Load program using a gateway

TECHNICAL NOTE V20190919

Sometimes, loading a new program to a Pluto remotely is necessary. Using some gateways this functionality is possible. Here there is an example of a load of a new Pluto program remotely through a Gate PN.

Material needed

For this example, the material used is the one listed below:

- **Gate PN:** REF 2TLA020071R9300
  Gateway for 2-way communication between the Pluto bus and Ethernet. Ethernet protocol PROFINET.

  ![Figure 1.- Gate PN](image)

- **Pluto B20 v2:** REF 2TLA020070R4600
  Safety PLC with Pluto safety bus. Totally 20 I/O: 8 failsafe inputs + 8 non-failsafe outputs/failsafe inputs + 2 individually failsafe relay outputs + 2 individually failsafe transistor outputs.

  ![Figure 2.- Pluto B20 v2](image)

- **Computer with Pluto Manager software**
  Pluto Manager is a software tailored for the safety PLC Pluto. Programming is done in ladder and together with the function block creates the structure of your safety functions. The
software comes with predefined function blocks approved by TÜV to facilitate the work on designing the safety functions.

The software can be downloaded from the ABB web, it needs a free license. Contact with technical support to get the license.

Figure 3.- Computer with Pluto Manager

- **Pluto cable USB**: REF 2TLA020070R5800
  Pluto programming and on-line monitoring cable from a PC USB port to the Pluto programming port.

Figure 4.- Pluto USB cable

- **IDFIX-PROG 10K**: REF 2TLA020070R2600
  External program memory, 10 kbyte. For projects with only one Pluto the memory can store the PLC program. Can also be used to give Pluto AS-i a specific address.

Figure 5.- IDFIX-PROG 10k

- **Power supply 24Vdc (CP-E)**: REF 1SVR427031R0000
  Power supply needed for the AS-i bus and Pluto.

Figure 6.- Power supply
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Connection diagram

The connection diagram for this example is the next one:

![Connection diagram example]

Note that the PLC AC500 is connected, but it is because it is used for the configuration of the gateway IP. This part is explained in other technical notes.

In the table 1 there are explained connector by connector the electrical connections needed.

**Table 1.- Electrical connections**

<table>
<thead>
<tr>
<th>Device 1</th>
<th>Connector 1</th>
<th>Device 2</th>
<th>Connector 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pluto B20</td>
<td>CH</td>
<td>Gate-PN</td>
<td>CH</td>
</tr>
<tr>
<td>Pluto B20</td>
<td>CL</td>
<td>Gate-PN</td>
<td>CL</td>
</tr>
<tr>
<td>Pluto B20</td>
<td>ID</td>
<td>IDFIX-PROG</td>
<td>Black</td>
</tr>
<tr>
<td>Pluto B20</td>
<td>0 V</td>
<td>IDFIX-PROG</td>
<td>Blue</td>
</tr>
<tr>
<td>Pluto B20</td>
<td>0 V</td>
<td>CP-E</td>
<td>L-</td>
</tr>
<tr>
<td>Pluto B20</td>
<td>24 V</td>
<td>CP-E</td>
<td>L+</td>
</tr>
<tr>
<td>Gate-PN</td>
<td>1</td>
<td>CP-E</td>
<td>L+</td>
</tr>
<tr>
<td>Gate-PN</td>
<td>0 V</td>
<td>CP-E</td>
<td>L-</td>
</tr>
<tr>
<td>AC500</td>
<td>L+</td>
<td>CP-E</td>
<td>L+</td>
</tr>
<tr>
<td>AC500</td>
<td>M</td>
<td>CP-E</td>
<td>L-</td>
</tr>
</tbody>
</table>

**Procedure**

**Enable remote server**

Once the gateway is connected as in the connection diagram above, the remote server must be activated (in order to have access to the gateway through the network). Otherwise the communication port will not be opened. This functionality is done using the **terminal window** of the Pluto Manager and following the next steps:

1. Connect the computer to the gateway using the Pluto cable USB.
2. Configure the communication port with the USB cable connected (VCP0).
3. Open the Terminal Window

4. Use the “REMOTE” command and select the configuration desired (1 in this case).
After the gateway restart, the remote server is enabled.

5. In order to test this functionality, change the communication Port to “Network” and set the IP parameters of the gateway in the format XXX.XXX.XXX.XXX:50100, where “X” is the IP of the gateway and 50100 is the default port.

![Figure 10.- Set communication port parameters](image1)

6. Come back to the terminal window. You can check that now the connection is through network because in the “h” menu (help), there are less options displayed. For example, the “remote” command does not appear.

![Figure 11.- Help menu using the network communication port](image2)
**Program load**

The load of a new program is done by following the next steps:

a. Use the “Pl” or “Plk” command and press enter.

b. Select the program to load by clicking “Send File”.

c. Press the K-button of the gateway. This is needed for security. If this action was not needed, anyone could change the safety program of the application, creating a risk.

d. Write “y” and wait until the flash memory is erased (Er20 will be displayed in the Pluto).
e. Select the program to load again. Make sure that both times the same program is sent, otherwise the error message “Error, program failed” can be displayed.

![PlutoManager Terminal Window](image)

Figure 14.- Loading program steps

Now the Pluto/s will be in “HA” (Program execution stopped from PC computer or not started after program download), The application can be started either from PC or by power off-on.)
FAQs

Does it matter if the “REMOTE” functionality of a gateway remains always enabled?

It is not a problem for the application, but, note that anyone who has got physical access to the gateway (being able to press the K-button) will be able to load a program. If the gateway is in a place with restricted access, there is no problem.
Useful links:

First Pluto project:  https://www.youtube.com/playlist?list=PLf6X6x2ECXPWNvrZ0k2ePSH6BhWXQCR4

Training videos:  
https://www.youtube.com/playlist?list=PLge96zSySnICY9Qgj8RxBWskZaOORrQXc


Gate PN webpage:  https://new.abb.com/products/2TLA020071R9300/gate-pn-pluto-gateway-ethernet-profinet