

# Three PC Control Solutions using Think & Do



## Think & Do 8.0

### PC-TD8-USB

USB key Development and Runtime key

### PC-TD8-WEB4-USB

Four concurrent with USB key with web viewing capability

### ESS-BASIC

Extended service and support;  
Basic 1 year

### ESS-PREMIUM

Extended service and support;  
Premium 1 year

### Includes:

- Flowchart logic
- Superior HMI features
- Easy SQL interface
- Web view capable (requires web view version)
- Importing screens
- Integrated serial communication
- Modbus TCP, Modbus RTU and Modbus Plus support
- Integrated motion control
- Integrated vision control
- PID process control (64 loops)
- Powerful debugging tools
- Offline logic testing]
- Common database for HMI, logic and motion

## Choose Think & Do 8.0 when you need

1. to communicate to an SQL database
2. a superior HMI with animation and advanced graphics

## System requirements

### Development System

Windows 2000 (SP4), XP (SP2), Vista  
Pentium IV compatible processor  
256 MB RAM (512 MB or higher recommended),  
750 MB available hard disk space  
CD-ROM drive  
64 MB or higher video adapter  
Color monitor (min resolution 800 x 600),  
Ethernet adapter

### Windows 2000/XP/Vista Runtime Target

Windows 2000 (SP4), XP (SP2), Vista  
Pentium IV compatible processor  
256 MB RAM (512 MB or higher )  
500 MB available hard disk space  
CD-ROM drive  
64 MB or higher video adapter  
Color monitor or flat-panel display for HMI  
min resolution 800x600)  
Ethernet adapter

### PLC Runtime Target

H2-WINPLC3



Completely compatible with original Think&Do Development Software applications

## Think & Do Live!

### PC-ENT-LIVE

Development/run-time license

### PC-WPLC-LIVE

WinPLC programming pack (HMI creator and external I/O drivers not included)

### Includes:

- Flowchart logic
- HMI creator
- Reuseable subcharts
- Integrated serial communication
- Integrated motion control
- OPC Client and Server
- Modbus TCP & Modbus RTU Support
- PID process control (64 loops)
- Powerful debugging tools
- Offline logic testing
- Common database for HMI, logic and motion
- Productivity Analysis tools
- WinPLC support

## Choose Live! when

- 1) HMI requirements are moderate
- 2) no SQL is required
- 3) projects are created by a single developer

## System requirements

### Development System

Windows NT/2000/XP-Certified Pentium 133

Windows NT/2000/XP Operating System

### Ram Requirements:

Windows NT - 32 MB  
Windows 2000- 64 MB  
Windows XP - 128 MB  
450 MB available hard disk space  
CD-ROM drive  
Color monitor (min resolution 800 x 600)

### Windows Runtime Target

Windows NT/2000/XP-Certified Pentium 300 (or higher)  
Windows NT/2000/XP Operating System  
128 MB RAM  
300 MB available hard disk space  
CD-ROM drive (optional)  
Color monitor or flat-panel display for HMI (min resolution 640 x 480)  
I/O scanner or network card

### PLC Runtime Target

H2-WINPLC3



The WinPLC is our lowest cost PC control solution

## The WinPLC, a hybrid PC/PLC solution

### H2-WPLC3-EN

Development/run-time license  
For Think & Do Live! 8 MB ROM/8 MB RAM

The WinPLC is a truly unique hybrid solution providing Think & Do PC control programming benefits on a PLC-style device. Develop applications with Think & Do Live! and download them to the WinPLC.

Use a WinPLC when you need:

1. The advantages of PC control: complex math, data manipulation and connectivity
2. A PLC's rugged industrial form, non-volatile memory and standard PLC I/O

Or when:

1. A standard OI will suffice for your HMI
2. You don't need a PC

## Think & Do Live! for WinPLC Programming Pack (PC-WPLC-LIVE)

Just the programming features needed for the WinPLC at a low price. Includes flowchart logic, reusable subcharts, PID functions, serial drivers, Modbus TCP/IP and a free OPC/DDE server.

## System requirements

### Development System

Windows NT/2000/XP-Certified Pentium 133

Windows NT/2000/XP Operating System

### Ram Requirements:

Windows NT - 32 MB  
Windows 2000- 64 MB  
Windows XP - 128 MB  
450 MB available hard disk space  
CD-ROM drive  
Color monitor (min resolution 800 x 600)

### PLC Runtime Target

H2-WINPLC3

*Note: PC Runtime Target not supported*

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

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# Think & Do 8.0 Overview



Think & Do™ Version 8.0 is an integrated control environment that lets you do more with a given PC platform. It supports development, deployment and operation of high-value automated control systems for material handling and manufacturing. Think & Do 8.0 provides an intuitive, open-architecture environment that readily integrates with hardware and software components from virtually all major suppliers.

Projects created with Think & Do 8.0 integrate seamlessly with enterprise information systems to provide valuable data about system operation. Major components of Think & Do 8.0 are:

- ProjectCenter: Provides ready access to all project elements and the fully integrated tagname database using the Data Item Explorer.
- FlowView: For creating control logic.
- ScreenView: For creating HMI screens.
- I/O View: For configuring project I/O.
- AppTracker: For fast, graphical debugging.
- Runtime Engine: Provides a robust, deterministic project execution environment.

Think & Do 8.0 makes it easy to target your project to the Microsoft Windows platform that best suits your needs. Whether you create a project for a Certified PC or CE, scaling for a different platform requires only minor adjustment. There are four USB key versions available, so selecting the

product that best meets your needs is easy. There are two USB key development packages, one with and one without web viewing capabilities.

## Extended Software Service and Support (ESS) Products

We offer two extended support products, a basic package and a premium package. The basic ESS package, **ESS-BASIC**, is a one-year subscription and includes

- 8 AM to 5 PM EST telephone support directly from Phoenix Contact
- E-mail support
- USB-Parallel key swaps
- Defective or damaged key replacements
- Software maintenance updates.

The premium ESS package, **ESS-PREMIUM**, is also a one-year subscription. It contains everything in the basic package, plus

- Webex training seminars
- A 50% discount on training seats
- Major software platform updates
- Upgrade from Think & Do Live! version 5.x to Think & Do 8.0 plus hardware key
- Or an upgrade from Think & Do Studio version 7.x via a hardware key field upgrade or replacement.

*Note: ESS products cannot be purchased online. The order must be phoned in (800-633-0405) and a valid software serial number is required.*

## Conversion from Think & Do Studio and Live!

Studio: Flowcharts developed in Studio can be converted to Think & Do 8.0, but HMI screens cannot be converted.

Live!: Flowcharts and HMI screens developed in Live! cannot be converted to Think & Do 8.0.

## Demo Mode

To see if Think & Do 8.0 is right for you, you can install and use it for up to 40 hours within a 30-day time period at no cost.

## System requirements

### Development System

Windows 2000 (SP4), XP (SP2), Vista  
 Pentium IV compatible processor  
 256 MB RAM (512 MB or higher recommended),  
 750 MB available hard disk space  
 CD-ROM drive  
 64 MB or higher video adapter  
 Color monitor (min resolution 800x600),  
 Ethernet adapter

### Windows 2000/XP/Vista Runtime Target

Windows 2000 (SP4), XP (SP2), Vista  
 Pentium IV compatible processor  
 256 MB RAM (512 MB or higher )  
 500 MB available hard disk space  
 CD-ROM drive  
 64 MB or higher video adapter  
 Color monitor or flat panel display for HMI  
 min resolution 800x600)  
 Ethernet adapter

### PLC Runtime Target

H2-WPLC3-EN

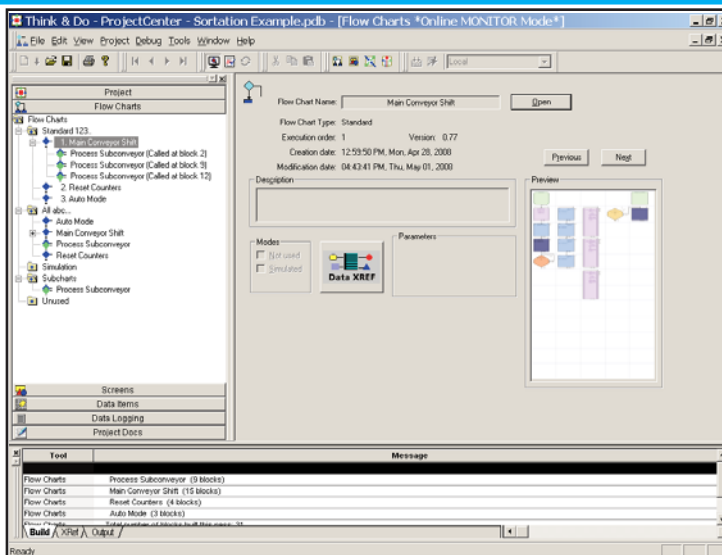
## Training

Phoenix Contact offers training courses led by certified Phoenix Contact Solution Providers at their headquarters in Ann Arbor, MI. Get the most from this powerful software by understanding it inside and out. Check [www.phoenixcon.com/software](http://www.phoenixcon.com/software) for training dates. Training is half price for subscribers to Premium Extended Service and Support, ESS-PREMIUM.

# Features

## ProjectCenter for creating your project

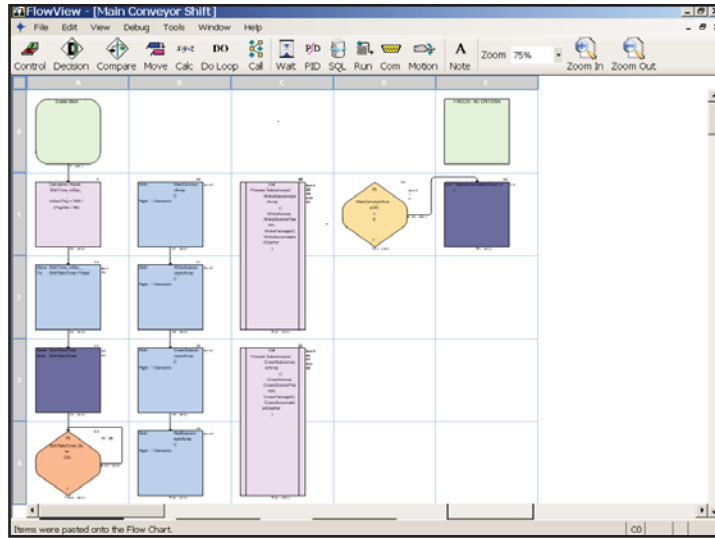
ProjectCenter is the starting point for developing your project and provides access to all Think & Do development tools, such as menus, project information and runtime settings. It provides ready access to all project elements and the fully integrated tagname database.



# Think & Do 8.0 Overview

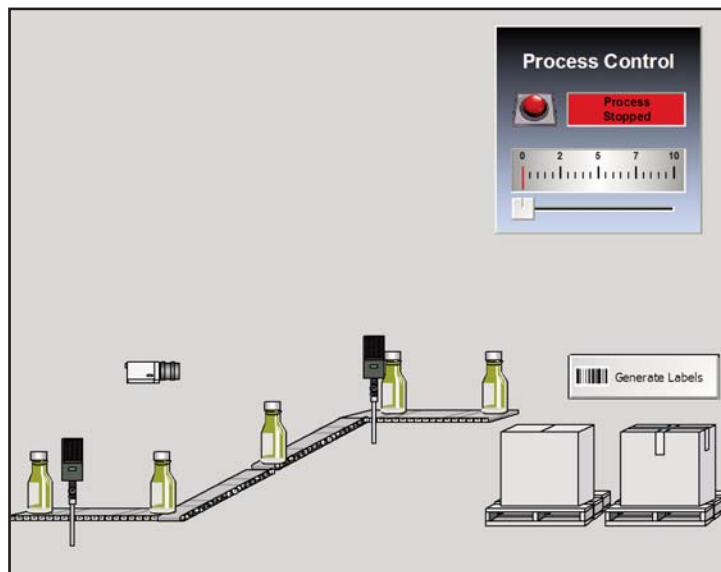
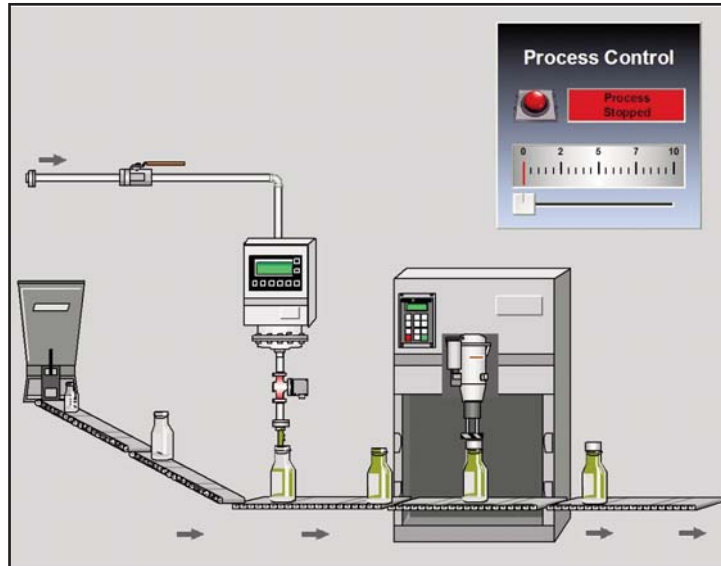
## FlowView for creating control logic in easy-to-use and read control flowcharts

Think & Do uses flow chart control programs and FlowView is where you develop control flowcharts. Menus provide access to all commands in FlowView, as well as online help.



## ScreenView for creating and editing HMI screens

The most dramatic improvement in this revision of Think & Do is the new HMI screen tool. ScreenView appears in an independent window that provides a complete HMI screen development environment. The graphical capabilities and functionality in v8.0 far surpass any previous screen tools we have employed for this PC-based control environment.



PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

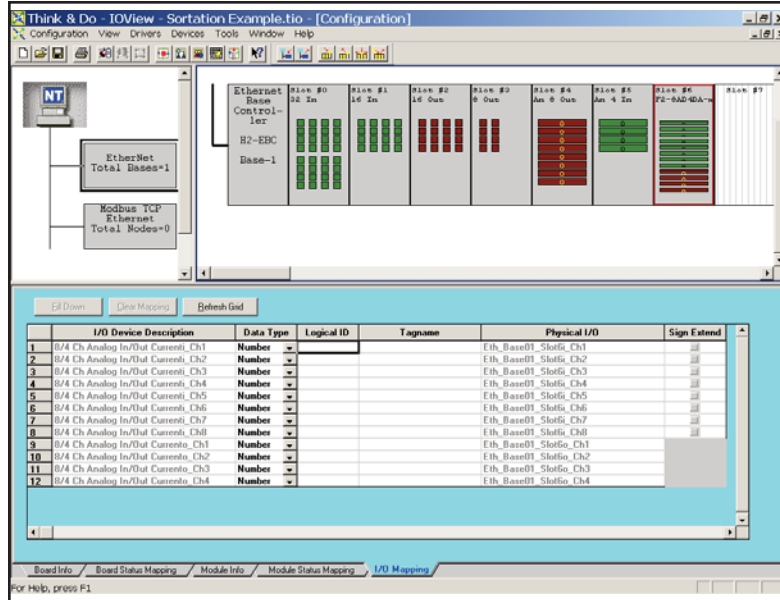
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# Think & Do 8.0 Overview

## I/OView for configuring your project I/O

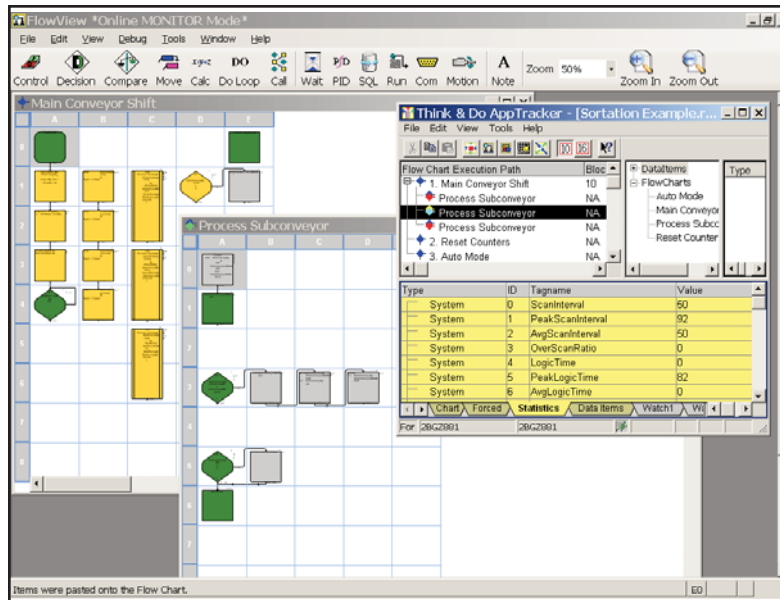
Use IOView to easily:

- Specify inputs, outputs, and data items
- Configure I/O
- Add I/O drivers and devices
- Map I/O
- Scan and monitor I/O
- Use a watchdog timer



## AppTracker provides a fast, graphical debugging tool

AppTracker is a stand-alone application. It can run even if the development tools in ProjectCenter are not running and can help identify problems easily during development.



# Think & Do Live! Overview



Think & Do Live! (PC-ENT-LIVE) is a full-featured control and Human Machine Interface (HMI) development tool. A common tag database and built-in HMI make Live! a great low cost PC-based control solution. Live! contains these features:

## Flowcharts for control

- Easy-to-use and easy-to-read flowcharts for control let you program like your machine or process operates, rather than one device at a time
- Subcharts (subroutine flowcharts) let you develop your logic once and reuse it on multiple projects
- Online changes are supported with graphical debugging to simplify troubleshooting your application
- Develop for Windows 2000, Windows XP and Windows CE platforms in the same environment

## Built-in HMI with same database

- Full screen editor with over 2,000 bitmapped graphic symbols, such as buttons, lights, pumps, motors, conveyors, and tanks
- Single database for HMI and control functions means there are no communication errors
- Text, numeric display, messaging, and trend charts
- Import any bit map or metafile format graphics to display CAD drawings, company logos, or digital photographs
- Function key and touch screen support to give you flexibility in design

## Communicate to business systems

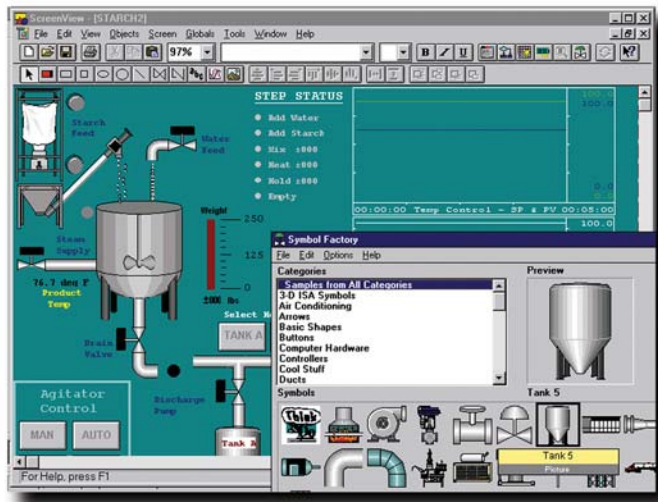
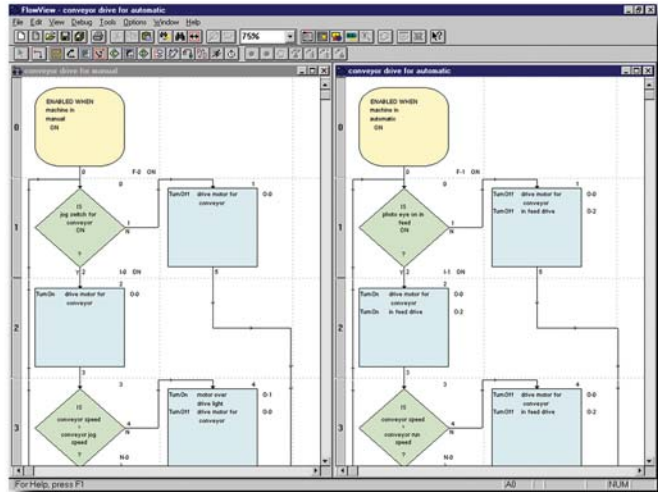
- OPC (OLE for process control) support allows easy connectivity to other standard software applications at host and ERP levels
- DCOM/COM for communications to other programs or for network communications
- OCX allows direct connections to Visual Basic® and C++ user programs
- Easy serial communication and string manipulation

## For control, HMI, motion, PID, and serial communications

Chances are you think your application out in flowcharts, so why not use them to program the control logic? Think & Do Live! is completely compatible with original Think & Do Development Software applications.

## Choose Live! when:

- You do not currently use or do not plan to use Windows Vista Operating System
- HMI requirements are moderate
- Hardware costs must be kept low
- SQL communications are not required



## System requirements

### Development System

Windows NT/2000/XP-Certified Pentium 133  
Windows NT/2000/XP Operating System

### Ram Requirements:

Windows NT - 32 MB  
Windows 2000- 64 MB  
Windows XP - 128 MB  
450 MB available hard disk space  
CD-ROM drive  
Color monitor (min resolution 800 x 600)

### Windows Runtime System

Windows NT/2000/XP-Certified Pentium 300 (or higher)  
Windows NT/2000/XP Operating System  
128 MB RAM  
300 MB available hard disk space  
CD-ROM drive (optional)  
Color monitor or flat-panel display for HMI (min resolution 640 x 480)  
I/O scanner or network card

### PLC Runtime Target

H2-WINPLC3

**NOT Vista operating system compatible**

# Think & Do Live! Overview



Lots of features for a little price

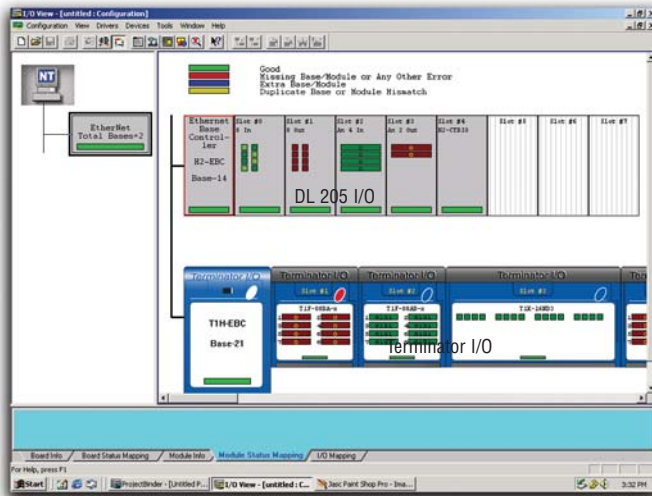
## Think & Do Live! Development & Runtime Licenses

### PC-ENT-LIVE

Includes one Live! development and runtime license. Use to develop or modify a Think & Do Live! project on a PC.

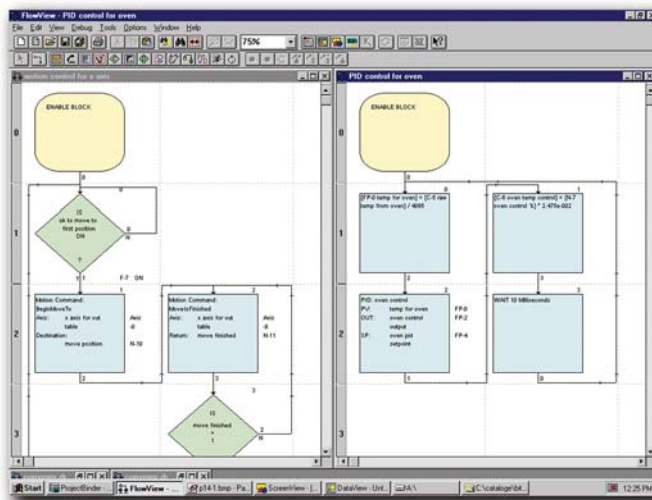
### PC-WPLC-LIVE

Live! programming pack for DL205 WinPLC CPUs. Includes one development license without HMI.



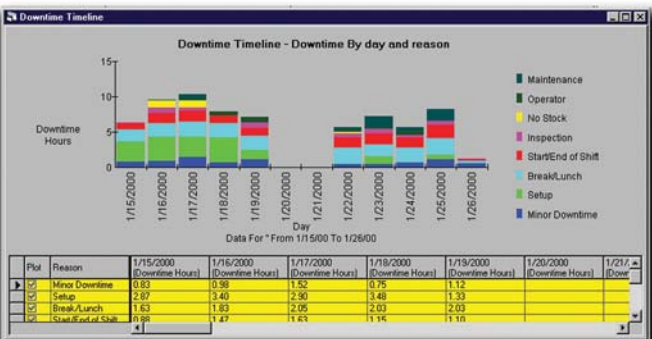
## Easy connection to I/O and serial devices

- All I/O drivers are included, with virtually no limit on I/O tags including Ethernet, Profibus, DeviceNet and SDS
- Built-in serial communication block within the flowchart environment allows easy communication to barcode readers, drives, and other smart devices
- All motion drivers are included for both serial and PC-card based motion



## Integrated motion and PID control with easy-to-use flowchart blocks

- Common flowchart language for motion control independent of the motion card you choose
- All motion parameters accessible to flowcharts and screens
- Several motion drivers supported; check the Phoenix Contact Web site for the latest list
- Easy to synchronize motion and control with your flowchart logic
- 64 full function PID loops
- Advanced PID functions like cascaded loops, bumpless transfer, anti-windup and wildflow variables allow you to perform complex process control applications



## Productivity analysis tools

- Downtime analysis — monitor machine downtime by reason codes to identify production bottlenecks
- Cyclotime analysis — View machine cycle time by hour, shift or operator to enable you to increase machine and production yield
- Capacity analysis — compare production yield versus maximum capacity to determine maintenance schedules, identify supply problems, or to justify new equipment purchases

## Also includes

Powerful debugging and offline logic testing tools

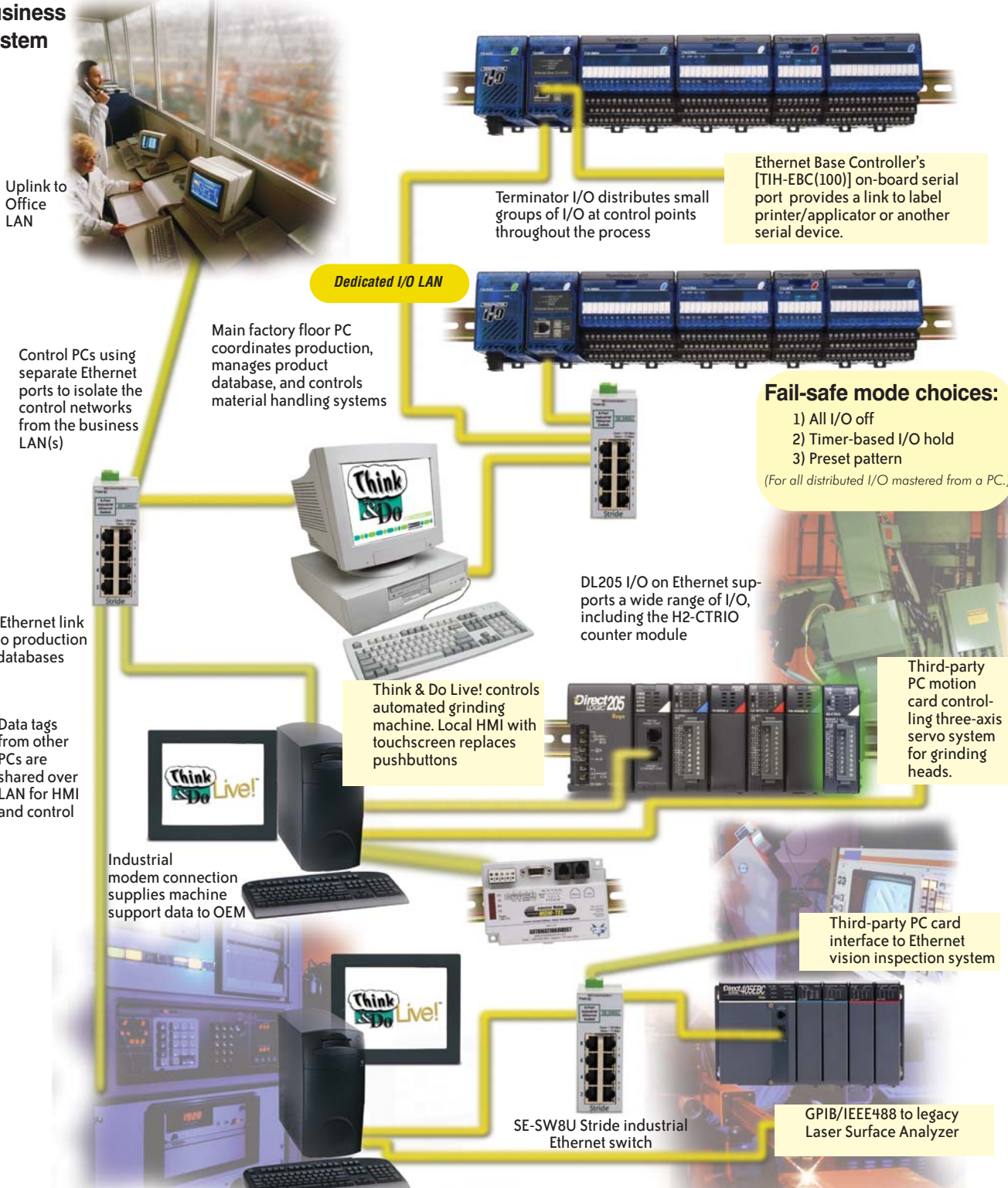
Check out

[www.phoenixcon.com/software](http://www.phoenixcon.com/software) for full details

# PC Control with Field I/O

Think & Do, with your choice of I/O, is a powerful, flexible solution for all your automation needs. The example below uses Ethernet, but Think & Do PC Control supports DeviceNet, Profibus, and other popular fieldbus networks as well.

## Business System



Uplink to Office LAN

Terminator I/O distributes small groups of I/O at control points throughout the process

Ethernet Base Controller's [TIH-EBC(100)] on-board serial port provides a link to label printer/applicator or another serial device.

**Dedicated I/O LAN**

Main factory floor PC coordinates production, manages product database, and controls material handling systems

Control PCs using separate Ethernet ports to isolate the control networks from the business LAN(s)

### Fail-safe mode choices:

- 1) All I/O off
  - 2) Timer-based I/O hold
  - 3) Preset pattern
- (For all distributed I/O mastered from a PC.)

Ethernet link to production databases

DL205 I/O on Ethernet supports a wide range of I/O, including the H2-CTRIO counter module

Data tags from other PCs are shared over LAN for HMI and control

Think & Do Live! controls automated grinding machine. Local HMI with touchscreen replaces pushbuttons

Third-party PC motion card controlling three-axis servo system for grinding heads.

Industrial modem connection supplies machine support data to OEM

Third-party PC card interface to Ethernet vision inspection system

SE-SW8U Stride industrial Ethernet switch

GPIB/IEEE488 to legacy Laser Surface Analyzer

Think & Do Live! controls application of specialty surfaces in oven using complex flow calculations. Also performs visual inspection of finished product

**All industrial hardware shown is available in this catalog**

# I/O Selection Guide for PC Control

Our PC-based control architecture allows you to choose I/O from our most complete and flexible I/O families. AUTOMATIONDIRECT I/O also supports the most popular control networks, such as Ethernet, Profibus and DeviceNet. Check out this chart to see most of the available options. Refer to I/O specifications in the PLC or Field I/O section for a complete list.

DL205 Discrete Input Modules		DL405 Discrete Input Modules		DL405 Temperature Modules	
D2-08ND3	8-pt 12-24VDC sink/source	D4-08ND3S	8-pt 12-24VDC source	F4-08RTD	8-ch RTD
D2-16ND3-2	16-pt 24VDC sink/source	D4-16ND2	16-pt 12-24VDC source	F4-08THM	8-ch thermo F/type, (J,E,K,R,S,T,B,N,C)
D2-32ND3	32-pt 24VDC	D4-16ND2F	16-pt 12-24VDC input, fast response	<b>DL405 Specialty Modules</b>	
D2-32ND3-2	32-pt 5-15VDC	D4-32ND3-1	32-pt 24VDC sink/source	D4-HSC	DL405 high speed counter
D2-08NA-1	8-pt 110VAC	D4-32ND3-2	32-pt 5-12VDC sink/source	D4-16SIM	8/16 pt input simulator
D2-08NA-2	8-pt 170-265VAC, 2 commons	D4-64ND2	64-pt 20-28VDC source	<b>Terminator I/O Discrete Input Modules</b>	
D2-16NA	16-pt 110VAC	D4-08NA	8-pt 110-220VAC	T1K-08ND3	8-pt 12-24VDC sink/source
<b>DL205 Discrete Output Modules</b>		D4-16NA	16-pt 110VAC	T1K-16ND3	16-pt 12-24VDC sink/source
D2-04TD1	4-pt 12-24VDC sink	D4-16NA-1	16-pt 220VAC	T1K-08NA-1	8-pt 110VAC
D2-08TD1	8-pt 12-24VDC sink	D4-16NE3	16-pt 12-24VAC/VDC sink/source	T1K-16NA-1	16-pt 110VAC
D2-08TD2	8-pt 12-24VDC source	F4-08NE3S	8-pt 90-150VAC/DC sink/source isolated	<b>Terminator I/O Discrete Output Modules</b>	
D2-16TD1-2	16-pt 12-24VDC sink, 0.1A/pt 1.6A/mod	<b>DL405 Discrete Output Modules</b>		T1K-08TD1	8-pt 12-24VDC sink
D2-16TD2-2	16-pt 12-24VDC source, 0.1A/pt 1.6A/mod	D4-08TD1	8-pt 12-24VDC sink	T1K-08TD2-1	8-pt 12-24VDC source
D2-32TD1	32-pt 24VDC sinking	F4-08TD1S	8-pt 24-150VDC sink/source isolated out	T1H-08TDS	8-pt 12-24VDS isoated sink/source
D2-32TD2	32-pt 24VDC sourcing	D4-16TD1	16-pt 5-24VDC sink	T1K-16TD1	16-pt 12-24VDC sink
D2-08TA	8-pt 18-220VAC	D4-16TD2	16-pt 12-24VDC source	T1K-16TD2-1	16-pt 12-24VDC source
D2-12TA	12-pt 18-110VAC	D4-32TD1	32-pt 5-24VDC, sink	T1K-08TA	8-pt 110-240VAC
D2-04TRS	4-pt isolated relay 5-30VDC or 5-250VAC	D4-32TD1-1	32-pt 5-15VDC, sink	T1K-08TAS	8-pt 110-240VAC isolated commons
D2-08TR	8-pt relay, 5-30VDC or 5-240VAC	D4-32TD2	32-pt 12-24VDC, source	T1K-16TA	16-pt 110-240VAC
F2-08TR	8-pt relay, 10A/com, 5-30VDC or 5-240VAC	D4-64TD1	64-pt 5-24VDC sink	T1K-08TR	8-pt relay 5-30VDC or 5-240VAC
F2-08TRS	8-pt relay 12-28VDC, or 12-250VAC	D4-08TA	8-pt 18-220VAC	T1K-16TR	16-pt relay 5-30VDC or 5-240VAC
D2-12TR	12-pt relay, 5-30VDC or 5-250VAC	D4-16TA	16-pt 18-220VAC	T1K-08TRS	8-pt isolated relay 5-30VDC or 5-240VAC
<b>DL205 Combination Discrete Modules</b>		D4-08TR	8-pt relay 5-30VDC or, 5-250VAC	<b>Terminator I/O Analog Modules</b>	
D2-08CDR	Combo 4-pt 24VDC in and, 4-pt relay out	F4-08TRS-1	8-pt relay 12-30VDC or, 12-250VAC	T1F-08AD-1	8-ch analog input 4-20mA 14-bit res
<b>DL205 Analog Modules</b>		F4-08TRS-2	8-pt relay 12-30VDC or, 12-250VAC	T1F-08AD-2	8-ch analog input voltage 14-bit res
F2-04AD-1	4-ch input, 4-20mA 12 bit res	D4-16TR	16-pt relay 5-30VDC or, 5-250VAC	T1F-08DA-1	8-ch analog output 4-20mA 12-bit res
F2-04AD-2	4-ch input, voltage 12 bit res	<b>Network Bus Interfaces and I/O Bases</b>		T1F-08DA-2	8-ch analog output voltage 12-bit res
F2-04AD-1L	4-pt in 4-20mA, 12 bit, ext 12VDC pwr	DL205 and DL405 bases, Terminator I/O power supplies and terminal bases, Bus adapter modules for PC control: DL205 (Ethernet, Profibus, DeviceNet, SDS); DL405 (Ethernet); Terminator I/O (Ethernet, Profibus, DeviceNet)		T1F-16AD-1	16-ch analog input 4-20mA 14-bit res
F2-04AD-2L	4-pt in voltage, 12 bit, ext 12VDC pwr	<b>DL405 Analog Modules</b>		T1F-16AD-2	16-ch analog input voltage 14-bit res
F2-08AD-1	8-ch input 4-20mA, 12-bit res	F4-04AD	4-ch analog input voltage/current	T1F-16DA-1	16-ch analog output 4-20mA 12-bit res
F2-08AD-2	8-ch input voltage, 12-bit res	F4-04ADS	4-ch isolated analog voltage/current	T1F-16DA-2	16-ch analog output voltage 12-bit res
F2-02DA-1	2-ch output 4-20mA, 12-bit res	F4-08AD	8-ch analog input, voltage/current	T1F-14THM	14-ch thermocouple 16-bit res
F2-02DA-2	2-ch output voltage, 12-bit res	F4-16AD-1	16-ch analog input, current, 12-bit	T1F-8AD4DA-1	I/O 8-ch analog input 4-ch analog output, current
F2-02DA-1L	2-ch 4.20 mA out 12-bit, ext 12VDC pwr	F4-16AD-2	16-ch analog input, voltage, 12-bit	T1F-8AD4DA-2	I/O 8-ch analog input 4-ch analog output, voltage
F2-02DA-2L	2-ch voltage out 12-bit, ext 12VDC pwr	F4-04DA-1	4-ch analog output, current, 12-bit	<b>Terminator I/O Specialty Modules</b>	
F2-02DAS-1	Isolated, 2-ch 4-20mA 16-bit out	F4-04DA-2	4-ch analog output, voltage, 12-bit	T1H-CTRIO	High-speed counter with pulse out
F2-02DAS-2	Isolated, 2-ch voltage 16-bit out	F4-04DAS-1	4-ch isolated, 16-bit analog out, 4-20mA		
F2-08DA-1	8-ch, 4-20mA, 12-bit out	F4-04DAS-2	4-ch isolated 16-bit analog output, voltage		
F2-08DA-2	8-ch, 0-5VDC or 0-10V, DC, 12-bit out	F4-08DA-1	8-ch analog output, current		
F2-4AD2DA	4-ch in /2-ch out., 4-20mA 12-bit res.	F4-08DA-2	8-ch 0-5VDC or 0-10VDC, 12-bit analog out		
F2-8AD4DA-1	8-ch in/4-ch out, current, 16-bit	F4-16DA-1	16-ch analog output, current		
F2-8AD4DA-2	8-ch in/4-ch out, voltage, 16-bit	F4-16DA-2	16-ch 0-5VDC or 0-10V DC 12-bit analog out		
F2-04RTD	4-channel RTD, 0.1 DEG C res				
F2-04THM	4 ch thermocouple or, 16-bit volt. input				
<b>DL205 Specialty Modules</b>					
H2-CTRIO	DL205 high speed counter with pulse out				
F2-08SIM	8-pt input simulator				
H2-SERIO	3-port serial for Win PLC				

Note: All networked I/O has fail-safe mode choices 1. All I/O off 2. Leave I/O in last state 3. Fail-safe pattern