## How to Setup Uticor Panel Communication with Siemens HMI S7 300 Series over MPI

Needed: Uticor HMI (any version), S7 300 PLC (any version), HMI MPI Adapter (example: 6ES7 972-0CA11-0XA0), Uticor CBL-UTICW-012 cable

Software: Simatic v5.5, uWin Tough Panel (any version)

Follow these directions you will create a push button and coil on both PLC and HMI. The PLC and HMI will communicate.

S7 300 directions (Simatic v5.5)

- 1. Start SIMATIC Manager v5.5.
- 2. Click on File > New and name your new project (Ex: MPI Program) then click OK.

| Induie                      | Storage path                   | ^             |
|-----------------------------|--------------------------------|---------------|
| 300-1200 Communications     | C:\Program Files\Siemens\Ste   | :p7\s7pi      |
| 315F_2DP                    | C:\Program Files\Siemens\Ste   | p7\s7pi       |
| 315F_2DP_1                  | C:\Program Files\Siemens\Ste   | p7\s7pi       |
| Anybus_1                    | C:\Program Files\Siemens\Ste   | p7\s7pi       |
| Anybus_2                    | C:\Program Files\Siemens\Ste   | p7\s7pi       |
| ANYBUS_SETUP                | C:\Program Files\Siemens\Ste   | :p7\s7pi      |
|                             | Cil Brogram Eilasl Ciamanal Ch | •7\•7•r≚<br>▶ |
| Add to current multiproject |                                |               |
| Name:                       | Туре:                          |               |
| MPI Program                 | Project                        |               |
|                             | -                              |               |
| Storage location (path):    | I - F Libra                    | ry            |

3. The screen dialogue should open. There right click on file name and select **Insert New Object > SIMATIC 300 Station**. You can then name it whatever you want.



- 4. Double left click on the Module you inputted (Default name: SIMATIC 300(1)). Then double left click on Hardware.
- 5. In the dialog that pops up on the right side. Select **SIMATIC 300 > RACK 300 > Rail** and place it on the screen. You should get an empty table with numbers on the left side.

| HW Config - SIMATIC 300(1)                     |  |    |
|--|--|----|
| Staton Edit Insert PLC Wew Options Window Help |  |    |
|  |  |    |
|  |  | 믜최 |
| PESIAA (IC 300(1) (Contiguration) MPI Program  | Sychen: nt   | ni |
|  | Brolie Standard  | -  |
|  | *         CP-200           *         CP-200           *         CPU 312           *         CPU 313           *         CPU 313           *         CPU 3132           *         CPU 3144           *         CPU 3142           *         CPU 3152           *         CPU 3152 | 0  |
| ★ ➡ SIMATIC 300(1)                             | V3.1   |    |
| Slot Designation                               | A GENERAL IN A CONTRACT  | ~  |
|  | 6ES7 315 2FJ14 0A80<br>512 KB work memory: 0.05ms/1000<br>instructions: PROFINET connection: S7<br>Communication (loadable FBs/FCs):   | τŗ |

Next go back to the right side and in SIMATIC 300 > CPU-300 > (Select own PLC) (Ex: CPU 315F-2 PN/DP) > (Select version) (Ex: 6Es7 315-2FJ14-0AB0 [Found at bottom of door on PLC CPU]) > (Select Firmware) (Ex: V3.2)

| ALL THE HEAT ALL THE LATER AND THE PARTY OF A DESCRIPTION OF<br>A DESCRIPTION OF A DESCRIPTION |                              |                 |
|---|------------------------------|-----------------|
|   |                              |                 |
|   | Sychen:                      | ox<br>atai      |
| S S   | 6E57 390 17770 0AA0          | - <sub>₹,</sub> |
| Ski U Module Older number Firmware MPI address I address Domment  | pavadable in various lengths |                 |

7. Drag this selected CPU to the 2<sup>nd</sup> slot. Input wanted IP address (make sure that computer on IP address close by). Then press new and press OK to create an industrial Ethernet. Press OK to finish hardware setup.

| Properties - Ethernet interface PN-10 (                                      | R0/S2.2)  |
|--|---|
| General Parameters<br>IP address: 10.1.200.220<br>Subnet mask: 255.255.255.0 | If a subnet is selected,<br>the next available addresses are suggested.<br>Gateway<br>© Do not use router<br>© Use router |
| Use different method to obtain IP address<br>Subnet:<br>not networked        | Address:<br>Network<br>Properties<br>Delete   |
| ОК   | Cancel Help   |

| Properties - New                    | subnet Industrial Ethernet 🛛 🛛 🔀               |
|-------------------------------------|--|
| General                             |  |
| Name:                               | Ethernet                                       |
| S7 subnet ID:                       | 0142 - 0009                                    |
| Project path:                       |  |
| Storage location<br>of the project: | C:\Program Files\Siemens\Step7\s7proj\MPI_Prog |
| Author:                             |  |
| Date created:                       | 07/08/2016 04:21:39 PM                         |
| Last modified:                      | 07/08/2016 04:21:39 PM                         |
| Comment:                            |  |
|                                     |  |
|                                     | CancelHelp                                     |

8. Then save and compile the hardware setup. Exit out of the HW Config.

| 🖳 HW Config - SIMATIC 300(1    | 1                      |   |  |
|--------------------------------|------------------------|---|--|
| Station Edit Insert PLC View O | Options Window Help    |   |  |
| 」D 📽 ≌ 📲 🕎 🎒 I B I             | 🗈 🛙 🏜 👔 📳 🖼 👷          |   |  |
| SIMATIC 300(1) (Configu        | uration) MPI Program   |   |  |
| Ethernet: PROFINET-IO-Syste    | em (100)               |   |  |
|                                |                        |   |  |
| ξ                              | 🚍 (0) UR               |   |  |
|                                | 1                      | ~ |  |
|                                | 2 CPU 315F-2 PN/DP     |   |  |
|                                | X1 MIF//UF<br>X2 PN-10 |   |  |
|                                | X2P1 R Port 1          |   |  |
|                                | 3                      |   |  |
|                                | 4                      |   |  |
|                                | 15 1                   |   |  |
|                                |                        |   |  |
|                                |                        |   |  |
|                                |                        |   |  |
|                                |                        |   |  |
|                                |                        |   |  |

9. In the SIMATIC Manager double left click on SIMATIC 300(1). Then double left click on CPU. Then double left click on Connections.



10. Here you can configure the MPI and Ethernet setup. Double clicking MPI/DP then you can configure the MPI adapter. Click on Properties, then select the MPI network (if not created then select New).

| Short Description: | MPI/DP        |          |
|--------------------|---------------|----------|
|                    |               |          |
|                    |               |          |
|                    |               | <u> </u> |
|                    |               |          |
| Name:              | MPI/DP        |          |
| Interface          |               |          |
| Туре:              | MPI           |          |
| Address:           | 2             |          |
| Networked:         | No Properties |          |
| Comment            |               |          |
|                    |               |          |
|                    |               |          |
|                    |               |          |

11. To configure the MPI then you click on Properties again. There go to the Network Settings tab. Here you select the options which will need to be the same as on the Uticor HMI. For now select 187.5 Kbps and the Highest MPI address should be 31. Click OK three times.

|                          |  | 2.4.21      |
|--------------------------|--|-------------|
| Properties - MPI         |  |             |
| General Network Settings |  |             |
| Highest MPI address:     | 31 Change  |             |
| Transmission rate:       | 19.2 Kbps<br>187.5 Kbps<br>1.5 Mbps<br>3 Mbps<br>6 Mbps<br>12 Mbos |             |
|                          |  |             |
| OK                       |  | Cancel Help |

| uddress: 2 💌                           | If a subnet is select<br>available address is | ed, the next<br>suggested. |
|--|---|----------------------------|
| ransmission rate: 187.5 Kbps<br>ubnet: |   |                            |
| not networked<br>MPI(1)                | 187.5 Kbos                                    | New                        |
|  |   | Ppperties                  |
|  |   | Delete                     |
|  |   |                            |
|  |   |                            |

12. Currently everything should be setup and you should download these settings to the PLC. Select the CPU and then go to **Download to Current Project > Selected Stations**. Select Yes for overwrite configuration data. Click OK and the project should download to the PLC. (If anything else pops op select OK to download the project). Then restart the CPU.



| NetPro - MPI Prog   | ram  |                  |  |        |
|---------------------|--|------------------|--|--------|
| Network Edit Insert | PLC View Options Window Helj   | p                |  |        |
|                     | Download to Current Project  | Þ                | Selected Stations  | Ctrl+L |
|                     | Upload   |                  | Selected and Partner Sta   | itions |
| Ett                 | Activate Connection Status<br>Update Connection Status                 | F5               | Stations on the Subnet<br>Selected Connections<br>Connections and Gatewa | iys    |
| Ind<br>MF<br>MF     | Module Information<br>Operating Mode<br>Clear/Reset<br>Set Time of Day | Ctrl+D<br>Ctrl+I |  |        |

13. Exit the NetPro pogram after saving. Then double left click on S7 Program. Then left click on Blocks. Then left double click on OB1. In the dialog change nothing except the Created in Language should be LAD. Click Ok afterwards. A new program should open which has an empty ladder logic network.

| MPI Program<br>SIMATIC 300(1)<br>CPU 315F-2 P<br>S7 Program<br>Source<br>Blocks   | N/DP<br>m(2)<br>es   | ¶Ç <sup>0B1</sup>  |
|---|--|--|
| Properties - Organiza   | ation Block  | ×  |
| General - Part 1   General<br>Name:<br>Symbolic Name:   | al - Part 2   Calls   Attributes   |  |
| General - Part 1   General<br>Name:<br>Symbolic Name:<br>Symbol Comment:  | al · Part 2   Calls   Attributes   |  |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:  | al - Part 2 Calls Attributes   |  |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Braiset path:   | al - Part 2   Calls   Attributes   |  |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Project path:<br>Storage location   | al - Part 2   Calls   Attributes   |  |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Project path:<br>Storage location<br>of project:  | al - Part 2   Calls   Attributes   | /\s7proj\MPI_Prog  |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Project path:<br>Storage location<br>of project:  | al - Part 2 Calls Attributes<br>LAD<br>C:\Program Files\Siemens\Step7<br>Code<br>02/09/2015 04:19:10 Pt                                  | '\s7proj\MPI_Prog<br>Interface                                       |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Project path:<br>Storage location<br>of project:<br>Date created:<br>Last modified:             | al - Part 2 Calls Attributes<br>DB1<br>LAD<br>C:\Program Files\Siemens\Step7<br>Code<br>07/08/2016 04:19:10 PM<br>02/07/2001 03:03:43 PM | '\s7proj\MPI_Prog<br>Interface<br>02/15/1996 04:51:12 PM             |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Project path:<br>Storage location<br>of project:<br>Date created:<br>Last modified:<br>Comment: | al - Part 2 Calls Attributes<br>DB1<br>LAD<br>C:\Program Files\Siemens\Step7<br>Code<br>07/08/2016 04:19:10 PM<br>02/07/2001 03:03:43 PM | <sup>r</sup> \s7proj\MPI_Prog<br>Interface<br>02/15/1996 04:51:12 PM |
| General - Part 1 General<br>Name:<br>Symbolic Name:<br>Symbol Comment:<br>Created in Language:<br>Project path:<br>Storage location<br>of project:<br>Date created:<br>Last modified:<br>Comment: | al - Part 2 Calls Attributes )   | '\s7proj\MPI_Prog<br>Interface<br>02/15/1996 04:51:12 PM             |

14. On the left side select Bit logic and put a normally open contact and a normally open coil on the network. Drag and drop. Input address location for these as M0.1 and M0.2 by clicking on ??? and typing in the address. Then go to PLC > Download. Click Yes or OK to download to PLC. Then save and exit the LAD/STL/FBD.

| KAD/STL/FBD - [0B1 MPI Program\SIMATIC 300/1   | NCPU 315F-2 PN/DP1                         |
|--|--|
| File Edit Insert PLC Debug View Options Window H   | elp  |
|  | º 60   !≪ ≫!   🔲 🛤   ++ +/- O 🕾 ၊→ → ⊢   🐶 |
| ××   | Contents Of: 'Environment\Interface'       |
|  | Interface     Interface     TEMP     TEMP  |
| E · · · · · · · · · · · · · · · · · · ·  |  |
| E Comparator   |  |
| E Guiveren   | OP1 - "Wain Brogram Steam (Cucle)"         |
| ⊕ DB cal     □ | Comment:                                   |
| E Integer function   |  |
| Inoting-point fct.     Move  | Network 1: Title:                          |
| Program control  | Comment:                                   |
| E in Groude  |  |
| E in Word logic  |  |
| E B blocks   |  |
| G FC blocks  |  |
| E 2 SFC blocks   |  |
| Multiple instances   | N N  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| → File Edit Insert PLC Debua View Ontions V  | Vindow Help                                |
|  |  |
|  |  |
|  | Contents Of: 'Environment\Interface'       |
| HK1 · · ·  | Name Name                                  |
| Bit logic  |  |
|  |  |
|  | · · · · · · · · · · · · · · · · · · ·      |
|  | OB1 : "Main Program Sweep (Cycle)"         |
|  | Comment:                                   |
| (R)  |  |
|  | Network 1: Title:                          |
|  | Comment:                                   |
|  |  |
| (P)  |  |
|  | 22.2 22.2                                  |
| E POS  |  |
| E Comparator   |  |
|  |  |
|  |  |
|  |  |
|  | J  |
|  |  |
| OB1 : "Main Drogram  | Sween (Cwcle)"                             |
| obi . hain program   | Dweep (Dycie)                              |
| Comment:   |  |
|  |  |
|  |  |
| Network 1: Title:  |  |
| Commont -  |  |
| commeric:  |  |
|  |  |
|  |  |
| l l mon  |  |
| MO.I   | 010.2                                      |
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| 🔣 LAD/STL/FBD - [                              | OB1 MPI Program\SIM/  | TIC 300(1)\CPU 315 | F-2 PN/DP]           |
|--|---|--------------------|----------------------|
| 🖬 File Edit Insert                             | PLC Debug View Options  | Window Help        |                      |
| · D ☞ ≌~ 🖬   ∉                                 | Download Ctrl+L<br>Selve Online CPU<br>Establish Connection to Configured CPU |                    | ≫!   [ [ [ ] [ ]   # |
| Height         New network           Bit logic | CPU Messages<br>Display Force Values<br>Monitor/Modify Variables              | Ctrl+Alt+F         | 'EMP                 |
|  | Module Information<br>Operating Mode<br>Clear/Reset<br>Set Time of Day        | Ctrl+D<br>Ctrl+I   | "Main Program Sweej  |
|  |   | Commen             | t:                   |

15. The PLC should now be setup.

Uticor HMI Setup:

- 1. Open uWin ToughPanel. Select Edit Program Off-Line.
- 2. Browse to location that you want to save file. Enter file name and then select Panel Family of HMI.
- 3. For PLC select Siemens and S7-Rev H/E.

| Project Information   |   |
|---|---|
|   | <b>UWIN</b> Programming Software for Uticor Panels  |
|   | VEISIOIT 2.3.3  |
|   | www.uticor.net  |
|   | Selected Action - Edit OEE LINE Write Later   |
| SELECT ACTION   | ENTER PROJECT INFORMATION   |
|   | Project Location : C\Users\dilavsky\Desktop\Projects\Siemens\ Browse  |
| Edit Program<br>OFF-LINE (Write to<br>Panel Later)                                    | Project Name : Uticor MPI.ppp   |
|   | Start Editing Screen  |
| Read Program from<br>Panel and Edit<br>OFF-LINE                                       | Number I     Name       Select Tough Panel       Ponel Family       Tough Panel          4"       6"       8"       10" |
| Edit Program ON-LINE  | Select Model All 10" (UTP-10TC-xxxxxxx)   |
| PC to Panel Connection  | PLC1<br>PLC Monufacturer: PLC Model and Protocol:<br>Siemens S2- Rev H / E View/E[\$PLC Com Setup                       |
| © Local Host<br>(127.0.0.1 / 10001)<br>© Ethernet<br>© Ethernet (EzEther)<br>© Modern |   |
|   | Ok Help License Setup Clear Exit  |

4. Then select View PLC Com Setup. Here you need to match the settings of the Simens PLC setup of the MPI adapter for the shown settings. Also please enter unused address for Panel MPI address (#3 for example)

1-000101-1-0-1-1

| P   | Properties - MPI interface MPI/DP (R0/S2.1)  | $\mathbf{X}$ |
|---|--|--------------|
| Siemens 57  PLC Revision Number: H  Baud Rate 9600 Parity Odd Viring RS 232 Control RTS No Require CTS No Default MPI Address Default MPI Address Default MPI Address Default MPI Address Default Rack Number Default Stot Number 0 | Properties - MPI interface MPI/DP (R0/S2.1)         General       Parameters         Address:       2         Highest address:       31         Transmission rate:       187.5 Kbps         Subnet:       New         MPI(1)       187.5 Kbps         Delete |              |
| OK Cancel Help  | OK Cancel Help   |              |

- 5. Press Ok and again Ok to enter panel screen editor.
- 6. Select button and enter tag address and name of M0.1 for button. Place on screen with your choice of settings.

| Buttons   | ADD NEW TAG DETAILS  |
|---|--|
| General Protection Visibility/Details Label Text Select Style   | Enter Tag Details for the Tag<br>M0.1  |
| Language 1 Character Size 6x8 V<br>Label Text PUSH Position Or Text V<br>Background V   | Select Tag Type<br>© PLC 1: Siemens S7-Rev H<br>© PLC 2:<br>© Internal Tag<br>© Expression   |
| Tag Name     M0.1     Image: Toggle       Actuator Type     Toggle     Image: Toggle       On/Off Text     Char Size     Color/Blink       Image: Toggle     Image: Toggle     Image: Toggle       On Text     On     Image: Toggle       Off Text     On     Image: Toggle       Off Text     Image: Toggle     Image: Toggle       Off Text     On     Image: Toggle       Off Text     Image: Toggle     Image: Toggle | Address String M0.1<br>Expected IO Type : P/W<br>Data Type DISCRETE<br>No. of Chars 0<br>Initial Value/Retentive Flag<br>Initial Value Retentive Characterity Flag |
| Simulate Press OK Cancel Help   | OK Cancel Help   |

7. Select indicator light and enter tag address and name of M0.2. Place on screen with your choice of settings.

| Indicator Light                                      | ADD NEW TAG DETAILS             |  |  |
|--|---------------------------------|--|--|
| General Visibility/Detaile                           | Enter Tag Details for the Tag   |  |  |
| Label Text Select Style                              | M0.2                            |  |  |
| Language 1 🐥 Character Size 6x8 💌 Selected           | Select Tag Type                 |  |  |
| Label Text INDLIGHT                                  | PLC1: Siemens S7-Rev H          |  |  |
|  | ⊙ PLC 2:                        |  |  |
|  | 🔘 Internal Tag                  |  |  |
| Bottom Background                                    | © Expression                    |  |  |
|  | Address String M0.2             |  |  |
| Tag Name M0.2    M0.2                                | Expected IO Type : R/W or ROnly |  |  |
| On/Off Text Char Size Color                          | Data Type DISCRETE -            |  |  |
| Language 1 📥 Text Blink Background Blink             | No. of Chars                    |  |  |
| On Text On 6x8 • • • • • • • • • • • • • • • • • • • | Initial Value/Retentive Flag    |  |  |
|  | Initial Value                   |  |  |
|  | Retentive                       |  |  |
|  |                                 |  |  |
| Simulate Press OK Cancel Help                        | OK Cancel Help                  |  |  |
|  |                                 |  |  |

8. Download program to HMI. Connect HMI and PLC using Uticor CBL-UTICW-012 and a HMI MPI Adapter (example: 6ES7 972-0CA11-0XA0).

To troubleshoot PLC:

- Make sure HMI and PLC are connected using Uticor CBL-UTICW-012 and a HMI MPI Adapter (example: 6ES7 972-0CA11-0XA0).
- Go to online mode. Select the CPU and right click and select **PLC > Module Information**. Go to the communication tab and make sure that the Transmission Rate on Interface X1 is the same as setup on the Uticor HMI. If not then change Uticor HMI settings to match.



| O Module Information - C                  | CPU 315F-2 PN/DP                           |  |           |             |  |  |
|---|--|--|-----------|-------------|--|--|
| Path: MPI Program\SIMATIC 3<br>Status: OK | 300(1)\CPU 315F-2                          | Operating mode of t<br>Not a force job | he CPU:   | RUN         |  |  |
| General Diagnostic                        | Buffer Memo<br>Communication               | ry Scan Cyc<br>Stacks                  | le Time   | Time System |  |  |
| Transmission Rate                         | 187.5 Kbps                                 | Cycle load due to<br>Configured:       | communica | ation 20 %  |  |  |
| Connection Resources<br>Maximum number:   | 16   | Not used:                              | 14        |             |  |  |
|   | Reserved                                   | Occupied                               |           |             |  |  |
| PG communication:                         | 1  | 1                                      |           |             |  |  |
| OP communication:                         | 1  | 1                                      |           |             |  |  |
| S7 basic communication:                   | 0  | 0                                      |           |             |  |  |
| S7 communication                          | 0  | 0                                      |           |             |  |  |
| Other communication:                      |  | 0                                      |           |             |  |  |
| Open communication via Inc                | Open communication via Industrial Ethernet |  |           |             |  |  |
| Connection resources in use               | <b>X</b> )                                 | 0                                      | Di        | agnostics   |  |  |
| Close Update                              | Print                                      |  |           | Help        |  |  |