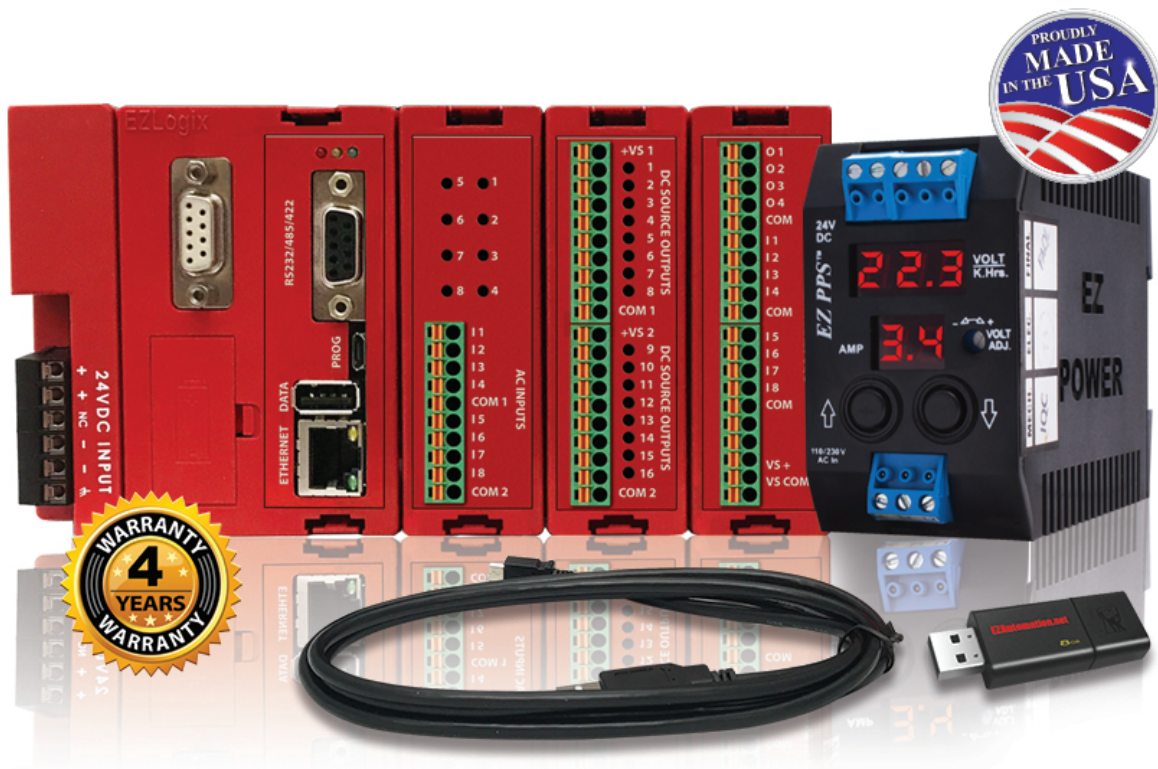




# Starter Kit Documentation



**EZRack PLC Catalog**

**Pg 01 - 72**

**EZ Power Supply Catalog**

**Pg 73 - 78**

**Application Examples**

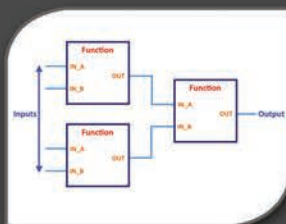
**Pg 79 - 82**

# **EZ** RackPLC™

## ***Heavy Duty High Performance PLC at Logical Prices***



IIOT / Industry 4.0  
Ready



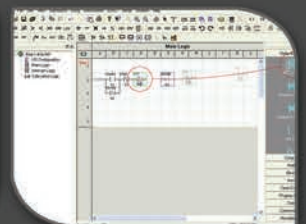
Advanced  
Function Blocks



Built-in  
Data Logging  
on USB



Drop-in-replacement  
I/O to Do-More &  
DirectLogics



Free EZ Flow  
Drag-n-Drop  
Ladder Logic

## **Technologically Advanced Machine Controller**



# EZAutomation.net

## **EZRackPLC™** Heavy Duty Industrial Modular PLC



### Traditional Rack Style Din-rail PLC with Extraordinary Features and Prices

- IIoT / Industry 4.0 ready
- Data Logging built-in
- 37.02 MB Total memory
- 500,000 Instruction words Ladder Memory
- 2.4 ms scantime
- Advanced function blocks with drag-n-drop ladder logic programming



### FREE Video Tutorials:

[www.ezautomation.net/videos/ezrackplc](http://www.ezautomation.net/videos/ezrackplc)



Download a QR Scanner for your smart phone and scan now to view video tutorials and cad drawings!

### CAD drawings:

[www.ezautomation.net/caddrawings](http://www.ezautomation.net/caddrawings)



# Top 5 Logical Points for EZ Rack PLC

## 1. Rugged modular rack PLC at unbeatable prices

The EZ Rack PLC is a High Performance modular PLC with a rugged chassis for industrial applications at a fraction of the cost of typical modular PLCs. It includes all top end specs such as 2.4ms scantime, 500,000 instruction words memory and built-in USB, Serial & Ethernet ports with a CPU price of only \$149.



## 2. Free Drag-n-drop Ladder Logic Software

With over 70 instruction sets, advanced mathematical function blocks, and auto-tuned PID control, the FREE EZ Rack PLC Designer Pro software is ideal for both simple machines and complex discrete / process manufacturing applications.

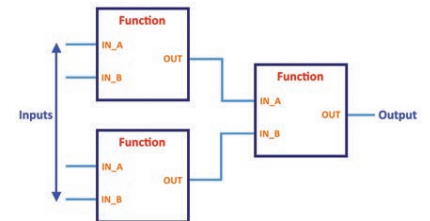
## 3. IIoT Ready, Industry standard 4.0

As more plants are looking to increase connectivity and access valuable data produced by factory machines to enhance plant efficiency, cut costs and reduce downtime, IIoT is becoming the hot topic of manufacturing. With EZ Rack PLC MQTT protocol support, simple data logging interface, and unique webserver application, plant personnel can easily access machine data locally on a server or in the cloud.



## 4. Advanced Function Blocks

EZ Rack PLC support of function blocks simplify programming operations such as timers, counters, break points, compare functions, averaging, min/max, scaling etc. They also make it easier for end-users to follow with a graphical language in case they are not as familiar with typical ladder wiring diagrams.



## 5. Data Logging

EZ to log data on local USB drive, on local server or to the cloud.



### What is EZ Rack PLC?

EZ Rack PLC is a high performance heavy duty PLC at the price of brick PLCs. It is packed with features and memory only found in high end PLC's that cost 3 to 5 times more.

### What does it have?

#### Hardware

- 3, 5 & 7 Slot PLC bases with built-in power supply
- CPU with 2 Serial (RS232/422/485) and Ethernet ports
- Data Logging on USB

#### Software

- IIoT/Industry 4.0 ready
- Automatic I/O Configuration
- Total Program/Data memory 1 MB
- Fast scantime, 2.4ms for 1K instructions
- Powerful Ladder Logic programming
- Advanced function blocks
- Supports ASCII In/Out instructions
- Off-line program simulation
- EZ to use programming software
- User program stored in Flash
- 8 Auto-tuned PID loops
- 32 Bit Floating point Math
- Timers, Counters, Drum Sequencers

### Where does it make sense?

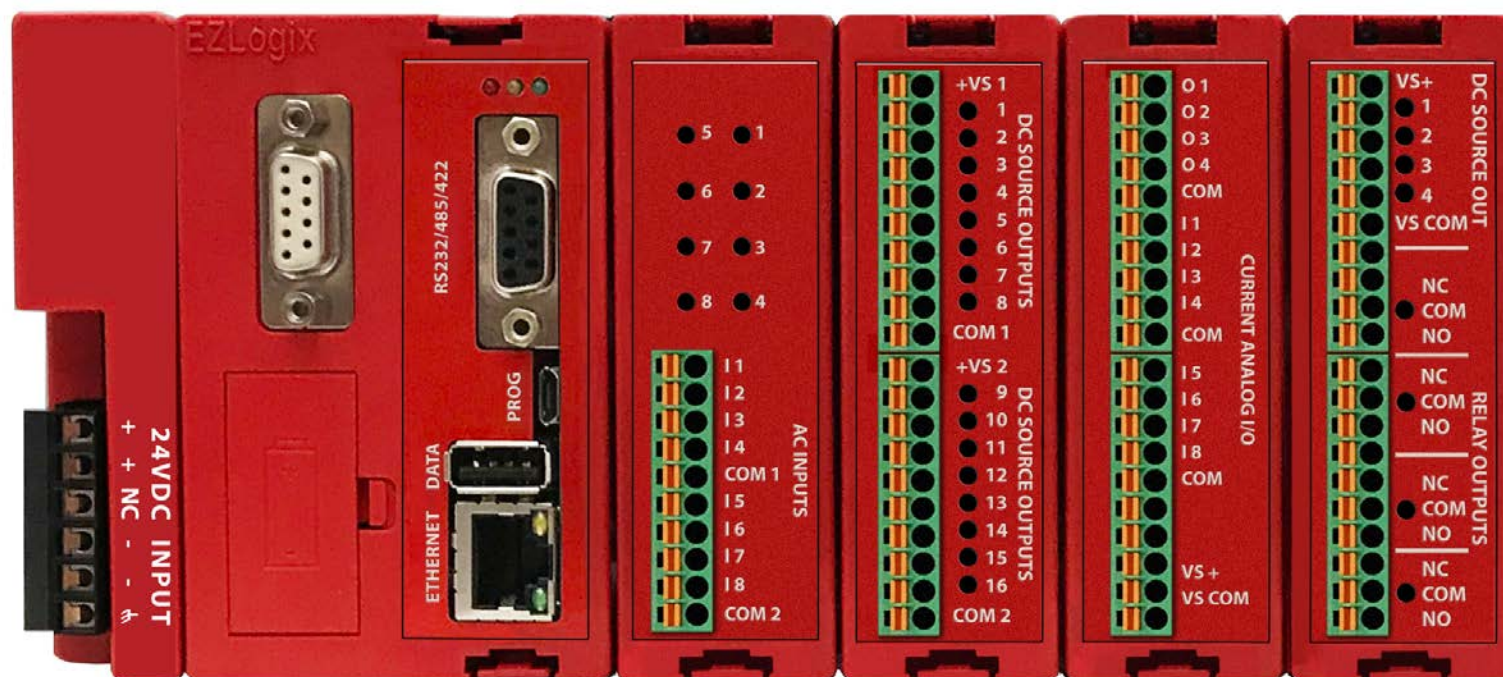
At its very attractive price point, yet extremely powerful logic features, the EZ Rack PLC can be used on small machines under 50 I/O to large machines up to 2048 I/O.

Ideal for Discrete & Process Manufacturing Applications

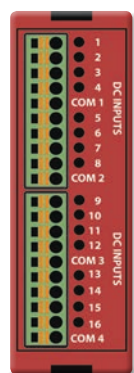
EZ Rack PLC I/O Drop-in Replacement for Automation Direct Do-More & DirectLogics PLCs at 1/2 the cost!



# EZRackPLC™ Technologically Advanced



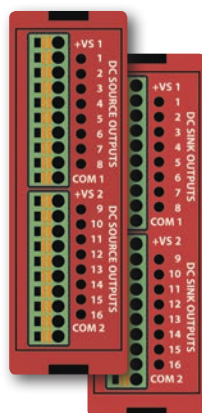
## DC Input Modules



16pts. \$49

EZRPL-IO-16DCI

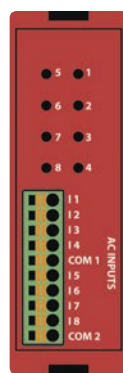
## DC Output Modules



16pts. \$59

EZRPL-IO-16DCOP  
EZRPL-IO-16DCON

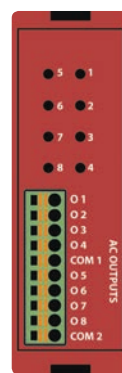
## AC Input Modules



8pts. \$39

EZRPL-IO-8ACI

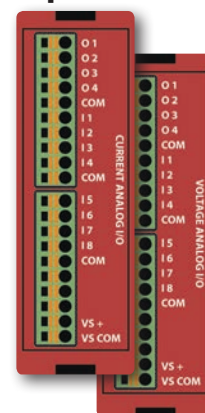
## AC Output Modules



8pts. \$49

EZRPL-IO-8ACO

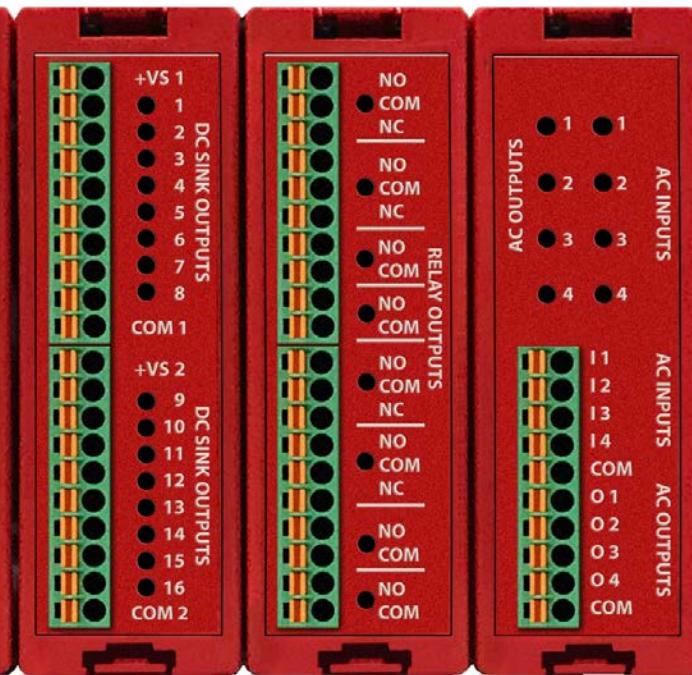
## Analog Input / Output Modules



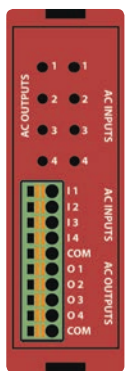
12pts. \$199

EZRPL-IO-8ANI4ANOC  
EZRPL-IO-8ANI4ANOV

# Powerful PLC



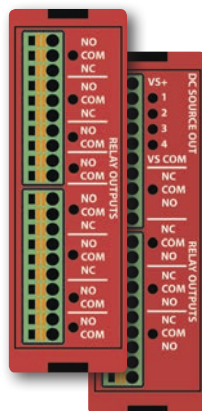
## AC In/Out Combo Modules



8pts. \$49

**EZRPL-IO-4ACI4ACO**

## Relay Modules



8pts. \$52

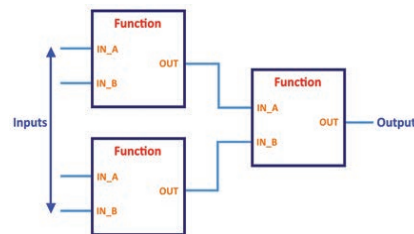
**EZRPL-IO-8RLO**  
**EZRPL-IO-4DCOP4RLO**

## IIoT Ready / Industry 4.0



Get Connected to the Cloud with EZ Rack PLC's IIoT ready controller. Store data on local server over Ethernet or transmit to the Cloud using EZ Rack PLC built-in MQTT Protocol. View Data Remotely over the Internet using EZ Rack PLC web interface.

## Advanced Function Block with Ladder Logic



EZ Rack PLC programming software includes advanced function blocks to simplify complex programming applications.

## Data Logging



Store Data locally on CPU USB Port, Send over Ethernet to a local server, or transfer to the Cloud using EZ Rack PLC IIoT ready CPU.

## Drop-in Replacement

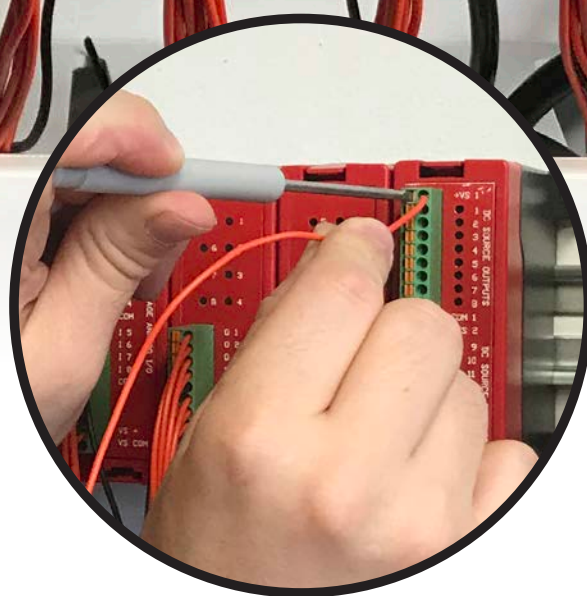
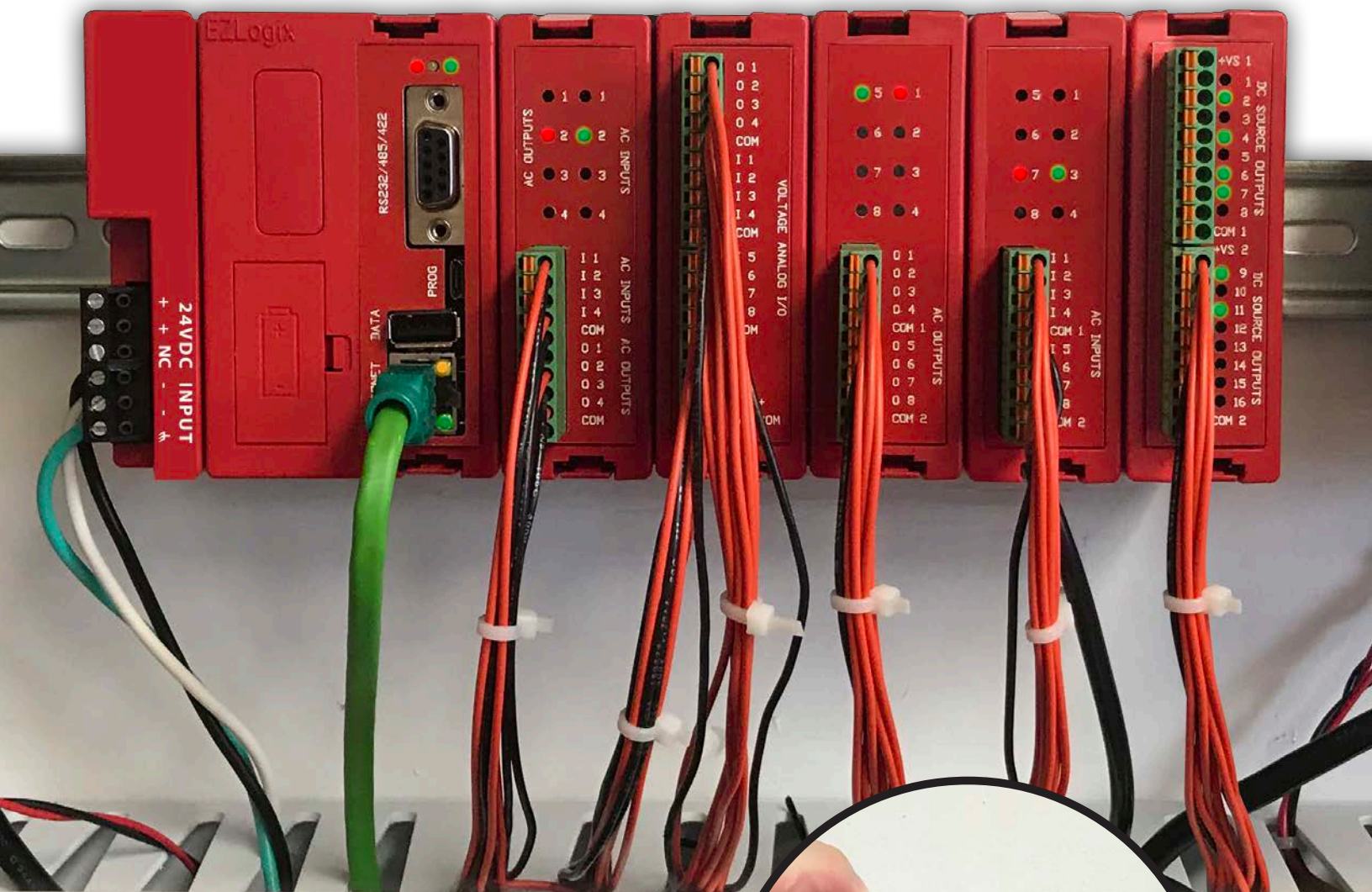


EZ Rack PLC I/O at half the cost of Automation Direct's Do-More and DirectLogics I/Os fits and functions in the same slots!



# EZRackPLC™

## Convenient Features for your Plant Floor

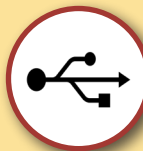


- *Spring loaded I/O terminal blocks provide a secure connection yet make it easy for field wiring*
- *CPU LED Indicator to show status of processor*
- *LED indicator per Input/Output*
- *Status indicator for USB data logging*
- *Off the shelf micro USB programming cable (used in standard smart phones and printers)*
- *Self latching DIN rail mounting*



# Powerful PLC used in a Variety of Discrete and Process Manufacturing Industries

EZ Rack PLC



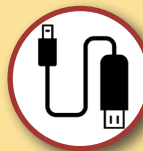
USB



Ethernet



2 RS232



Micro USB

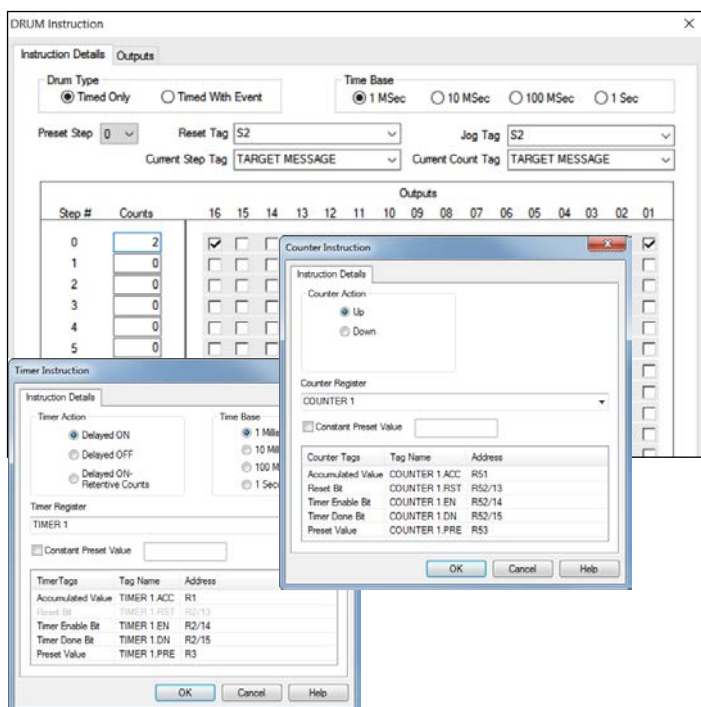


- **Agriculture**
- **Automotive**
- **Can Manufacturing**
- **Conveyor/Transport**
- **Clothing**
- **Car Wash**
- **Food & Beverage**
- **HVAC**
- **Metal Stamping**
- **Oil & Gas**
- **Pharmaceutical**
- **Packaging**
- **Steel**
- **Semiconductors**
- **Solar Power Industry**
- **Textile**



# **EZRackPLC™** No Frustration, EZ to Program

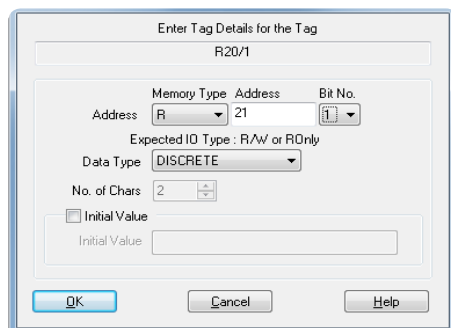
Timers, Counters, Scaling,  
Drum Sequencer, Math  
Equations, Statistical  
Functions (avg, min/max, etc.)



## Built-in Simulator

Creates a virtual PLC so you can test your logic without any hardware.

Bit Level  
Addressing  
Access each  
bit within a  
register



500,000 Instruction  
Words User Memory,  
16384 Registers

16384 Registers

1MB  
Available  
for  
Ladder &  
Memory

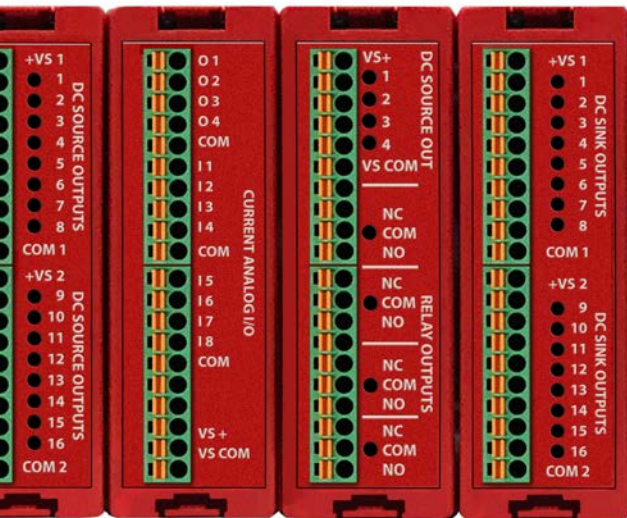
2.4 ms  
Scantime



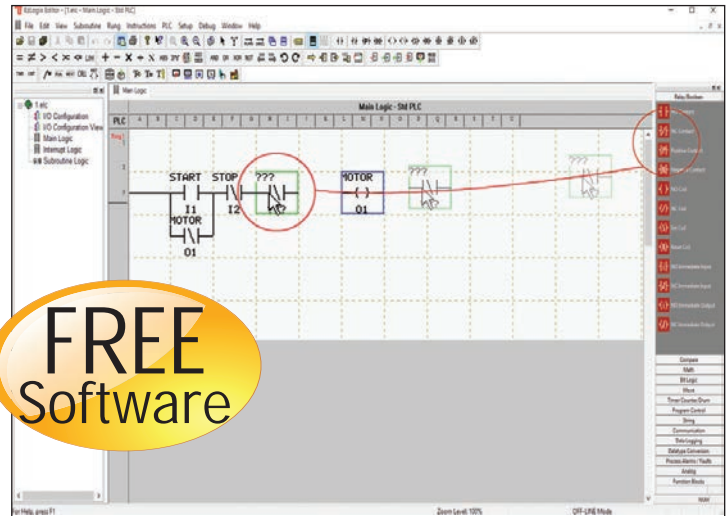
## Break-point Ladder Logic Execution

Debug Ladder Logic by executing rung-by-rung

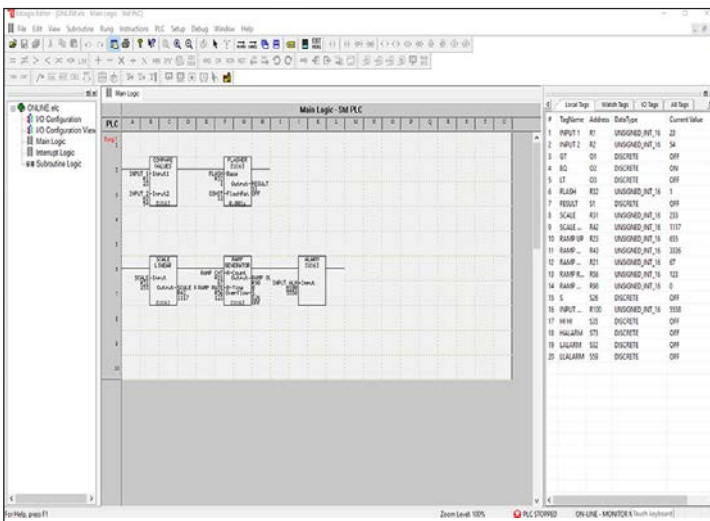
# Free PLC Programming Software!!



## Simple Drag-n-Drop Ladder Logic Software



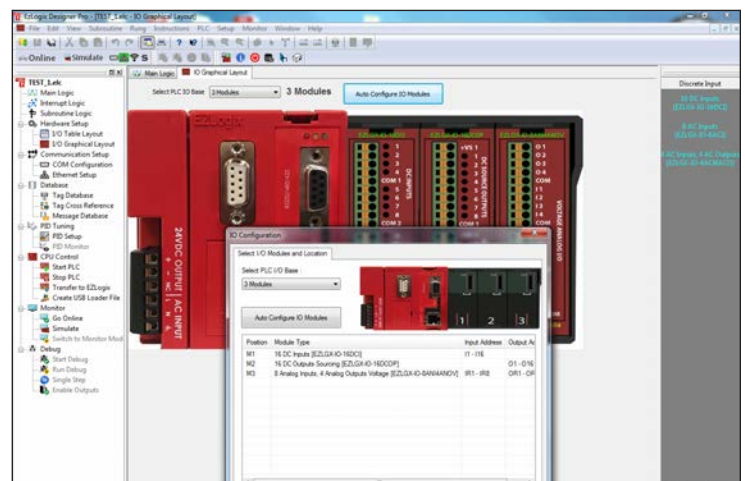
## Advanced Instruction Set & Function Blocks



EZRack PLC has powerful instructions & Advanced function blocks found only in much more expensive PLCs

- Flexible, powerful and easy to use instructions designed to simplify programming
- Free Flow Ladder Logic
- Each Rung Commented
- User friendly dialog boxes

## Automatic I/O Configuration



Connect to the EZ Rack PLC & automatically detect your I/O modules and addresses in the local base



# EZ RackPLC™ Do More with Our Incredible Programming Software...

## Break Point Debugging

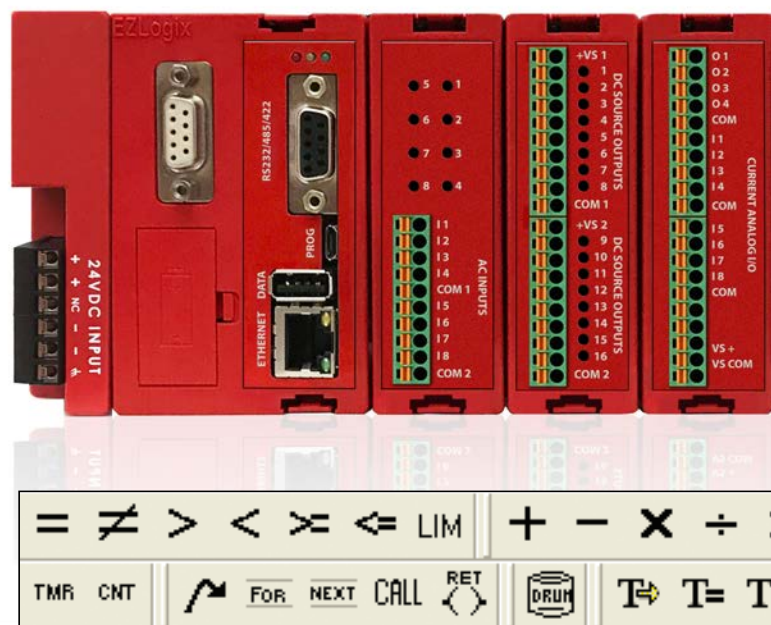
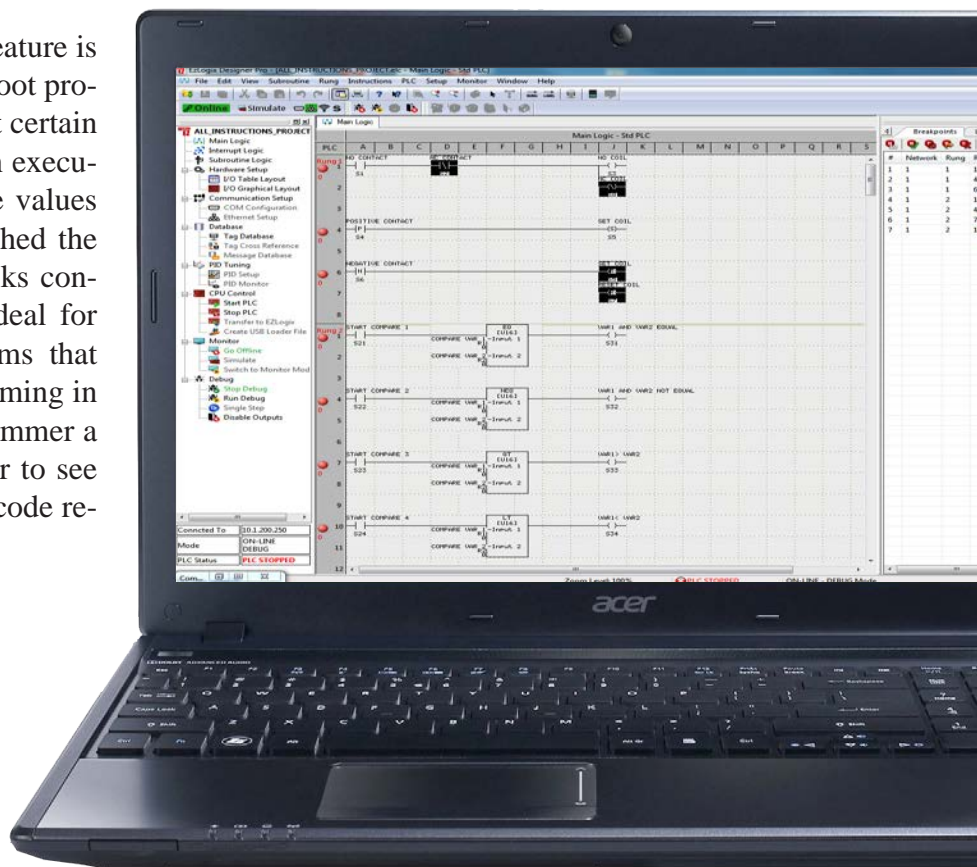
EZRack PLC Designer Pro's Break Point feature is a excellent debugging function to troubleshoot programming errors. Break points can be set at certain positons in the program in order to force an execution stop. At each stop, respective variable values can be examined. Only the tasks that reached the break point are stopped while all other tasks continue to run. The break point feature is ideal for troubleshooting large ladder logic programs that do not have syntax errors but are not performing in the manner intended. It provides the programmer a step-by-step execution of variables in order to see where the potential bug in the ladder logic code resides.

## Force Input/Outputs (Troubleshooting Tool)

Forcing I/O is one of the handiest ways of troubleshooting logic and checking peripheral devices. In EZRack PLC Designer Pro forcing tags is done directly from the ladder logic or from the tag monitor window. This allows you to physically control the state of an input or output even if the logic condition is "false".

## 32 Bit Floating Point Math

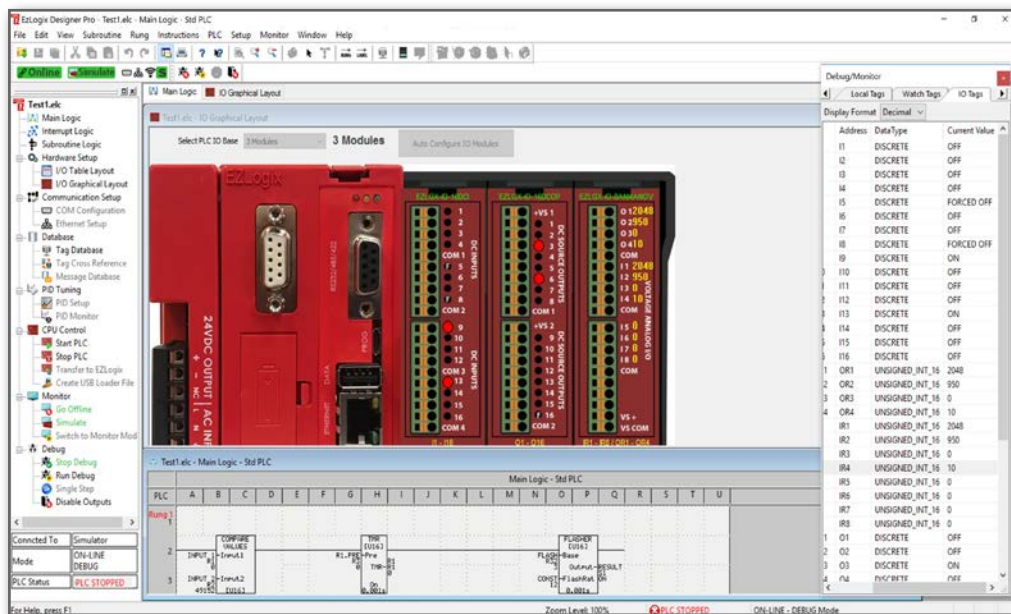
This incredible distributed I/O modular PLC supports 32 bit floating point, 32 bit signed & unsigned double integer, 16 bit signed and unsigned integer data options which support all mathematical functions such as Addition, Subtraction, Multiplication, Division, Modulo & Absolute. It also supports data conversions from binary to BCD or gray code.



# ... with No Activation Key code Required!!

Free  
Software,  
Intuitive  
Simulator

EZ Rack PLC



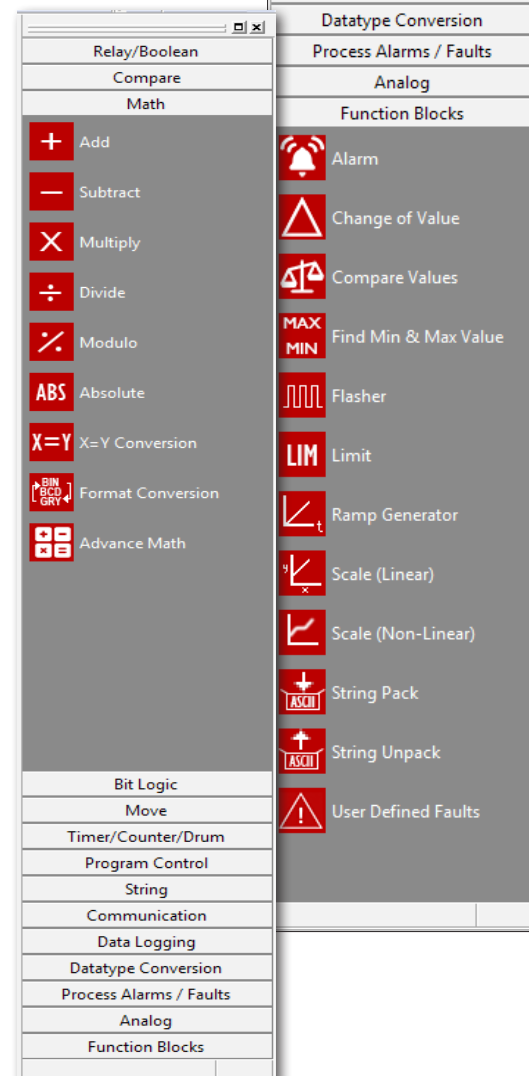
## PLC Simulator

The built-in simulator creates a virtual PLC so you can test your ladder logic without any PLC hardware present.

- Visually see on the virtual PLC, LED indicators light up inputs & outputs based on your ladder logic simulation.
- Our Windows application uses the same code as the EZ Rack PLC CPU firmware for the most accurate simulation.
- Simulates discrete and analog I/O with access to timers, counters, control bits, etc.
- View LED Indicators and Ladder Logic rungs in Simulation mode.

## New Updated Function Blocks

With optimized instruction sets and a whole new library of pre-defined function blocks such as scaling, compare, hi/low alarm, averaging, min/max, ramp generator, advanced math and many more, the Free EZ Rack PLC software has been designed to provide our customers a more flexible and easy to use PLC programming software. The EZ Rack PLC functions will continue to grow with customer feedback at no additional costs to upgrade.





# EZRackPLC™ Designer Pro Software Layout



## Online / Simulate

Go online with the PLC or simulate your ladder logic using the built-in simulator. When in Simulation mode, you can see exactly how the LEDs would light up as if the hardware is actually present!



## Communication Setup

Serial / USB, Ethernet, Wifi or Simulator mode connectivity. Choose how to communicate.



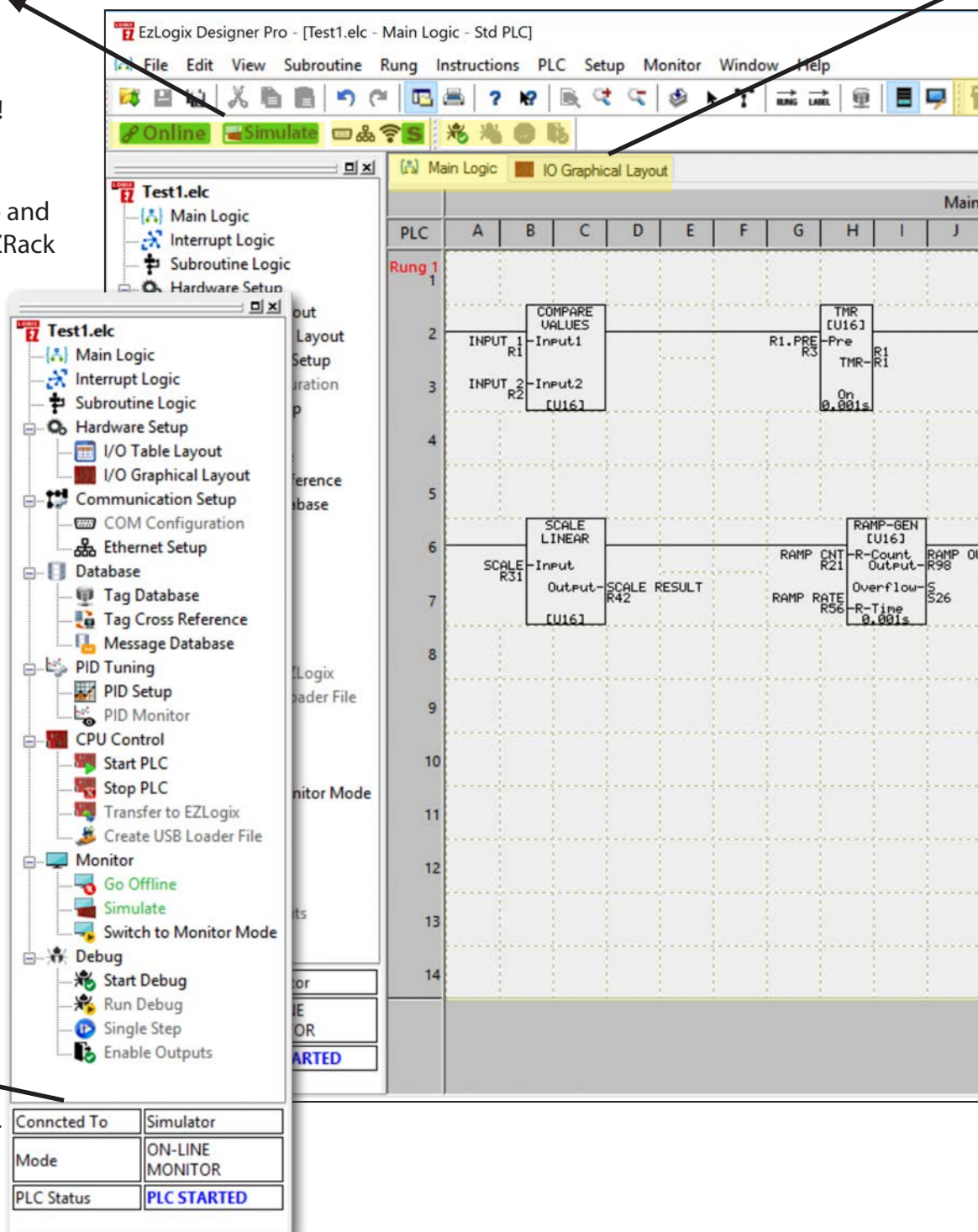
## Debug

Start/Stop debug mode, Single step debugging, Enabling/disabling outputs and forcing I/O. Great for troubleshooting.

## EZ Access Tree Menu

Quickly access various setup and control parameters of the EZRack PLC. Tree includes:

- Ladder Logic
- Subroutines
- Hardware Setup
- Communication Setup
- Tag/Message Database
- PID Tuning
- CPU Control
- Monitor/Debug



## PLC Status

Quick indication of current state of PLC whether in Online mode, Simulation mode, Debug mode or Offline mode



### Ladder / Graphical Layout

Switch between ladder diagram or IO Graphical layout as seen on the physical PLC. Both modes are great for debugging and simulation!



### PLC Communication Toolbar

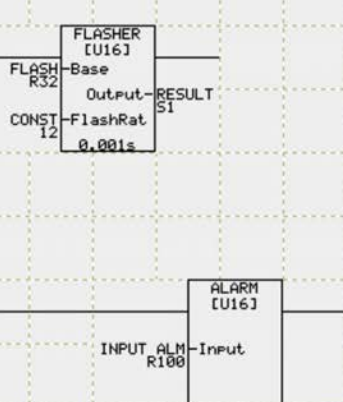
Quick access icons for CPU Info and control



### Instructions / Function Blocks

Toolbar for extensive ladder instructions / Advanced function blocks, datalogging and IIoT setup.

Logic - Std PLC

K	L	M	N	O	P	Q	R	S	T	U
										

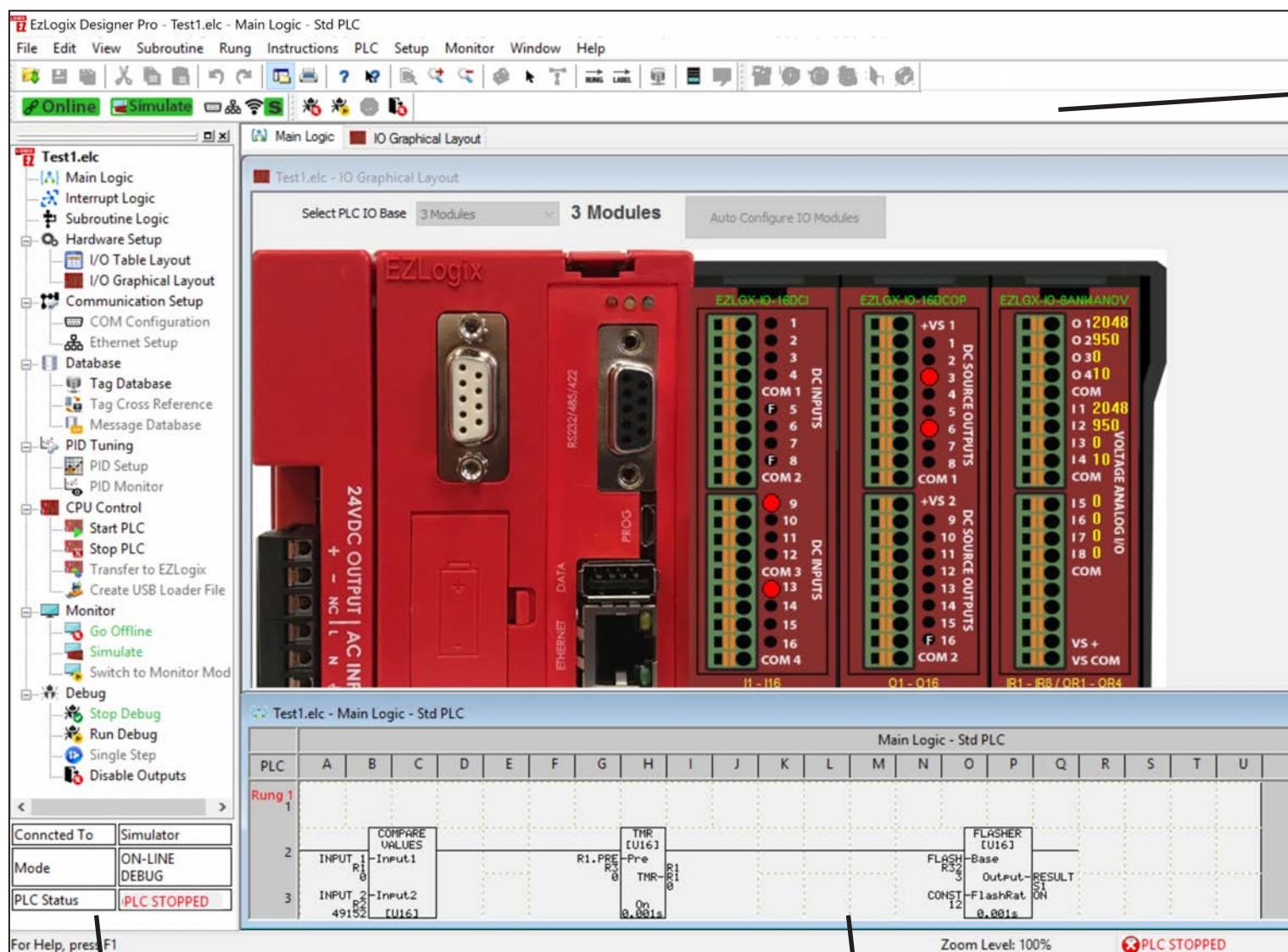
**Ladder Space**  
Simple free flow drag-n-drop ladder logic programming

Instructions / Function Blocks:

- Relay/Boolean
- Compare
- Math
- Bit Logic
- Move
- Timer/Counter/Drum
- Program Control
- String
- Communication
- Data Logging
- Datatype Conversion
- Process Alarms / Faults
- Analog
- Function Blocks
- Alarm
- Change of Value
- Compare Values
- Find Min & Max Value
- Flasher
- Limit
- Ramp Generator
- Scale (Linear)
- IIoT



# EZRackPLC™ Designer Pro Software Layout



## CPU Status

Quick indication of current state of PLC whether in Online mode, Simulation mode, Debug mode or Offline mode.

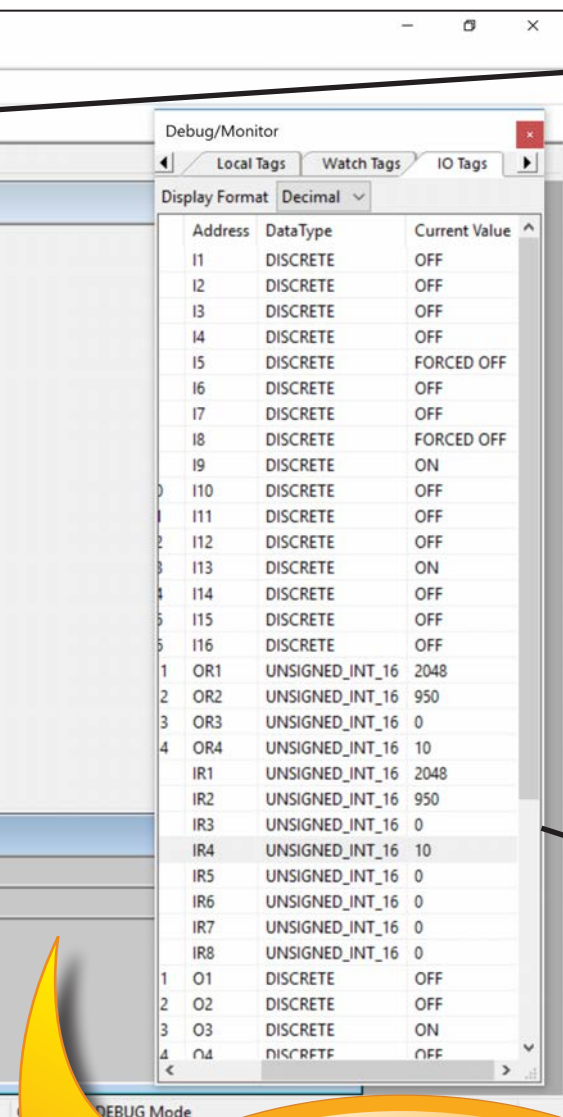
## Ladder Logic

Monitor and debug your ladder logic while online or in simulation mode

### “Virtual” PLC Layout

Select I/O base when in Offline mode to automatically configure your I/O. If your PLC is connected, the EZ Rack PLC Designer Pro automatically detects which I/O module is in its respective slot.

When in simulation mode you can test for free your ladder logic program as if you have the hardware right in front of you. Force any discrete I/O to an ON or OFF state and see the corresponding LEDs light up on the simulator. Force an analog value and see corresponding output logic values virtually on the PLC Simulator.



### Debug/Monitor Modes (Break-point and Tags Table)

- Break-point troubleshooting
- See all local tags
- See all watch tags
- See I/O tags
- See all PLC tags
- Troubleshoot using Force I/O

Simultaneously view tags, ladder logic and virtual PLC when online with CPU or in simulation mode



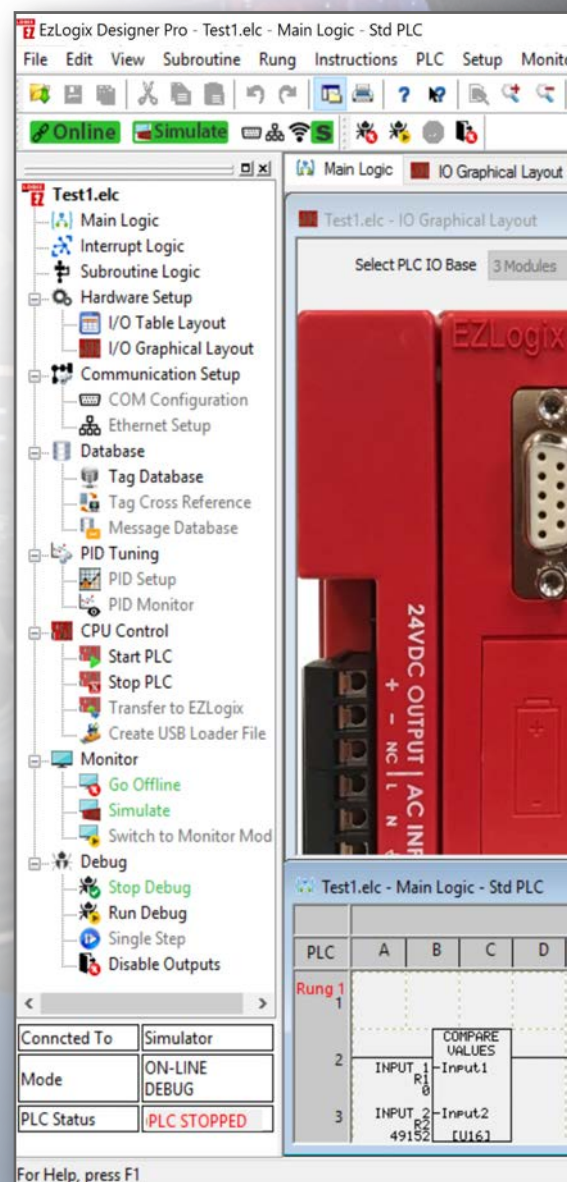
# **EZRackPLC™** Built-in Simulator

The built-in simulator creates a virtual PLC so you can test your ladder logic without any PLC hardware present.

- Visually see on the virtual PLC, LED indicators light up discrete inputs & outputs based on your ladder logic simulation.
- See register values within simulator to test out proper ladder logic instructions.
- View LED Indicators and Ladder Logic rungs simultaneously in Simulation mode.
- Simulates discrete and analog I/O with access to timers, counters, control bits, etc.
- Force discrete I/O "On" or "Off" to troubleshoot ladder logic
- Break-point debugging while in simulation mode to test certain portions of the ladder program
- Our Windows application uses the same code as the EZRack PLC CPU firmware for the most accurate simulation.

## Built-in Simulator

Creates a virtual PLC so you can test your logic without any hardware.



Virtually see how your EZ-Rack PLC ladder program performs for FREE before buying any hardware

or Window Help

3 Modules Auto Configure IO Modules

EZLGX-IO-16DCI EZLGX-IO-16DCOP EZLGX-IO-8ANMANOV

DC INPUTS COM 1 F 5 COM 2 F 8 COM 3 COM 4

DC SOURCE OUTPUTS +VS 1 1 2 3 4 5 6 7 8 COM 1 +VS 2 9 10 11 12 13 14 15 16 F 16 COM 2

0 12048 0 2950 0 30 0 410 COM 11 2048 12 950 13 0 14 10 VOLTAGE ANALOG I/O COM 15 0 16 0 17 0 18 0 VS + VS COM

11 - I16 Q1 - Q16 IR1 - IR8 / OR1 - OR4

Main Logic - Std PLC

FLASHER [U16] Base Output-RESULT

FLASH-R3 FlashRate 0.001s

THR [U16] Pre THR On 0.001s

Zoom Level: 100% **PLC STOPPED** ON-LINE - DEBUG Mode

Debug/Monitor

Local Tags Watch Tags IO Tags

Display Format Decimal

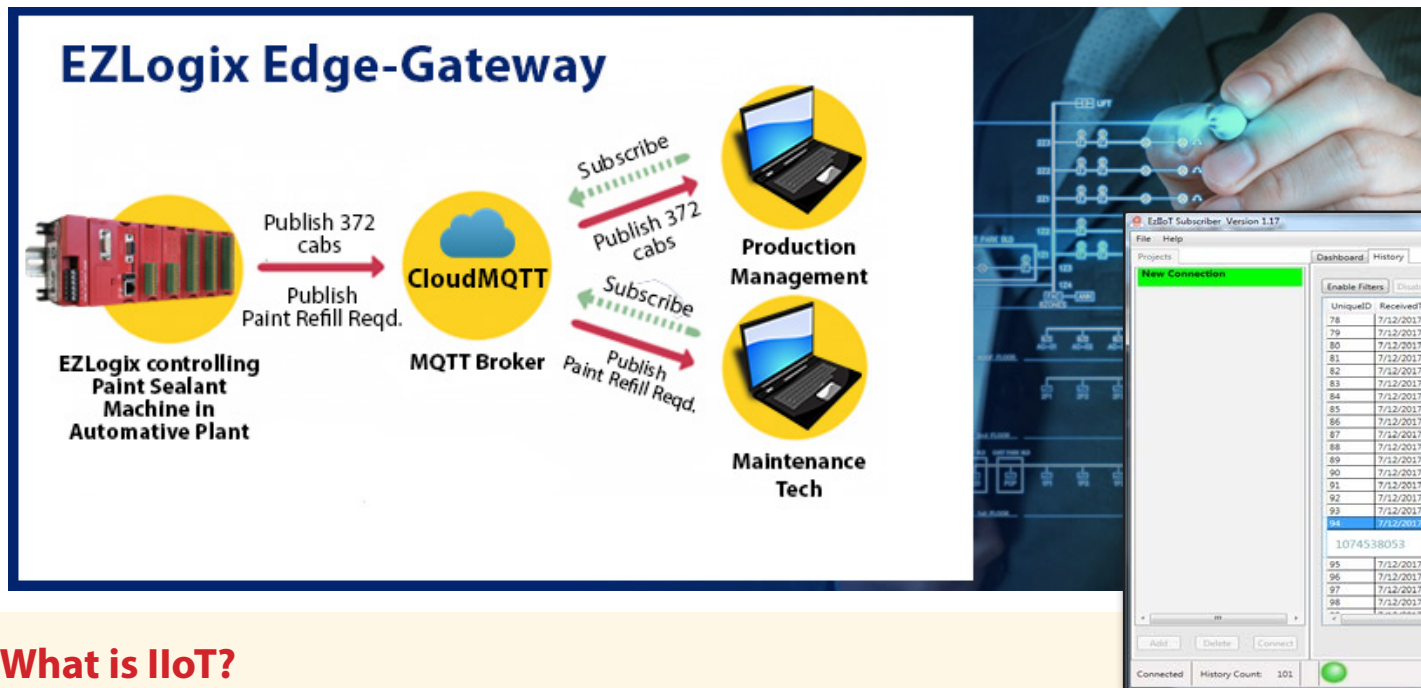
Address	Data Type	Current Value
I1	DISCRETE	OFF
I2	DISCRETE	OFF
I3	DISCRETE	OFF
I4	DISCRETE	OFF
I5	DISCRETE	FORCED OFF
I6	DISCRETE	OFF
I7	DISCRETE	OFF
I8	DISCRETE	FORCED OFF
I9	DISCRETE	ON
I10	DISCRETE	OFF
I11	DISCRETE	OFF
I12	DISCRETE	OFF
I13	DISCRETE	ON
I14	DISCRETE	OFF
I15	DISCRETE	OFF
I16	DISCRETE	OFF
OR1	UNSIGNED_INT_16	2048
OR2	UNSIGNED_INT_16	950
OR3	UNSIGNED_INT_16	0
OR4	UNSIGNED_INT_16	10
IR1	UNSIGNED_INT_16	2048
IR2	UNSIGNED_INT_16	950
IR3	UNSIGNED_INT_16	0
IR4	UNSIGNED_INT_16	10
IR5	UNSIGNED_INT_16	0
IR6	UNSIGNED_INT_16	0
IR7	UNSIGNED_INT_16	0
IR8	UNSIGNED_INT_16	0
O1	DISCRETE	OFF
O2	DISCRETE	OFF
O3	DISCRETE	ON
O4	DISCRETE	OFF



# **EZRackPLC™** IIoT / MQTT Ready

## **EZRack PLC - IIoT**

The EZRack PLC PLC is ready for the Industrial Internet of Things (IIoT) applications. With MQTT protocol support and direct connectivity to external devices such as sensors, RTDs, analog inputs, etc. as well as a easy to setup secure communication with open networks such as Modbus TCP/IP, EZRack PLC is not only a powerful PLC but also a low cost Edge Gateway device.



## **What is IIoT?**

The Industrial Internet of Things (IIoT) focuses on the interconnectivity and utilization of powerful data in a manufacturing environment. IIoT enables the acquisition and accessibility of important plant data at far greater speeds, security and reliability. IIoT incorporates machine learning and big data technology, harnessing the sensor data, machine-to-machine communication and automation technologies that have existed in industrial settings for years. The driving philosophy behind the IIoT is that smart machines are better than humans at accurately, consistently capturing and communicating data.

EZRack PLC built in IIoT and MQTT protocol support acts as a "bridge" between existing operational technology within a plant, for example factory machines, and plant database networks, so valuable data can be shared reliably and securely to improve plant productivity and efficiency.

## **Benefits of IIoT**

- Achieve better access to data and increase your company's bottom line
- Notify production management of essential data to improve efficiency.
- Alert maintenance team of critical data to troubleshoot machine and / or do preventive maintenance
- Increase connectivity and communications of essential data within manufacturing plant personnel from factory floor to executive offices
- Securely and reliably share existing operational data of factory machines with plant networks
- Get real-time data from anywhere in the world over secure MQTT protocol

## EZ-IIoT Utility

**Quick and EZ Access to Data that is published to a Broker by EZLogix**

**Store Data locally on PC or Server by using Utility's "push data" feature**



## Edge Gateway

Edge gateway, also known as "Edge-of-Network," devices unlock valuable data from existing operational equipment, providing your business powerful information that can be utilized to improve overall productivity and efficiency, thus increasing your bottom line! In the manufacturing world, edge gateway devices translate existing data used by control applications into an IIoT friendly format that can be sent to the "Internet". A secure, reliable and fast method of "edge gateway communication" is done through the widely accepted MQTT protocol.

The EZ Rack PLC operates as an "Edge-Gateway" device with direct connectivity to external devices such as sensors, RTDs, analog inputs, etc. It can take these direct inputs from devices, for example a 4-20 mA signal from an analog sensor, and do complex manipulations using the CPU's advanced math function blocks, and can then communicate that output securely with other operational devices over open protocols such as Modbus RTU or TCP/IP. Through the use of the MQTT protocol, EZ Rack PLC IIoT ready CPU can also publish up to 80 tags of the computed data to the "Internet" via a "Broker", thus providing a subscriber pertinent real time data from these external devices. The use of the MQTT protocol allows for great interoperability since it is becoming an industry standard. It also allows for great security through the broker. An important note with the EZ Rack PLC PLC, is that it is very secure with the MQTT protocol instruction as there is no backwards flow of data. That is data is only ever published from the PLC; it will never accept any data or commands back from any server, broker or client. Hence, there is no fear of disruption to the machine/ PLC operation. It is a secure and reliable method of sharing machine data to intended personnel.

## EZ-IIoT Utility

- Free IIoT Subscriber Utility
- Automatically populates "topics" (Data) sent to broker from EZ Rack PLC MQTT Instruction
- Push data function to local PC or Server
- EZ to navigate "Essential Data" dashboard





# **EZRackPLC™** Data Logging Instruction

- **Store up to 64GB of valuable PLC data on EZRack PLC built-in USB port**
- **Stay connected from anywhere in real-time with plant production and maintenance data using EZRack PLC secure IIoT / MQTT protocol for data transfer**
- **Store real-time PLC data based on tag event and time intervals in .csv format**
- **Remotely access PLC data using Free EZIIoT utility with integrated message queuing telemetry transport (MQTT) protocol**



LOG DATA TO FILE			
CONST	-Base	RAMP	OUT
Paint Boo	Stat-	R98	
	File-	32	
	R12		
0	-Time		
MilliSeco	-Interval		

# on USB

Log Data to File Instruction

Instruction Details

File Name and Size

Max 32 char including ext and any appended fields.

☐ Tag Based ☐ Fixed

Paint Booth Station A

Append to File Name ☒ Hour (Uses 4 char) ☐ Day (Uses 2 char) ☐ Month (Uses 3 char)

File Size Tag

Tag shows file size in bytes. Data Saved in CSV Format.

Log

Log Type: At Regular Time Intervals (When Enable Tag is High)

Event/Enable Tag: LT

Log Time-interval: 0 MilliSecond

Status Tag: INPUT ALM

Status value definitions:  
 00: Normal operation (No Errors)  
 02: File open error (USB Drive may not be plugged)  
 04: File write error (USB Drive may be full)

Select Tags

Tag Names are used as column headers in CSV file. With each record ☒ Log PLC Date ☒ Log PLC Time Decimal Places for Floating Point Tags: 5

Available Tags:

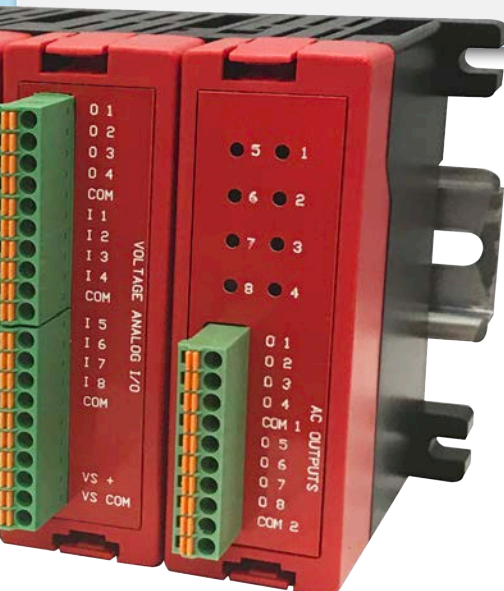
Name	Address	Type
INPUT 1	R1	UNSIGNED_INT_16
R1.ACC	R1	UNSIGNED_INT_16
R1.PRE	R3	UNSIGNED_INT_16
RAMP CNT	R21	UNSIGNED_INT_16
RAMP UP	R23	UNSIGNED_INT_16
SCALE	R31	UNSIGNED_INT_16
FLASH.RES1	R33	UNSIGNED_INT_16
FLASH.RES2	R34	UNSIGNED_INT_16
SCALE RESULT	R42	UNSIGNED_INT_16
RAMP RATE	R56	UNSIGNED_INT_16

Selected Tags: (4/10)

Name	Address	Type
R1	R1	UNSIGNED_INT_16
INPUT 2	R2	UNSIGNED_INT_16
FLASH	R32	UNSIGNED_INT_16
RAMP MIN	R43	UNSIGNED_INT_16

Delete Tag(s)  
Move Tag Up  
Move Tag Down

OK Cancel Help

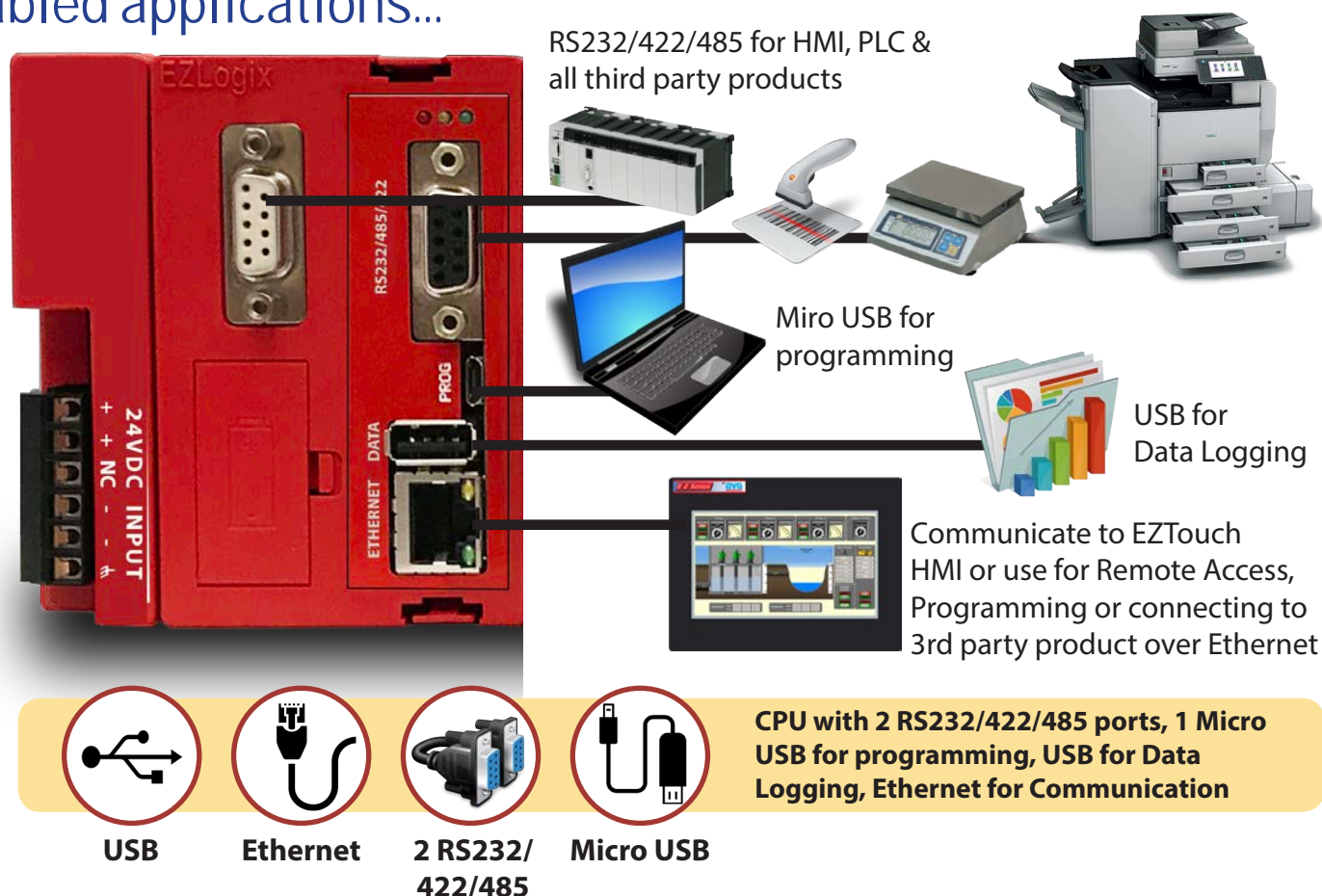




# EZRackPLC™

## Communications as Easy as 1-2-3

Top reasons to choose EZRack PLC for communication-enabled applications...



### 1 Built-in Ethernet TCP/IP

Use EZRack PLC enhanced base models for Ethernet connectivity included in the CPU. The ethernet port can also be used for programming the EZRack PLC thus leaving Port 1 and Port 2 free for other communication and networking needs. This offers the most flexible communication setup in the Micro-PLC world at the most affordable prices! The ethernet port has 3 protocols, EZ TCP/IP, Modbus TCP/IP and MQTT.

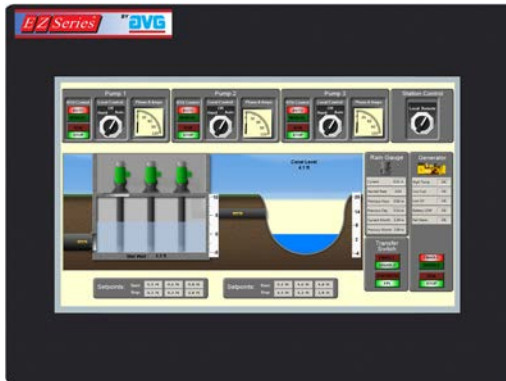
### 2 2 Serial Comm. Ports

The EZRack PLC has two serial communication ports for maximum flexibility. Both Port 1 & 2 can be used for programming, communication to an operator interface, networking to AC drives or any other compatible device with multi-drop capability over RS232/422/485.



### 3 Data Logging on USB

Store data locally on CPU USB Port, send over Ethernet to a local server, or transfer to EZiIoT Utility for real-time data.



### 5 Built-in Ethernet Port

Use Ethernet on EZ Rack PLC for connecting an HMI, AC Drive or 3rd Party device over Modbus TCP/IP. The Ethernet port can also be used for programming and viewing data in real-time over the secure MQTT Protocol.

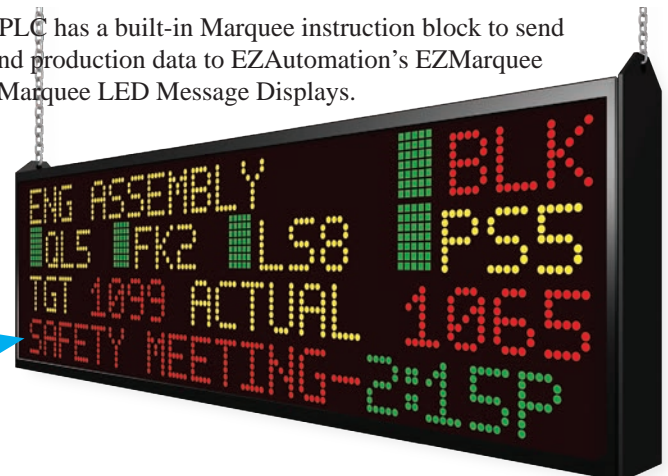


### 6 Uses of RS232/422/485 Built-in Serial Ports

- EZ Rack PLC has built-in ASCII In/Out communication capability which allows you to connect to any compatible ASCII device in a seamless manner
- Expand your EZ Rack PLC rack over RS422/485 up to 2048 I/O
- Send data to weigh scale, bar code scanners and printers

### 7 Connect to EZMarquee over Serial or Ethernet

EZ Rack PLC has a built-in Marquee instruction block to send critical and production data to EZAutomation's EZMarquee and EZ iMarquee LED Message Displays.



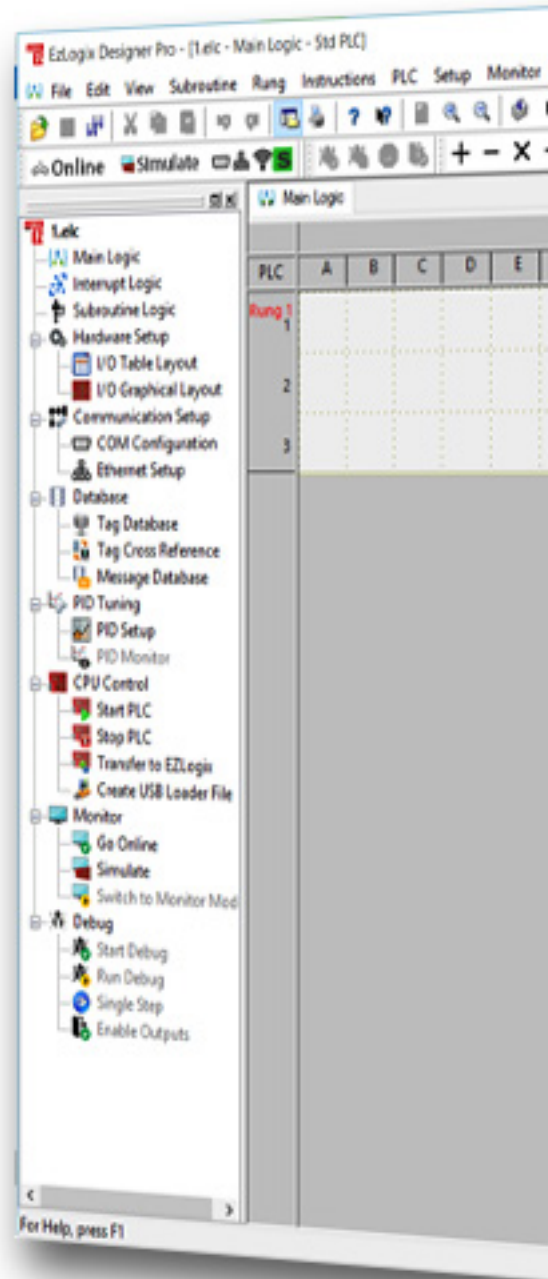


# **EZRackPLC™** Advanced Function Blocks

EZRack PLC Designer Pro comes with a library of pre-defined function blocks such as scaling, compare, hi/low alarm, averaging, min/max, ramp generator, advanced math and many more, found typically in much more expensive PLCs.

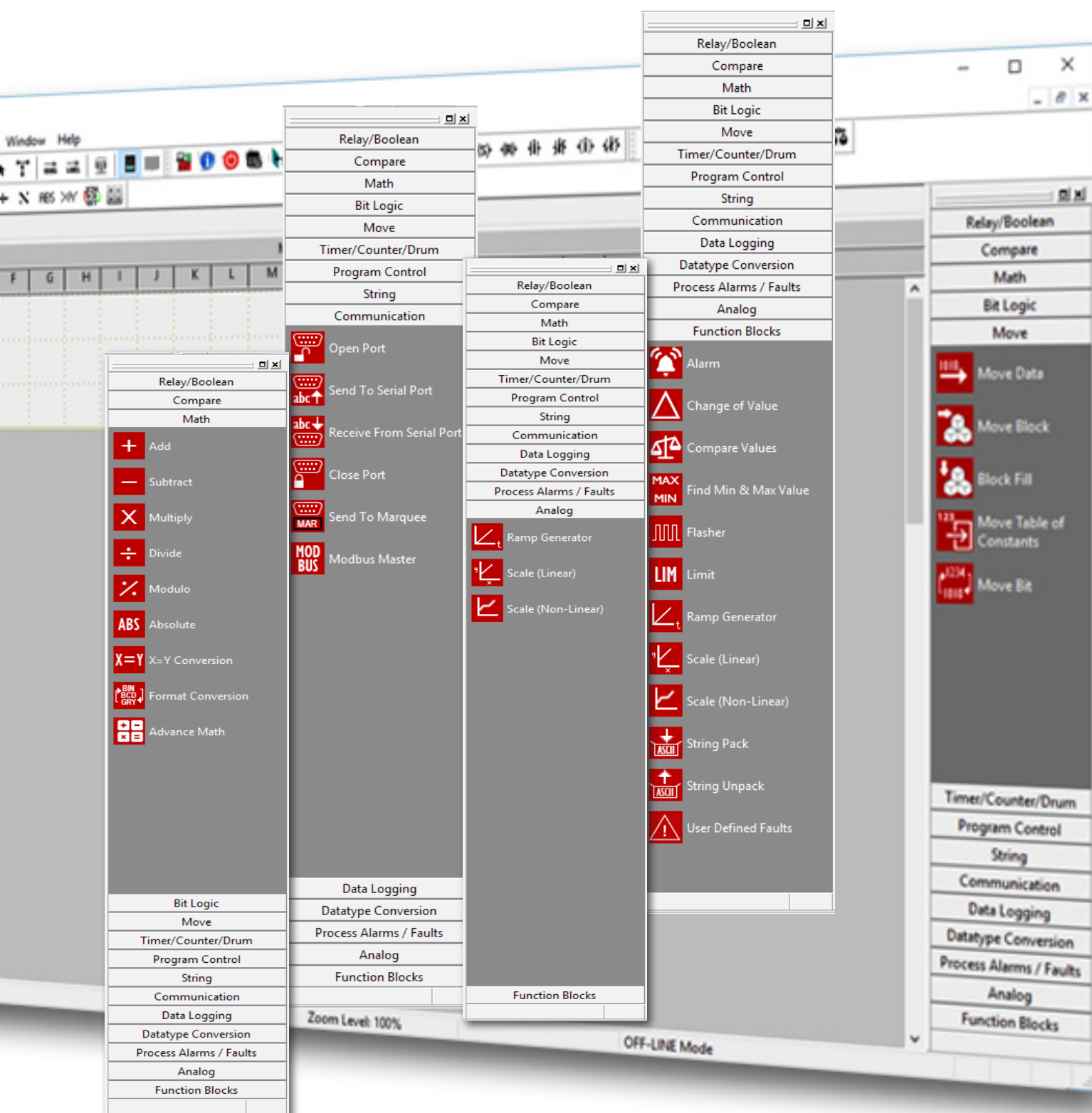
The Free EZRack PLC Designer Pro software has been designed to provide our customers a more flexible and easy to use PLC programming experience. The EZRack PLC function blocks will continue to grow with customer requests at no additional costs to upgrade.

- Alarm
- Advanced Math
- Change of Value
- Compare Values
- Find Min and Max
- Flasher
- Limit
- Ramp generator
- Scale (Linear)
- Scale (Non-linear)
- String Pack
- String Unpack
- User defined faults
- IIoT (MQTT Publish)



## Advanced Function Blocks

EZRack PLC has powerful instructions & Advanced function blocks found only in much more expensive PLCs



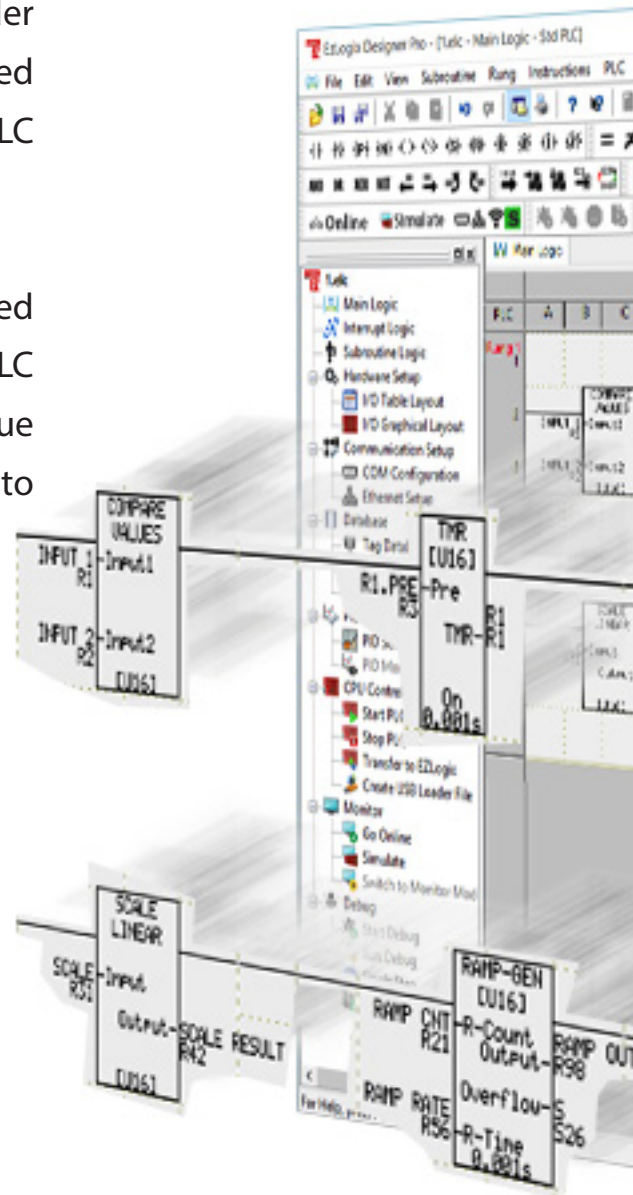


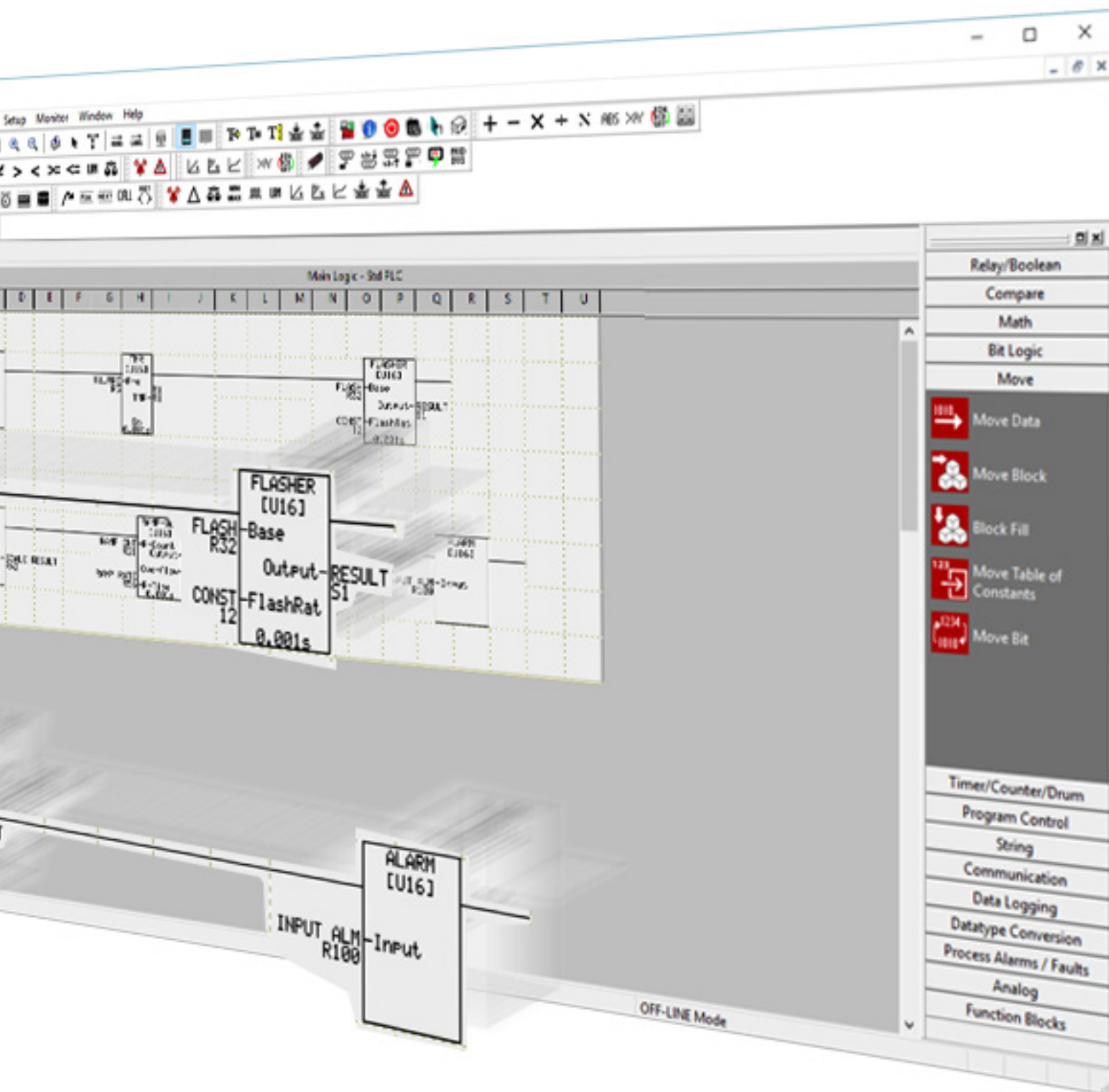
# **EZRackPLC™** Rich Instruction Set

With optimized instruction sets whether it be simple ladder relay, boolean, move, bit logic instructions etc... or advanced math instructions for complex algorithm, the EZRack PLC Designer Pro has it all.

The Free EZRack PLC Designer Pro software has been designed to provide our customers a more flexible and easy to use PLC programming software. The EZRack PLC functions will continue to grow upon customer requests at no additional costs to upgrade.

- Relay/Boolean
- Compare
- Advanced Math
- Bit Logic
- Move
- Time, Counter, Drum
- Program control
- String
- Communication
- Data Logging
- Datatype conversion
- Process alarms/ Faults
- Analog
- IIoT







# EZRackPLC™ Automatic I/O Configuration

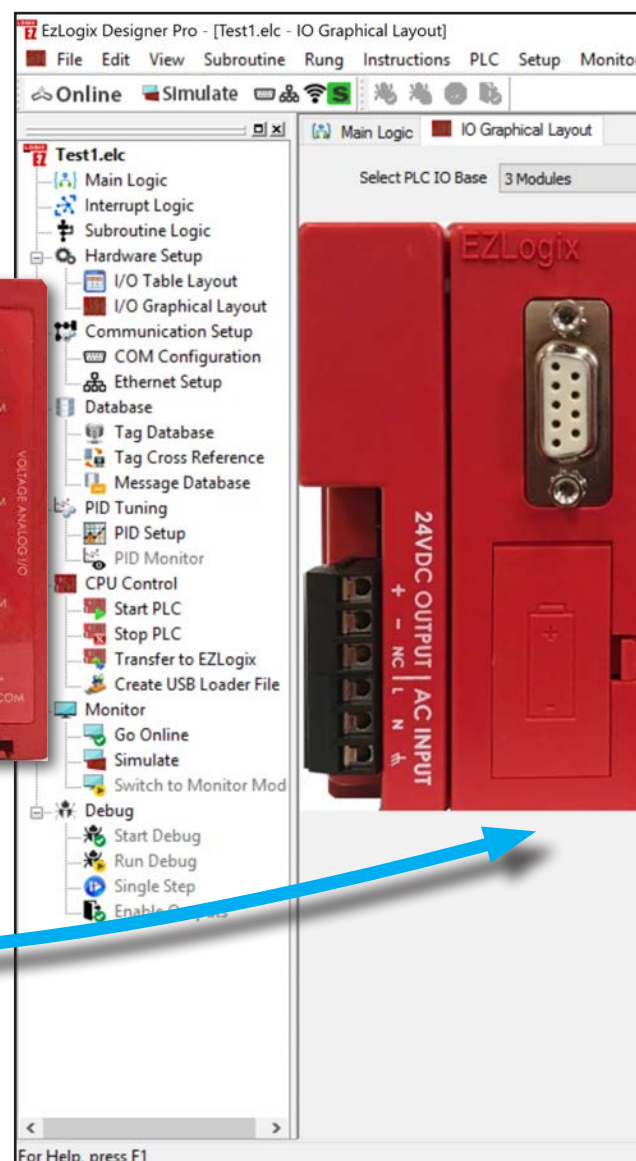
Configure your EZRack PLC I/O modules automatically when you are connected over USB, Ethernet, EZ WiFi or Serial programming ports.

- Auto detect discrete, analog, and speciality modules within EZRack PLC Designer Pro.
- Automatically assigns respective tag address range.

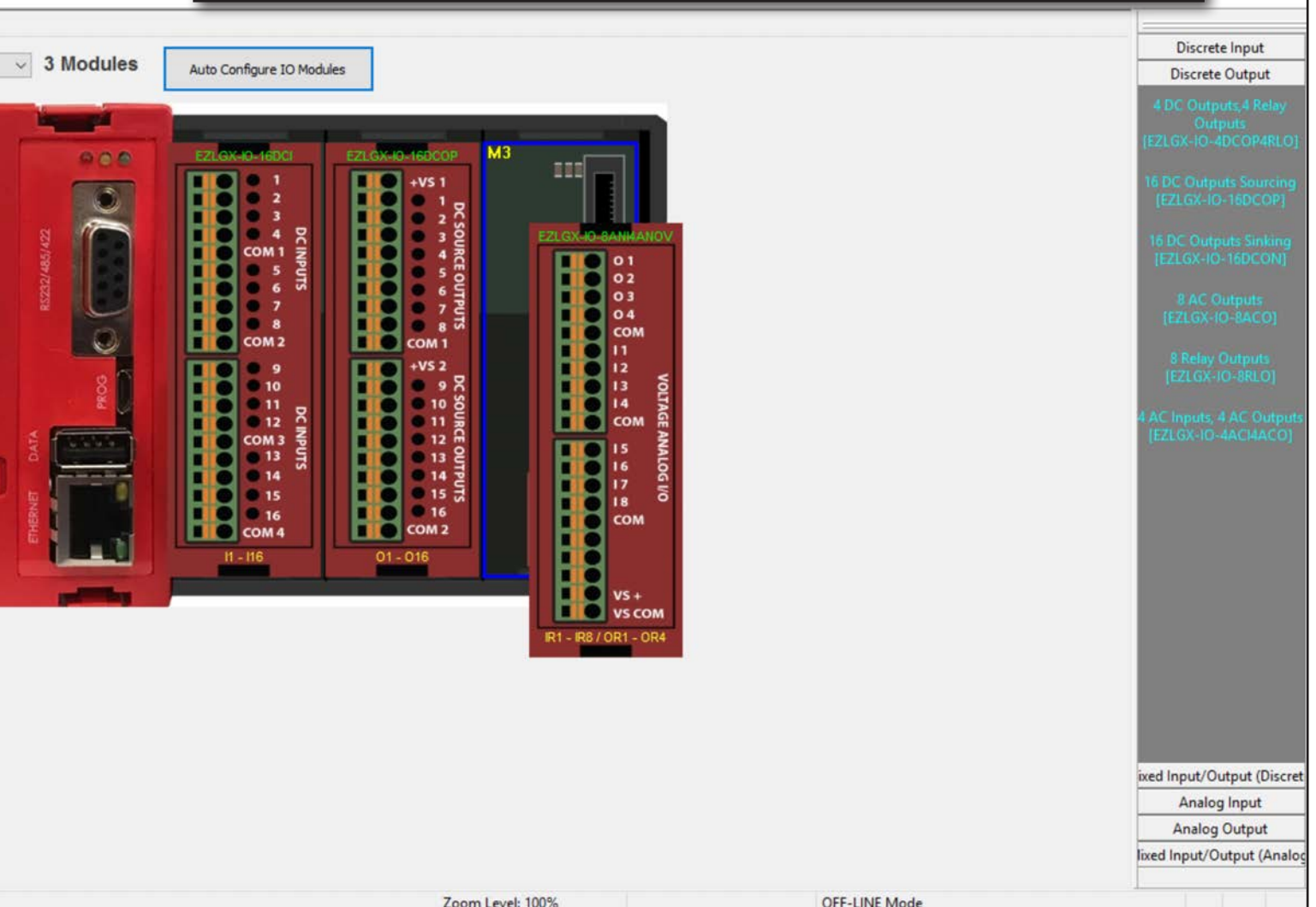
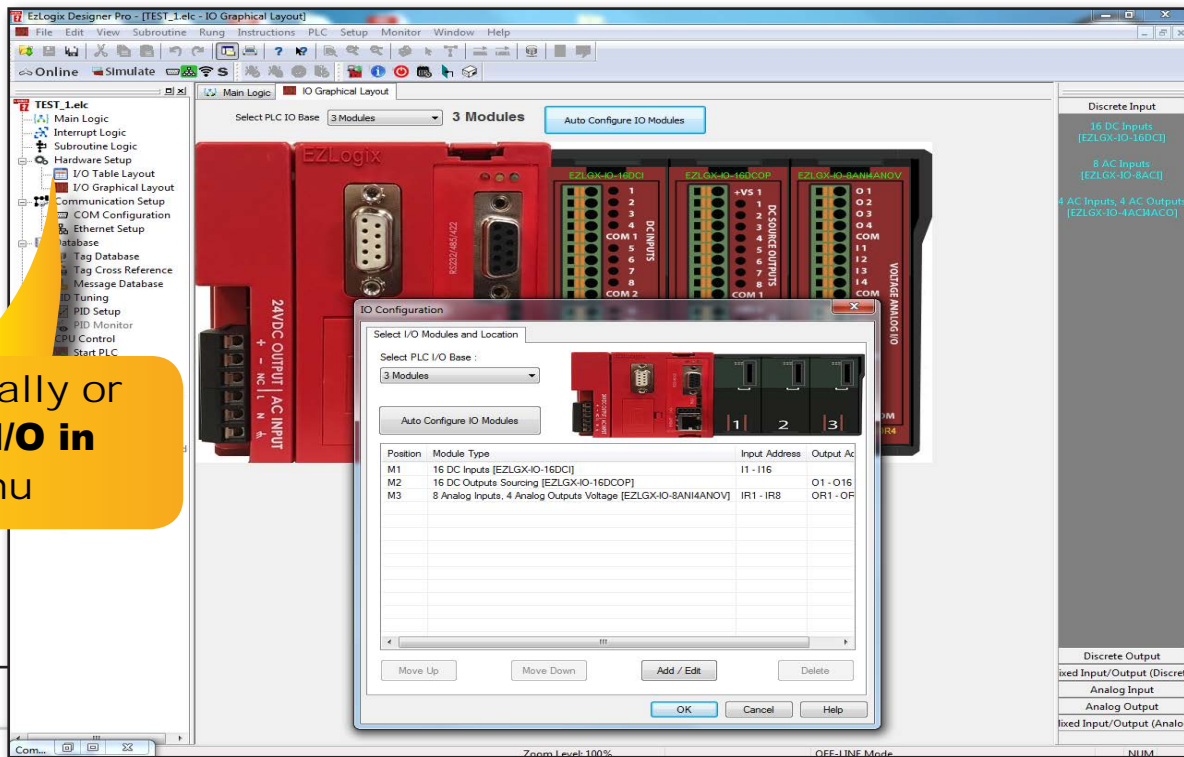
Option to **manually** hardware

## Automatic I/O Configuration

Connect to the EZRack PLC & automatically detect your I/O modules and addresses in the local base



automatically or  
**configure I/O in**  
 setup menu







# The Incredible EZRack PLC can handle Auto-tuned PID Loops with Unique PID Monitor

## What is PID Loop?

PID is one of the most popular control algorithms used in the industry to control the variables involved in an industrial manufacturing process for the proper operation of the process. PID stands for Proportional, Integral and Derivative control algorithm. With a proper choice of P, I, and D settings, a user can maintain a process value very close to the setpoint. In addition, if the setpoint changes, the PID algorithm can quickly bring the process back under control. EZRack PLC supports up to 8 auto-tuned PID loops. For each loop you have to define several parameters, as shown below in the PID Setup window. You may change most of these parameters during run time, using EZRack PLC Designer Pro in online mode.

## PID Loop Auto Tuning

To achieve a stable and responsive process control, it is very important to select the proper PID parameters. Experienced users can estimate good starting values for these parameters and later tweak them to optimize the PID loop performance. This is called as the manual tuning of the process. Whereas, those who want help in estimating the starting values of the parameters like P, I, and D coefficients, EZRack PLC provides an Autotune feature.

## Autotune Control

Each PID Loop is controlled by the Start Autotune discrete variable (which is at Discrete Base+4). If the variable goes from false to true, and the loop is in manual mode, EZRack PLC would start autotuning that loop.

## Autotune Setup

The EZRack PLC can autotune PID loops, i.e. it can estimate the values for the Proportional Gain, Integral (Reset) time, and Derivative (Rate) time for PID loop. The dialog box allows you to setup the loop for autotune. EZRack PLC uses Ziegler-Nichols method to estimate the PID parameters.

## Start Autotune

Shown on the dialog box for information only.

The Start Autotune discrete is at Discrete Base+4. EZRack PLC initiates autotuning of a loop when this bit transitions from 0 to 1. Autotuning of the loop is started regardless of the selected "PID Loop Mode" of the loop. Once Autotune is started, you can stop it by setting this bit to 0.

## Timeout Time (in sec)

User programs Autotune timeout in seconds in this register. If EZRack PLC can not finish autotuning within this time, the Autotune is aborted. User should program this field based on the dynamics of the process.

## Autotune Status

Shown on the dialog box for information only. During Autotune, EZ Rack PLC reports the status of Autotune in the register.

0	Tuning in Progress
1	Tuning Done
2	User cancelled tuning
3	Control Value could not be incremented
4	The tuning algorithm failed to fit the curve
5	Division by zero error
6	Could not determine dead time
7	one or more of P, I or D was out of range

*Note: Autotune is performed by EZ Rack PLC observing open loop response to a step change in the control value. Before starting autotune, the process should be in a steady state. During Autotune, watch the process variable closely for it to be within the safe limits.*



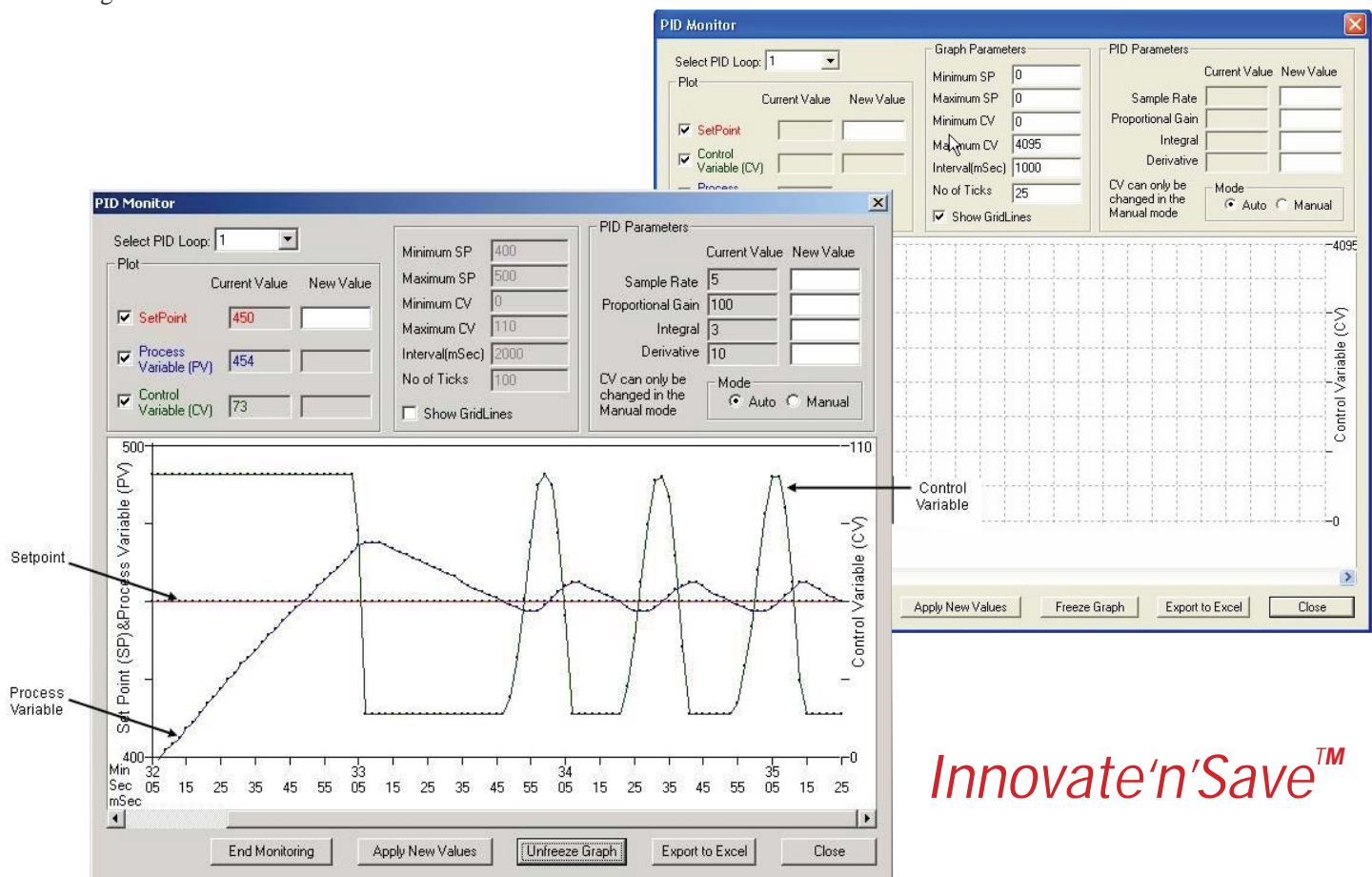
Auto Tuned  
PID Loops with  
Unique PID  
Monitor

## Tuning Type

User selects if PI or PID tuning is required.

## PID Monitor

You can use the PID Monitor function to monitor and make real-time changes to your PID Loop. In order to use it, you must be connected to the PLC and select Main Menu > EZ Rack PLC > PID Monitor. A PID Monitor window will show up. Here you can change the current values of the parameters by entering a value in the New Value field. Once all of the parameters are defined, press the Apply button and then the Start Monitoring button at the bottom, to begin monitoring your PID Loop. A graph will begin to appear as shown in the image below.



*Innovate'n'Save™*

In the illustration above, the Setpoint and Process Variable were set to 450 and are represented by the line running through the middle of the graph. The Minimum SP of 400 is shown at the bottom left and the Maximum Limit of 500 is shown at the top left of the graph. The Control Variable was set to 110 and is represented on the right side of the graph.



# EZRackPLC™ Force Inputs/Outputs (Gr

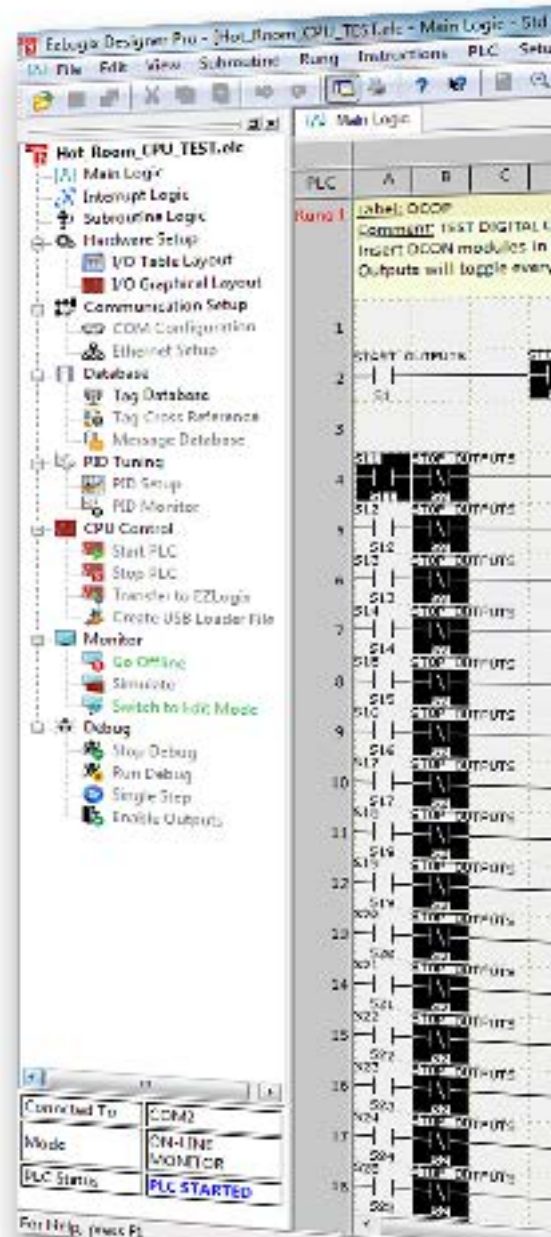
EZRack PLC CPU supports true Forcing of I/O and internal memory elements. Discrete I/O can be forced to either an ON or OFF state. Analog I/O points can be forced to constant values.

The forcing of numeric and bit memory elements simple means the CPU sets the element to the forced value and does not permit any additional update to the memory element as long as it is forced.

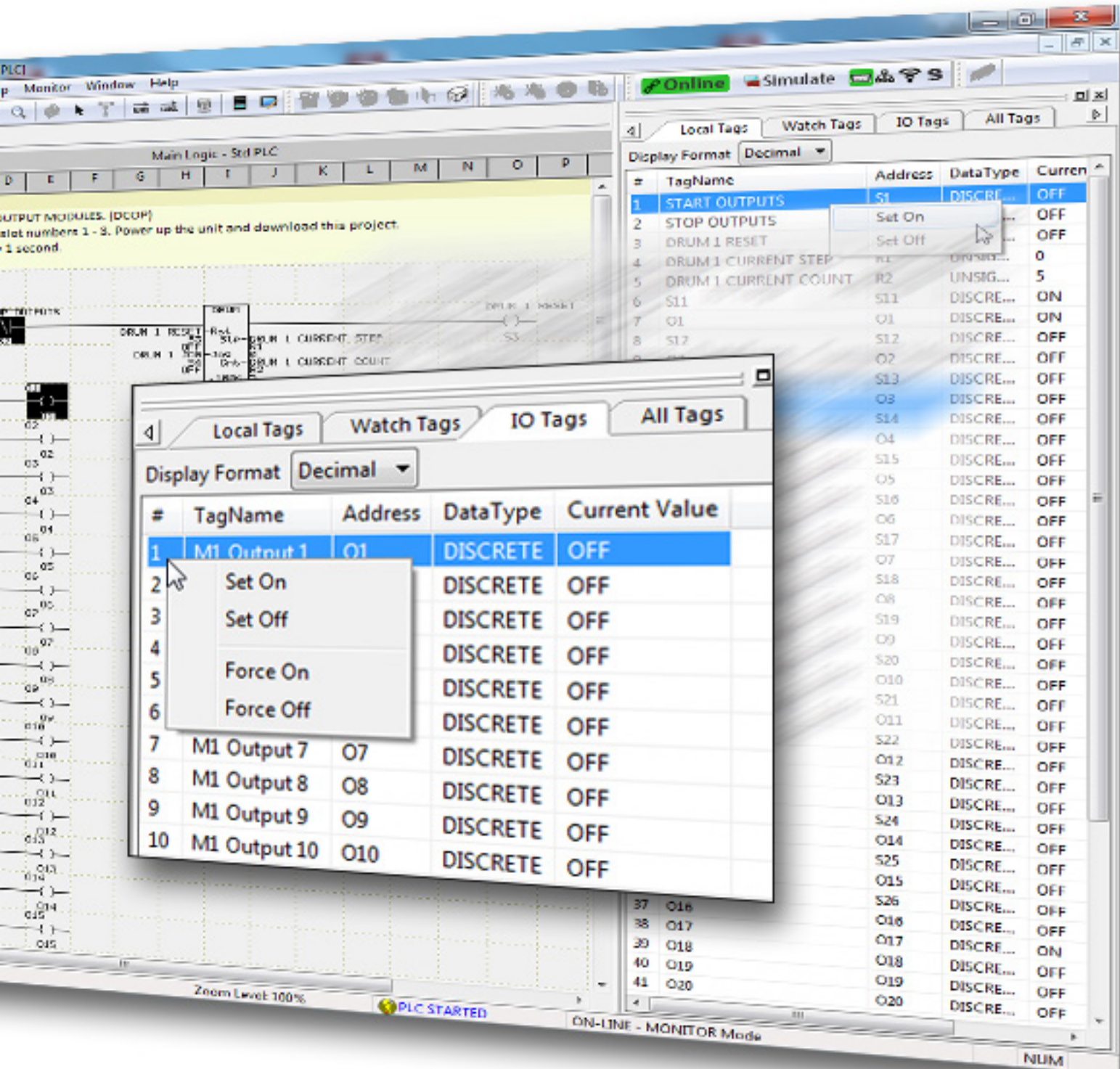
## What is Forcing I/O?

The ability to Force I/O allows you to troubleshoot particular sections of your ladder program by “forcing” a state, in the case of a discrete I/O, or value, in an analog I/O, to make sure you are getting the expected result.

In order to comprehend the benefit of Forcing I/O, one must first distinguish the difference between the physical I/O of a PLC, called the “field side”, and the internal status of that physical I/O within the ladder program, called the “logic side”. In regular operation of a PLC, the status of the physical inputs is copied to the logic side at the top of the PLC scan, and the logic side of the outputs is copied to the fields side at the bottom of each scan. Forcing I/O interrupts the normal processing of the inputs and outputs. Instead, when an I/O is forced, the “logic side” is set to the forced value, and any change in the physical I/O is ignored, and any attempt to change the value or state in the logic is also ignored until the force is released.



# Great Troubleshooting Tool)



The screenshot displays the EZ Rack PLC software interface. The main window shows a ladder logic diagram for a PLC. Overlaid on this is the 'IO Tags' window, which lists various tags and their current values. A context menu is open over the first row of the 'IO Tags' table, showing options: 'Set On', 'Set Off', 'Force On', and 'Force Off'.

**IO Tags Table:**

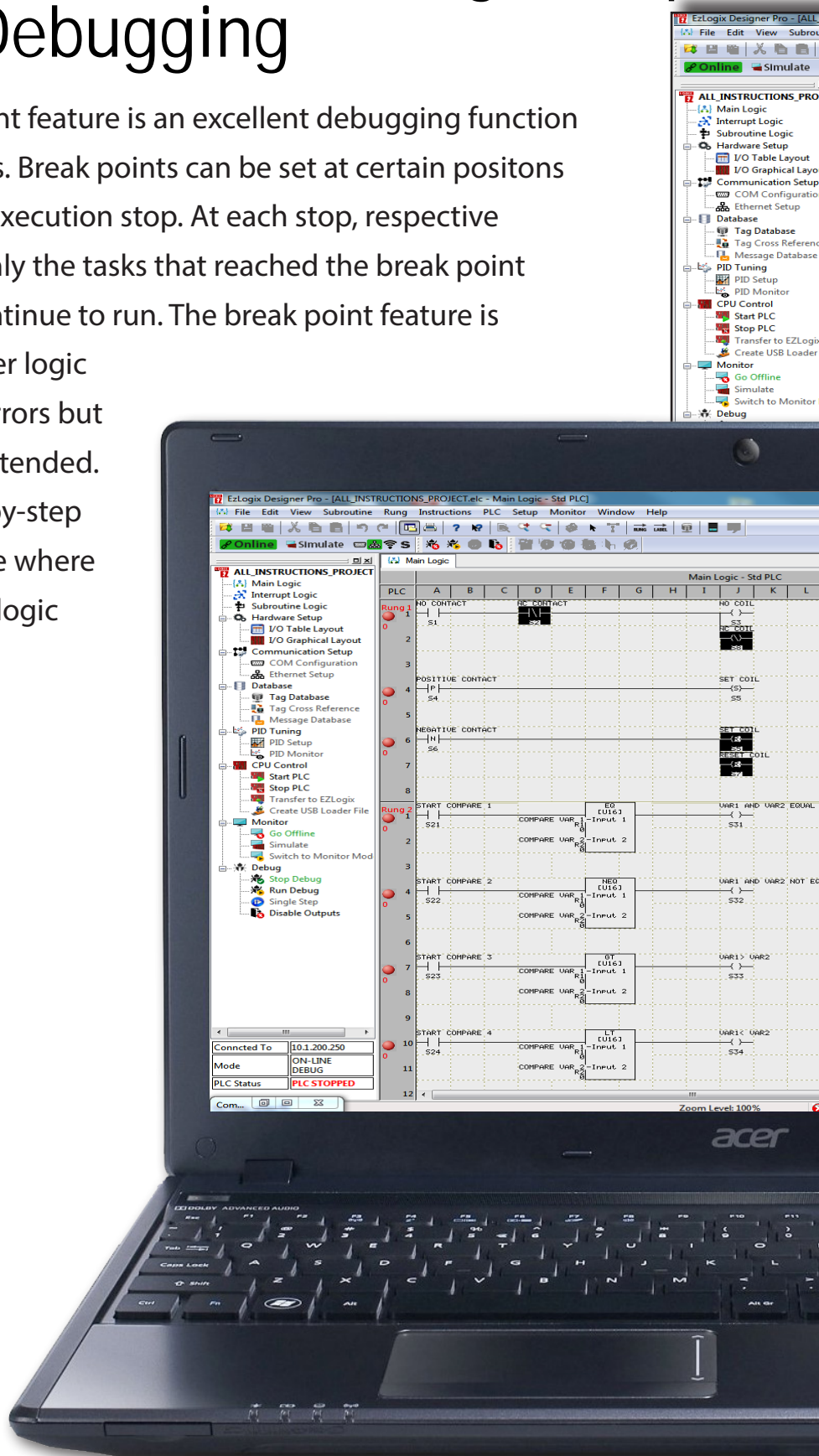
#	TagName	Address	Data Type	Current Value
1	START OUTPUTS	S1	DISCRETE	OFF
2	STOP OUTPUTS			OFF
3	DRUM 1 RESET			0
4	DRUM 1 CURRENT STEP	R2	UNSIGNED	5
5	DRUM 1 CURRENT COUNT			
6	S11	S11	DISCRETE	ON
7	O1	O1	DISCRETE	ON
8	S12	S12	DISCRETE	OFF
9	O2	O2	DISCRETE	OFF
10	S13	S13	DISCRETE	OFF
11	O3	O3	DISCRETE	OFF
12	S14	S14	DISCRETE	OFF
13	O4	O4	DISCRETE	OFF
14	S15	S15	DISCRETE	OFF
15	O5	O5	DISCRETE	OFF
16	S16	S16	DISCRETE	OFF
17	O6	O6	DISCRETE	OFF
18	S17	S17	DISCRETE	OFF
19	O7	O7	DISCRETE	OFF
20	S18	S18	DISCRETE	OFF
21	O8	O8	DISCRETE	OFF
22	S19	S19	DISCRETE	OFF
23	O9	O9	DISCRETE	OFF
24	S20	S20	DISCRETE	OFF
25	O10	O10	DISCRETE	OFF
26	S21	S21	DISCRETE	OFF
27	O11	O11	DISCRETE	OFF
28	S22	S22	DISCRETE	OFF
29	O12	O12	DISCRETE	OFF
30	S23	S23	DISCRETE	OFF
31	O13	O13	DISCRETE	OFF
32	S24	S24	DISCRETE	OFF
33	O14	O14	DISCRETE	OFF
34	S25	S25	DISCRETE	OFF
35	O15	O15	DISCRETE	OFF
36	S26	S26	DISCRETE	OFF
37	O16	O16	DISCRETE	OFF
38	S27	S27	DISCRETE	OFF
39	O17	O17	DISCRETE	OFF
40	S28	S28	DISCRETE	ON
41	O18	O18	DISCRETE	OFF
42	S29	S29	DISCRETE	OFF
43	O19	O19	DISCRETE	OFF
44	S30	S30	DISCRETE	OFF
45	O20	O20	DISCRETE	OFF

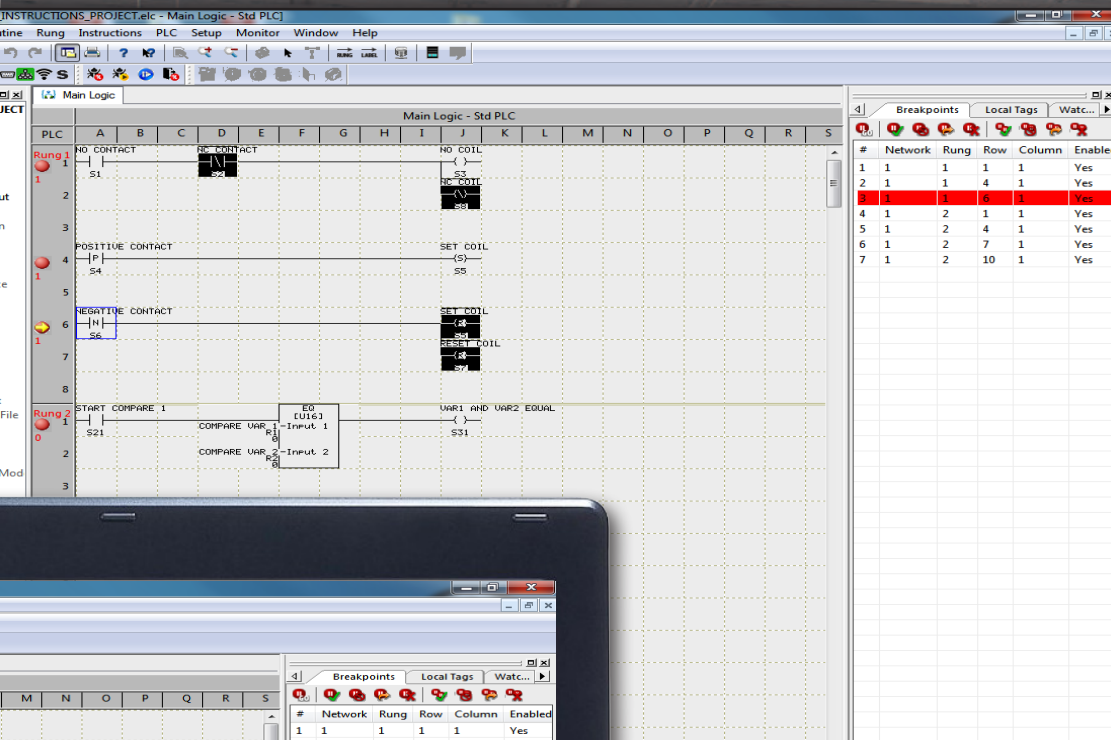
The interface also shows a 'Main Logic - Std PLC' window with a ladder logic diagram. The status bar at the bottom indicates 'PLC STARTED' and 'ON-LINE - MONITOR Mode'.



# EZRackPLC™ Break-Point / Single Step Debugging

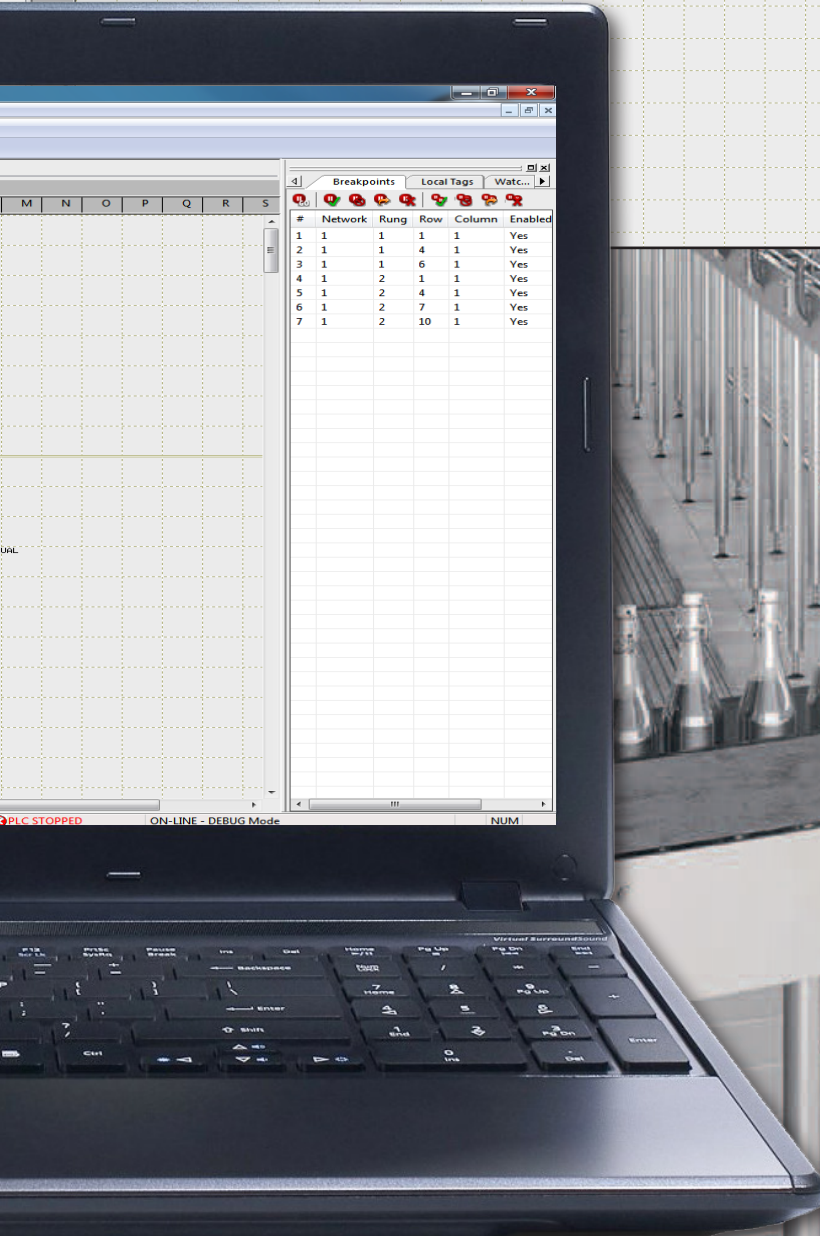
EZRack PLC Designer Pro's Break Point feature is an excellent debugging function to troubleshoot programming errors. Break points can be set at certain positions in the program in order to force an execution stop. At each stop, respective variable values can be examined. Only the tasks that reached the break point are stopped while all other tasks continue to run. The break point feature is ideal for troubleshooting large ladder logic programs that do not have syntax errors but are not performing in the manner intended. It provides the programmer a step-by-step execution of variables in order to see where the potential bugs are in the ladder logic code.





## Single Step Debugging

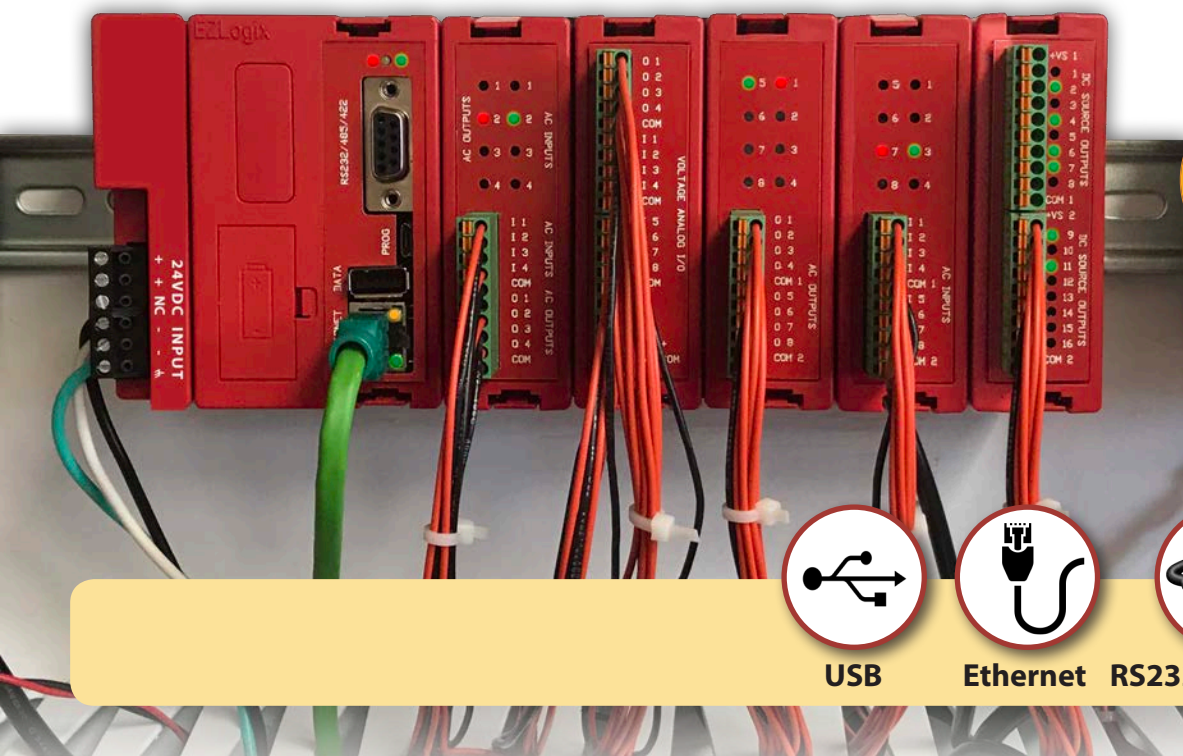
Takes you step-by-step to debug the rung from the start of your break-point





# EZRackPLC™

## Heavy Duty, Powerful Modular PLC ...



Base + CPU  
\$248



USB



Ethernet



RS232/422/485



Micro USB



### 1 Vibration Ready Plug-in I/O Modules

Rugged Snap-in latches to secure the EZRack PLC I/O Modules to its base. Unlike DirectLogics and Do-More that can easily pop-out.

### 2 Engineered Shatter-proof Plastic Housing

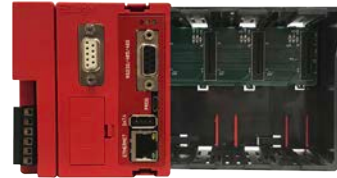
EZRack PLC construction is designed for rugged environments with dust, vibration and typical industrial control cabinet conditions. Tested and proven on a stamping press application.



# ... at a Fraction of the Cost of Traditional Micro-Brick PLCs

## 3 CPU + 3, 5 and 7 Slot Bases

- Standard with RS232/422/485 communications
- 10/100 Base-T Ethernet for programming and communications
- USB for Datalogging
- Micro USB for Programming
- CPU slot is independent of base I/O slots allowing extra I/O per PLC



EXTRA  
SLOT

*When compared to  
DirectLogics and  
Do-More PLCs*

## 4 CPU Status, Low Battery and USB LED Indicators

Quick diagnostics LEDs for CPU status, low battery indication and data logging on USB thumb drive.



## 5 Din-Rail or Panel Mounting

EZRack PLC base equipped with self-locking DIN-rail latch or Panel mount screw holes.





# EZRackPLC™ Rugged Modular Rack Hardware



## AC / DC Input Power Supply with 24 VDC Auxillary Output

20-28 VDC or 90-265 VAC  
Input with 24 VDC, 800mA  
Auxillary Output to Power external device



CPU S  
and L  
Quick c  
status,  
data lo

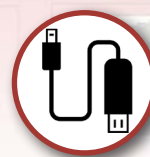


## Secure Snap-in Latches - No breaking tabs!

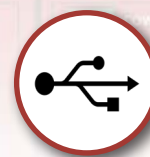
Rugged Snap-in latches to secure the EZRack PLC I/O Modules to it's base. Unlike DirectLogics and Do-More I/O that notoriously break.



RS232/422/485 Micro USB



USB



Eth



## Engineered Shatter-proof Plastic Housing

Shock test: 30g (IEC 60068-2-27)

Vibration test: 2g @ 10...500 Hz  
(IEC 60068-2-6)

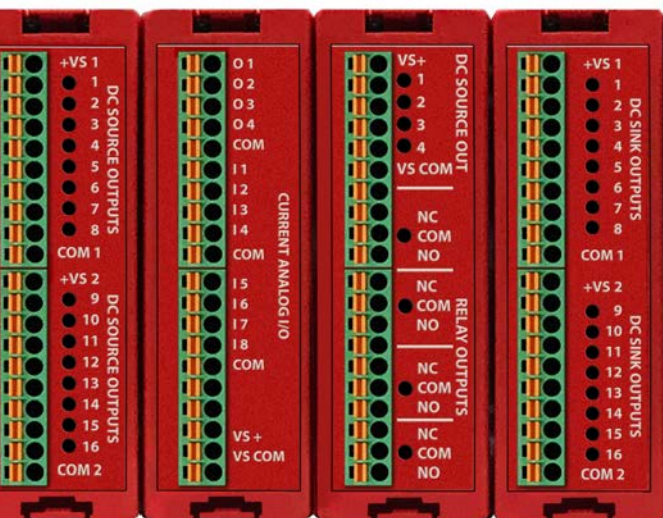
## Host of Communication Capabilities / Ports

- Ethernet as a standard: Modbus TCP, EZRack PLC TCP/IP, MQTT, monitoring, programming
- Serial RS232/422/485: Modbus RTU Master / Slave, ASCII In / Out, EZRack protocol, programming, monitoring, EZ WiFi
- USB type A: Data Logging up to 64GB
- Micro USB: Programming

# ware Constructions

## Status, Low Battery USB LED Indicators

Diagnostic LEDs for CPU  
Low battery indication and  
Logging on USB thumb drive.



P/IP,  
ing and

ck PLC  
and

GB

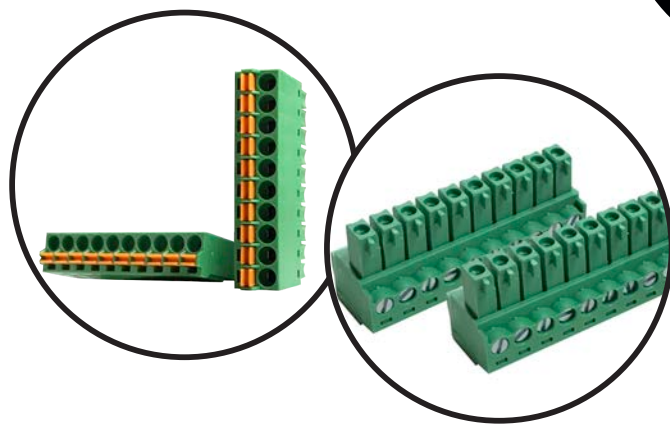
## Electrical Noise Immune

Nema ICS 2-230 Showering arc;  
ANSI C37.90a SWC;  
Level C Chattering Relay Tested

## Din-Rail or Panel Mounting

DIN EN standard 50022

4/6 screws with star washers



## Spring Loaded or Screw type I/O Terminal Blocks

EZ to wire spring loaded or screw type I/O terminal blocks that can take 14 to 24 AWG wires (1 14AWG, 2 18 AWG, 4 22AWG wires per terminal)



## Free Filler Modules

Filler modules cover the unused I/O slots to maintain a completely rugged and closed construction

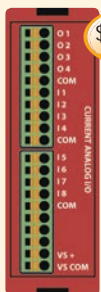




# EZ RackPLC™

## Drop-In Replacement I/O for Do-More and DirectLogics PLCs at 1/2 the Cost

### 8 Analog In, 4 Analog Out



\$199

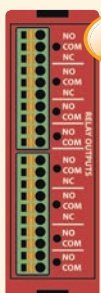


\$363

EZRPL-IO-8ANI4ANOC

F2-8AD4DA-1

### 8 Relay Output



\$52

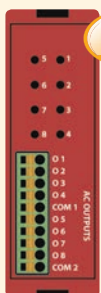


\$103

EZRPL-IO-8RLO

F2-08TRS

### 8 AC Outputs



\$49

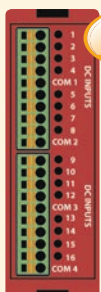


\$124

EZRPL-IO-8ACO

F2-08TA

### 16 DC Inputs



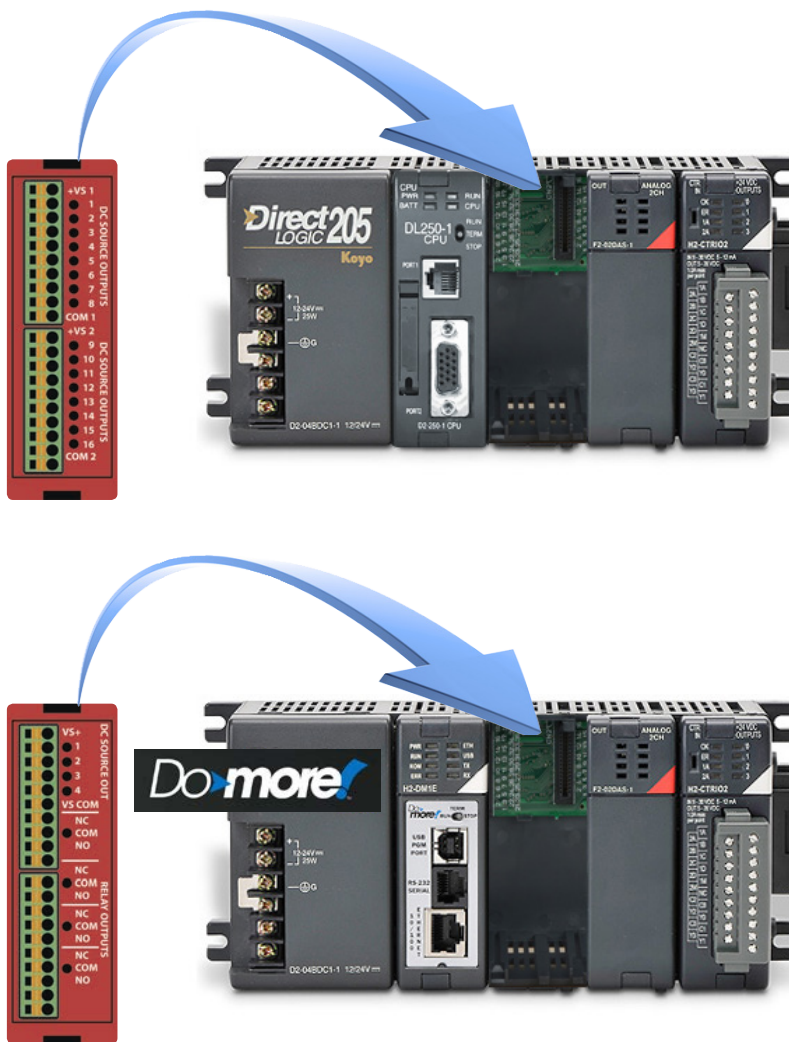
\$49



\$91

EZRPL-IO-16DCI

F2-16ND3-2



- Durable Snap-in Clips to secure to PLC base rack
- EZ to wire spring loaded terminal blocks
- LED indicators per input/output
- Short-circuit protection
- Removable terminal blocks

# EZRack PLC Snap-in I/O Modules Auto-detects on DirectSoft and Do-More Designer



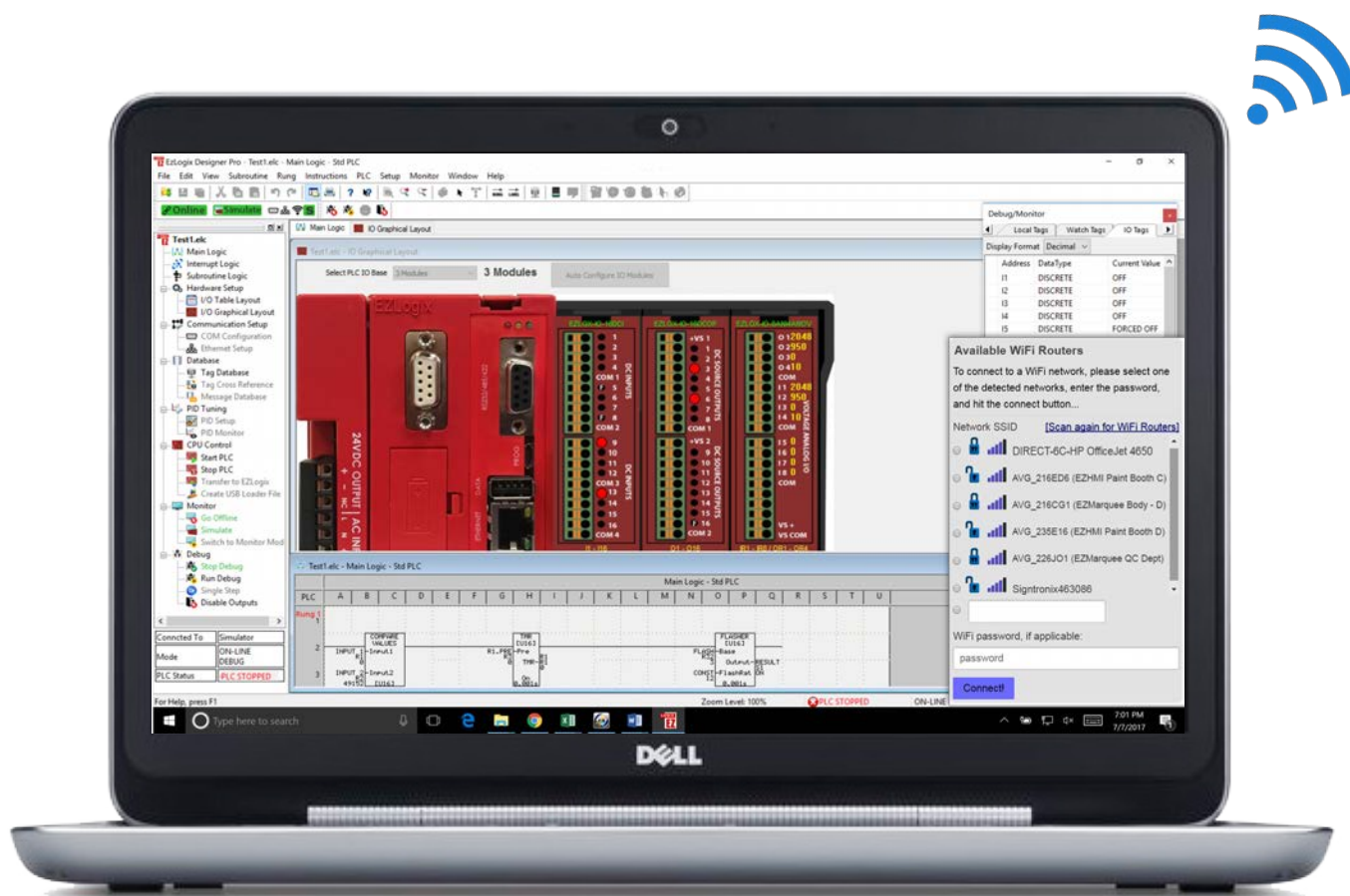
- EZ Rack PLC I/O Modules Snaps in directly to DL205 or Do-More PLCs
- No change in the I/O configuration
- Detects EZ Rack PLC I/O as H2 I/O Modules
- Program EZ Rack PLC I/O modules just like programming on DL06, DL205 or Do-More I/O Modules



# EZRackPLC™ Program & Go Online with EZR

Using the EZWifi module, the EZRack PLC CPU can be both programmed offline and accessed online while in run mode over a wireless Wifi Connection. With EZRack PLC and EZWifi, choose between a one-to-one AD-HOC (AP Mode) connection or connect to your infrastructure network wirelessly through Ethernet (STA Mode).

The EZWifi module for EZRack PLC, can be powered by the on board 24 VDC auxillary output on the EZRack PLC Base, or by 2 AAA Batteries. And don't you worry about Security accesss, as each EZWifi module has its own unique SSID and password. Software security fomats include WPA/WPA2 with encryption WEP/TKIP/AES. Network protocols supported with EZWifi on EZRack PLC include IPV4, TCP/UDP/HTTP/FTP.

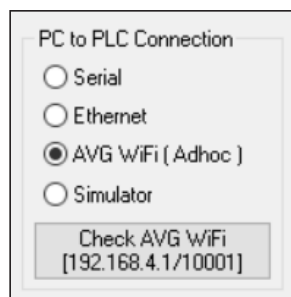
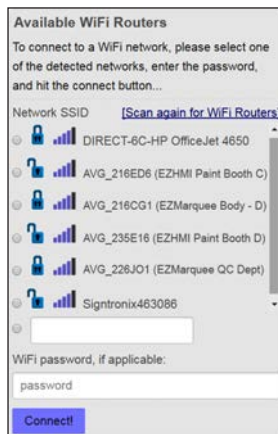


# Rack PLC Wirelessly



## Ad-Hoc Mode Connection

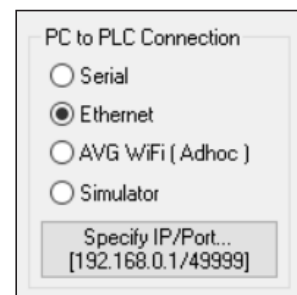
- 1 **Connect to available AVG Wifi Access pt.**
- 2 **Open EZ Rack PLC Designer Pro Programming Software**
- 3 **Select AVG-Wifi (AdHoc)**



## Infrastructure Mode Connection

- 1 **Connect to your Local Network**
- 2 **Open EZ Rack PLC Designer Pro Programming Software**
- 3 **Select PC to PLC Connection as Ethernet**

Ensure IP Address of Network and EZ-Wifi Module match





# EZ RackPLC™ Various Bases for Small to Large Machines including CPU



## 3 Base Slot for Small Machines

- Up to 48 I/O locally.
- Up to 2048 I/O Networked

3 Base+CPU

\$248

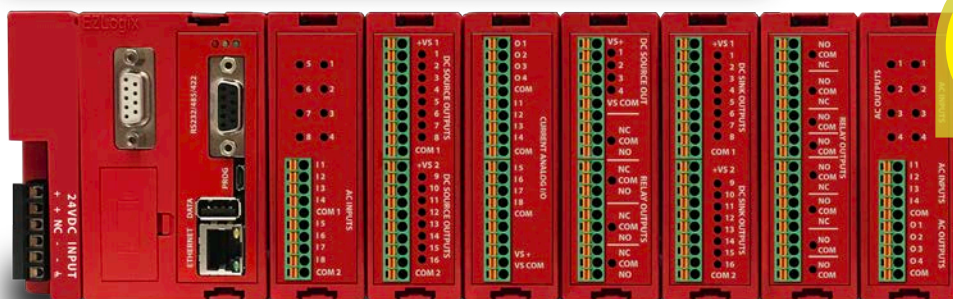


5 Base+CPU

\$268

## 5 Base Slot for Medium Machines

- Up to 80 I/O locally.
- Up to 2048 I/O Networked



7 Base+CPU

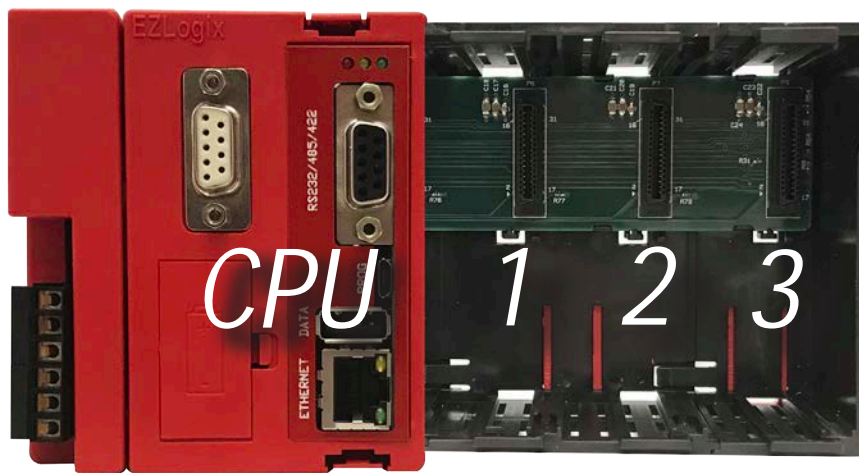
\$288

## 7 Base Slot for Large Machines

- Up to 112 I/O locally.
- Up to 2048 I/O Networked

- **Same Hardware and Software Specs for Small to Large Machines**
- **Advanced Ladder Logic and User friendly Function Blocks**
- **Data logging locally to the PLC, on a local server or to the Cloud**
- **IIoT / Industry 4.0 Ready**
- **2.4 ms scan time including overhead!**
- **500,000 instruction words PLC Program Memory**
- **Independent of Size of PLC base**
- **Built-in Auto-tuned PID Control Loops**
- **Rugged Rack Style, Din-Rail Mount Housing for Industrial Applications**

# Dedicated CPU Slot with Extra Base...



3 Base+CPU  
\$248

Actual  
3 Slot Base  
with CPU

- EZ Rack PLC comes in 3, 5 and 7 Slot Base models with an independent CPU slot
- Power supply is built in to Base PLC rack
- Daisy Chain multiple EZ Rack PLC racks up to 2048 I/O

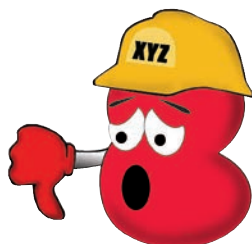


## ... Compare to AutomationDirect

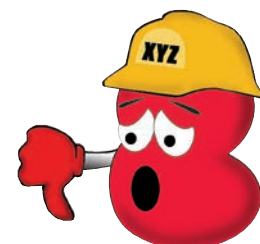


- DirectLogic 205 (D2-250 CPU) + E-Com Module (H2-ECOM100) + 3 Base
- Room for only 1 I/O Module!
- Do-More (H2-DM1E CPU) + 3 Base
- Room for only 2 I/O Modules!

3 Base+CPU  
\$747



3 Base+CPU  
\$531





# EZ RackPLC™ Now has Distributed Control for a fraction of the Cost



500 I/O  
5 Station system  
over Ethernet < \$3000

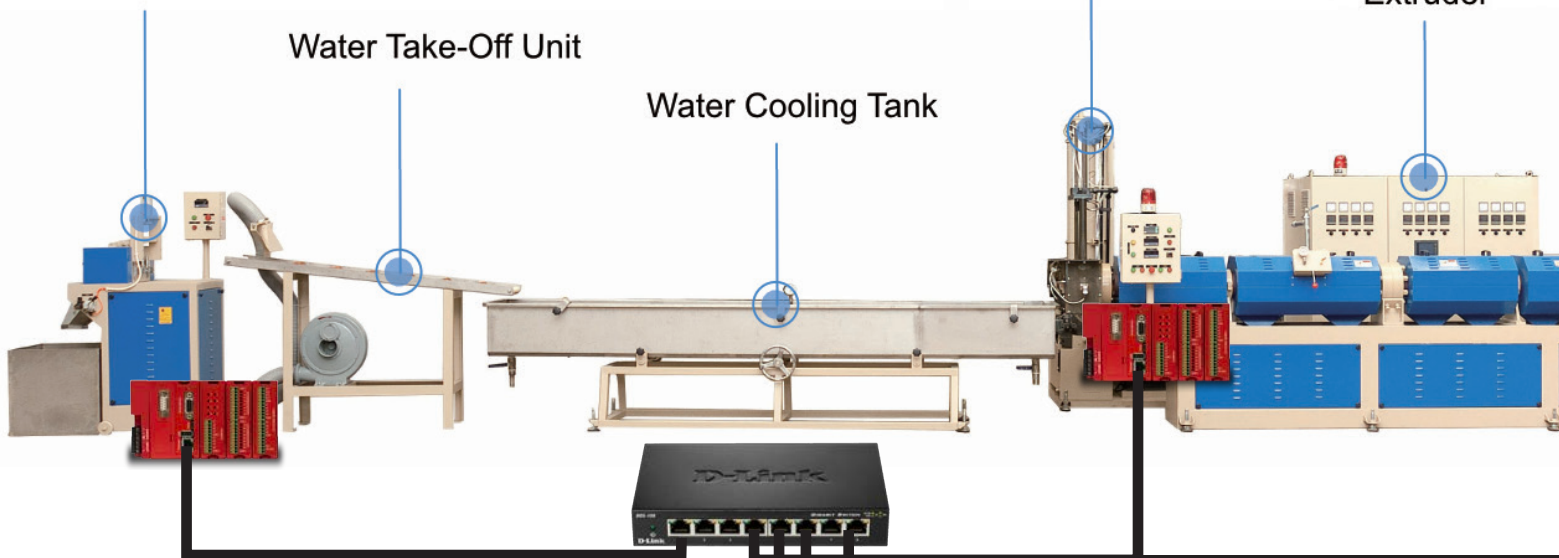
Cutting Unit & Square Storage Tank

Water Take-Off Unit

Water Cooling Tank

Hydraulic Screen Changer

Extruder

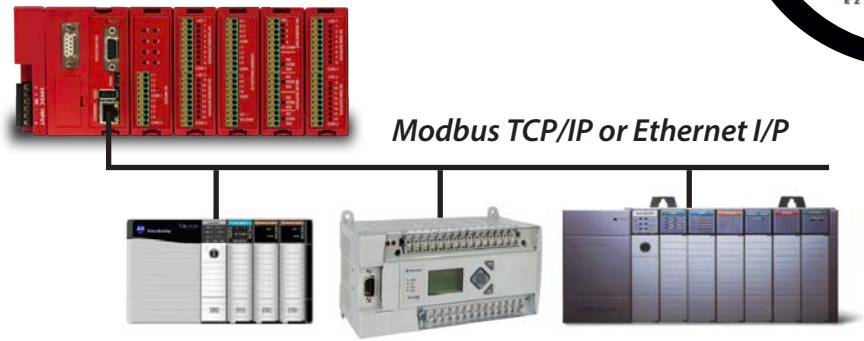


## All the PLCs in the Distributed Network can be programmed either locally or through one port

Many control applications require local controllers working in conjunction with each other forming what is known as a Distributed Control Network. Each local controller has its own CPU and I/O to provide local logic to achieve higher system reliability (you are not counting on one master PLC to control the entire system) as well as higher speeds. Yet the controllers need to work in seamless synchronization as one control system. There are many systems out there in the market from suppliers that service the process control industry such as Honeywell and Foxbro. However the starting price for these systems is over \$20,000!! EZAutomation has enhanced its popular EZRack PLC to provide a comparable if not better Distributed Control system for a fraction of the cost.

EZRack PLC can easily communicate to any other controller with Modbus TCP/IP or Ethernet I/P

(ControlLogix, MicroLogix, SLC PLCs from Allen Bradley)



EZ Rack PLC

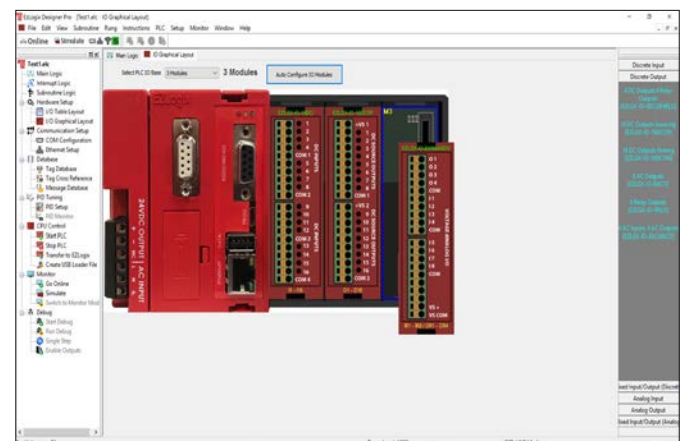
Each local CPU with 1 MB of Memory and **240MHz coldfire Risc processor capable of 60µs screw-to-screw response.**



**You will not find a PLC that has common hardware and software from as little as 8 I/O to 2048 I/O!!**

## Common Software

EZ Drag-n-Drop software with patent pending free flow logic is the same whether you use 8 I/Os or all the way to 2048 I/O





# EZRackPLC™ Free PLC Software

## EZ Drag-n-Drop Ladder Logic

**No Licenses!**

**No Activation Key code required!**

**No Annual Maintenance agreement!**

**Free Upgrades  
when released!**



When PLCs came into existence, the PLC manufacturers followed the same convention as in relay ladder logic. However each manufacturer chose their own rules for connecting and adding ladder elements, such as start and stop contacts. Just like English, Spanish, German, Chinese, Hindi and other languages have their own scripts and their own grammar, PLC manufacturers like AB, Modicon, Siemens, Mitsubishi, EZAutomation and others developed their own grammar and syntax. Once you learn one language, you usually stick with that brand of PLC.

Today one single plant is likely to have multiple brands of PLCs, requiring Electricians & Maintenance personnel to remember these multiple languages. One may have learned AB Language months ago, but had not gotten a chance to use it. Troubleshooting the PLC system months later, it is going to be difficult trying to remember the correct syntax. If it is a Siemens PLC, it might take the same person a week to just get started. **It is in this context the EZRack PLC Drag-n-Drop software was developed. It is essentially a graphical language, you draw the ladder intuitively.**

**No complicated syntax and rules**

**EZRack PLC Designer Pro uses the "Electricians" language**



# PLC Programming

## Rich Instruction Set

### Relay/Boolean Instructions

#### - NO Contact

When the corresponding memory bit is a 1 (on) it will allow power flow through this element

#### - NC Contact

When the corresponding memory bit is a 0 (off) it will allow power flow through this element

#### - Positive Transition

When the corresponding memory bit switches from 0 (off) to 1 (on) it will allow power flow through this element

#### - Negative Transition

When the corresponding memory bit switches from 1 (on) to 0 (off) it will allow power flow through this element

#### - NO Coil

Sets the corresponding memory bit to 1 (on)

#### - NC Coil

Sets the corresponding bit to 0 (off)

#### - Set Coil

Sets the corresponding bit to 1 (on) and remains On even if the rung condition goes to false (use RESET COIL instruction to turn the corresponding bit Off)

#### - Reset Coil

Sets the corresponding bit to 0 (off) and remains off even if the run condition becomes false (use SET COIL instruction to turn the corresponding bit Off)

#### - NO Immediate Input

When the corresponding memory bit is a 1 (on) it will allow power flow through this element. The NO Immediate Input is updated immediately with the current memory Bit status when processed in the program scan

#### - NC Immediate Input

When the corresponding memory bit is a 0 (off) it will allow power flow through this element. The NC Immediate input is updated immediately with the current memory Bit status when processed in the program scan

#### - NO Immediate Output

Sets the corresponding memory bit to 1 (on). The NO Immediate Output Bit status is updated immediately when processed in the program scan

#### - NC Immediate Output

Sets the corresponding memory bit to 0 (off). The NC Immediate Output Bit status is updated immediately when processed in the program scan

### Compare Instructions

#### - Equal to

Allows power flow through this element if the data value of "Opr1" register is Equal to "Opr2" register

#### - Not Equal to

Allows power flow through this element if the data value of "Opr1" register is NOT Equal to "Opr2" register

#### - Greater than

Allows power flow through this element if the data value of "Opr1" register is Greater Than "Opr2" register

#### - Less than

Allows power flow through this element if the data value of "Opr1" register is Less Than "Opr2" register

#### - Greater than or Equal to

Allows power flow through this element if the data value of "Opr1" register is Greater Than or Equal to "Opr2" register

#### - Less than or Equal to

Allows power flow through this element if the data value of "Opr1" register is Less Than or Equal to "Opr2" register

#### - Limit

Allows power flow through this element if the data value of "Input" register is within the data values of "High Limit" and "low Limit" registers

### Math Instructions

#### - Add

Adds two data values in "Opr1" and "Opr2" registers and stores the result in "Result" register

#### - Subtract

Subtracts "Opr2" register data value from "Opr1" register data value and stores the result in "Result" register

#### - Multiply

Multiplies two data values in "Opr1" and "Opr2" registers and stores the result in "Result" register

#### - Divide

Divides "Opr1" register data value by "Opr2" register data value and stores the result in "Result" register

#### - Modulo

Divides "Opr1" register data value by "Opr2" register data value and stores only the remainder in "Result" register

#### - Absolute

Converts a negative data value from "Opr1" register to a positive value and stores it in "Result" register

#### - Conversion

Copies the data value of "Opr" register, converts it into "Result" registers data type, and stores the data value in "Result" register

#### - Binary Conversion

Converts the data value of "Source" register in Binary, BCD, or GRAY code to the data value of "Result" register in Binary, BCD or GRAY Code

### Bitwise Instructions

#### - AND

Performs a bitwise AND operation between the data values of two registers "Opr1" and "Opr2". The result is stored in "Result" register

#### - OR

Performs a bitwise OR operation between the data values of two registers "Opr1" and "Opr2". The result is stored in "Result" register

#### - XOR

Performs a bitwise XOR operation between the data values of two registers "Opr1" and "Opr2". The result is stored in "Result" register

#### - NOT

Performs a bitwise NOT operation on the data value of "Source" register and stores the result in "Destination" register

#### - Shift Left

Performs a logical Shift Left on the data value of "Opr1" register by the data value of "Opr2" register and stores the result in "Result" register

#### - Shift Right

Performs a logical Shift Right on the data value of "Opr1" register by the data value of "Opr2" register and stores the result in "Result" register

#### - Rotate Left

Performs a logical Rotate Left on the data value of "Opr1" register by the data value of "Opr2" register and stores the result in "Result" register

#### - Rotate Right

Performs a logical Rotate Right on the data value of "Opr1" register by the value of "Opr2" register and stores the result in "Result" register

### Move Instructions

#### - Move Data

Moves data value of "Source" register to "Destination" register

#### - Bit Move

Moves either words to bits or bits to words with user-specified length for the number of words to move. Maximum of 16 words can be moved at a time

#### - Move Block

Moves a block of memory area. "Source" register defines the starting area of memory address/register to Move from and "Destination" register defines the starting area of memory address/register to move to. The number of elements to move is user defined

#### - Block Fill

Fills a block of memory area. "Source" register defines the data value to Fill with and "Destination" register defines the starting area of memory address/register to Fill to. The number of elements to move is user defined. The number of elements to Fill is user defined

#### - Move Table of Constants

Loads a table of user defined constants to a consecutive memory/register locations with the starting memory address/register location defined by "Destination" register

### Timer/Counter Instructions

#### - Timer

This instruction starts timing when called and once it reaches the preset value as defined by the data value of "Timer Preset Value" register, it will stop timing and will allow power flow through the element

#### - Counter

This instruction starts counting either Up or Down by the increments of one until the counter reaches the data value of "Counter Preset Value" register. The Counter will then allow power flow through the element

### Program Control Instructions

#### - Jump

Skips the rung containing Jump instruction (after execution of the rung) to a rung with the label specified in the JUMP instruction and continues executing the program thereafter

#### - For Loop

Executes the logic between the FOR Loop and NEXT instructions by the data value of "Loop Count" register

#### - Next Statement

Specifies the return/end point for the FOR Loop instruction

#### - Call Subroutine

Calls a Subroutine specified by the label in CALL Subroutine instruction and is terminated by the RETURN instruction

#### - Return

Terminates a subroutine and returns back to the main logic

### String Instructions

#### - String Move

Moves the data value (string type) of "Source" register to "Destination" register by the number of characters specified by the user

#### - String Compare

Allows power flow through this element if the data value (string type) of "Source1" register is Equal to "Source2" register by the number of characters specified

#### - String Length

Computes the length of a null-terminated "String" register (string type) and stores the result in "Save Length in" register

### Communication Instructions

#### - Open Port

Opens the serial port for communication using the parameters specified by the user

#### - Send to Serial Port

Sends an ASCII string data from "Source" register to the serial port with control and character count from user defined "Control Address" and "Character Count Address" registers respectively

#### - Receive From Serial Port

Receives an ASCII string data from serial port to "Source" register with control and character count from user defined "Control Address" and "Character Count Address" registers respectively

#### - Close Port

Closes the serial port opened for communication

#### - Send to Marquee

Sends ASCII instructions for marquee communication. The message to be displayed on a marquee is selected by the data value of "Message Number" register which looks up the message number for a corresponding message from the central message database. If message number is not found in the message database, user selected action for unmatched messages is done.

### Miscellaneous Instructions

#### - Drum

Time and/or Event driven drum type sequencer with up to 16 steps and 16 discrete outputs per step. The outputs are updated during each step. Counts have a specified time base (1MSec to 1 Sec) and every step has its own counter along with an event to trigger the count. After the time expires for one step, it transitions to the next step and completes up to 16 steps total. After the completion of all the steps this element allows power flow through it



# EZ RackPLC™ Advanced Pre-defined Function Blocks

## Advanced Function Blocks:

### Timer

EZRack PLC supports 3 types of timer specified by the user. Time On Delay, Time Off Delay and Delayed on Retentive Counts.

### Counters

This function block instruction counts Up, Down, or Up/Down depending on the user setting. Also, keeps track of the number of time power flow switches.

### Compare Values

This instruction uses a mathematical operator as a basis of comparison of two data values. When the data values satisfy the selected mathematical relationship (>,<=,etc.) the compare contacts turns On.

### Alarm

This instruction allows you to monitor an input value and enable alarm bit outputs based on pre-defined set points.

### Average

This function block calculates the average on a variable input value.

### Change of Value

This instruction reads two consecutive values from a tag at a pre-determined Sample Rate and outputs the amount of change.

### Min/Max Values

This instruction stores the lowest and highest values of a numerical tag.

### Ramp Generator

This instruction increases or decreases the value of an output based on user defined rate.

### Linear Scaling

Scale a input variable from one type of unit in to another type of unit. For example, take a 16-bit integer and scale to a floating 32-bit

### Non-Linear Scaling

Scale a non-linear input variable in to a non-linear output using up to 16 break points.

### User-defined Fault

Compare up to 8 tags or constant values against other tags or constant values and generate Faults or Stop Program based on the results.

### Flasher

Cycle an output bit ON/OFF based on a user-defined programmable rate (ms).

### Math Editor

The Math instruction solves a user-defined formula during the execution of the ladder program. Once the enable rung transitions from OFF to ON the formula will be solved and the result will be stored in the data format and location selected for the result.

### Packing Strings

Combine data from two or more numeric, boolean or string tags in to one common string tag.

### Un-Packing Strings

Extract data from a string and place in to one or more numeric, boolean or string tags.



FREE TECHNICAL SUPPORT



FREE SOFTWARE

# **EZ** RackPLC™ Powerful Ladder Logic Instructions

## Instructions Blocks:

### 32-bit floating point calculations

The EZPLC supports 32-bit floating point mathematical and logical operations. The data options allow you to use signed or unsigned integer data as well as floating point data type.

### Data Conversion

This instruction is meant to make ladder programming EZ and flexible. You can copy the data in one register, convert its data type and save it into another register without altering the 'source' register. The data can be converted from binary to BCD or grey code or vice versa.

### Move Block

This instruction adds convenience to handling data inside the ladder program. You can move blocks of memory. All you need to specify is starting point of your source address, number of data elements to move and starting point of destination memory address. Along with Move Block, Fill Block and Move table of Constants also make life of a programmer much simpler.

### String

These instructions operate on ASCII string data type. You can Move string data between registers, base rung power flow upon string comparison and compute string length to store the length value in a different register.

### Subroutines

Capability to use subroutines is a huge plus in EZPLC programming. For large and complex programs, user can define many subroutines and use them in the main ladder program. These subroutines can be called from the main logic. Return instruction allows user to return to the main logic at any step.

### Drum Sequencer

This is a time or event based sequencer that updates up to 16 outputs per step, up to 16 steps. Time base of each count is user defined and each step has its own counter. User can define an event to trigger the count. The rung power flow is allowed after completion of all the steps in a drum.

### Marquee Instructions

Now you don't have to spend days to send signals to your marquee. Send to marquee instruction allows you to communicate to the marquee via ASCII strings. A unique message number is assigned to each message in the message database. This instruction looks up the message number, corresponding to the intended message to be displayed and sends it to the marquee. User can define actions if a message number cannot be found in the database.

### Interrupt Routine

This is how your EZPLC would process external events that require "instantaneous" response. User can write a separate interrupt logic routine. At the instance of an external event, the PLC would interrupt the main logic, execute this interrupt logic on a priority, and scan corresponding I/O. It would return to the main logic automatically after processing the interrupt routine.

### ASCII Instructions

User can send/receive ASCII string data to/from any register in PLC to a predefined serial port. User can also define the Control address and character count of the source register. Similarly, user can send ASCII string data to a Marquee directly from the main logic.

### Bit Move Instructions

Bit move instructions allow the user to move word data from a register type memory address to a bit in a discrete memory location and backward.





# Get 2 EZRack PLCs for the Price of one Do-More

## Let's Configure a PLC System with a Total of 44 I/O, 110 VAC Power

- 16 DC In
- 16 DC Out
- 8 Analog Inputs; 4 Analog Outputs
- 8 Autotune PID loops
- 2.4ms Scantime
- Remote Connectivity



\$555



EZRack PLC: CPU-1UE Processor



\$1084



Do-More: H2DMI Processor

Part Number	Description	Price
EZRPL-CPU-1UE	CPU; 37.02 MB Memory	<b>\$149</b>
EZRPL-AC-03B	3 Slot Base 110 VAC Power Supply	<b>\$99</b>
EZRPL-IO-16DCI	16 Point; DC In	<b>\$49</b>
EZRPL-IO-16DCOP	16 Point; DC Out	<b>\$59</b>
EZRPL-IO-8ANI4AOC	8 Analog In; 4 Analog out	<b>\$199</b>

Part Number	Description	Price
H2DM1-E	CPU; 192 KB Memory	<b>\$399</b>
	3 Slot Base 110 VAC Power Supply	<b>\$132</b>
D2-16ND3-2	16 Point; DC In	<b>\$91</b>
D2-16TD1-2	16 Point; DC Out	<b>\$99</b>
F2-8AD4DA-1	8 Analog In; 4 Analog out	<b>\$363</b>

## Let's Configure a PLC System with a Total of 32 I/O, 110 VAC Power

- 16 DC In
- 8 AC Out
- 4 DC Outputs; 4 Relay Outputs
- 2.4ms Scantime
- Remote Connectivity



\$405



EZRack PLC: CPU-1UE Processor



\$798



Do-More: H2DMI Processor

Part Number	Description	Price
EZRPL-CPU-1UE	CPU; 37.02 MB Memory	<b>\$149</b>
EZRPL-AC-03B	3 Slot Base 110 VAC Power Supply	<b>\$99</b>
EZRPL-IO-16DCI	16 Point; DC In	<b>\$49</b>
EZRPL-IO-4DCOP4RLO	4 DC Out; 4 Relay Out	<b>\$59</b>
EZRPL-IO-8ACO	8 AC output	<b>\$49</b>

Part Number	Description	Price
H2DM1-E	CPU; 192 KB Memory	<b>\$399</b>
	3 Slot Base 110 VAC Power Supply	<b>\$132</b>
D2-16ND3-2	16 Point; DC In	<b>\$91</b>
D2-08CDR	4 DC Out; 4 Relay Out	<b>\$66</b>
D2-08TA	8 AC output	<b>\$110</b>

# With Increased I/O for Mid-Sized Machines Save over 50% against Productivity Series

## Let's Configure a PLC System with a Total of 52 I/O, 110 VAC Power

- 16 DC In
- 12 DC Out
- 8 AC In
- 4 AC Out

- 8 Analog Inputs
- 4 Analog Outputs
- 2.4ms Scantime
- Remote Connectivity



EZ Rack PLC: CPU-1UE Processor

\$663



Productivity 2000

\$1081.5



Part Number	Description	Price
EZRPL-CPU-1UE	EZ Rack PLC CPU	<b>\$149</b>
EZRPL-AC-05B	5 Slot Base 110 VAC Power Supply	<b>\$119</b>
EZRPL-IO-16DCI	16 DC Inputs	<b>\$49</b>
EZRPL-IO-16DCOP	16 DC Outputs	<b>\$59</b>
EZRPL-IO-8ACI	8 AC Inputs	<b>\$39</b>
EZRPL-IO-8ACO	8 AC Outputs	<b>\$49</b>
EZRPL-IO-8ANI4ANOC	8 Analog In; 4 Analog out	<b>\$199</b>

Part Number	Description	Price
P2-07B	7 slot Base	<b>\$99</b>
P2-01AC	Power Supply	<b>\$69</b>
P2-550	P2000 CPU	<b>\$255</b>
P2-16ND3	16 DC Inputs	<b>\$69</b>
P2-15TD1	15 DC Outputs	<b>\$65</b>
P2-08NAS	8 AC Inputs	<b>\$77</b>
P2-08TAS	8 AC Outputs	<b>\$105</b>
P2-8AD4DA-1	8 Analog In; 4 Analog Out	<b>\$310</b>
P2-RTB (Qty. 5)	Terminal blocks	<b>\$6.50x5</b>



EZ Rack PLC: CPU-1UE Processor

\$663



Productivity 3000

\$1541



Part Number	Description	Price
EZRPL-CPU-1UE	EZ Rack PLC CPU	<b>\$149</b>
EZRPL-AC-05B	5 Slot Base 110 VAC Power Supply	<b>\$119</b>
EZRPL-IO-16DCI	16 DC Inputs	<b>\$49</b>
EZRPL-IO-16DCOP	16 DC Outputs	<b>\$59</b>
EZRPL-IO-8ACI	8 AC Inputs	<b>\$39</b>
EZRPL-IO-8ACO	8 AC Outputs	<b>\$49</b>
EZRPL-IO-8ANI4ANOC	8 Analog In; 4 Analog out	<b>\$199</b>

Part Number	Description	Price
P3-05B	5 slot Base	<b>\$104.50</b>
P3-01AC	Power Supply	<b>\$133</b>
P3-530	P3000 CPU	<b>\$419</b>
P3-16ND3	16 Point DC In	<b>\$116</b>
P3-16TD1	16 Point DC Out	<b>\$123</b>
P3-08NAS	8 Point AC In	<b>\$96</b>
P3-08TAS	8 Point AC Out	<b>\$135</b>
P3-8AD4DA-1	8 Analog In/4 Analog Out	<b>\$332</b>
P3-RTB (Qty. 5)	Terminal blocks	<b>\$16.50x5</b>



# EZRack PLC CPU Selection Guide and Specifications

**EZRPL-CPU-1UE**

**EZRPL-CPU-2UE**

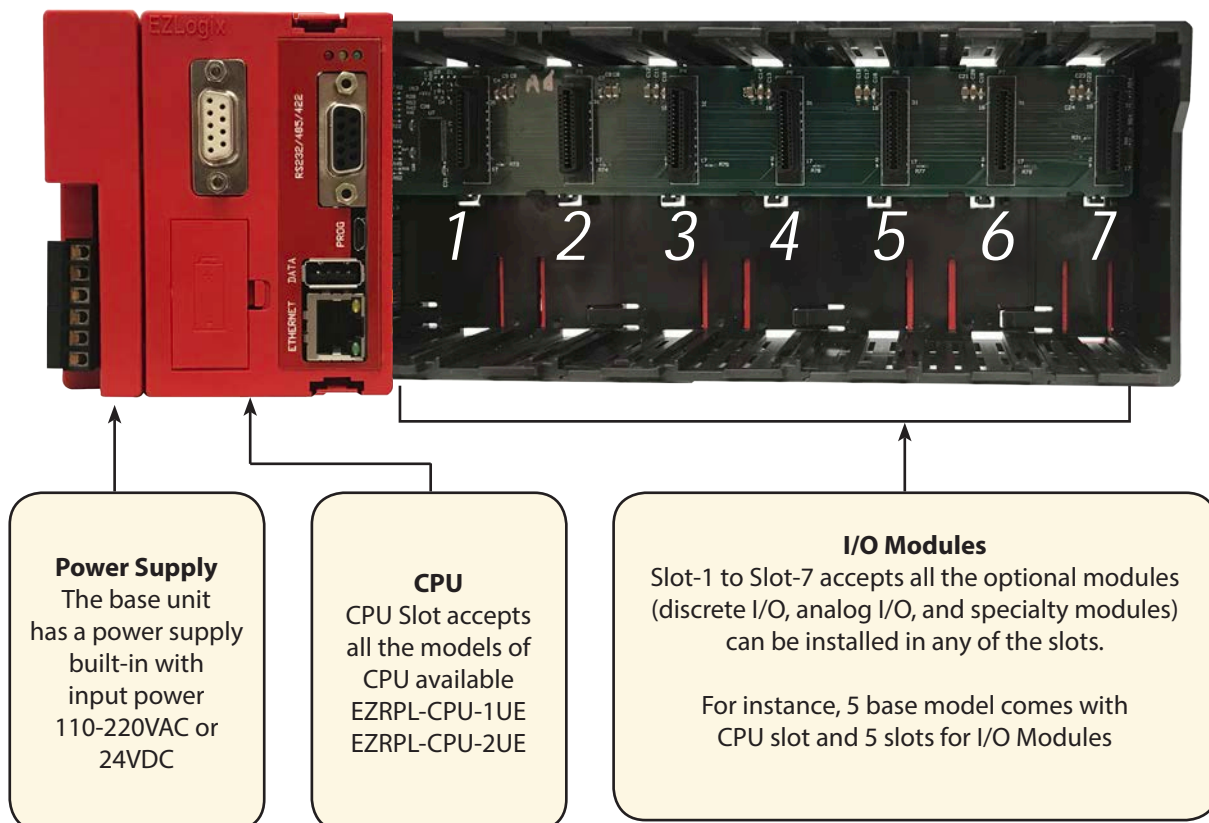

EZRack PLC CPU Specifications			
Feature		EZRPL-CPU-1UE    \$149	EZRPL-CPU-2UE    \$199
Total Memory (bytes)		37.02 MB	
Ladder Memory (instruction words)		500,000 instruction words	
Data Memory	Internal Bits	1024	
	Internal Registers	16384	
Current Consumption		400mA	
Boolean execution/K		2.4 ms	
Interrupt Instruction Response Time		50 µs	
Programming Software for Windows		Free EZRack PLC Designer Pro	
Built-In communications ports		RS232/422/485 Ethernet 10/100Mbps	2 RS232/422/485 Ethernet 10/100Mbps
Program Memory		Flash	
Data Logging		Yes, USB (Up to 64 Gb)	
USB Programming		Yes	
PLC Simulation		Yes	
IIoT Ready		Yes, MQTT Protocol	
LED Indicators		Input Power, Program Run, Low Battery, USB Logging	
I/O Modules Supported		AC, DC, Analog, Relays with Removable Terminal Block & LED Indicator per I/O	
Operating Temperature		-20 to 60°C (-4 to 140° F)	
Storage Temperature		-40 to 85°C (-40 to 185° F)	
Max Number of Ethernet slaves per Channel		4	
Discrete I/O Module Point Density		8/12/16	
Slots per Base		3/5/7	
Number of instructions available		>70	
Control relays		131,072	
Timers		256 (default)	
Counters		256 (default)	
Immediate I/O		Yes	
Subroutines		Functions Block, up to memory limit	
Drum Sequencer		Yes, up to memory limit	
Loops		FOR/NEXT/JUMP loops	
Math		Yes, Advanced Function Blocks: Integer, Floating Point, Trigonometric, Logical, Bitwise	
ASCII		Yes, Send/Receive	
PID Loop Control, Built In		Yes, Auto-tuned	
Time of Day Clock/Calendar		Yes RTC	
Run Time Edits		Yes	
Supports True Force		Yes	
Internal Diagnostics		Yes	
Password security		Yes	
Battery backup		Yes (Battery included)	
Shock		30g (IEC 60068-2-27)	
Vibration		2g @ 10...500 Hz (IEC 60068-2-6)	
Electrical Noise		Nema ICS 2-230 Showering arc; ANSI C37.90a SWC; Level C Chattering Relay Test	
ESD Immunity		6kV contact discharge (IEC 61000-4-2)	
Agency Approvals		CE, UL, cUL	

# EZRack PLC Base and Power Supply Selection Guide



EZ Rack PLC

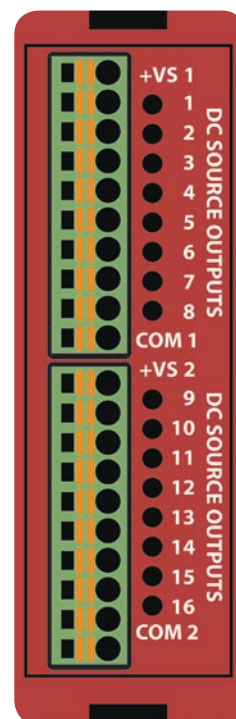
EZ Rack PLC Base & Power Supply Specifications						
Specifications	AC Powered Bases			DC Powered Bases		
Part Numbers	EZRPL-AC-03B	EZRPL-AC-05B	EZRPL-AC-07B	EZRPL-DC-03B	EZRPL-DC-05B	EZRPL-DC-07B
Input Voltage Range	110 / 220 VAC (90-265VAC)			24VDC (20-28VDC)		
Number of Slots	3 Slot Base	5 Slot Base	7 Slot Base	3 Slot Base	5 Slot Base	7 Slot Base
Auxiliary 24 VDC Output	800mA					
Maximum Inrush Current	1 Amp					
Maximum Power Consumption	10 Watts					
Operating Temp.	-20 to 60°C (-4 to 140° F)					
Storage Temp.	-40 to 85°C (-40 to 185° F)					
Price	\$99	\$119	\$139	\$119	\$129	\$149



# EZ I/O™ 16 pt. 24VDC Output Sourcing Module

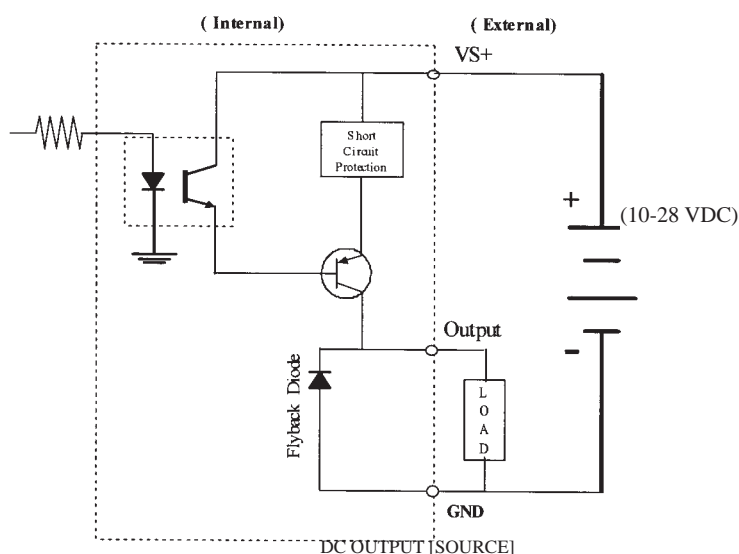
EZRPL-IO-16DCOP  
\$59

Module Specifications	
Number of Outputs	16 sourcing
Output Voltage Range	11-30 VDC
Peak Voltage	50 VDC
Maximum Steady State Output Current	0.5A per output, 1.0A max per module @ 50°C
Maximum Leakage Current	100µA @ 50 VDC @ 50°C
ON Voltage Drop	2 VDC @ 0.5A
Maximum Inrush Current	0.8A for 10ms
OFF to ON Response	< 2µs
ON to OFF Response	<10µs
Status Indicators	Red LED for each output
+V Terminals & Commons	Two V+, 2 Commons Separate
Short Circuit Protection	1 Amp per module, turns off outputs upon short circuit detection
Base Power Required (5V)	80mA, all outputs on
Optical Isolation	2500 Volt
Wires	14 to 24 AWG



EZRPL-IO-16DCOP

Pinout Information			
1	+VS1	11	+VS2
2	Output(1)	12	Output(9)
3	Output(2)	13	Output(10)
4	Output(3)	14	Output(11)
5	Output(4)	15	Output(12)
6	Output(5)	16	Output(13)
7	Output(6)	17	Output(14)
8	Output(7)	18	Output(15)
9	Output(8)	19	Output(16)
10	COM1	20	COM2





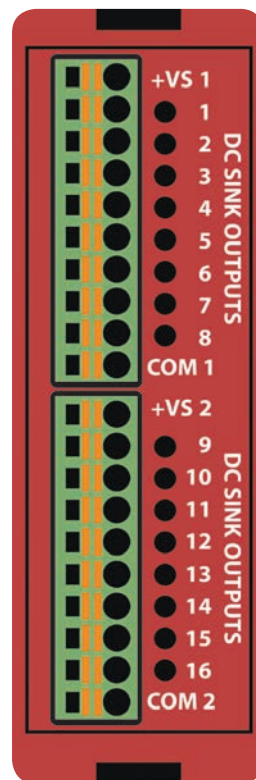


# 16 pt. 24VDC Output Sinking Module

EZ Rack PLC

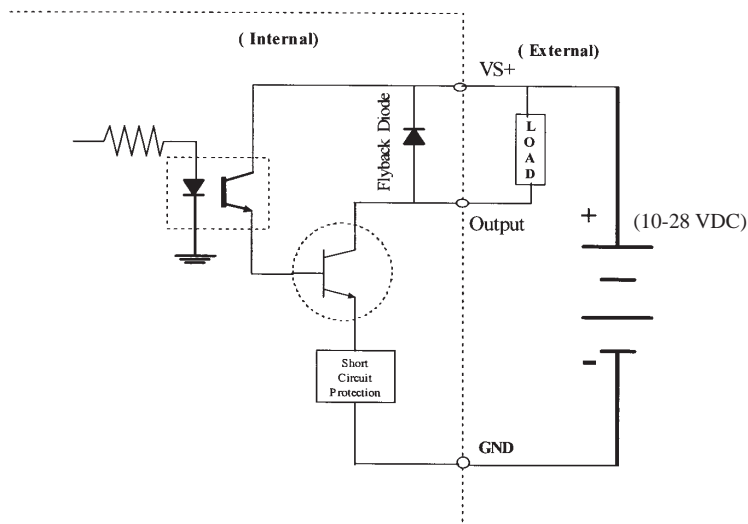
 EZRPL-IO-16DCON  
**\$59**

Module Specifications	
Number of Outputs	16 sinking
Peak Voltage	50.0 VDC
Maximum Steady State Output Current	0.4A per output
Maximum Leakage Current	100 $\mu$ A @ 50 VDC @ 50°C
ON Voltage Drop	1.3 VDC @ 0.5A
Maximum Inrush Current	1.0A for 10ms
OFF to ON Response	< 2 $\mu$ s
ON to OFF Response	<10 $\mu$ s
Status Indicators	Red LED for each output
+V Terminals & Commons	Two V+, 2 Common
Short Circuit Protection	Turns off outputs upon short circuit detection
Base Power Required (5V)	40mA, all outputs on
Optical Isolation	2500 Volt
Wires	14 to 24 AWG



EZRPL-IO-16DCON

Pinout Information			
1	+VS1	11	+VS2
2	Output(1)	12	Output(9)
3	Output(2)	13	Output(10)
4	Output(3)	14	Output(11)
5	Output(4)	15	Output(12)
6	Output(5)	16	Output(13)
7	Output(6)	17	Output(14)
8	Output(7)	18	Output(15)
9	Output(8)	19	Output(16)
10	COM1	20	COM2

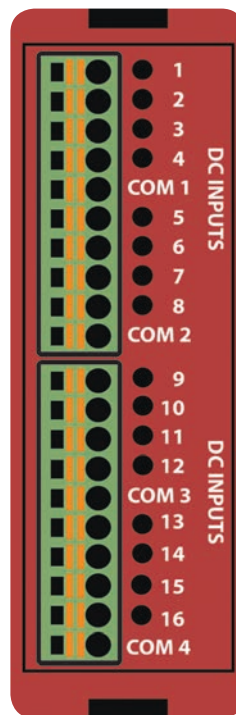


DC OUTPUT [SINK]



# 16 pt. 24VDC Input Module

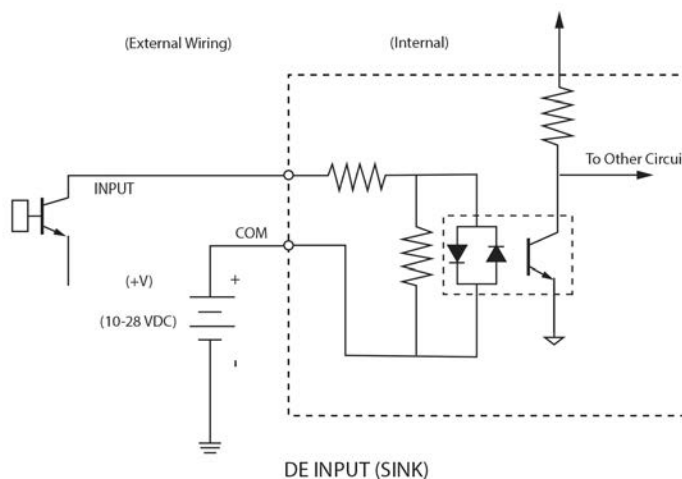
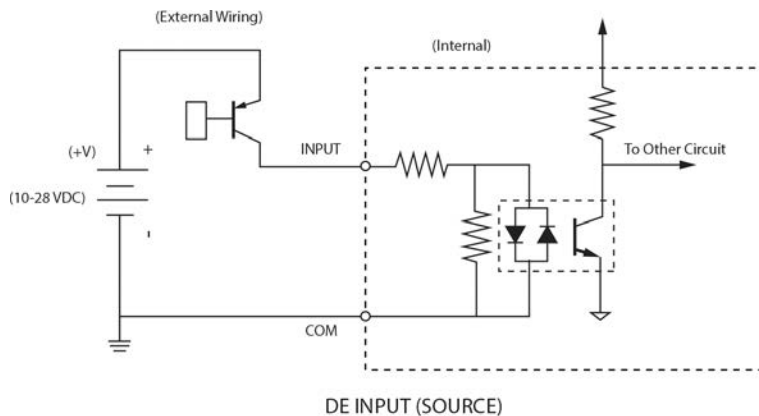
Module Specifications	
Number of Inputs	16
Input Voltage Range	11 - 30 VDC
Peak Voltage	40 VDC
Input Current	1.92 mA @ 12 VDC 4.0 mA @ 24 VDC
Maximum Input Current	5 mA @ 28 VDC
Input Impedance	5.6k @ 10-28 VDC
ON Voltage Level	> 10 VDC
OFF Voltage Level	< 2 VDC
Min. ON Current	1.5 mA
Min. OFF Current	0.2 mA
OFF to ON Response	2-4 ms, typical 3 ms
ON to OFF Response	2-4 ms, typical 3 ms
Status Indicators	Red LED for Source Green LED for Sinking
Commons	2 points/4 points Separate
Base Power Required (5V)	Typical 30mA (all inputs on)
Optical Isolation	2500 Volt
Wires	14 to 24 AWG



EZRPL-IO-16DCI  
\$49

EZRPL-IO-16DCI

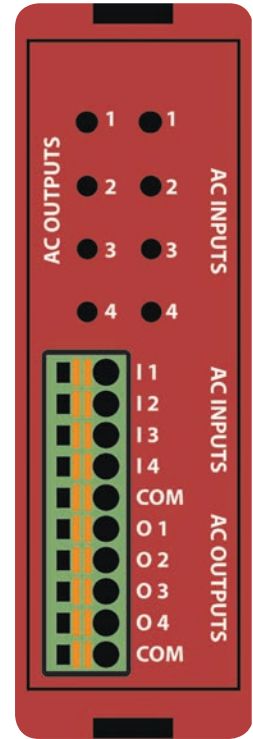
Pinout Information			
1	Input(1)	11	Input(9)
2	Input(2)	12	Input(10)
3	Input(3)	13	Input(11)
4	Input(4)	14	Input(12)
5	COM-1	15	COM-3
6	Input(5)	16	Input(13)
7	Input(6)	17	Input(14)
8	Input(7)	18	Input(15)
9	Input(8)	19	Input(16)
10	COM-2	20	COM-4





# 4 pt. 110VAC In , 4 pt. 110VAC Out Module

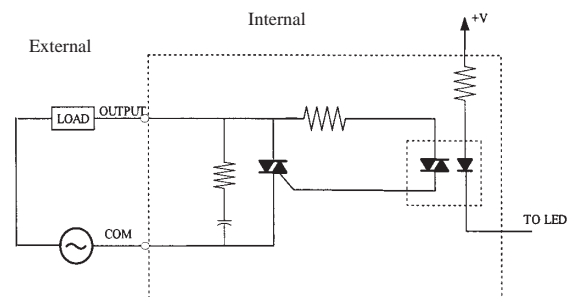
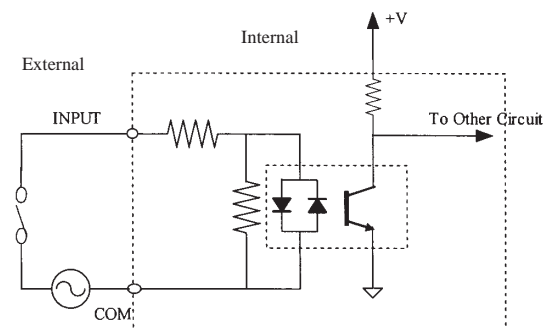
EZRPL-IO-4ACI4ACO  
\$49



EZRPL-IO-4ACI4ACO

Module Specifications		
AC Input Specs	Number of Inputs	4
	Input Voltage Range	70-132 VAC
	AC Frequency	47-63 Hz
	Peak Voltage	180 Volt
	Input Current	0.5mA @ 110 VAC
	Maximum Input Current	0.6mA @ 132 VAC
	Input Impedance	200K
	ON Voltage Level	70 VAC
	OFF Voltage Level	40 VAC
	OFF to ON Response	< 10ms
	ON to OFF Response	< 10ms
	Status Indicators	Green LED for each input
	Commons	1 Common
	Base Power Required (5V)	10mA for all 4 on
AC Output Specs	Optical Isolation	2500 Volt
	Wires	24-16 AWG
	Number of Output Points	4
	Number of Commons	1
	Output Voltage Range	20-132 VAC
	Peak Voltage	180 Volt
	ON Voltage Drop	1.2 V @ 1A
	Maximum Current	1.2 A @ 25°C, 0.8A @ 50°C for each output
	Maximum Leakage Current	1mA @ 132 VAC
	Maximum Inrush Current	38Amps for 16.6ms
	Minimum Load	15mA
	OFF to ON Response	max 1/2 cycle
	ON to OFF Response	max 1/2 cycle
	Fuse	No fuse
	Base Power Required (5V)	35mA for all 4 on
	Optical Isolation	2500 Volt
	Wires	14 to 24 AWG

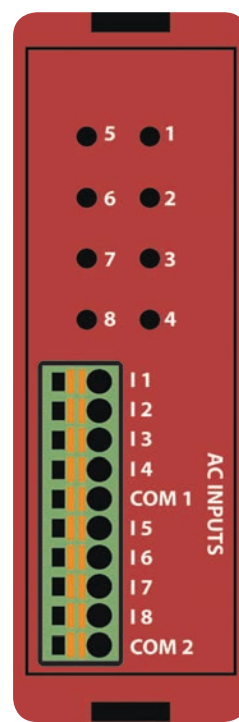
Pinout Information	
1	Input(1)
2	Input(2)
3	Input(3)
4	Input(4)
5	Input-COM
6	Output(5)
7	Output(6)
8	Output(7)
9	Output(8)
10	Output-COM





# EZI/O™ 8 pt. 110VAC Input Module

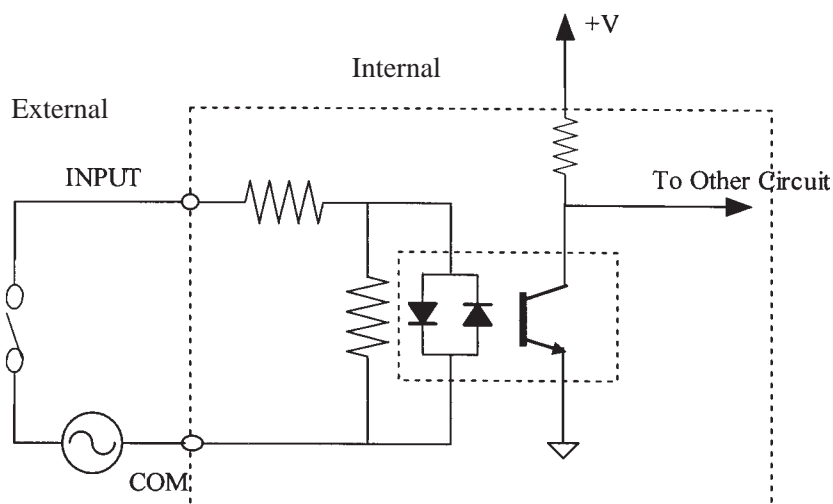
Module Specifications	
Number of Inputs	8
Input Voltage Range	70-132 VAC
AC Frequency	47-63 Hz
Peak Voltage	180 Volt
Input Current	0.5mA @ 110 VAC
Maximum Input Current	0.6mA @ 132 VAC
Input Impedance	200K
ON Voltage Level	70 VAC
OFF Voltage Level	40 VAC
OFF to ON Response	< 10ms
ON to OFF Response	< 10ms
Status Indicators	Red LED for each input
Commons	2 Commons
Fuse	No fuse
Base Power Required (5V)	20mA for all 8 on
Optical Isolation	2500 Volt
Wires	14 to 24 AWG



EZRPL-IO-8ACI  
\$39

EZRPL-IO-8ACI

Pinout Information	
1	Input(1)
2	Input(2)
3	Input(3)
4	Input(4)
5	AC_Common
6	Input(5)
7	Input(6)
8	Input(7)
9	Input(8)
10	AC_Common



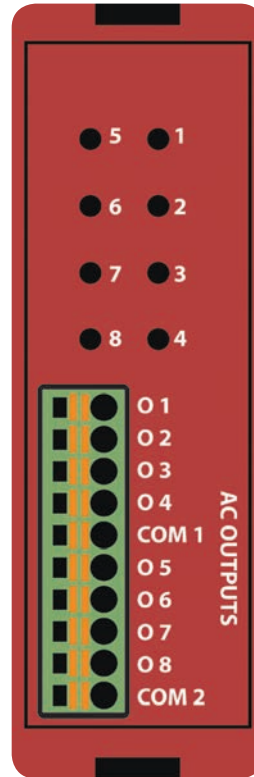


# 8 pt. 110VAC Output Module

EZ Rack PLC

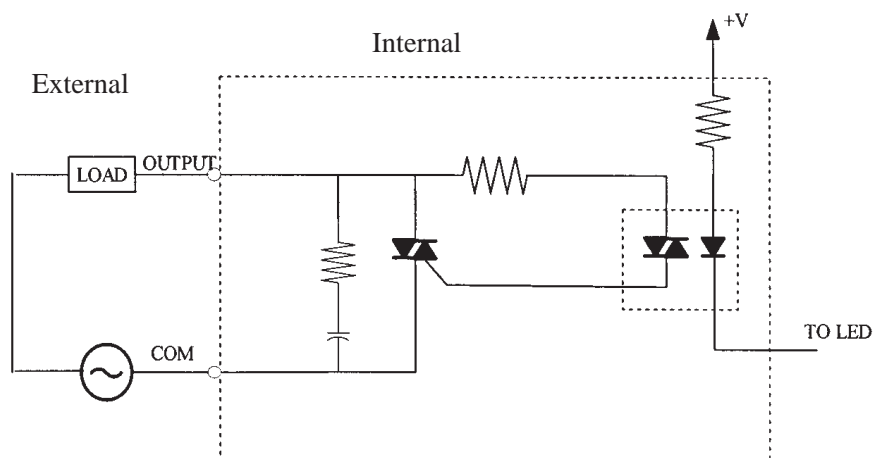
 EZRPL-IO-8ACO  
 \$49

Module Specifications	
Number of Output Points	8
Number of Commons	2
Output Voltage Range	20-132 VAC
Peak Voltage	180 Volt
ON Voltage Drop	1.2 V @ 1A
Maximum Current	1.2 A @ 25°C, 0.8A @ 50°C for each output
Maximum Leakage Current	1mA @ 132 VAC
Maximum Inrush Current	38Amps for 16.6ms
Minimum Load	15mA
OFF to ON Response	max 1/2 cycle
ON to OFF Response	max 1/2 cycle
Base Power Required (5V)	70mA for all 8 on
Optical Isolation	2500 Volt
Wires	14 to 24 AWG



EZRPL-IO-8ACO

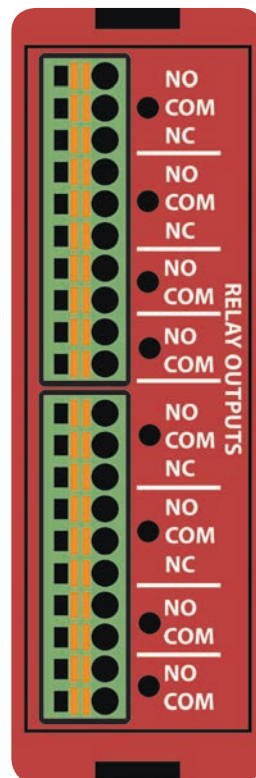
Pinout Information	
1	Output(1)
2	Output(2)
3	Output(3)
4	Output(4)
5	AC_Common
6	Output(5)
7	Output(6)
8	Output(7)
9	Output(8)
10	AC_Common





# 8 pt. Relay Out Module with built-in Electromagnetic shield

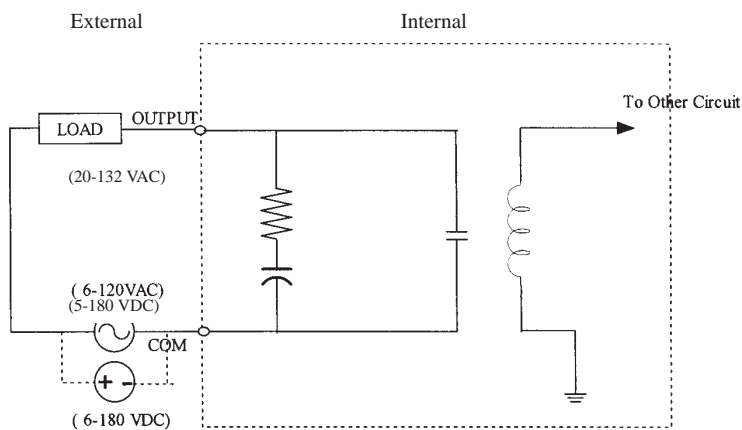
EZRPL-IO-8RLO  
\$52



EZRPL-IO-8RLO

Module Specifications	
Number of Outputs	8
Output Voltage Range	5-30 VDC or 20-250 VAC
Output Type	8 Form C (SPDT)
Output Terminals Consumed	20
Peak Voltage	30 VDC/380 VAC
AC Frequency	47-63 Hz
Maximum Current (resist.)	5A/point
Maximum Leakage Current	0.5mA @ 130 VAC @ 60Hz
Maximum Switching Current	5A
Electromagnetic Shield	2 pF between contact and shield
Dielectric Strength	1000VAC between contacts, 4000VAC between contacts and coil
OFF to ON Response	≤1ms (typical)
ON to OFF Response	≤1ms (typical)
Status Indicators	Red LEDs
Contacts	8 isolated
Base Power Required (5V)	50mA

Pinout Information			
1	Output(1)_Normally open	11	Output(5)_Normally open
2	Output(1)_COM	12	Output(5)_COM
3	Output(1)_Normally close	13	Output(5)_Normally close
4	Output(2)_Normally open	14	Output(6)_Normally open
5	Output(2)_COM	15	Output(6)_COM
6	Output(2)_Normally close	16	Output(6)_Normally close
7	Output(3)_Normally open	17	Output(7)_Normally open
8	Output(3)_COM	18	Output(7)_COM
9	Output(4)_Normally open	19	Output(8)_Normally open
10	Output(4)_COM	20	Output(8)_COM





**EZ I/O™**

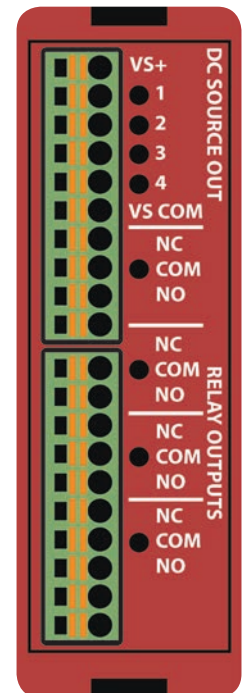
# 4 pt. 24VDC Output (Sourcing), 4 pt. Relay Out Module

 EZRPL-IO-4DCOP4RLO  
**\$59**

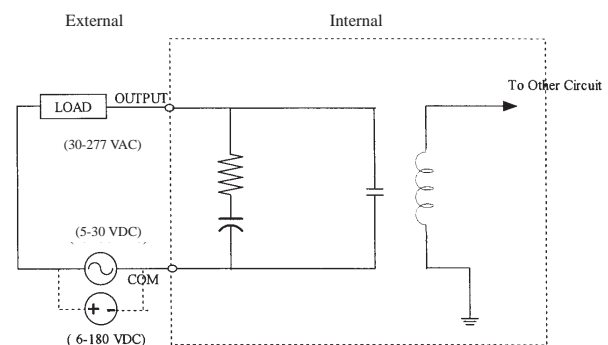
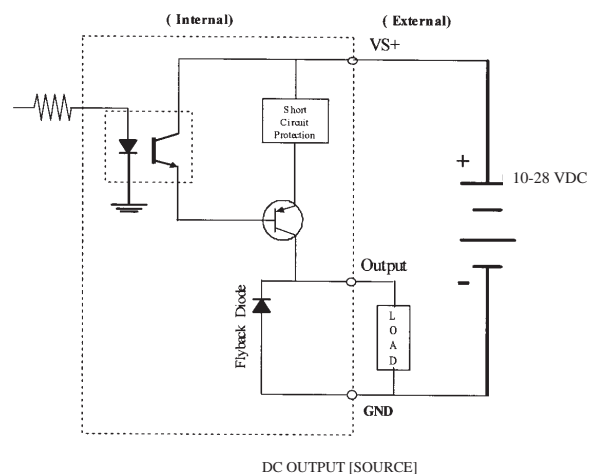
DC Output Specs	Module Specifications	
	Number of Outputs	4 sourcing
	Output Voltage Range	20-30 VDC
	Peak Voltage	50.0 VDC
	Maximum Steady State Output Current	0.5A per output, 1.0A max per module @ 50°C
	Maximum Leakage Current	100µA @ 50 VDC @ 50°C
	ON Voltage Drop	2 VDC @ 0.5A
	Maximum Inrush Current	0.8A for 10ms
	OFF to ON Response	< 2µs
	ON to OFF Response	<10µs
	Status Indicators	Red LED for each output
	+V Terminals & Commons	One + One
	Short Circuit Protection	1 Amp per module, turns off outputs upon short circuit detection
	Base Power Required (5V)	40mA, all outputs on
	Optical Isolation	2500 Volt
Relay Output Specs	Wires	14 to 24 AWG
	Optical Isolation	2500 Volt
	Number of Outputs	4 Isolated
	Output Voltage Range	10A @ 277 VAC or 30VDC
	Output Type	4 Form C (SPDT)
	Output Terminals Consumed	12
	Peak Voltage	30 VDC/3800 VAC
	AC Frequency	47-63 Hz
	Maximum Current (resist.)	5A/point
	Maximum Leakage Current	0.5mA @ 130 VAC @ 60Hz
	Maximum Switching Current	15A
	Electromagnetic Shield	2 pF between contact and shield
	Dielectric Strength	750 VAC between contacts, 1500 VAC between contacts & coil
	OFF to ON Response	Max 10ms
	ON to OFF Response	Max 5ms
	Status Indicators	Red LEDs
	Base Power Required (5V)	50mA
	Wires	14 to 24 AWG

Pinout Information			
1	+24V	11	NC-2
2	Output(1)	12	COM-2
3	Output(2)	13	NO-2
4	Output(3)	14	NC-3
5	Output(4)	15	COM-3
6	24V-COM	16	NO-3
7	Not Connected	17	NC-4
8	NC-1	18	COM-4
9	COM-1	19	NO-4
10	NO-1	20	Not Connected

Note: NO-Normally Open, NC-Normally Closed



EZRPL-IO-4DCOP4RLO





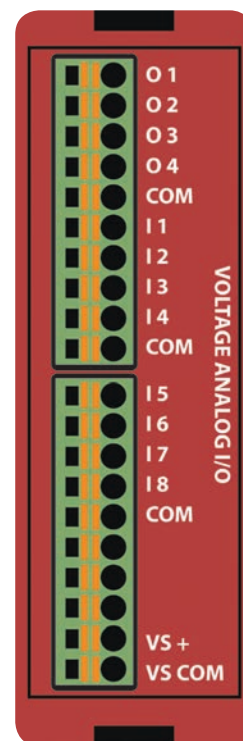
# 8 pt. Analog In/4 pt. Analog Out Module (Voltage)

EZRPL-IO-8ANI4ANOV

\$199

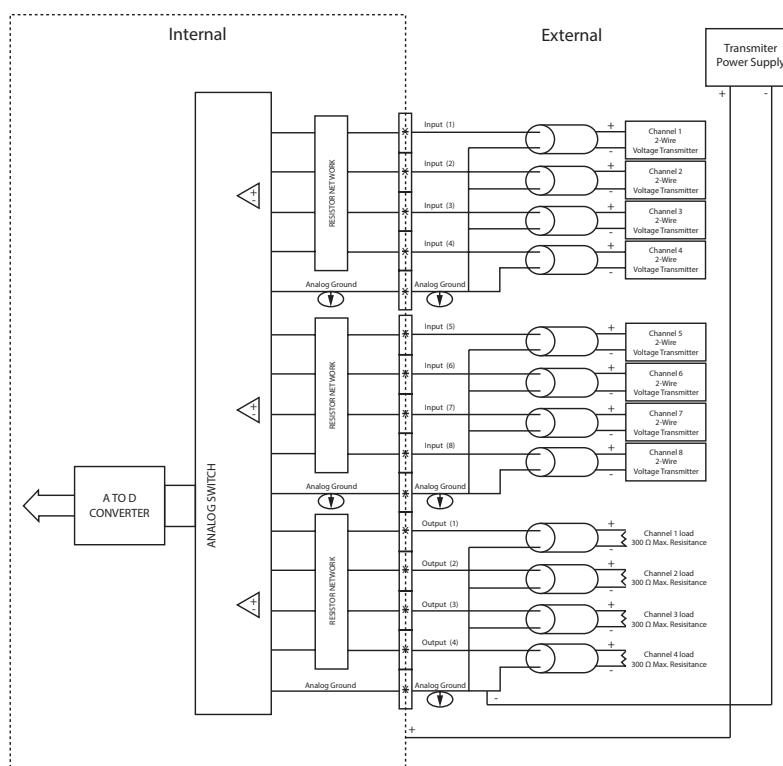
Module Specifications		
Analog Voltage Input Specs	Number of Channels	8 single ended (2 commons)
	Input Range	0-10V
	Resolution	12 bit (1-4096)
	Step Response	200µs to 95% of FS
	Crosstalk	1/2 count max, -80db
	Input Impedance	>20KΩ
	Absolute Max Ratings	± 15V
	Converter Type	successive approximation
	Linearity Error (end to end)	± 2 count
	Input Stability	± 2 count
	Gain Error	± 2 counts
	Offset Calibration Error	± 5 counts
	Max Inaccuracy	± 0.2% at 25°C, ± 0.4% at 0-60°C
	Accuracy vs. Temperature	± 50 ppm/°C typical
Analog Voltage Output Specs	Number of Channels	4 single ended (1 common)
	Output Range	0-10 VDC
	Resolution	12 bits (1 in 4096)
	Conversion Setting Time	100 µs for FS
	Crosstalk	1/2 count max, -80db
	Peak Output Voltage	± 18 VDC
	Offset Error	± 0.15% of range
	Gain Error	± 0.3% of range
	Linearity Error (end to end)	± 1 count
	Output Stability	± 2 counts
	Load Impedance	2k Ω min.
	Load Capacitance	.01 microF max
	Accuracy vs. Temperature	± 50 ppm/C typical

Pinout Information			
1	Output(1)	11	Input(5)
2	Output(2)	12	Input(6)
3	Output(3)	13	Input(7)
4	Output(4)	14	Input(8)
5	COM	15	COM
6	Input(1)	16	Not Connected
7	Input(2)	17	Not Connected
8	Input(3)	18	Not Connected
9	Input(4)	19	+VS
10	COM	20	VS-COM



EZRPL-IO-8ANI4ANOV

Module Specifications	
Operating Temperature	-20 °C to 60 °C
Storage Temperature	-20 °C to 70 °C
Relative Humidity	5 to 95 %
Removable Terminal Block	300 Volt/8 Amp/ 14 AWG UL Rating
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304



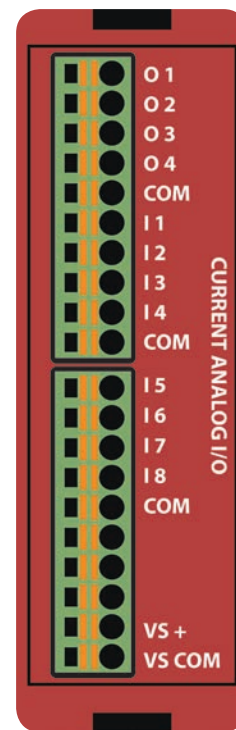


# 8 pt. Analog In/4 pt. Analog Out Module (Current)

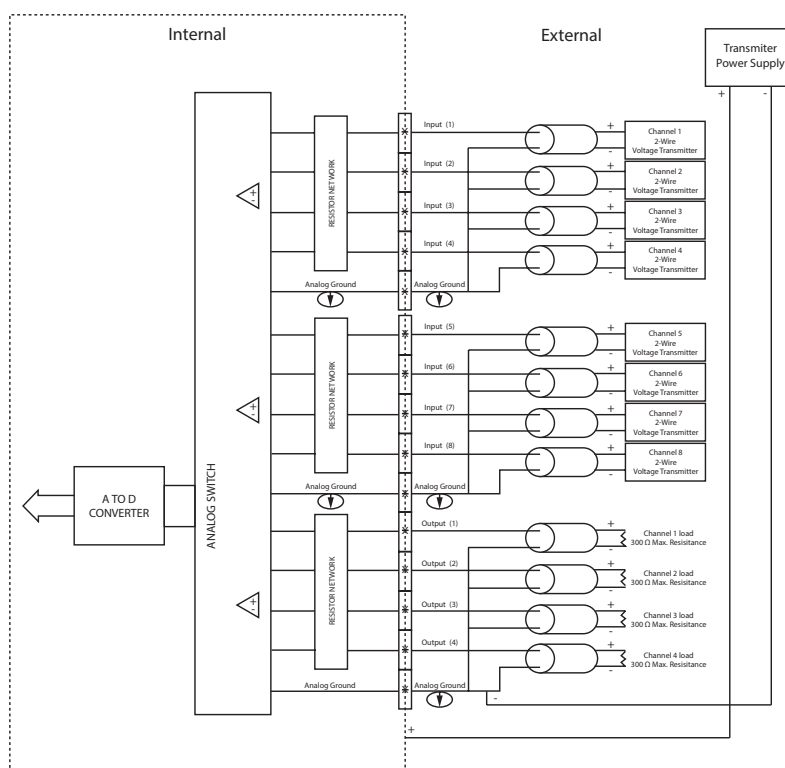
EZRPL-IO-8ANI4ANOC  
**\$199**

Analog Specifications		
Analog Current Input Specs	Number of Channels	8 Single Ended
	Input Range	4-20 mA
	Resolution	12 bit (1-4096)
	Step Response	1ms for 95% FS
	Crosstalk	1/2 count max, -80db
	Input Impedance	62.5Ω ± 0.1%
	Absolute Max Ratings	-30mA to 30mA
	Converter Type	Successive Approximation
	Linearity Error (end to end)	± 2 counts
	Input Stability	± 1 count
	Full-scale Calibration Error	± 10 counts @ 20mA
	Offset Calibration Error	± 5 counts
	Max Inaccuracy	± 0.3% @ 25°C, ± 0.6% @ 60°C
	Accuracy vs. Temperature	± 50 ppm/°C typical
	Recommended Fuse	.032 Amp, series 217 fast acting
Analog Current Output Specs	Number of Channels	4 single ended
	Output Range	4-20mA
	Output Type	Current Sourcing
	Resolution	12 bit (1-4096)
	Max. Loop Voltage	6 VDC
	Load/loop	0-300Ω
	Linearity Error (end to end)	± 2 counts
	Conversion Setting Time	100μs for FS
	Full-scale Calibration Error	± 12 counts
	Offset Calibration Error	± 6 counts
	Max. Full-scale Inaccuracy (all errors included)	± 0.3%
	Wires	14 to 24 AWG

Pinout Information			
1	Output(1)	11	Input(5)
2	Output(2)	12	Input(6)
3	Output(3)	13	Input(7)
4	Output(4)	14	Input(8)
5	COM	15	COM
6	Input(1)	16	Not Connected
7	Input(2)	17	Not Connected
8	Input(3)	18	Not Connected
9	Input(4)	19	+VS
10	COM	20	VS-COM



EZRPL-IO-8ANI4ANOC



Module Specifications	
Operating Temperature	-20 °C to 60 °C
Storage Temperature	-20 °C to 70 °C
Relative Humidity	5 to 95 %
Removable Terminal Block	300 Volt/8 Amp/ 14 AWG UL Rating
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304





# Resistance Temperature Detector

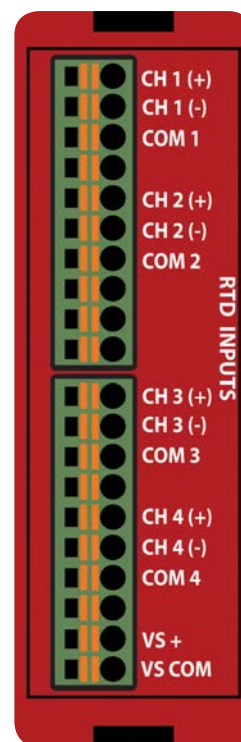
EZRPL-IO-4RTD

\$189

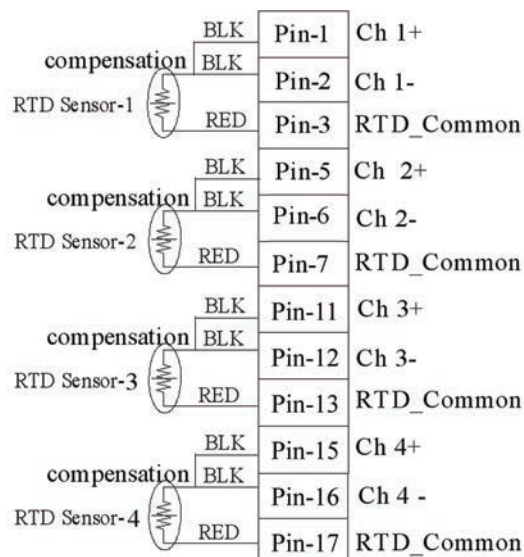
Pinout Information			
1	CHAN1 +	11	CHAN3 +
2	CHAN1 -	12	CHAN3 -
3	COM-1	13	COM-3
4	Not Connected	14	Not Connected
5	CHAN2 +	15	CHAN4 +
6	CHAN2 -	16	CHAN4 -
7	COM-2	17	COM-4
8	Not Connected	18	Not Connected
9	Not Connected	19	VS +
10	Not Connected	20	VS - COM

RTD Input Specifications	
Number of Channels	4
Common Mode Range	0-3.3 VDC
Resolution	12-bit
Update Rate	All Channels per scan
Input Words Required	4 IR Words
Temperature Drift	50 ppm / °C (max)
Maximum Inaccuracy	+ / - 1 °C
RTD Excitation Current	500 uA
Operating Temperature	-20 °C to 60 °C
Storage Temperature	-20 °C to 70 °C
Relative Humidity	5 to 95 %
Terminal Block	300 Volt/8 Amp/ 14 AWG UL Rating
Optical Isolation	2500 Volt
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304

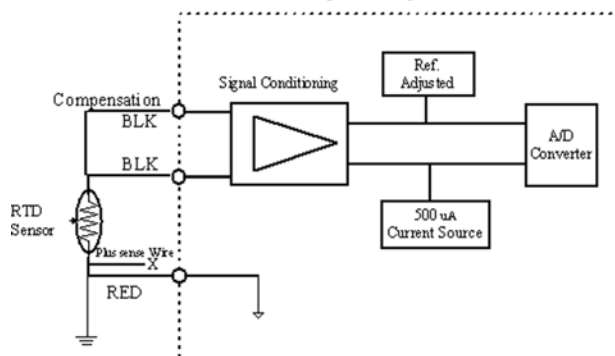
RTD Input Ranges			
RTD Input Ranges	Temperature Coefficient of Resistance (TCR) ( $\Omega/\Omega^{\circ}\text{C}$ )	Temperature Ranges	Resolution
Pt100	0.00385	-200 °C to + 850 °C	0.29
120 Ni	0.00672	-80 °C to 260 °C	0.22
10 Cu / 25 Cu	0.00427	-200 °C to 260 °C	2.64



EZRPL-IO-4RTD



Equivalent Input Circuit



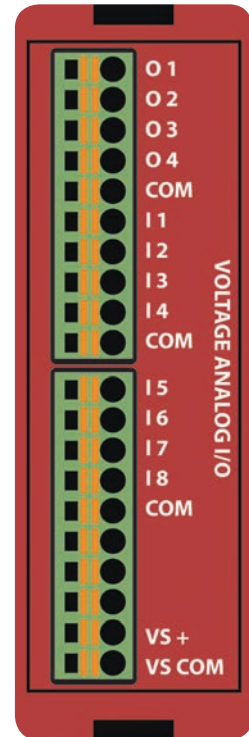


# 16-Bit, 8 pt. Analog In, 4 pt. Analog Output Module (Voltage)

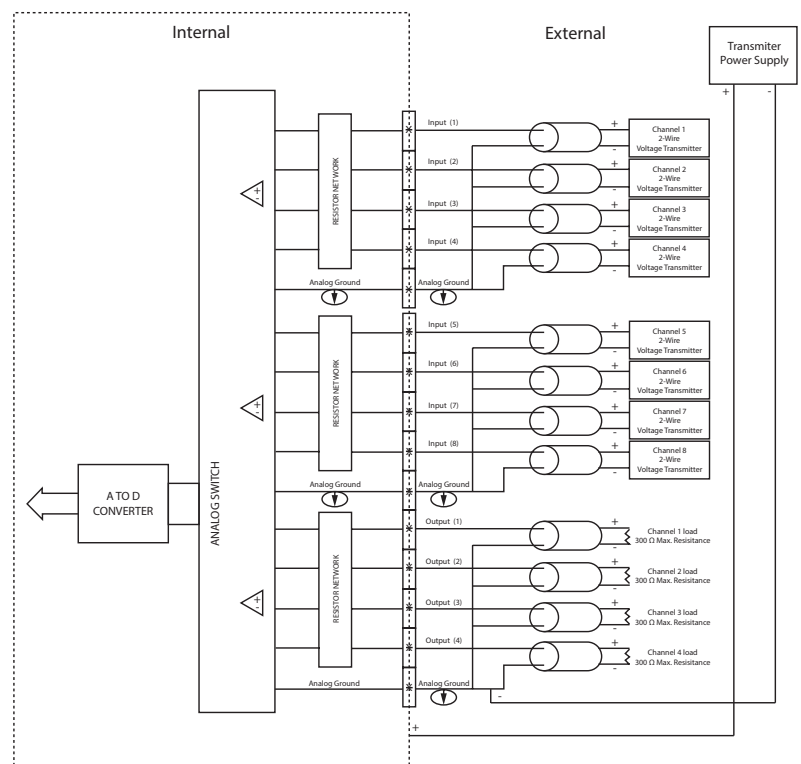
Module Specifications		
Analog Voltage Input Specs	Number of Channels	8 Single ended
	Input Range	0-10 VDC
	Resolution	16-bit (1-65535)
	Step Response	15µs to 95% of FS
	Crosstalk	1/2 count max, -120dB
	Input Impedance	>10MΩ
	Absolute Max Ratings	±12V ±100mA
	Converter Type	successive approximation
	Linearity Error (end to end)	±2 LSB
	Input Stability	
	Gain Error	±1 LSB
	Offset Calibration Error	±5 LSB
	Max Inaccuracy	0.1% @ 25° C
	Accuracy vs. Temperature	± 1 ppm/°C
Analog Voltage Output Specs	Number of Channels	4 Single ended
	Output Range	0-10 VDC
	Resolution	16-bit (1-65535)
	Conversion Setting Time	10µs to 95% of FS
	Crosstalk	1/2 count max, -100dB
	Peak Output Voltage	±18 VDC
	Offset Error	±0.15% of range
	Gain Error	±0.15% of range
	Linearity Error (end to end)	±2 LSB
	Output Stability	±2 count
	Load Impedance	2KΩ min.
	Load Capacitance	0.01µF max.
	Accuracy vs. Temperature	5ppm/°C

EZ RPL-IO-8ANI4ANOV-16BIT

Pinout Information			
1	Output(1)	11	Input(5)
2	Output(2)	12	Input(6)
3	Output(3)	13	Input(7)
4	Output(4)	14	Input(8)
5	COM	15	COM
6	Input(1)	16	Not Connected
7	Input(2)	17	Not Connected
8	Input(3)	18	Not Connected
9	Input(4)	19	+VS
10	COM	20	VS-COM



EZ RPL-IO-8ANI4ANOV-16BIT



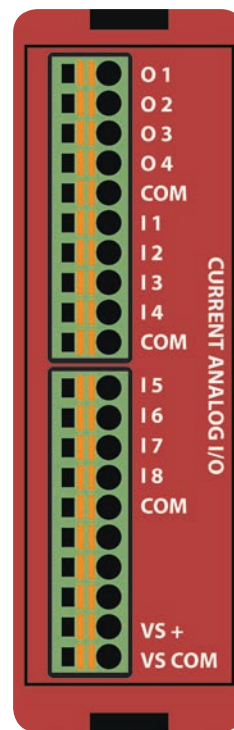


# 16-Bit, 8 pt. Analog In, 4 pt. Analog Output Module (Current)

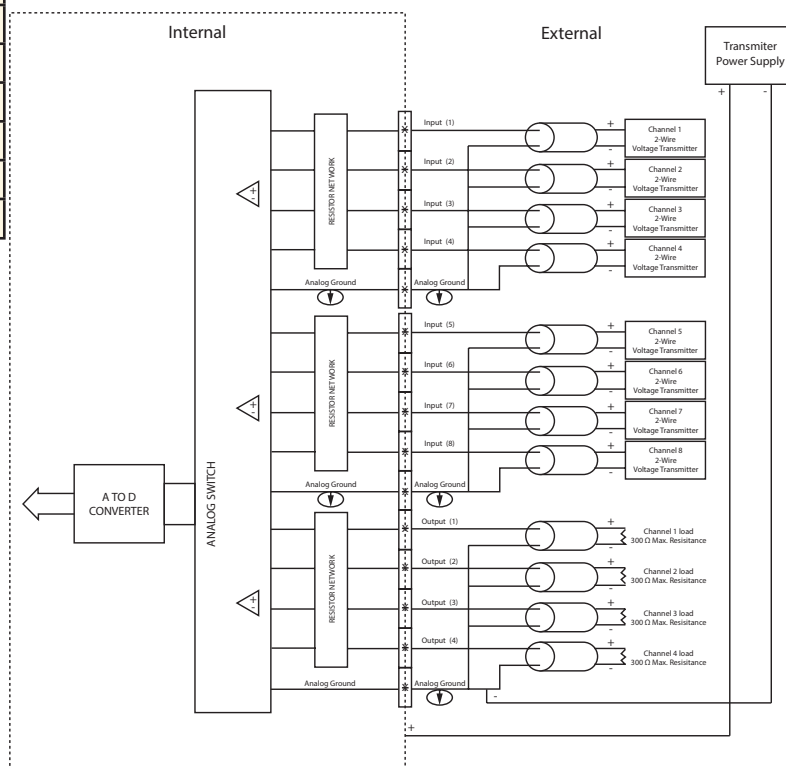
Module Specifications		
Analog Voltage Input Specs	Number of Channels	8 Single ended
	Input Range	4-20 mA
	Resolution	16-bit (1-65535)
	Step Response	15µs to 95% of FS
	Crosstalk	1/2 count max, -120dB
	Input Impedance	>10MΩ
	Absolute Max Ratings	±12V ±100mA
	Converter Type	successive approximation
	Linearity Error (end to end)	±2 LSB
	Input Stability	
	Gain Error	±1 LSB
	Offset Calibration Error	±5 LSB
	Max Inaccuracy	0.1% @ 25° C
	Accuracy vs. Temperature	± 1 ppm/°C
Analog Voltage Output Specs	Number of Channels	4 Single ended
	Output Range	4-20 mA
	Resolution	16-bit (1-65535)
	Conversion Setting Time	10µs to 95% of FS
	Crosstalk	1/2 count max, -100dB
	Peak Output Voltage	±18 VDC
	Offset Error	±0.15% of range
	Gain Error	±0.15% of range
	Linearity Error (end to end)	±2 LSB
	Output Stability	±2 count
	Load Impedance	2KΩ min.
	Load Capacitance	0.01µF max.
	Accuracy vs. Temperature	5ppm/°C

EZRPL-IO-8ANI4ANOC-16BIT

Pinout Information			
1	Output(1)	11	Input(5)
2	Output(2)	12	Input(6)
3	Output(3)	13	Input(7)
4	Output(4)	14	Input(8)
5	COM	15	COM
6	Input(1)	16	Not Connected
7	Input(2)	17	Not Connected
8	Input(3)	18	Not Connected
9	Input(4)	19	+VS
10	COM	20	VS-COM



EZRPL-IO-8ANI4ANOC-16BIT





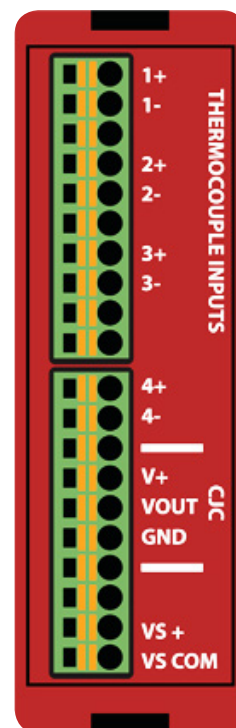


# Thermocouple Input Module

Module Specifications	
Number of Channels	4, differential
Common Mode Range	-1.5 VDC to +4.0 VDC
Common Mode Rejection	100dB min. @ VDC 50/60Hz
Input Impedance	5MΩ
Absolute Maximum Ratings	Fault-protected inputs to ±50 VDC
Accuracy vs. Temperature	± 15ppm/°C max. 0-1.25V ±35 ppm/°C max. (including max. offset change)
PLC Update Rate	4 channels per scan
Base Power Required	10mA @ 3.3 VDC supplied by base
Operating Temperature	-4° to 140°F (-20° to 60°C)
Storage Temperature	-4° to 158°F (-20° to 70°C)
Relative Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304

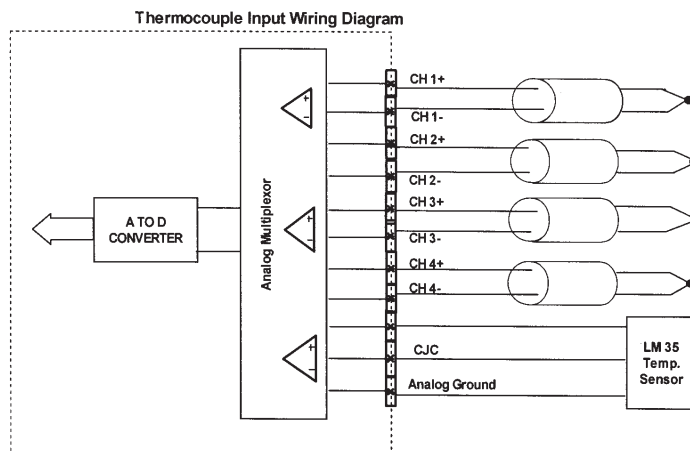
EZRPL-IO-4THIE  
\$149

Pinout Information			
1	Input 1+	11	Input 4+
2	Input 1-	12	Input 4-
3	Not Connected	13	Not Connected
4	Input 2+	14	CJC V+
5	Input 2-	15	CJC VOut
6	Not Connected	16	CJC Ground
7	Input 3+	17	
8	Input 3-	18	
9	Not Connected	19	VS+
10	Not Connected	20	VS Common



EZRPL-IO-4THIE

Thermocouple Specifications	
Input Ranges in C	Type J -210 to 1200°C
	Type K -200 to 1372°C
	Type S -50 to 1768°C
	Type T -200 to 400°C
	Type E -200 to 1000°C
	Type R -50 to 1768°C
	Type B 250 to 1820°C
	Type N -200 to 1300°C
Display Resolution	Type J,K,T, E,B,N ± 0.1°C; Type S,R ± 1°C
Resolution	16 Bit (1 in 65535)
Cold Junction Compensation	Automatic
Conversion Time	1ms per channel
Warm-Up Time	30 minutes typically ± 1°C repeatability
Linearity Error (End to End)	± 1°C max. ± 0.5°C typical
Maximum Inaccuracy	± 2°C (excluding thermocouple error)





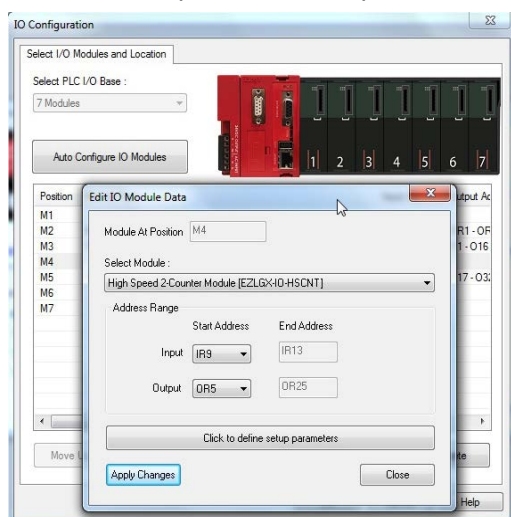
# High Speed Counter Inputs with Fast DC/PLS Outputs

High Speed 24 bit Counter Modules with PLS outputs that accept quadrature encoder inputs. The PLS outputs compare the counter value to two on/off presets and turn on outputs within 100µs of position change. Presets can be loaded into the counter modules from EZRack PLC. All inputs and outputs are optically isolated.

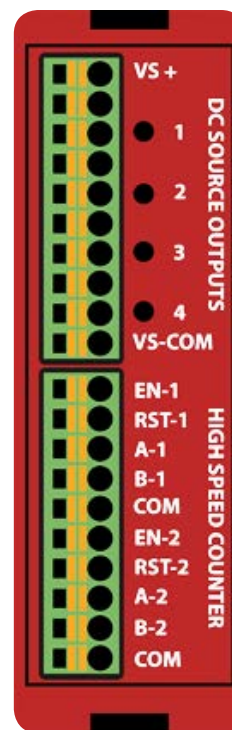
The counters have various preset/reset and inhibit modes as shown on the following page.

## Configuring your High Speed Counter Module is EZier than Ever!

**1** In EZRack PLC's I/O configuration specify the range of registers to be used for input and output.

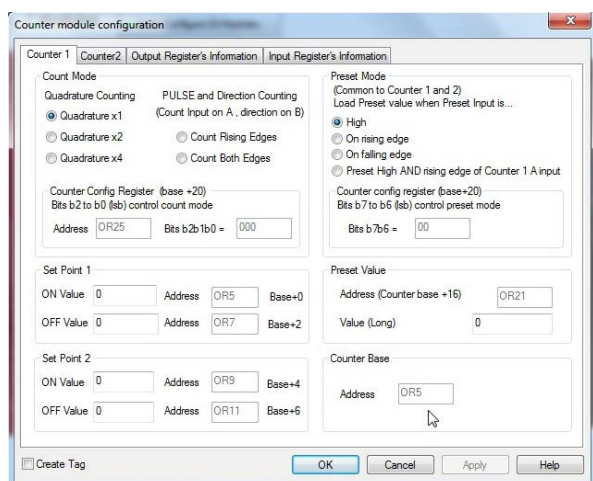


Pinout Information			
1	VS+	11	Counter EN-1
2		12	Counter RST-1
3	Output 1	13	Counter A-1
4		14	Counter B-1
5	Output 2	15	Common
6		16	Counter EN-2
7	Output 3	17	Counter RST-2
8		18	Counter A-2
9	Output 4	19	Counter B-2
10	VS Common	20	Common

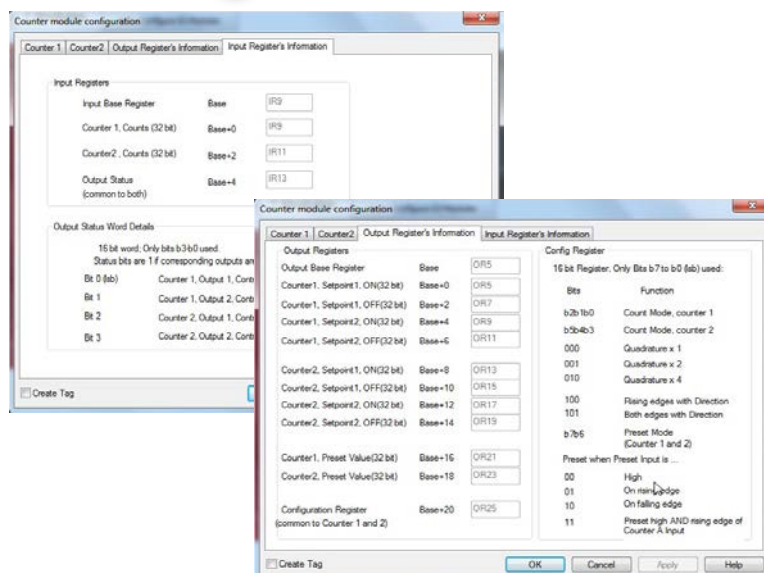


EZRPL-IO-HSCNT

**2** Configure pulse, direction, quadrature counting, set points, preset values and preset mode



**3** Detailed information for input and output registers

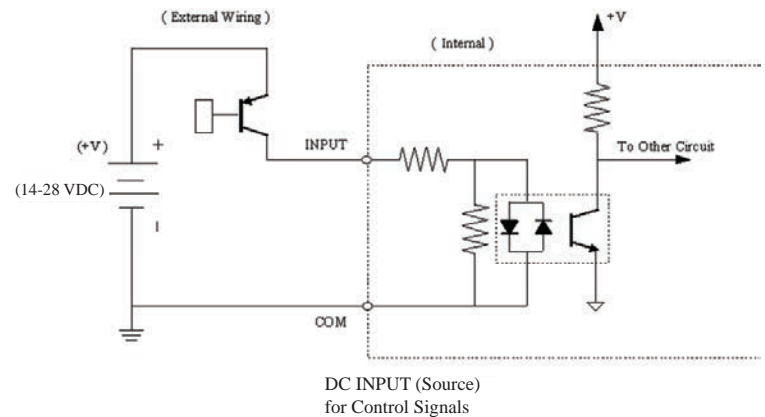




# High Speed Counter Module Specifications

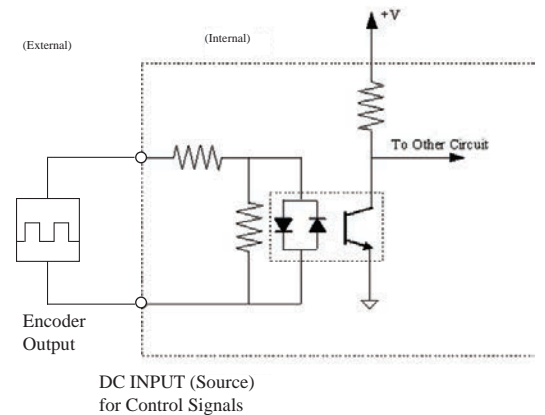
Module Specifications	
Feature	EZRPL-IO-HSCNT
Module Type	Intelligent High Speed Dual Counter Module
Maximum Input Frequency	100KHz after 1X, 2X or 4X Multiplication
Minimum Pulse Width	5 $\mu$ s
Resource Options	1X, 2X, or 4X Quadrature, Up or Down Counter, Reset
Counter Range	16 million (24 bits)
Preset Modes	1. This mode will preset the counter to the preset value while preset is held high. While the preset signal is high, no new count signals will be counted. 2. This mode will create an interrupt on the rising edge of the reset signal to set the counter to the preset value. 3. This mode will create an interrupt on the falling edge of the preset signal to set the counter to the preset value. 4. This mode will create a preset pulse every time that there is a rising edge of signal A and the preset signal is high.
Reset Modes/Input	Same as Preset except the reset input sets the counter value to zero
Inhibit Input	Inhibits the counter from counting when high

General Specifications	
Optical Isolation	2500 Volt
Wires	1 of 14 AWG, 2 of 18 AWG, 4 of 22 AWG
Operating Environment	-20-60°C, Humidity non-condensing 5-95%

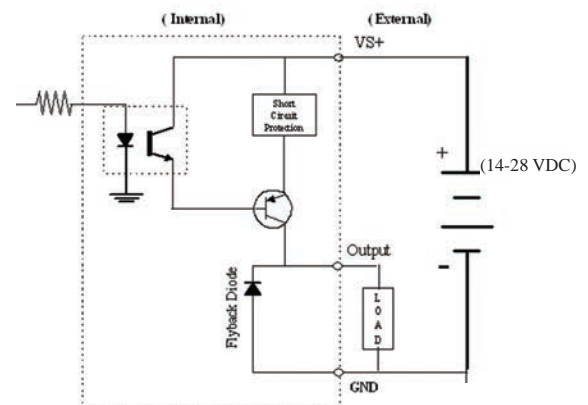


High Speed Output Specifications	
Feature	EZRPL-IO-HSCNT (dual counter)
Number of Outputs	4 High Speed PLS / DC Source outputs
Response Time	100 $\mu$ s
PLS Setpoints	1 on/off pair for each output
Peak Voltage	50.0 VDC
Maximum Steady State Output Current	0.5A per output, 1.0A max per module @ 50°C
Maximum Leakage Current	100 $\mu$ A @ 50 VDC @ 50°C
ON Voltage Drop	2 VDC @ 0.5A
Maximum Inrush Current	0.8A for 10ms
OFF to ON Response	< 2 $\mu$ s
ON to OFF Response	< 10 $\mu$ s
Status Indicators	Red LED for each output
+V Terminals & Commons	One V+, 1 Common
Short Circuit Protection	1 Amp per module, turns off outputs upon short circuit detection
Optical Isolation	2500 Volt

Counter Input Specifications	
Feature	EZRPL-IO-HSCNT (dual counter)
Number of Inputs	4 per High Speed Channel Inputs (A, B, EN, RST)
Input Voltage Range	14-28 VDC
Peak Voltage	40 VDC
Input Current	2.5 mA @ 14 VDC 5.0 mA @ 28 VDC
Maximum Input Current	5 mA @ 28 VDC
Input Impedance	5.6K $\Omega$ min. @ 14-28 VDC
ON Voltage Level	> 14 VDC
OFF Voltage Level	< 2 VDC
Min. ON Current	2.5 mA
Min. OFF Current	0.2 mA
OFF to ON Response	< 2 $\mu$ s
ON to OFF Response	< 3 $\mu$ s
Commons	1 per High Speed Counter Input

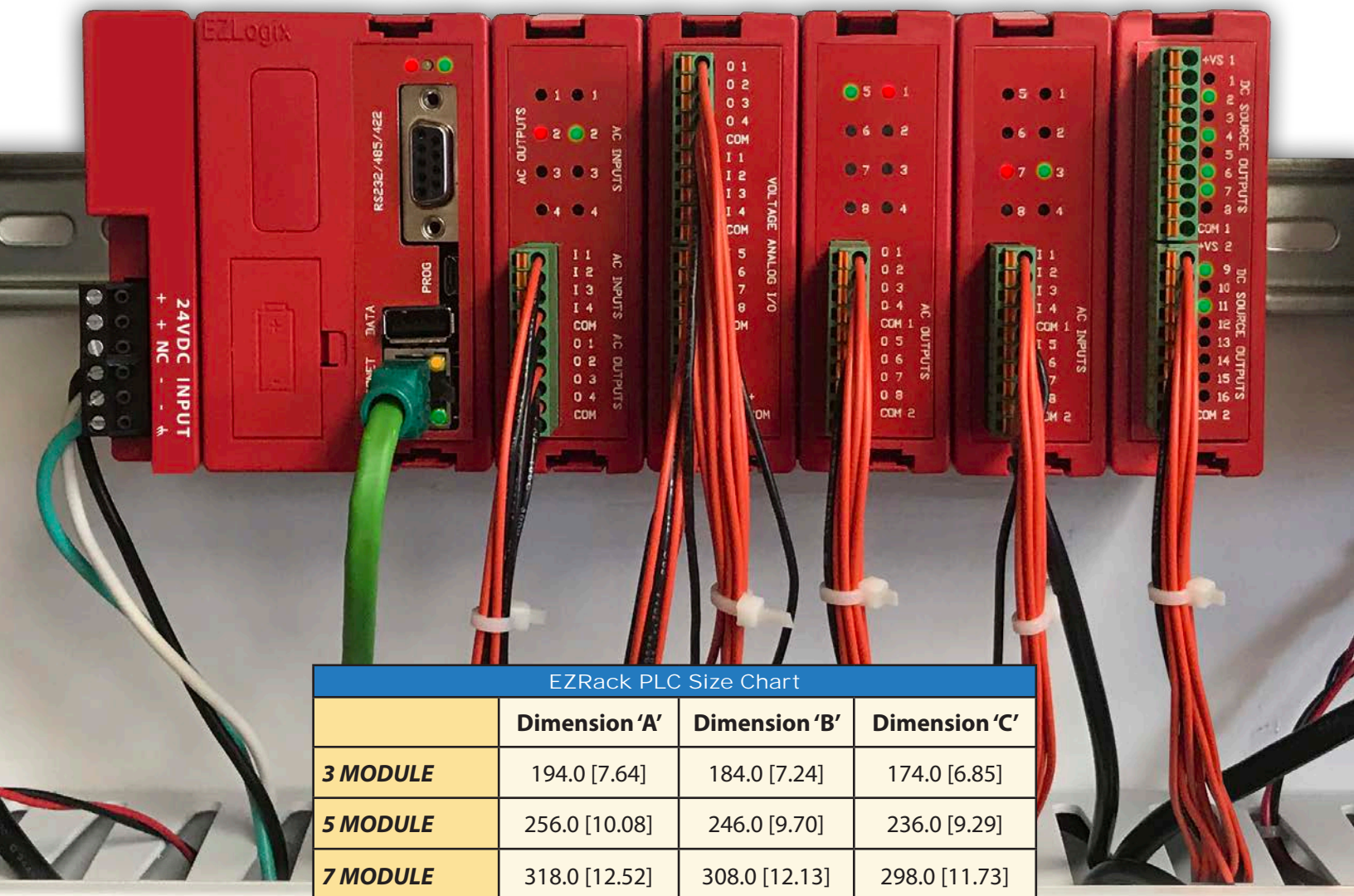


Output Wiring

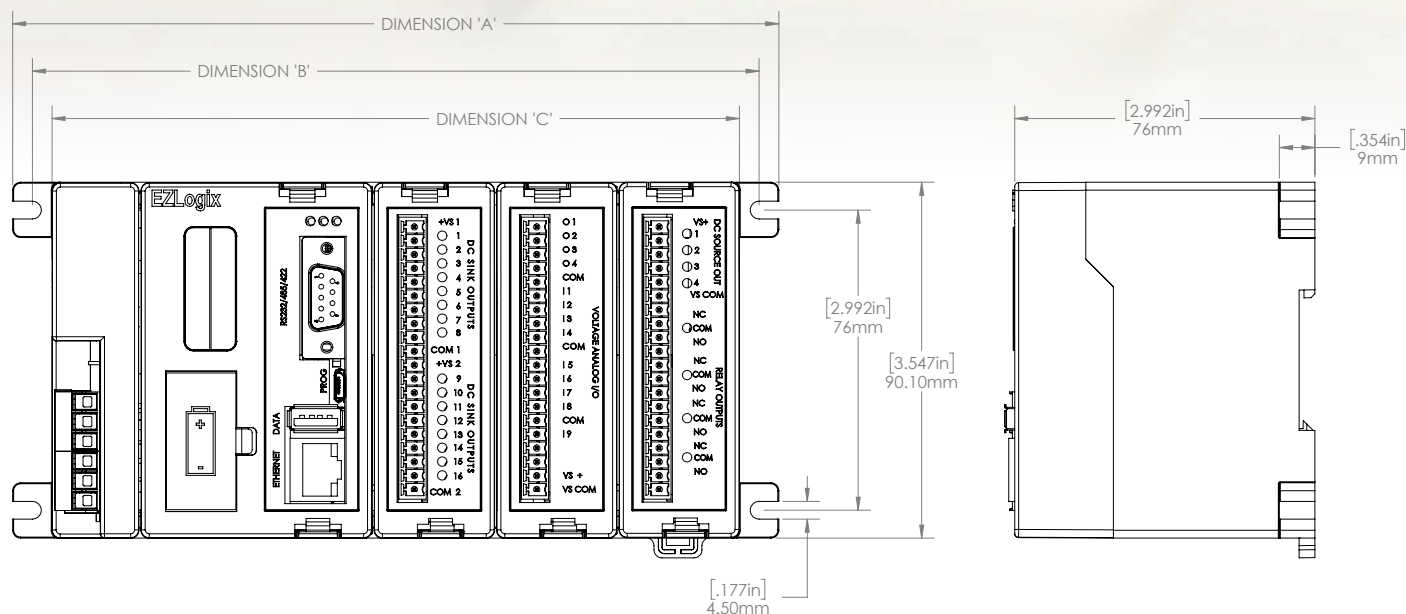




# EZRackPLC™ Dimensions and Drawings



EZRack PLC Size Chart			
	Dimension 'A'	Dimension 'B'	Dimension 'C'
<b>3 MODULE</b>	194.0 [7.64]	184.0 [7.24]	174.0 [6.85]
<b>5 MODULE</b>	256.0 [10.08]	246.0 [9.70]	236.0 [9.29]
<b>7 MODULE</b>	318.0 [12.52]	308.0 [12.13]	298.0 [11.73]



**EZPPS<sup>®</sup>**

# ***Low Cost, Ultra Compact DIN-Mount Programmable Power Supply with Built-in Display/Diagnostics***



3-Digit LED  
Display for Output  
Voltage



2 Digit LED Display  
for Output Current



Maint. Timer  
Remaining Time  
1.2 K Hrs



Adjustable Voltage  
Setting



Programmable  
Current Limit

**Once you have used EZPPS<sup>™</sup>,  
You will never go back!!**



# EZAutomation.net

## **EZ PPS**

## Din-Rail Power Supply with Load Current Read-out loved by Endusers



### Customer Review ★★★★★

**Excellent Power Supply - TD, St Charles** ★★★★★  
This is a great, reliable power supply with built in overload protection.

**Digital power supplies - Covina, CA** ★★★★★  
5 or so installed. Love the digital readout of load!

**Din-Rail Power Supply with Display - Louisville, KY** ★★★★★  
Have over a 100 of these supplies in a harsh environment automotive plant. The voltage & current readouts at a glance are great for maintenance!



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# Five Best Features - Feedback from Customers

## 1. Load Current Read-Out

Too often maintenance engineers are concerned about the DC voltage and current draw from their Switch Mode Power Supply (SMPS) in the control panel. With a typical power supply you will need to have a volt meter and a clamp current meter to find out the load on the SMPS. EZPPS changes this forever with the 2 Digit LED Display that shows both the current load current as well as maximum load current seen by the SMPS.



## 2. Compact Size

Control panel real-estate is becoming more and more precious these days with the cost of sheet metal rising. The EZPPS, irrespective of output power, fits nicely on a din-rail with a width of only 1.8"

## 3. Short-Circuit, Over Voltage, and Overtemperature Protection

The EZPPS is NEC, National Electric Code Class 2 certified. NEC is the source of the Class 2 circuit definition which limits the maximum voltage and current. Such Class 2 circuits have reduced requirements regarding wire size, derating factors, overcurrent protection, insulation, wiring methods and installation materials.

## 4. Adjustable Output Voltage

The EZPPS has the ability to adjust the output voltage via a potentiometer upfront. The 3 digit LED display quickly shows the user the precise output voltage.

## 5. Cost Effective & Made in USA

The EZPPS with all of its bells and whistles is still priced very attractively in the market. There is no power supply out there that has the same features at the same price point. Furthermore the EZPPS is 100% manufactured in the United States unlike most power supplies available in the market.



# **EZPPS** First DIN-Mount Programmable Power Supply with Built-in Display/Diagnostics

## At Incredible Prices!!

60W - \$65  
90W - \$79  
120W - \$149<sup>99</sup>  
240W - \$249<sup>99</sup>



Self-locking  
DIN-rail latch

Maintenance Timer  
shows hours of use and  
remaining life in K Hrs.

DC-output monitoring  
via PNP output

3 Digit LED display  
for output Voltage

Short-circuit,  
overvoltage and  
overtemperature  
protection

- ✓ EZ for Control Panel Maintenance
- ✓ EZ Display
- ✓ EZ Monitoring
- ✓ EZ Troubleshooting
- ✓ EZ Programmability
- ✓ EZ Wiring with Class 2

*Innovate'n'Save™*

### What is EZPPS?

Too often maintenance engineers are concerned about the DC voltage and current draw from their Switch Mode Power Supply (SMPS) in the control panel. With a typical power supply you will need to have a volt meter and a clamp current meter to find out the load on the SMPS. EZPPS changes this forever. In addition, all SMPS's have limited life due to the electrolytic capacitors, and dependent on the current draw and the temperature of the power supply. EZPPS keeps track of total number of hours it has been ON and provides an alarm for preventive maintenance and replacement before the power supply dies a sudden death.

### Benefits of NEC National Electric Code Class 2

NEC is the source of the Class 2 circuit definition, which limits the max. voltage and current. Such Class 2 circuits have reduced requirements regarding wire size, derating factors, overcurrent protection, insulation, wiring methods and installation materials. Considering Class 2 in a system can be an important factor for reducing the cost and improving the flexibility of the system. Especially when the voltage level of the control circuits is shifted from AC 120V to a DC voltage with 24V <100W, Class 2 would be applicable.

**EZPPS™**

# One you have used EZPPS™, you'll never go back!

**30W**
**\$59<sup>99</sup>**

 EZ to Wire Phoenix  
Plug-in Terminal Blocks

 2 Digit Readout of  
Load Current!

 Adjustable  
output voltage

 Programmable  
current limit

 Input Voltage  
(L1-L2)

**240W Just 1.8" Wide**

 voltage  
regulation 1%  
and max. ripple  
<100mV

 Triple overload and  
Thermal protection  
No internal Fan  
Compact Size

 CE compliance  
including EN61000-3-2, UL508  
UL/CSA / IEC/EN 60950

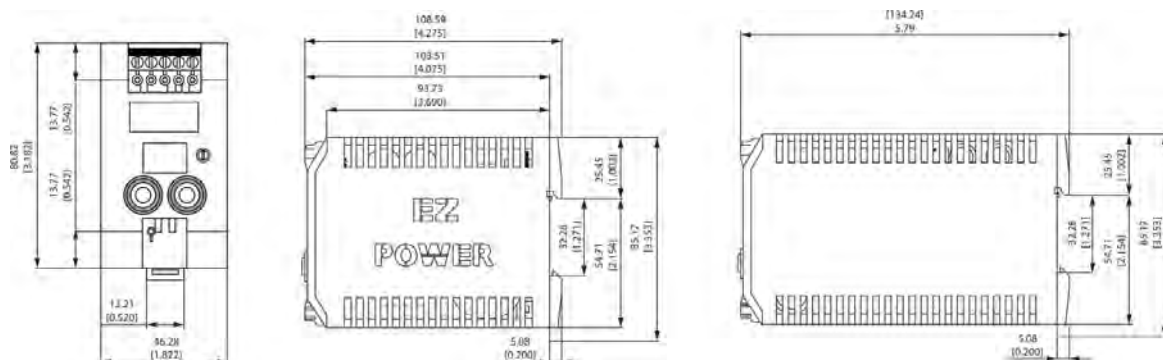
	Power Supply, 24VDC, 30W		Power Supply, 24VDC, 60W		Power Supply, 24VDC, 90W	
	EZAutomation EZ PPS	Automation Direct PSC Series	EZAutomation EZ PPS	Automation Direct PSC Series	EZAutomation EZ PPS	Automation Direct PSC Series
Part Number	EZPPS-30W	PSC-24-030	EZPPS-60W	PSC-060	EZPPS-90W	PSC-24-090
NEC Class 2	Yes	Yes	Yes	Yes	Yes	Yes
Voltage Display	Yes	No	Yes	No	Yes	No
Current Display	Yes	No	Yes	No	Yes	No
Maintenance Timer	Yes	No	Yes	No	Yes	No
Programmable Current Limit	Yes	No	Yes	No	Yes	No
Size	1.82x3.18x4.25" (24.6 cubic inch)	2.07x2.34x3.52" (17 cubic inch)	1.82x3.18x4.25" (24.6 cubic inch)	2.76x2.34x3.52" (22.73 cubic inch)	1.82x3.18x4.25" (24.6 cubic inch)	4.13x2.34x3.52" (34 cubic inch)
Price	\$59.99	\$57	\$65	\$69	\$79	\$87



# EZPPS® Specifications

Specifications for 30W, 60W, 90W, 120W, and 240W							
Specifications	EZPPS-30W \$59.99	EZPPS-60W \$64.99	EZPPS-90W \$78.99	EZPPS-110-120W \$149.99	EZPPS-110-240W \$249.99	EZPPS-230-120W \$149.99	EZPPS-230-240W \$249.99
Input Voltage	85 - 264VAC Universal Input Voltage 47-63Hz			90-135VAC (50-60Hz)	100-135VAC (50-60Hz)	180-270VAC (50-60Hz)	200-270VAC 60-60Hz
Typical Input Current at Full Load	0.65A @ 115VAC, 0.35A @ 230VAC	1.15A @ 115VAC, 0.65A @ 230VAC	1.55A @ 115VAC, 0.85A @ 230VAC	1.84A @ 115VAC	3.5A @ 115VAC	1A @ 230VAC	1.8A @ 230VAC
C-curve Circuit Breaker/ Slow Blow Fuse	5 Amps						
Typical Efficiency	85%			90%			
Output Voltage/Current/Watt	Adjustable 23 - 27V, 24VDC-C/1.25A 1.25A max, 30W	Adjustable 23 - 27V, 24VDC/2.5A 2.5A max, 60W	Adjustable 23 - 27V, 24VDC/3.75A 3.75A max, 90W	Adjustable 23 – 24.5V, 24VDC/5.0A 5A max, 120W	Adjustable 23 – 24.5V, 24VDC/10.0A 10A max, 240W	Adjustable 23 – 24.5V, 24VDC/5.0A 5A max, 120W	Adjustable 23 – 24.5V, 24VDC/10.0A 10A max, 240W
Typical Life/MTBF	MTBF@25°C without taking in to account electrolytic capacitors, operating temperatures and output load is meaningless. Expected Life of EZPPS is 50K - 100K hrs. depend- ing on load and temperature.						
Hold-up Time	10ms min @ 115VAC, 20ms min @ 230VAC			20ms @ 115VAC	20ms @ 115VAC	20ms @ 230VAC	20ms @ 230VAC
Programmable Current Limit	20% - 100% of Full Load with automatic recovery upon short-circuit						
Temperature	Operating: -25°C to 60°C (-13°F to 140°F). Above +60°C(140°F) 2.5% /°C derating up to 70°C (185°F) Storage (non-operating): -25°C to + 85°C max (-13°F to 185°F)			Operating: -25°C to 50°C (-13°F to 122°F). Above 50°C(122°F): 2.5% /°C derating up to 70°C (185°F) Storage (non-operating): - 25°C to + 85°C max (-13°F to 185°F)			
Humidity	10% - 95% (non-condensing)						
Output Regulation	1%						
Output Voltage Ripple	<100 mV peak-to-peak						
Over-temperature Protection	Switch off at over-temperature, automatic restart						
Status Indicators	LED Display						
Electrical Noise	Nema ICS 2-230 Showering arc; ANSI C37.90a SWC; Level C Chattering Relay Test (pending)						
Withstand Voltage	1000VDC (1 minute) between power supply input terminal and protective ground						
Insulation Resistance	Over 20M Ohm between power supply input and terminal and protective ground						
Vibration	5 to 55Hz 2G's for 2 hours in X, Y, and Z axis						
Shock	10G for under 12ms in the X,Y, and Z axis						
Enclosure Rating	NEMA 1, IP20						
Enclosure Material	Engineered Plastic						
Mounting	Snap-on with self-locking spring for 35mm DIN rails per EN 50022-35x15/75, or wall mount with bracket						
Connection	Pluggable screw terminals (plugs included) 2 terminals per output						
Wiring	24 -12 AWG / 3.30mm² max						
Agency Approvals	UL (File No. E209355), cUL, CSA, CE						

## Dimensions and Drawing

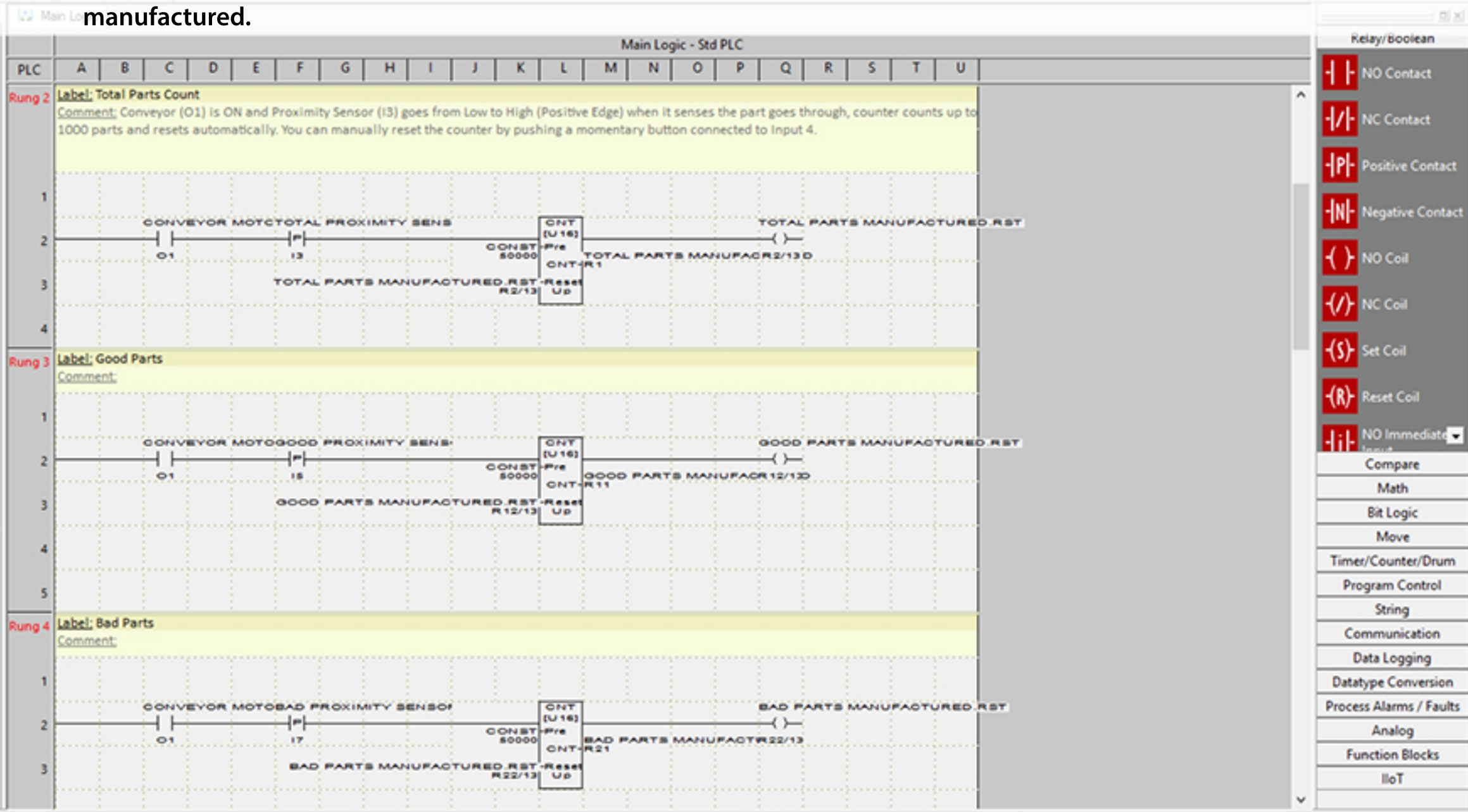


# Batch Count:

This sample project explains how to count the total number of products manufactured and which are moving on a conveyor belt. Count the number of good parts and bad parts. Calculate percentage of good parts and bad parts manufactured.

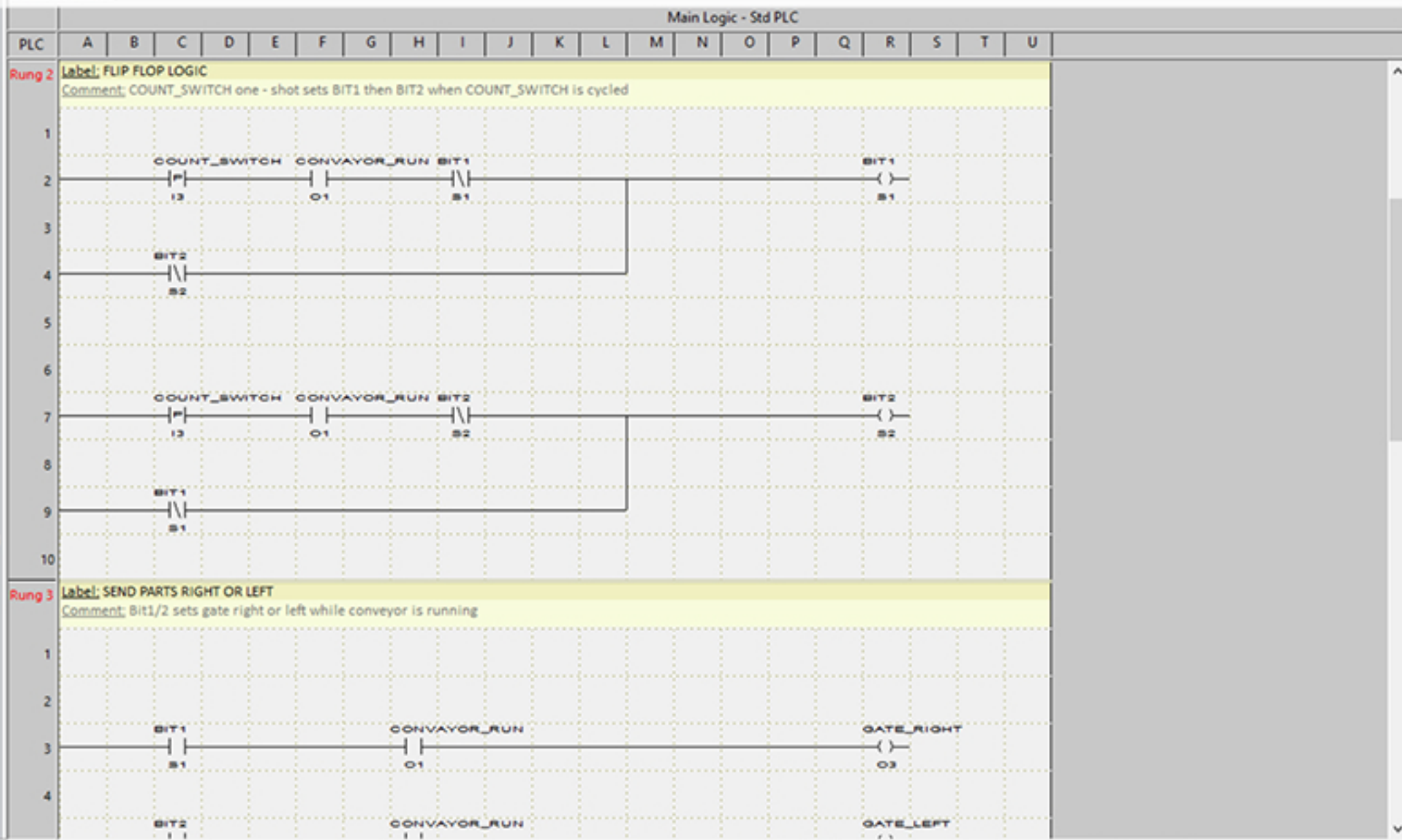
Batch\_CountLeic

- Main Logic
- Interrupt Logic
- Subroutine Logic
- Hardware Setup
- I/O Table Layout
- I/O Graphical Layout
- Communication Setup
- COM Configuration
- Ethernet Setup
- Database
- Tag Database
- Tag Cross Reference
- Message Database
- PID Tuning
- PID Setup
- PID Monitor
- CPU Control
- Start PLC
- Stop PLC
- Transfer to EZLogix
- Create USB Loader File
- Monitor
- Go Online
- Simulate
- Switch to Monitor Mod
- Debug
- Start Debug
- Run Debug
- Single Step
- Enable Outputs



## Flip Flop:

- Conveyor Parts\_FlipFlop.eix
  - Main Logic
  - Interrupt Logic
  - Subroutine Logic
  - Hardware Setup
  - I/O Table Layout
  - I/O Graphical Layout
  - Communication Setup
  - COM Configuration
  - Ethernet Setup
  - Database
    - Tag Database
    - Tag Cross Reference
    - Message Database
  - PID Tuning
  - PID Setup
  - PID Monitor
  - CPU Control
    - Start PLC
    - Stop PLC
    - Transfer to EZLogix
    - Create USB Loader File
  - Monitor
    - Go Online
    - Simulate
    - Switch to Monitor Mod
  - Debug
    - Start Debug
    - Run Debug
    - Single Step
    - Enable Outputs



- Relay/Boolean
- NO Contact
  - NC Contact
  - Positive Contact
  - Negative Contact
  - NO Coil
  - NC Coil
  - Set Coil
  - Reset Coil
  - NO Immediate
- Compare
- Math
- Bit Logic
- Move
- Timer/Counter/Drum
- Program Control
- String
- Communication
- Data Logging
- Datatype Conversion
- Process Alarms / Faults
- Analog
- Function Blocks
- IoT



# Motor Directional Control:

This sample project explains how to change the motion of a DC motor to go in forward or reverse direction.

