1-800-245-2327

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CONTROL SOLUTIONS

CATALOG

1403

ABOUT DIVELBISS CORPORATION

Divelbiss Corporation is located in Fredericktown, Ohio and was founded in 1974 with the goal of providing quality electronic product engineering and assembly services to original equipment manufacturers.

Since then, Divelbiss has grown and evolved into a diversified corporation. In 1978 we introduced the first ICM Programmable Controllers to compliment the complex systems engineering and product design being done for various client organizations. These early controllers featured modular construction and were designed from the beginning for use in factory environments.

As acceptance of electronic automation control grew, so did our commitment to meet or exceed the highest quality standards while maintaining fair prices for our products. Our commitment caused many OEM clients to begin using our staff as an extension of their own.

In 2004, Divelbiss introduced the patented PLC on a Chip™ Technology; which provides complete PLC functionality in one integrated circuit. PLC on a Chip™ allows OEMs to create a unique product, utilizing PLC technology without time consuming expense of developing low level software and device drivers.

Unlike other companies, Divelbiss does not avoid the word *custom*. In fact, Divelbiss welcomes the opportunity to develop and provide custom solutions. Whether you wish to private label, require a modification to our standard product offering or would like a completely custom product, Divelbiss has the experience.

Divelbiss Corporation currently operates a 17,000 square foot manufacturing facility that operates both Thru-hole and Surface Mount (SMT) assembly lines and can provide mechanical assembly, cable assembly and panel assembly. In addition, Divelbiss offers technical services programming and testing.

COMMITMENT TO EXCELLENCE

Divelbiss Corporation is committed to resolving customer application problems through effective design and production of electronic products. Dedicated to continuous improvements of products and processes, Divelbiss Corporation will exceed our customers' expectations of technology, quality and delivery.

Terry L. Divelbiss
President, Divelbiss Corporation

Products

Effective Date: 9/10/2014

This Catalog & Price List Supercede all previous catalogs and price lists.
Prices & Specifications Subject to Change without Notice

EZ LADDER TOOLKIT

The Divelbiss EZ Ladder® Toolkit software is a powerful and easy-to-use Windows® based programming platform used to create the ladder diagram programs for any PLC on a Chip™ based controller. When used in conjunction with any PLC on a Chip™ based controller, EZ LADDER Toolkit provides a quick and easy to use GUI interface for designing and drawing ladder diagram projects using function blocks, ladder diagram objects and structured text. Controllers (*targets)*, that will be the final destination are configured using a built-in menu system. With the target selected, only the supported features are available for creating the ladder diagram project. OEM branding is available for EZ LADDER.

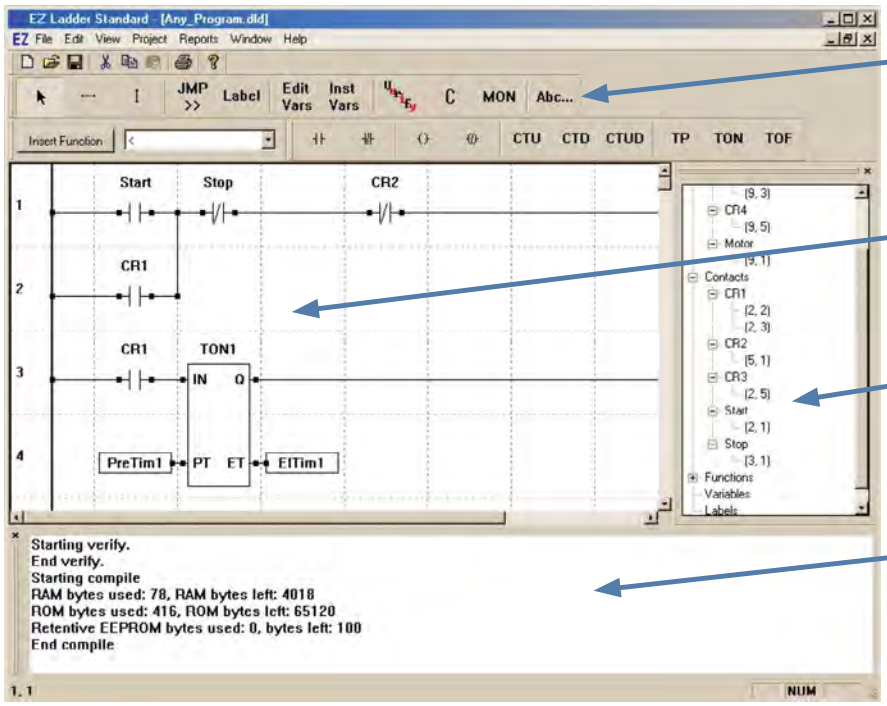
- **Parallels IEC61131-3 Standard**
- **Ladder Diagram and Function Blocks**
- **Supports Structured Text**
- **Over 90 Functions / Function Blocks**
- **RS232 Serial Interface**
- **Modbus Master / Slave Support**
- **SAE J1939 /NMEA 2000 Support**
- **Real Time Monitoring**
- **Debugging Tools**
- **Printable Reports**

When coupled with the PLC on a Chip Development Kit it provides a full featured design and proof-of-concept capability at very reasonable cost. Includes support for OptiCAN network for up to 10 nodes without purchasing additional hardware or software.

Production tooling is easier since any programs developed are *transportable* for use with the final product. Code libraries are easily created to allow for simple *cut and paste* reuse of previously designed circuit elements. All elements are cross referenced making it easy to locate all instances of an element used in multiple rungs of the program ladder.

Now with Structured Text

Structured Text may be used on all P-Series hardware targets to program target functionality for entire programs, custom serial port drivers and more. Structured Text allows for creating Structured Text Functions and Function Blocks using the built-in Strutured Text Editor and then these functions and function blocks may be utilized from EZ LADDER's ladder diagram project.



Tool Bars:
Easy to use shortcut buttons for object placement, drawing links, and variable insertion.

Ladder Diagram Workspace:
Power rails with numbered rungs.

Cross Reference Window:
Quick reference for contacts, coils, functions, and variables used in the displayed ladder.

Output Window:
Displays status, memory use, and any errors encountered during the Compile or Verify process.

EZ LADDER TOOLKIT SOFTWARE PART NUMBERS	
Model #	**Description**
EZLDCD-01	EZ LADDER Toolkit Standard Edition on CD. Operates with all targets. Allows for installation on two computers.
EZLD-LDR-01	EZ LADDER Loader Software. Provides method to EZ LADDER programs loaded on hardware targets by creating and sending executable file (.exe) that can be loaded into target with only PC serial port and programming cable. Does not allow end-user to view or change program in any way

EZ LADDER TOOLKIT FUNCTION & FUNCTION BLOCK LIST

Absolute	Direct Coil	Logarithm	Rotate Right
Add	Divide	Max	Seed
And	Drum Sequencer	Min	Select
Arc Cosine	Equal To	Modbus Master	Serial Print
Arc Sine	EEPROM_Read	Modulo	Set the Date
Arc Tangent	EEPROM_Write	Moving Average	Set Dominant SR Flip Flop
Average	Exponentiation	Multiply	Set the Time
Bit Pack	Falling Trigger	Multiplexer	Shift Left
Bit Unpack	Floor	Natural Exponential	Shift Right
Bitwise Not	Gray Code SSI	Natural Logarithm	Sine
Bitwise Or	Get Current Date	Not Equal To	Square Root
Ceiling	Get Current Time	Optican Nodestatus Read	Structured Text FN
Clear LCD Display	Greater Than	Optican Txnetmsg Send	Structured Text FB
Compare	Greater Than Or Equal To	PID	Subtract
Convert to Boolean	High Speed Timer/Counter	Print to LCD Display	Tangent
Convert to Integer	Hysteresis	PWM	Time Delay OFF
Convert to Real	J1939 SPN Read	PWM Frequency	Time Delay ON
Convert to Timer	Jump	Quadrature Cntr Read	Timer Counter
Cosine	Keypad	Quadrature Cntr Compare	Pulse Timer
Counter Timer	Keypad2	Quadrature Cntr Velocity	Uart Set Property
Counter LS7366R	Label	Random	Unlatch Coil
Count Down	Latching Coil	Reset Dominant RS Flip Flop	Bitwise XOR
Count Up	Less Than	Rising Trigger	
Count Up / Down	Less Than Or Equal To Limit	Rotate Left	

- Hardware Targets may not support all functions.

OPTICAN CONFIGURATION TOOL PROFESSIONAL

OptiCAN is a CAN network employed by PLC on a Chip™ controllers. The OptiCAN network is register based and allows for communication between supported controllers, other supported controllers, and I/O. The network includes built-in status monitoring capabilities and error detection.

Using OptiCAN, a controller can receive or transmit data across the 2-wire CAN network to another controller or dedicated I/O devices such as the HEC-1100. Transmissions are global allowing all nodes to be able to receive the data. Nodes will only receive data when the desired source node is selected to be received from.

EZ LADDER Toolkit provides support for up to 10 nodes internally with its built-in OptiCAN Configuration Tool. OptiCAN Configuration Tool Professional is available in the event more than 10 nodes are required, or additional trouble shooting tools are needed. The professional version includes a USB-CAN interface module and software required to be able to print reports, monitor network traffic in real-time, see statistics including transmit rates, view the heartbeat and control the network (start, stop, reset).

OPTICAN CONFIGURATION TOOL PROFESSIONAL PART NUMBERS

Model #	Description
OPTICFGTOOL-01	OptiCAN Configuration Tool Professional. Includes USB-CAN module, connection cabling and software for advanced control and monitoring of OptiCAN networks.

Divelbiss provides Application Notes for controllers.

View Application Notes

SOFTWARE COMPATIBILITY MATRIX

FEATURE	CONTROLLER SERIES / FAMILY: P-Series Bear Bones Controllers	Versatile Base (VB) Controllers	Harsh Environment Controllers	Harsh Environment HMI / Controllers	Enhanced Baby Bear Controllers	PLC on a Chip	PCS Controllers	Micro Bear Controllers	Solves-It! Plug-in PLCs	Application Modules	Boss Bear Controllers	Boss 32 Controllers	Universal Control Panels
EZ LADDER Toolkit Standard	•	•	•	•	•	•	•	•	•	•			
OptiCAN Configuration Tool Pro.	•	•	•	•	•	•	•						
EZ LADDER Loader	•	•	•	•	•	•	•	•	•	•			

HARSH ENVIRONMENT CONTROLLERS

Divelbiss Harsh Environment Controllers are designed for use in areas with less than ideal conditions such as moisture, temperature and vibration. Perfect for off-road and mobile applications, the Harsh Environment Controllers are housed in a sealed, water-tight enclosure and operate on wide range DC Power. The Harsh Environment Controllers are easily programmed in ladder diagram and function block using the powerful EZ LADDER Toolkit.

Each of the Harsh Environment Controller models provide a combination of Digital Inputs, Digital Outputs and High Speed Counter Inputs - all DC voltage. Digital Outputs can be operated as a standard DC Voltage Output or as a Pulse Width Modulated (PWM) Output. Some models also provide analog inputs for voltage or current (DC).

Communications and Networking are standard on all Harsh Environment Controllers. Most models support the SAE J1939 protocol and our OptiCAN network. Using the OptiCAN network, multiple Harsh Environment Controllers may be networked together and to other controller families and I/O Modules. Optional serial ports are available for serial printing and for communication as a slave on a Modbus network.

- ▶ 8-32VDC POWER
- ▶ -40°C to +80°C
- ▶ Quick Disconnects
- ▶ 40KHZ Counters
- ▶ 2 Amp Outputs*
- ▶ May be Submersed to 3 Feet of Water

HEC-P5000/P5100

CHART LEGEND • = Supports Feature Num = Qty of Feature • FS = Field Selectable Feature	MODELS																	
FEATURE	HEC-P5000	HEC-P5100	HEC-1500-E-R	HEC-1504-E-R	HEC-2000-E-R	HEC-2004-E-R	HEC-4000-E-R	HEC-4004-E-R	HEC-4010-E-R	HEC-4014-E-R	HEC-4100-E-R	HEC-4104-E-R	HEC-4110-E-R	HEC-4114-E-R	HEC-4200-E-R	HEC-4204-E-R	HEC-4210-E-R	HEC-4214-E-R
# of 8-32VDC Inputs	16	16	6	6	8	8	4	4	4	4	4	4	4	4	4	4	4	4
Input Type K=Sink / S=Source	•FS	•FS	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
High Speed Counter Inputs***	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
High Speed Count Type - PNP/NPN	FS	FS	FS	FS	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP	PNP
High Speed Counter Freq Max. (HZ)	100K	100K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K
# of Quadrature Counter Inputs	1	1																
# of 8-32VDC Sourcing Outputs	16	16	6	6	8	8	6	6	6	6	6	6	6	6	6	6	6	6
# Outputs selectable as PWM	12	12	6	6	8	8	6	6	6	6	6	6	6	6	6	6	6	6
Output Current per Output*	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A
# of Output Current w/Feedback	6	6					4	4	4	4	4	4	4	4	4	4	4	4
Real Time Clock	•	•	•	•														
# of CAN Ports	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2
# Ethernet Ports	1	1																
SAE J1939	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
NMEA 2000	•	•																
Divelbiss OptiCAN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Modbus TCP	•	•																
Modbus - Master (M) / Slave (S)	M/S	M/S	S	S		S		S		S		S		S		S		S
Multipurpose RS232 Serial Port**	2-FS			FS		FS		FS		FS		FS		FS		FS		FS
Multipurpose RS422 Serial Port**				FS		FS		FS		FS		FS		FS		FS		FS
Multipurpose RS485 Serial Port**	2-FS			FS		FS		FS		FS		FS		FS		FS		FS
# of Analog Inputs	2	2	2	2			4	4	4	4	4	4	4	4	4	4	4	4
0-20mADC Analog Inputs	FS	FS	FS	FS			•	•			•	•			•	•		
0-5VDC Analog Inputs	FS	FS	FS	FS					•	•			•	•			•	•
0-10VDC Analog Inputs	FS	FS	FS	FS														
10 Bit Resolution Analog			•	•			•	•	•	•								
12 Bit Resolution Analog	•	•									•	•	•	•				
15 Bit Resolution Analog															•	•	•	•

* Per Single Point. Total Max. Current may be adjusted based on target per output pair or group. See product hardware manuals.
** Serial Communications Port available on certain models. Refer to hardware manuals for details.
*** # of Digital Inputs (Part of total Digital Inputs) or other input types that also operate as High Speed Counters.

HEC CONTROLLER PART NUMBERS							
Model #		Model #		Model #		Model #
HEC-1500-E-R		HEC-2004-E-R		HEC-4100-E-R		HEC-4210-E-R
HEC-1504-E-R		HEC-4000-E-R		HEC-4104-E-R		HEC-4214-E-R
HEC-2000-E-R		HEC-4003-E-R		HEC-4110-E-R		HEC-P5000
HEC-2001*		HEC-4004-E-R		HEC-4114-E-R		HEC-P5100
HEC-2002*		HEC-4010-E-R		HEC-4200-E-R		
HEC-2003*		HEC-4014-E-R		HEC-4204-E-R		

*** Non-RoHS Model. Other specifications same as E-R Part number. Available while supplies last.**

HEC-1500/2000/4000-E-R

HARSH ENVIRONMENT I/O MODULES

- **8-32VDC POWER**
- **-40°C to +70°C**
- **4 Amp Outputs***
- **May be Submersed to 3 Feet of Water**

CHART LEGEND • = Supports Feature FEATURE	MODELS HEC-1100
8-32VDC Sinking Inputs	•
# of Inputs	8
High Speed Counter Inputs	
8-32VDC Sourcing Outputs	•
# of Sourcing Outputs	8
Outputs selectable as PWM	•
Output Current per Output Pair *	4A

* Total Max. Current for Output Pair

Harsh Environment I/O Modules allow for additional I/O requirements in any system. HEC I/O Modules are designed to withstand the same environments as the Harsh Environment Controllers.

HEC I/O Modules connect to any Divelbiss controller that supports OptiCAN. The modules individual I/O are controlled from the connected controller(s) using OptiCAN network registers.

HEC I/O MODULE PART NUMBERS
Model #
HEC-1100

HARSH ENVIRONMENT ACCESSORIES & COMBO KITS

HEC ACCESSORIES & COMBO KITS INFORMATION	
Model #	Description
HEC-PS5	5VDC Power Supply. Converts input power 8-32VDC to 5VDC for external devices.
HEC-OC-INT	HEC Open-Collector Interface for HEC High Speed Counter Inputs. Converts Open-Collector (NPN) device signals to PNP signals for counter inputs.
SK-HEC	Starter Kit for HEC Products (not HEC-P). Includes HEC-100, HEC-110, HEC-910, 126-102860 and EZ LADDER Toolkit.

HARSH ENVIRONMENT HMI / HMI-CONTROLLERS

The Divelbiss HEC-HMI series expands the Harsh Environment Controller product family with a harsh environment HMI and combination HMI / Controller. Built to withstand rugged environments including temperature extremes, the HEC-HMI series provides an easy to implement, feature rich, and powerful HMI and HMI with controller. All models program using EZ LADDER Toolkit.

Common to all HEC-HMI models is an LCD Display with Backlight, programmable buttons, power monitor, programmable LED indicators, SAE J1939, OptiCAN and Modbus Slave networking.

Models with integrated controllers, include analog, digital and high speed counter inputs with digital, PWM and relay outputs.

- ▶ 8-32VDC POWER
- ▶ -40°C to +80°C
- ▶ Networking
- ▶ 4 Amp Outputs *
- ▶ Relay Outputs
- ▶ 2x16 or 4x20 Display
- ▶ Up/Quadrature Counters
- ▶ Programmable Keys/LEDS
- ▶ DAC Outputs
- ▶ 10 or 15 Bit Analog Inputs
- ▶ NEMA 4X, IP66, UL94V-0
- ▶ Thermocouple Inputs

CHART LEGEND
- • = Supports Feature
- Num = Qty of Feature
- • FS = Field Selectable Feature

FEATURE	MODELS						EXPANSION MODELS											
	HEC-HMI-2-ER	HEC-HMI-4-E-R	HEC-HMI-C2100-E-R	HEC-HMI-C2150-E-R	HEC-HMI-C4100-E-R	HEC-HMI-C4150-E-R	HEC-HMI-21-ER	HEC-HMI-22-ER	HEC-HMI-41-ER	HEC-HMI-42-ER	HEC-HMI-C2101-E-R	HEC-HMI-C2102-E-R	HEC-HMI-C4101-E-R	HEC-HMI-C4102-E-R	HEC-HMI-C2151-E-R	HEC-HMI-C2152-E-R	HEC-HMI-C4151-E-R	HEC-HMI-C4152-E-R
# of Inputs (8-32VDC Sinking)			6	6	6	6					6	6	6	6	6	6	6	6
# of High Speed Counter Inputs			2	2	2	2					2	2	2	2	2	2	2	2
High Speed Count Type - PNP/NPN			•FS	•FS	•FS	•FS					•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS
High Speed Counter Freq Max. (HZ)			200K	200K	200K	200K					200K	200K	200K	200K	200K	200K	200K	200K
# of Quadrature Counter Inputs							1	1	1	1	1	1	1	1	1	1	1	1
Quadrature Input Freq Max (HZ)							100K	100K	100K	100K	100K	100K	100K	100K	100K	100K	100K	100K
# of Sourcing Outputs (8-32VDC)			4	4	4	4	4	2	4	2	8	6	8	6	8	6	8	6
Outputs selectable as PWM			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Output Current per Output Pair *			4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
Output Current Feedback			•	•	•	•					•	•	•	•	•	•	•	•
# of Relay Outputs 2A, Form C			2	2	2	2					2	2	2	2	2	2	2	2
# of CAN Ports	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Divelbiss OptiCAN / SAE J1939	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
# of Analog Inputs			2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
RS232/RS422/RS485/Modbus Port	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
0-20mADC Analog Inputs			•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS
0-5VDC Analog Inputs			•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS
0-10VDC Analog Inputs							•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS	•FS
# Analog Outputs (12 Bit)								2		2		2		2		2		2
0-20mADC Analog Outputs, 12 bit								•FS		•FS		•FS		•FS		•FS		•FS
0-10VDC Analog Outputs, 12 bit								•FS		•FS		•FS		•FS		•FS		•FS
10 Bit Resolution Analog Inputs			•		•		•	•	•	•	•	•	•	•				
15 Bit Resolution Analog Inputs				•		•									•	•	•	•
# Type K Thermocouple Inputs								2		2		2		2		2		2
2x16 Large Character Display	•		•	•			•	•	•	•	•	•			•	•		
4x20 Standard Character Display		•			•	•							•	•			•	•

* Total Max. Current for Output Pair

HEC HMI PART NUMBERS		
Model #	Model #	Model #
HEC-HMI-2-E-R	HEC-HMI-21-E-R	HEC-HMI-C2151-E-R
HEC-HMI-4-E-R	HEC-HMI-22-E-R	HEC-HMI-C2152-E-R
HEC-HMI-C2100-E-R	HEC-HMI-41-E-R	HEC-HMI-C4101-E-R
HEC-HMI-C2150-E-R	HEC-HMI-42-E-R	HEC-HMI-C4102-E-R
HEC-HMI-C4100-E-R	HEC-HMI-C2101-E-R	HEC-HMI-C4151-E-R
HEC-HMI-C4150-E-R	HEC-HMI-C2102-E-R	HEC-HMI-C4152-E-R

Divelbiss provides Application Notes for controllers.

View Application Notes

I/O & POWER CABLES / KITS PRICING

Model #	Description
HEC-10	"A" Plug Connector kit with keyed connector, wedge lock and crimp pins. HEC Series
HEC-20	"B" Plug Connector kit with keyed connector, wedge lock and crimp pins. HEC Series
HEC-100	"A" Plug Cable Assembly with 6 Ft. Flying Leads HEC Series
HEC-110	"B" Plug Cable Assembly with 6 Ft. Flying Leads HEC Series
HEC-120	"A" Receptacle Cable Assembly with 6 Ft. Flying Leads HEC Series
HEC-130	"B" Receptacle Cable Assembly with 6 Ft. Flying Leads HEC Series
HEC-P10	"A" Plug Connector kit with keyed connector, wedge lock and crimp pins. HEC P-Series
HEC-P20	"B" Plug Connector kit with keyed connector, wedge lock and crimp pins. HEC P-Series
HEC-P30	"C" Plug Connector kit with keyed connector, wedge lock and crimp pins. HEC P-Series
HEC-P40	"D" Plug Connector kit with keyed connector, wedge lock and crimp pins. HEC P-Series
HEC-P100	"A" Plug Cable Assembly with 6 Ft. Flying Leads HEC P-Series
HEC-P110	"B" Plug Cable Assembly with 6 Ft. Flying Leads HEC P-Series
HEC-P120	"C" Plug Cable Assembly with 6 Ft. Flying Leads HEC P-Series
HEC-P130	"D" Plug Cable Assembly with 6 Ft. Flying Leads HEC P-Series
HEC-P-SEAL	HEC-P Series Sealing Pins - 12 Pack. Used with HEC-P10/P20/P30/P40 for unused pins.

PROGRAMMING CABLES PRICING

Model #	Description
HEC-900	In-line Breakout Programming Cable Assembly with Deutsche Interface to PC.
HEC-910	In-line Breakout Programming Cable Assembly with 9 pin D-sub Interface to PC.
HEC-920	Programming Cable with Deutsche to 9 Pin D-sub for PC. Mates with HEC-900.
HEC-P910	For P-Series HEC. In-line Breakout Programming Cable Assembly with 9 pin D-sub Interface to PC.
126-102860	Null Modem Cable. Required to connect HEC-910 and HEC-920 to PC.
138-106865	USB to Serial Port Adapter Cable.

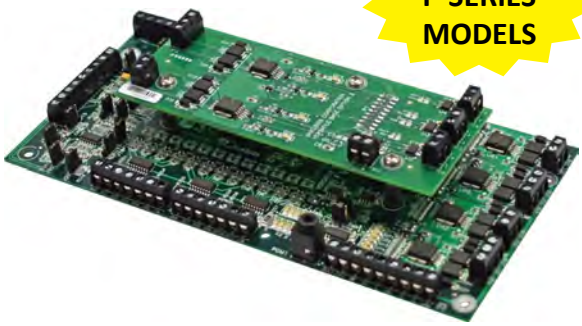
HEC SERIES CABLE COMPATIBILITY CHART

HEC MODELS	CABLES																	
	HEC-10	HEC-20	HEC-100	HEC-110	HEC-900	HEC-910	HEC-920	HEC-P10	HEC-P20	HEC-P30	HEC-P40	HEC-P100	HEC-P110	HEC-P120	HEC-P130	HEC-P910	126-102860	138-106865	SI-PGM
HEC-P5000								•	•	•	•	•	•	•	•	•	•	•	
HEC-P5100								•	•	•	•	•	•	•	•	•	•	•	
HEC-1500-E-R	•	•	•	•	•	•	•										•	•	
HEC-1504-E-R	•	•	•	•	•	•	•										•	•	
HEC-2000-E-R	•	•	•	•	•	•	•										•	•	
HEC-2004-E-R	•	•	•	•	•	•	•										•	•	
HEC-4000-E-R	•	•	•	•	•	•	•										•	•	
HEC-4004-E-R	•	•	•	•	•	•	•										•	•	
HEC-4010-E-R	•	•	•	•	•	•	•										•	•	
HEC-4014-E-R	•	•	•	•	•	•	•										•	•	
HEC-4100-E-R	•	•	•	•	•	•	•										•	•	
HEC-4104-E-R	•	•	•	•	•	•	•										•	•	
HEC-4110-E-R	•	•	•	•	•	•	•										•	•	
HEC-4114-E-R	•	•	•	•	•	•	•										•	•	
HEC-4200-E-R	•	•	•	•	•	•	•										•	•	
HEC-4204-E-R	•	•	•	•	•	•	•										•	•	
HEC-4210-E-R	•	•	•	•	•	•	•										•	•	
HEC-4214-E-R	•	•	•	•	•	•	•										•	•	
HEC-HMI-2x-E-R																		•	•
HEC-HMI-4x-E-R																		•	•
HEC-HMI-C210x-E-R																		•	•
HEC-HMI-C215x-E-R																		•	•
HEC-HMI-C410x-E-R																		•	•
HEC-HMI-C415x-E-R																		•	•

P & M SERIES VERSATILE BASE SERIES CONTROLLERS

P-Series / M-Series

NEW P-SERIES MODELS



The Verstatile Base Series controllers are open-board programmable logic controllers that are designed with many standard or base features that are expandable using field-installable option boards and plug-in expansion boards.

The Versatile Base Series is divided into two familes based on the type of PLC on a Chip on-board. The two types are VB-1xxx which is based on M-Series PLC on a Chip and VB-2xxx which is based on P-Series PLC on a Chip.

The base models includes many of the needed base features: Digital Inputs, Digital Outputs (supports PWM), Analog Inputs, Analog Outputs, Counter Inputs, DC Powered, Communication Ports (Serial, CAN, Ethernet - model dependent) and Keypad and Display ports (model dependent). Removable terminal blocks are standard.

Optional field installable options and expansion boards include addtional I/O, thermocouple inputs, display and keypad assemblies. The Versatile Base Series programs using EZ LADDER Toolkit. Operates from -40˚ to 80˚ C. VBDSP Expanders require additonal panel sealing components.

- ▶ 8-32VDC Power
- ▶ -40°C to +80°C
- ▶ Display Port
- ▶ Counter Inputs
- ▶ 8-32V Sourcing Digital Outputs (PWM)
- ▶ 8-32V Sink / Source Digital Inputs
- ▶ Keypad Port
- ▶ Expandable
- ▶ Real Time Clock
- ▶ EEPROM Memory
- ▶ SD Card Support
- ▶ Indicator LEDs
- ▶ Analog Inputs Field Selectable 0-20mA,0-5VDC or 0-10VDC
- ▶ Analog Output Field Selectable 0-20mA or 0-10VDC

CHART LEGEND

• = Supports Feature
Num = Qty of Feature
FS = Field Selectable

M-SERIES MODELS	# On-board Inputs 8-32VDC	Input Type: K=Sink / S=Source	High Speed Counter Inputs	High Speed Count Type - PNP/NPN	High Speed Counter Freq Max. (KHZ)	# On-Board Outputs - 8-32VDC	Outputs Support PWM	Output Current per Output Point	# Analog Inputs	# of CAN Ports	# RS232 Serial Ports	# RS485 Serial Ports	Ethernet Port	SD Card Socket	Real Time Clock	SAE J1939	NMEA 2000	Divelbiss OptiCAN	Modbus Slave	Modbus Master	Modbus TCP	# Thermocouple Inputs - Type K	VBDSP Display \ Keypad Port	Standard LCD \ Keypad Port	# of Buttons / Keys	LCD Size	Din Rail Mountable
VB-1000	12	FS	2	FS	100	8	•	2A*	7	2	1					•		•	•								
VBEX-4K																						4					
VBEX-4K4DOT						4		2A*														4					
P-SERIES MODELS																											
VB-2000	12	FS	3	FS	100	8	•	2A	7	1	1	1		•		•	•	•	•	•			•				•
VB-2100	12	FS	3	FS	100	8	•	2A	7	1	1	1	•	•	•	•	•	•	•	•	•		•				•
VB-2200	12	FS	3	FS	100	8	•	2A	7	1	1	1	•	•	•	•	•	•	•	•	•			•			•
VB2X-4K																						4					
VB2X-4K4DOT						4	•	2A														4					
VBDSP-01																							•		20	2x16	
VBDSP-02																							•		20	4x20	
VBDSP-03																							•		6	2x16	

* Total Max Current is 4A total per point/pair.

M-SERIES VERSATILE BASE PART NUMBERS

Model #	Description
VB-1000	Verstatile Base Controller with 12 Digital Inputs, 8 Digital Outputs and 7 Analog Inputs. Expandable using VBEX boards. M-Series PLC on a Chip
VBEX-4K	Versatile Base expander with 4 Type K Thernocouple Inputs.
VBEX-4K4DOT	Versatile Base Expander with 4 Type K Thermocouples and 4 Digital Outputs.

P-SERIES VERSATILE BASE PART NUMBERS

Model #	Description
VB-2000	P-Series Verstatile Base Controller with 12 Digital Inputs, 8 Digital Outputs and 7 Analog Inputs, 1 Analog Output and VBDSP Display/Keypad Port. Expandable using VB2X, VBDSP boards.
VB-2100	P-Series Verstatile Base Controller with 12 Digital Inputs, 8 Digital Outputs and 7 Analog Inputs, 1 Analog Output, Ethernet, Real Time Clock and VBDSP Display/Keypad Port. Expandable using VB2X, VBDSP boards.
VB-2200	P-Series Verstatile Base Controller with 12 Digital Inputs, 8 Digital Outputs and 7 Analog Inputs, 1 Analog Output, Ethernet, Real Time Clock and Std Display/Keypad Port. Expandable using VB2X boards.
VB2X-4K	P-Series Versatile Base expander with 4 Type K Thernocouple Inputs.
VB2X-4K4DOT	P-Series Versatile Base Expander with 4 Type K Thermocouples and 4 Digital Outputs.

Additional Part Numbers Next Page

P-SERIES VERSATILE BASE PART NUMBERS - Continued	
Model #	**Description**
VBDSP-01	P-Series Verstatile Base Plug-in Expander with 20 buttons, 2x16 (3/8" Character Height) Backlit LCD Display, Buzzer and 3 Programmable LED Indicators.
VBDSP-02	P-Series Verstatile Base Plug-in Expander with 20 buttons, 4x20 Backlit LCD Display, Buzzer and 3 Programmable LED Indicators
VBDSP-03	P-Series Verstatile Base Plug-in Expander with 6 buttons, 2x16 (3/8" Character Height) Backlit LCD Display, Buzzer and 3 Programmable LED Indicators.

VERSATILE BASE CABLES & ACCESSORIES PART#s	
Model #	**Description**
SI-PGM	Solves-It! Programming Cable, RS232.
138-106865	USB to Serial Port Adapter Cable.

P-SERIES BEAR BONES CONTROLLERS

NEW PRODUCT FAMILY

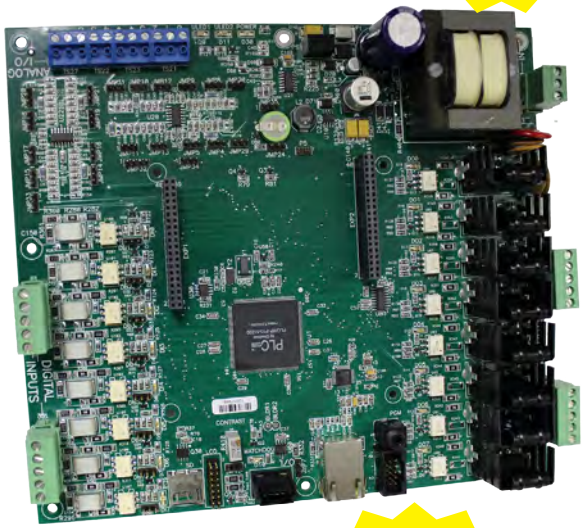
The P-Series Bear Bones controllers are programmable logic controllers that are designed with many standard control features in an open-board format and are expandable with additonal I/O and specialty function options. The P-Series Bear Bones programs using EZ LADDER Toolkit with ladder diagram, function block and structured text via the programming port and an SI-PGM programming cable.

The -P-Series Bear Bones controllers are a mechanical drop-in for the original Bear Bones controllers introduced in the 1980's. Today's P-Series Bear Bones controllers can be installed in any location where an original Bear Bones was installed providing the same number of I/O plus advanced features including:

Analog Inputs, Analog Output, Real Time Clock, Communication Ports (CAN, Ethernet) and Keypad and Display ports. Removable terminal blocks are standard.

The P-Series Bear Bones controllers are available with AC or DC input power and digital I/O.

- ▶ **AC or DC Power and I/O**
- ▶ **Analog Inputs Field Selectable 0-20mA,0-5VDC or 0-10VDC**
- ▶ **Analog Output Field Selectable 0-5VDC or 0-10VDC**
- ▶ **8 Digital Outputs**
- ▶ **8 Digital Inputs**
- ▶ **EEPROM Memory**
- ▶ **Real Time Clock**
- ▶ **SD Card Support**
- ▶ **-40°C to +80°C**
- ▶ **Display Port**
- ▶ **Keypad Port**
- ▶ **Expandable**
- ▶ **Ethernet Port**



Mechanical Drop-in for Bear Bones

CHART LEGEND
• = Supports Feature
Num = Qty of Feature
FS = Field Selectable

	FEATURE																	
	8-32VDC Input Power	# On-board Inputs 8-32VDC	# On-board Outputs 8-32VDC	115 VAC Input Power	# On-board Inputs 115VAC	# On-board Outputs 115VAC	Output Current per Output Point	# Analog Inputs	# Analog Outputs	# of CAN Ports (I/O Port)	Ethernet Port	SD Card Socket	Real Time Clock	SAE J1939 / NMEA 2000	Divelbiss OptiCAN	Modbus TCP	Standard LCD \ Keypad Port	I/O Expansion Port (ICM-IO-Cxx)	Specialty Expansion Port
ICM-BB-P13-30	•	8	8				2A	8*	1*	1	•	•	•	•	•	•	•	•	•
ICM-BB-P13-40				•	8	8	2A	8*	1*	1	•	•	•	•	•	•	•	•	•

*Analog I/O total is 8 (8 Inputs or 7 Inputs and 1 Output)

P-SERIES BEAR BONES CONTROLLER PART NUMBERS	
Model #	**Description**
ICM-BB-P13-30	P-Series Bear Bones Controller with 8-32VDC Input Power and Digital I/O. I/O Expandable using ICM-IO-CXX P-Series I/O Expanders.
ICM-BB-P13-40	P-Series Bear Bones Controller with 115VAC Input Power and Digital I/O. I/O Expandable using ICM-IO-CXX P-Series I/O Expanders.

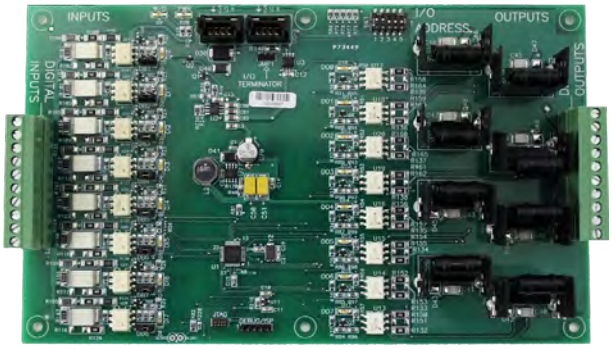
P-SERIES BEAR BONES I/O, CABLES & ACCESSORIES

The P-Series Bear Bones I/O Expanders allow for digital I/O expansion for the P-Series Bear Bones controllers (or any OptiCAN enabled controller).

The P-Series I/O Expander uses the Divelbiss OptiCAN (CAN) bus and allows for additional I/O to be added in groups of 8 inputs and 8 outputs; either AC or DC. Up to 32 I/O Expanders may be connected to a controller.

The I/O expanders connect to the controller and/or I/O expanders using the included communication link cable that provides the data and power for the logic of the I/O expander(s). Expanders are 'daisy-chained' from one to another and to the controller.

In addition to I/O Expanders, additional specialty function expanders are available.



P-SERIES BEAR BONES I/O PART NUMBERS	
Model #	**Description**
ICM-IO-C21	P-Series Bear Bones I/O Expander, 115VAC Digital I/O (8 Inputs and 8 Outputs). Addressible via on-board switches.
ICM-IO-C24	P-Series Bear Bones I/O Expander, 8-32VDC Digital I/O (8 Inputs and 8 Outputs). Addressible via on-board switches.

P-SERIES BEAR BONES SPECIALTY / ACCESSORIES	
Model #	**Description**
ICM-PUI-01	P-Series Bear Bones Specialty Expander. Simulates Bear Bones Timers (ICM-TM-0X) or provides programmble dip switches, LED indicators and potentiometers (uses P-Series Bear Bones Controller Analog Inputs.)
SI-PGM	Solves-It! Programming Cable, RS232.
138-106865	USB to Serial Port Adapter Cable.

PCS CONTROLLERS

PCS Controllers are powerful and easy to use programmable logic controllers. The PCS Series are DIN rail mounted and provide a wide variety of features and options. All PCS models support up to 128 digital inputs and 128 digital outputs from the High Density I/O Series. Enclosed in a plastic box, the PCS maintains a small footprint and can operate on 10VAC or 10-30VDC and programs using Divelbiss EZ LADDER Toolkit.

CHART LEGEND

• = Supports Feature
Num = Qty of Feature

FEATURE	MODELS					
	PCS-100	PCS-101	PCS-102	PCS-200	PCS-201	PCS-202
On-board Inputs						
Maximum # Inputs -HDIO	128	128	128	128	128	128
High Speed Counter Inputs				2	2	2
High Speed Count Type - PNP/NPN				PNP	PNP	PNP
High Speed Counter Freq Max. (HZ)				100K	100K	100K
On-Board Outputs						
Maximum # Outputs - HDIO	128	128	128	128	128	128
# of CAN Ports				2	2	2
SAE J1939				•	•	•
Divelbiss OptiCAN				•	•	•
Modbus Slave*See Note	•	•	•	•	•	•
# of Analog Inputs			6	6	6	6
0-20mADC Analog Inputs			•			•
0-5VDC Analog Inputs		•			•	
# Analog Outputs		2/4	2/4		2/4	2/4
0-20mADC Analog Outputs						
0-5VDC Analog Outputs		•			•	
# PWM Channels - Open Collector		2	2		2	2
Real Time Clock	•	•	•	•	•	•
SSI Port				•	•	•

* Requires optional Serial Port Module be factory installed for functionality. Consult Factory for Model Number and Availability.

PCS CONTROLLER PART NUMBERS		
Model #		**Model #**
PCS-100		PCS-200
PCS-101		PCS-201
PCS-102		PCS-202

Models shown are normally stocked. For additional models and features available, please see:

http://www.divelbiss.com

Compatible Digital I/O and Cables on Page 15

PCS CABLES & ACCESSORIES

PCS PROGRAMMING CABLES PART NUMBERS	
Model #	**Description**
126-102860	Null Modem Cable. Required to connect PCS to PC Serial Port
138-106865	USB to Serial Port Adapter Cable.

PCS POWER & I/O CABLES	
Model #	**Description**
PIMS-CA-6	Input Power Cable Assembly with 6 Ft. Flying Leads.
PCS-CA-PWM	PWM Breakout Cable. Provides connectivity to PWM Channels

ENHANCED BABY BEAR CONTROLLERS

The Enhanced Baby Bear Series (EBB) is a family of open-board programmable logic controllers. This series open-board construction provides powerful features at a lower cost. The Enhanced Baby Bear controllers program using EZ LADDER Toolkit.

Each controller boasts a different set of features and options including expandable I/O (using High Density I/O or EBB I/O) , High Speed Counters, CAN Network Port, Real Time Clock optional 2nd Serial Port.

All models have 10-30 VDC/VAC Inputs and Relay Outputs.

- ▶ 10VAC or 12VDC Power
- ▶ 10-30VAC / 10-30VDC Inputs
- ▶ -40°C to +60°C
- ▶ On-Board I/O

CHART LEGEND • = Supports Feature Num = Qty of Feature	MODELS						
FEATURE	ICM-EBB-100	ICM-EBB-200	ICM-EBB-300	ICM-EBB-400	ICM-EBB-500	ICM-EBB-600	ICM-EBB-700
Flash Memory (bytes)	128K	128K	128K	128K	128K	256K	256K
# On-board Inputs 10-30VDC/VAC	5	5	5	5	5	5	5
Input Expansion - HDIO / EBB				EBB	HDIO	EBB	HDIO
Max # Inputs w/Expansion (Total)	5	5	5	12	125	12	120
High Speed Counter Inputs		1	1	1	1	1	1
High Speed Count Type - PNP/NPN		PNP	PNP	PNP	PNP	PNP	PNP
High Speed Counter Freq Max. (HZ)		100K	100K	100K	100K	100K	100K
# On-Board Outputs - Relay	5	5	5	5	5	5	5
Output Expansion - HDIO / EBB				EBB	HDIO	EBB	HDIO
# of CAN Ports						2	2
SAE J1939						•	•
Divelbiss OptiCAN						•	•
Modbus Slave*						•	•
Real Time Clock			•	•	•	•	•

* With Optionally purchased RS232, RS422 or RS485 Serial Port Module.

EBB CONTROLLER PART NUMBERS		
Model #		Model #
ICM-EBB-100		ICM-EBB-500
ICM-EBB-200		ICM-EBB-600
ICM-EBB-300		ICM-EBB-700
ICM-EBB-400		

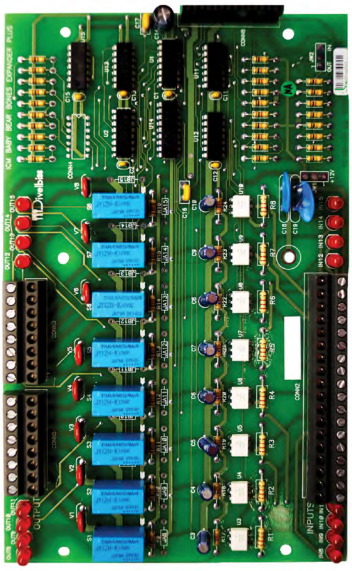
EBB SERIAL PORT MODULES PART NUMBERS	
Model #	Description
ICM-EBB-RS232	RS232 Serial Port Module with Hardware
ICM-EBB-RS422	RS422 Serial Port Module with Hardware
ICM-EBB-RS485	RS485 Serial Port Module with Hardware

Compatible Digital I/O and Cables on Page 15

ENHANCED BABY BEAR I/O, CABLES & ACCESSORIES

EBB I/O PART NUMBERS	
Model #	Description
ICM-EBB-IO-54RE-P	EBB I/O Expansion Board, 8 Inputs 10-30VDC, 8 Relay Outputs, Stack mounts vertically to Enhanced Baby Bear Controller

EBB CABLES & ACCESSORIES PART NUMBERS	
Model #	Description
126-102860	Null Modem Cable. Required to connect EBB Controller to PC Serial Port.
138-106865	USB to Serial Port Adapter Cable.
PIMS-CA-6	Input Power Cable Assembly with 6 Ft. Flying Leads.
ICM-HP-01	Enhanced Baby Bear Mounting Kit. Mounts EBB to Sub-plate with spacers and screws.
ICM-HP-08	EBB I/O Mounting Kit. Mounts ICM-EBB-IO-54RE-P to Enhanced Baby Bear (Stacking Configuration).



MICRO BEAR CONTROLLERS

- ▶ 9-32VDC Input Power
- ▶ 9-32VDC Digital Inputs
- ▶ Two DPDT Relay Outputs
- ▶ Two Form C Relay Outputs
- ▶ 0°C to +60°C
- ▶ High Speed Counter Inputs
- ▶ Analog Inputs
- ▶ Sinking or Sourcing Inputs

The Micro Bear is a mini programmable logic controller with in an open-board design. Programmed using EZ LADDER Toolkit, the Micro Bear is rich in features and it's small form factor make it ideal for many control situations. In addition to it's base features, it can optionally be ordered with programmable push buttons and display.

CHART LEGEND • = Supports Feature Num = Qty of Feature • FS = Field Selectable Feature	MODELS	
FEATURE	ICM-MB-100	ICM-MB-110
# of Digital Inputs	6	6
Sinking Inputs	•FS	•FS
Sourcing Inputs	•FS	•FS
# High Speed Counter Inputs	2	2
High Speed Count Type - PNP/NPN	PNP	PNP
High Speed Counter Freq Max. (HZ)	25K	25K
# On-Board Outputs	4	4
DPDT Relays , 2 Amp	2	2
Form C Relays, 5 Amp	2	2
Programmable Push Buttons		3
4-digit Programmable LED Display		•
# Analog Inputs, 0-5VDC, 10 Bit	1	2

MICRO BEAR CONTROLLERS PART NUMBERS	
Model #	Description
ICM-MB-100	Standard Micro Bear with Digital I/O and One Analog Input Channel
ICM-MB-110	Standard Micro Bear with Expansion Display Board, Push Buttons and additional Analog Input Channel (2 Total).

MICRO BEAR PROGRAMMING CABLES PART NUMBERS	
Model #	Description
SI-PGM	Programming Cable for Micro Bear & Solves-It!
138-106865	USB to Serial Port Adapter Cable.

MICRO BEAR HARDWARE MOUNTING KITS PART NUMBERS	
Model #	Description
MB-HP-01	Micro Bear DIN Rail Mount Kit.
MB-HP-02	Micro Bear Screw Tab Mount Kit.
MB-HP-03	Micro Bear Hardware Mount Pack, 1/2" Standoffs

SOLVES-IT! PLUG-IN PLCs

The Solves-It! series of plug-in PLCs provide a new solution where a small, yet versatile logic controller is required. Based on patented PLC on a Chip™ technology, the Solves-It! is easy to apply and program using the included PC based EZ LADDER Toolkit.

The Solves-It! controllers are ideal for small system control and monitor applications, particularly in instances where panel space is limited. Solves-It! mounts in any standard 11-pin octal base and requires only 1.75" of DIN rail space in the panel.

Standard models include digital and/or analog I/O and programmable LED indicators. Enhanced models also include programmable push-buttons and programmable LED display.

- ▶ Digital I/O
- ▶ Analog Inputs
- ▶ Programmable LEDs
- ▶ Small Form Factor
- ▶ Fits Standard 11-pin Octal Socket
- ▶ Programmable Push Buttons
- ▶ Programmable Display
- ▶ DC Powered & I/O

CHART LEGEND • = Supports Feature Num = Qty of Feature FEATURE	SOLVES-IT! PLUG-IN PLC MODELS SI-100	SI-101**	SI-110	SI-200	SI-201	SI-210**
# Dedicated Digital Inputs	4	4	---	4	4	---
Inputs: K=Sink, S-Source	S	K	K	S	K	K
# Dedicated Outputs	4	4	2	4	4	2
Outputs: K=Sink, S=Source	S	K	S	K	4	S
Output Current per PT (mA)	300	500	300	300	300	500
# High Speed Counters	1	1	1	1	1	1
High Speed Counter Freq Max.	25KHZ	25KHZ	25KHZ	25KHZ	25KHZ	25KHZ
# Multi-purpose I/O*	---	---	4	---	---	4
Input Power Voltage (DC)	10 - 24.5VDC	8 - 32VDC	10 - 32VDC	10 - 24.5VDC	10 - 24VDC	8 - 32VDC
4-digit 7-Segment Display	---	---	---	•	•	•
# Programmable LEDs	4	4	1	4	4	1
# Programmable Push Buttons	---	---	---	2	2	2
# Analog Inputs - Total	---	---	3	---	---	3
Analog In External / Internal	---	---	1 / 2	---	---	1 / 2
Real Time Clock	---	---	---	•	•	•
Operating Temperature	0 to 60˚C	-40 to 65˚C	0 to 60˚C	0 to 60˚C	0 to 60˚C	-40 to 65˚C

* Multipurpose I/O can be used as Digital Input or Digital Output (not simultaneously). Inputs are Sinking, Outputs are Sourcing, 300mADC maximum each output.

** Features are for Rev 2.0 Hardware.

SOLVES-IT PLC MODELS		
Model #		Model #
SI-100		SI-200
SI-101		SI-201
SI-110		SI-210

Each Solves-It! Plug-in PLC is available as a starter kit that includes everything needed to get started including the programming cable and EZ LADDER Toolkit Software.

SOLVES-IT! STARTER KITS

All Solves-It! Plug-in PLC models may be ordered in a starter kit. This kit is perfect for first time users as it provides everything needed to start using the Solves-It!.

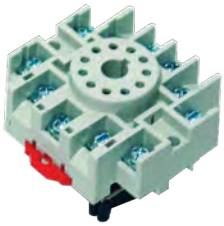
Included is the Solves-It! Plug-in PLC, SI-PGM programming cable, 11-pin Octal Socket for mounting and wiring the Solves-It! and the EZLDCD-01 (EZ LADDER Toolkit on CD).

SOLVES-IT! STARTER KIT MODELS		
Model #		Model #
SK-100		SK-200
SK-101		SK-201
SK-110		SK-210

SOLVES-IT! PROGRAMMING CABLES & ACCESSORIES

SOLVES-IT! PROGRAMMING CABLES PART NUMBERS	
Model #	Description
SI-PGM	Solves-It! Programming Cable, RS232.
138-106865	USB to Serial Port Adapter Cable.

SOLVES-IT! ACCESSORIES PART NUMBERS	
Model #	Description
SI-DEMO-01	Simulator/Demo Board for SI-100, SI-200. Provides connections, switches and indicators for I/O. Ideal for debugging ladder diagram projects.
SI-DEMO-02	Simulator/Demo Board for SI-110, SI-210. Provides connections, switches and indicators for I/O and Analog. Ideal for debugging ladder diagram projects.
115-105328	11-Pin Octal Socket for Solves-It!. Sub plate or DIN rail mount.
130-105868	Auxiliary Power Supply, 100-240VAC Input, 24VDC Output, 1.5ADC Maximum. DIN rail mount.



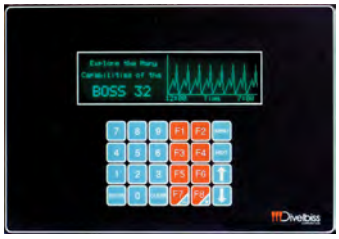
SOLVES-IT! APPLICATION MODULES

Based on the Solves-It! Plug-in PLC, Application Modules are pre-programmed to function as commonly needed applications for pump alternation, hour meters, tachometers and more. The application module ships with the software pre-loaded and includes the user's manual. The application module ladder diagram application software is available for download from http://www.divelbiss.com. The software allows for software modification to your exact needs. The SI-APPMOD-PGMKIT is required for customizing the application software.

APPLICATION MODULES & ACCESSORIES	
Model #	**Description**
SI-APPMOD-2PUMPALTERNATE	Controls and Alternates 2 Pumps as Master / Slave based on requirements.
SI-APPMOD-3PUMPALTERNATE	Controls and Alternates 3 Pumps as Master / Slave based on requirements.
SI-APPMOD-DEADBAND	Compares analog input signal to a +/- tolerance of the set point. Outputs: Above Dead band, Below Dead band, In Dead band
SI-APPMOD-TACHOMETER	Input pulses are read and RPM is calculated and displayed. Based on a 60 Tooth Gear (can be changed). 4 Programmable RPM set points to control 4 individual alarm outputs.
SI-APPMOD-HOURMETER	On power timer increments hour meter in 1 second increments. Two alarm set point outputs.
SI-APPMOD-RANGECOMPARE	Analog input is compared to two set points to determine if between them (in range). Outputs: Above Range, Below Range, In Range.
SI-APPMOD-MULTICOUNT	Three counter channels from a single input source. Each channel has individual set point, output and reset.
SI-APPMOD-TIMES4	4 Channel Independent Timer Module, Configures as on-delay or off-delay.
SI-APPMOD-PGMKIT	Solves-It! Application Module Programming Kit with EZ LADDER Tookit and Programming Cable

MULTI-FUNCTION BASIC CONTROLLERS

Compatible Digital I/O and Cables on Page 15



BOSS 32

The Boss 32 family controllers are fully integrated, 32-bit HMI and multi-functional, multi-tasking microcomputers. Powerful and versatile, Boss 32 controllers provide solutions for multiple control requirements such as temperature, pressure, speed, position, counting and communications. The Boss 32 family programs using an on-board multi-tasking BASIC compiler. Only a terminal program and optional text editor are needed. Transformer Included.

BOSS BEAR

The Boss Bear is an 8 Bit multi-functional industrial controller with an integrated operator interface (HMI). The highly versatile Boss Bear provides control solutions for temperature, speed, counting, communications, monitoring and pressure. Panel mounted, the Boss Bear supports a 2 x 40 LCD, 2 x 40 LCD with Backlight or a 2x40 Vacuum Fluorescent Display. Blind, sub-plate mounted units are available upon request. Transformer included.

UNIVERSAL CONTROL PANELS

The Universal Control Panel is an 8 Bit multi-functional industrial controller with an integrated operator interface (HMI). Versatile, the Universal Control Panel (UCP) provides control solutions for temperature, speed, counting, communications, monitoring and pressure.

Panel mounted, the UCP supports a 2 x 20 LCD with Backlight or a 2x20 Vacuum Fluorescent Display. Blind, sub-plate mounted units are available upon request. Transformer included. In addition to normally stocked models, the UCP may be ordered with additional internal options including analog inputs, analog outputs, digital inputs, digital outputs and thermocouple inputs.

PRODUCT DETAILS FOR ALL MULTI-FUNCTION CONTROLLERS IS AVAILABLE ON OUR WEB SITE. PLEASE CONSULT FACTORY FOR ADDITIONAL PRICING, MODELS & AVAILABILITY.

HIGH DENSITY INPUT/OUTPUT

The High Density I/O Series of I/O Expansion cards provide digital I/O for Divelbiss PLCs and Controllers with a variety of input and output voltages and configurations.

Each card is designed to function with the Divelbiss HDIO bus system and are DIN rail mounted. Connections are made to High Density I/O (HDIO) cards from controllers using a power and data cable series (HDCA).

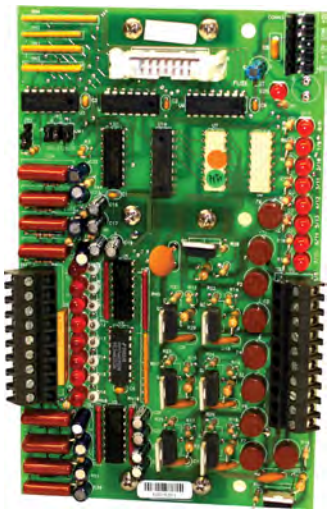


CHART LEGEND • = Supports Feature Num = Qty of Feature	MODELS													
FEATURE	ICM-HDIO-01P	ICM-HDIO-03P	ICM-HDIO-06P	ICM-HDIO-11P	ICM-HDIO-12P	ICM-HDIO-13P	ICM-HDIO-17P	ICM-HDIO-19P	ICM-HDIO-20P	ICM-HDIO-22P	ICM-HDIO-23P	ICM-HDIO-24P	ICM-HDIO-25P	ICM-HDLEAK-01
# of Inputs	16	8	16	8	8		8		Up to 8*	8		8	8	4
Inputs: 10-32 VDC	•	•	•				•						•	
Inputs: 24 VAC												•		
Inputs: 115 VAC				•	•					•				
Inputs: Common Returns			•	•	•		•			•		•	•	
Inputs: Isolated Returns	•	•												
Conductivity Detection Inputs														•
# of Outputs (1 Amp per point **)	16	8	16	8		8	8	8	Up to 8*	8	8	8	8	
Outputs: 10-32 VDC	•	•	•											
Outputs: 24-115 VAC				•		•								
Outputs: Relay (5 Amp) 1 Form A							•	•						
Outputs: Relay (10 Amp) 1 Form C										•	•	•	•	
Outputs: Opto 22 Solid-state I/O*									•					
Outputs: Common Returns			•	•		•								
Outputs: Isolated Returns	•	•					•	•	•	•	•	•	•	
Fused Outputs			•	•		•			•					

* 8 total I/O Module Slots per card. I/O Modules available as single point input or output. Uses Solid-State Opto-22 I/O Plug-in Modules.

** 1 Amp Outputs standard on all models except relay output and Opto-22 types.

HIGH DENSITY I/O PART NUMBERS

Model #
ICM-HDIO-01P
ICM-HDIO-03P
ICM-HDIO-06P
ICM-HDIO-11P
ICM-HDIO-12P
ICM-HDIO-13P
ICM-HDIO-17P
ICM-HDIO-19P
ICM-HDIO-20P
ICM-HDIO-22P
ICM-HDIO-23P
ICM-HDIO-24P
ICM-HDIO-25P
ICM-HDLEAK-01

Models shown are normally stocked. For additional models and features available, please see

View All Models

HIGH DENSITY I/O AND CABLING COMPATIBILITY MATRIX

	CONTROLLER FAMILY / SERIES									
I/O SERIES	Harsh Environment Controllers	PLC on a Chip™ IC & Modules	PCS Controllers	Enhanced Baby Bear Controllers	Solves-it! Plug-in PLCs	Micro Bear Controllers	Boss Bear Controllers	Boss 32 Controllers	Universal Control Panels	Application Modules
High Density I/O Compatibility		•	•	•			•	•	•	
HDCA-0X Compatibility		•	•	•				•	•	
HDCA-1X Compatibility							•			

HIGH DENSITY I/O CABLES PART NUMBERS

Model #	Description	Model #	Description
ICM-HDCA-01	Power & Data Cable Set. PLC to 1 HDIO.	ICM-HDCA-11	Power & Data Cable Set. PLC to 1 HDIO.
ICM-HDCA-02	Power & Data Cable Set. PLC to 2 HDIO.	ICM-HDCA-12	Power & Data Cable Set. PLC to 2 HDIO.
ICM-HDCA-03	Power & Data Cable Set. PLC to 3 HDIO.	ICM-HDCA-13	Power & Data Cable Set. PLC to 3 HDIO.
ICM-HDCA-04	Power & Data Cable Set. PLC to 4 HDIO.	ICM-HDCA-14	Power & Data Cable Set. PLC to 4 HDIO.
ICM-HDCA-05	Power & Data Cable Set. PLC to 5 HDIO.	ICM-HDCA-15	Power & Data Cable Set. PLC to 5 HDIO.
ICM-HDCA-06	Power & Data Cable Set. PLC to 6 HDIO.	ICM-HDCA-16	Power & Data Cable Set. PLC to 6 HDIO.

P-SERIES PLC ON A CHIP™ INTEGRATED CIRCUITS & MODULES

- ▶ Ethernet, SD Card & other new Features
- ▶ Powerful Networking & Communications
- ▶ No Low Level Programming Required
- ▶ Programs Using EZ LADDER Toolkit Software
- ▶ Fully Integrated IC or Module Construction
- ▶ Integrated Circuit is RoHS Compliant
- ▶ I/O, PWM and PID Functionality
- ▶ Modbus Master,Slave & Modbus TCP
- ▶ Quick to Market Solutions
- ▶ Full Featured Industrial PLC

The next generation of PLC on a Chip™, the P-Series builds on the features of the original PLC on a Chip™ by adding new powerful features. Designed to provide embedded intelligence in OEM products, the Patented P-Series PLC on a Chip™ is a cost-effective programmable logic controller packaged in a single integrated circuit or as a module.

All I/O and integrated functions are pre-assigned for use within the Divelbiss EZ LADDER Toolkit software and with Structured Text; it has never been easier to interface to other equipement by writing custom serial drivers. The full featured PLC on a Chip controller and EZ Ladder combination provides for solutions that are powerful, versatile and easy to implement.

P-SERIES PLC ON A CHIP™ PART NUMBERS	
Model #	**Type**
PLCHIP-P13-51220	Integrated Circuit
PLCMOD-P13-512210	Module

PLC on a Chip Technology is easy to integrate. Just add the required conditioning circuits for I/O, communications and analog or adapt our pre-designed interface circuits that are provided as part of our Development Kits. Either way, you will be quickly past the hardware stage and with no low-level software to write; you will be writing your ladder diagram immediately.

MODELS	FEATURES																		
	256K User Flash Memory	Program Port (TTL)	# Serial Ports	# of Digital I/O (Total)*	# CAN Ports*	# SPI Interface Ports*	# PWM Outputs*	# Counter Inputs*	# Quadrature Inputs	# 12-bit Analog Inputs*	# Analog Outputs*	Real Time Clock	Ethernet Support	SAE J1939 Support	NMEA 2000 Support	OptiCAN Support	SD Flash Card Support	I²C Support	Keypad / LCD Support	Modbus Master / Slave
PLCHIP-P13-51220	•	•	4	164	2	2	12	3	1	8	1	•	•	•	•	•	•	•	•	•
PLCMOD-P13-512210	•	•	4	164	2	2	12	3	1	8	1	•	•	•	•	•	•	•	•	•

* Up to # Shown (Maximum). I/O and Features share multiple pins.

P-SERIES PLC ON A CHIP™ DEVELOPMENT KIT

The P-Series PLC on a Chip™ Devkit is a design aid tool for hadware targets. Each Devkit provides all the required items to begin development of a P-Series PLC on a Chip™ based product.

Compatible Serial Port Modules on Page 18

Each kit provides a copy of EZ LADDER Toolkit (EZLDCD-01), a P-Series Module (PLCHIP-P13-512210), development board, Power Supply, Null Modem cable, USB to RS232 converter and documentation CD.

The development board provides basic connections for serial port, USB and power. Additional connections are provided for plug-in serial port modules. The PLC on a Chip™ Module provides an Ethernet port.

A solder 'perf-board' section allows for creation of circuitry for development and testing purposes.

P-SERIES DEVKIT PART NUMBERS	
Model #	**Description**
PLCDK-P13-01	P-Series PLC on a Chip™ Devkit with EZ LADDER Toolkit, PLC on a Chip™ Module, Dev. Board, Powersupply & Cables

M-SERIES PLC ON A CHIP™ INTEGRATED CIRCUITS & MODULES

Designed to provide embedded intelligence in OEM products, the Patented M-Series PLC on a Chip™ is a cost-effective programmable logic controller packaged in a single integrated circuit or as a module. All I/O and integrated functions are pre-assigned for use within the Divelbiss EZ LADDER Toolkit software - a PC based industrial ladder diagram software. The full featured PLC on a Chip controller and EZ Ladder combination provides for solutions that are both versatile and easy to implement.

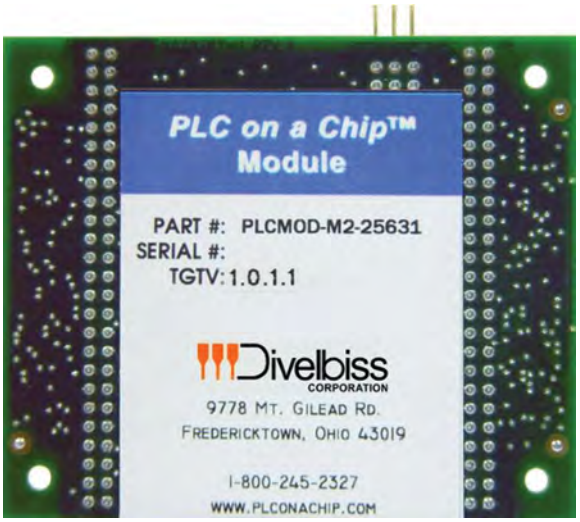
PLC on a Chip Technology is easy to integrate. Just add the required conditioning circuits for I/O, communications and analog or adapt our pre-designed interface circuits that are provided as part of our Development Kits. Either way, you will be quickly past the hardware stage and with no low-level software to write; you will be writing your ladder diagram immediately.

- ▶ **Quick to Market Solutions**
- ▶ **Full Featured Industrial PLC**
- ▶ **I/O, PWM and PID Functionality**
- ▶ **Integrated Circuit is RoHS Compliant**
- ▶ **Powerful Networking & Communications**
- ▶ **No Low Level Programming Required**
- ▶ **Programs Using EZ LADDER Toolkit Software**
- ▶ **Fully Integrated IC or Module Construction**

CHART LEGEND • = Supports Feature Num = Qty of Feature	MODELS								
	Integrated Circuits			Modules					
FEATURE	PLCHIP-M2-12800	PLCHIP-M2-25600	PLCHIP-M2-25620	PLCMOD-M2-128000	PLCMOD-M2-128010	PLCMOD-M2-256000	PLCMOD-M2-256010	PLCMOD-M2-256200	PLCMOD-M2-256210
128K Flash	•			•	•				
256K Flash		•	•			•	•	•	•
512K Flash									
Program Port (TTL)	•	•	•	•	•	•	•	•	•
Multipurpose Serial Port (TTL)		1	1			1	1	1	1
# of Inputs (Total)*	33	33	33	33	33	33	33	33	33
# of Outputs (Total)*	33	33	33	33	33	33	33	33	33
# CAN Ports*			2					2	2
# SPI Interface Ports*		2	2			2	2	2	2
PWM Outputs*	•	•	•	•	•	•	•	•	•
# Counter Inputs*	2	2	2	2	2	2	2	2	2
# Analog Inputs*	8	8	8	8	8	8	8	8	8
# Analog Outputs*									
High Density I/O Support	•	•	•	•	•	•	•	•	•
Real Time Clock Support	•	•	•		•		•		•
Ethernet Support									
SAE J1939 Support			•			•	•	•	•
OptiCAN Support			•			•	•	•	•
SD Flash Card Support									
USB Support									
I²C Support									
Keypad / LCD Support	•	•	•	•	•	•	•	•	•
Modbus Slave		•	•			•	•	•	•

* Up to # Shown (Maximum). I/O and Features share multiple pins.

M-SERIES PLC ON A CHIP™ PART NUMBERS	
Model #	**Type**
PLCHIP-M2-12800	Integrated Circuit
PLCHIP-M2-25600	Integrated Circuit
PLCHIP-M2-25620	Integrated Circuit
PLCMOD-M2-128000	Module
PLCMOD-M2-128010	Module
PLCMOD-M2-256000	Module
PLCMOD-M2-256010	Module
PLCMOD-M2-256200	Module
PLCMOD-M2-256210	Module



M-SERIES PLC ON A CHIP™ DEVELOPMENT KITS

The M-Series PLC on a Chip™ Development Kits provide the complete library of documentation required to apply PLC on Chip at the module and integrated circuit level as well as a development board, I/O modules, and the EZ Ladder Tool Kit software. The development kit may be ordered with options including display and keypad, serial ports and additional I/O modules.

The library provides information required to implement PLC on a Chip and the peripheral circuitry, including PCB layout requirements, standard part numbers, and more.

Advantages of a PLC on a Chip™ Solution

- **Low Integration Cost**
- **Quick to Market Solutions**
- **Full Factory Support**
- **Pre-designed Circuits Library**
- **No Low Level Programming**
- **RAPID Design Program Available**
- **Protects Intellectual Property**
- **Increased Product Value**
- **Increased Replacement Parts Sales**

Compatible Digital I/O and Cables on Page 15

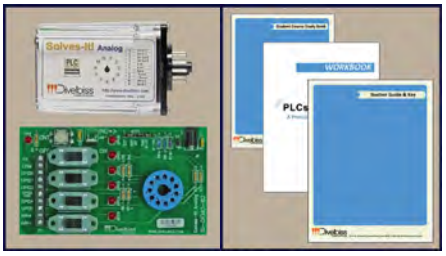
Included in Base Development Kit		
Qty	**Part Number**	**Description**
1	PLCMOD-M2-256210	M-Series PLC on a Chip™ Module with Real Time Clock and 2 CAN Ports
1	PLCDKMB(U)	M-Series PLC on a Chip™ Development Kit Main Board with HMI support.
4	BM-0470048-2AC	110 VAC Input Module, Optically Isolated with Status LED Indicator. Plugs into main board.
4	BM-0470048-2DC	12-24 VDC Input Module, Optically Isolated with Status LED Indicator. Plugs into main board.
4	BM-0470048-4	110 VAC Output Module, Optically Isolated with Status LED Indicator. Plugs into main board.
4	BM-0470048-3	12-24 VDC Output Module, Optically Isolated with Status LED Indicator. Plugs into main board.
2	BM-0470048-5	Relay Output Module, 110VAC @ 2A with Status LED Indicator. Plugs into main board.
1	PLCDKCD-01	Development Library CD with Design Documentation and Circuit Guidelines
1	EZLDCD-01	EZ LADDER Toolkit Standard Edition on CD.
1	PLCDKPS	Power Supply for PLCDKMB(U) Main Board.

M-SERIES PLC ON A CHIP™ DEVELOPMENT KIT AND OPTIONS PART NUMBERS	
Option	**Description**
PLCDK-01	M-Series PLC on a Chip™ Development Base Kit - Does not support HMI Options or PWM to Analog Out.
PLCDK-03	M-Series PLC on a Chip™ Development Base Kit with HMI Support
BM-0470048-2AC	110 VAC Input Module, Optically Isolated with Status LED Indicator. Plugs into main board.
BM-0470048-2DC	12-24 VDC Input Module, Optically Isolated with Status LED Indicator. Plugs into main board.
BM-0470048-4	110 VAC Output Module, Optically Isolated with Status LED Indicator. Plugs into main board.
BM-0470048-3	12-24 VDC Output Module, Optically Isolated with Status LED Indicator. Plugs into main board.
BM-0470048-5	Relay Output Module, 110VAC @ 2A with Status LED Indicator. Plugs into main board.
PLCDK-IO-2x20	Operator Interface Option, 2x20 LCD Display with 20 Button Keypad and connection cabling.
PLCDK-IO-2x40	Operator Interface Option, 2x40 LCD Display with 20 Button Keypad and connection cabling.
PLCDK-IO-4x20	Operator Interface Option, 4x20 LCD Display with 20 Button Keypad and connection cabling.
BM-0770564-12	Digital to Analog Converter Module (PWM to Analog Output). Plugs into main board.
PLCDK-RS232	Plug-in RS232 Serial Port Module for the main board. Provides RS232 Serial Port.
PLCDK-RS422	Plug-in RS422 Serial Port Module for the main board. Provides R422 Serial Port.
PLCDC-RS485	Plug-in RS485 Serial Port Module for the main board. Provides RS485 Serial Port.

PLCs: A PRACTICAL APPROACH EDUCATOR EDITION

In an effort to make learning PLC application and programming more affordable, the Divelbiss Technical Services Group developed this training course for use by educators. The basic outline closely mirrors the material presented when providing training for our industrial customers. The hardware items are the same products being used worldwide in commercial and industrial control applications.

The study outline is comprised of 16 blocks which, taken in order, build on one another to teach the basics of PLCs in addition to programming a controller using ladder logic with function block. The course is designed for hands-on study using standard hardware manufactured by Divelbiss.



The idea is each student receives their own kit which includes all the PLC and trainer hardware and EZ LADDER Toolkit software for the education process. Additionally, text and workbooks are included in portable document format (.pdf).

The teacher's kit includes all the same hardware, software and standard documentation, but also includes the Teacher's Guide.

Course Outline - Chapter Titles

I. PLC & Control - An Overview
II. PLC/Control Digital I/O Circuits
III. PLC/Control Wiring Practices
IV. PLC Programming Basics
V. Basic Circuits
VI. Timer Circuits
VII. Counter Circuits
VIII. Analog Circuits with Math
IX. Comparison Circuits
X. Bit Manipulation Circuits
XI. Trigger & Latching Circuits
XII. Memory Types & Circuits
XIII. Drum Sequencer Circuits
XIV. Displaying Control Values
XV. Variable Conversion Circuits
XVI. Putting it all Together

EDUCATOR PLC TRAINING PRODUCTS PART NUMBERS	
Model #	**Description**
ETS-KIT-TEACH-001	Teacher Edition Training Kit. Includes SI-210, SI-DEMO-02, SI-PGM and Teacher Edition CD with EZ LADDER Toolkit Standard, Teacher Versions of Workbook, Textbook and Manuals.
ETS-KIT-STDNT-001	Student Edition Training Kit. Includes SI-210, SI-DEMO-02, SI-PGM and Student Edition CD with EZ LADDER Toolkit Standard, Student Versions of Workbook, Textbook and Manuals.

PLCs: A PRACTICAL APPROACH PERSONAL STUDY EDITION

The basic course of instruction of PLCs, A Practical Approach (Educator Edition) has been modified for use by companies in upgrading employee skill levels. The course is structured so it can be used for individual and/or home study as well as corporate level training.

- **Hands-on Training**
- **Illustrated Textbook**
- **Step by Step Instruction**
- **Real World Exercises**

The course material begins with an introduction to electrical control circuits and is fully illustrated to aid understanding of each topic presented. As the course progresses, I/O types and their usage is explained along with good wiring practices and networking. The balance of the material presented deals with the actual programming and covers each segment in detail. Exercises for each chapter make use of the Solves-It! PLC and development board to provide hands-on example of theory.

The Personal Study Kit includes the hardware, software and documentation required to learn PLC hardware and programming basics.

EDUCATOR PLC TRAINING PRODUCTS PART NUMBERS	
Model #	**Description**
EHSTDY-KIT-001	Personal PLC Training Kit. Includes SI-210, SI-DEMO-02, SI-PGM and Personal Study Edition CD with EZ LADDER Toolkit Standard, Workbook, Textbook and Manuals.

PRICE LIST

Model	Price ($)	Stock	Tier
105-100754	27.00	✓	1
105-100755	26.00	✓	1
109-100851	40.00	✓	1
109-100924	44.00	✓	1
109-101153	39.00	✓	1
109-101154	53.00	✓	1
111-101012	2.00	✓	1
115-105328	5.00	✓	2
119-101313	7.00	✓	1
119-102292	7.00	✓	1
124-101733	9.00	✓	1
124-101782	8.00	✓	1
125-100974	10.00	✓	1
125-101183	4.00	✓	1
126-102860	14.00	✓	1
130-105868	53.00	✓	2
136-102032	23.00	✓	1
138-106865	49.00	✓	2
146-102042	CONSULT	✓	1
146-102043	CONSULT	✓	1
146-102044	CONSULT	✓	1
146-102045	CONSULT	✓	1
146-102046	CONSULT	✓	1
146-102047	CONSULT	✓	1
146-102048	CONSULT	✓	1
146-102049	CONSULT	✓	1
146-102050	CONSULT	✓	1
146-102051	CONSULT	✓	1
146-102052	CONSULT	✓	1
146-102053	CONSULT	✓	1
BM-0470048-2AC	15.00	✓	N/A
BM-0470048-2DC	15.00	✓	N/A
BM-0470048-3	15.00	✓	N/A
BM-0470048-4	15.00	✓	N/A
BM-0470048-5	15.00	✓	N/A
BM-0770564-12	52.00	✓	N/A
BOSS32B-BP-G	906.00		1
BOSS32B-BP-H	1036.00		1
BOSS32B-BP-I	1217.00		1
BOSS32B-BP-J	954.00		1
BOSS32B-BP-K	1088.00		1
BOSS32B-BP-L	1268.00		1
BOSS32B-BP-M	1231.00		1
BOSS32B-BP-N	1098.00		1
BOSS32B-BP-O	1131.00		1

Model	Price ($)	Stock	Tier
BOSS32B-BP-P	1281.00		1
BOSS32B-GS-G	1784.00		1
BOSS32B-GS-H	1914.00		1
BOSS32B-GS-I	2095.00		1
BOSS32B-GS-J	1832.00		1
BOSS32B-GS-K	1966.00		1
BOSS32B-GS-L	2146.00	✓	1
BOSS32B-GS-M	2109.00		1
BOSS32B-GS-N	1976.00		1
BOSS32B-GS-O	2009.00		1
BOSS32B-GS-P	2159.00	✓	1
BOSS32B-VS-G	1474.00		1
BOSS32B-VS-H	1604.00		1
BOSS32B-VS-I	1785.00		1
BOSS32B-VS-J	1522.00		1
BOSS32B-VS-K	1656.00		1
BOSS32B-VS-L	1836.00	✓	1
BOSS32B-VS-M	1799.00		1
BOSS32B-VS-N	1666.00		1
BOSS32B-VS-O	1699.00		1
BOSS32B-VS-P	1849.00	✓	1
CIDII-AD12-C	425.00		1
CIDII-BOSS32B-BP-L	1365.00		1
CIDII-BOSS32B-BP-P	1370.00		1
CIDII-BOSS32B-VS-L	2100.00		1
CIDII-BOSS32B-VS-P	2105.00		1
CIDII-DA10-04	448.00		1
CIDII-HDIO01P	376.00		1
CIDII-HDIO03P	272.00		1
CIDII-MAGPICKUP	165.00		1
CIDII-PS24	206.00		1
CIDII-TM-02	392.00		1
CIDII-UMCB-100	590.00		1
CIDII-UMCB-101	622.00		1
CIDII-UMCB-102	633.00		1
CIDII-UMCB-103	628.00		1
CIDII-UMCB-110	710.00		1
CIDII-UMCB-111	742.00		1
CIDII-UMCB-112	753.00		1
CIDII-UMCB-113	748.00		1
EHSTDY-KIT-001	299.00	✓	N/A
EX-BBB-BPS-A	569.00		1
EX-BBB-BPS-B	694.00		1
EX-BBB-BPS-C	778.00		1
EX-BBB-BPS-D	640.00		1

Model	Price ($)	Stock	Tier
EX-BBB-BPS-E	740.00		1
EX-BBB-BPS-F	899.00		1
EX-BBB-LCS-A	907.00		1
EX-BBB-LCS-B	1032.00		1
EX-BBB-LCS-C	1116.00		1
EX-BBB-LCS-D	978.00		1
EX-BBB-LCS-E	1078.00		1
EX-BBB-LCS-F	1237.00	✓	1
EX-BBB-LDS-A	870.00		1
EX-BBB-LDS-B	995.00		1
EX-BBB-LDS-C	1079.00		1
EX-BBB-LDS-D	941.00		1
EX-BBB-LDS-E	1041.00		1
EX-BBB-LDS-F	1200.00	✓	1
EX-BBB-VFS-A	1260.00		1
EX-BBB-VFS-B	1385.00		1
EX-BBB-VFS-C	1469.00		1
EX-BBB-VFS-D	1331.00		1
EX-BBB-VFS-E	1431.00		1
EX-BBB-VFS-F	1590.00	✓	1
EX-MOD-AD12-C	408.00	✓	1
EX-MOD-AD12-D	411.00		1
EX-MOD-AD12-S	474.00	✓	1
EX-MOD-CTR24-01	268.00	✓	1
EX-MOD-CTR24-02	357.00	✓	1
EX-MOD-CTR24-04	527.00	✓	1
EX-MOD-DA10-02	336.00	✓	1
EX-MOD-DA10-04	431.00	✓	1
EZLDCD-01	0.00	✓	N/A
EZLD-LDR-01	0.00	✓	N/A
EZLDSTCD-01	25.00	✓	N/A
HEC-10	25.00	✓	0
HEC-100	47.00	✓	0
HEC-110	45.00	✓	0
HEC-120	49.00	✓	0
HEC-130	49.00	✓	0
HEC-1100	270.00	✓	0
HEC-1500-E-R	310.00	✓	0
HEC-1504-E-R	357.00	✓	0
HEC-20	34.00	✓	0
HEC-2000-E-R	277.00	✓	0
HEC-2004-E-R	345.00	✓	0
HEC-2001	340.00	✓	0
HEC-2002	338.00	✓	0
HEC-2003	337.00	✓	0
HEC-4000-E-R	333.00	✓	0

Model	Price ($)	Stock	Tier
HEC-4003-E-R	410.00	✓	0
HEC-4004-E-R	408.00	✓	0
HEC-4010-E-R	333.00	✓	0
HEC-4014-E-R	408.00	✓	0
HEC-4100-E-R	377.00	✓	0
HEC-4104-E-R	452.00	✓	0
HEC-4110-E-R	377.00	✓	0
HEC-4114-E-R	452.00	✓	0
HEC-4200-E-R	438.00	✓	0
HEC-4204-E-R	513.00	✓	0
HEC-4210-E-R	438.00	✓	0
HEC-4214-E-R	513.00	✓	0
HEC-900	81.00	✓	0
HEC-910	91.00	✓	0
HEC-920	44.00	✓	0
HEC-CRMPTL	CONSULT		N/A
HEC-HMI-2-E-R	473.00	✓	0
HEC-HMI-21-E-R	629.00	✓	0
HEC-HMI-22-E-R	754.00	✓	0
HEC-HMI-4-E-R	473.00	✓	0
HEC-HMI-41-E-R	629.00	✓	0
HEC-HMI-42-E-R	754.00	✓	0
HEC-HMI-C2100-E-R	548.00	✓	0
HEC-HMI-C2101-E-R	709.00	✓	0
HEC-HMI-C2102-E-R	834.00	✓	0
HEC-HMI-C2150-E-R	654.00	✓	0
HEC-HMI-C2151-E-R	809.00	✓	0
HEC-HMI-C2152-E-R	934.00	✓	0
HEC-HMI-C4100-E-R	548.00	✓	0
HEC-HMI-C4101-E-R	709.00	✓	0
HEC-HMI-C4102-E-R	834.00	✓	0
HEC-HMI-C4150-E-R	654.00	✓	0
HEC-HMI-C4151-E-R	809.00	✓	0
HEC-HMI-C4152-E-R	934.00	✓	0
HEC-OC-INT	35.00	✓	0
HEC-P5000	682.00	✓	0
HEC-P5100	490.00	✓	0
HEC-P10	36.00	✓	0
HEC-P20	36.00	✓	0
HEC-P30	36.00	✓	0
HEC-P40	36.00	✓	0
HEC-P100	60.00	✓	0
HEC-P110	60.00	✓	0
HEC-P120	60.00	✓	0
HEC-P130	60.00	✓	0
HEC-P910	90.00	✓	0

Model	Price ($)	Stock	Tier
HEC-PS5	39.00	✓	0
HEC-P-SEAL	16.00	✓	0
ICM-BB-P13-40	466.00	✓	1
ICM-BB-P13-30	388.00	✓	1
ICM-EBB-100	178.00	✓	1
ICM-EBB-200	184.00	✓	1
ICM-EBB-300	200.00	✓	1
ICM-EBB-400	205.00	✓	1
ICM-EBB-500	210.00	✓	1
ICM-EBB-600	222.00	✓	1
ICM-EBB-700	228.00	✓	1
ICM-EBB-IO-54RE-P	190.00	✓	1
ICM-EBB-RS232	53.00	✓	1
ICM-EBB-RS422	56.00		1
ICM-EBB-RS485	51.00		1
ICM-HDBU-DR	176.00	✓	1
ICM-HDBU-RC	233.00	✓	1
ICM-HDCA-01	22.00	✓	1
ICM-HDCA-02	32.00	✓	1
ICM-HDCA-03	42.00	✓	1
ICM-HDCA-04	52.00	✓	1
ICM-HDCA-05	62.00	✓	1
ICM-HDCA-06	72.00	✓	1
ICM-HDCA-11	22.00	✓	1
ICM-HDCA-12	33.00	✓	1
ICM-HDCA-13	43.00	✓	1
ICM-HDCA-14	53.00	✓	1
ICM-HDCA-15	63.00	✓	1
ICM-HDCA-16	73.00	✓	1
ICM-HDIO-01P	318.00	✓	1
ICM-HDIO-02P	185.00		1
ICM-HDIO-03P	163.00	✓	1
ICM-HDIO-04P	125.00		1
ICM-HDIO-06P	313.00	✓	1
ICM-HDIO-07P	166.00		1
ICM-HDIO-08P	175.00		1
ICM-HDIO-09P	109.00		1
ICM-HDIO-10P	127.00		1
ICM-HDIO-11P	226.00	✓	1
ICM-HDIO-12P	140.00	✓	1
ICM-HDIO-13P	165.00	✓	1
ICM-HDIO-14P	218.00		1
ICM-HDIO-15P	128.00		1
ICM-HDIO-16P	215.00		1
ICM-HDIO-17P	194.00	✓	1
ICM-HDIO-19P	151.00	✓	1

Model	Price ($)	Stock	Tier
ICM-HDIO-20P	147.00	✓	1
ICM-HDIO-22P	228.00	✓	1
ICM-HDIO-23P	159.00	✓	1
ICM-HDIO-24P	220.00	✓	1
ICM-HDIO-25P	192.00	✓	1
ICM-HDLEAK-01	237.00		1
ICM-HDME-16	41.00	✓	1
ICM-HDPS-01	168.00	✓	1
ICM-HP-01	13.00	✓	1
ICM-HP-08	11.00	✓	1
ICM-IO-C21	257.00	✓	1
ICM-IO-C24	205.00	✓	1
ICM-MB-100	99.00	✓	1
ICM-MB-110	152.00	✓	1
ICM-PM-04	41.00	✓	1
ICM-PUI-01	79.00	✓	1
ICM-RE-03	8.00	✓	1
MB-HP-01	25.00		1
MB-HP-02	23.00		1
MB-HP-03	9.00		1
OPTICFGTOOL-01	628.00	✓	0
PCS-100	193.00	✓	1
PCS-101	337.00	✓	1
PCS-102	346.00	✓	1
PCS-110	247.00		1
PCS-111	391.00		1
PCS-112	400.00		1
PCS-120	252.00		1
PCS-121	396.00		1
PCS-122	405.00		1
PCS-130	247.00		1
PCS-131	194.00		1
PCS-132	400.00		1
PCS-200	226.00	✓	1
PCS-201	370.00	✓	1
PCS-202	379.00	✓	1
PCS-210	280.00		1
PCS-211	424.00		1
PCS-212	433.00		1
PCS-220	285.00		1
PCS-221	429.00		1
PCS-222	438.00		1
PCS-230	280.00		1
PCS-231	424.00		1
PCS-232	433.00		1
PCS-CA-PWM	15.00	✓	1

Model	Price ($)	Stock	Tier
PIMS-CA-6	13.00	✓	1
PIMS-CA-7	16.00	✓	1
PLCDK-01	445.00	✓	N/A
PLCDK-03	595.00	✓	N/A
PLCDK-OI-2x20	150.00	✓	N/A
PLCDK-OI-2x40	175.00	✓	N/A
PLCDK-OI-4x20	200.00	✓	N/A
PLCDK-P13-01	560.00	✓	N/A
PLCDK-RS232	45.00	✓	N/A
PLCDK-RS422	47.00	✓	N/A
PLCDK-RS485	47.00	✓	N/A
PLCHIP-M2-XXXXX	CONSULT	✓	N/A
PLCHIP-P13-51220	CONSULT	✓	N/A
PLCMOD-M2-128000*	132.50	✓	N/A
PLCMOD-M2-128010*	148.76	✓	N/A
PLCMOD-M2-256000*	144.55	✓	N/A
PLCMOD-M2-256010*	160.82	✓	N/A
PLCMOD-M2-256200*	156.61	✓	N/A
PLCMOD-M2-256210*	172.87	✓	N/A
PLCMOD-P13-512210*	194.92	✓	N/A
SI-100	91.00	✓	1
SI-101	91.00	✓	1
SI-110	106.00	✓	1
SI-200	144.00	✓	1
SI-201	144.00	✓	1
SI-210	160.00	✓	1
SI-APPMOD-2PUMPALTERNATE	179.00	✓	1
SI-APPMOD-3PUMPALTERNATE	179.00	✓	1
SI-APPMOD-DEADBAND	189.00	✓	1
SI-APPMOD-HOURMETER	179.00	✓	1
SI-APPMOD-MULTICOUNT	179.00	✓	1
SI-APPMOD-PGMKIT	21.00	✓	1
SI-APPMOD-RANGECOMPARE	189.00	✓	1
SI-APPMOD-TACHOMETER	179.00	✓	1
SI-APPMOD-TIMES4	179.00	✓	1
SI-DEMO-01	72.00	✓	1
SI-DEMO-02	69.00	✓	1
SI-PGM	16.00	✓	1
SK-100	104.00	✓	1
SK-101	104.00	✓	1
SK-110	120.00	✓	1
SK-200	158.00	✓	1
SK-201	158.00	✓	1
SK-210	173.00	✓	1
SK-HEC	194.00	✓	0
UCP-21101000	728.00	✓	1

Model	Price ($)	Stock	Tier
UCP-31101000	840.00	✓	1
UMCB-110	531.00	✓	1
UMCB-111	570.00	✓	1
UMCB-112	575.00	✓	1
UMCB-113	571.00	✓	1
VB-1000	284.00	✓	1
VB-2000	392.00	✓	1
VB-2100	429.00	✓	1
VB-2200	417.00	✓	1
VBEX-4K	97.00	✓	1
VBEX-4K4DOT	126.00	✓	1
VB2X-4K	94.00	✓	1
VB2X-4K4DOT	119.00	✓	1
VBDSP-01	209.00	✓	1
VBDSP-02	218.00	✓	1
VBDSP-03	175.00	✓	1

✓	Typically Stocked Item
Note:	Some items may be in stock but are not on the typically stocked list. Consult Factory.
$	All Prices are List Price in US Dollars
CONSULT	Consult Factory for Price/Availability
*	Consult Factory for quantities greater than 10.

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INDUSTRY CHARTS

Current Carrying Capacity of Copper Conductors

Conductor Size	Polyethylene Neoprene Polyurethane Polyvinylchloride (Semi - Rigid) @ 80° C	Polypropylene polyethylene (High Density) @ 90°C	Polyvinylchloride PVC (Irradiated) Nylon @ 105°C	Kynar Polyethylene (Crosslinked) Thermoplastic Elastomers @ 125°C	Kapton Teflon Silicone @ 200°C
8 AWG	65 Amperes	70 Amperes	75 Amperes	90 Amperes	100 Amperes
10 AWG	47 Amperes	55 Amperes	58 Amperes	70 Amperes	75 Amperes
12 AWG	36 Amperes	40 Amperes	45 Amperes	50 Amperes	55 Amperes
14 AWG	27 Amperes	30 Amperes	33 Amperes	40 Amperes	45 Amperes
16 AWG	19 Amperes	22 Amperes	24 Amperes	26 Amperes	32 Amperes
18 AWG	15 Amperes	17 Amperes	18 Amperes	20 Amperes	24 Amperes
20 AWG	10 Amperes	12 Amperes	13 Amperes	14 Amperes	17 Amperes
22 AWG	8 Amperes	9 Amperes	10 Amperes	11 Amperes	13 Amperes
24 AWG	6 Amperes	7 Amperes	7 Amperes	8 Amperes	10 Amperes
26 AWG	4 Amperes	5 Amperes	5 Amperes	6 Amperes	7 Amperes
28 AWG	3 Amperes	4 Amperes	4 Amperes	5 Amperes	6 Amperes
30 AWG	2 Amperes	3 Amperes	3 Amperes	3 Amperes	4 Amperes

Single Conductor in Free Air with 30°C Ambient Temperature

Resistor Color Code

Color	1st Color Band	2nd Color Band	Multiplier (Tolerance)
Black	0	0	1
Brown	1	1	10
Red	2	2	100
Orange	3	3	1,000
Yellow	4	4	10,000
Green	5	5	100,000
Blue	6	6	1,000,000
Violet	7	7	10,000,000
Gray	8	8	100,000,000
White	9	9	--------
Gold	--------	--------	.1 (5%)
Silver	--------	--------	.01 (10%)
No Color	--------	--------	-------- (20%)

Typical Power Wiring Color Code

120 / 240 Volt	
Black	Phase 1
Red	Phase 2
Blue	Phase 3
White	Neutral
Green	Ground

277 / 480 Volt	
Brown	Phase 1
Orange	Phase 2
Yellow	Phase 3
Gray	Neutral
Green w/ Yellow Strip	Ground

Average Electric Motor Specifications - General Guide only

For General purpose motors such as for fans, furnace and pump applications with normal duty cycles. Currents can vary greatly, so this should be used only as a general guide. Refer to actual motor for specifications.

115 Volt, 60 Hz, 1 Phase AC Electric Motors. For 230 Volt, Divide Full Load Amps by 2.

Motor Horsepower	RPM	Full Load Amps	Motor Horsepower	RPM	Full Load Amps
1/20	1550	2.5	1/4	1075	3.4 - 6.8
1/15	1550	2.8	1/4	850	6.9
1/12	1725	2.2 - 2.8	1/3	3450	5.6 - 6.5
1/12	1550	4.1	1/3	1725	5.3 - 6.8
1/12	850	3.2	1/3	1140	5.0 - 7.2
1/10	1550	3.5	1/3	1075	5.1
1/10	1050	3.4 - 4.2	1/2	3450	9.8
1/8	1725	1.8 - 2.7	1/2	1725	7.0 - 9.2
1/8	1140	3.8	1/2	1075	7.3
1/8	1075	1.8 - 5.0	3/4	3450	11.8
1/6	1725	3.3 - 4.7	3/4	1725	11.6
1/6	1550	4.0 - 4.8	3/4	1075	9.5
1/6	1140	4.0 - 4.9	1	3450	13.0 - 15.0
1/6	1075	2.4 - 5.0	1	1725	13.6 - 16.0
1/4	1725	4.4 - 6.3	1-1/2	3450	16.4 - 19.6
1/4	1625	3.1 - 3.6	1-1/2	1725	19.6
1/4	1140	5.6 - 6.8	2	2450	19.0 - 23.0

Conduit Size vs TW Wire Size

Wire Size AWG	Minimum Conduit Size per Number of Type TW Wires. Number of Wires inside Conduit.				
	2	3	4	5	6
14	1/2"	1/2"	1/2"	1/2"	1/2"
12	1/2"	1/2"	1/2"	1/2"	1/2"
10	1/2"	1/2"	1/2"	1/2"	3/4"
8	1/2"	3/4"	3/4"	1"	1"
6	3/4"	1"	1"	1-1/4"	1-1/4"
4	1"	1"	1-1/4"	1-1/4"	1-1/2"
2	1"	1-1/4"	1-1/2"	1-1/2"	2
1/0	1-1/4"	1-1/2"	2	2	2-1/2"
2/0	1-1/2"	1-1/2"	2	2	2-1/2"
3/0	1-1/2"	2	2	2-1/2"	2-1/2"

Refer to the National Electric Code for wire types other than TW.

Commonly Used Enclosure Types

Type	Service Conditions
1	Indoor - General Conditions
3	Outdoor - Windblown dust, rain, sleet and ice.
3R	Outdoor - Falling rain and ice.
4	Indoor / Outdoor - Windblown dust and rain, splashing water, hose directed water and ice.
4X	Indoor / Outdoor - Corrosion, windblown dust and rain, splashing water, hose directed water and ice.
12	Indoor - Dust, falling dirt and dripping non-corrosive liquids.

NOTICE: All information provided is for general reference only. For actual specifications and information, refer to the product manufacturer's data sheet.