



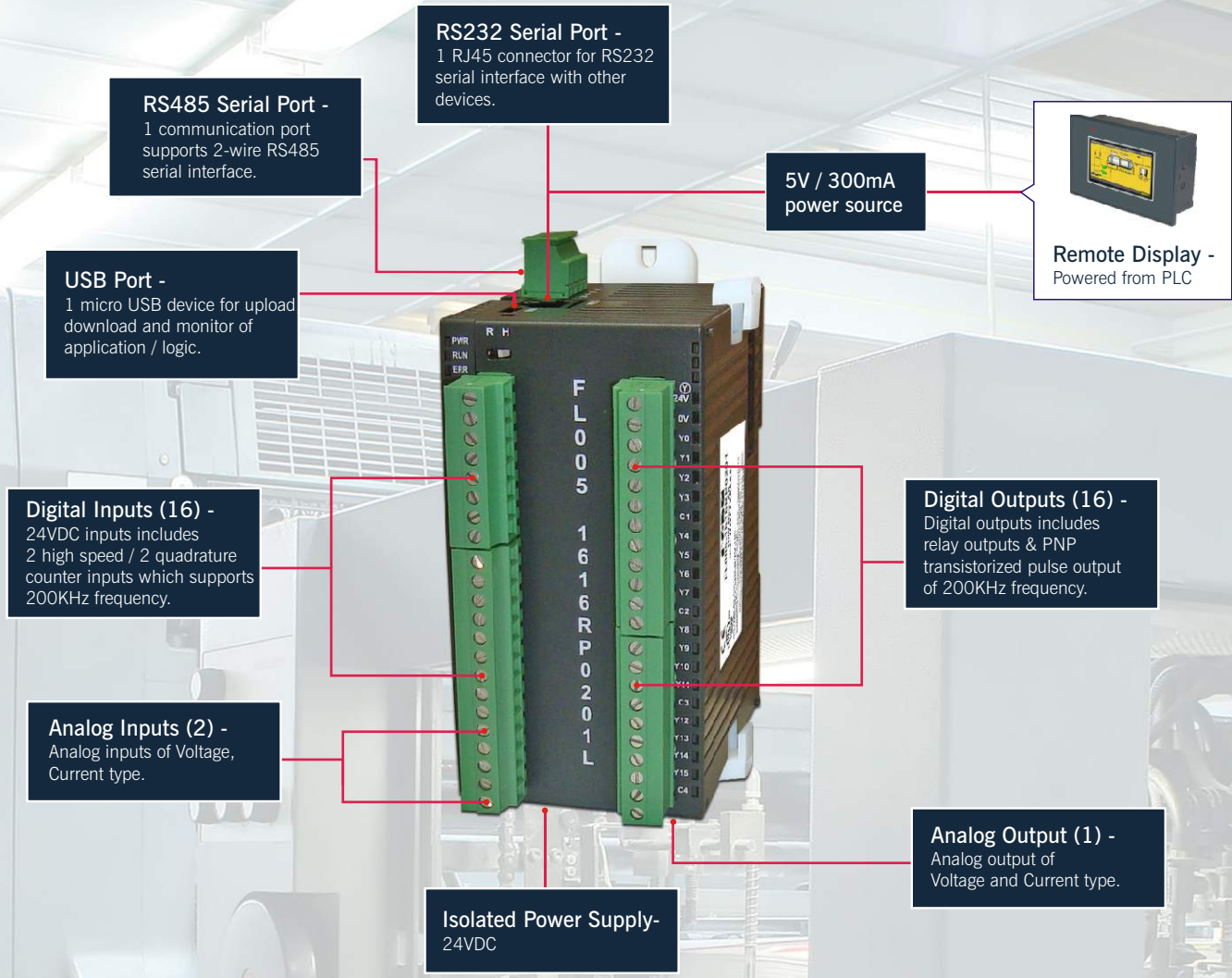
- » Supports IEC61131-3 programming
- » LD, FBD, ST, SFC, IL languages
- » 0.06 $\mu$ s per contact
- » Power remote display

FL005 (Expandable Series)

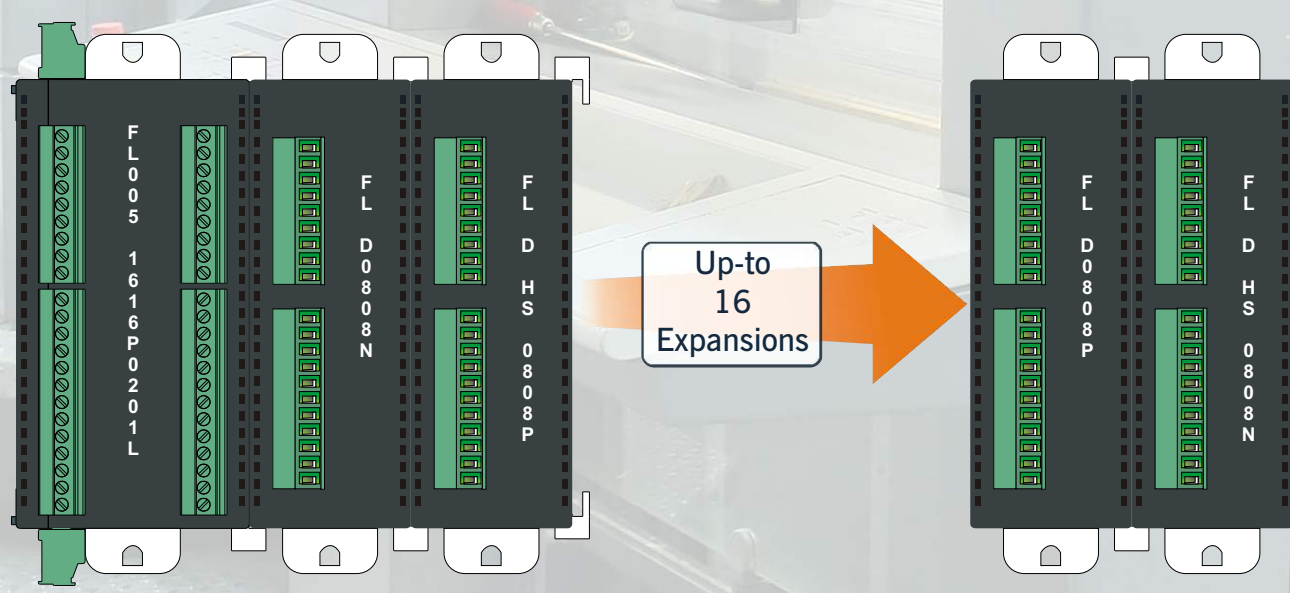
## Salient Features

- DIN rail / Back panel mounted PLC
- Transistor or Relay outputs
- Expandable up to 16 expansions
- 32 Bit RISC processor
- Built-in RTC
- DC inputs, DC Outputs
- Analog Inputs (Voltage, Current, RTD and Thermocouple)
- Analog Output (Voltage, Current)
- Support for High Speed Counters / Quadrature (up to 200 KHz) and Timers
- High Speed PWM output (200 KHz)
- Up-to 2 Serial Ports. Support for various PLC protocols
- 1 USB Device Port
- DC powered units (24 V DC)
- Simple Ladder programming using Windows<sup>®</sup> based software
- Support for LD, FBD, ST, SFC, IL type IEC61131-3 programming languages
- CE, UL Class1 Div2 approved

# Model Description



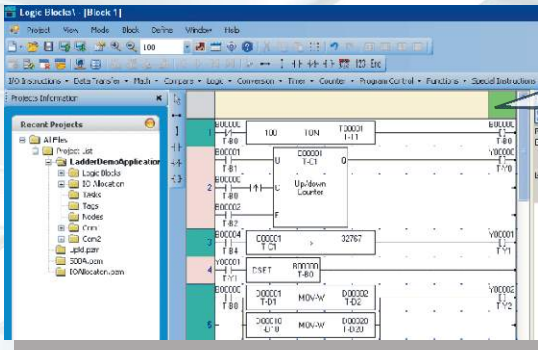
## Greater Expandability - Up-to 16 Expansions



# Model Comparison

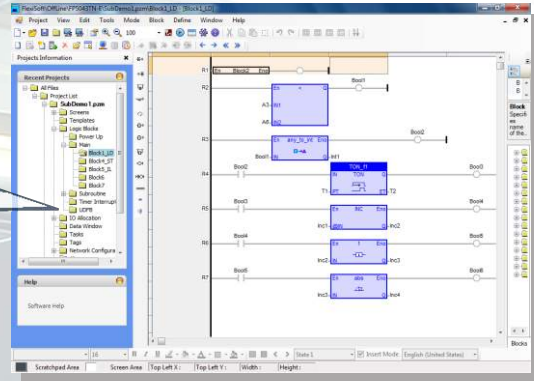
Model		FL005-1616P	FL005-1616RP	FL005-0808RP0402U	FL005-1616P0201L	FL005-1616N0201L	FL005-1616RP0201L	FL005-1616P0201L-S1
Power Supply	Rated Power	24VDC	24VDC	24VDC	24VDC	24VDC	24VDC	24VDC
	Isolation	1KV	1KV	1KV	1KV	1KV	1KV	1KV
	Power Consumption (With I/Os)	10W	14W	15W	12W	12W	16W	10W
Digital Inputs	Input Signal	DC Input Bi-directional	DC Input Bi-directional	DC Input Bi-directional	DC Input Bi-directional	DC Input Bi-directional	DC Input Bi-directional	DC Input Bi-directional
	Total Channels	16	16	8	16	16	16	16
	High Speed Channels	4	4	4	4	4	4	4
	Isolation	3.7KV	3.7KV	3.7KV	3.7KV	3.7KV	3.7KV	3.7KV
	High Speed Inputs	2	2	2	2	2	2	2
	Quadrature Inputs	2	2	2	2	2	2	2
	Max. HSC frequency	200KHz each	200KHz each	200KHz each	200KHz each	200KHz each	200KHz each	200KHz each
Digital Outputs	Total Channels	16	16	8	16	16	16	16
	Output Type	PNP	14 Relay, 2 PNP	6 Relay, 2 PNP	PNP	NPN	14 Relay, 2 PNP	PNP
	Isolation	3.7KV	3.7KV	3.7KV	3.7KV	3.7KV	3.7KV	3.7KV
	Maximum Relay contact current	-	2A at 24VDC 2A at 230VAC 8A/common	2A at 24VDC 2A at 230VAC 5A/common	-	-	2A at 24VDC 2A at 230VAC 8A/common	-
	High Speed Outputs	2	2	2	2	2	2	2
	Max pulse output frequency	200KHZ each	200KHZ each	200KHZ each	200KHZ each	200KHZ each	200KHZ each	200KHZ each
	Maximum transistor output current	0.25A at 24VDC	0.25A at 24VDC	0.25A at 24VDC	0.25A at 24VDC	0.3A at 24VDC	0.25A at 24VDC	0.25A at 24VDC
Analog Inputs	Channels	-	-	4 Universal input channels	2	2	2	2
	Resolution	-	-	16-bit	16-bit	16-bit	16-bit	16-bit
	mA	-	-	0 to 20 mA, 4 to 20 mA	0 to 20 mA, 4 to 20 mA	0 to 20 mA, 4 to 20 mA	0 to 20 mA, 4 to 20 mA	0 to 20 mA, 4 to 20 mA
	mV	-	-	0 to 50mV, 0 to 100mV	-	-	-	-
	V	-	-	0 to 10 VDC, 0 to 5 VDC	0 to 10 VDC, 0 to 5 VDC	0 to 10 VDC, 0 to 5 VDC	0 to 10 VDC, 0 to 5 VDC	0 to 10 VDC, 0 to 5 VDC
	RTD	-	-	PT100	-	-	-	-
	Thermocouple	-	-	J & K Type	-	-	-	-
Analog Output	Channels	-	-	2	1	1	1	1
	Resolution	-	-	12-bit	12-bit	12-bit	12-bit	12-bit
	mA	-	-	4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA
	V	-	-	0 to 10 VDC	0 to 10 VDC	0 to 10 VDC	0 to 10 VDC	0 to 10 VDC
Comm. Ports	Serial	2	2	2	2	2	2	2
	Type	One 3.81 pitch PBT RS485 (2-wire)	One 3.81 pitch PBT RS485 (2-wire)	One 3.81 pitch PBT RS485 (2-wire)	One 3.81 pitch PBT RS485 (2-wire)	One 3.81 pitch PBT RS485 (2-wire)	One 3.81 pitch PBT RS485 (2-wire)	One 3.81 pitch PBT RS485 (2-wire)
		One RJ45 RS232 with 5V/300 mA power source	One RJ45 RS232 with 5V/300 mA power source	One RJ45 RS232 with 5V/300 mA power source	One RJ45 RS232 with 5V/300 mA power source	One RJ45 RS232 with 5V/300 mA power source	One RJ45 RS232 with 5V/300 mA power source	One RJ45 RS232 with 5V/300 mA power source
	USB	1	1	1	1	1	1	1
	Type	USB Micro (Device)	USB Micro (Device)	USB Micro (Device)	USB Micro (Device)	USB Micro (Device)	USB Micro (Device)	USB Micro (Device)
Expansion Connectivity		Up to 16 modules	Up to 16 modules	Up to 16 modules	Up to 16 modules	Up to 16 modules	Up to 16 modules	No
RTC		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions		Fig. A	Fig. A	Fig. A	Fig. A	Fig. A	Fig. A	Fig. A
Certification		CE & UL Class1 Div 2	CE & UL Class1 Div 2	CE & UL Class1 Div 2	CE & UL Class1 Div 2	CE & UL Class1 Div 2	CE & UL Class1 Div 2	CE & UL Class1 Div 2

# Software Features

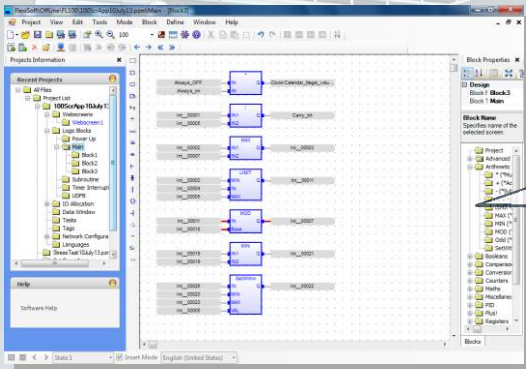


Configuration Software FlexiSoft® is a compact, Windows® based software to configure the PLC. Following image from FlexiSoft® shows the snap shot of ladder configuration window:

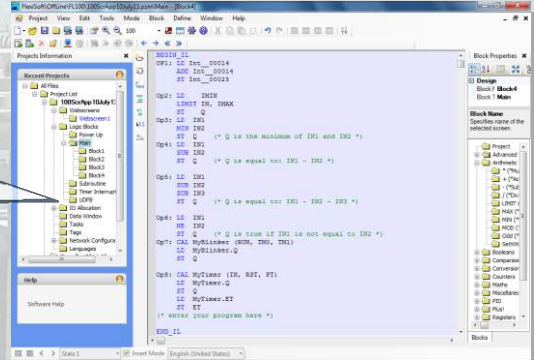
IEC61131-3 Programming Environment Create application using LD language



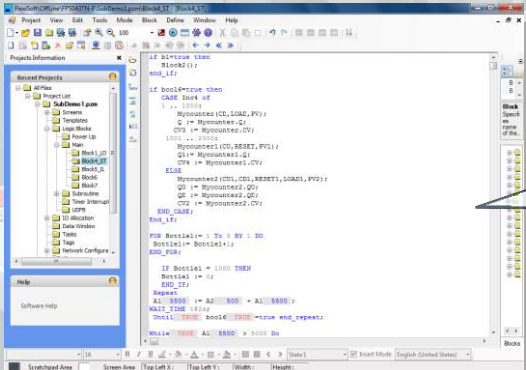
IEC61131-3 Programming Environment Create application using FBD language



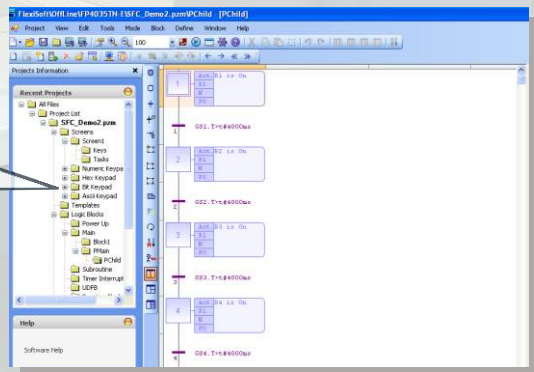
IEC61131-3 Programming Environment Create application using IL language



IEC61131-3 Programming Environment Create application using ST language



IEC61131-3 Programming Environment Create application using SFC language



- System requirements for FlexiSoft® Software are -
- Windows Version : Microsoft Windows® 2000 or above
  - Processor : 266 MHz PENTIUM or higher
  - Mouse : Required
  - RAM : 64 MB or more
  - Display resolution : 800 x 600 (VGA) or better
  - Display colors : 256 colors minimum
  - Serial Port : 1 serial port for FlexiPanels® programming
  - USB Port : 1 USB port (Host) for FlexiPanels® programming
  - Keyboard : Required

# Software Features

Comprehensive Instructions supported in FlexiLogics®:

## Native Ladder Instructions -

Some of the supported Instructions in FlexiLogics® are listed below :

1. Math  
Instructions such as ADD, Subtract, Multiply and Divide. These instructions could be Single word or Double word, signed or unsigned format.
2. Data compare  
Instructions such as Less than, Greater than, Equal to, Less than or Equal to, Greater than or Equal to etc. are supported.
3. Data Transfer Instructions  
Data transfer instruction supports word and double word operands, Multiplexer / demultiplexer instructions.
4. Data conversion  
Data conversion such as hex to ASCII, ASCII to hex, Binary, BCD, 2's Compliment, 7 segment etc. are possible.
5. Shift / Rotate  
Rotate left, Rotate Right, Shift Left, Shift Right for word / double word.
6. I/O Instructions  
Normally Open / Normally Closed contacts, positive pulse contact, negative pulse contact, Leading / Falling edge etc. are implemented.
7. Immediate I/O instruction  
This instruction can be used to sample instantaneous physical inputs and outputs in PLC ladder.
8. Set / Reset  
Coil / Bit / Register Set / Reset Instructions are supported.
9. Program Control  
FlexiLogics® also support subroutine call, MCS / MCR, JCS / JCR, Enable / Disable Interrupts and step sequence instructions.
10. Functions  
The function instructions like Moving average, Digital filter, Function generator, PID , Encode / Decode, Min / Max / Average Value, Lower / Upper Limit, Flip Flop are also supported.
11. High speed input and PWM Output  
FlexiLogics® base module supports 2 high speed inputs up-to 200KHz. User can define 2 inputs of the base module (IP1 and IP3) for High speed application. The base module also supports PWM output up-to 100KHz.

Some of the supported IEC 61131-3 instructions are listed below:

1. Advanced-  
Instructions such as Alarm\_A, Alarm\_M, Average, Derivate, Hyster ,RAMP etc .are supported.
2. Arithmetic-  
Instructions such as Multiply .Divide, Addition Substraction, MOD etc .are supported.
3. Booleans-  
Boolean And, F\_TRIG, OR, FlipFlop, R\_TRIG, XOR etc .are supported.
4. Comparisons-  
Less than ,Less or equal, Is not equal ,Greater than etc. are supported.
5. Conversions-  
Conversions such as Any to bool, Any to dint, Any to int ,Any to real etc. are possible.
6. Counters-  
CTD(Down Counter) ,CTU(UP Counter), TUD(Up-Down Counter), CTDr(Down counter with rising edge detection) ,CTUDr(UP/DOWN counter with rising edge detection) are supported.
7. Maths-  
Abs, modR, root trunc, Trigonometric functions.
8. Miscellaneous-  
ActiveRTSwitch, EnableEvents are supported instructions.
9. PID-  
PID instruction is supported.
10. Registers-  
And\_mask, Hibyte, Hiword, Lobbyte etc.
11. Selectors-  
MUX, SEL, MUX4, MUX8.
12. Standard-  
Instructions such as 1, DEC, INC, Neg etc are supported.
13. Timers-  
Blink, PLS, TMD, TMU, TOF, TON etc. instructions are supported.
14. Strings-  
Instructions such as ASCII, CONCAT, AtoH, Char, Mlen etc. are supported.

# General Specifications

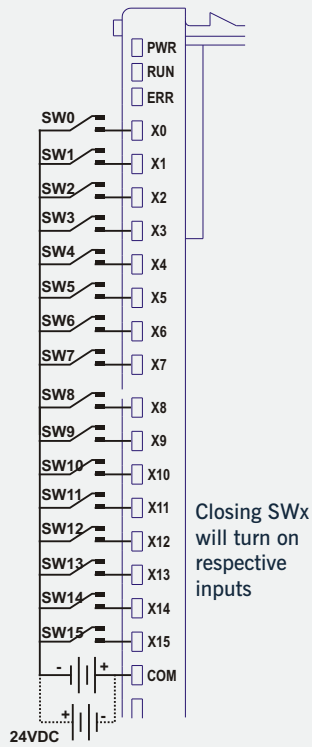
Functional	
Program Capacity	30K Steps
Total Program Memory	270KB (Application + Ladder)*
Execution Speed	60.0 ns / contact
	240.01 ns /coil
	373.35 ns/16 bit transfer
	366.68 ns/16 bit signed addition
Clock-Calendar	Year, month, day, hour, minute, second, & Day of the week

Environmental	
Temperature	0 to 55° C (operating), -20 to 85° C (storage)
Humidity	10 to 90 % non condensing
Vibration immunity	IEC60068-2-6
Shock immunity	IEC60068-2-27
Dimensions (mm)	100mm(H) X 52mm(W) X 70mm(D)
Isolation	Isolation between communication ports, power and I/O is 500 V DC for 1 Min.

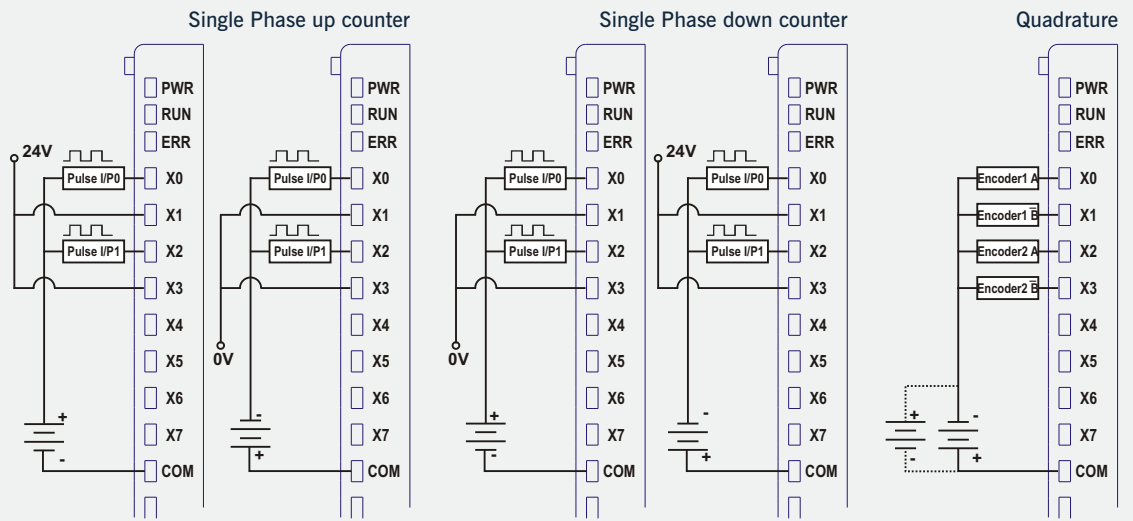
\*Additional retentive memory is 2.8KB.  
Maximum 30000 EEPROM write cycles are allowed. Above this performance may degrade.

EMI/EMC	
Immunity to ESD	as per IEC61000-4-2
Immunity to Fast Transients	as per IEC61000-4-4
Immunity to Radiated electromagnetic field	as per IEC61000-4-3
Immunity to Conducted disturbances	as per IEC61000-4-6
Surge	as per IEC61000-4-5
Radiated emission	as per EN55011

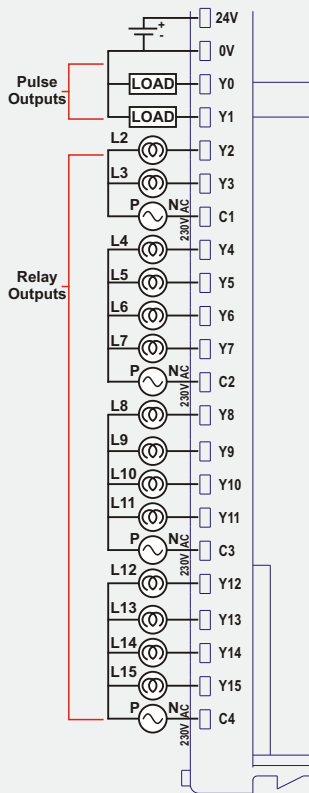
## 1. Digital Inputs



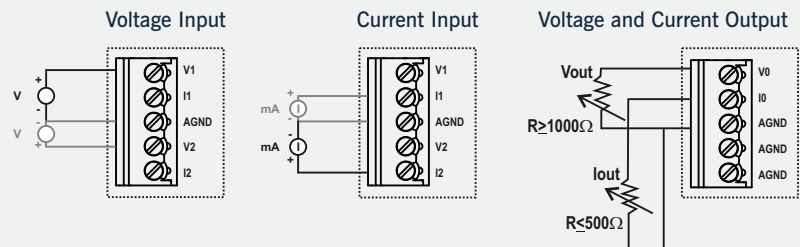
## 2. HSC Inputs



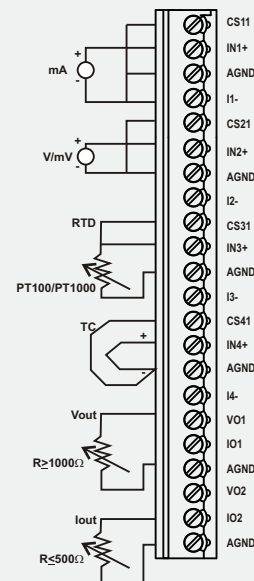
## 3. Digital Outputs



## 4. Analog Inputs and Outputs



## 5. Analog Input / Outputs for FL005-0808RP0402U

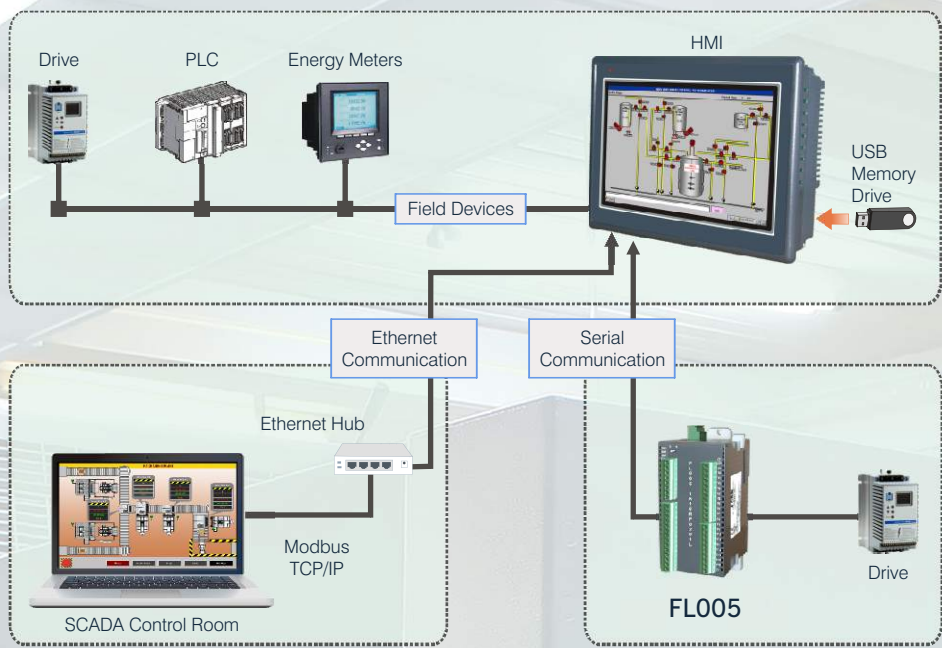


# Protocols Supported for

# PLC Based Control Application

Driver	FL005
ABB PLCs	✓
Allen Bradley DF1	✓
Aromat FP Series	✓
Baldor	✓
Danfoss Drive	✓
Delta PLCs	✓
Fatek PLCs	✓
FlexiLogics Slave Driver*	✓
GE SNP	✓
GE SNP- X	✓
Idec PLCs	✓
LG Master K Series PLC	✓
LG Master K 300S	✓
Mitsubishi FX	✓
Mitsubishi Q Series PLCs (Serial)	✓
Modbus ASCII (Unit as Master)	✓
Modbus RTU (Unit as Master)	✓
Modbus RTU (Unit as Slave)	✓
Omron Host Link	✓
Omron Inverter Memobus	✓
Serial Monitor*	✓
Serial Printer	✓
Siemens Gas analyzer (Master)	✓
Siemens micromaster driver (USS)	✓
Toshiba (Link Port) Series PLCs	✓
Toshiba Inverters PLCs	✓
Toshiba T Series	✓
TriPLC	✓
Twido PLCs	✓
Unitelway PLCs	✓
Universal Serial Driver(ASCII)	✓

\*Supported with native programming environment



## Expansion Models

### Digital Expansion Modules

Model	Digital I/P	Digital O/P	Digital O/P
FLD1600	16	0	16 Digital Inputs
FLD0016P	0	16	16 Digital Outputs (PNP)
FLD0016N	0	16	16 Digital Outputs (NPN)
FLD0016R	0	16	16 Digital Outputs (Relay)
FLD0808P	8	8	8 Digital Inputs, 8 PNP type Transistor Outputs Digital module
FLD0808N	8	8	8 Digital Inputs, 8 NPN type Transistor Outputs Digital module
FLD0808R	8	8	8 Digital Inputs, 8 Relay type Outputs Digital module
FLD-HS-0808P	8	8	8 Digital Inputs, 8 Digital Outputs (PNP), 4 High Speed Inputs (Single phase & Quadrature counter), 2 PWM Outputs
FLD-HS-0808N	8	8	8 Digital Inputs, 8 Digital Outputs (NPN), 4 High Speed Inputs (Single phase & Quadrature counter), 2 PWM Outputs

### Analog Expansion Modules

Model	Analog I/P	Analog O/P	Digital O/P
FLA0800L	8	0	8 Analog Inputs (0-10 VDC / 4-20 mA), 16 Bits
FLA0402U	4	2	4 Universal Inputs (0-10 V / 0-100 mV / 0-50 mV / 0-20 mA / 4-20 mA / RTD PT-100 / Thermocouple - B, R, S, E, J, K, N, T) 2 Analog Outputs (0-10 V / 4-20mA), 16 Bits
FLA0004	0	4	4 Analog Outputs (0-10 VDC / 4-20 mA), 16 Bits

N: Transistor output (NPN 500mA), R: Relay O/P, ( 6 Relay + 2 OC ) P: PNP output (500mA)

Please contact factory for more information. We welcome an opportunity to develop new, custom drivers and customized units.

## Dimensions

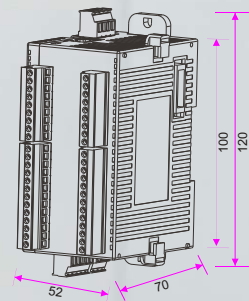


Fig. A  
FlexiLogics® controller module

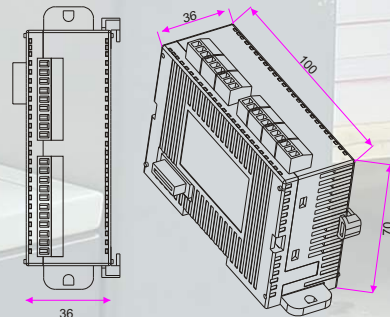


Fig B  
FlexiLogics® expansion module

All dimensions are in mm.



### HEAD OFFICE

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An ISO 9001:2008 and ISO 14001:2004 certified company

(Specifications subject to change without prior notice. DS-FL005-Expandable-Rev.G)

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