

# MULTISTACK®

## FlexSys / Optix Controllers

### *Why would a chiller manufacturer develop a chilled water distribution control system?*

Chiller efficiency is one of the hottest topics in the HVAC world today. But the chiller is just one part of the energy consumption of a chilled water distribution system. Inefficient operation of cooling towers, pumps and valves will all decrease the efficiency of the overall chiller plant.

The FlexSys Chiller Controller was introduced a few years ago and through its real-time chiller management technology it showed Multistack Engineers just how inefficiently buildings were being controlled. With cooling towers running out of control, and pumps running at radically higher speeds than necessary the efficiencies of even a Multistack MagLev™ powered chiller were being wasted in systems such as this.

Optix is the logical progression and extension of Multistack chiller development. The Optix Controller platform takes a common sense approach to look at the whole picture and positions all the components of the chilled water distribution system to do what they do best—and at their peak efficiencies. Starting with a look at overall demand of the building, Optix monitors the chilled and condenser water systems simultaneously to find the best energy balance. It is as simple as making sure the left hand knows what the right hand is doing—all the time.

A common misconception in the HVAC Industry is that just by having variable speed equipment, by default, you have achieved optimum energy efficiency. That is not the case at all. An orchestra with world class musicians and sheet music still needs a great conductor to become a truly world class symphony. Optix is the great Maestro who sees the overall energy picture while understanding the basic principles and inter-relationships of all the central plant components. Simply stated . . . FlexSys/Optix makes MagLev central plants sing!



## Optix

System control capabilities for:

- Four Multistack MagLev Chillers
- Four Variable Speed Condenser Water pumps
- Four Variable Speed Chilled Water Pumps
- Chilled Water By-Pass Valve
- Condenser Water By-Pass Valve
- Four Variable Speed Cooling Tower Fans
- Optional Hartman Loop Logic
- Future Feature — Other Manufacturer's Variable Speed Drive Chillers



## Modular Design

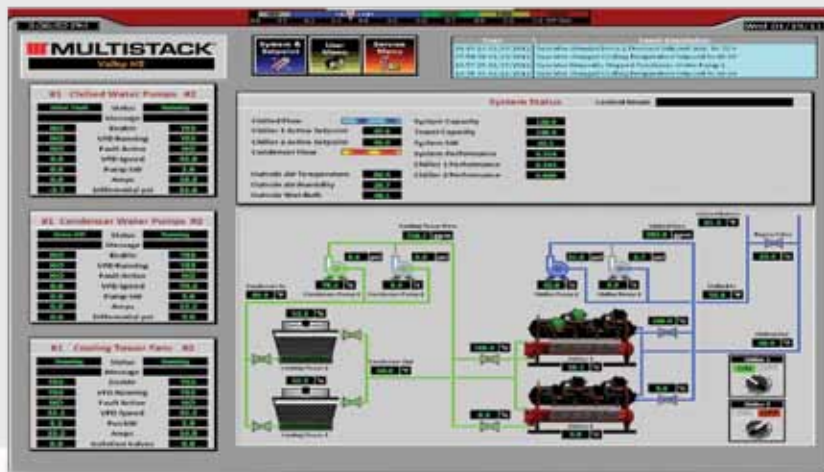
Utilizing a modular I/O system that consists of electronic terminal blocks, Optix EtherCat technology ensures protocols remain fully intact down to the individual terminal. This adds security in the connections and reliability in operation.

## Visuals

Optix provides a 19-inch touch screen with highly detailed graphics of all system components. The state of each device is easily recognized by color changes. Industry leading trend graphing provides an accurate view of data in five second intervals.

## Communications

Communications are not an option—they are the standard that Optix is built on. Featuring a built in, fully integrated Bacnet and Modbus Master/Slave configuration to efficiently deliver all data from the controlled devices to the BAS system, communications are real time. With remote connectivity capabilities, anything that can be done from the touch screen can be done through the internet—including accessing the chillers from the Optix controller. (An Ethernet or LAN-Cell 3G router is required for remote capabilities.)



## Speed

Optix offers controls built on EtherCat technology. This speeds the process of communications up over 500 times faster than Modbus-based systems. EtherCat is far superior to standard Ethernet because the information being passed through the system does not have to stop at each data point to be interpreted; rather it passes through while being interpreted in live time. You could liken it to the speed a train would have if it could pass through a station and off-load passengers and cargo—and re-load—without stopping.

## Reliability

Reliability—or sustainability for your plant—is a main feature of Optix. Our Optix Controller is the only system on the market that has truly redundant fail safe features built in including:

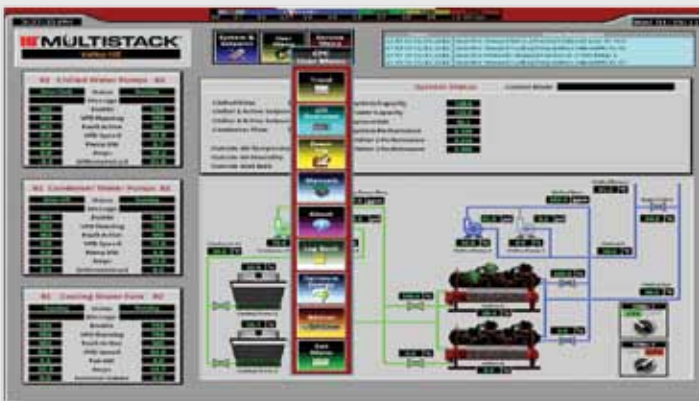
- 100% Redundant CPU Hard Drives
- SATA RAID Feature
- Star Topology
- Fail-to-Run Mode (All devices can operate in a non-optimized back-up mode in the absence of the main control)
- Industrial Hardware Construction
- Integrated Uninterruptible Power Supply (UPS)

## Easy Installation

Optix does not require costly conduit installation to carry the communications wiring. Instead it is as easy as running an Ethernet cable to your device and it is connected using Star Topology Technology. Should your device not offer an Ethernet connection, Optix offers a remote I/O package to get it online.

## Custom Solutions

Optix, and the flexible software platform it is based on, allows for simple integrations when you want them. Since the software is part of the system you can set up the central plant controls as you want to. No special software, no waiting for downloads, no separate computer or interface device, and no extra fees required.



Category	Item	Value	Status
Prevaling Signals	Control Water FIP	0.000	Normal
	Control Water FIP	0.000	Normal
	Control Water FIP	0.000	Normal
	Control Water FIP	0.000	Normal
Prevaling Signals	Control Water FIP	0.000	Normal
	Control Water FIP	0.000	Normal
	Control Water FIP	0.000	Normal
	Control Water FIP	0.000	Normal
Control FIP Signals	Control FIP Signal	0.000	Normal
	Control FIP Signal	0.000	Normal
	Control FIP Signal	0.000	Normal
	Control FIP Signal	0.000	Normal
Control FIP Signals	Control FIP Signal	0.000	Normal
	Control FIP Signal	0.000	Normal
	Control FIP Signal	0.000	Normal
	Control FIP Signal	0.000	Normal

## FlexSys

The Multistack FlexSys Controller can be applied to Multistack Air- and Water-Cooled Flooded Chillers, Multistack MagLev™ Modular Chillers and other OEM chillers equipped with Magnetic Levitation compressors. The FlexSys Controller is simply the most sophisticated control system available—which is obvious based on the breadth of its application.

FlexSys was the first and remains the only controller available that can run multiple sized compressors on the same shell set. This engineering feat allows design of the most energy efficient MagLev chillers in the world. With 1-to-1 technology that isolates each compressor's communications, interlocks and safeties; FlexSys looks at the entire chiller and controls each compressor individually to its maximum efficiency.

A built-in 15" touch screen, industrial grade components, DC power supplies, dual hard drives, modular I/O design and Ethernet communications are just some of the reasons FlexSys is the industry leader. Complete remote capabilities allow chiller monitoring and troubleshooting from the comfort of your office—rather than sending a technician out to investigate an alarm or fault trip.



### Features—Software

The MagLev™ FlexSys Controller includes these unique software features:

- Control of up to ten (10) MagLev Turbocor compressors of varying capacities using either independent or common refrigeration circuits.
- On-site individual compressor and system fine tuning using the MagLev™ FlexSys touch-screen.
- Proprietary MagLev™ FlexSys optimization logic maintains energy balances for all systems
- Two (2) year historical data log capacity, trend graphing in five-second intervals, as well as exportable images.
- Fault logging features a calendar mode with the ability to sort by alarm type, time stamp, or by individual compressor.
- MagLev™ FlexSys can be reconfigured via the touch-screen or via remote internet connection for custom system integration of the compressors.
- MagLev™ FlexSys features on-board installation and maintenance manuals, wiring diagrams and support data that are all built-in.
- Built-in web interface provides full remote control including fault notification via e-mail.
- On-board Danfoss Turbocor (DTC) software eliminates the need for a service technician to carry a portable computing device.
- Full BAS connectivity standard including integrated Modbus® RTU, Modbus® TCP/IP, BacNet®/IP, BacNet/MSTP. Lon is an available option.
- MagLev™ FlexSys controller can manage up to 24 electronic expansion valves when applied in a retrofit application.

### Features—Hardware

Multistack® selected high-end, fail-safe hardware features:

- Windows based, on-board high resolution PC for maximum reliability and performance
- Dual drive design insures redundancy, reliability and eliminates the need for partitioning.
- Solid State hard drives have no moving parts, eliminating the possibility of mechanical failure.
- 15-inch touch-screen display has 1024 x 768 resolution and an interface that eliminates the need for on-site laptop connectivity.
- DC Power Supply ensures resistance to on-site EMI and RFI issues.
- On-board industrial grade battery back-up for power outage protection.
- Modular I/O design simplifies troubleshooting by utilizing LED indicators for all inputs and outputs
- Spring capture wiring technology assures positive connections and eliminates traditional terminal blocks.
- MagLev™ Hub System provides dedicated Ethernet communication to all system compressors ensuring fast, reliable communication.