

## Welcome!

The IzoT FT 6000 EVK is a complete hardware and software development platform for creating LONWORKS<sup>®</sup>, LonTalk<sup>®</sup>/IP, and BACnet/IP devices based on the Series 6000 Smart Transceivers and Neuron 6000 Processors. You can also create LONWORKS devices based on Series 5000 and 3100 Smart Transceivers and Neuron Chips. You can use the FT 6000 EVK to create devices such as VAV controllers, thermostats, card-access readers, lighting controls, and many other devices for the Industrial Internet of Things (IIoT). You can use these devices in a variety of systems including building and lighting controls, factory automation, energy management, transportation, and other IIoT applications. You can use the FT 6000 EVK for the following:

- View and create profiles and datapoint types.
- Automatically generate Neuron C code that implements your device's network interface and provides the framework for your device application.
- Edit your Neuron C code to implement your device's functionality.
- Compile, build, and download your application to one of the included Evaluation Boards (EVBs) or to your own custom devices.
- Test with prototype I/O hardware with the included EVBs or use your own custom device to build and test your own I/O hardware.
- Install your device into a LONWORKS or LonTalk/IP network and test how your device interoperates with other like devices.

**NOTE: The IzoT Router and FT 6050 chips included with the FT 6000 EVK are for lab use, prototype, or engineering sample development use only. For production uses of the routers and chips, please order these products separately from the FT 6000 EVK by contacting your Echelon representative.**

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## Step 1: Register Your Software

To register your product, go to [www.echelon.com/register](http://www.echelon.com/register), select the **FT 6000 EVK** product, enter the IzoT NodeBuilder serial number from the back of your OpenLNS Commissioning Tool EVK Edition case, and then click **Register Now**.

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## Step 2: Install the Software

The IzoT Network Services Server and the IzoT Commissioning Tool (CT) require activation. The FT 6000 EVK includes one IzoT CT Activation Key that is used by both products. The FT 6000 EVK also includes an IzoT NodeBuilder Serial Number that is required to install the IzoT NodeBuilder software. The IzoT CT Activation Key and IzoT NodeBuilder Serial Number are printed on the back of the Open LNS Commissioning Tool EVK Edition DVD included with the EVK.

To install the IzoT Network Services Server, follow these steps:

1. Insert the IzoT Network Services Server CD into your CD or DVD drive.
2. If the installation does not start automatically, browse the CD and double-click the **IzoTNetServer402.exe** installation program.
3. If you do not have an Echelon download account, create one at [www.echelon.com/downloads](http://www.echelon.com/downloads). Your account will enable you to download software from the Echelon Web site; make activating and managing licenses for multiple Echelon products easier; enable you to return, transfer, and recover licenses; and help you receive technical support from Echelon faster. If you already have an Echelon Store account, use the same e-mail address for your Echelon download account.
4. Follow the instructions provided by the installation wizard. When you see the **Customer Information** screen, enter the IzoT CT or OpenLNS CT Activation Key printed on the back of the OpenLNS

Commissioning Tool DVD. Under Echelon Account, enter the user name (e-mail address) and password you created for your Echelon download account.

5. Click **Next**.
6. Click **Install**, and complete the instruction steps.
7. If you have not previously installed and activated the OpenLNS Commissioning Tool, insert the OpenLNS Commissioning Tool EVK Edition DVD and install that now, entering the same IzoT CT or OpenLNS CT Activation Key that you used for the IzoT Network Services Server installation. If you previously installed the OpenLNS Commissioning Tool Professional Edition, you can continue to use it and skip to the next step. If you previously installed and activated the OpenLNS Commissioning Tool Standard Edition, use the Echelon License Wizard to return the OpenLNS Commissioning Tool Standard Edition license to your account, and re-activate using the IzoT CT or OpenLNS CT Activation Key used above. This will remove the network limit set by the Standard Edition Activation Key.

Installing the IzoT Network Services Server on the same computer with the OpenLNS Commissioning Tool converts the OpenLNS Commissioning Tool to an IzoT Commissioning Tool. The product names referenced by the OpenLNS Server and the OpenLNS Commissioning Tool are not all updated to the new IzoT names by the IzoT Network Services Server. You will see references to both sets of names in the software and documentation.

8. Download the **IzoT NodeBuilder Software** from [www.echelon.com/downloads](http://www.echelon.com/downloads). This software requires an IzoT NodeBuilder Serial Number that is located on the back of your OpenLNS Commissioning Tool DVD case. Once you have inserted the serial number, you can follow the instructions in the Setup Wizard.

See the *IzoT Commissioning Tool User's Guide* and the *IzoT NodeBuilder User's Guide* for details on using the IzoT Commissioning Tool, and the IzoT NodeBuilder software, respectively. These manuals are available at [www.echelon.com/docs](http://www.echelon.com/docs). The *IzoT NodeBuilder User's Guide* is also installed on your computer with the NodeBuilder software.

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## Step 3: Connect the FT 6000 EVB Evaluation Boards

Use these steps to connect your FT 6000 EVB boards.

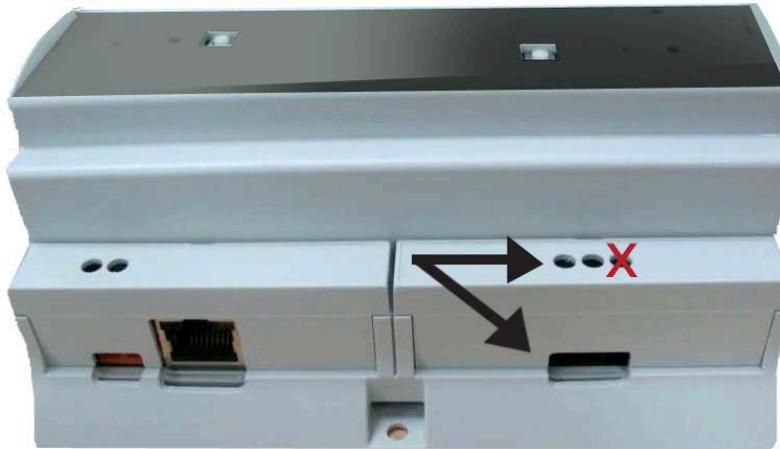
1. Connect the orange network connector on each FT 6000 EVB to the included network cable.
2. Connect the barrel connectors of the included power supplies into the barrel jacks on the FT 6000 EVB Evaluation Boards. Connect the power supplies to the included power cords that are appropriate to your region, and plug the power cords into a power outlet.

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## Step 4: Connect the IzoT Router

Use these steps to connect your IzoT Router. Having connected the EVBs, you should have one more power supply and one Ethernet cable.

1. Connect the stranded end of the network cable to the left 2 terminals of the black **LON/FT** terminal block on the right, as shown in figure 3. Do not connect anything to the right terminal of the black connector on the right (the terminal with the red **X**), and do not connect anything to the orange connector on the left.



2. Insert one end of the Ethernet cable into the 10/100BASE-TX jack next to the orange connector, and the other end into an Ethernet switch or hub connected to the same network as your computer.
3. Connect the barrel connector of the included power supply into the barrel jack for the IzoT Router. Connect the power supply to one of the included power cords, and plug the power cord into a power outlet. The router is ready to use when the **Power** indicator turns solid blue.

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## Step 5: Create a LonTalk/IP Network Interface

To create a LonTalk/IP Network Interface for use with the IzoT Commissioning Tool or the NodeUtil Node Utility, follow these steps:

1. Start the **LonTalk/IP Interfaces** application from the Start menu under **All Programs** → **Echelon IzoT Network Services Utilities** → **IzoT Network Services LonTalk-IP Interfaces**.
2. Type a name such as **LonTalk IP** in the **LonTalk/IP Interfaces** field. This will be the name you supply when specifying an interface to NodeUtil and in the IzoT Commissioning Tool.
3. Select **Local Area Connection** as an IP network interface for this LonTalk/IP interface to use in the **IP Interface** box.
4. Click **Create**.
5. Close the LonTalk/IP Interfaces application.

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## Step 6: Find the IP Address of your IzoT Router

Use these steps to test communication between your computer and the IzoT Router and also to determine your IzoT Router's IP address:

1. To open a Windows command prompt, click the Windows **Start** button, type **cmd** in the search box, and then press the **Enter** key.
2. At the command prompt, type **NodeUtil -d<interfaceName>**. Enclose the interface name in quotes if there are any spaces in the name. For example:  

```
NodeUtil -d"LonTalk IP"
```
3. Press the **Service/Connect** button on your IzoT Router. NodeUtil displays a message similar to the following:  

```
Received an ID message from device 1
```
4. Type **G** to go to a device, type **1** to go to device 1, and then press the **Enter** key.
5. Type **S** to report device status and statistics to display status information about the IzoT Router. The last line of the display includes the IzoT Router's IP address.
6. Type **N** to preserve the router's statistics. You can type **Y** instead to reset the router's statistics counters.
7. Type **E** to exit the device menu.
8. Type **E** to exit NodeUtil.
9. Close the command prompt.

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## Step 7: Create a Simple Network

The FT 6000 EVK includes three Neuron C example applications that you can use to test the I/O devices on the FT 6000 EVBs, and to create and manage a network with the FT 6000 EVBs and your IzoT Router. The FT 6000 EVB comes with the NcMultiSensorExample application loaded. This application uses the push buttons, LEDs, temperature sensor, light sensor, LCD, and joystick on the FT 6000 EVB. You can load a different example in the FT 6000 EVB, and you can also load your own custom applications in the FT 6000 EVB.

You can create a network with the FT 6000 EVBs in two ways—you can either use Interoperable Self-Installation (ISI) to enable the EVBs to be connected to each other by pressing Connect buttons on each, or you can use the IzoT Commissioning Tool to specify the devices to be installed in a network and to create connections. To create a network using ISI, see the *FT 6000 EVB Examples Guide* for details. To create a network using the IzoT Commissioning Tool and your FT 6000 EVBs with the NcMultiSensorExample application, follow these steps:

1. To add an IP route for your LonTalk/IP Ethernet and FT channels, open a Windows command prompt and enter the following commands:

```
route -p add 10.128.1.1 mask 255.255.255.255 <IzoT Router IP address>  
route -p add 10.128.2.0 mask 255.255.255.0 <IzoT Router IP address>
```

The 10.128.1.1 and 10.128.2.0 IP addresses encode the domain ID length (1 byte) and domain ID value of 128 (0x80) used for the FT 6000 EVK network. The first route encodes subnet 1 node 1 for the Ethernet side of the IzoT router, and the second route encodes subnet 2 for the FT side of the router and the EVB devices, as assigned in the IzoT CT network drawing. If you are using a different IzoT CT network you can use the LonTalkIpAddressCalculator application to translate LonTalk addresses into IP addresses. If you are installing your devices onto a network that already uses any IP addresses in the ranges of 10.128.1.0 to 10.128.1.255 or 10.128.2.0 to 10.128.2.255 IP addresses, change the domain for the IzoT CT network as described in the *IzoT Commissioning Tool User's Guide*. This will be the case if you install multiple FT 6000 EVBs on the same IP network. For more information on IP addresses for LonTalk/IP devices, see *How Devices Communicate Using Network Variables* in the *Neuron C Programmer's Guide*. For more information on the LonTalkIpAddressCalculator, see the *IzoT*



menu. In the Application Image window, clear the **Load Application Image** and **Update Firmware** options if they are selected, and then click **Next**. In the Application State window, select the **Online** state and then click **Next**. In the New Device Wizard, select **Service Pin** and then click **Finish**. When the Device Installation window is displayed, press the **Service** button on each of your EVBs. The **Service** button is located at the top right corner of the EVB, and is next to the LED labelled **Service**. The Neuron ID for each of your EVBs will appear in the Neuron ID column. Press **Continue** to commission the two EVBs.

8. To verify that your EVBs are communicating, toggle the joystick down twice to display the **Remote Info Mode** panel. The joystick is located at the bottom center of the EVB and is labeled **SW3**. Repeat this on the second EVB. Then cover the light-level sensor on one EVB with your finger and verify that the **Light** value changes on the second EVB. The light-level sensor is located at the bottom right of the EVB and is labeled **LIGHT**. This update is enabled by the network variable output on each EVB that publishes the light level as a lux value, a network variable input on each EVB that receives light-level updates from other devices, and connections between these network variables that are created by the IzoT Commissioning Tool.

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## Step 8: Get More Information

1. Download the IzoT NodeBuilder documentation from [www.echelon.com/docs](http://www.echelon.com/docs). The *IzoT NodeBuilder User's Guide* will get you going.
2. Get information on free online training at [www.echelon.com/training](http://www.echelon.com/training).
3. Get information on support at [www.echelon.com/support](http://www.echelon.com/support).
4. Find all the latest documentation at [www.echelon.com/docs](http://www.echelon.com/docs).
5. Download updates for your software at [www.echelon.com/downloads](http://www.echelon.com/downloads).