

PLC datasheet [Base + Extenders]



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1. Key features – Base PLC

- 24VDC Auxiliary Power Supply
 - 24VDC supply – [20 – 30VDC]
 - Reverse polarity protection <= 1000VDC.
 - Surge protection
 - Resettable fuse for protection against incorrect power supply connections.
- 2 × Digital/Analog Inputs
 - User configurable through DIP switches between digital | analog(0-10VDC)
 - Digital input: PNP, optically isolated rated at 24VDC.
 - Analog input: Manufacturer customizable between 0-10VDC | 4-20mA
 - Please note in case of 4-20mA input customization, user will not be able to use digital/0-10V input mode.
 - Signal levels

Signal type →	Digital input	Analog input
Input signal ↓	Voltage on ESP32 pin	Voltage on ESP32 pin
0 VDC	3.3VDC	-
24 VDC	0 VDC	-
0 VDC	-	0 VDC
10 VDC	-	2 VDC
0 mA	-	0 VDC
20 mA	-	2 VDC

- 2 × Digital/Analog Outputs
 - Digital output: NPN type rated at 100mA.
 - Analog output: Manufacturer customizable between 0-10VDC | 4-20mA
 - 0–10VDC output will be rated at 100mA
 - Signal levels

Signal type →	Digital output	Analog output
Output signal from ESP32 ↓	Output on terminal	Output on terminal
0 VDC	GND	-
3.3 VDC	Floating i.e. open collector	-
0 VDC	-	0 VDC
3.3 VDC	-	10 VDC
0 VDC	-	0 mA
3.3 VDC	-	20 mA

- RS485 Communication
 - 1.5kV isolated RS485
 - RS485_A and RS485_B terminals

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- User inputs
 - 1 button – user configurable
 - Reset button not accessible normally. Can be accessed using a pin to reach the button.
- LED Indicators
 - LED indication for each input [Green]
 - LED indication for each output [Green]
 - Power LED [Red]
 - Internet LED [Blue]
- Wireless Communication
 - Wi-Fi with external antenna
 - Bluetooth
- Programming interface
 - Type-c connector (16 pin i.e. Orientation-free) with CH340 driver.
- Expansion Interface
 - I²C on extender
 - UART on extender
 - Suitable for GSM and additional I/O capabilities
- Optional Add-ons
 - Ethernet with magnetic isolation [On SPI bus-1]
 - W5500 chip based
 - HR86116OC connector with integrated magnetics
 - SD card for local storage [On SPI bus-2]
 - Micro-SD card compatible only.
 - Accessible via user without opening the PLC.
 - RTC [On I2C]
 - DS3231 chip based
 - Powered with coin cell battery.

2. Terminal details

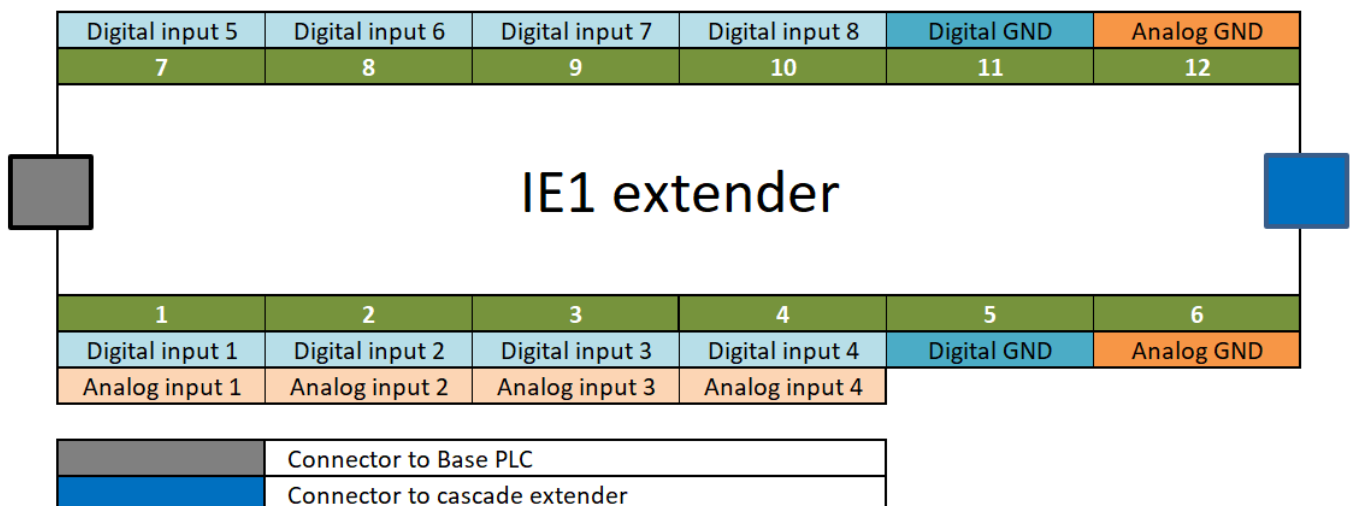
Analog output 1	Analog output 2				
Digital output 1	Digital output 2	Digital output GND	Analog output GND	RS485_A	RS485_B
7	8	9	10	11	12
1	2	3	4	5	6
+24VDC	GND	Digital input 1	Digital input 2	Digital input GND	Analog input GND
		Analog input 1	Analog input 2		

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3. Key features – Extender modules

1. IE1 – Input Extender 1

- Will have 8 digital inputs.
- All digital inputs will be PNP type and optically isolated rated at 5KV.
- Out of these, 4 inputs can be modified to work as analog inputs.
- The configuration of choosing between digital or analog inputs can be done by user using a DIP switch.
- Analog inputs will be either 0-10VDC or 4-20mA and this choice will come under manufacturer customization.
- IE1 will communicate with Base PLC via I2C protocol.
- IE1 will be powered by a 8-bit micro-controller NUVOTON MS51FB9AE (pre-programmed) because of its good availability, less cost and availability of ADC and sufficient GPIOs. ADC will have resolution of 12-bits.
- IE1 1 itself will have connector facility to cascade multiple extender modules.
- All 8 inputs will have green LED indication.
- Red Power LED will be provided
- There will be no separate terminals on the extender modules for connecting 24VDC power supply. The power will also be connected to extenders and cascaded modules via the extender connector itself.
- Terminal details (Tentative)



2. IOE1 – Input Output Extender 1

- Will have 4 digital inputs.
- All digital inputs will be PNP type and optically isolated rated at 5KV.

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- Out of these, 2 inputs can be modified to work as analog inputs.
- Analog inputs will be either 0-10VDC or 4-20mA and this choice will come under manufacturer customization.
- Will have 4 digital outputs.
- All the digital outputs will be NPN types rated at 24VDC and can handle $\leq 100\text{mA}$ current.
- Out of these outputs, 2 can be modified to work as analog outputs.
- The configuration of choosing between digital or analog inputs can be done by user using a DIP switch.
- Analog outputs will be either 0-10VDC or 4-20mA and this choice will come under manufacturer customization.
- IOE1 will communicate with Base PLC via I2C protocol.
- IOE1 will be powered by a 8-bit micro-controller NUVOTON MS51FB9AE (pre-programmed) because of its good availability, less cost and availability of ADC and sufficient GPIOs
- For DAC, we will be using MCP4725 chip which is a 12-bit DAC.
- IOE1 1 itself will have connector facility to cascade multiple extender modules.
- All 8 input/outputs will have green LED indication.
- Red Power LED will be provided
- There will be no separate terminals on the extender modules for connecting 24VDC power supply. The power will also be connected to extenders and cascaded modules via the extender connector itself.
- Terminal details (Tentative)

