FlexiPanels®

HMI OR HMI + Pluggable I/O

FP5043

Front view
(4.3" TFT Color LCD)

Back view for HMI with expansion
(Up-to 3 expansions)

Back view for HMI

RENU
ELECTRONICS PVT. LTD.

Salient Features :-

- 4.3” Graphical Touchscreen TFT Color Display
- Only HMI or HMI with Pluggable I/O options available
- Support for Digital I/O (OC / Relays)
- Pluggable Analog I/Os
- Analog Inputs for RTD, mV, mA, Thermocouple, 0 to 5 VDC, 0 to 10 VDC, -10 to +10VDC
  Analog Outputs are 4-20 mA / 0-10 VDC
- High Speed Counters and Timers
- Support for Quadrature inputs and PWM output
- Ladder editor with powerful instruction set
- Support for Recipes and 32K color Bitmaps

- Communication Ports:
  Two serial ports to connect PLC / Printer / Programming Port (Port 1: RS485, Port 2: RS232)
  One USB (Device) port as Programming Port
  One USB (Host) port to connect USB memory drive
  One optional Ethernet port to connect PLC / Programming Port / Remote monitoring
- Data Logging, Transfer logged data on USB memory drive
- Floating point support, Trending (Real Time & Historical), Alarms (Real Time & Historical)
- Multilanguage (Unicode) support with true type Windows® fonts
- IP66 design. CE, UL approved. RoHS compliant
- Common Programming software for the entire FlexiPanels® family.....FREE!!

Operations :-

FlexiPanels® support Operator interface as well as 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. The FlexiPanels® operator interface functions revolve around Screens and Tasks that can be assigned to screens and application.

Pluggable I/O (Digital)

FlexiPanels® have facility to support I/O using pluggable I/O modules. The I/O modules can be selected based on the application requirement. User can select and plug different Digital I/O modules to meet application I/O requirements. Each high speed I/O module can support 4 nos. Of high speed inputs of 25KHz. Quadrature input of up-to 20KHz is also supported. Each high speed I/O Module can support 1 quadrature input of 20KHz or 2 quadrature inputs of 5KHz. Each high speed I/O Module can support up-to 2 PWM outputs of 10KHz. Up-to 3 I/O modules can be connected to FP5043T-E unit.

Digital I/O

FP5043T-E can have up-to 48 digital I/O on the unit through the expansion units. Digital inputs are high impedance 24 VDC and outputs are relay (NO), transistor outputs or a combination of both.

Analog I/O

FP5043T-E supports pluggable Analog I/O Modules. FlexiPanels® can have up-to 24 Analog inputs and / or 6 Analog outputs. The Analog inputs are 0-5 VDC, 0-10 VDC,4-20 mA, mV, TC, RTD, - 10 to + 10 VDC and Analog outputs are 4-20mA / 0-10VDC. User can Plug only Analog I/O modules or use them in combination with Digital I/O.

Touch Keys Task

Touch Keys in FlexiPanels® can be assigned Tasks for three instances: when the screen is touched, while the screen is touched and when the screen is released. Multiple tasks can be assigned to a touch key. In addition to above, tasks for data entry, alarm management etc. can be defined. These definitions allow Complete flexibility in cursor control and key operations when changing data.

Alarms

Real time and historical Alarms can be defined in FlexiPanels®. User-friendly Alarm object can be defined on the display. Alarms can be real time or historical. Keys can be assigned to acknowledge Alarm, view and scroll.

Recipes

Recipes data is stored in the FlexiPanels® memory. With one button stroke, a set of data can be downloaded to the PLC. Once in the local memory, the recipes data can be edited using simple data entry objects.

Bitmaps / Wizards

Different bitmaps can be embedded on the FlexiPanels® screen. Transparent buttons can be used for data entry and set points on bitmap images. Bitmaps can be imported into the application and displayed on the FlexiPanels® screens.
In addition, several wizards are supported to create commonly used objects such as Analog meters, Lamps, Buttons and Bar graphs. 32K colors are supported for bitmaps.

High Speed Counters

FlexiPanels® with I/O support High Speed Counter inputs up-to 25 KHz. These High Speed Counter inputs can be used for applications such as Rate Measurement, Speed Measurement, Totalizer, etc. The user can define up-to 2 High Speed inputs in each high speed Digital I/O module.

Easy events logging and trend tracking

FlexiPanels® support data logging feature. A part of FlexiPanels® memory can be allotted for data logging. Real time as well as Historical Trending is also supported. The user can also display multiple trends with different pen color on one screen.

Ladder Support

FlexiPanels® support ladder functionality. User can define logic in the unit using FlexiSoft® software. The execution of ladder could be through communication port or through I/O. Only HMI version of FP5043 also supports ladder functionality. It is used for critical applications where data is processed before sending it to controller. The FlexiPanels® support following different types of instructions:

I/O Instructions -

NO contact	NC contact	Output
Falling Edge	Rising Edge	Inverter
Inverter Coil	Positive Pulse Contact	Negative Pulse Contact
Positive pulse coil	Negative Pulse Coil	

Data Transfer -

MOV word	MOV DWORD	Invert Transfer
Table Initialize	Table Block Transfer	Table Invert Transfer
Data Exchange	Multiplexer	Demultiplexer

Math-

Addition	Subtraction	Multiplication
Division	Addition with Carry	Subtraction with Carry
Increment	Decrement	

Compare -

Greater than	Greater than or equal	Equal
Not Equal	Less ThanLess than or Equal	

Logic -

AND	OR	XOR
Shift	Rotate	

Data Conversion -

Hex to AsciiAscii to Hex	Absolute Value	
7 segment decode	Ascii conversion	Binary Conversion
BCD conversion	2's complement word	2's complement Double word

Timer -

TON	TOFF	TSS

Counter-

Up counter	UP Down Counter	

Program Control -

Subroutine CALL	Subroutine RET	For
Next	Master Control Set	Master Control Reset
Jump Control Set	Jump Control Reset	En Intr
Dis Intr	DT	Step sequence Init
Step sequence Input	Step sequence output	

Function -

Moving Average	Digital Filter	PID1,4
Upper limit Lower limit	Function generator	
Average Value	Maximum Value	Minimum Value

Special -

Device Set	Device Reset	Register Set
Register Reset	Set Carry	Reset Carry
Encode Decode	Bit Count	Flip Flop
Direct I/O	Set Calender	Calender Operation

The execution of ladder logic is in microseconds. Ladder monitoring for debugging is also supported in FlexiPanels® configuration software.

Multilanguage / Unicode Support

All the languages are supported in the FP5043T. The user can now display messages, alarms in any regional language. All Windows® fonts can also be used in an application.

Communication Ports

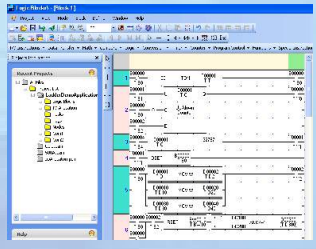
FlexiPanels® have two serial communication ports. Both the ports can be used for programming of FlexiPanels®, printing screens (only text), connecting to third party serial devices (barcode readers, temp scanners etc.) or to connect to a PLC or drive. Dual port feature is supported for FlexiPanels® models. User can configure these serial ports to connect 2 different devices supporting different protocols such as PLC / Drives / DCS / SCADA etc.

Ethernet Port

FlexiPanels® support optional Ethernet port (Modbus TCP/IP). It can be used to connect to a PLC and monitor machine / process status from remote location. The Ethernet port can also be used for remote programming of FP5043.

Configuration Software

FlexiSoft® is a compact, Windows® based software to configure the FlexiPanels® units. User friendly configuration tools and easy approach, helps user create applications quickly and easily.



To get started with FlexiPanels®, user needs:
1. FlexiPanels® unit 2. FlexiSoft® Software
3. USB Programming cable (Part no. PC-USBAB-00)

OS requirements for FlexiSoft® are:
Windows Version : Microsoft Windows® 2000 or above

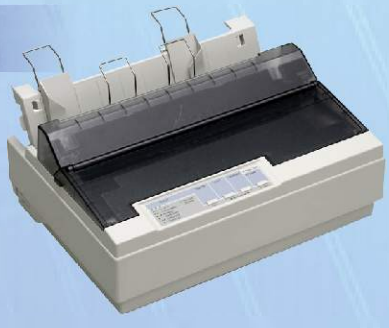
Supported Task in FlexiPanels® are :-

Task \ Type	Power up	Global	Screen		
			Before showing	While showing	After hiding
Go to screen	✓	×	✓	×	✓
Go to next screen	×	×	✓	×	✓
Go to previous screen	×	×	✓	×	✓
Write value to tag	✓	✓	✓	✓	✓
Add constant to tag	✓	✓	✓	✓	✓
Subtract constant from tag	✓	✓	✓	✓	✓
Add tag B to Tag A	✓	✓	✓	✓	✓
Subtract tag B from Tag A	✓	✓	✓	✓	✓
Turn bit ON	✓	✓	✓	✓	✓
Turn bit OFF	✓	✓	✓	✓	✓
Toggle bit	✓	✓	✓	✓	✓
Copy Tag B to Tag A	✓	✓	✓	✓	✓
Swap Tag A and tag B	✓	✓	✓	✓	✓
Print Data	×	×	×	×	×
Set RTC	×	×	×	×	×
Copy tag to STR	✓	✓	✓	×	✓
Copy tag To LED	×	×	×	×	×
Delay	×	×	×	✓	×
Wait	×	×	×	✓	×
Copy HMI block to HMI/PLC block	✓	✓	✓	✓	✓
Copy HMI/PLC block to HMI block	✓	✓	✓	✓	✓
Copy RTC to PLC block	×	✓	×	×	×
GoTo Popup screen	×	×	×	×	×
USB Data Log Upload	✓	✓	✓	✓	✓

Supported Printers :-

FlexiPanels® support following Dot matrix serial printers:

- EPSON
- SAMSUNG
- TVS



Protocols Supported for :-

Driver	FP5043
ABB	✓
Allen Bradley DF1	✓
Aromat FP Series	✓
Baldor	✓
Danfoss Drive	✓
Delta	✓
Fatek	✓
GE Fanuc	✓
GE SNP-X	✓

Driver	FP5043
Idec	✓
LG Master K series	✓
LG Master-K 300S	✓
Mitsubishi FX	✓
Mitsubishi Q series (Serial)	✓
Modbus master	✓
Modbus slave	✓
Omron Host Link	✓
Omron Yaskawa Drive	✓

Driver	FP5043
Serial Monitor	✓
Siemens-S7-200	✓
Siemens-S7-300	✓
Toshiba Inverters	✓
Toshiba T1	✓
Toshiba T2 Link port	✓
Twido	✓
Unitelway	✓
Universal Serial (ASCII)	✓

Specifications :-

Power	:	+ 24V DC ±15%, 6 W Max
Bezel	:	IP66 rated Touch Screen
Operating Temperature	:	0° to 50°C
Storage Temperature	:	-20° to 80°C
Humidity	:	10% to 85% (Non condensing)
Communication Ports	:	Two serial ports (RS232 / RS422 /RS485 levels supported)
USB Device Port	:	As programming and monitoring port
USB Host port	:	Supports USB Memory drive
Ethernet Port	:	For connecting to a PLC, programming of FlexiPanels®, a third party device, Drive or remote monitoring (10 / 100 MBPS).
Type of LCD	:	TFT Color Touch Screen
LCD Life	:	20000 hrs at 25°C
Isolation	:	Isolation between communication ports, power and I/O (if applicable) is 500 V DC for 1 Min.
Supported Colors	:	32K for Color TFT LCD
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

Analog Inputs

Resolution	12-bit
Voltage Mode	Y
Input Range	-10V to +10V
Value of LSB	For 0-10V : 2.44mV
	For +/- 10V : 4.88mV
Input Impedance	200K
Accuracy at 25°C	0.1% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	0.3% of full scale
Frequency Limit (-3db)	3.5KHz
Behavior upon sensor failure	Input goes to 0, as if no input is connected
Current Mode	Y
Input Range	4mA – 20mA, 0mA - 20mA
Value of LSB	3.906uA
Input Impedance	120
Accuracy at 25°C	0.2% of full scale
Overall accuracy (–25°C to 55°C) Full scale	0.8% of full scale
Frequency Limit (-3db)	15KHz
Behavior upon sensor failure	Input goes to 0, as if no input is connected
Maximum permissible voltage (surge voltage)	
between analog inputs	500V
between analog inputs and reference	1000V
Reverse Connection Protection	No

Digital Inputs

Rated Input Voltage

	For Normal Input	For High Speed
Rated Input Voltage	24 VDC (Max is 28 VDC)	24 VDC (Max is 28 VDC)
Impedance	4.7 k	2.3 k

Logic '0' Voltage : 0 to 5 V Logic '1' Voltage : 14 to 28 V

Rated Input Current at (24 VDC)

	For Normal Input	For High Speed
Rated Input Current	4.89 mA	10 mA

Digital Outputs (Open Collector)

Maximum Load current : 500 mA NPN or PNP. Short circuit protected
Voltage drop at ON : 0.4 V or less

Digital Outputs (Relay)
Relay Rating : 230 V AC, 2 Amp. (Max) 5 Amp per common

Analog Outputs

Resolution	12bit
Voltage Mode	Y
Output Range	0 to +10V
Value of LSB	2.44mV/step
Output Load minimum	1000
Accuracy at 25°C	0.05% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	±10ppm/°C
Current Mode	
Output Range	4mA to 20mA
Value of LSB	3.9umA
Output Load maximum	500
Accuracy at 25°C	0.13% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	±10ppm/°C
Current Mode	
Output Range	0mA to 20mA
Value of LSB	4.8umA
Output Load	500
Accuracy at 25°C	0.13% of full scale
Overall accuracy (–25°C to 55°C) % Full Scale	±10ppm/°C

Specifications :-

High Speed Digital inputs and PWM output -
FPED-HS-0808N (NPN Type transistor output)
FPED-HS-0808P (PNP Type transistor output)

24V DC Digital Inputs	
Number of Inputs	8 Inputs Bi-directional Type (Within which 4 are high speed)
Isolation	Optically isolated from internal circuit. High isolation voltage(BV=3750Vr.m.s.)
Input Impedance	4.9K
Turn OFF time	10msec
Turn ON time	10msec
High Speed Inputs	
Number of HS Inputs	4
High Speed Channels	X0, X5, X2, X7
Max. input frequency	25KHz
Max. input count	4294967295
24V DC Digital Outputs PNP / NPN Transistor type	
Number of Outputs	8 PNP / NPN type (Within which 2 are high speed outputs)
Nominal Output current per channel	500mA Typical [For HS: FPED-HS-0808N: 300mA and FPED-HS-0808P: 250mA]
Isolation	Optically isolated from internal circuit. High isolation voltage(BV=3750Vr.m.s.)
Short Circuit protection	Auto Protection for 6 normal digital output PNP / NPN type channels.
Nominal load	
- Ohmic	48 / 12 W
- Lamp	12 W
- Inductive	12 VA (1.2 H, 50 W)
Switching frequency with	
- Inductive nominal load	0.5 Hz (1.2 H, 50 W), maximum
24V DC Auxiliary Power Supply	
Nominal value	24 V DC
Tolerance	-15% / +20% according to EN 61131-2
Safety equipment	Surge voltage, protection against Reversal polarity

Universal Analog Inputs - FPEA-0402U-16

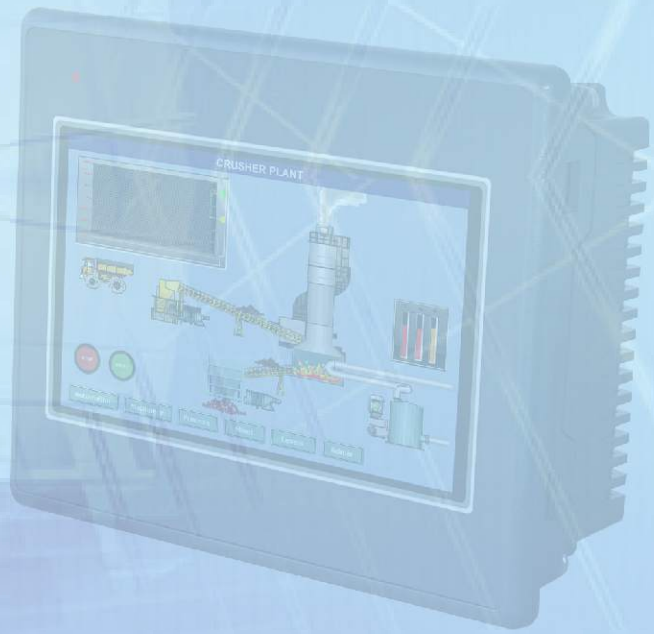
Analog Inputs	
Number of inputs	4
Resolution	16 Bit
Input range:	
Voltage	0 to 10VDC and 0 to 5VDC
Current	0 to 20mA and 4 to 20mA
Thermocouple	J type -210 to 1200°C K type -200 to 1373°C
mV	0 to 50mV and 0 to 100mV
RTD	(PT100): -200 to 850°C (PT100): -100 to 457°C and PT1000: -200 to 850°C
Overall accuracy	1 % of full scale (Max)
Input Impedance	1M for voltage, thermocouple, mV and RTD input 100 for current input (with fuse)
Absolute maximum input	±30VDC, 30mA
Output Type	**Analog (voltage and current), non-isolated**
Number	2
Resolution	16 bit
Output range:	
Voltage	0 to 10VDC
Current	0 to 20mA and 4 to 20mA
Overall accuracy	1% of full scale (Max)
Load	1K (Min) for Voltage and 500 (Max) for current
24V DC Auxiliary Power Supply	
Nominal value	24 V DC
Tolerance	-15% / +20% according to EN 61131-2
Safety equipment	Surge voltage, protection against Reversal polarity

FPEA0800LV

Analog Inputs	
Number of inputs	8
Resolution	12 Bit
Voltage Mode:	
Input Range	-10V to +10V, 0V to 10V
Value of LSB	For 0-10V : 2.44mV
	For +/- 10V : 4.88mV
Input Impedance	200 K
Accuracy	At 25°C: 0.1% of full scale.
	Overall accuracy (–25°C to 55°C) : 1% of full scale Max.
Behavior upon sensor failure	Input goes to 0, as if no input is connected

FPEA0800LC

Analog Inputs	
Number of inputs	8
Resolution	12 Bit
Current Mode:	
Input Range:	4 - 20mA, 0 - 20mA
Value of LSB:	3.906uA
Input Impedance	120
Accuracy	At 25°C: 0.1% of full scale.
	Overall accuracy (–25°C to 55°C) : 1% of full scale Max.
Behavior upon sensor failure	Input goes to 0, as if no input is connected



Model Comparison :-

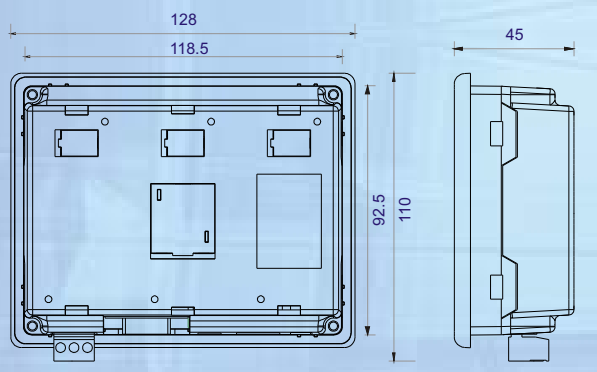
Product	Model	Display	LCD Life at 25°C	TS	Memory	PLC Steps	Screen Memory	Logging Memory	Expansion	Serial Ports **	USB	Ethernet Port	RTC	Power Consumption	Weight	Bezel Dimensions (mm)	Panel Cutout (mm)
FP5043	FP5043T	480x272 WQVGA 4.3" Color TFT	20000 hrs	Yes	Up-to 14 MB	160 k	Up-to 10 MB	Yes	NA	2**	Device and Host	No	Yes	5W	320 gms.	128 W x 110 H x 45 D (Drawing B)	118.5 W x 92.5 H
	FP5043TN	480x272 WQVGA 4.3" Color TFT	20000 hrs	Yes	Up-to 14 MB	160 k	Up-to 10 MB	Yes	NA	2**	Device and Host	Yes	Yes	5W	320 gms.	128 W x 110 H x 45 D (Drawing B)	118.5 W x 92.5 H
	FP5043T-E	480x272 WQVGA 4.3" Color TFT	20000 hrs	Yes	Up-to 14 MB	160 k	Up-to 10 MB	Yes	3	2**	Device and Host	No	Yes	6W	330 gms.	128 W x 110 H x 45 D (Drawing B)	118.5 W x 92.5 H
	FP5043TN-E	480x272 WQVGA 4.3" Color TFT	20000 hrs	Yes	Up-to 14 MB	160 k	Up-to 10 MB	Yes	3	2**	Device and Host	Yes	Yes	6W	330 gms.	128 W x 110 H x 45 D (Drawing B)	118.5 W x 92.5 H

Pluggable Expansion Modules (Digital I/O)		Power Consumption	Weight (Approx.)	Dimensions (mm)
FPED0808P	8 Digital inputs (PNP or NPN) and 8 outputs (0.5A PNP transistor)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808P#	8 Digital inputs and 8 Digital Outputs (PNP Type)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0808N	8 Digital inputs (PNP or NPN) and 8 outputs (0.5A NPN transistor)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808N#	8 Digital inputs and 8 Digital Outputs (NPN Type)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0012R	12 Digital outputs (Relay)	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)
FPED1600	16 Digital inputs	0.3 W	65 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0016N	16 Digital outputs (0.5A NPN transistor)	0.3 W	65 gms.	36 W x 79 H x 45 D (Drawing G)
FPED0016P	16 Digital outputs (0.5A PNP transistor)	0.3 W	75 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808RP	8 Digital inputs (PNP or NPN) and 8 outputs (6 Relay, 2 PNP)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)
FPED-HS-0808RN	8 Digital inputs (PNP or NPN) and 8 outputs (6 Relay, 2 NPN)	0.3 W	70 gms.	36 W x 79 H x 45 D (Drawing G)

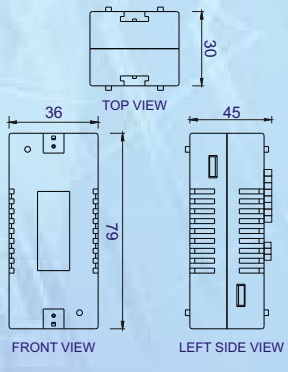
Pluggable Expansion Modules (Analog I/O)		Power Consumption	Weight (Approx.)	Dimensions (mm)
FPEA0202L	2 Analog inputs (4-20mA, 0 – 20mA, 0 – 10 V, -10 to + 10V ranges) 2 Analog Outputs (4-20mA, 0 – 20mA, 0 – 10 V)	0.3 W	85 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA0400L	4 Analog inputs (4-20mA, 0 – 20mA, 0 – 10 V, -10 to + 10V ranges)	0.3 W	80 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA-0402U-16	4 Universal Analog Inputs (4-20mA, 0 – 20mA, TC , RTD, 0-5V, 0 – 10 V, 0-50mV, 0 - 100mv ranges) 2 Analog Outputs (4-20mA, 0 – 20mA, 0 – 10 V). All AI/O 16 bit resolution	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA0800LC	8 Analog inputs (4-20mA)	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)
FPEA0800LV	8 Analog inputs (0-10VDC)	0.3 W	90 gms.	36 W x 79 H x 45 D (Drawing G)

4 inputs can be configured as high speed inputs (25KHz) and 2 outputs can be configured for PWM (10 KHz) or 1 quadrature input of 20KHz or 2 quadrature inputs of 5 KHz.
** One "D" type port that supports RS232 and RS485 levels on different pins. "Y" type cable can be used for separate RS232 and RS485 levels simultaneously.

Dimensions :-



Drawing B
Depth 90mm with pluggable module. Height including power connector.



Drawing G
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.

RENU ELECTRONICS PVT. LTD.

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