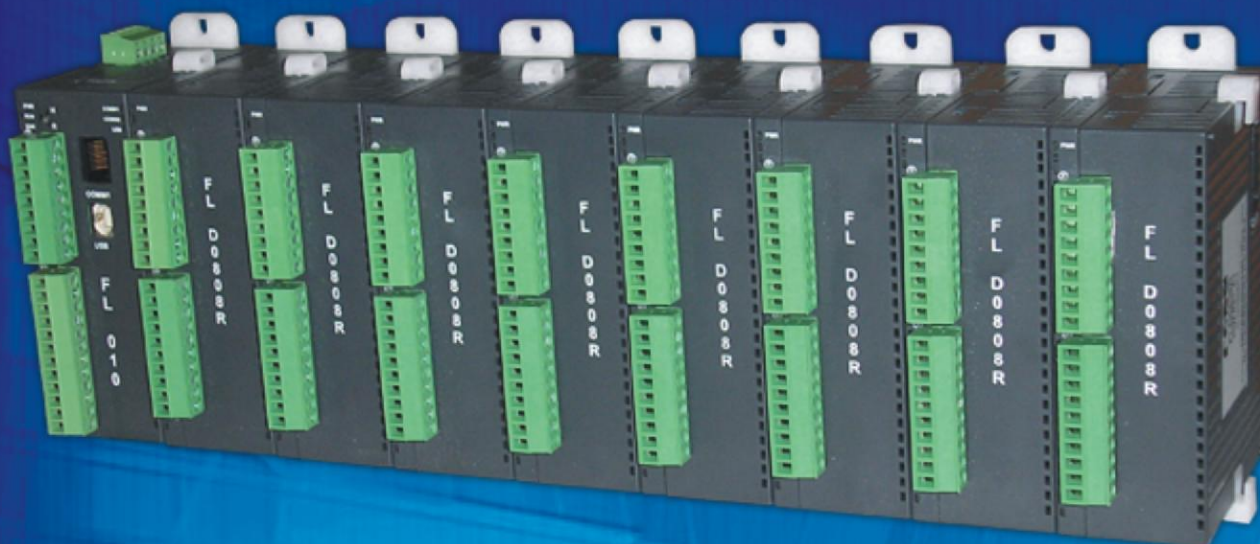




Flexible PLC Salient Features :-

- DIN rail / Back panel mounted compact PLC
- Transistor or Relay outputs
- DC inputs
- One optional Ethernet port to connect PLC / Programming Port / Remote monitoring over Modbus TCP/IP
- Expandable up to 8 expansions
- 32 Bit RISC processor
- Support for High Speed Counters (up to 50 KHz) and Timers
- Simple Ladder programming using Windows® based software
- Strong Communication capabilities. PLC can be configured as Modbus RTU Master or Slave
- High Speed PWM output (5 KHz)
- Up-to 2 Serial Ports , 1 USB Device Port
- DC powered units (24 V DC)
- CE, UL approved

Key Features :-

The FlexiLogics® support standard Programmable Logic Controller features. The user can implement logic, specific to application using standard Ladder programming. A PLC logic block can be executed at power up, during every scan, upon receiving an interrupt on specific I/O pins or upon a timer interrupt.

Supported Tasks include:

- Write value to Tag
- Subtract a constant value form Tag
- Subtract Tag B to Tag A
- Turn Bit Off
- Copy Tag B to Tag A
- Add a constant value to Tag
- Add Tag B to Tag A
- Turn Bit On
- Toggle Bit
- Swap Tag A and Tag B

The FlexiLogics® possess powerful programmable logic features. User can implement logic, specific to application using standard Ladder programming. Some of the Key features are as mentioned below :

Local I/O (Digital)

The base FlexiLogics® module has up to 8 digital inputs and up to 8 digital outputs. The inputs are DC inputs rated to 24 VDC. The outputs are transistor rated 500mA at 24 VDC and/or relay supporting 2 A contact current.

Expansion module (Digital and Analog)

FlexiLogics® I/O can be expanded using modular I/O modules. These modular I/O are Digital and Analog type. User can use Digital / Analog or combination of both. Various combination of Digital expansion modules are available. User can have up to 4 universal analog inputs and 2 analog outputs or 8 analog inputs. Analog inputs are mA, mV, 0-10 VDC, RTD and TC. The Analog outputs are 4-20 mA or 0-10 VDC. User can select appropriate I/O module depending on the application.

High Speed I/O functions

The Base module supports two high speed inputs which can be configured in single phase up counter (up to 50 KHz), single phase speed counter (up to 50 KHz), quadrature bi-pulse counter (1X, 2X, 4X up-to 5KHz) Interrupt input function. The module also has two transistor outputs configurable as PWM / Pulse outputs up-to 5KHz.

Communication

The PLC is designed to have up-to 2 serial and 1 USB communication ports. Serial ports can be defined as Modbus RTU (Master or Slave) or can be connected to various third party devices such as PLCs, Drives, PID Controllers, SCADA etc. Most industry standard protocols are supported. The USB port is used for programming the PLC.

Ethernet Port (For Ethernet model-FL050)

The FlexiLogics® supports 10/100 MBPS Base Ethernet port. Following Ethernet drives are supported : Modbus TCP/IP Client, Modbus TCP/IP Server, Toshiba PLC.

PLC Configuration through the software over Ethernet is also possible.

FlexiLogics® Functionality

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 50KHz. User can define first 2 inputs of the base module (IP1 and IP2) for High speed application. The base module also supports PWM output up-to 5KHz.

Comprehensive Instructions supported in FlexiLogics®:

I/O Instructions -
NO contact
Falling Edge
Inverter Coil
Positive pulse coil

NC contact
Rising Edge
Positive Pulse Contact
Negative Pulse Coil

Output
Inverter
Negative Pulse Contact

Data Transfer -
MOV word
Table Initialize
Data Exchange

MOV DWORD
Table Block Transfer
Multiplexer

Invert Transfer
Table Invert Transfer
Demultiplexer

Math-
Addition
Division
Increment

Subtraction
Addition with Carry
Decrement

Multiplication
Subtraction with Carry

Compare -
Greater than
Not Equal

Greater than or equal
Less Than

Equal
Less than or Equal

Logic -
AND
Shift

OR
Rotate

XOR

Data Conversion -
Hex to Ascii
7 segment decode
BCD conversion

Ascii to Hex
Ascii conversion
2's complement word
2's complement Double word

Absolute Value
Binary Conversion

Timer -
TON

TOFF

TSS

Counter-
Up counter

UP Down Counter

Program Control -
Subroutine CALL
Next
Jump Control Set
Dis Intr
Step sequence Input

Subroutine RET
Master Control Set
Jump Control ResetEn Intr
DT
Step sequence output

For
Master Control Reset
Step sequence Init

Function -
Moving Average
Upper limit
Minimum Value

Digital Filter
Lower limit
Average Value

PID1,4
Maximum Value
Function generator

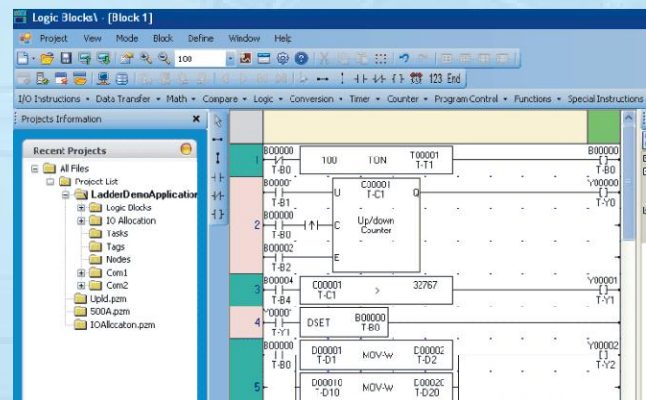
Special -
Device Set
Register Reset
Encode Decode
Direct I/O

Device Reset
Set Carry
Bit Count
Set Calender

Register Set
Reset Carry
Flip Flop
Calender Operation

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:



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 |

Protocols Supported for :-

Driver	FL010	FL050
ABB	✓	✓
Allen Bradley DF1	✓	✓
Aromat FP Series	✓	✓
Baldor	✓	✓
Danfoss Drive	✓	✓
Delta	✓	✓
Fatek	✓	✓
GE Fanuc	✓	✓
GE SNP-X	✓	✓
Idec	✓	✓
LG Master K series PLC	✓	✓
LG Master-K 300S	✓	✓
Mitsubishi FX	✓	✓

Driver	FL010	FL050
Modbus master	✓	✓
Modbus slave	✓	✓
Modbus TCP Master	✗	✓
Modbus TCP Server	✗	✓
Serial Monitor	✓	✓
Toshiba Inverters	✓	✓
Toshiba Ethernet driver	✗	✓
Toshiba T1	✓	✓
Toshiba T2 Link port	✓	✓
Twido	✓	✓
Unitelway	✓	✓
Universal Serial (ASCII)	✓	✓

FL010 and FL050 Specifications :-

Functional	
Control Method	Stored program cyclic scan system
I/O Processing	Batch I/O update(refresh) and Direct I/O access
I/O Points	Main unit: 16 points (8 inputs/8 outputs) Expansion I/O: Up to 8 I/O modules, Expandable up to 128 points
Programming Language	Ladder diagram
Program Capacity	8K Steps
Memory	Program: Flash Type Data: SRAM and EEPROM
Execution Speed	1msec/1000 steps for boolean instructions
User Data	
Timer Registers	256 Words (R/W)
Counter Registers	256 Words (R/W)
System Registers	256 Words (R/W)
Internal Registers	256 Words (R/W)
Data Registers	4096 Words (R/W)
Input Registers	400 Words (Max) (R)
Output Registers	400 Words (Max)
Configuration Regs.	1600 Words (Max)
Configuration Coils	25600 Points (Max)
System Coils	100 Points (R/W)
Internal Coils	4096 Points (R/W)
Timer Coils	256 Points
Counter Coils	256 Points
Retentive Registers	1400 Words

Clock-Calendar	Year, month, day, hour, minute, second, & day of the week
Special I/O Functions	High-speed counter (2 single or 1 quadrature) Transistor output configurable as one PWM or CW/CCW mode
Timer	256 timers T0000 to T0255 T0000 to T0060: 10ms T0061 to T0190: 100ms T0191 to T0255: 1s
Communication Interface	1 Port of RS232/RS485 on RJ45 1 Port with 2-wire RS 485 on Terminal Block 1 USB Port for Programming and monitoring (Device)
Electrical	
Power Supply	DC powered units - 24VDC (+/-15%)
Discrete Inputs (FL010)	
Input points	8 points (8 points/common)
Input voltage - Rated	24 VDC, +/- 10%
Input current - Rated	5 mA for normal and 20 mA for High Speed input
Minimum ON voltage	9.6 VDC
Maximum OFF voltage	3.6 VDC
Relay Output Specifications (FL010)	
Output points	6 points (3 points/common)
Maximum voltage	230 VAC/24VDC
Maximum Current	2A/point (resistive), 6A/common

Continue

General Specifications :-

DC Output specifications (FL010)	
Output points	2 points (2 points/common)
Maximum voltage	+24VDC
Maximum Current	0.5A/point (resistive)
Environmental (FL010, FL050)	
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 36mm(W) X 70mm(D)
Isolation	Isolation between communication ports, power and I/O is 500 V DC for 1 Min.

EMI/EMC (FL010, FL050)	
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

Digital I/O Specifications :

Expansion I/O capacity	8 expansion modules
Expansion Bus	SPI (1 MHz)
Local I/Os	16 (8 IN / 8 OUT)
Digital Inputs	8 Unidirectional Digital inputs (2 High Speed inputs of up to 50KHz) 8 points per common
Rated Input voltage	24VDC
Rated Input Current	Up to 5mA. (20mA for High Speed I/Ps)
Input Impedance	5.4Kohm (1.2Kohm for High Speed I/Ps)
Minimum ON voltage	9.6 VDC
Maximum OFF voltage	3.6 VDC

Turn ON time	10 msec
Turn OFF time	10 msec
Digital outputs	6 Relay (Form A) outputs 3 points per common 2 Transistor Output
Output Capacity	2A per o/p for Relay (6A per common), 0.5 A for transistor
Rated load	230V / 2A, 30VDC / 2A for Relay, 0.5 A at 24VDC for transistor

Analog I/O Specifications :

For mVolt inputs :
Uses 0-100 mV input range resolved in 16 bits. Total error max : $\pm 0.2\%$ of scale ± 1 LSB.
For Current inputs :
Uses 0-20mA input range is resolved in 16 bits. Total error max : $\pm 0.2\%$ of scale ± 1 LSB.
For Volt inputs :
Uses 0-10V input range resolved in 16 bits. Total error max : $\pm 0.2\%$ of scale ± 1 LSB.
For RTD input (Pt100/ Pt1000):
Uses 3 wire compensation technique. Excitation Current is 0.1mA. Power dissipated in RTD is 0.025mW max @ 100 Ω Range supported : -200 to 850°C.
For Thermocouple Input :
Uses 0-100mV input range resolved into 16 bits. Cold junction error is 1° maximum and 0.5° typical. Total error max : 0.5% of scale ± 1 bit + CJC error Temperature Drift for Input and Output : 60 PPM max

Input Type	Temperature Range	1 Bit Corresponds to
J	-210 to 1200°C	0.035°C
K	-200 to 1373°C	0.049°C
E	-200 to 1000°C	0.027°C
R	-50 to 1769°C	0.16°C
S	-50 to 1769°C	0.18°C
B	0 to 1820°C	0.25°C
N	-200 to 1300°C	0.056°C
T	-200 to 400°C	0.043°C

Analog Outputs	
Resolution	16 Bit
Load:	
4-20 mA	Less than 500 Ω
0-10 V DC	Minimum 1k Ω

Models :-

FlexiLogics® controller modules

Model	Digital I/P	Digital O/P	Analog I/P	Ethernet Port	USB Port	Serial Port	RTC
FL010	8	8 (2 OC,6 Relay)	0	No	Yes (Device)	Yes (2 nos.)	Yes
FL050	0	0	0	Yes	Yes (Device)	Yes (2 nos.)	Yes

Digital Expansion Modules

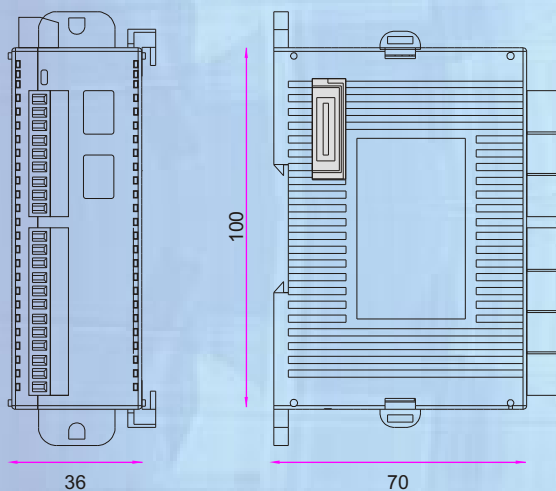
Model	Digital I/P	Digital O/P	Details
FLD1600	16	0	16 Digital Inputs
FLD0016P	0	16	16 Digital Outputs (PNP)
FLD0016N	0	16	16 Digital Outputs (NPN)
FLD0016R	0	16	16 Digital Outputs (Relay)
FLD0808P	8	8	8 Digital Inputs, 8 PNP type Transistor Outputs Digital module
FLD0808N	8	8	8 Digital Inputs, 8 NPN 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

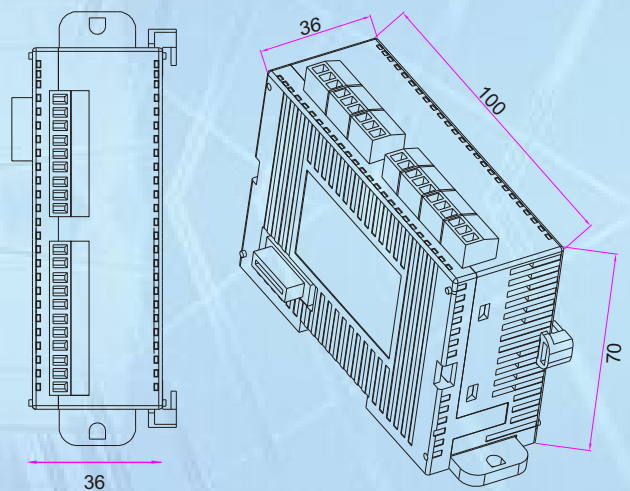
Model	Analog I/P	Analog O/P	Details
FLA0800L	8	0	8 Analog Inputs (0-10 VDC / 4-20 mA), 16 Bits
FLA0402U	4	2	4 Universal Inputs (0-10 V / 0-100 mV / 0-50 mV / 0-20 mA / 4-20 mA / RTD PT-100 / Thermocouple - B, R, S, E, J, K, N, T)
FLA0004	0	4	2 Analog Outputs (0-10 V / 4-20mA), 16 Bits 4 Analog Outputs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

Dimensions :-



FlexiLogics® controller module



FlexiLogics® expansion module

All dimensions are in mm.

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



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