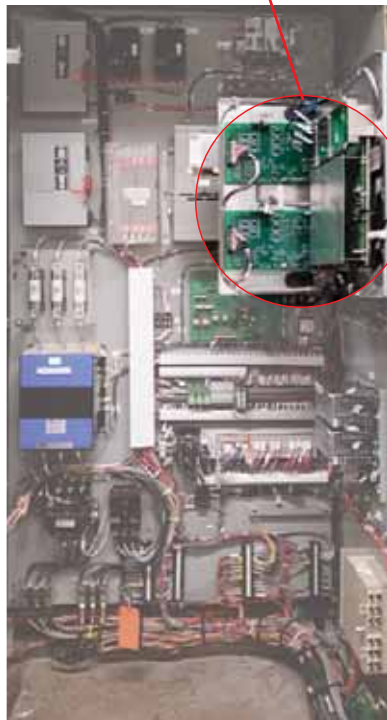
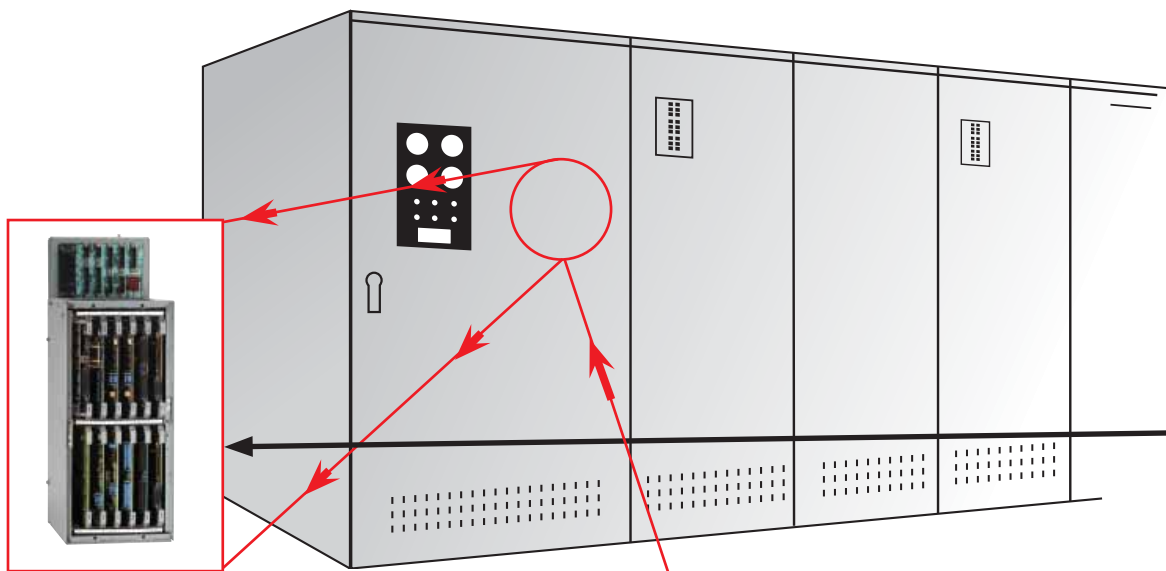
With the TMEiC LCI control upgrade and optional Human-Machine Interface, key operating drive parameters as well as system performance information are continuously available to plant operations for process optimization.

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:

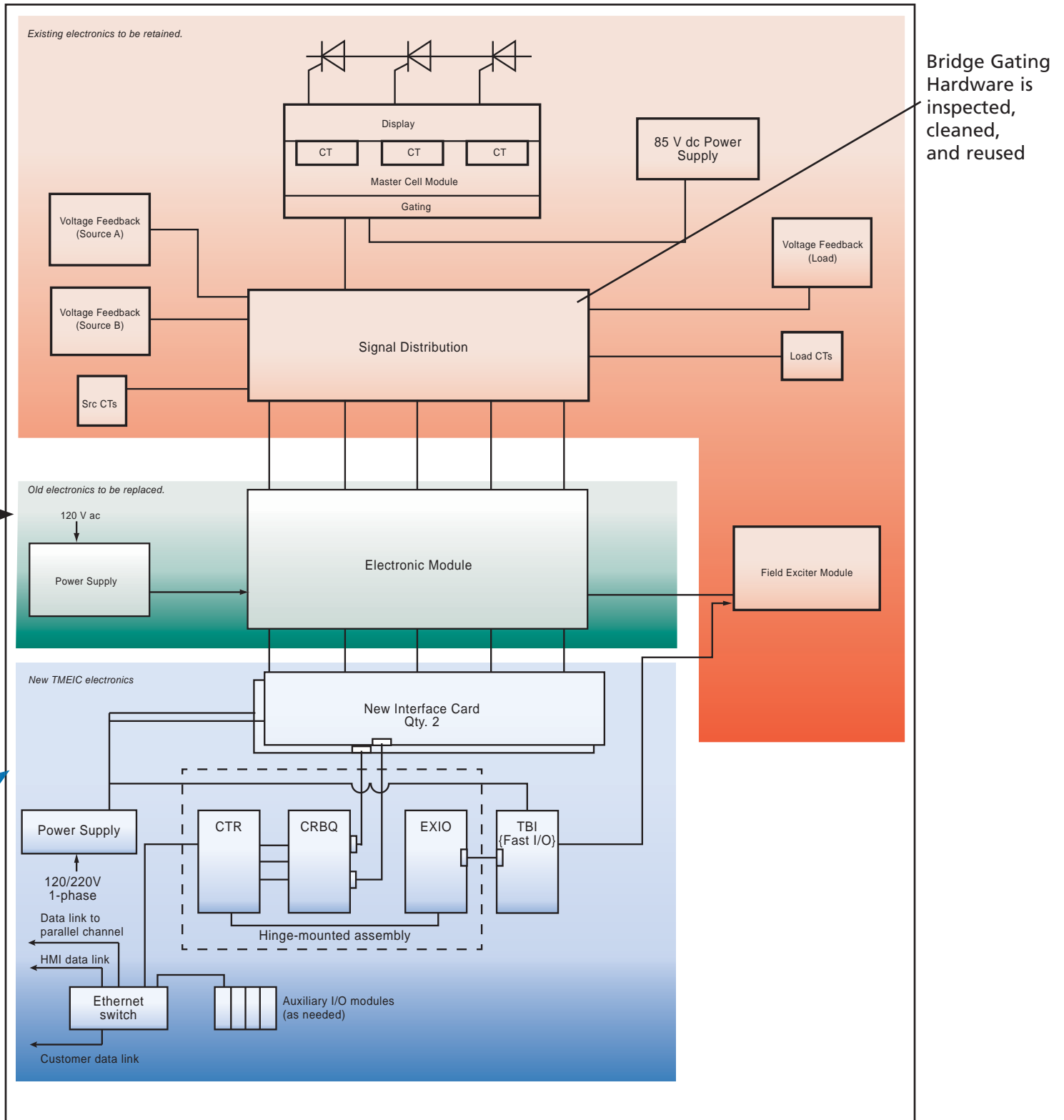
- Additional Panel Real Estate is Minimized
- Utilizing a Proven Hardware / Software Combination to Lower Overall Project Risk
- Minimized Wiring Changes
- Distributed I/O Flexibility
- No Requirement for Rotor Position Sensor

Existing DIRECTO-MATIC LCI controller is removed.



New TMEIC control card assembly is fitted in the place of old control rack

DIRECTO-MATIC (prior to 1997)

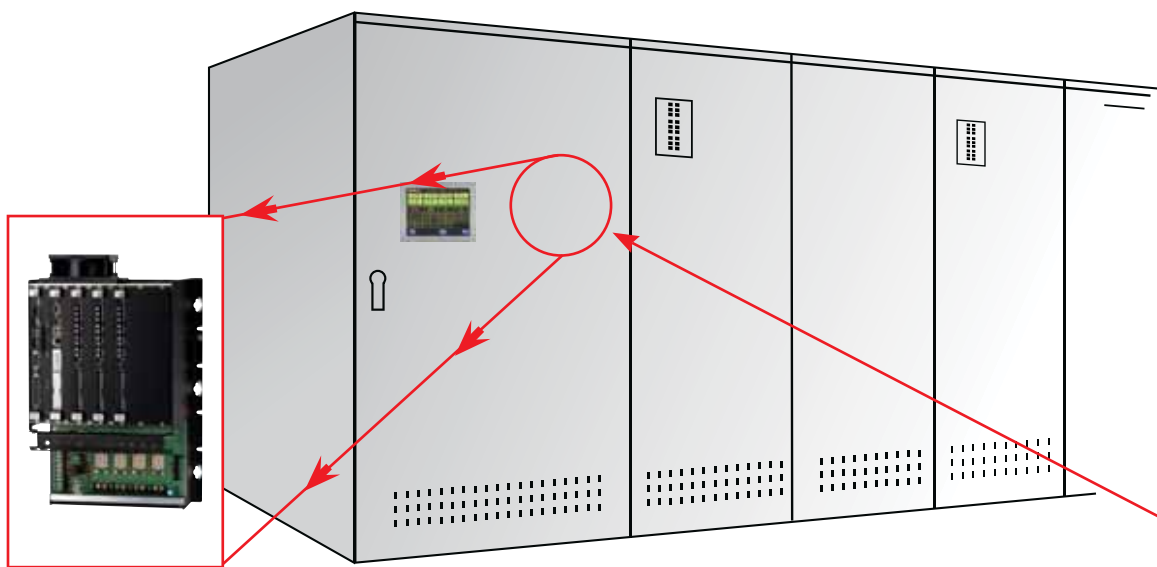


The LCI Control Is Designed to Exceed All Specifications of the Legacy LCI Drive Systems

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

- Additional Panel Real Estate is Minimized
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- Minimized Wiring Changes
- Distributed I/O Flexibility

Existing Innovation Series LCI controller is removed.



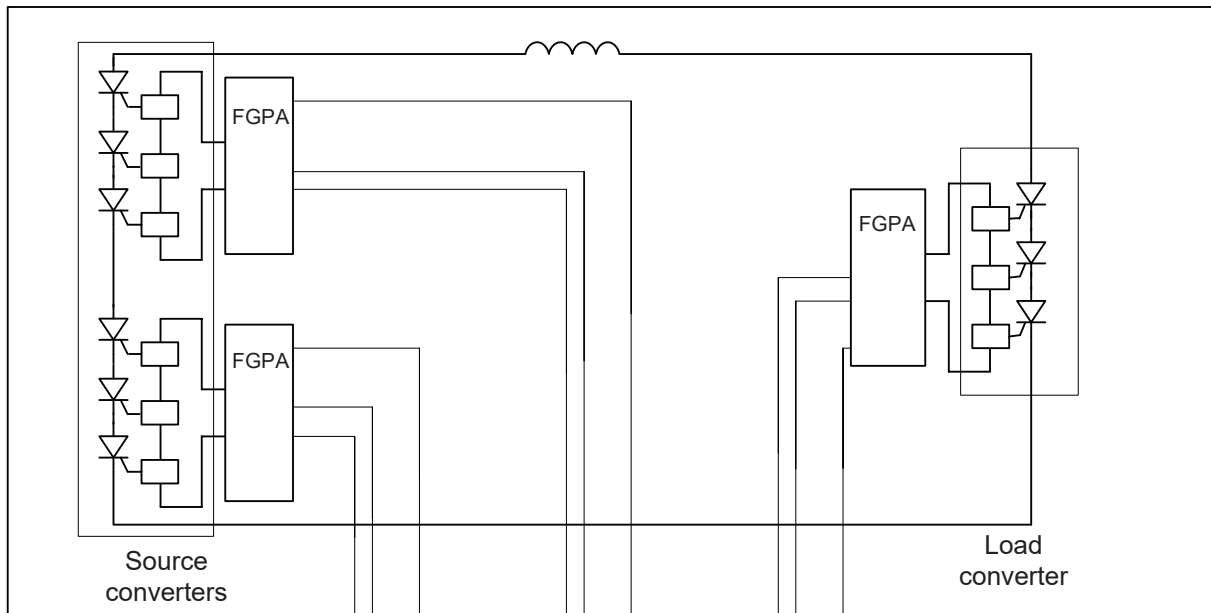
Obsolete Innovation control is removed.

Replaced with new TMEIC controls.

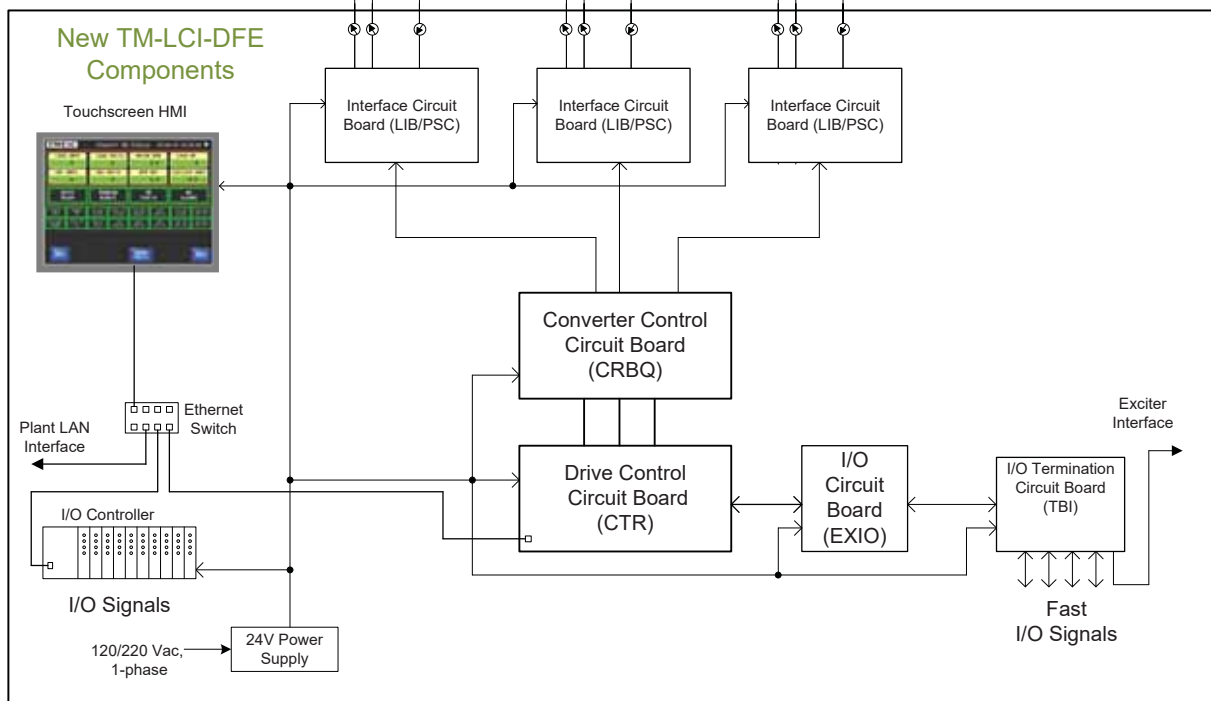
Innovation (after 1997)

Retained Components

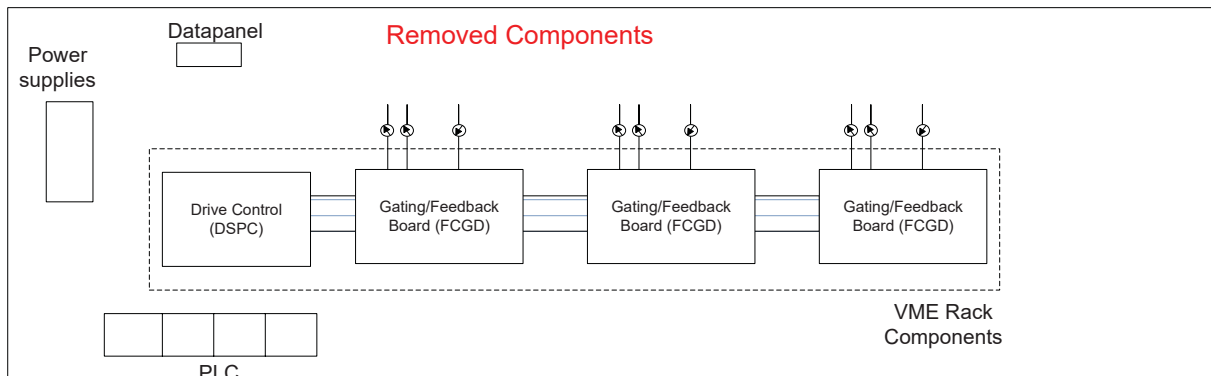
Typical LCI Power Converter



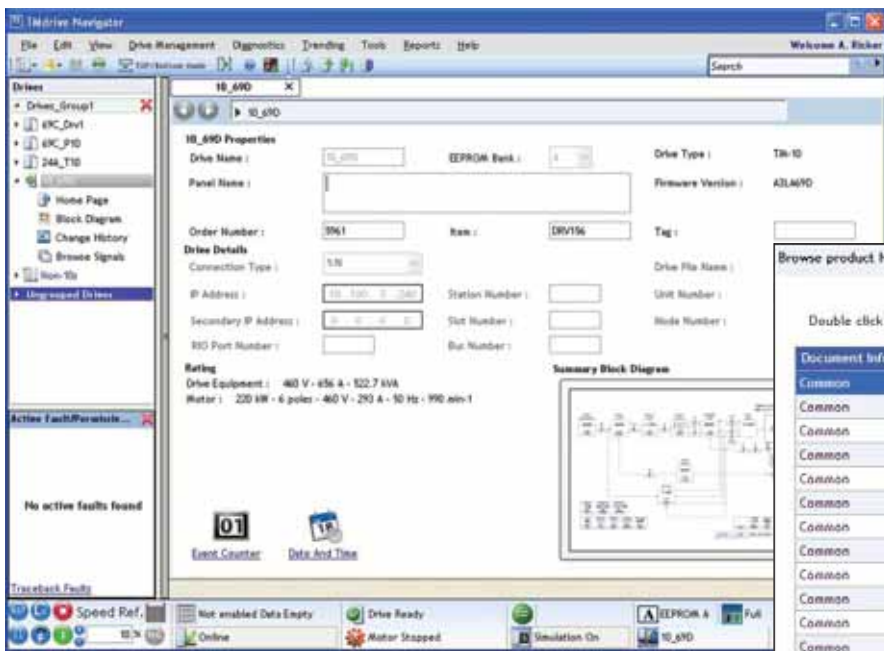
New TM-LCI-DFE Components



Removed Components

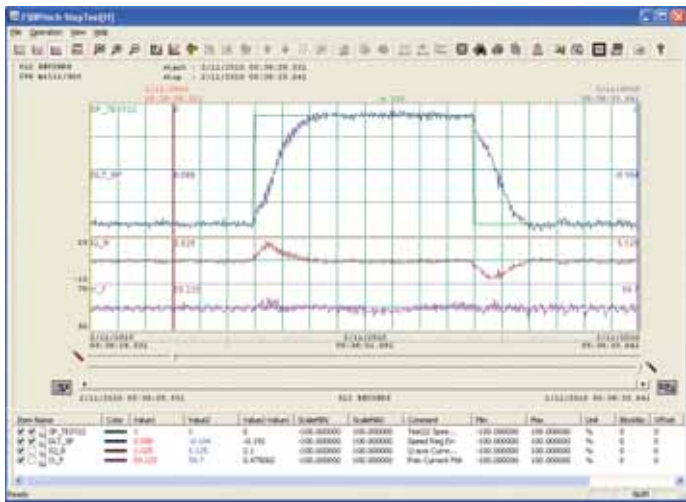


TMEIC Drive Navigator – A Tool for All of Your System Drive Products



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.

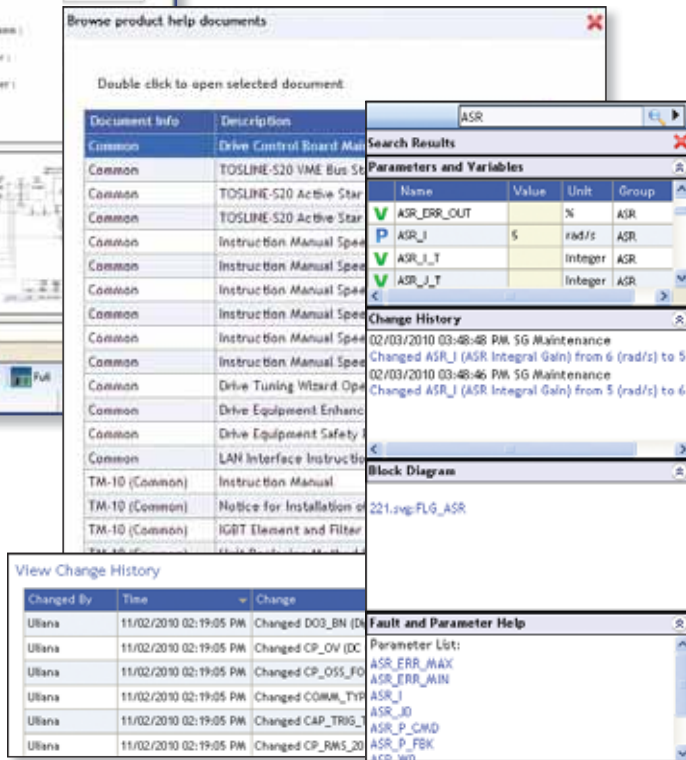


Live block diagrams provide a real-time graphical view of drive functions. Functions can be configured directly from the graphical view.

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

Compatible with:

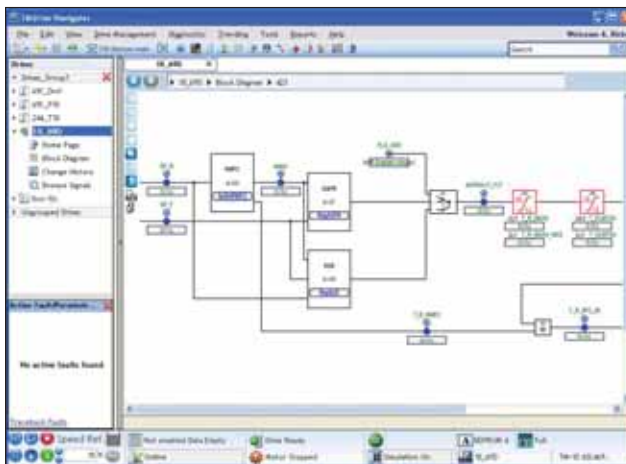
- Windows XP, Vista, 7
- Windows Server 2003, 2008



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.

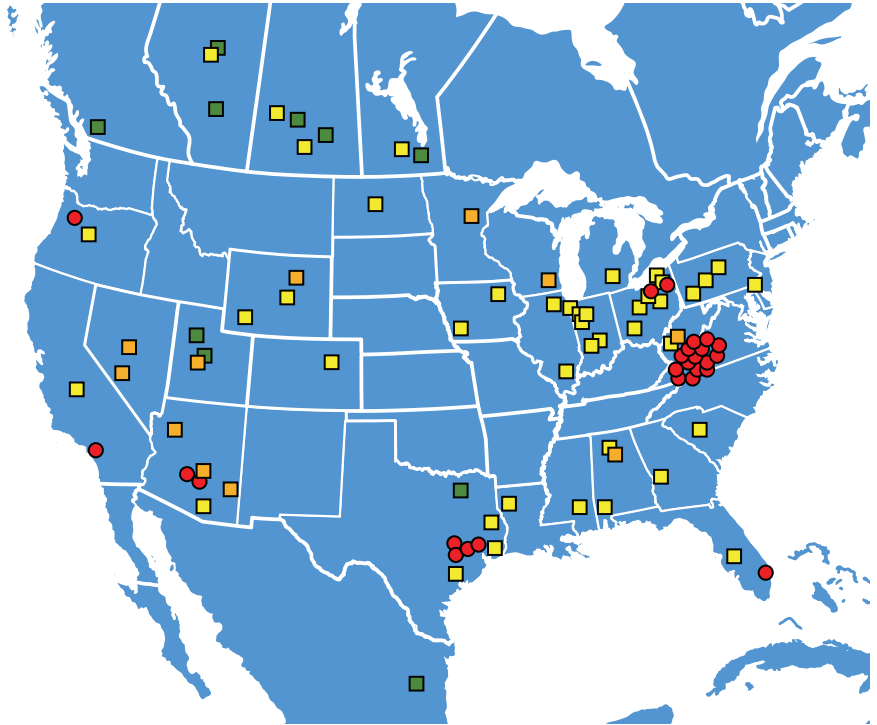
Wizards support tuning of drive functions.



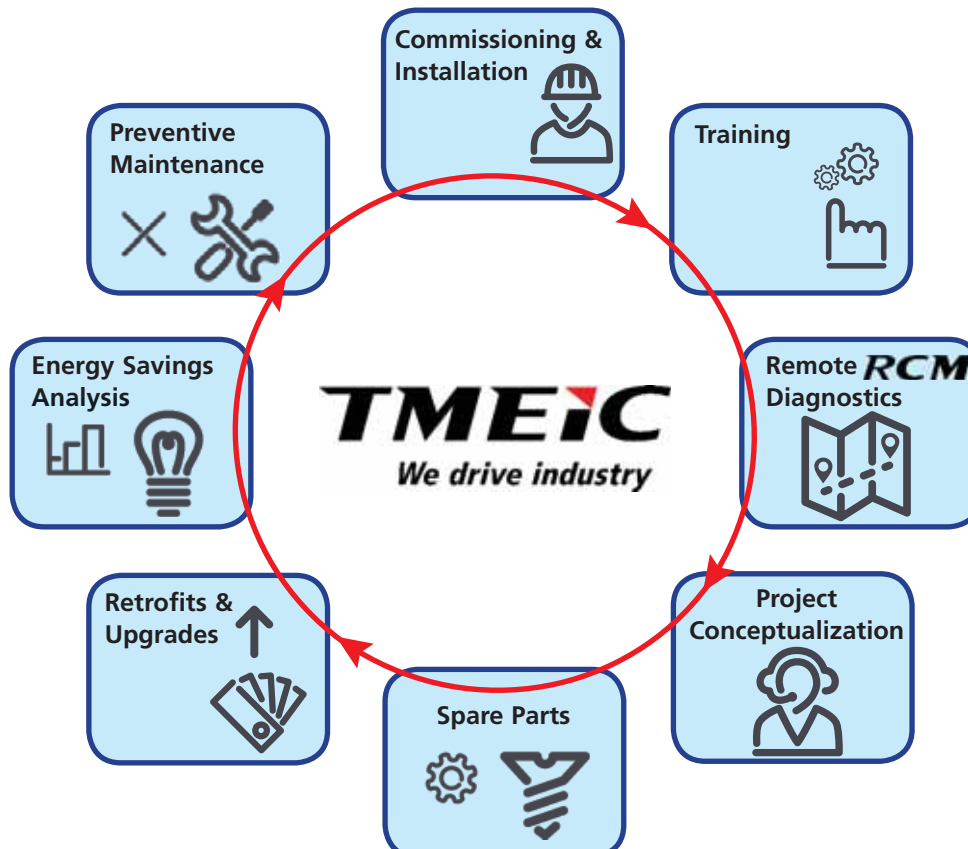
North American Sales and Service Network

Whether the equipment is up and running or experiencing downtime, live help from TMEiC is a phone call away. With bases in North America and around the world, regional TMEiC companies and TMEiC motor service shops provide reliable support whenever needed.

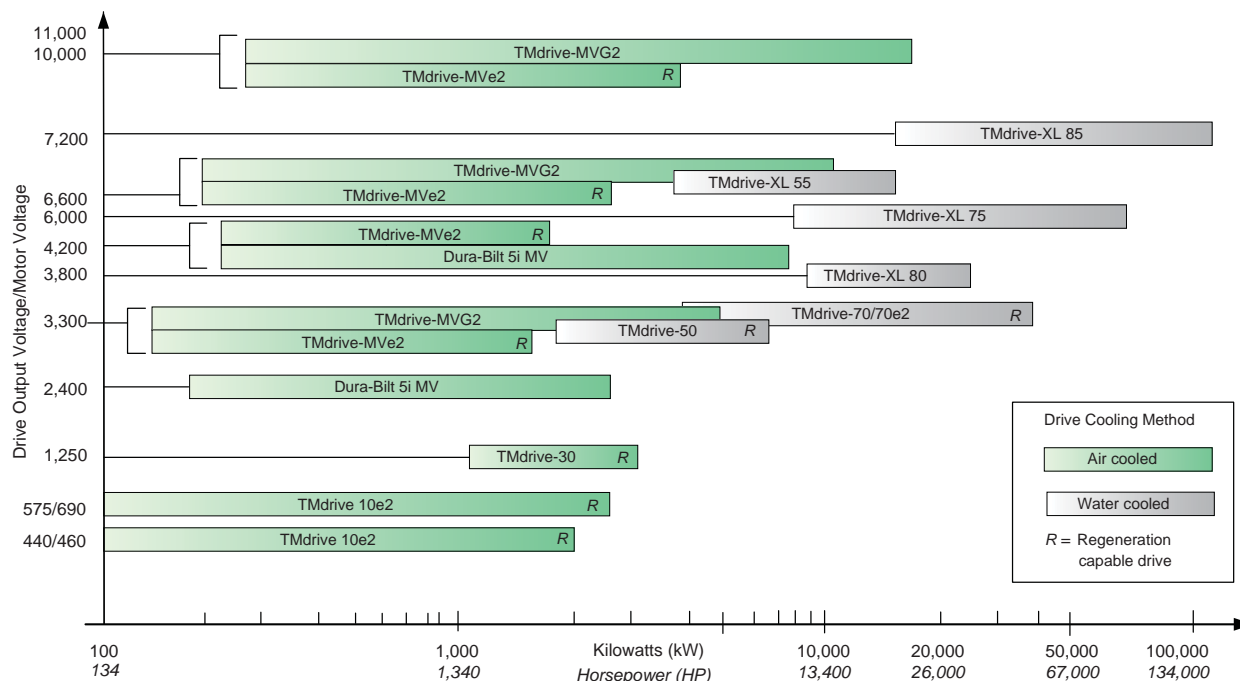
- 77 TMEiC VFD Service Engineers
- 43 Motor service locations
- Authorized VFD service providers
- Authorized MV Motor Repair Technicians



Service 24/7 – Talk to a service engineer, we’re available when you need us



TMEIC AC Drives Offer Complete Coverage



TMEiC

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