



## SIEMENS S7 300 SIMATIC Controller Instructions

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# SIEMENS

### SIEMENS S7 300 SIMATIC Controller



### Product Information

The product is a PLC1.ir device that is used for industrial automation. It has a HMI (Human Machine Interface)

and supports TCP/IP communication. The HMI's factory setting is PLC1.ir IPPLACd1d.irress:P1L9C21..i1r 68.0P.1LC1.ir. It has a COM Port: 102 CPoLnCt1r.oirl ArePaL/C1S.tiratus PALrCea1.:irDBWP0L/C1D.iBr W20PLC1.ir. The device can be connected to a PLC and controlled through the HMI CPoLCn1n.eirct i onPLMca1n.iru al PLC1.ir.

- **Siemens S7 300 (ISO TCP)**
- **HMI Factory Setting:**
- **IP Address:** 192.168.0.1
- **COM Port:** 102
- **Control Area / Status Area:** DBW0 / DBW20

## **Connection**

Standard Jumper Cable / Network Cable without jumper (Auto-detected by HMI)

## **Definition of PLC Read/Write Address**

### **a.Registers**

| Type             | Format                            | Read/Write Range               | Data Length | Note              |
|------------------|-----------------------------------|--------------------------------|-------------|-------------------|
|                  | Word No.(n)<br>Bank No.(m)        |                                |             |                   |
| Input Image      | IW <sub>n</sub>                   | IW0 – IW65534                  | Word        |                   |
|                  | ID <sub>n</sub>                   | ID0 – ID65532                  | Double Word |                   |
| Output Image     | QW <sub>n</sub>                   | QW0 – QW65534                  | Word        |                   |
|                  | QD <sub>n</sub>                   | QD0 – QD65532                  | Double Word |                   |
| Internal Bits    | MW <sub>n</sub>                   | MW0 – MW65534                  | Word        |                   |
|                  | MD <sub>n</sub>                   | MD0 – MD65532                  | Double Word |                   |
| Data Area        | DB <sub>m</sub> .DBW <sub>n</sub> | DB1.DBW0 –<br>DB65535.DBW65534 | Word        | <a href="#">1</a> |
|                  | DB <sub>m</sub> .DBD <sub>n</sub> | DB1.DBD0 –<br>DB65535.DBW65532 | Double Word | <a href="#">1</a> |
| Data Area (DB10) | DBW <sub>n</sub>                  | DBW0 – DBW65534                | Word        |                   |
|                  | DBD <sub>n</sub>                  | DBD0 – DBD65532                | Double Word |                   |
|                  | VW <sub>n</sub>                   | VW0 – VW65534                  | Word        |                   |
|                  | VD <sub>n</sub>                   | VD0 – VD65532                  | Double Word |                   |
| Timer            | T <sub>n</sub>                    | T0 – T65535                    | Word        | <a href="#">2</a> |
| Counter          | C <sub>n</sub>                    | C0 – C65535                    | Double Word | <a href="#">3</a> |

## b.Contacts

| Type             | Format                                     | Read/Write Range                | Note |
|------------------|--|---------------------------------|------|
|                  | Word No.(n)<br>Bank No.(m) Bit No<br>. (b) |                                 |      |
| Input Image      | In.b                                       | I0.0 – I65535.7                 |      |
| Output Image     | Qn.b                                       | Q0.0 – Q65535.7                 |      |
| Internal Bits    | Mn.b                                       | M0.0 – M65535.7                 |      |
| Data Area        | DB <sub>m</sub> .DBX <sub>n</sub> .b       | DB1.DBX0.0 – DB65535.DBX65535.7 |      |
| Data Area (DB10) | DBX <sub>n</sub> .b                        | DBX0.0 – DBX65535.7             |      |
|                  | Vn.b                                       | V0.0 – V65535.7                 |      |

## NOTE

1. PLC needs to enable DB memory (DBm.DBWn DBm.DBn DBm.DBXn.b) before DB data can be read.
2. Timer reads only up to 3 digits. If a value input is more than 3 digits, the Timer will regard the highest 3 (decimal) and replace the rest by 0. For example, a value 12345 will be written as 12300 in PLC.
3. Counter reads only up to 3 digits. If a value input is more than 3 digits, the Counter will regard the first 3 digits and leave out the rest. For example, a value 12345 will be written as 123 in PLC.
4. Except register Tn and Cn data type of register is Byte and its order is opposite to usual controller, for example:
  - IW3 is a word which combined from IB3 and IB4 High Byte of IW3 is IB3 Low Byte of IW3 is IB4.
  - ID3 is Double Word which combined from IB3, IB4, IB5 and IB6, and its order from highest to lowest is IB3, IB4, IB5 and IB6.

And please be attentive to use these registers, because their Data type is different with Data Length, it will need more than one register for each access, for example:

- AIW6 which Data Type is Word and Data Length is 1 Word, when it used for one word Numeric Entry, it will occupy two addresses AIW6 and AIW7
- MD12 which Data Type is Word and Data Length is Double Word when it used for one word Numeric Entry, it will occupy four addresses MD12, MD13, MD14 and MD15; But data only stored in MD14 and MD15.
- IW3 which Data Type is Word and Data Length is 1 Word, when it used for double word Numeric Entry, it will occupy for addresses IB3, IB4, IB5 and IB6 order from highest to lowest byte is IB5, IB6, IB3 IB4.

## Settings

### Screen Editor

1. HMI Ethernet Setting

**Configuration**

Standard **Communication** Print Default Others

Add Move Up  
Delete Move Down

COM1  
COM2  
COM3  
**Ethernet**  
Base Port

☒ Recovery the IP address in HMI  
☐ DHCP

|                 |                     |
|-----------------|---------------------|
| HMI Name        | HMI                 |
| HMI IP Address  | 192 . 168 . 0 . 2   |
| Subnet Mask     | 255 . 255 . 255 . 0 |
| Default Gateway | 0 . 0 . 0 . 0       |

OK Cancel

## 2. PLC Ethernet Setting

**Configuration**

Standard **Communication** Print Default Others

Add Move Up  
Delete Move Down

COM1  
COM2  
COM3  
**Ethernet**  
Base Port

**Communication Parameter**

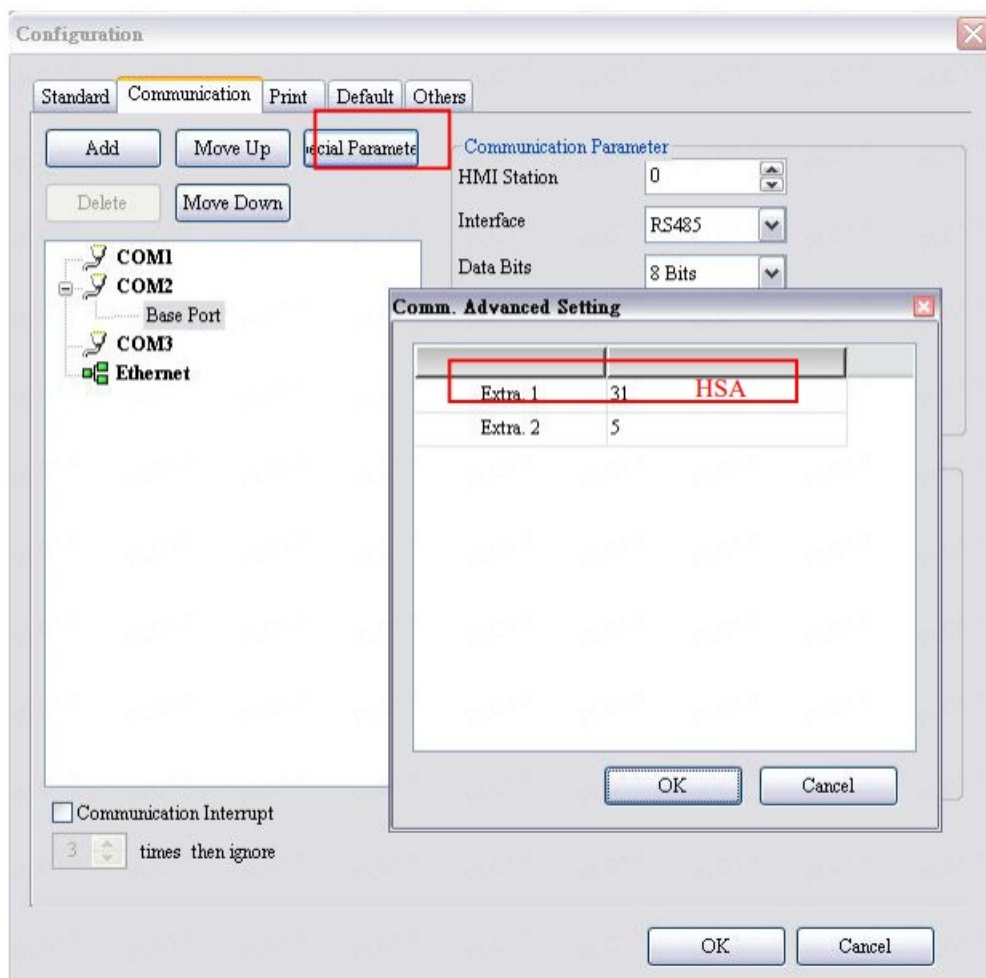
|             |                   |
|-------------|-------------------|
| HMI Station | 0                 |
| IP Address  | 192 . 168 . 0 . 1 |
| COM Port    | 102               |

**Controller Settings**

|  |                                     |
|--|-------------------------------------|
| Controller                                   | S7 300 (ISO TCP)                    |
| Password                                     | 12345678                            |
| PLC Station                                  | 2                                   |
| Comm. Delay                                  | 0                                   |
| Timeout(ms)                                  | 300                                 |
| Retry Count                                  | 3                                   |
| <input checked="" type="checkbox"/> Optimize | <input type="checkbox"/> Size Limit |

OK Cancel

- Right click on “CP343-1 Lean” module and select “Object Properties”, on this page set up “IP address” and “Subnet mask” for CP343-1 Lean Module. Please be aware that the “IP address” setting must be the same as PLC Ethernet setting in Screen Editor and the “Subnet mask” setting must be the same as the HMI Ethernet setting in Screen Editor.
- To add a new “Other station”, right click on “Object Properties”, add a new Interface and set the “Type” as “Industrial Ethernet”. To set up HMI “IP address” and “Subnet mask”, go to “Ethernet interface” > “Properties”, please be aware that this setting must be the same as the HMI Ethernet setting in Screen Editor. As the setting is completed, left click on the green box above “Other station” and drag to link with the green line above.
- Right click on the CPU module and select “Insert New Connection”, for “Connection Partner” select “Unspecified” and for “Type” select “TCP connection”. Then go to “Properties – TCP connection” > “Options”, and set “Mode” to “Fetch passive”; please follows the restriction for “Address” setting, set “Address” to Local Port No. must be the same as PLC Ethernet setting in Screen Editor, to Partner’s IP must be the same as HMI Ethernet setting in Screen Editor, but Port No. can be any Port No. depending on the structure of network connection.
- Right click on another CPU to add a new “TCP connection” and repeats setting 3, except the “Mode”, go to “Options” > “Mode” and select “Write passive”.
- After setting 1~4 is done, you will see two “TCP connection” at the bottom of PLC Ethernet setting page. PLC Ethernet setting is completed.
- For detail on parameter setting, please refer to Siemens PLC user manual.



## Documents / Resources

Siemens S7 300 (PSO TCP)

## Siemens S7 300 (PSO TCP)

### Web-Server Settings

|             |                       |
|-------------|-----------------------|
| IP Address  | 192.168.1.1           |
| Gateway     | 192.168.1.1           |
| Subnet Mask | 255.255.0.0 (Default) |

### Connection

Network Address Gate: Network Address without jumper (also recommended by IEC)

### Definition of PLC Read/Write Address

#### 1. Register

| Type            | Address<br>(Start Address) | Read/Write Range                 | Start Address  | End            |
|-----------------|----------------------------|----------------------------------|----------------|----------------|
| Input Register  | PIW                        | PIW 0 - PIW 127                  | PIW 0          | PIW 127        |
| Output Register | QW                         | QW 0 - QW 127                    | QW 0           | QW 127         |
| Global Memory   | M                          | M 0 - M 127                      | M 0            | M 127          |
| Counter Memory  | C                          | C 0 - C 127                      | C 0            | C 127          |
| Timer Memory    | T                          | T 0 - T 127                      | T 0            | T 127          |
| Local Memory    | DB                         | DB 0 - DB 127                    | DB 0           | DB 127         |
| Local Memory    | DB                         | DB 128 - DB 255                  | DB 128         | DB 255         |
| Local Memory    | DB                         | DB 256 - DB 511                  | DB 256         | DB 511         |
| Local Memory    | DB                         | DB 512 - DB 1023                 | DB 512         | DB 1023        |
| Local Memory    | DB                         | DB 1024 - DB 2047                | DB 1024        | DB 2047        |
| Local Memory    | DB                         | DB 2048 - DB 4095                | DB 2048        | DB 4095        |
| Local Memory    | DB                         | DB 4096 - DB 8191                | DB 4096        | DB 8191        |
| Local Memory    | DB                         | DB 8192 - DB 16383               | DB 8192        | DB 16383       |
| Local Memory    | DB                         | DB 16384 - DB 32767              | DB 16384       | DB 32767       |
| Local Memory    | DB                         | DB 32768 - DB 65535              | DB 32768       | DB 65535       |
| Local Memory    | DB                         | DB 65536 - DB 131071             | DB 65536       | DB 131071      |
| Local Memory    | DB                         | DB 131072 - DB 262143            | DB 131072      | DB 262143      |
| Local Memory    | DB                         | DB 262144 - DB 524287            | DB 262144      | DB 524287      |
| Local Memory    | DB                         | DB 524288 - DB 1048575           | DB 524288      | DB 1048575     |
| Local Memory    | DB                         | DB 1048576 - DB 2097151          | DB 1048576     | DB 2097151     |
| Local Memory    | DB                         | DB 2097152 - DB 4194303          | DB 2097152     | DB 4194303     |
| Local Memory    | DB                         | DB 4194304 - DB 8388607          | DB 4194304     | DB 8388607     |
| Local Memory    | DB                         | DB 8388608 - DB 16777215         | DB 8388608     | DB 16777215    |
| Local Memory    | DB                         | DB 16777216 - DB 33554431        | DB 16777216    | DB 33554431    |
| Local Memory    | DB                         | DB 33554432 - DB 67108863        | DB 33554432    | DB 67108863    |
| Local Memory    | DB                         | DB 67108864 - DB 134217727       | DB 67108864    | DB 134217727   |
| Local Memory    | DB                         | DB 134217728 - DB 268435455      | DB 134217728   | DB 268435455   |
| Local Memory    | DB                         | DB 268435456 - DB 536870911      | DB 268435456   | DB 536870911   |
| Local Memory    | DB                         | DB 536870912 - DB 1073741823     | DB 536870912   | DB 1073741823  |
| Local Memory    | DB                         | DB 1073741824 - DB 2147483647    | DB 1073741824  | DB 2147483647  |
| Local Memory    | DB                         | DB 2147483648 - DB 4294967295    | DB 2147483648  | DB 4294967295  |
| Local Memory    | DB                         | DB 4294967296 - DB 8589934591    | DB 4294967296  | DB 8589934591  |
| Local Memory    | DB                         | DB 8589934592 - DB 17179869183   | DB 8589934592  | DB 17179869183 |
| Local Memory    | DB                         | DB 17179869184 - DB 34359738367  | DB 17179869184 | DB 34359738367 |
| Local Memory    | DB                         | DB 34359738368 - DB 68719476735  | DB 34359738368 | DB 68719476735 |
| Local Memory    | DB                         | DB 68719476736 - DB 137438953471 | DB             |                |

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S7 300 SIMATIC Controller, S7 300, SIMATIC Controller, Controller