ISC PEM NETWORK INTEGRATION INSTRUCTIONS

Contents

BASIC SIGNALS FROM / TO PLC

In order to have proper response from ISC PEM, it is necessary to send / receive basic signals when a PLC is connected. The following signals are all necessary no matter what type of equipment ISC PEM is equipped with.

1. Life bit (Input /Output):

Address (word/byte/bit)	Unit	ISC TO LINE		LINE TO ISC
0.0.0	Bit	Life bit		Life bit

ISC PEM sends back to PLC whatever heartbeat/**life bit** signal it gets. It is commonly done by sending 250ms ON -> 250ms OFF pulses. As the line PLC sends the heartbeat/Life bit signal to ISC PEM and at the same time receiving the same signal, the communication is established.

2. System ready (Input)/ Motor running (Output)

Address (word/byte/bit)	Unit	ISC TO LINE		LINE TO ISC
0.0.1	Bit	System ready		Motor running

When motor starts running, send 1 to this Motor running bit. This is necessary to make ISC PEM work as expected. ISC PEM will monitor encoder signals to see if the encoder is functioning properly. If encoder signal is not present when motor running signal is given, ISC PEM will generate an Encoder Fault.

Note: There is a 1 second on and off delay before the motor run signal or encoder fault would be set.

When PLC receives a System ready signal, it means ISC PEM does not have any fault/warning, and it is in a healthy state.

Common practice is to stop the belt motor when the System ready bit drops, because usually it means there's fault(s) on the machine.

3. Signals that are not necessary but good to use

Address (word/byte/bit)	Unit	ISC TO LINE		LINE TO ISC
0.0.2	Bit	Belt moving		Spare
0.0.3	Bit	Master fault		Reset fault
0.0.4	Bit	Master warning		Reset warning
0.0.5	Bit	System ready for next product		Spare

Belt moving (Input): signal indicates the encoder is pulsing correctly correspond to give "Motor Running" signal.
Master fault (Input): indicates any fault at ISC PEM level that prevents the equipment from functioning.
Master warning (Input): indicates any warning signals, which does not necessarily need motor to stop, but would recommend checking.
Reset fault / **Reset warning (Output):** are used to remotely reset any faults and warnings after they are cleared.

4. Run Mode (Output)

Address (word/byte/bit)	Unit	LINE TO ISC
0.1.0	Bit	Run mode internal
0.1.1	Bit	Run mode external

The ISC PEM needs to be set either in Internal or External run mode by sending the corresponding bit as 1.
Run mode **internal** means the ISC PEM will distribute products to exits spontaneously upon the "counter" values which are accessed thru web-HMI.
Run mode **external** means the line PLC decides each product where to go upon the Destination signal, which is introduced in the section below.

5. Destination (Output)

Address (word/byte/bit)	Unit	LINE TO ISC
1.0.0	Word	Product destination

Important note:
When changing the product destination, the destination for the incoming product should be assigned before the product leading edge comes to the infeed PE (photo eye).

It is common practice in the industry to use the product sensor bit shown below to know when the previous product has finished scanning to, then send the next product's destination.

Address (word/byte/bit)	Unit	ISC TO LINE
3.0.1	Bit	Status IO 1

In the cyclic communication at I 3.0.1, this is the status of the infeed photo eye which can be used for this purpose.

Note: See the communication data document for the full list of available signals.

6. Fault bits (Input)

Address (word/byte/bit)	Unit	ISC TO LINE
1.0.0	Bit	Min gap fault
1.0.1	Bit	Infeed jam fault
1.0.2	Bit	Spare
1.0.3	Bit	Buffer full fault
1.0.4	Bit	Peg sensor fault
1.0.5	Bit	Destination too late fault
1.0.6	Bit	Spare
1.0.7	Bit	Spare
1.1.0	Bit	Encoder fault
1.1.1	Bit	Motor signal fault
1.1.2	Bit	Spare
1.1.3	Bit	Spare
1.1.4	Bit	IO-link fault
1.1.5	Bit	Supply voltage fault
1.1.6	Bit	Spare
1.1.7	Bit	Overcurrent fault

Individual fault bits are sent from ISC PEM to indicate corresponding faults.

7. Warning bits and other useful data (Input)

Address (word/byte/bit)	Unit	ISC TO LINE
2.0.0	Bit	Small gap warning
2.0.1	Bit	Infeed jam warning
2.0.2	Bit	Spare
2.0.3	Bit	Buffer almost full warning
2.0.4	Bit	AIM Peg missing / damaged
2.0.5	Bit	Spare
2.0.6	Bit	Spare
2.0.7	Bit	Spare
2.1.0	Bit	Belt speed too low
2.1.1	Bit	Belt speed too high
2.1.2	Bit	Belt elongation limit reached
2.1.3	Bit	Belt acceleration too high
2.1.4	Bit	Belt deceleration too high
2.1.5	Bit	Spare
2.1.6	Bit	High CPU usage
2.1.7	Bit	Spare
3.0.0	Bit	Status IO 0
3.0.1	Bit	Status IO 1
3.0.2	Bit	Status IO 2
3.0.3	Bit	Status IO 3
3.0.4	Bit	Status IO 4
3.0.5	Bit	Status IO 5
5.0.0	Word	Throughput (PPM)
6.0.0	Word	Product destination (last inducted product)

Warning bits doesn't necessarily require system to be stopped; however, it would require to be checked to avoid potential faults happening.
The throughput of the equipment is calculated internally, and the value is PPM (Products Per Minute)
The product destination of last inducted product will be updated once there is a new product seen at the infeed photo eye.

8. Subsystem Faults/Warnings

Address (word/byte/bit)	Unit	ISC TO LINE
10.0.0	Bit	Fault / Warning Subsystem 0 (PEM)
10.0.1	Bit	Fault / Warning Subsystem 1
10.0.2	Bit	Fault / Warning Subsystem 2
10.0.3	Bit	Fault / Warning Subsystem 3
10.0.4	Bit	Fault / Warning Subsystem 4
10.0.5	Bit	Fault / Warning Subsystem 5
10.0.6	Bit	Fault / Warning Subsystem 6
10.0.7	Bit	Fault / Warning Subsystem 7

The subsystems faults or warnings indicate whether that are any subsystem level faults or warnings on the ISC CAM modules that are connected to ISC PEM.

9. Unused Words

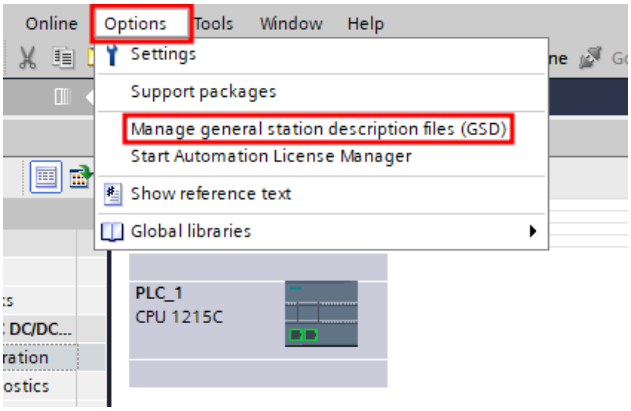
Word 16-31 are unused and reserved for future use.

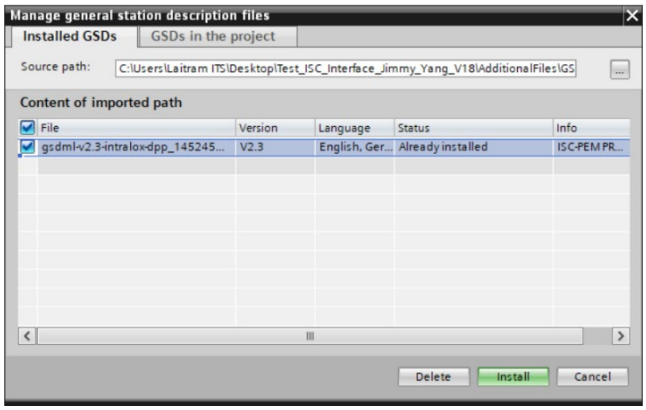
SIEMENS TIA PORTAL CONFIGURATION INSTRUCTIONS

1. **Download the GSDML configuration file**

    a. Download “ISC CAM Network Integration Support Files” from Intralox Webpage. Within that folder there will be two important documents.
    b. “gsdml-v2.3-intralox-dpp_1452454_isc_pem-20250407-100000.xml”
    c. “ISC PEM TIA Portal Library Project V18”

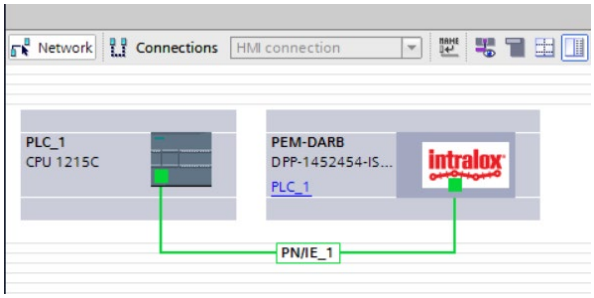
2. **Add the GSDML file to TIA Portal project network configuration**





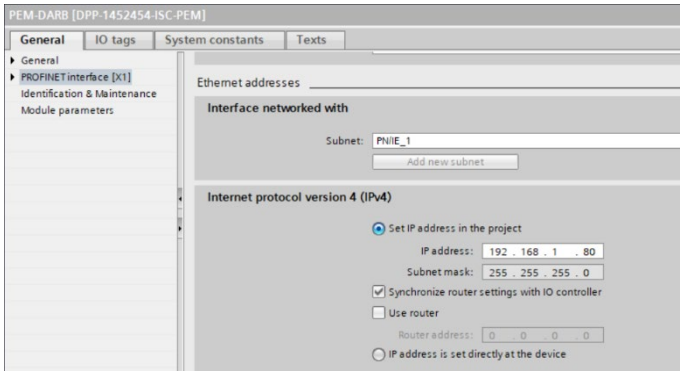
3. **Add ISC PEM to Network View**

    a. Navigate to “Other field devices” – “PROFINET IO” – “I/O” – “Intralox” – “ISC-PEM” – “ISC-PEM” in catalog, select “DPP-1452454-ISC-PEM”.
    b. Drag and drop the device into the “Network View”.
    c. Select the controller to connect to the ISC PEM device.

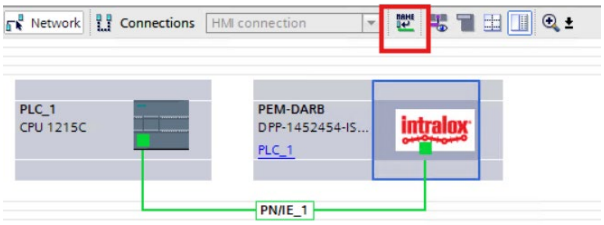


4. **Setup device configuration**

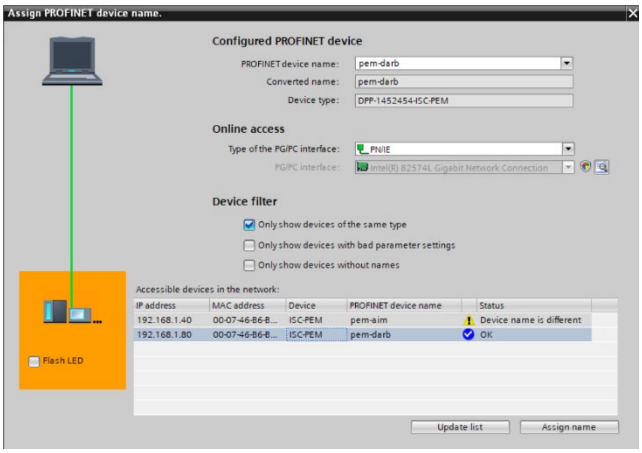
    a. Assign the IP address of the target ISC PEM device.



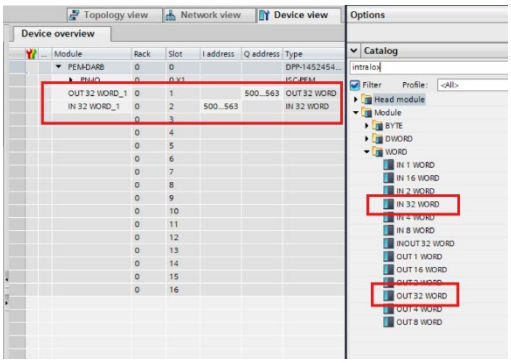
    b. Having the ISC PEM device powered-up and physically connected to the PLC controller, click “Assign device name”.



c. Update list and assign name to the correct ISC PEM device.

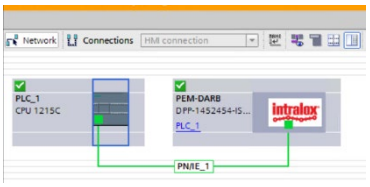


d. Double click the ISC PEM device and open up “Device View”. Configure the OUT / IN Word size as “OUT 32 WORD” and “IN 32 WORD”. Select the corresponding module from “Hardware Catalog”, drag and drop to the available slots. The “I address” and “Q address” are set at 500 because it is set this way in the provided example project “ISC PEM TIA Portal Library Project V18”. You can change the starting addresses to other, but remember to change the tags’ addresses referring to later section in this document.



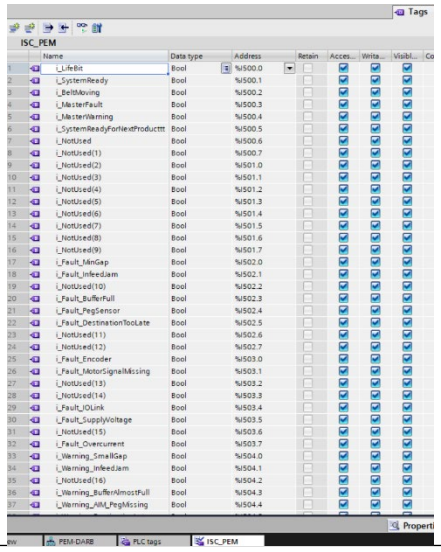
***Note:** it is required to put “OUT 32 WORD” at slot 1 and “IN 32 WORD” at slot 2. Otherwise, it does not work.*

e. Now if you go online, you can see the ISC PEM device is successfully connected.



5. Copy and paste the tags from example projects provided.

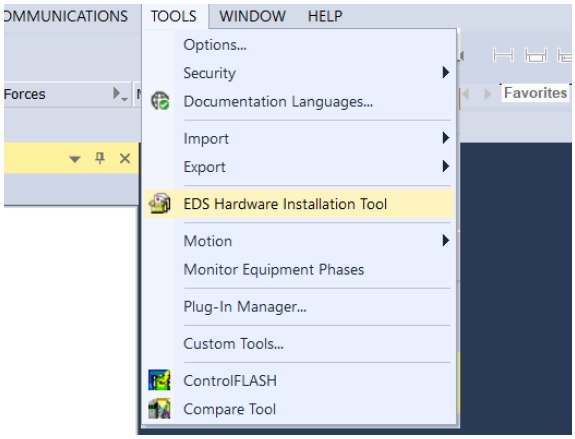
a. From the example project which is provided, copy the tags and paste it into your TIA Portal project

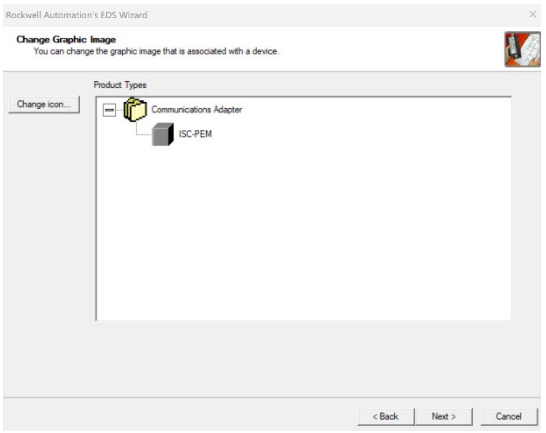


ROCKWELL STUDIO5000 CONFIGURATION INSTRUCTIONS

1. **Download the EDS file from Intralox ISC PEM website**
   a. “ISC-PEM_R2.7.eds”

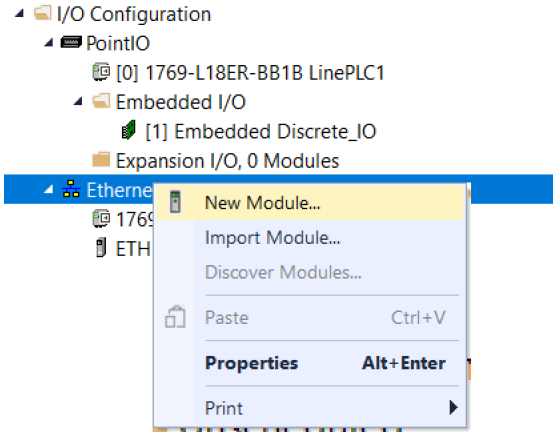
2. **Within Studio5000, use EDS Hardware Installation Tool to register the EDS file**

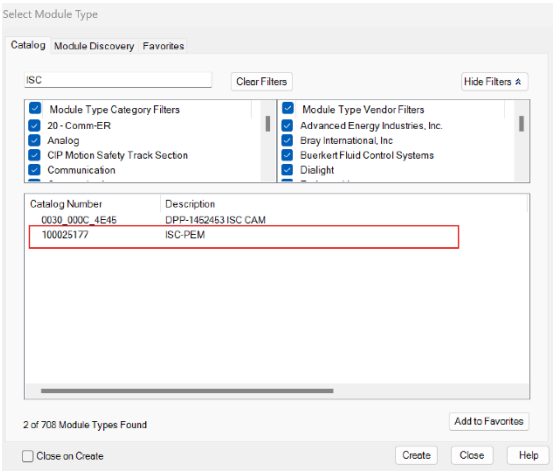




3. **Add the ISC-PEM to the hardware configuration**

Go to “Change” under Module Definition and make the IO data in DINT format, assign the IO address as you need.





4. **Now you can use and access the IO data in your controller tags.**