# **EVK-W262U** Evaluation kit for ODIN-W2 series User Guide

## Abstract

This document describes how to set up the EVK-W262U evaluation kit to evaluate u-blox ODIN-W2 series with UART communication.



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# **1** Introduction

This document describes how to set up the u-blox EVK-W262U evaluation kit to evaluate the ODIN-W2 series modules with UART communication.

# 1.1 Overview

The ODIN-W2 is a compact and powerful stand-alone multiradio module, designed for Internet-of-Things gateway applications. The module includes embedded Bluetooth<sup>®</sup> stack, Wi-Fi driver, IP stack, and an application for wireless data transfer, all configurable using AT commands. The wireless support includes dual-mode Bluetooth v4.0 (BR/EDR and low energy) and dual-band Wi-Fi (2.4 and 5 GHz bands).

The EVK-W262U evaluation kit enables easy evaluation of the u-blox ODIN-W2 series stand-alone IoT gateway modules. All configurations are handled over a single USB interface that provides both power supply and high-speed data transfer thus eliminating the need for an external power supply. A powerful software tool is also included so evaluation can start immediately. The u-blox EVK-W262U evaluation kit is compact and mobile and does not require any cables or extra antennas. Its user friendly interface makes it ideally suited for use in laboratories and vehicles alike.



Figure 1: Overview of EVK-W262U evaluation kit

## 1.1.1 Features

- ODIN-W262 multiradio module with internal antenna
- USB 2.0 connector for virtual COM port interface and power
- 5 LED indicators for status and activity
- Reset button for quick rebooting
- Factory restore button for easy recovery from non-standard settings

## **1.1.2 System requirements**

- PC with USB interface
- Operating system: Windows Vista, 7, 8, and 10
- Internet connection for downloading the FTDI driver



## 1.1.3 Specifications

Parameter	Specification
Serial Interfaces	1 USB 2.0
Dimensions	55.5 x 17.0 mm
Power Supply	5 V through USB
Normal Operating Conditions	-40 °C to +65 °C

Table 1: EVK-W262U specifications

# 1.2 Block diagram



### Figure 2: Block diagram of main components of EVK-W262U

The EVK-W262U evaluation kit uses only one USB interface to communicate with the evaluation software and for power supply. A DC/DC step down voltage converter (U1) supplies the ODIN module with a 3.3 V system voltage. To transform the USB data signals to a common UART interface used by the module, a UART converter chip (U2) is used. To help in the evaluation process, a reset and system restore button is featured as well as five LEDs to indicate system status.

# **1.3 Connectors**

A USB 2.0 compatible serial port is featured for data communication and power supply.

Function	Description	Name
UART over USB	USB Type A connector, power source and interface for sending AT commands	J2

Table 2: Available connectors in EVK-W262U

# 1.4 LEDs

The evaluation board has five LEDs to indicate status of system and communication link. The LEDs LD1 to LD4 are located on the side of the PCB and indicate when the UART signals TXD, RXD, RTS and CTS are active as shown in Table 3. The LD5 is an RGB LED located in the middle of the board that changes color according to the current system mode.



Function	Description	Name	Color
TXD	Blinks when data is being transmitted to the PC	LD2	Yellow
RXD	Blinks when data is being received from the PC	LD1	Green
RTS	Lit when the UART RTS signal is asserted	LD4	Yellow
CTS	Lit when the UART CTS signal is asserted	LD3	Green
Mode	RGB diode indicates the current system mode	LD5	RGB

Table 3: Available LED indicators and their functions

# 1.5 System modes

The ODIN-W2 series modules can enter different modes of operation. The EVK includes an RGB LED to indicate the current mode. See *ODIN-W2 AT Commands manual* **[1]** for more information about the modes.

Mode	Status	RGB LED color
Data mode	IDLE	Green
AT mode	IDLE	Orange
Data or AT mode	CONNECTING <sup>1</sup>	Purple
Data or AT mode	CONNECTED1	Blue

Table 4: Different operational modes

## 1.6 Buttons

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The evaluation board has two push-buttons located at the edge of the PCB as shown in **Figure 1**. Pressing the Reset button will force a reset of the host CPU on the ODIN module. The Restore button will, in combination with a reset, restore the settings of the serial interface and the current AT-configuration to its factory default as

## described in the Restoring default factory settings section.

Function	Description	Name
Reset host	Forced reset of the host CPU	SW1
Restore factory settings / External connect	Restores all the factory settings of the ODIN-W262 module <sup>2</sup> / External input for multiple use, see the ODIN-W2 AT Commands manual [1] for detailed use.	SW2

Table 5: Available push-buttons on the evaluation board

Be careful not to damage the electrical components through electrostatic discharge.

<sup>&</sup>lt;sup>1</sup> The LED will flash in this state indicating data activity

<sup>&</sup>lt;sup>2</sup> Restore function is enabled during startup. After starting up, SW2 is used as External connect. UBX-15020900 - R04



# 2 Getting started

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Internet connection is required for downloading the FTDI driver in the EVK-W262U evaluation kit.

# 2.1 Software installation

The EVK-W262U can be used together with the s-center software tool. The s-center software tool can be downloaded from u-blox website. Download and run the executable. The software components will be installed on your system and placed under the "u-blox" folder in the "Start -> All Programs" menu.

## 2.2 Hardware installation

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Connecting the unit to a USB powered hub is not recommended. The unit may draw more power than the USB hub can supply, thus resulting in a power failure in all connected USB devices.

- 1. Connect the unit to a PC running Microsoft Windows through an empty USB port.
- 2. If connected to the internet, the operating system will install the correct drivers automatically. The drivers will only need to be installed the first time you connect the unit to a new computer.
- 3. A COM port will automatically be assigned to the unit by Windows. On Windows 7, open the Control Panel, click Hardware and Sound and click Device Manager to view the assigned COM ports.

# 2.3 Basic operations using s-center

## 2.3.1 Connect to the ODIN-W2

Start the s-center evaluation software and assigned COM port of the unit using the default settings as mentioned in Table 6. Refer to the *ODIN-W2 User Guide* [4] for more information.

ParameterConfigurationUSB Virtual COM port115200 baud, 8 data bits, no parity, 1 stop bit, hardware flow control

### Table 6: Default settings for the virtual COM port

Connection Type		TCP Conne	ction
Serial Compo	ort Connection	Туре	TCP Client
TCP Connection	on	Client IP	192.168.0.99
Serial		Port	8080
COM Port	COM1	<ul> <li>Select Mod</li> </ul>	e
Baud Rate	115200	<ul> <li>Enter A</li> </ul>	T Mode after Open the Port
Data Bits	8	▼ Vse DS	R to detect AT Mode
Parity	None	•	
Stop Bits	1	•	
Flow Control	CTS/RTS	•	
Log COM Port		<ul> <li>AT Comman</li> </ul>	nd Escape Sequence
Log Baud Rate	Not in use	▼ 1100 +	1100

Figure 3: COM port settings in s-center



## 2.3.2 Using the s-center

Once you establish connection with the COM port, the main screen will be shown. The Basic Connection tab enables you to perform some simple tasks like finding other devices and setting up connections.

The s-center will start up by trying to set the module in AT-Mode. If successful, it will read out the basic information like Bluetooth, Wi-Fi address, and firmware version.

🕐 s-center 0.11.1 - COM73		
File Settings Tools Help		
Basic Connection 👔 Bluetooth Settings 😲 Wi-Fi Settings 🔮 Advanced Connection and Settings	🔙 User Defines	
Find Devices         Bluetooth Inquiry         Low Energy Inquiry         Wi-Fi Scan         Bluetooth Low Energy         Wi-Fi Station         Wi-Fi Access Point         Ethernet         Network Configuration         Connect Peer         spp < spp://	Server Configuration Add 1 • tcp • Remove 5003	er Status letooth Disconnected Address - Wi-Fi Disconnected Channel 0 SSID - twork Status State Network Down Address - Subnet - iateway -
Peer Handle       Disconnect Peer       Enter Data Mode on Connect       Connection Status         Console Window       AT+UWSSTAT=2	Fi	Store Factory rmware Enable AT
Close Port AT Mode Data Mode EDM Mode PPP 0	Reset Clear All	Get All Set All
COM73 115200 8-N-1 HW Flow DSR Off, DTR Off B:78A5042F4B7A "u-blox" "ODIN-W2" Uptime 0 day	y 00:00:11 Firmware 0.12.0, Sep 14 2015,	13:46:27

Figure 4: Main screen in s-center



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## 2.3.3 Get and set configuration

The Get All and Set All are used to get and set a complete configuration to the ODIN-W2.

Nothing will be stored in flash until the *Store* button is clicked. That will store the current configuration into the flash of the ODIN-W2 and will be used when the module starts up after a reset. Some commands like +UWSCA stores the settings without the need of using the *Store* button.

Use the Factory Button if you need a complete reset (of the configuration).

Ie Settings Tools Help   Basic Connection Bluetooth Settings Find Devices Find Devices Serve Bluetooth Inquiry Low Energy Inquiry Wi-Fi Scan Wi-Fi Scan Wi-Fi Scan Wi-Fi Station Wi-Fi Station Wi-Fi Access Point Ethernet Network Configuration Connect Peer Spp:// Default Peer Service Search Spp Spp:// Default Peer Service Search Spp Peer Handle Disconnect Peer Enter Data Mode on Connect Connection Status Connection Status Connect Picer Connect Peer Service Search Spp Vive Stata 2,0 OK Art-UWSSTATe 3 +UWSSTATe 0,10 ERROR Art-UNSTATe 0,100 ERROR Art-UNSTATe 0,100 ERROR	
Basic Connection Bluetooth Settings Wi-Fi Settings Advanced Connection and Settings U Find Devices Bluetooth Inquiry Wi-Fi Scan Bluetooth Low Energy Wi-Fi Station Wi-Fi Access Point Ethernet Network Configuration Connect Peer spp spp:// Default Peer Service Search spp spp:// Default Peer Service Search spp Enter Data Mode on Connect Connection Status Console Window AT+UWSSTAT=2 +UWSSTAT=2 +UWSSTAT=3 +UWSSTAT=3 +UWSSTAT=3 +UWSSTAT=0,10 AT+UNSTAT=0,10 BKROR AT+UNSTAT=0,100 BKROR AT+UNSTAT=0,101 AT+UNSTAT=0,101 BKROR	
Find Devices  Find Devices  Serve  Bluetooth Inquiry  Ken  Wi-Fi Scan  Wi-Fi Station  Wi-Fi Access Point  Ethernet Network Configuration  Connect Peer Service Search Spp Service Search Spp Peer Handle Disconnect Peer Enter Data Mode on Connect Connection Status  Peer Handle Disconnect Peer Enter Data Mode on Connect Connection Status  At-UNSSTAT=2 +UWSSTAT=3 +UWSSTAT=3 +UWSSTAT=0,10  CK  At+UNSTAT=0,100 ERROR At+UNSTAT=0,101 +UNSTAT=0,101 ENTERDED	
Connect Peer spp v spp:// Default Peer Service Search spp v Peer Handle v Disconnect Peer Enter Data Mode on Connect Connection Status Console Window AT+UWSSTAT=2 +UWSSTAT=2 +UWSSTAT=3 +UWSSTAT=3,1 OK AT+UNSTAT=0,10 ERROR AT+UNSTAT=0,100 ERROR AT+UNSTAT=0,101 eRROR AT+UNSTAT=0,101 eRROR	Ver Configuration Add 1 tcp emove 5003 Peer Status Bluetooth Disconnected Address - Wi-Fi Disconnected Channel 0 SSID - Network Status Status
Console Window AT+UWSSTAT=2 +UWSSTAT=2 +UWSSTAT:3,0 OK AT+UWSSTAT=3 +UWSSTAT=0,1 +UMSTAT=0,10 OK AT+UNSTAT=0,10 OK AT+UNSTAT=0,10 ERROR AT+UNSTAT=0,10 AT+UN	IP Address - Subnat Gateway - Store Facto
-UWS3TAT:5,1 OK AT+UNSTAT=0,1 +UNSTAT:0,1,0 OK AT+UNSTAT=0,100 ERROR AT+UNSTAT=0,101 =UNSTAT=0,101	Firmware Enable
OK CK	
Close Port AT Mode Data Mode EDM Mode PPP 0     Data Pump	Reset Clear All Get All Set A

Figure 5: Main screen in s-center



## 2.3.4 Basic Bluetooth operation

### Finding other units

Clicking the Bluetooth Inquiry initiates a search for other Bluetooth devices and the results are shown after 5 seconds.

💽 s-center 0.11.1 - COM73
File Settings Tools Help
Basic Connection 🚯 Bluetooth Settings 🕺 Wi-Fi Settings 🔅 Advanced Connection and Settings
Find Devices
Bluetooth Inquiry
Low Energy Impany
Wi-Fi Scan 🗸
Bluetooth Low Energy Wi-Fi Station Wi-Fi Access Point Ethernet Network Configuration
Connect Peer spp ▼ spp://

Figure 6: Bluetooth inquiry in s-center

### Select device

If the s-center finds some Bluetooth devices, it will be shown in the list as shown in Figure 7.

🕐 s-center 0.11.1	- COM73
File Settings	ools Help
Basic Connection	🛯 🚯 Bluetooth Settings 😱 Wi-Fi Settings 😳 Advanced Connection and Settings
Find Device	s Inquiry 4 Extended Inquiry Result: 3 Devices
Low Energ	y Inquiry 🗸
Wi-Fi	Scan
Bluetooth	Low Energy Wi-Fi Station Wi-Fi Access Point Ethernet Network Configuration
Conne	t Peer spp  spp://

Figure 7: Response to Bluetooth inquiry in s-center



### Connect to device

Select the device you want to connect to and press Connect Peer to establish a connection. If the other device is also an ODIN-W2, it accepts and establishes the connection. If there are other devices, some actions must be taken.

🔁 s-center 0.11.1 - COM73
File Settings Tools Help
Basic Connection 🥹 Bluetooth Settings 🔮 Wi-Fi Settings 🔮 Advanced Connection and Settings
Find Devices
Bluetooth Inquiry Bluetooth Device, RSSI: -55dBm , 000000, 55555555555
Low Energy Inquiry
Wi-Fi Scan
Bluetooth Low Energy Wi-Fi Station Wi-Fi Access Point Ethernet Network Configuration
Connect Peer spp  spp://55555555555
Service Search spp  Name: Bluetooth Device Device Class: Miscellaneous Service Class: No Service found
Peer Handle

Figure 8: Connecting to peer in s-center

## Send data to other device

The easiest way is to enter data mode by clicking the Data Mode button or type ATO1. All the data that is typed in the console window is sent to the other device.

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If ODIN-W2 is in AT-Mode it is unable to send or receive any data.

Console Window AT+UMLA=3 +UMLA:00000000000
OK AT+UBTI +UBTI:22222222222,-18,000000, "Bluetooth Device" +UBTI:C4850882BDCDp,-89,0C0118,""
AT+UBTI + UBTI:222222222222,-17,000000,"Bluetooth Device" + UBTI:C4850882BDCDp,-87,0C0118,"" OK
AT+UDCP=spp://2222222222 +UDCP:0 OK
Close Port AT Mode Data Mode Data Pump
COM5 115200 8-N-1 HW Flow BCB On Dax Off B:11111111111 u-blox

Figure 9: Switching to data mode in s-center



## 2.3.5 Basic Wi-Fi operation

### Finding other units

Clicking the Wi-Fi Scan initiates a search for other Wi-Fi Access Points and the results are shown after about 5 seconds..

Basic Connection 🚯 Bluetooth Settings 🤫 Wi-Fi Settings 🚱 Advanced Connection and Settings
Find Devices
Bluetooth Inquiry 🗸
Low Energy Discovery
Wi-Fi Scan J-blox-hw-lab-open, Channel: 36, RSSI: -48dBm, 0,0,0, D0C2822E1670 -
Divetooth Low Energy Wi-Fi Station Wi-Fi Access Point Ethernet Network Configurations
Connect Peer tcp://192.168.0.1:5003 Default Peer Reflector
Activate Wi-Fi u-blox-hw-lab-open Store Deactivate
List Active Wi-Fi Open 🔻 🗌 Startup 📝 DHCP Client
Peer Handle

Figure 10: Scanning for Wi-Fi Networks in s-center

### Connect to device

Select the Wi-Fi Access Point, enter the SSID, and if needed, enter the Password, and then press Activate Wi-Fi. Wait for the network interface to go up, and make sure an IP Address has been received. Then click Connect Peer to connect a TCP or UDP connection.

Basic Connection 😝 Bluetooth Settings 🥡 Wi-Fi Settings 💮 Advanced Connection and Settings	
Find Devices	
Bluetooth Inquiry -	Connection Status
Low Energy Discovery	Bluetooth: -
Wi-Fi Scan u-blox-hw-lab-open, Channel: 36, RSSI: -48dBm, 0,0,0, D0C2822E1670 🔻	Wi-Fi: Wi-Fi Up
Bluetooth Low Energy Wi-Fi Station Wi-Fi Access Point Ethernet Network Configurations	SSID: u-blox-hw-lab-open Channel: 36
Connect Peer tcp://192.168.0.1:5003 Default Peer Reflector	RSSI: -48 dBm (Excellent)
Activate Wi-Fi u-box-hw-lab-open Store Deactivate	Network Status
List Active Wi-Fi Jopen - Startup VDHCP Client	State: Network Up [0] IP Address: 192.168.0.36
Peer Handle Disconnect Peer Enter Data Startup Data Connection Status	Subnet: 255.255.0.0 Gateway: 192.168.0.1

Figure 11: Activating Wi-Fi, TCP connection, and checking network status in s-center

# 2.4 Further information

See the ODIN-W2 Getting started [4] and ODIN-W2 AT Commands manual [1] for further settings.



# 2.5 Restoring default factory settings

While evaluating, if the current serial interface settings are lost or the interface becomes unresponsive, it might be necessary to perform a factory settings restore. Following the steps mentioned below will result in a complete restore of the settings of the serial interface and the current AT-configuration to factory defaults.

- 1. Press and hold the Restore button (SW2).
- 2. Press once on the Reset button (SW1).
- 3. The system mode LED will turn green. Continue holding the Restore button for around 5 seconds until the system mode LED turns orange.
- 4. Release the Restore button. The serial settings are now restored and the evaluation board is ready for use.



Figure 12: Position of the reset and restore buttons on the evaluation board



# Appendix

# A List of acronyms

Abbreviation / Term	Explanation / Definition
ВТ	Bluetooth
CAN	Controller Area Network
DHCP	Dynamic Host Configuration Protocol
FW	Firmware
GND	Ground
GPIO	General Purpose Input Output
Н	High
I	Input (means that this is an input port of the module)
IEEE	Institute of Electrical and Electronics Engineers
L	Low
LPO	Low Power Oscillator
МІМО	Multi-Input Multi-Output
N/A	Not Applicable
0	Output (means that this is an output port of the module)
PCN / IN	Product Change Notification / Information Note
PD	Pull-Down
PU	Pull-Up
RXD	Receive Data
ТСР	Transmission Control Protocol
TXD	Transmit Data
UART	Universal Asynchronous Receiver-Transmitter serial interface
UDP	User Datagram Protocol
USB	Universal Serial Bus

Table 7: Explanation of abbreviations used



# **Related documents**

- [1] u-blox Short Range Modules AT Commands Manual, Document Number UBX-14044127
- [2] ODIN-W2 series Data Sheet, Document Number UBX-14039949
- [3] ODIN-W2 series System Integration Manual, Document Number UBX-14040040
- [4] ODIN-W2 Getting started, Document Number UBX-15017452

# **Revision history**

Revision	Date	Name	Comments
R01	31-July-2015	ajoh	Initial release.
R02	21-Sep-2015	fbro	Update to Advance Information status.
R03	19-Mar-2016	cmag	Updated document status to Early Production Information. Added Basic Wi-Fi operation (section 2.3.5). Minor changes in section 1.1.
R04	26-May-2017	kgom	Minor updates.



# Contact

For complete contact information visit us at www.u-blox.com.

#### u-blox Offices

#### North, Central and South America

#### u-blox America, Inc.

Phone: +1 703 483 3180 E-mail: info\_us@u-blox.com

#### **Regional Office West Coast:**

Phone: +1 408 573 3640 E-mail: info\_us@u-blox.com

#### Technical Support:

Phone: +1 703 483 3185 E-mail: support\_us@u-blox.com

#### Headquarters Europe, Middle East, Africa

### u-blox AG

Phone: +41 44 722 74 44 E-mail: info@u-blox.com Support: support@u-blox.com

#### Asia, Australia, Pacific

#### u-blox Singapore Pte. Ltd.

Phone:	+65 6734 3811
E-mail:	info_ap@u-blox.com
Support:	support_ap@u-blox.com

#### Regional Office Australia:

Phone:	+61 2 8448 2016
E-mail:	info_anz@u-blox.com
Support:	support_ap@u-blox.com

 Regional Office China (Beijing):

 Phone:
 +86 10 68 133 545

 E-mail:
 info\_cn@u-blox.com

E-mail: info\_cn@u-blox.com Support: support\_cn@u-blox.com

#### Regional Office China (Chongqing):

 Phone:
 +86 23 6815 1588

 E-mail:
 info\_cn@u-blox.com

 Support:
 support\_cn@u-blox.com

#### Regional Office China (Shanghai):

Phone: E-mail: Support: +86 21 6090 4832 info\_cn@u-blox.com support\_cn@u-blox.com

#### Regional Office China (Shenzhen): Phone: +86 755 8627 1083

Phone: E-mail: Support:

info\_cn@u-blox.com support\_cn@u-blox.com

#### **Regional Office India:**

Phone: E-mail: Support:

#### +91 80 4050 9200 info\_in@u-blox.com support\_in@u-blox.com

#### Regional Office Japan (Osaka):

 Phone:
 +81 6 6941 3660

 E-mail:
 info\_jp@u-blox.com

 Support:
 support\_jp@u-blox.com

Regional Office Japan (Tokyo):Phone:+81 3 5775 3850E-mail:info\_jp@u-blox.com

E-mail: info\_jp@u-blox.com Support: support\_jp@u-blox.com

#### Regional Office Korea:

Phone: +82 2 542 0861 E-mail: info\_kr@u-blox.com Support: support\_kr@u-blox.com

#### **Regional Office Taiwan:**

Phone: +8 E-mail: inf Support: su

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