EXOR® *Tech-note*

Connecting UniOP to the Simatic S7-200

The UniOP panel can be connected to the Siemens Simatic S7-200 family of PLCs. The communication is performed via the PLC programming ports using the PPI and the PPI+ protocols. This technical note describes the principal points to follow for a successful connection and adds some information on the PPI+ features.

The Simatic S7 PPI protocol is associated to the Designer file UPLC54.DLL.

Contents

1. Introduction

UniOP panels can be connected to the Simatic S7 200 series PLCs via the PLC port using PPI communication protocol. All the available ports on the Simatic S7 200 CPU can be used to connect the panel to the PLC.

The PPI+ version of the protocol is has been introduced in DLL version 5.03 and Driver version 3.04.

2. Designer Configuration

To use the PPI protocol with Designer, follow this procedure:
- Select the option "Project/Change Communication Driver" and choose the "Simatic S7 PPI" driver.
- Select the type of CPU that you intend to use with the option "Project/Controller Setup".
- Select the protocol type: PPI or PPI+.
- In case you are going to use PPI+ support you will have to fill the Max ID field with the highest node number in PPI+ network.
- Panel ID contains the node number of the UniOP panel.
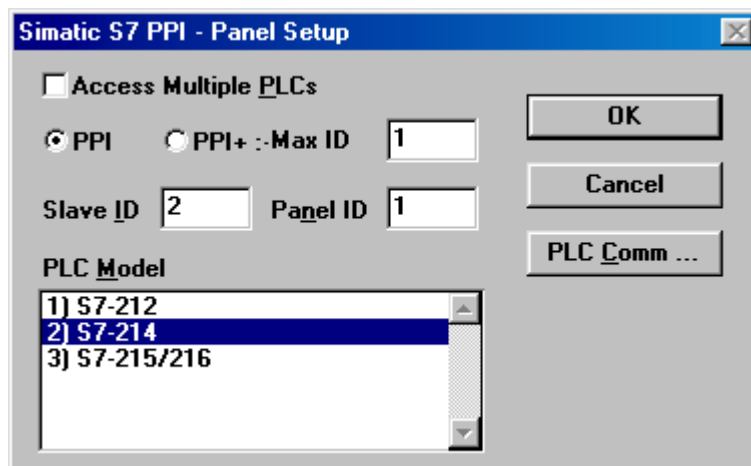- Slave ID contains the node number of the connected PLC.

Figure 1 - Controller Setup

Note: *It is important to select the actual PLC CPU type that you will work with. Selecting the wrong type can result in communication problems, under certain particular conditions, and can result in the optimum communication not being achieved.*

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3. RDA information

- The Real Time Clock information in the reserved data area (RDA) is coded in BCD

- The Real Time Clock is arranged in the RDA in the following order:

VBn	Day of the week
VBn+1	0
VBn+2	Month
VBn+3	Day
VBn+4	Hour
VBn+5	Year
VBn+6	Seconds
VBn+7	Minutes

- The page number displayed and the page number requested in the RDA are coded in binary.

- The RDA can be freely positioned within the PLC memory.

- For the parts of the RDA organized in bits (Keyboard Status, LED Control, Alarms, UniOP Status Word and PLC Command Word), the first bit in the RDA corresponds to the first bit in the PLC (i.e. the bit with the lowest address). For example, if the Keyboard Status area is positioned at the address VB0, then the key F1 will be mapped to V0.0, the key F8 will be mapped to V0.7 and so on as listed in the following table:

	.7	.6	.5	.4	.3	.2	.1	.0
VB0	F8	F7	F6	F5	F4	F3	F2	F1
VB1	F16	F15	F14	F13	F12	F11	F10	F9

Similarly, if the UniOP Status Word is positioned at the address VB12, then the status bit S0 will be mapped to V12.0, the bit S7 will be mapped to V12.7 while the bit S8 will be mapped to V13.0.

4. PPI+ Connectivity

UniOP supports connection to more than one CPU S7-200 as shown in the figure below. It is also possible to connect more than one UniOP panel to the same PLC. UniOP panels will not interfere with PPI+ communication between the PLC's
If you want to make use of this possibility you need to:
- select the option "Project/Controller Setup" (see figure 1)
- click on the option "Access Multiple PLCs"
- specify the address of all the PLCs that you want to access
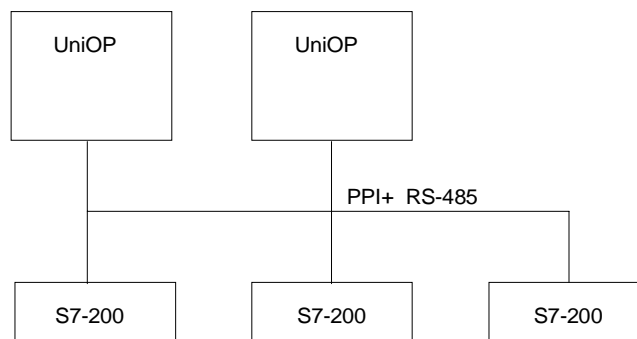

Figure 2 – Connecting multiple PLC and panels

PPI+ support gives you the possibility to use more complex configurations than the standard PPI protocol.
Each PLC can be configured to use read and write operations to and from other PLCs. At the same time more than one panel can be connected on the PPI network and can access all the variables from all the PLCs.
It is possible to connect the PLC programming software and to do online programming without interfering with the communication UniOP-PLC.

4.1. Cable

The cable to use for the point to point connection between the panel and a CPU S7-200 is CA96. The same cable is to be used as a reference to connect the UniOP panel to a PPI+ network.

Appendix A - Communication Error Codes

Current communication status is displayed in the System Menu of the UniOP. Beside the string describing the current status of the communication, there is an additional error code representing the last (which may be not the current one) error encountered. The codes are the following:

Code	Description
0	**No error** There are no communication errors and there have been no errors since start-up.
04	**Negative acknowledgement to request** The PLC rejected the request. Badly formed request.
05	**Time-out error to token** UniOP could not process the request because it is not receiving the token. Check that the UniOP address is correct and is within the MaxAddress range of the PLCs and other UniOPs. Valid only for the PPI+ protocol.
08	**Time-out to request** Timed out while waiting for the response from the PLC.
11	**Line error** Probably wrong baud rate.
12	**Unexpected data received** Unexpected frame while waiting for response. Received a non response frame or a frame from an unexpected node.
18	**Reply error** The PLC response was not of the expected length.
19	**Negative acknowledgement in response** The PLC returned the response but set an error flag. Probably the request referenced an invalid address range.