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IITS2203-5 Fieldbuses and Internet (I-IT-4N)

Laboratory Report 3: PROFIBUS-DP and Distributed I/O with PLC

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AIM

The purpose of the lab is to introduce the Profibus DP and remote distributed I/O with the S7-300 PLC.

The laboratory arrangement is made according to set up as shown in the figure 1.

The activities are carried out in order to understand the connection between different blocks and their programing. The implementation is done in a such way that:

 Control Devices are driven by the ET200B via a switch switches and the output of the motor output is indicated by its flags.

 Power output (Contactor, K91, K92) switching I/O is via the ET200S unit.

LABORATORY SETUP

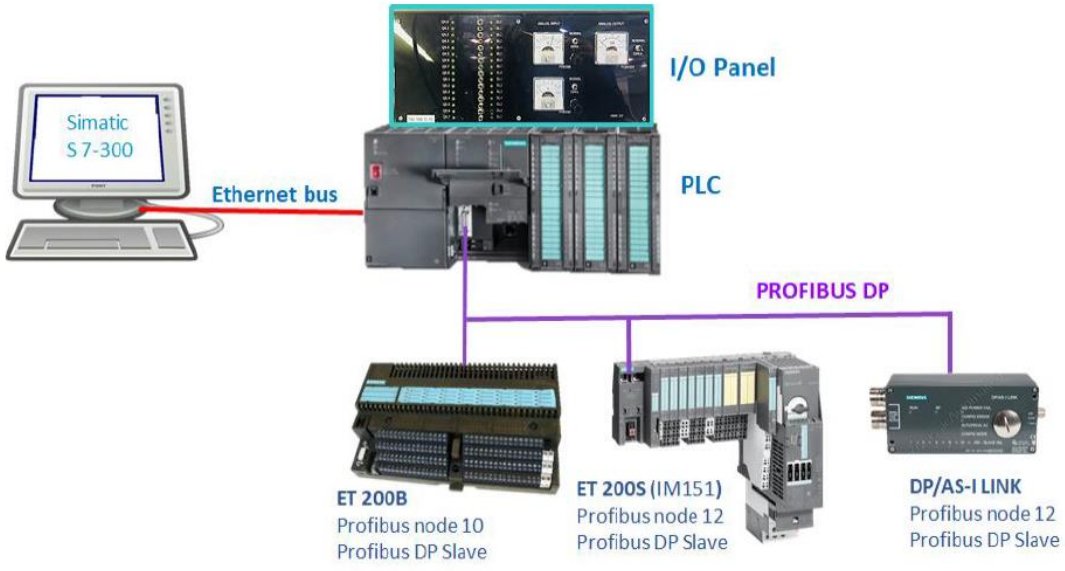

Figure 2: S7-300 Master, ET200B and ET 200 S.

PROCEDURE:

The PLC acting as the Master unit. First the HW of remote I/O of the ET200 B and ET200S unit are configured and then the node addresses are set, and the PROFIBUS-DP network is created. Next the ET200B unit is added by inserting its program HW library from the step7 catalogue and by inserting it to the Profibus DP and setting the HW at the node address.

In the third step, you insert the ET200S I/O unit so that its Profibus node address and HW node number are the same.

In the next step it is possible to simulate a motor output connection and test the program

Motor output is then tested through the AI and AO and the ET200S unit.

Summary:

1. Configure the hardware (HW) of the PROFIBUS-DP INTERFACE by using the right IP address in accordance with the Profibus node number
2. Setup the Bus and the logic for the HW configuration
3. Make a new S7 project, (Give it a name, for example Dist_io) and insert the S7-300 station and Set the Profibus address as 6.
4. Connect the ET 200 B to the Bus. Set the Profibus address of the ET200B to 10 (Same as in the address of the physical device).
5. Connect the ET 200 S to the Profibus DB. Assemble the ET200S remote I/O system and set the physical address. Then insert the right configuration. HW and configuration must match exactly.

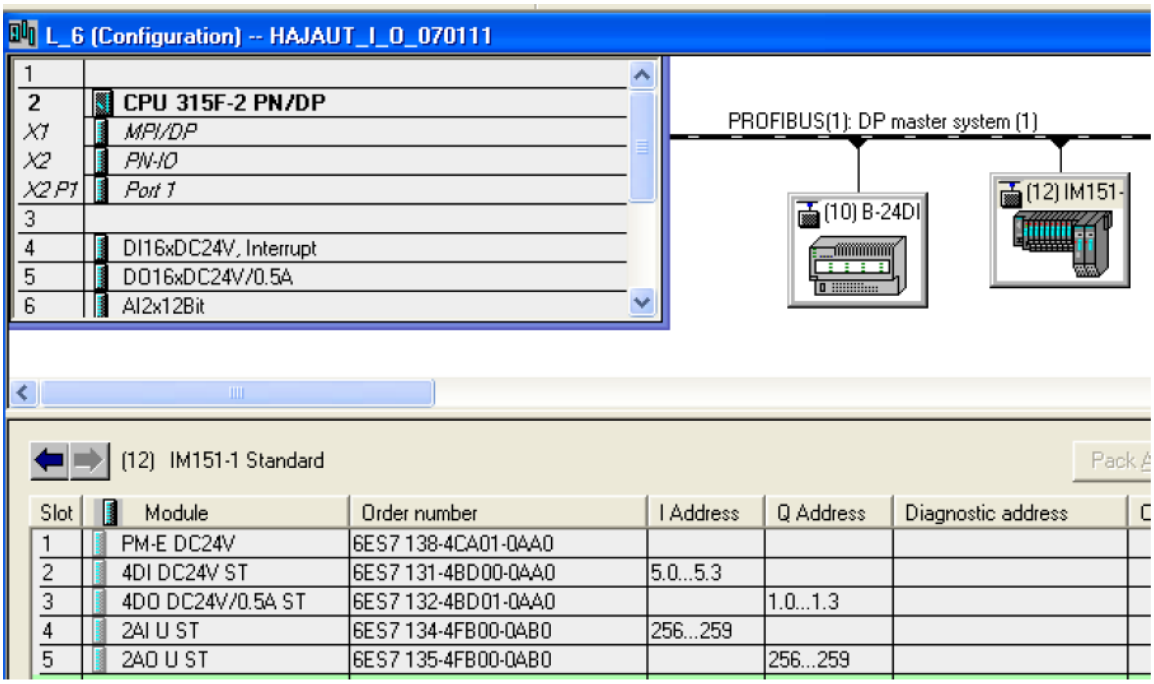

Figure 3: The ET 200S and ET200B connected to the system through a PROFIBUS-DP

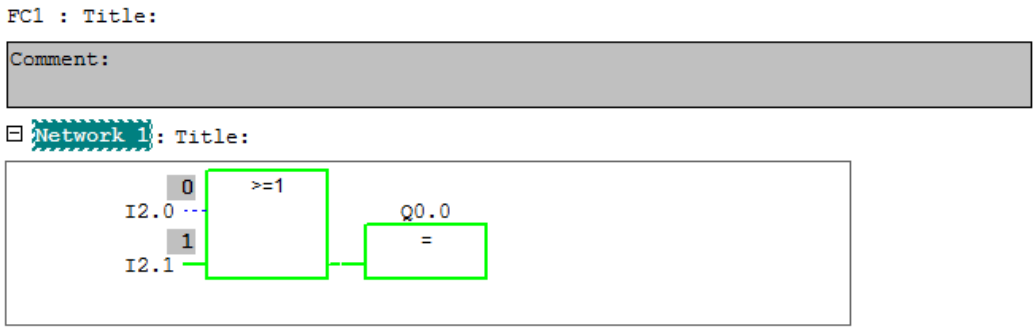

Figure 4: Test Results.

Answer with your own words, what are ET200B and ET200S Disturbed I/O systems and for what they are used for?

ET200S is a Distributed I/O System based on the PROFIBUS standard (EN 50170, Part 1) and PROFIBUS-DP standard (EN 50170, Part 3). It is connected as a DP slave device.

Sometimes, it has up to 63 modules such as; power modules, I/O modules, and motor starters.

ET200B is an ET 200 distributed I/O system based on the PROFIBUS standard (EN 50170, Part 1) and PROFIBUS-DP standard (EN 50170, Part 3). It is connected as a DP slave device. It is used when we have space limitations. It has two parts: The Terminal block which has permanent electrical wirings and the Electronics block which contains logic circuits.

They are suitable when we want to install the controller CPU centrally, decentralize the I/O system and over long distances, and to ensure high data rate and smooth communication (minimum reaction times) between the CPU and I/O systems.

Which devices can be connected to PROFIBUS DP?

- SIMATIC 7 300 (S7-300)
- ET-200S
- ET-200B
- DP/AS-I LINK
- Programing Device
- I/O modules
- Field devices

What is the DP/ASi Link?

The DP/ASi link is used to connect the actuator sensor interface (ASi) to the PROFIBUS-DP field bus. By doing this, the protocols of the bus systems are converted.

The DP/ASi link belongs to the Distributed I/O System family.