

WARNINGS AND CAUTIONS:

- Do not use this device with a larger antenna than provided or specified.
- Always ensure antenna is securely fastened for optimum performance.
- Performance of device can also be affected if used outside its temperature range.

DESCRIPTION:

The LevNet RF computer link (WSCOM) is a USB transceiver (transmitter and receiver) tool which is utilized for testing, monitoring, and commissioning in a LevNet RF or any EnOcean enabled environment. It can be attached to any PC computer systems (desktop, laptop, or notebook) and other USB host devices (tablets).

This tool works by receiving and transmitting at 315MHz using the EnOcean wireless protocol packets and allows connectivity to the world of EnOcean based wireless products. The WSCOM tool works with EnOcean DolphinView Basic software for Windows® XP/7 to provide a visual environment for analyzing wireless radio messages (telegrams). With the provided antenna the device has the following operational receiving and transmitting distances:

- Line of site: Up to 200ft receiving and 200ft transmitting in hallways.
- Line of site outdoors: Up to 250ft receiving and 200ft transmitting range.
- Indoor drywall: Up to 100ft range, through max. 5 walls.
- Fire safety and Ferroconcrete walls / ceilings: Coverage is not guaranteed.

FEATURES:

- Receive telegrams from EnOcean enabled devices including self-powered switches and sensors.
- Signal strength analysis (RSSI) of transmitted wireless telegrams.
- Send messages to control EnOcean enabled devices.
- Remote configuration of devices that support the Remote Management capability.
- Compatible with EnOcean's DolphinView and other 3rd party software.
- Supports all message formats of EnOcean Equipment Profile (EEP) 2.1.
- Compatible with EnOcean Serial Protocol 3 (ESP3).
- Offers programmable repeater (1/2 Level).

COMPATIBLE DEVICES:

Any EnOcean Alliance enabled device which conforms to the EnOcean Equipment Profile (EEP) is compatible with the WSCOM tool. This includes but is not limited to 3 & 5 wire relays, room controllers, thermostats, occupancy sensors, wall box receiver switches, unpowered switches, and light sensors made by Leviton as well as other EnOcean Alliance companies which support EEP 2.0 and above.

EQUIPMENT NEEDED FOR INSTALLATION:

- Desktop/laptop/notebook PC or similar USB Enabled Device.
- DolphinView Basic (minimum) or other Third Party Software.

DolphinView Basic System requirements:

Windows® XP, Windows® Vista or Windows® 7;
.NET Framework 3.5 installed;
CPU 1.5GHz, 1 GB RAM, 200 MB Disc Space;
Screen resolution 1280x768 with DirectX 9 support.

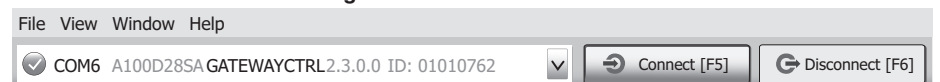
- FTDI Drivers (Included with DolphinView).
- USB Extension Cable (Optional).

INSTALLATION:

This installation guide concentrates on the usage of the WSCOM tool with the EnOcean DolphinView Basic software package. DolphinView Basics allows for signal monitoring of transmitted wireless telegrams. In order to transmit telegrams or utilize Remote Management features the DolphinView Advanced or other third party software package will be required. See details at the bottom of this documentation for these other software options.

1. Make sure the WSCOM tool is not plugged into the PC.
2. Download DolphinView Basic from Leviton: www.leviton.com/LevNetRF/DolphinViewBasic
3. Install DolphinView Basic 3.2.1.0 or newer on your Windows® PC. Be sure to accept all selections: Uninstall previous DolphinView, Create desktop icon, and Update or install FTDI drivers version 2.08.02 (or newer).
4. Restart your PC after installation is complete.
5. Start DolphinView.
6. Plug in the LevNet RF USB computer link. When first plugging in the WSCOM tool the red power LED will turn ON while the amber and green LED will blink twice at the same time. This signals the device has received power, booted up, and is working properly.
7. The WSCOM Tool should automatically be detected by the Windows® XP/7 PC and any new drivers required will be installed.
 - It is important to allow Windows® to search for software. This is a process that can take up to 2 minutes. Both a USB Com Port Driver and USB Serial Port Driver will be installed.
 - **Note:** If the driver fails to install, a manual install of the FTDI driver maybe required. Refer to the troubleshooting section towards the end of this document for more details.
8. In the drop-down area next to Connect [F5] select the COM PORT that shows the "GATEWAYCTRL" device with the green check mark (figure 1).
9. Click Connect [F5] and the DolphinView software will now be able to access the WSCOM USB tool.
 - Any 315MHz EnOcean telegram transmitted will appear in the Telegram Log at the bottom of screen.
10. Use an unpowered switch (WSS0S) or similar transmitter to verify EnOcean telegrams are being received and the WSCOM tool is working properly.

Figure 1. COM Port connection



DEVICE STATUS LED'S:

- Red power LED: Device is being power from host.
- Amber receive LED: Device received a wireless telegram.
- Green transmit LED: Device transmitted a wireless telegram (**Transmit is not available with DolphinView Basic**).

PRODUCT USAGE:

With software and the device plugged into a PC the LevNet RF computer link (WSCOM) can be used in the following ways:

- As a communication gateway between EnOcean enabled devices.
- For monitoring and logging a site having EnOcean enabled devices.
- For testing new or pre-existing installs.
- As a repeater.

COMMUNICATION GATEWAY USAGE:

Utilizing a third party software package and the WSCOM tool opens the door to wireless control of all devices within range of the centrally controlled Gateway PC. In this environment the WSCOM tool and accompanying software can simulate all transmitting devices within range and then can be learned into all receiving devices. This situation allows for the Gateway PC, if desired, to monitor and handle all of the lighting controls.

MONITORING AND LOGGING:

The WSCOM tool can be connected to a PC in an office and that PC can be utilized to monitor the lighting within a small office. This is most useful in conjunction with wireless occupancy sensors to determine a room's occupancy over the course of a day, week, or month. It can also be used to determine if sensors are false tripping (turning on when they shouldn't) in order to adjust their sensitivity.

TESTING NEW OR PRE-EXISTING INSTALLS:

Perhaps the best usage for the WSCOM device is enabled by using the DolphinView Basic software to perform a site survey:

- Checking signal strength (dBm level and sub-telegrams) of packets transmitted.
- Verifying if devices are transmitting (occupancy sensors) with proper signal strength. The WSCOM should be located close to the receiving device.
- Validating an install is working properly by logging a rooms data over several days.

ENABLING REPEATER:

The repeater function is useful for sites where devices are installed within a reasonable range of one another (<100ft) but encounter RF/EMI or other wireless interference which degrades the transmission of signals. Those sites with poor signal quality (refer to Device Performance section below) between transmitter and receiver can use the WSCOM device to determine best location of repeater. This would require enabling one WSCOM device as a repeater and using another device to monitor the received signal near the transmitter.

Enabling the repeater of the WSCOM device requires usage of the DolphinView Advanced or other software tool with access to the Telegram Transmit function. When using with DolphinView Advanced open up the "Telegram Transmit" tab (use drop-down menu under the EnOcean logo if not seen).

- Click the "+ Add Operation" tab.
- From the drop-down menu select "Send Serial: ESP3 Packet"
- Level 1 Repeater: Type 05, Data: 09, 01, 01
- Level 2 Repeater: Type 05, Data: 09, 01, 02
- Click on the "Executed selected" to enable the repeater of a device.
- To disable the repeater: Type 05, Data: 09, 00, 00

A repeater will show up on the receive side as an increase in Sub-telegrams transmitted and also as bit changes in the last four bits of the Status Byte. A Level 1 Repeater only repeats the original transmitted message. A Level 2 Repeater can re-transmit a repeated message.

ENABLING SUB-TELEGRAMS:

By default Sub-telegrams are enabled on the WSCOM unit when using DolphinView Basic software. When using DolphinView Advanced this feature can be enabled/disabled by accessing the Telegram Transmit function. To do this select Add operation from the drop-down menu and select Sending serial ESP3 packet. To enable sub-telegrams: Type 05, Data: 10, 01, Execute selected. To disable sub-telegrams: Type 05, Data: 10, 00, Execute selected.

The only benefit to disabling sub-telegrams is to reduce the reception of a transmitted message in the case there are many transmissions taking place and some messages are being missed.

DOLPHINVIEW TELEGRAM LOG:

In the DolphinView Basic tool, locate the Telegram Log at the bottom of the page. This log provides telegram packet arrival time, ID of device, RORG (type of device), Data transmitted, Status Byte (repeated info), Signal Strength (dBm), Sub-telegrams, and time difference between last transmission of the same telegram received.

An EnOcean enabled Occupancy Sensor will broadcast a message similar to what is shown in **Figure 2**. The Occupancy Sensor will be a 4BS type package (RORG), an unpowered switch will have an RPS type package, and a window/door sensor will have a 1BS type package. Each of these devices will have a unique ID (1 of 4 billion). The quality of the signal can be determined by the dBm level and sub-telegrams. Typically the PTM240C module used in an occupancy sensor will have a best case dBm of -42dBm and 3 sub-telegrams. As the dBm goes lower (more negative) and the sub-telegrams decrease the signal quality goes down.

Figure 2. DolphinView Telegram Log

Direction	Port	Time	ID	RORG	Data	Status	dBm	Subtel	DestinationID	Security	TimeDif.
→	COM3	15:22:03.107	0001B37C	4BS	FF FF FF FF	00	-76	2	FFFFFFF	🔒	00:01:21.928
→	COM3	15:22:37.632	00015446	4BS	FF FF FF FF	00	-65	4	FFFFFFF	🔒	00:01:05.128
→	COM3	15:22:51.885	0001B37C	4BS	FF FF FF FF	00	-78	2	FFFFFFF	🔒	00:00:48.777
→	COM3	15:22:59.324	0001DE29	4BS	FF FF FF FF	00	-75	3	FFFFFFF	🔒	00:01:04.679
→	COM3	15:23:22.873	00011C5B	4BS	FF FF FF FF	00	-45	3	FFFFFFF	🔒	00:01:39.475

DOLPHINVIEW NODE STATISTICS:

A good way to visually monitor a device is to click on the Node Statistics tab (figure 3). Then click on one of the devices in the Unassigned or Workspace area to monitor the telegram transmission of that device. This will provide a node time-line as well as signal strength of each transmitted signal. The color code represents the quality of the received signal.

DOLPHINVIEW BASIC FEATURES:

Figure 4. Telegram Log Features



In order to apply filters the device ID will need to show up in the Workspace on the left hand side of the screen. Double click a device in the unassigned column and it will be added to the Workspace. With this done we can now apply some filters within the Telegram Log section of DolphinView.

- DolphinView starts an event log anytime it opens. The program will log all data and save it to an XML file. This file can be opened, viewed, sorted, and searched using Microsoft Excel.
- Click on the Direction header (figure 4) to filter direction. By default this shows everything.
- Click on the ID (figure 4) to filter which ID (device) is shown. This is good for isolating an area down to watch what only a few devices are doing. The device ID being filtered must show up in the Workspace column to the left in order to selectively filter devices. By default this shows all devices.
- Click on RORG (figure 4) to sort by the different type of EnOcean packet devices. By default all packet types are shown.
- Click on Status (figure 4) to filter for repeated packets, errors, and others. By default all packets are shown.

Additional details on using DolphinView along with more advanced features can be found through the DolphinView Help tab.

The DolphinView Advanced tool provides for the following additional features over DolphinView Basic:

- Ability to access the transmit telegrams function allowing for serial communication and the sending of radio messages.
- Telegram and sub-telegram analyzer.
- Basic Remote Management Tools.
- Ability to communicate with Dolphin TCM300C chipset and set-up Level 1 and Level 2 repeater modes.

DEVICE PERFORMANCE:

The LevNet RF computer link (WSCOM) along with the DolphinView Basic tool will enable users to determine the quality of transmissions at a given site. When doing a site survey it is important to check the signal level (dBm) and sub-telegrams (Subtel) to determine if they are in an acceptable range. Below is a guideline on signal quality.

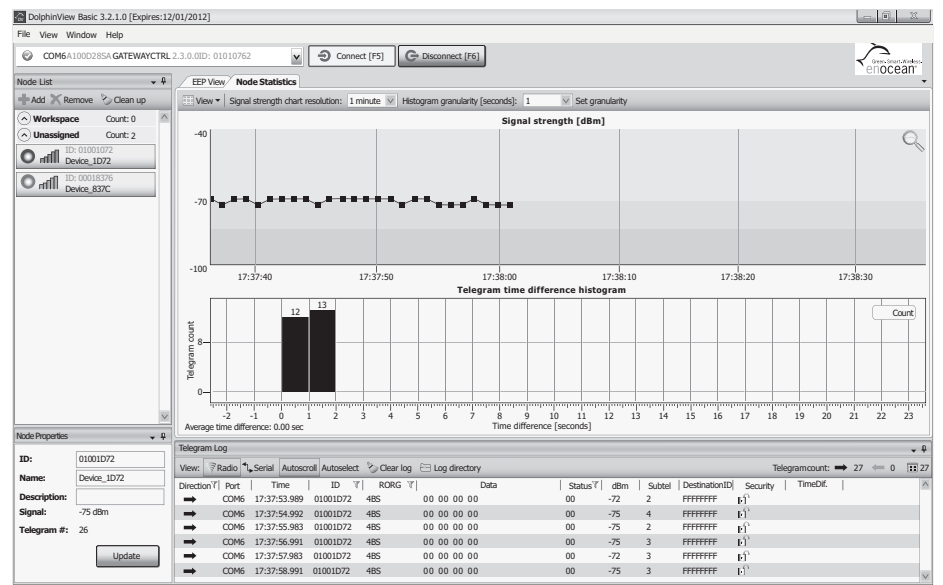
Signal level as seen by the WSCOM device

Color Code	Signal Quality	Signal Level
Green	Excellent	-40 to -50 dBm
Green	Good	-50 to -60 dBm
Green	Okay	-60 to -70 dBm
Yellow	Marginal	-70 to -80 dBm
Red	Poor (may miss telegrams)	< -80 dBm

Sub-telegrams received (including repeated telegrams)

Device Type	Great	Good	Poor
Unpowered Switch/PTM (1BS)	>=4	3	1-2
Sensor/STM (4BS)	>=3	2	1
Transceiver/TCM	>=3	2	1

Figure 3. Node Statistics



TROUBLESHOOTING:

Driver Installation Problems (Device not detected): DolphinView and other 3rd Party software providers will typically install the latest FTDI drivers. If problems are encountered the latest (2.08.14 or newer) Virtual COM Port Drivers (VCP) from FTDI can be installed. Visit www.ftdichip.com/Drivers/VCP.htm for more details along with installation guides. A reboot after installation maybe required. Refer to FTDI AN_104 for Windows® XP installations.

Driver Not Installed: If the driver does not get installed properly and the device is no longer detected when plugging into the PC this will require accessing the Device Manager. Under "Other devices" look for FT232R USB UART or Serial USB, right click and select "Update Driver Software..." If the PC is connected to the internet this should find the proper driver and continue. If automatic updating is disabled on the PC then you may have to go into Windows® Update, Change settings and confirm that "Allow all users to install updates on this computer" is checked. If this still fails then the drive can be uninstalled. The next time the device is plugged in make sure, if using Windows® 7, that Windows® is allowed to automatically download a driver. This allows Windows® to search the internet and install the correct driver. If this fails then the best case is to go to the FTDI chip website and download the latest VCP driver as noted above. A manual search for the driver should allow the install to complete properly.

Marginal-Poor Signal Quality: Reposition the transmitter so the antenna is aligned with the receiving device (ensuring also that the antenna is securely fastened). When re-position of the transmitter or receiver is not possible then repeaters maybe required.

Improving Performance: Metal around or near the antenna will cause signal degradation. Keep these guidelines in mind to increase device operational performance:

- Devices should not be installed near metal or behind metal faceplates.
- Avoid installing sensors on metal ceilings.
- Leviton occupancy sensors should be rotated so that the Leviton logo points towards the receiver.
- Relays and wall box switches installed in a metal single or dual gang electrical switch boxes need to have their antenna outside of the metal enclosure.

Other factors restricting transmission range:

- False ceilings with panels of metal or carbon fiber.
- Lead glass or glass with metal coating, steel furniture.
- Hollow lightweight walls filled with insulating wool on metal foil.
- The distance between EnOcean receivers and other transmitting devices such as computers, audio and video equipment that also emit high-frequency signals should be at least 3ft.

THIRD PARTY SOFTWARE:

Any third party software which supports the EnOcean Serial Protocol V3 (ESP3) can be used. This includes but is not limited to these tools and site gateway packages:

- LevNet RF view - www.leviton.com/LevNetRF/LevNetRFview
- EnOcean DolphinView Basic – www.leviton.com/LevNetRF/DolphinViewBasic
- EnOcean DolphinView Advanced – Contact Leviton technical or sales support for details on this version.
- BSC Software BSC-BOSE Home/Pro/Enterprise - www.bsc-software.com/
- BootUp myHomeControl - www.myhomecontrol.ch/

Leviton is the technical support provider for the LevNet RF view, EnOcean DolphinView Basic and Advanced software packages.

USB EXTENSION CABLE:

A USB cable of 1m or 2m in length can be used for those wanting to extend the USB device away from the target PC or USB host device. This cable needs to be a USB 2.0 A Male to A Female Extension Cable. An example of this is the 2M (P/N 52107) or 1M (P/N 52106) cables available from Cables To Go (www.cablestogo.com).

ANTENNA OPTIONS:

The WSCOM device can be used with the provided 50 Ohm, 0dBi antenna (Wellshow AR026WSG2519N). The following 50 Ohm alternative RP-SMA Monopole Antennas by Antenna Factor have been tested and are acceptable replacements: ANT-315-CW-RCS (-12dBi), ANT-315-CW-RAH (-11dBi), or ANT-315-CW-HWR-RPS (-1dBi).

FCC COMPLIANCE STATEMENT:

Contains FCC ID: QGH-LEV300C

The enclosed device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by Leviton could void the user's authority to operate this equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

SPECIFICATIONS	
Frequency / Range	315MHz / 100-250ft
Modulation Type	ASK (Amplitude Shift Keying)
Operational Temperature	0° to +50°C
Power Consumption	5V @35mA (175mW typical)
Connector	USB Type A
Addressing	Factory set unique ID (1 of 4 billion)
Antenna	315MHz RP-SMA, 50 Ohm, VSRW 2.0 Max, 151.2mm
UL Standard	UL 60950-1 and CSA C22.2 No. 60950-1-07
UL Certification	E228302
Radio Certification	FCC Part 15.231, IC RSS-210 Contains FCC ID (United States): QGH-LEV300C Contains IC (Canada): 2473A-LEV300C

INDUSTRY CANADA COMPLIANCE STATEMENT:

Contains IC: 2473A-LEV300C

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This radio transmitter (2473A-LEV300C) has been approved by Industry Canada to operate with the antenna types listed above under ANTENNA OPTIONS with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

ROHS:

Leviton certifies that to its knowledge the WSCOM-03W is RoHS compliant, conforming to the requirements of "Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment." This declaration is based on Leviton's current understanding of the RoHS Directive and information provided through supplier material declarations pertinent to the ingredients and materials comprising Leviton's product.

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Leviton warrants to the original consumer purchaser and not for the benefit of anyone else that this product at the time of its sale by Leviton is free of defects in materials and workmanship under normal and proper use for two years from the purchase date. Leviton's only obligation is to correct such defects by repair or replacement, at its option, if within such two year period the product is returned prepaid, with proof of purchase date, and a description of the problem to Leviton Manufacturing Co., Inc., Attn: Quality Assurance Department, 201 North Service Road, Melville, New York 11747. This warranty excludes and there is disclaimed liability for labor for removal of this product or reinstallation. This warranty is void if this product is installed improperly or in an improper environment, overloaded, misused, opened, abused, or altered in any manner, or is not used under normal operating conditions or not in accordance with any labels or instructions. There are no other or implied warranties of any kind, including merchantability and fitness for a particular purpose, but if any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to two years. Leviton is not liable for incidental, indirect, special, or consequential damages, including without limitation, damage to, or loss of use of, any equipment, lost sales or profits or delay or failure to perform this warranty obligation. The remedies provided herein are the exclusive remedies under this warranty, whether based on contract, tort or otherwise.

For Technical Assistance Call: 1-800-824-3005 (U.S.A. Only)
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