

WATTNODE[®] PLUG-IN

for LNS[®]

Installation and Operation Manual

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Continental Control Systems, LLC.

3131 Indian Rd.

Boulder, CO 80301

(303) 444-7422

FAX: (303) 444-2903

E-mail: techsupport@ccontrolsys.com

Web: <http://www.ccontrolsys.com>

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Overview

In conjunction with our line of WattNode meters for LonWORKS® networks, Continental Control Systems provides a free plug-in for use with LNS based network management and monitoring tools such as LonMaker®.

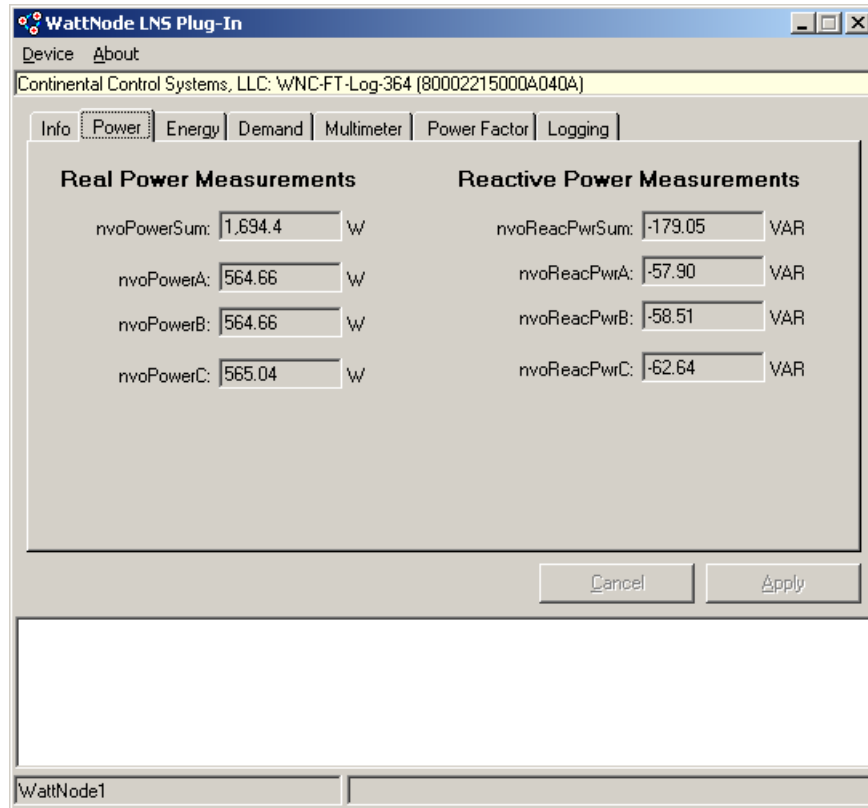


Figure 1: WattNode Plug-in Screen

The WattNode Plug-in provides the following features:

- Monitor WattNode meter measurements.
- Configure settings, like current transformer amps.
- Download logged measurement data for WattNode Logger models.

Additional Literature

- WattNode Plus for LonWorks - Installation and Operation Manual
- WattNode Logger for LonWorks - Installation and Operation Manual
- LonMaker User's Guide - Turbo Edition

Installation

The installation instructions include some steps to be performed using Echelon's LonMaker network management software. You should be able to install the WattNode Plug-in for LNS in other LNS based network management tools, but you may need to adapt some of the instructions for installing the plug-in.

Device Templates

LNS uses device templates to keep track of the characteristics of different types of LonWorks devices. Each unique type of device (with its own LonWorks program ID) used in your network will have a corresponding device template. The device template is normally created from the XIF (external interface) file.

The WattNode Plug-in setup program automatically creates device templates for the following two models during installation:

WattNode Family	Model Numbers	LonMark Certified?	Firmware Versions	Device Template Name
WattNode Plus for LonWorks (WNC)	WNC-xx-xxx-FT10	Yes, Version 3.4	3.33 - 3.37	WNC-FT-Plus-336
WattNode Logger for LonWorks (WNC)	WNC-xx-xxx-FT10-L	Yes, Version 3.4	3.62 - 3.67	WNC-FT-Log-366

Table 1: Automatic Device Template WattNode Models

If you will be using the WattNode Plug-in for LNS with any of the following WattNode models, you will need to manually create device templates as described below. You can do this after installing the WattNode Plug-in, but it is easier to do this first.

WattNode Family	Model Numbers	LonMark Certified?	Firmware Versions	Device Template Name
WattNode Plus for LonWorks (WNC) with Option PT	WNC-xx-xxx-FT10 Option PT	No	3.40	WNC-FT-Plus-PT-340
WattNode Logger for LonWorks (WNC) with Option PT	WNC-xx-xxx-FT10-L Option PT	No	3.70	WNC-FT-Log-PT-370
WattNode Plus for LonWorks (WNC) Option B	WNC-xx-xxx-FT10 Option B	No	3.00 - 3.03	WNC-FT-B-303
WattNode Plus for LonWorks (WNC) Option BI	WNC-xx-xxx-FT10 Option BI	No	3.12 - 3.13	WNC-FT-BI-313
WattNode Plus for LonWorks (WNB)	WNB-xx-xxx-FT10	No	2.06 - 2.09	WNB-FT-Plus-208
WattNode Plus for LonWorks (WNB) Option Integer	WNB-xx-xxx-FT10 Option Integer	No	2.10c - 2.12c	WNB-FT-Int-211

Table 2: Manual Device Template WattNode Models

Create Device Templates

You can skip these instructions (continue with [WattNode Plug-in Setup](#)) if you are using a LonMark certified WattNode from [Table 1](#) above, because the plug-in setup program will automatically create the device templates. You can also skip these steps if you've already installed your meter in LonMaker, because installing the meter creates a device template.

In LonMaker, the standard way to add a device template is to add a new device to your network drawing as follows:

- 1) If you haven't already, copy the XIF file for your WattNode meter to "C:\LonWorks\Import\CCS". The standard location for LonWorks files is "C:\LonWorks\", but if you've installed it somewhere else, then adjust the path accordingly.
- 2) Drag the "Device" shape from the LonMaker Basic Shapes stencil on the left side of the screen onto your drawing.

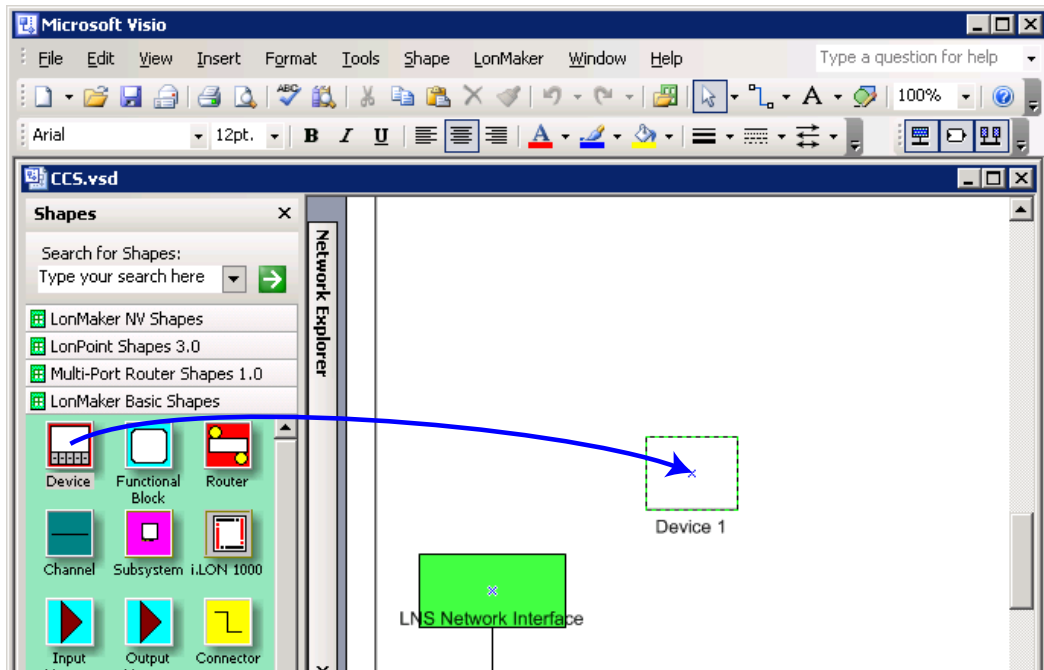


Figure 2: Drag New Device onto Drawing

- 3) When you stop dragging the new device, LonMaker will open the "New Device Wizard". Check the "Create new device template" checkbox and click "Next". If you want to install a WattNode meter at this point, then also check "Commission device" and select the correct channel before clicking "Next".

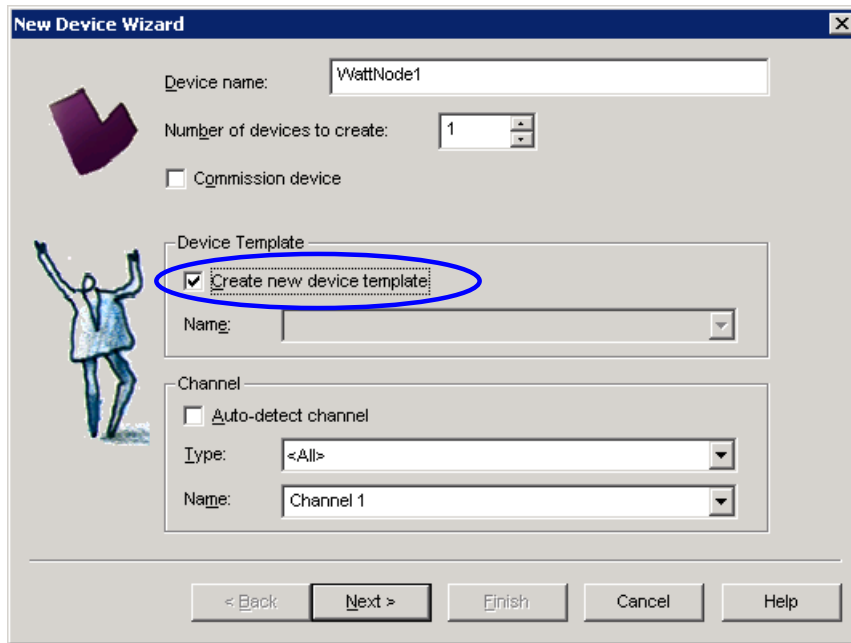


Figure 3: Create New Device Template

- 4) On the next screen, select the “Load XIF” option, browser to find the XIF file (in C:\LonWorks\Import\CCS”, and click “Next”. The Template name should be filled in automatically. If Lon-Maker complains that this template name is already used, then you already have a device template for this WattNode model, so you can click “Cancel” and skip forward to **WattNode Plug-in Setup**.

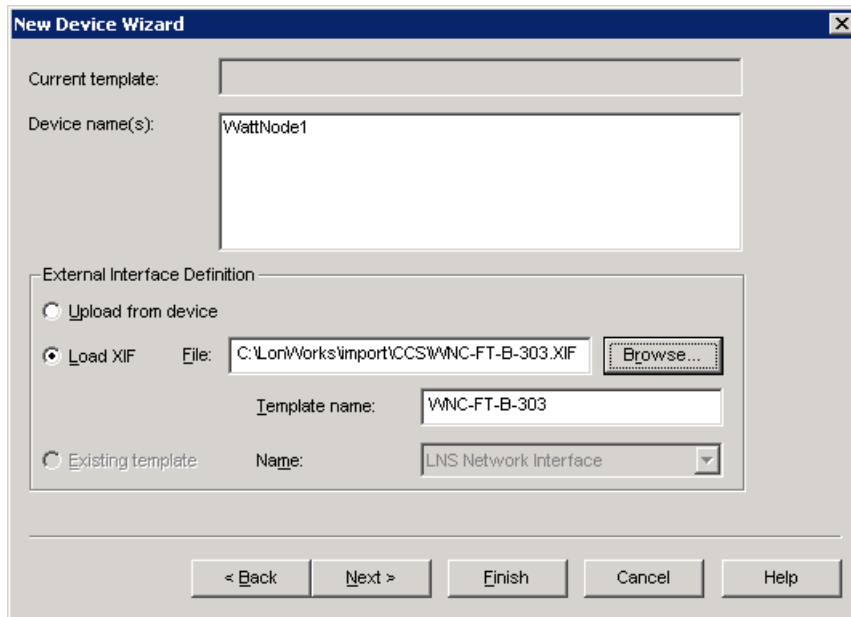


Figure 4: Load XIF File

- 5) The next screen lets you specify the device location and description. If you installing a meter, fill in useful values; otherwise, you can leave these blank. When you are ready, click “Finish”.
- 6) You will now have a new WattNode meter on your drawing and the new device template added. If you were not actually installing a meter, but just adding the device template, you

can select the new meter, right-click, and select “Delete” to remove the meter (the device template will not be deleted).

WattNode Plug-in Setup

The WattNode Plug-in is distributed as a Windows setup executable **WnPluginSetup111.exe**. Follow the steps below to install the plug-in. The plug-in setup program will also install Continental Control Systems LonWorks resource files and XIF (external interface) files for the LonMark certified WattNode models.

- 1) Find the Plug-in setup program on the CD-ROM supplied with the WattNode or on the Continental Control Systems website <http://www.ccontrols.com> on any of the product pages for the WattNode for LonWorks.
- 2) Close LonMaker (the Visio window) so that the setup program can install the Continental Control Systems resource files and register the plug-in.
- 3) Backup your LonMaker database from the “LonMaker Design Manager” by clicking the “Backup...” button (see below).

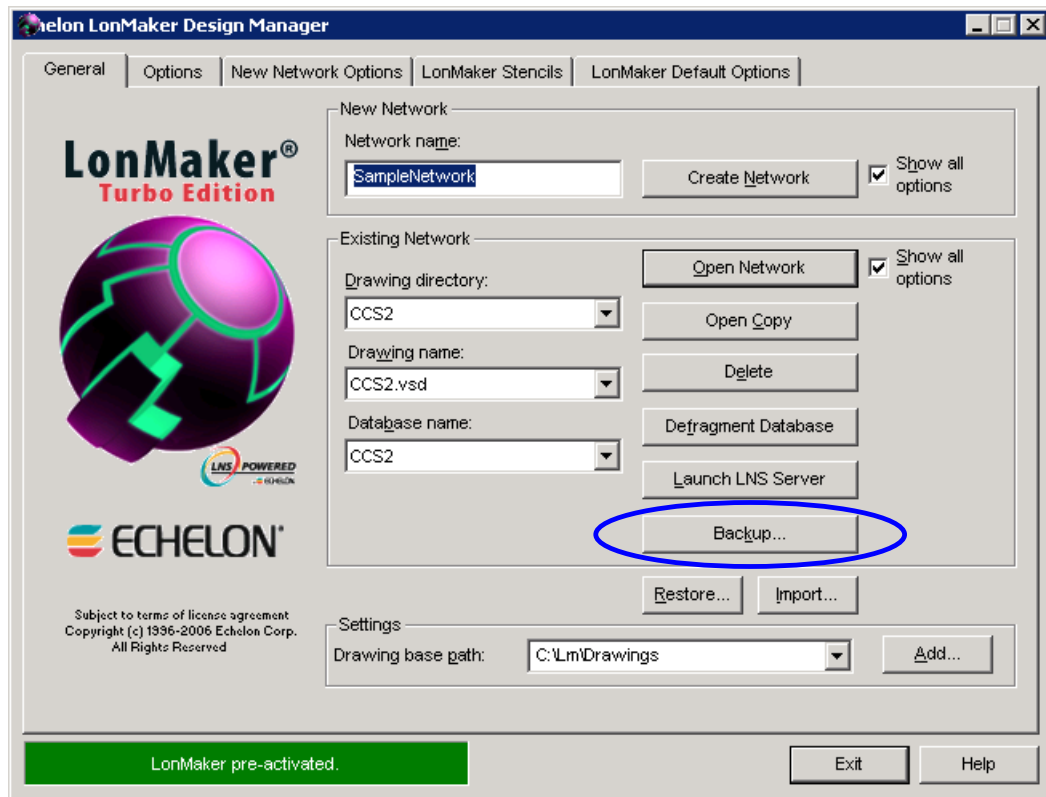


Figure 5: LonMaker Backup

- 4) Run the WattNode Plug-in setup program. On the welcome screen, click “Next”.
- 5) Review the license agreement. If you agree to the terms, select “I accept the agreement” and click “Next”.
- 6) The next screen lets you select which components you wish to install. You should generally install everything, but you may uncheck anything you don’t want. Then click “Next” to start the installation.
 - o **WattNode LNS Plug-In:** this installs (or upgrades) the plug-in executable.
 - o **WattNode Resource Files:** the resource files are required by LonMaker (and other LNS tools) to use the WattNode functional profiles and configuration properties.

- **XIF and Image Files:** the external interface (XIF) files are required to install WattNodes. The image files contain the firmware image, which can be used to field upgrade the firmware of equivalent WattNode models (you cannot upgrade from a WattNode Plus to a WattNode Logger).

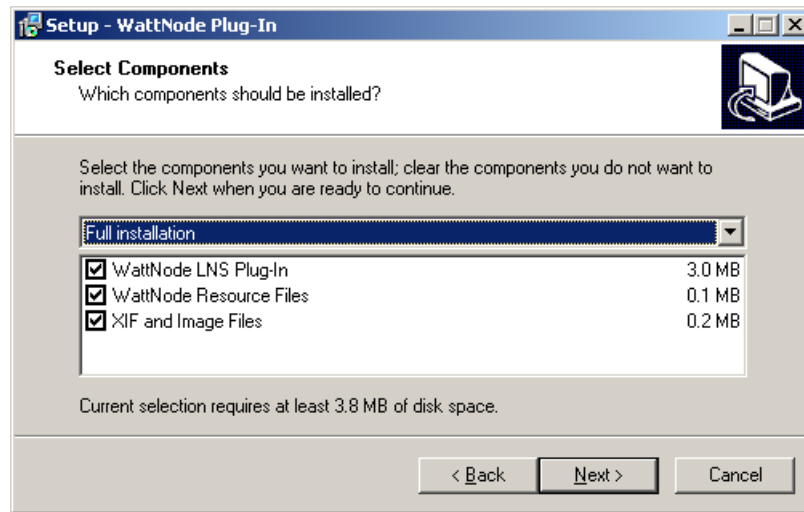


Figure 6: Setup - Select Components

- 7) The next screen will show the progress as the components are installed. This should only take a few seconds.
- 8) If you are upgrading from an earlier version of the plug-in, you may see the following error.

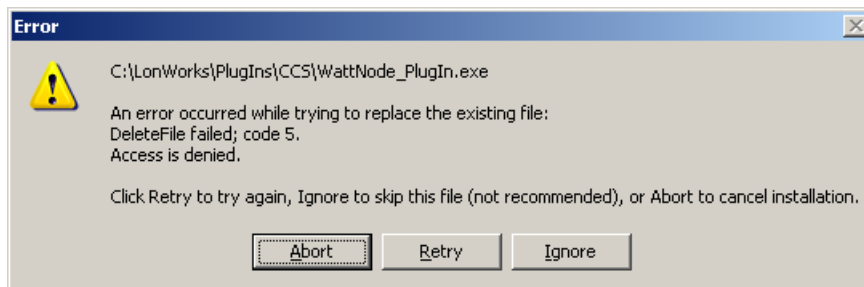


Figure 7: Error - Access Denied

This means that the plug-in is still running in the background and must be terminated to complete the upgrade. To do this, open the Task Manager, either by right-clicking on the taskbar and selecting “Task Manager”, or by pressing CTRL-SHIFT-ESC to open the Task Manager. Make sure the “Applications” tab is selected and look for the “WattNode LNS Plug-in” task (see **Figure 8** below). Select the plug-in and click “End Task”. Then switch back to the error screen above (**Figure 7**) and click “Retry”.

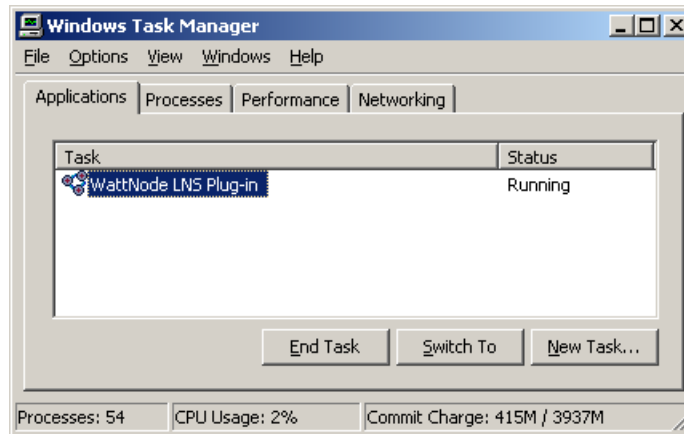


Figure 8: Task Manager

- 9) Finally, you should see that screen indicating that setup is complete. Click "Finish" to exit.
- 10) Now you can restart LonMaker. Make sure you select "Show all options" before clicking "Open Network".

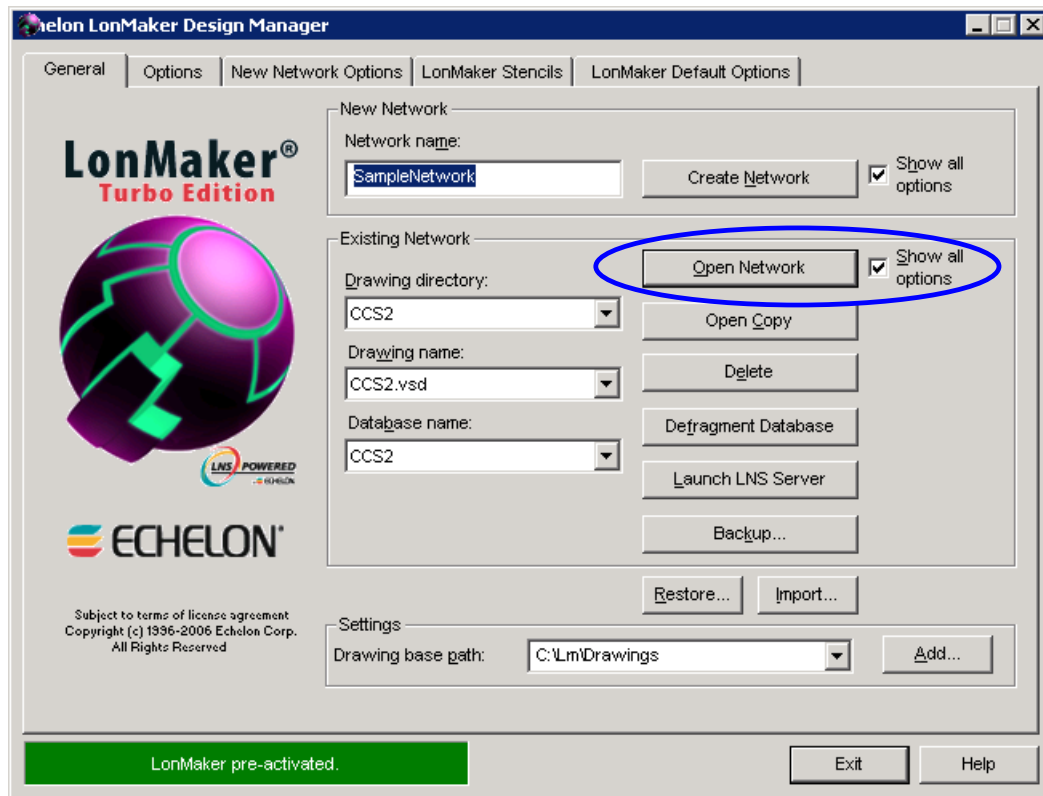


Figure 9: Open LonMaker Network

- 11) When you reach the "Plug-in Registration" screen, make sure the "WattNode LNS Plug-In (Version 1.11)" is in the "Pending" list. If not, select it and click "Register". You can skip this step if you've previously selected "Register all new plug-ins when re-opening this drawing".

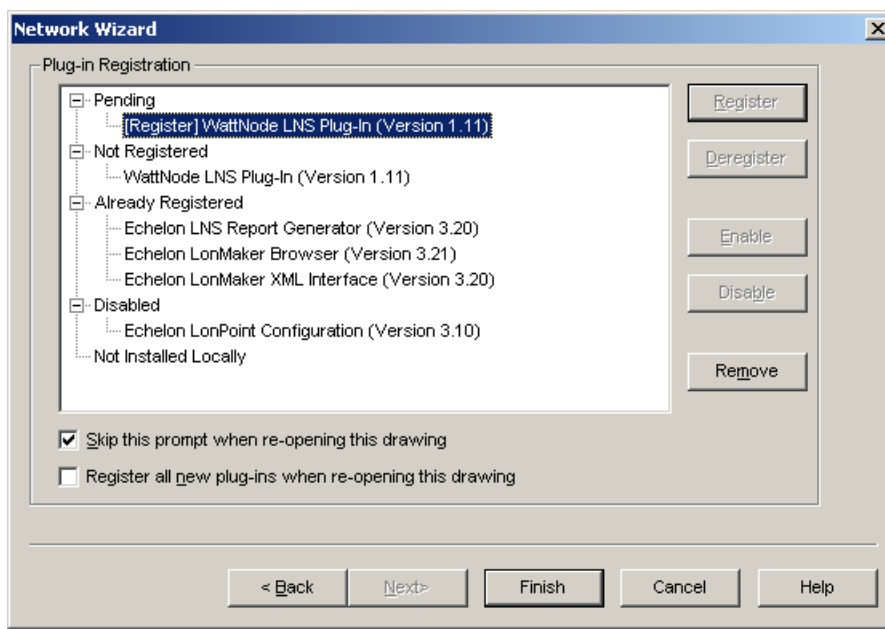


Figure 10: Plug-in Registration

Upgrading

There is no need to uninstall before upgrading. Just run the setup program for the latest version and it will update any files that need to be upgraded.

Installation Summary

The full WattNode Plug-in setup will add the following files and registry entries. The default base folder for all the files is "C:\LonWorks", but if you've installed LonWorks on another folder, the setup program will automatically use the alternate location.

- **WattNode Plug-in Executable:** C:\LonWorks\PlugIns\CCS\WattNode_PlugIn.exe
 - Backup: C:\LonWorks\PlugIns\CCS\backup\WattNode_PlugIn.exe
- **WattNode Resource Files:** C:\LonWorks\Types\User\CCS\...
 - CControlSys.enu - language strings (English only)
 - CControlSys.fmt - network variables and configuration property display formats
 - CControlSys.fpt - functional profile definitions
 - CControlSys.typ - network variable and configuration property types
- **Resource File Backup:** C:\LonWorks\Types\LDRF.CAT.bak
- **XIF Files:** C:\LonWorks\Import\CCS\...
 - WNC-FT-Log-364.XIF - WattNode Logger external interface file
 - WNC-FT-Log-364.XFB - WattNode Logger external interface file (binary)
 - WNC-FT-Plus-333.XIF - WattNode Plus external interface file
 - WNC-FT-Plus-333.XFB - WattNode Plus external interface file (binary)
 - WNC-FT-B-303.XIF - WattNode Plus Option B external interface file
 - WNC-FT-B-303.XFB - WattNode Plus Option B external interface file (binary)
- **System Files:** Windows System32 folder:
 - LcaDevCtrs.ocx - Echelon Plug-in system file
 - stdole2.tlb - Visual Basic 6 system file
 - msvbvm60.dll - Visual Basic 6 system file

- oleaut32.dll - Visual Basic 6 system file
- olepro32.dll - Visual Basic 6 system file
- asycfilt.dll - Visual Basic 6 system file
- comcat.dll - Visual Basic 6 system file
- **Image Files:** C:\LonWorks\Import\CCS\...
 - WNC-FT-Log-364.NXE - WattNode Logger firmware image file
 - WNC-FT-Plus-333.NXE - WattNode Plus firmware image file
 - WNC-FT-B-303.NXE - WattNode Plus Option B firmware image file
- **Plug-in Registry Entries:**
 - HKEY_LOCAL_MACHINE\SOFTWARE\LonWorks\LCA\Plug-Ins\WattNode LNS Plug-In
 - HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\...
- **Uninstall Information:**
 - C:\LonWorks\unins000.exe - Uninstall program (normally accessed from Add/Remove Programs)
 - C:\LonWorks\unins000.dat - Uninstall data

Operating Instructions

The following instructions include some references to Echelon's LonMaker network management software. The WattNode Plug-in for LNS should work with other LNS based network management tools, but you may need to adapt some of the instructions for starting the plug-in.

Starting the Plug-in

From within LonMaker or your LNS based tool, right-click on the WattNode you wish to monitor with the plug-in and select "Browse...". When you install the WattNode Plug-In, it replaces the default LonMaker browser for the Browse command.

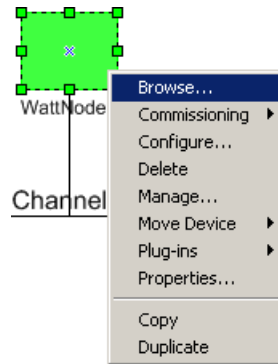


Figure 11: Open Plug-In with Browse

You can still access the default LonMaker browser by right-clicking the WattNode and selecting "Configure...".

If, for some reason, selecting "Browse..." doesn't open the WattNode Plug-In, right-click, select "Plug-ins" and then select "Browse WattNode" from the list.

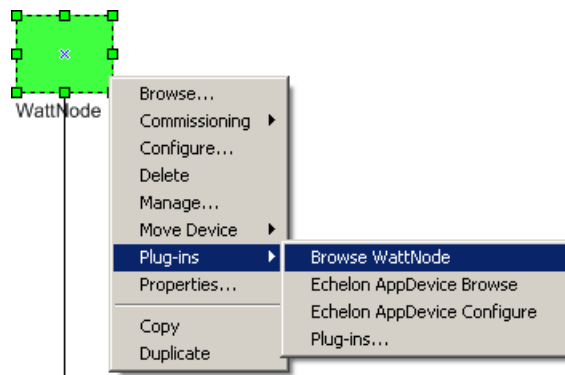


Figure 12: Plug-Ins Menu

If "Browse WattNode" does not appear in the list, then the WattNode Plug-In hasn't been correctly registered for this model of WattNode. Under the **Troubleshooting** section, see **Cannot Access Plug-In from LonMaker**.

While the plug-in is loading, you may see the following screens for a few seconds, which indicate the progress.

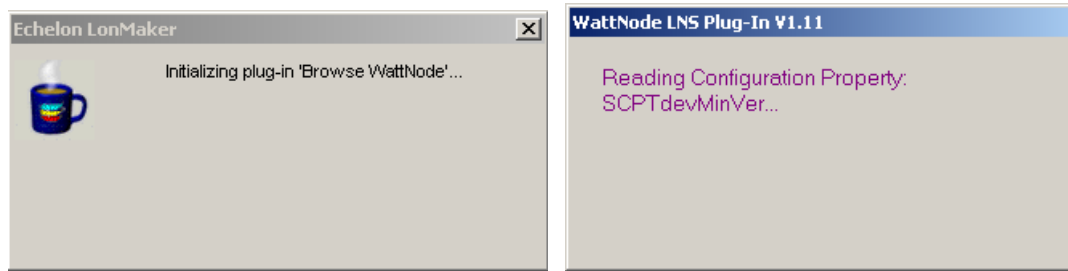


Figure 13: WattNode Plug-In Startup Screens

Overview

When the WattNode Plug-In opens, it should be showing the “Info” tab as shown below.

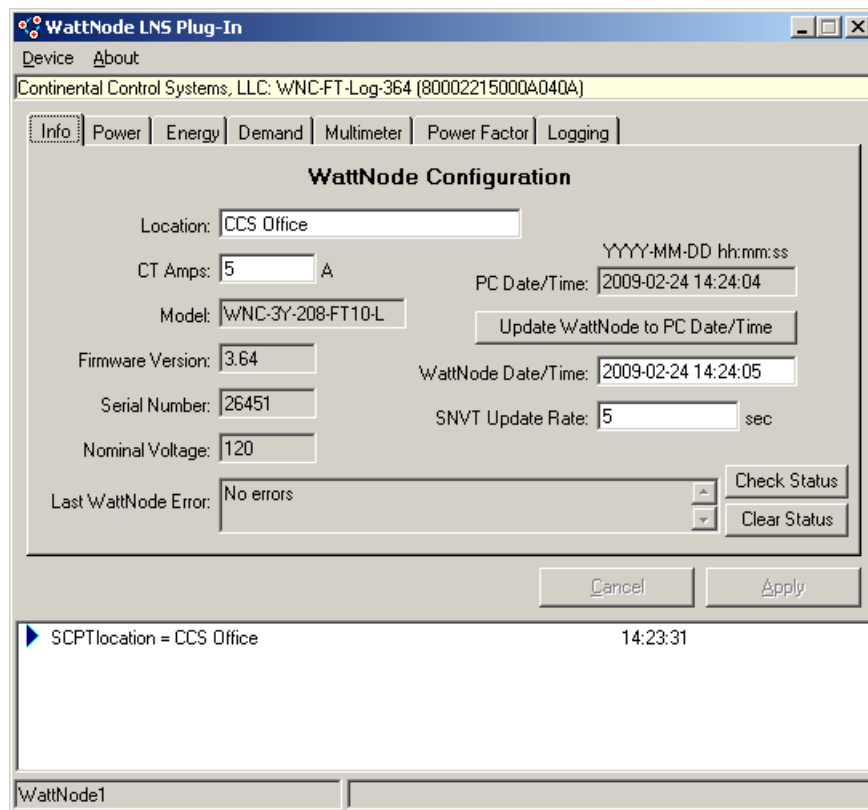


Figure 14: WattNode Plug-In Info Screen

Title Bar

At the very top of the plug-in window is the title bar, which normally reads “WattNode LNS Plug-In”. If the WattNode is offline, the network is disconnected, or you are experiencing errors communicating with the WattNode, a status indication will appear in the title bar:

- **Offnet:** LonMaker has been opened in the “Off Net” state, which means it is disconnected from the network. You must re-open LonMaker in the “On Net” state before you can browse or configure the WattNode.
- **Uncommissioned:** This WattNode has not yet been commissioned, so you cannot browse or configure it.
- **Test Failed:** An error occurred in the WattNode. Check the “Last WattNode Error” field on the “Info” tab (see above) for details.

- **Unconfigured:** The WattNode is unconfigured (this is similar to uncommissioned). Use LonMaker to configure or commission the WattNode, then try again.
- **App'less:** The WattNode is applicationless. This means the firmware image has been corrupted. Contact technical support for assistance.
- **Offline:** When installing devices, LonMaker provides the option of having the commissioned as “online” or “offline”. If you select “offline” when installing the WattNode, it will not operate until you use LonMaker to change the state to online. See the LonMaker manual for details.
- **Soft Offline:** This is similar to “Offline” above and indicates that the WattNode is installed, but has not been enabled by LonMaker. You must use LonMaker to change the state to online.
- **Bypass:** This is similar to “Offline” above. Try using LonMaker to change the state to online. If this fails, contact technical support for assistance.
- **Comm Error:** The plug-in cannot communicate with the WattNode. This can happen if the WattNode power is off, if there is a problem with the network wiring, or it may indicate a problem with the WattNode. Try using LonMaker to communicate with other LonWorks devices to determine if the network is functioning correctly.
- **Error:** Internal plug-in error. Contact technical support.

Menu

At the top, there is a menu with “Device” and “About”. The “Device” menu lets you start and stop network variable monitoring, save and clear the log window at the bottom of the screen, and exit the plug-in.

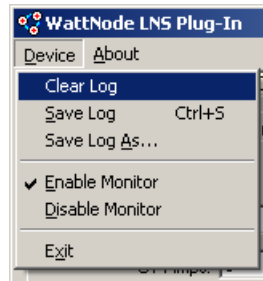


Figure 15: Device Menu

The “About” menu pops up an about box showing the plug-in version and which WattNode models are supported by this plug-in.

Device Template / Program ID

Immediately below the menu is a yellow bar showing the LonMaker device template name and the LonWorks program ID for the WattNode currently being monitored.

Monitoring Tabs

There are six tabs (seven for WattNode Logger models) to allow monitoring and configuration of different types of measurements.

- **Info:** Contains an overview of information about the WattNode and basic configuration.
- **Power:** Displays
- **Energy:**
- **Demand:**
- **Multimeter:**
- **Power Factor:**
- **Logging:**

See [Browsing Data](#) and [Downloading Log Data](#) below for details about the different tabs.

Cancel / Apply

In the lower right corner of the window, just above the event window, are a “Cancel” and “Apply” button. These are used to apply configuration changes or to cancel changes. Whenever you change a configuration like “CT Amps”, the text box will change to red text until you “Apply” to commit the change or “Cancel” to abort the change.

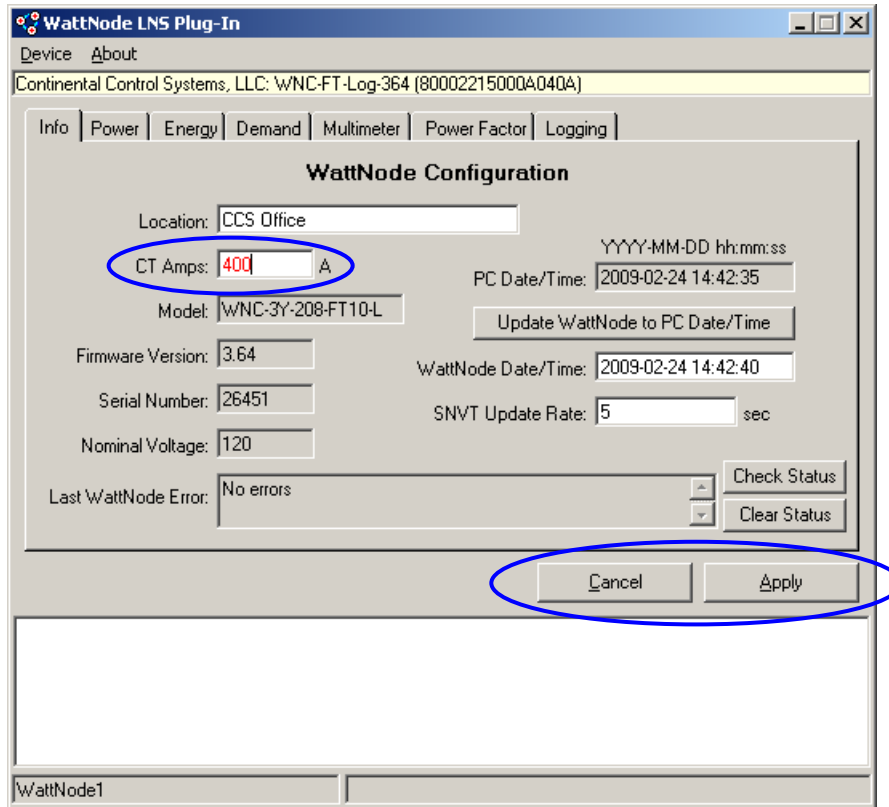


Figure 16: Set CT Amps

Event Window

The event window appears just below the Cancel and Apply buttons. This keep a log of configuration changes and errors until the plug-in is closed. You can save the log or clear it using the Device menu.

Status Bar

At the very bottom of the screen, the status bar displays the LonMaker name of the WattNode being monitored by the plug-in.

Configuring the WattNode

The first step will generally be to configure the WattNode using the plug-in. For each of the following fields (see [Figure 14](#) above), enter the desired value (the text will change to red) and then click the “Apply” button in the lower right corner. If you wish to abort the change, click “Cancel”.

- **CT Amps:** Set this to the current transformer rated amps for your CTs. See the WattNode manual for details.
- **Location:** Optionally set this to a descriptive location string for this WattNode.
- **WattNode Date/Time:** On the right side of the screen, you will see “PC Date/Time”, then a button, and then “WattNode Date/Time”. By comparing these, you can tell if the WattNode internal date and time is correct. If you click the “Update WattNode to PC Date/Time“ button,

the plug-in will set the WattNode date and time to match the PC date and time (you don't need to click "Apply"). The WattNode only updates its internal time every five seconds, so it is normal to see a few seconds disagreement between the PC and WattNode times.

- **SNVT Update Rate:** This controls the rate at which the WattNode updates network variables on the network. There is generally no need to change this value unless you bind WattNode network variables and wish to reduce network traffic by reducing the update rate to something less frequent than every five seconds. Five seconds is the fastest rate, while 12 hours (43200 seconds) is the slowest rate.

Browsing Data

Info

The screenshot shows the 'WattNode LNS Plug-In' window with the 'Info' tab selected. The window title is 'WattNode LNS Plug-In' and the device path is 'Continental Control Systems, LLC: \WNC-FT-Log-364 (80002215000A040A)'. The 'Info' tab is active, with other tabs like 'Power', 'Energy', 'Demand', 'Multimeter', 'Power Factor', and 'Logging' visible. The 'WattNode Configuration' section contains the following fields and controls:

- Location: CCS Office
- CT Amps: 5 A
- Model: WNC-3Y-208-FT10-L
- Firmware Version: 3.64
- Serial Number: 26451
- Nominal Voltage: 120
- Last WattNode Error: No errors
- PC Date/Time: 2009-02-24 14:24:04
- WattNode Date/Time: 2009-02-24 14:24:05
- SNVT Update Rate: 5 sec
- Buttons: Update WattNode to PC Date/Time, Check Status, Clear Status, Cancel, Apply

At the bottom, a status bar shows 'SCPTlocation = CCS Office' and '14:23:31'. The device name 'WattNode1' is visible in the bottom left corner.

Figure 17: Info Tab

This tab provides the following fields:

- **Location (SCPTlocation):** Optional 31 character location string.
- **CT Amps (nciCtAmps):** Rated amps for the current transformers.
- **Model (UCPTmodel):** WattNode model.
- **Firmware Version (SCPTdevMajVer, SCPTdevMinVer):** WattNode firmware revision.
- **Serial Number (UCPTserialNumber):** WattNode serial number.
- **Nominal Voltage (UCPTnominalVolt):** Nominal phase-to-neutral voltage for this model.
- **Last WattNode Error:** Most recent internal firmware error.
- **PC Date/Time:** Same as the date/time for your personal computer.
- **WattNode Date/Time:** Date and time value for the WattNode. This only updates every five seconds, so it won't perfectly match the PC date and time.

- **SNVT Update Rate (SCPTmaxSndT):** Rate at which the WattNode updates network variables on the network. This does not control the polling rate for the plug-in.
- **Check Status:** Button to read the WattNode error status. The plug-in automatically checks the status every 30 seconds.
- **Clear Status:** Button to clear any WattNode internal errors.

Info - Option PT

If you are using the plug-in with a WattNode model with Option PT, the Info tab will have two extra fields as shown below. These fields will not be visible for normal models.

The screenshot shows the 'WattNode LNS Plug-In' window with the 'Info' tab selected. The device is identified as 'Continental Control Systems, LLC: WNC-FT-Plus-PT-340 (90002215000A040C)'. The 'WattNode Configuration' section contains the following fields and values:

- Location: CCS Office
- CT Amps: 100 A
- Model: WNC-3Y-208-FT10
- Firmware Version: 3.40
- Serial Number: 27756
- Nominal Voltage: 120
- SNVT Update Rate: 5 sec
- PT Primary: 7200
- PT Ratio: 60

The 'PT Primary' and 'PT Ratio' fields are circled in blue. The 'Last WattNode Error' field shows 'No errors'. There are 'Check Status' and 'Clear Status' buttons at the bottom right of the configuration section, and 'Cancel' and 'Apply' buttons at the bottom of the window.

Figure 18: Info Tab - Option PT

- **PT Ratio:** This is used to configure the ratio of a potential transformer, most commonly for monitoring medium voltage services.
- **PT Primary:** This displays the computed potential transformer primary voltage, based on the WattNode meter's nominal voltage and the PT ratio. This is **not** the measured voltage (see the **Multimeter** tab for measured voltages).

Power

This tab provides real (active) and reactive power measurements. The values should update every five seconds unless you've configured the "SNVT Update Rate" to a longer interval. The displayed values include the per-phase values (Ex: *nvoPowerA*, *nvoPowerB*, and *nvoPowerC*) as well as the sum-of-phases values (Ex: *nvoPowerSum*).

Note: depending on the WattNode model and the associated SNVT types, power may be displayed with units of watts (W) or kilowatts (kW), and reactive power may be displayed with units of volt-amps reactive (VAR) or kilo-volt-amps reactive (kVAR).

Note: Option B and Option BI models document per-phase outputs like *nvoPower[0]*, *nvoPower[1]*, and *nvoPower[2]*. The plug-in displays these as *nvoPowerA*, *nvoPowerB*, and *nvoPowerC* respectively.

The screenshot shows the 'WattNode LNS Plug-In' window with the 'Power' tab selected. The window title is 'WattNode LNS Plug-In' and it has 'Device' and 'About' menus. The device name is 'Continental Control Systems, LLC: WNC-FT-Log-364 (80002215000A040A)'. The 'Power' tab is active, with other tabs including 'Info', 'Energy', 'Demand', 'Multimeter', 'Power Factor', and 'Logging'. The main area is divided into two columns: 'Real Power Measurements' and 'Reactive Power Measurements'. Each column contains four rows of data, each with a text box and a unit label.

Real Power Measurements		Reactive Power Measurements	
nvoPowerSum:	1,694.4 W	nvoReacPwrSum:	-179.05 VAR
nvoPowerA:	564.66 W	nvoReacPwrA:	-57.90 VAR
nvoPowerB:	564.66 W	nvoReacPwrB:	-58.51 VAR
nvoPowerC:	565.04 W	nvoReacPwrC:	-62.64 VAR

At the bottom of the window, there are 'Cancel' and 'Apply' buttons. The status bar at the very bottom shows 'WattNode1'.

Figure 19: Power Tab

Energy

This tab provides energy and reactive energy measurements, as well as a button to reset energy totals to zero. **NOTE:** not all of these values appear for all WattNode models.

- **nvoEnergySum:** Sum of energy (kWh) for all phases.
- **nvoEnergyPosSum:** Sum of positive energy (kWh) for all phases.
- **nvoEnergySumNR:** Sum of energy (kWh) for all phases. Cannot be reset to zero.
- **nvoEnergyPosSumNR:** Sum of positive energy (kWh) for all phases. Cannot be reset to zero.
- **nvoEnergyA:** Phase A energy (kWh).
- **nvoEnergyB:** Phase B energy (kWh).
- **nvoEnergyC:** Phase C energy (kWh).
- **nvoReacEngySum:** Sum of reactive energy (kVAR-hour) for all phases.

The “Reset Energy Totals” button zeros all energy values **except** those ending with “NR”.

The screenshot shows the 'Energy' tab of the 'WattNode LNS Plug-In' software. The window title is 'WattNode LNS Plug-In' and the device information is 'Continental Control Systems, LLC: WNC-FT-Log-364 (80002215000A040A)'. The 'Energy' tab is selected, with other tabs including 'Info', 'Power', 'Demand', 'Multimeter', 'Power Factor', and 'Logging'. The 'Energy Sums' section displays four values: nvoEnergySum (792.0 kWh), nvoEnergyPosSum (792.7 kWh), nvoEnergySumNR (3,002.7 kWh), and nvoEnergyPosSumNR (3,316.7 kWh). The 'Per-Phase Energies' section displays three values: nvoEnergyA (264.1 kWh), nvoEnergyB (263.8 kWh), and nvoEnergyC (264.1 kWh). The 'Reactive Energy Sum' section displays nvoReacEngySum (-85.5 kVARh). A 'Reset Energy Totals' button is located at the bottom right of the energy data area. Below the data area are 'Cancel' and 'Apply' buttons. The status bar at the bottom left shows 'WattNode1'.

Energy Sums	Per-Phase Energies
nvoEnergySum: 792.0 kWh	nvoEnergyA: 264.1 kWh
nvoEnergyPosSum: 792.7 kWh	nvoEnergyB: 263.8 kWh
nvoEnergySumNR: 3,002.7 kWh	nvoEnergyC: 264.1 kWh
nvoEnergyPosSumNR: 3,316.7 kWh	

Reactive Energy Sum
nvoReacEngySum: -85.5 kVARh

Figure 20: Energy Tab

Demand

The demand tab reports the demand, peak demand, and peak demand timestamp. It also supports configuring the demand measurement and resetting the peak demand.

- **nvoDemand:** The most recent demand reading (average power over the demand period).
- **nvoDemandPk:** The highest peak demand recorded.
- **nvoPeakDemT:** The date and time at which the peak demand measurement occurred.
- **Demand Period Minutes (UCPTdemandPeriodMins):** The duration of a demand period.
- **Demand Subintervals (UCPTdemandSubintervals):** The number of subintervals per demand period.

The “Reset Peak Demand” button clears the peak demand and timestamp values.

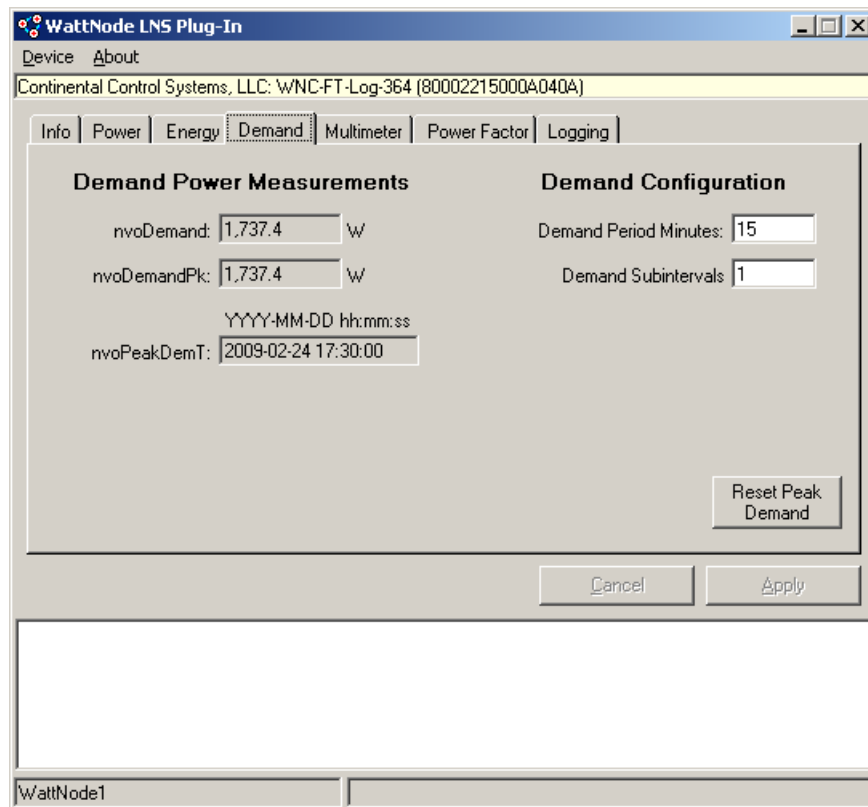


Figure 21: Demand Tab

Multimeter

The multimeter tab reports voltage, current, and frequency.

- **nvoVoltsA**: The line-to-neutral voltage for phase A.
- **nvoVoltsB**: The line-to-neutral voltage for phase B.
- **nvoVoltsC**: The line-to-neutral voltage for phase C.
- **nvoCurrentA**: The current (amps) for phase A.
- **nvoCurrentB**: The current (amps) for phase B.
- **nvoCurrentC**: The current (amps) for phase C.
- **nvoFreq**: The AC line frequency.

Note: Option B and Option BI models document per-phase outputs like *nvoVolts[0]*, *nvoVolts[1]*, and *nvoVolts[2]*. The plug-in displays these as *nvoVoltsA*, *nvoVoltsB*, and *nvoVoltsC* respectively.

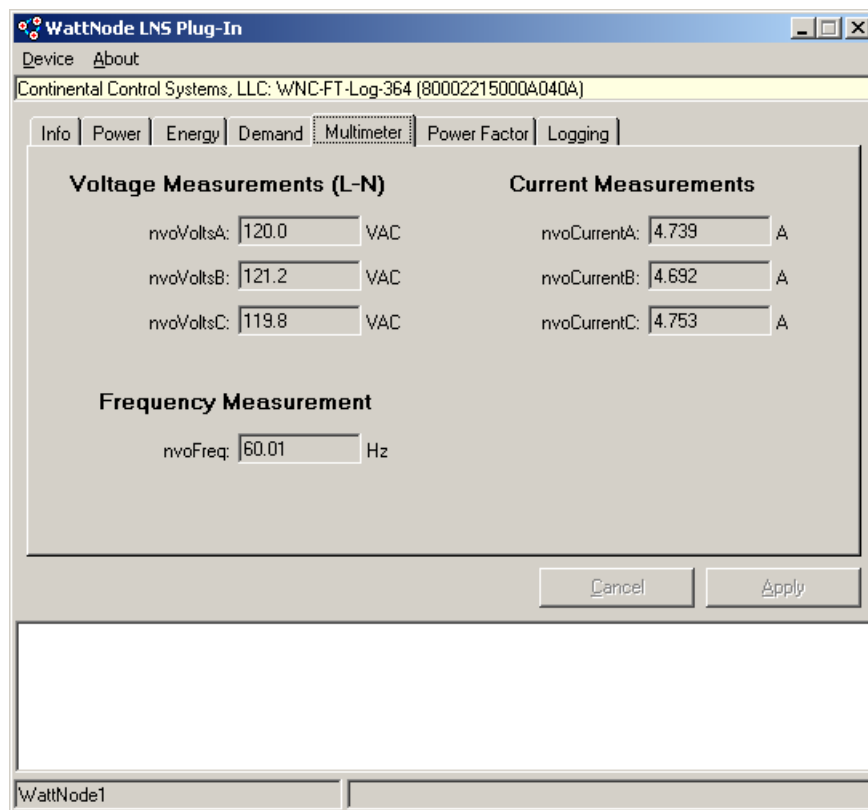


Figure 22: Multimeter Tab

Power Factor

The power factor tab reports the displacement power factor for each phase and the average power factor for all active phases.

The displacement power factor is the ratio of the real power to the apparent power at the fundamental frequency (50 or 60 Hz). Resistive loads, like incandescent lighting and electric heaters, should have a power factor near 1.0. Power-factor corrected loads, like computers, should be near 1.0. Motors can have power factors from 0.2 to 0.9, but are commonly in the 0.5 to 0.7 range.

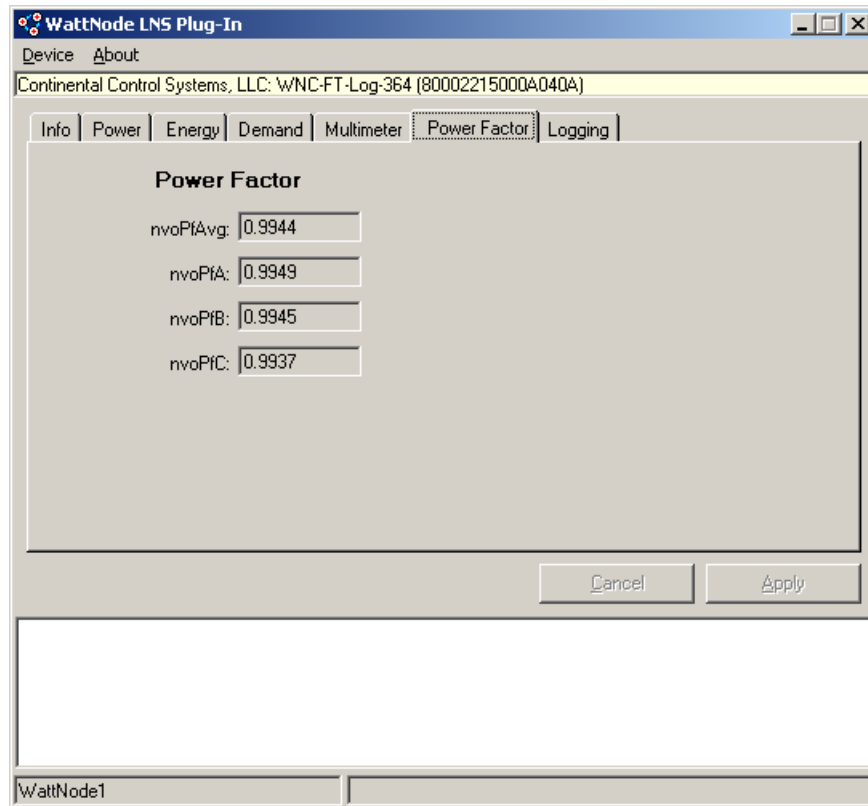


Figure 23: Power Factor Tab

Downloading Log Data

Overview

If you are using a WattNode Logger for LonWorks meter, you can download log data with the plug-in. WattNode Plus models do not include logging, so the following instructions only apply to Logger models.

Record Number

Every log record in the meter is assigned a unique number starting with “1” and counting up. This helps uniquely identify each log record, even if the clock is changed (as for daylight savings).

Short Records

The meter always stores full log records internally, but can transfer short log records to make the transfer rate faster, if you do not need the extra fields provided by the full log record. The short record includes: record number, status, date/time, demand, energy sum.

Full Records

Full log records include virtually all measurements made by the WattNode meter.

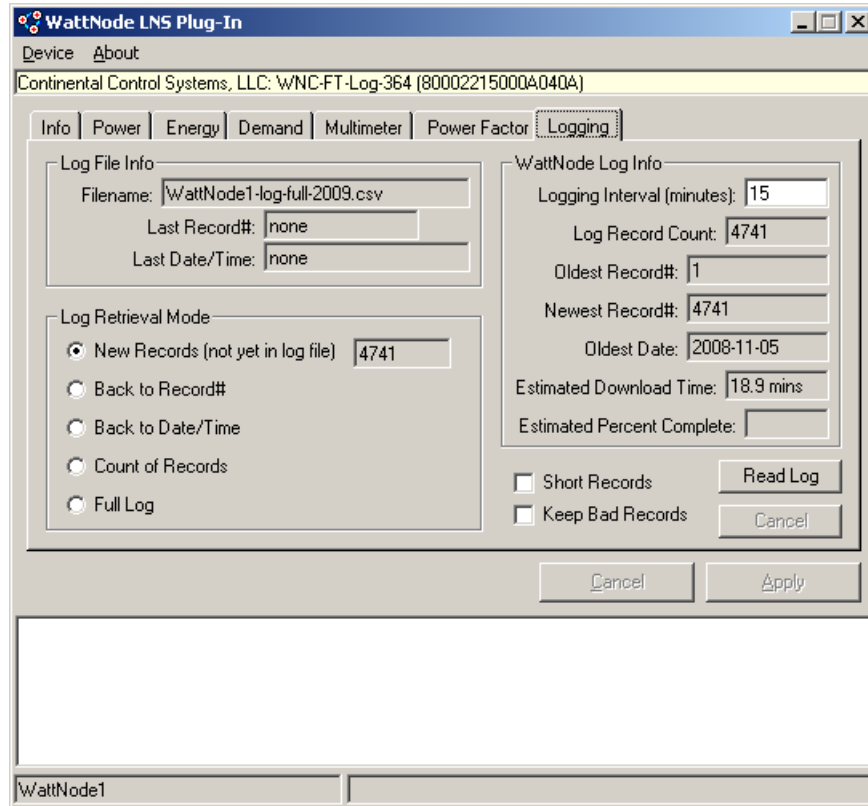


Figure 24: Logging Tab

Log File Info

The “Log File Info” section (upper left corner of **Figure 24** above) contains information about the comma separated variable (CSV) log file. CSV is a common format, where each data field is separated by a comma and each data record appears on one line of the file. All spreadsheet applications and many databases can easily import CSV files.

The log file is stored in the same location as the plug-in executable, typically:

- C:\LonWorks\PlugIns\CCS

The log filename is automatically generated and is composed of the following parts:

<WattNode-Name>-log-<size>-<year>.csv

- **<WattNode-Name>**: This is the same as the name that appears in LonMaker and in the plug-in status bar in the lower-left corner.
- **<size>**: This is either “full” or “short” to indicate full records or short log records.
- **<year>**: To keep the log file from becoming unmanageably large, there is a separate log file for each year (based on the year the data is downloaded).

The “Last Record#” field holds the last record number that appears in the current log file. “none” indicates an empty or new log file.

The “Last Date/Time” field holds the date and time of the last record that appears in the log file.

Log Retrieval Mode

There are several options to choose from when downloading new log records from the meter.

- **New Records:** This will download all new records not yet in the CSV log file. It downloads starting with the record just after the “Last Record#” from the CSV log file. You should normally use this mode.
- **Back to Record#:** This retrieves all log records starting with the most recent and ending with the specified record number. When this option is selected, a text box will appear in which you must enter the ending record number.
- **Back to Date/Time:** This retrieves all log records starting with the most recent and ending with the specified date and time. When this option is selected, a text box will appear in which you must enter the ending date/time.
- **Count of Records:** This retrieves the specified number of log records. When this option is selected, a text box will appear in which you must enter the count of records.
- **Full Log:** This retrieves every record available in the log. This may be less than the full 24186 if the log is not yet full.

In the lower right corner are two more fields that control the log download:

- **Short Records:** If this is checked, the plug-in will download short records instead of long records. This makes the download run about three times faster.
- **Keep Bad Records:** Log records include a checksum (CRC) to insure the data hasn't been corrupted. If “Keep Bad Records” is checked, even records with an invalid checksum will be logged to the CSV file. They will be marked to indicate the bad CRC, so they can be filtered out with a post-processing step.

WattNode Log Info

The log info section of the Logging tab appears in the upper right section and contains information about the actual log on the WattNode meter.

- **Logging Interval (minutes):** The WattNode meter logs a new set of data every time a log interval elapses. We recommend setting this to either the same interval as the demand interval or some integer fraction of the demand interval. For example, if the demand interval is 15 minutes, you could set the logging interval to 15 minutes, 5 minutes, 3 minutes, or 1 minute. Other values are possible, but may result in missed demand records.
- **Log Record Count:** This read-only field contains the count of records available in the meter.
- **Oldest Record#:** This is the oldest record number available in the meter.
- **Newest Record#:** This is the newest record number available in the meter.
- **Oldest Date:** This is the date/time timestamp of the oldest log record in the meter.
- **Estimated Download Time:** This estimates the number of seconds or minutes required to download the log. Changing the number of records to be download or changing from “Full” to “Short” records will change the estimated download time. This time assumes a lightly loaded network with a low error rate.
- **Estimated Percent Complete:** While a download is underway, this estimates the percent of the download that is complete, based on the number of records downloaded and remaining.

Download Log

When you have configured the “Log Retrieval Mode” (the default settings should work for most situations), you can click the “Read Log” button in the lower right corner. The download should take approximately the “Estimated Download Time”, which can range from seconds to 90 minutes.

While the download is occurring, you will see the “Estimated Percent Complete” field update every few seconds to indicate the progress. If you wish to abort the download, click the “Cancel” button. It may take several seconds for the download to stop.

Do not exit the plug-in while a download is in progress or you may receive error messages from the plug-in. If you must exit, cancel the download first, then exit.

Log records are never deleted from the the WattNode memory, until the memory fills up (24186 records) and old records start to get overwritten by new records. So you can download the same set of records repeatedly and you never have to worry that the plug-in will erase log records.

Troubleshooting

Cannot Access Plug-In from LonMaker

The most common problem is that somehow the plug-in did not get properly registered with LonMaker, so you cannot access it. If this happens, from the menu, select “LonMaker -> Plug-Ins -> Register Plug-Ins...”.

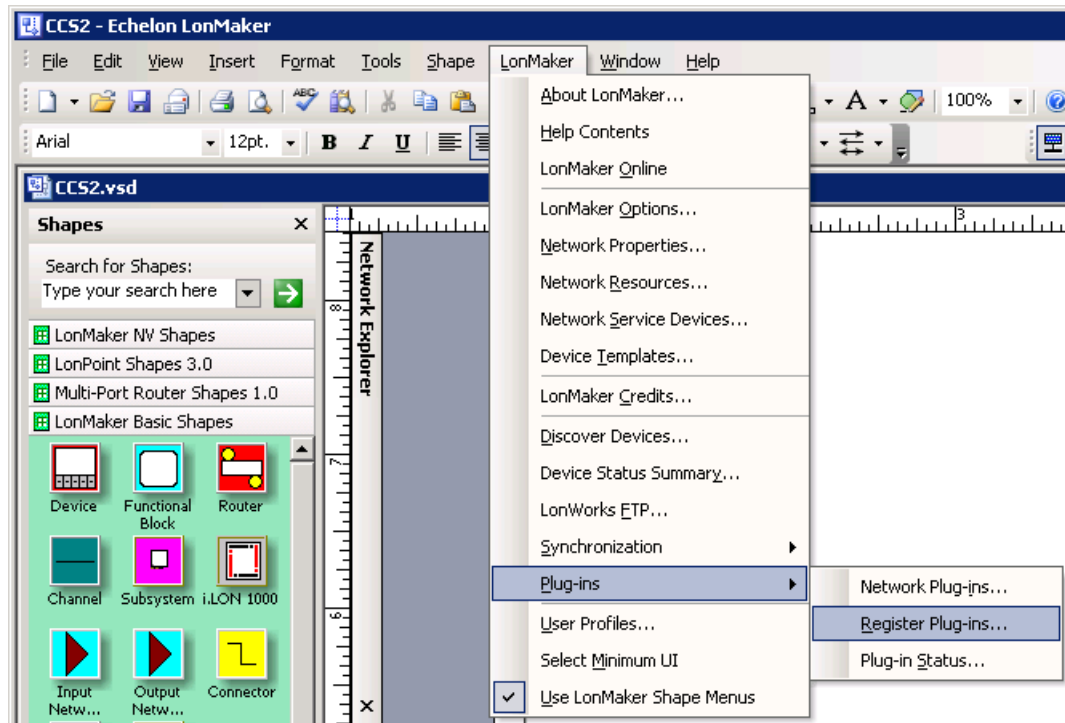


Figure 25: Access Register Plug-Ins Screen

This will open the “Plug-in Registration” screen (below), from which you should be able to select the “WattNode LNS Plug-In (Version 1.11)”, and click the “Register” button. If the WattNode Plug-In does not appear, then try exiting and restarting LonMaker. If the WattNode Plug-In still does not appear, the installation may not have succeeded, so try installing again. If this fails, contact Continental Control Systems technical support for assistance.

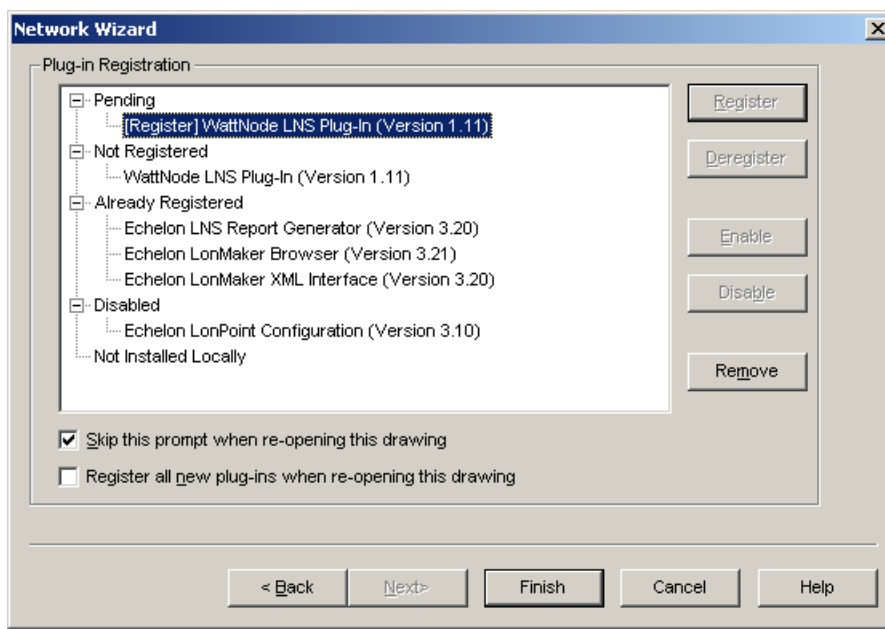


Figure 26: Plug-in Registration

Log File

On startup, the WattNode Plug-In checks to see if a logfile “WnPlugin.log” is present in the C:\LonWorks\PlugIns\CCS folder. If not, the plug-in creates one and logs internal diagnostic information until the plug-in exits. Generally, a small logfile will be created the first time the plug-in runs and then nothing more will happen, because a logfile already exists the next time the plug-in starts.

If you are having problems with the plug-in, such as a crash, you can:

- 1) Delete the logfile (so that a new one will be created the next time the plug-in runs).
- 2) Run the plug-in again, thereby creating a new logfile.
- 3) Replicate the problem.
- 4) Exit the plug-in and mail the logfile to Continental Control Systems technical support for analysis.

If you wish to leave logging permanently enabled, create an empty textfile named “EnableLog.txt” in the C:\LonWorks\PlugIns\CCS folder. **WARNING:** this can quickly create a multi-megabyte file that may become too large to email, so use this with care.

Uninstall

If you wish to uninstall the WattNode Plug-In, use the following steps:

- 1) Make sure the WattNode Plug-In is not running.
- 2) If possible, exit LonMaker, so that the uninstaller can unregister the plug-in.
- 3) Start -> Settings -> Control Panel -> Add or Remove Programs.
- 4) Scroll down to "WattNode Plug-In 1.11" and click "Remove". Note: this shows the size as larger than 100MB, but this is incorrect because it includes everything in the "C:\LonWorks" folder. The WattNode Plug-In is only a few megabytes. The uninstall program will only remove the WattNode Plug-In, NOT the entire C:\LonWorks folder.
- 5) Note: the uninstaller will not remove XIF files or CCS resource files. If you wish to remove these, go to the appropriate folders and manually delete them. See [Installation Summary](#) for a list of all installed files and locations.

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