

1 Introduction

This application note provides information on how to use the L-IP and multi-port L-IP with LNS-based network management tools. While Section 2 describes the use of the LOYTEC Shapes available for LonMaker™ for Windows Section 3 takes a more general approach which can be applied to any LNS-based integration tool.

Note: LOYTEC strongly recommends to use the L-IP in “Configured Router Mode”!

Note: If the L-IP is operated in “Smart Switch Mode” no more than 5 L-IPs should be used on one EIA-852 channel or the use of multi-cast is required!

2 Using the L-IP Shapes in LonMaker™ for Windows

2.1 Installing the LOYTEC Shapes for LonMaker™

1. Copy the “LoytecShapes.vss” file into your LonMaker shapes directory (e.g. “c:\Lonworks\LonMaker\Visio\”).
2. Open the LOYTEC shape sheet in the LonMaker (File->Stencils->OpenStencil and select “LoytecShapes.vss”).

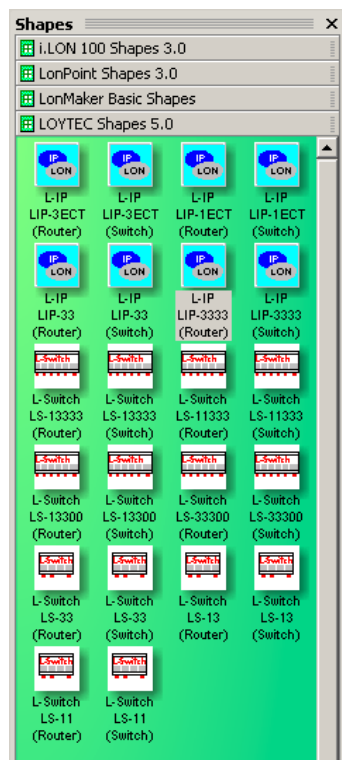


Figure 1: LOYTEC shapes sheet version 5.0.0

3. Now the LOYTEC shapes should be accessible in your LonMaker environment (see Figure 1).

This document assumes you use version 5.0.0 of the LOYTEC shapes and LonMaker™ 3.13.

2.2 Inserting an L-IP 2-Port shape in your project

1. Insert the L-IP shape by dragging the L-IP shape onto the drawing area. Depending on whether you operate your L-IP in “Configured Router Mode” or in “Smart Switch Mode” choose a shape with “(Router)” or “(Switch)” in its name respectively.

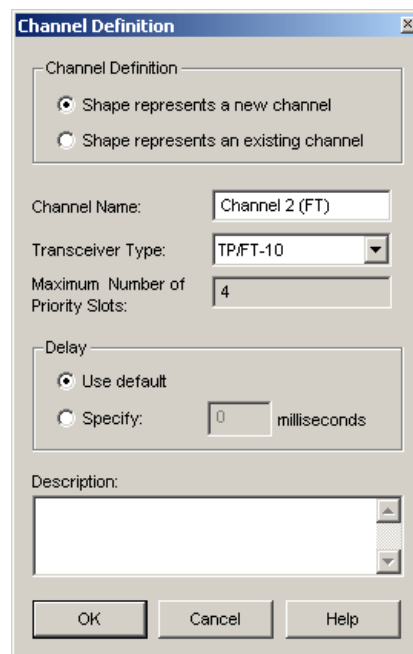


Figure 2: Channel definition dialog

2. Now for each port of the L-IP a dialog appears which asks for a channel definition (see Figure 2). You can either select an already existing channel or create a new channel with the required transceiver type.
3. The L-IP now appears in the drawing area as shown in Figure 3.

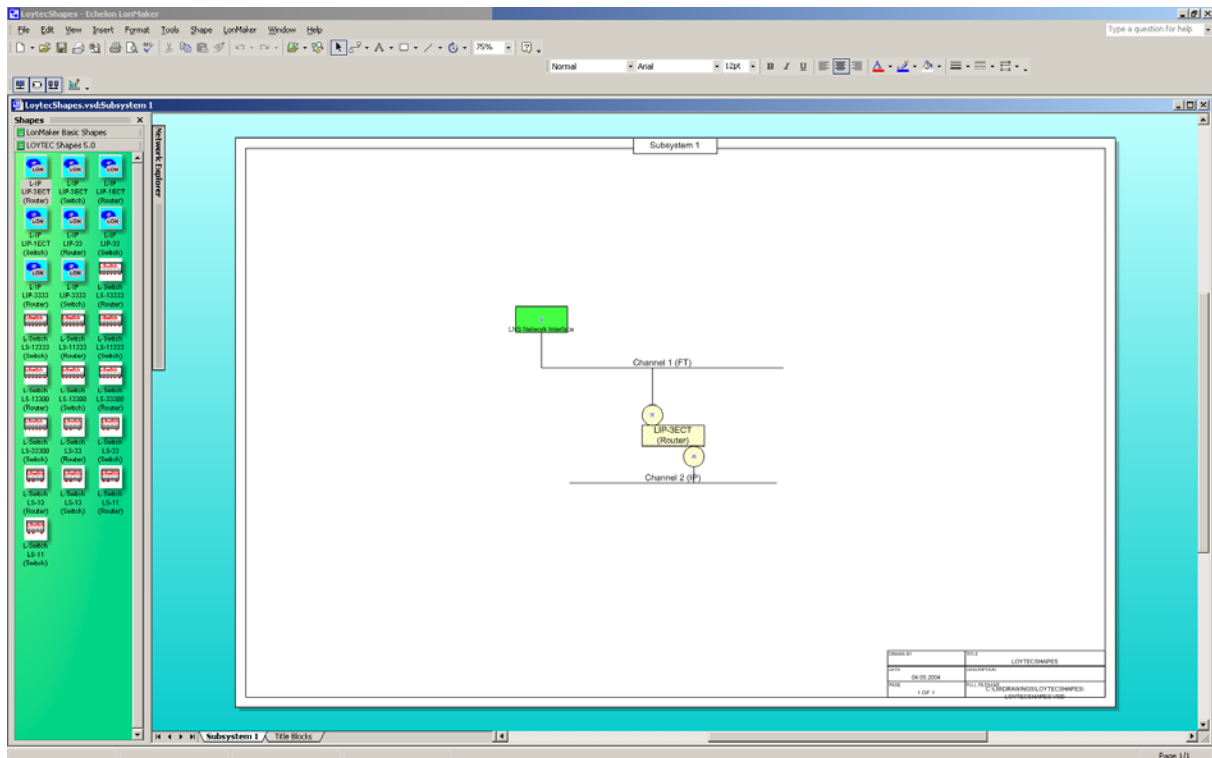


Figure 3: The unconfigured L-IP appears on the drawing area

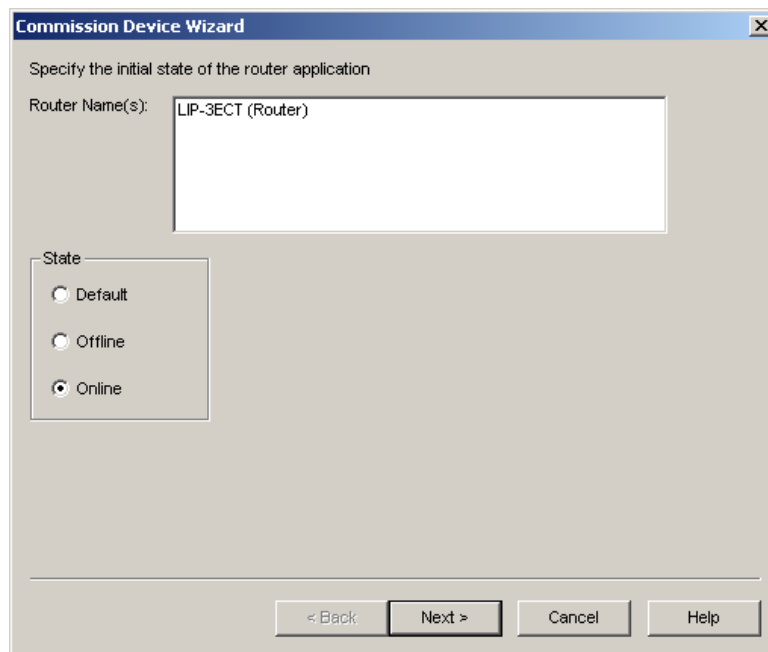


Figure 4: Commissioning the L-IP

4. Finally the L-IP has to be commissioned (when operating the L-IP in “Smart Switch Mode” this step is optional). To do this right click on the L-IP and select “Commission”. Note: You have to be online to be able to commission the L-IP.
5. In the appearing dialog set the state to “Online” and select “Next>” (see Figure 4).

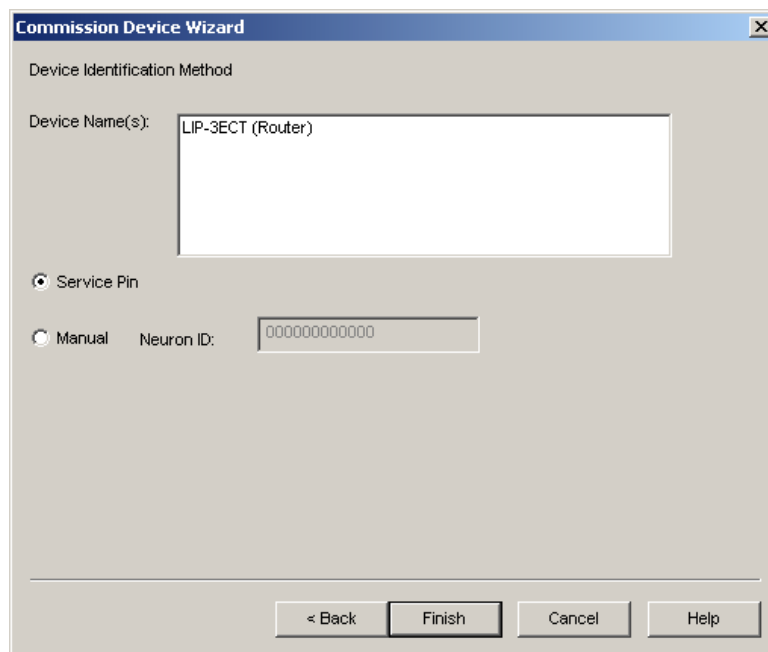


Figure 5: Either enter the Neuron ID manually or select Service Pin

6. In the next dialog either enter the Neuron ID manually or choose “Service Pin”. Select “Next>” (see Figure 5).

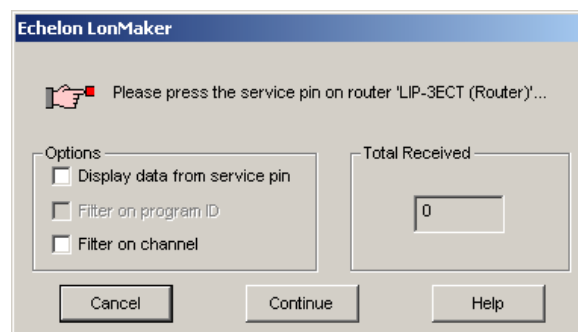


Figure 6: Press the service pin

7. If “Service Pin” was selected in the last dialog the dialog shown in Figure 6 appears. Shortly press the status button on the L-IP.
8. After the commissioning process the L-IP appears green in the drawing (see Figure 7). The L-IP is now commissioned and ready to forward packets.

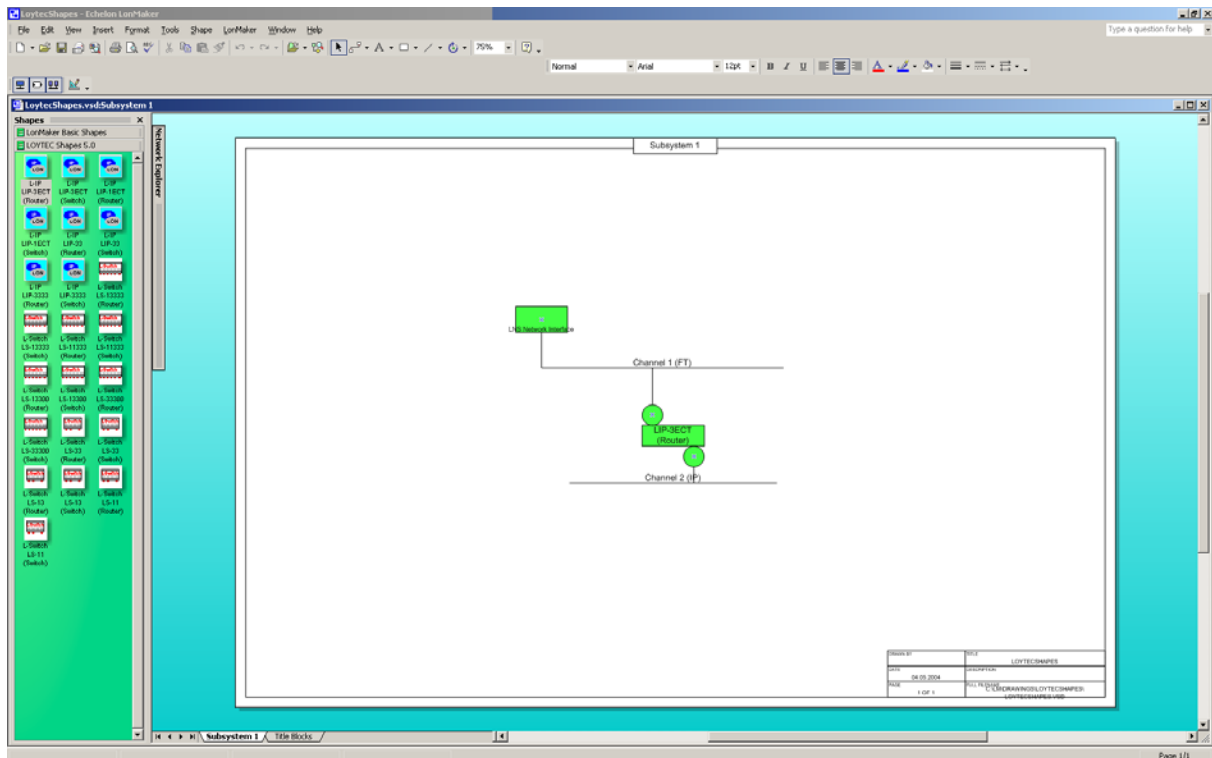


Figure 7: The L-IP is now commissioned and ready to use

2.3 Inserting an L-IP Multi-Port shape in your project

1. Insert the L-IP multi-port shape by dragging the L-IP shape onto the drawing area. Depending on whether you operate your L-IP in “Configured Router Mode” or in “Smart Switch Mode” choose a shape with “(Router)” or “(Switch)” in its name respectively.

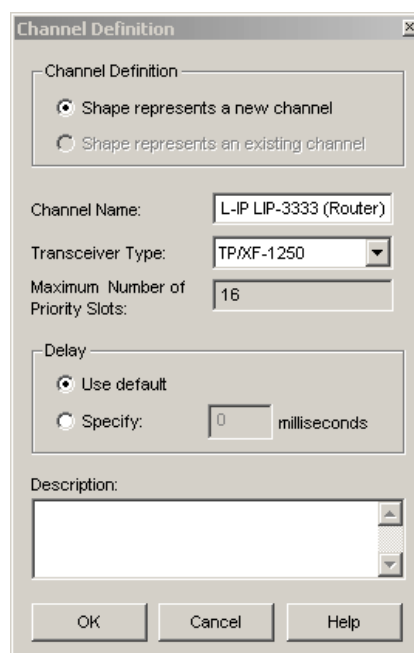


Figure 8: Channel Definition dialog

2. When using LonMaker 3.13 a dialog appears, which asks to create a new channel. This channel (e.g. named “L-IP LIP-3333ECTB (Router)”) represents the internal backbone of the L-IP. **Make sure you keep the “Channel Definition” selection on “Shape represents a new channel”!** Select “OK” (see Figure 8). Note, that if you insert a second L-IP shape to your LonMaker project “Shape represents a new channel” must be explicitly selected and the internal backbone channel of the L-IP will be named “L-IP LIP-3333ECTB (Router) 1”! **This dialog does not appear when using LonMaker TE!**
3. Now for each port of the L-IP a dialog appears which asks for a channel definition. You can either select an already existing channel or create a new channel with the required transceiver type.

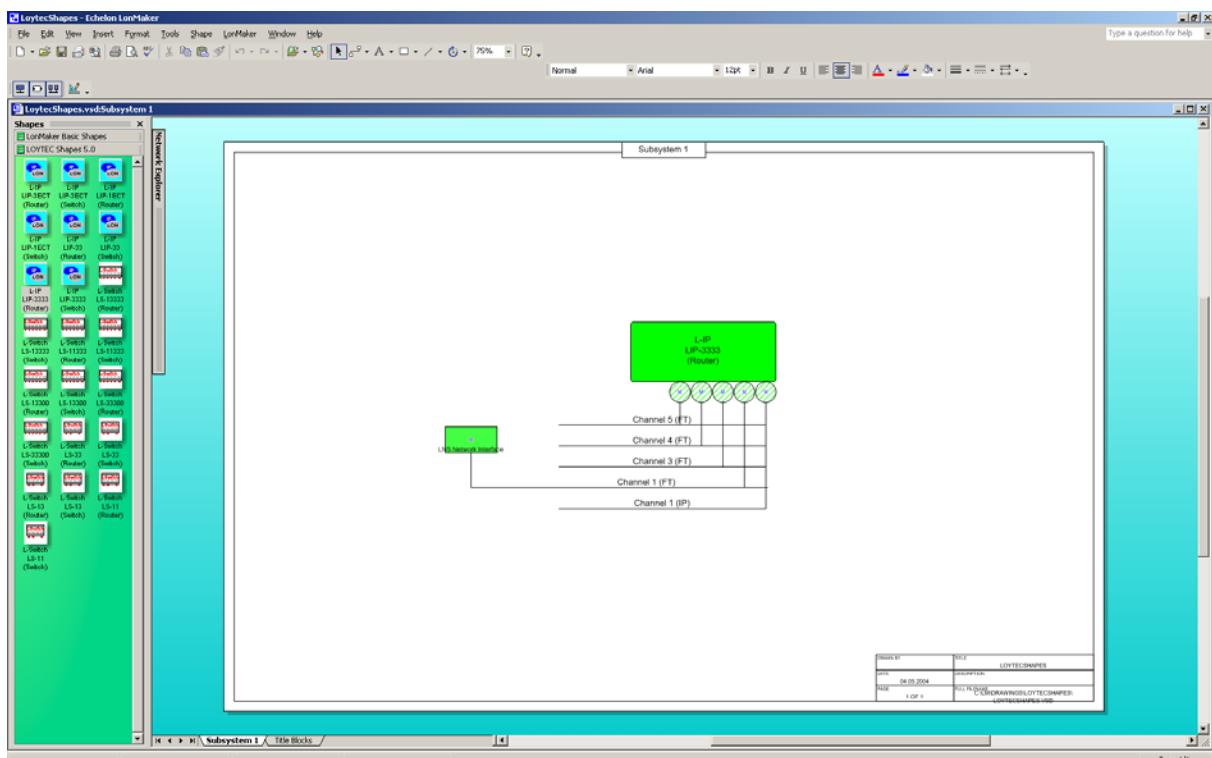


Figure 9: The L-IP appears on the drawing area

4. The L-IP now appears in the drawing area as shown in Figure 9.
5. Finally the ports of the L-IP have to be commissioned (when operating the L-IP in “Smart Switch Mode” this step is optional). To do this right click on each of the hatched circles at the bottom of the L-IP shape and select “Commission” from the context menu (see Figure 10). Start with the port closest to your network interface (in our example this is the port connected to Channel 1). Note: You have to be “Onnet” to be able to commission the L-IP.

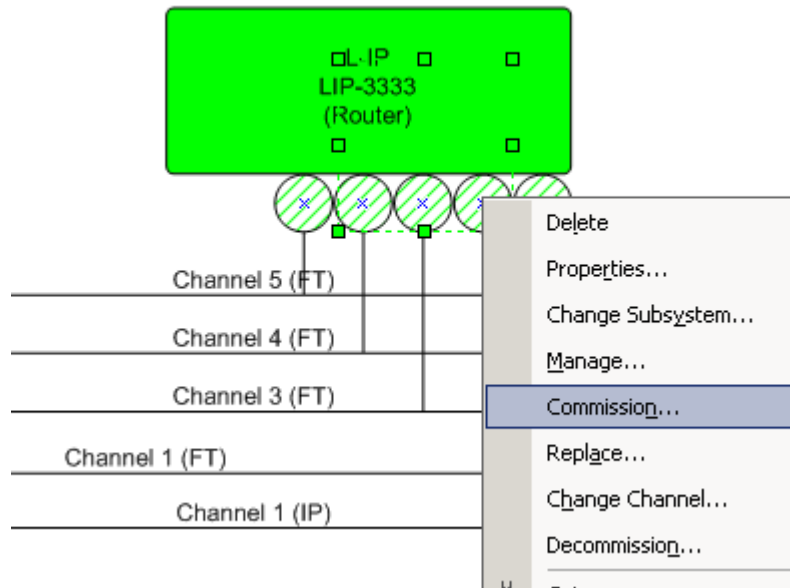


Figure 10: Commissioning an L-IP port

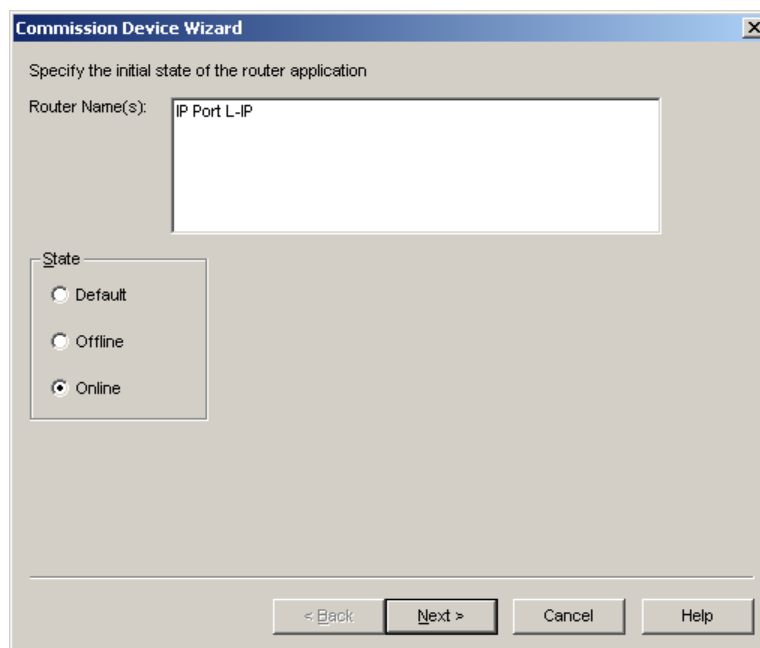


Figure 11: Commission Device dialog

6. In the appearing dialog set the state to “Online” and select “Next>” (see Figure 11).
7. In the next dialog either enter the Neuron ID manually or choose “Service Pin”. Select “Next>” (see Figure 12).

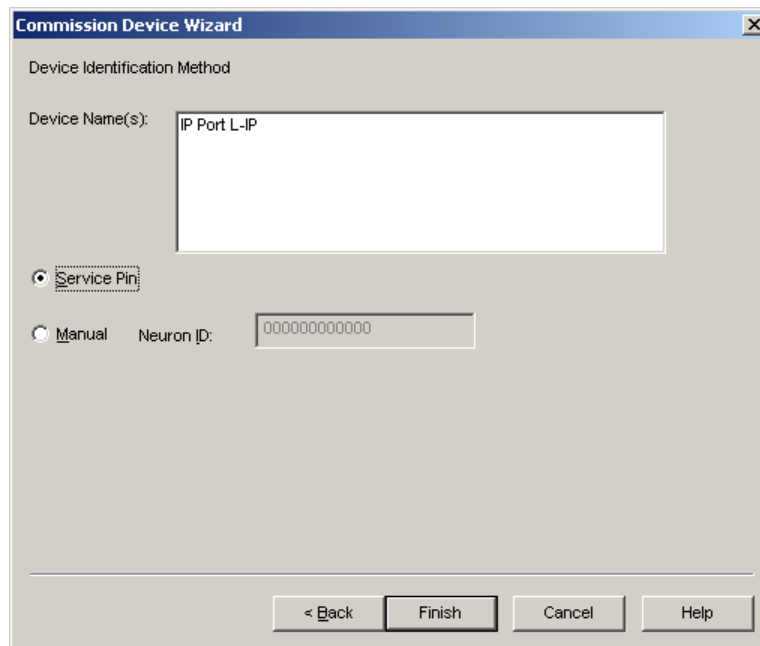


Figure 12: Either enter the Neuron ID manually or select Service Pin

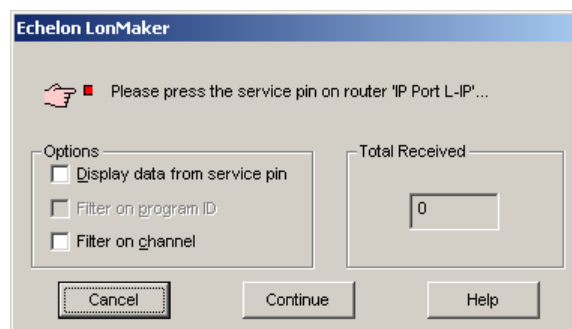


Figure 13: Press the service pin

8. If “Service Pin” was selected in the last dialog the dialog shown in Figure 13 appears. Pressing the status button longer than 2 seconds will allow you to select the port that sends out the “Service Pin Message”. If you continue to hold the button the first port will be selected and its port LED will light up orange. After 2 seconds the next available port will be selected. When the status button is released the “Service Pin Message” is sent out on the currently selected port/router.
9. Repeat steps 5 to 8 for the remaining ports of the L-IP.
10. After commissioning all ports all circles at the bottom of the L-IP shape appear solid green in the drawing (see Figure 14). The L-IP is now commissioned and ready to forward packets.

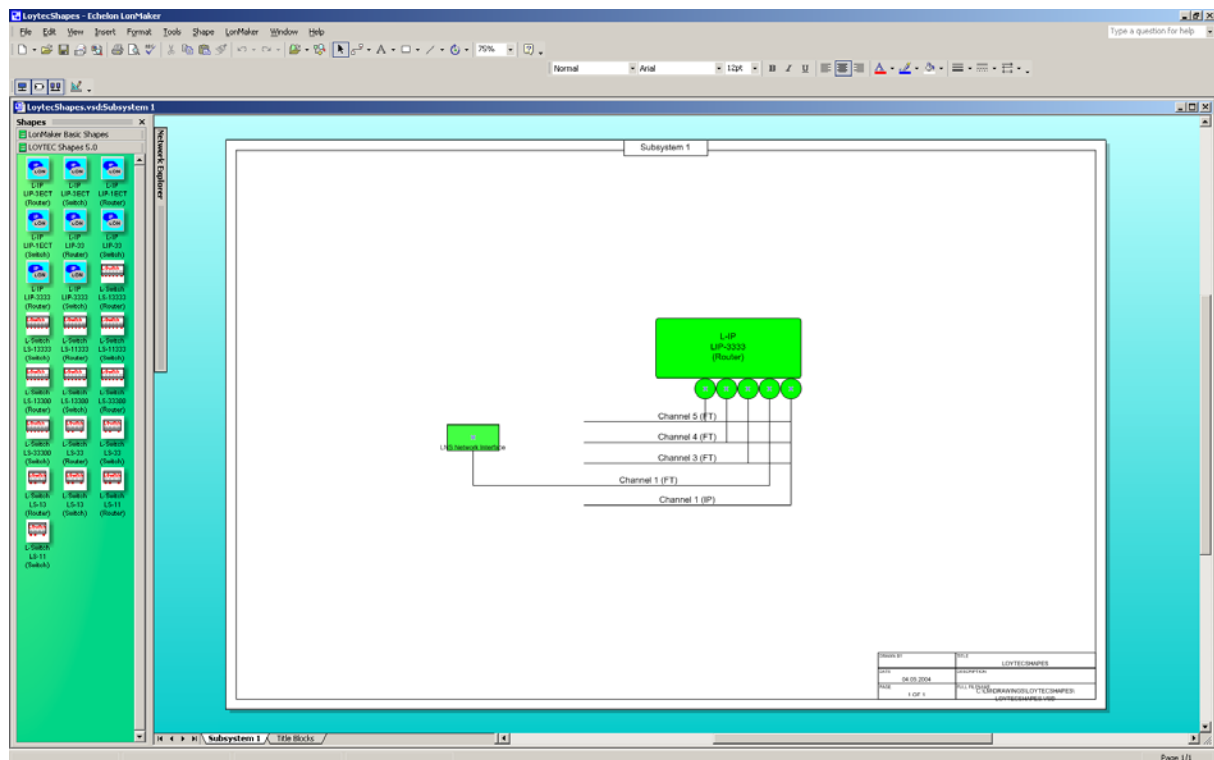


Figure 14: The L-IP is now commissioned and ready to use

2.4 Hints for using the Multi-Port L-IP Shapes

2.4.1 Moving an Multi-Port L-IP Shape

When moving an L-IP shape, always make sure that you first select all parts of the L-IP shape by dragging a rectangle around the whole shape. Now the whole shape can be moved.

2.4.2 Deleting an Multi-Port L-IP Shape

To delete the shape, select all parts of the L-IP shape by dragging a rectangle around the whole shape and select “Delete” from the context menu (Figure 15). Press “Yes to All” to delete the entire L-IP from the drawing.

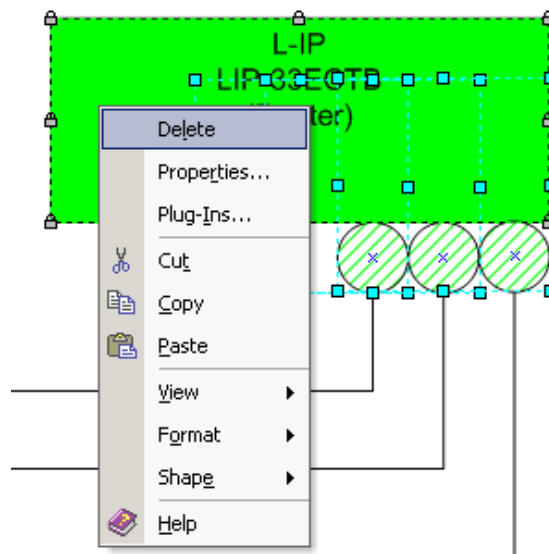


Figure 15: Deleting an L-IP shape

2.4.3 Background information on the Multi-Port L-IP Shapes

The L-IP can be represented by a combination of an internal (virtual) backbone channel and a common EIA-709 two port router for each port of the L-IP (including the IP port). Each of these routers connects a single external port to the internal backbone channel. The L-IP shapes connect these routers together with the internal backbone channel and build a single shape out of the routers and the internal backbone channel. The router shape ports are configured in the associated shape sheet to allow only the selection of the proper channel types. Some parts of the shapes and the internal backbone are hidden to create a proper L-IP shape.

Unfortunately it is not possible to group multiple LonMaker shapes to a single shape so that the different shapes cannot be moved independently. Therefore it is important to select all parts of the shape before moving or editing the L-IP shape. Further, it is necessary to step through all dialogs when creating the internal backbone channel and the routers for the different ports of the L-IP.

3 Using the L-IP with LNS-based Installation Tools

Although the example in this section refers to the LonMaker™ for Windows network integration tool, the basics are valid for every LNS-based network management tool.

3.1 L-IP used in configured EIA-709 router mode

3.1.1 L-IP 2-Port

The L-IP, when used in EIA-709 configured router mode, behaves like a standard EIA-709 router. The L-IP can be operated as “Configured Router”, “Repeater”, or “Bridge”. Figure 16 shows an example in LonMaker™.

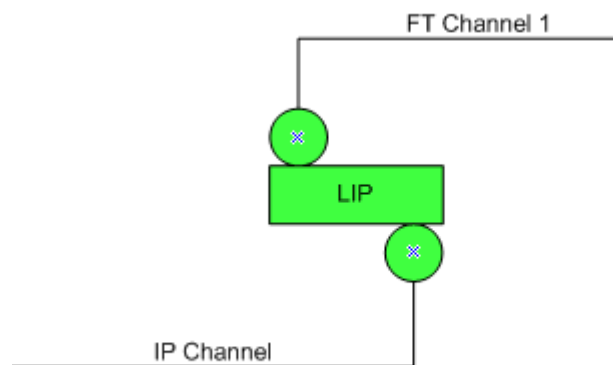


Figure 16: L-IP 2-Port in LonMaker™

Adding a “Router”:

1. Add a new channel with the desired transceiver type for each L-IP device to the network (e.g. Channel 1: FT-10) and an IP Channel with type IP-10L in an Intranet or IP-10W in an Internet environment.
2. For every L-IP device add a new router to the project and select Channel 1,2,3,... for the router near (channel A) and the IP Channel for the router far (channel B) side. Set the router mode to “CONFIGURED”.
3. Commission the router!

3.1.2 L-IP Multi-Port

The multi-port L-IP (e.g., LIP-33ECTB) contains multiple standard EIA-709 routers, one for each port, and an internal TP-1250 backbone. The internal TP-1250 is neither visible nor accessible from the outside and its sole task is to connect the individual routers. Figure 17 shows an example for the multi-port L-IP (LIP-33ECTB).

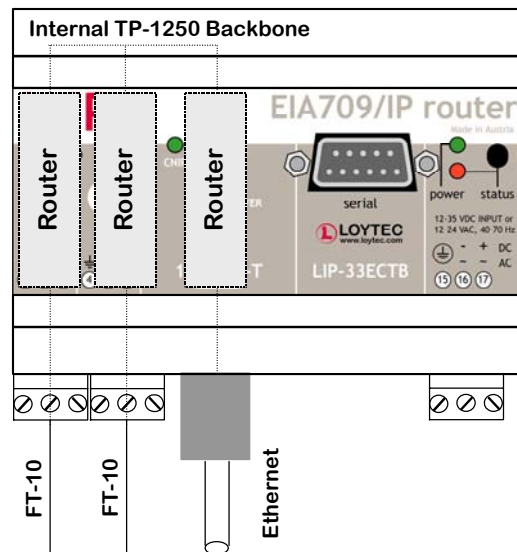


Figure 17: Internal structure of the multi-port L-IP in EIA-709 router mode.

Thus, to add the multi-port L-IP to a LonMaker drawing the following steps have to be taken:

1. Add channels which are connected to the L-IP ports (including the IP port).
2. Add the internal TP-1250 Backbone channel.
3. Add one router shape for each port, including the IP port. Connect one side of the router to the internal TP-1250 Backbone channel added in step 2. Connect the other side to the external channel connected to the L-IP port.

Each router must be commissioned separately. When commissioning the L-IP router shapes, start with the one closest to your network interface.

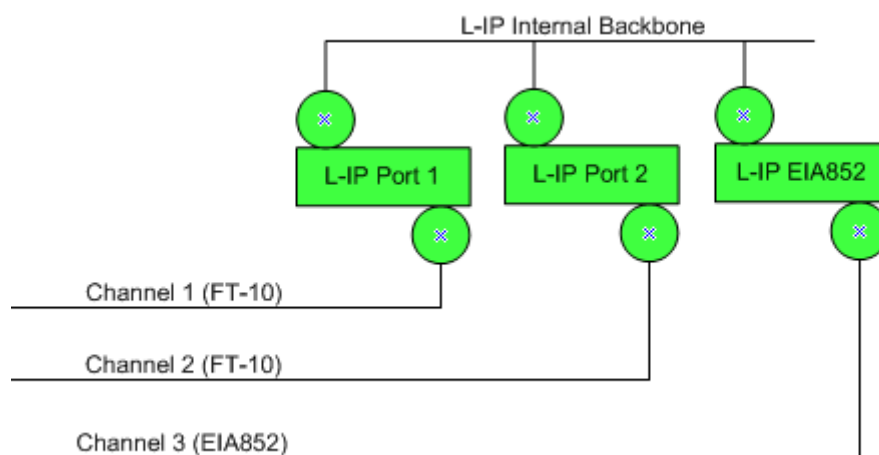


Figure 18: L-IP multi-port in LonMaker™ (LIP-33ECTB).

Pressing the status button longer than 2 seconds will allow you to cycle through the ports and select the port, which shall send out the “Service Pin Message” message: The port LED of the currently selected port will light up orange. After 2 seconds the next available port will be

selected. When the status button is released the “Service Pin Message” is sent out on the currently selected port/router.

Figure 18 shows an example for a multi-port L-IP (LIP-33ECTB).

Important: Please make sure to create a new internal backbone channel for each multi-port L-IP device in your project!

3.2 L-IP used in Smart Switch Mode

The L-IP, when used in smart switch mode in an Intranet, is a Plug and Play device and is completely transparent to network management tools as long as the nodes use the same transceiver type (in most cases FT-10). For a LonMaker™ project, generate a single channel and place all nodes on this channel. Since single subnets can spread over multiple ports on multiple L-IPs, the user does not need to create different channels like when using a common EIA-709 router.

In the following instances, however, not all nodes can be connected over the same channel:

- L-IPs with different transceiver types (e.g. FT-10 and TP-1250) are connected over the IP channel,
- native EIA-852 nodes are on the IP channel,
- the IP channel is an Internet environment with considerable propagation delays between network nodes (>20ms).

To use the L-IP transparently in these instances, “Phantom Routers” need to be added to the project.

Because the L-IP is no common EIA-709 router device if used in smart switch mode, it does not need to be commissioned to be operational. In this case the installation of a “Phantom router” as described above solely tells the LNS database that a physical connection between the different network channels is present. By doing that, nodes of different transceiver types can be installed and the self-learning features and Plug and Play capabilities of the L-IP can still be used.

3.2.1 L-IP 2-Port

For the 2-port L-IP complete the following steps for adding a “Phantom Router”:

1. Add a new channel with the desired transceiver type for each L-IP device to the network (e.g. Channel 1: FT-10) and an IP channel with type IP-10L in an Intranet or IP-10W in an Internet environment.
2. For every L-IP device add a new router to the project and select Channel 1,2,3,... for the router near (channel A) and the IP Channel for the router far (channel B) side. **Set the router mode to “Repeater”.**

3. Optionally commission the router (recommended).

3.2.2 L-IP Multi-Port

The multi-port L-IP has an internal TP-1250 backbone as depicted in Figure 17. Therefore, in Smart Switch Mode a “Phantom Router” needs to be added for each port of the L-IP, which connect to the internal TP-1250 backbone, resulting in a structure as shown in Figure 18.

To add the required “Phantom Routers” complete the following steps:

1. Add channels which are connected to the L-IP ports.
2. Add the internal TP-1250 Backbone channel.
3. Add one router shape for each port, including the IP port. Connect one side of the router to the internal TP-1250 Backbone channel added in step 2. Connect the other side to the external channel connected to the L-IP port. **Set the router mode to “Repeater”.**
4. Optionally commission the router (recommended).