ENERGY INDUSTRIES

ABB Wireless Industrial Network
AWIN GW100
Quick Start Guide – Using Web Browser
ENERGY INDUSTRIES

ABB Wireless Industrial Network
AWIN GW100
Quick Start Guide – Using Web Browser
NOTICE

This document contains information about one or more ABB products and may include a description of or a reference to one or more standards that may be generally relevant to the ABB products. The presence of any such description of a standard or reference to a standard is not a representation that all of the ABB products referenced in this document support all of the features of the described or referenced standard. In order to determine the specific features supported by a particular ABB product, the reader should consult the product specifications for the particular ABB product.

ABB may have one or more patents or pending patent applications protecting the intellectual property in the ABB products described in this document.

The information in this document is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this document.

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

This document and parts thereof must not be reproduced or copied without written permission from ABB, and the contents thereof must not be imparted to a third party nor used for any unauthorized purpose.

This product is designed to be connected to and to communicate information and data via a network interface. It is the User’s sole responsibility to provide and continuously ensure a secure connection between the product and the User’s network or any other network (as the case may be). The User is expected to establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB is not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

The software or hardware described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license.

This product meets the requirements specified in EMC Directive 2004/108/EC and in Low Voltage Directive 2006/95/EC.

TRADEMARKS

Ability is a trademark of ABB.

All rights to copyrights, registered trademarks, and trademarks reside with their respective owners.

Copyright © 2018 ABB.

Release: June 2020

Document Number: 3BND102910

Document Revision: B
# Table of Contents

1 About This Quick Start Guide ............................................................................................................. 7  
   1.1 Document Conventions ................................................................................................................. 7  
   1.2 Terminology ................................................................................................................................. 7  
   1.3 Related Documentation ................................................................................................................ 7  
   1.4 Product Revisions and Compatibility ............................................................................................ 8  
   1.5 Warning, Caution, Information, and Tip Icons .............................................................................. 8  
   1.6 Target Audience ........................................................................................................................... 8  

2 Introduction ......................................................................................................................................... 9  
   2.1 Product Overview .......................................................................................................................... 9  
   2.2 Get Familiar with AWIN GW100 ............................................................................................... 10  

3 Engineering Workflow ....................................................................................................................... 11  
   3.1 Workflow of a WirelessHART Network Engineering ................................................................ 11  

4 Pre-configuration Checklist .............................................................................................................. 12  
   4.1 Hardware Required ...................................................................................................................... 12  
   4.2 Setup Required .......................................................................................................................... 12  

5 Install and Power-up the Gateway .................................................................................................... 13  

6 Enable Connectivity of WirelessHART Devices ............................................................................. 14  

7 Configure WirelessHART Network .................................................................................................. 15  
   7.1 Change Gateway Login Credentials ............................................................................................. 15  
   7.2 Change IP Address ...................................................................................................................... 16  
   7.3 Change WirelessHART Network Credentials .............................................................................. 16  
   7.4 Provide General Details about the Setup ...................................................................................... 17  

8 Validate Modbus Map ...................................................................................................................... 18  

9 Test As-Built System ....................................................................................................................... 19  
   9.1 Verify Connected Devices ............................................................................................................ 19  
   9.2 Connect from Modbus Host ......................................................................................................... 19  

10 Create System Backup .................................................................................................................. 21  
   10.1 Document As-Built System ........................................................................................................ 21
List of Figures

Figure 1: WirelessHART Integration to System 800xA via AC800M Controller or Totalflow RTU........ 9
Figure 2: AWIN GW100 Gateway and its Interfaces ........................................................................ 10
Figure 3: Workflow of WirelessHART Network Engineering .......................................................... 11
Figure 4: Engineering Setup for Configuring AWIN GW100 Gateway ............................................ 12
Figure 5: DIN Mounting of the AWIN GW100 Gateway ................................................................. 13
Figure 6: AWIN GW100 Power Connections and Labels ................................................................. 13
Figure 7: Logs Tab of AWIN GW100 Gateway’s Webpage .............................................................. 19
Figure 8: Field Device Information .................................................................................................. 20
Figure 9: Network Information ......................................................................................................... 20
Figure 10: Create System Backup Functionality in the AWIN GW100 Gateway .............................. 21
Figure 11: Export as Built Functionality in the AWIN GW100 Gateway ......................................... 22
List of Tables

Table 1: Terminology ................................................................................................................. 7
Table 2: Related Documentation ............................................................................................... 8
Table 3: LEDs Information ....................................................................................................... 10
Table 4: Hardware Required ..................................................................................................... 12
Table 5: Data Available on Modbus from AWIN GW100 Gateway and Connected Devices .......... 18
1 About This Quick Start Guide

This quick start guide provides an overview of the minimum steps required to setup a WirelessHART network using AWIN GW100 WirelessHART gateway. The setup can be completed using your web browser only.

1.1 Document Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, and so on.

1.2 Terminology

Table 1 lists terms used in this document and are associated with the ABB Wireless Industrial Network. The reader should be familiar with these terms before proceeding further in this quick start guide.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRS</td>
<td>Minimum Recommended Settings</td>
</tr>
<tr>
<td>TCP</td>
<td>Transmission Control Protocol</td>
</tr>
<tr>
<td>RTU</td>
<td>Remote Terminal Unit</td>
</tr>
<tr>
<td>LED</td>
<td>Light Emitting Diode</td>
</tr>
<tr>
<td>DIN</td>
<td>DIN rails are standard mounting for equipment</td>
</tr>
<tr>
<td>AWIN GW100</td>
<td>Product name of WirelessHART Gateway from ABB</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
</tr>
<tr>
<td>ModbusTCP</td>
<td>Communication protocol</td>
</tr>
<tr>
<td>WirelessHART</td>
<td>IEC 62591 specified wireless communication protocol designed for HART protocol</td>
</tr>
</tbody>
</table>

1.3 Related Documentation

For a complete list of documentation applicable to ABB Wireless Industrial Network, refer to the user manual (3BNP102912). Table 2 lists the AWIN GW100 documents referenced in this quick start guide.
1.4 Product Revisions and Compatibility

For product revisions and compatibility with previous versions of the product, refer to the Release Notes.

1.5 Warning, Caution, Information, and Tip Icons

This document includes Warning, Caution, and Information if/where appropriate to point out safety related or other important information. It also includes Tip to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:

- Electrical warning icon indicates the presence of a hazard, which could result in electrical shock.

- Warning icon indicates the presence of a hazard, which could result in personal injury.

- Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard, which could result in corruption of software or damage to equipment/property.

- Information icon alerts the reader to pertinent facts and conditions.

- Tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all Warning and Caution notices.

1.6 Target Audience

This quick start guide is primarily intended for technical sales personnel, application engineers, system integrators and maintenance personnel within and outside ABB.

This quick start guide does not contain last-minute product information and updates which might affect functionality and/or performance. For information on last revisions, late changes and restrictions, the user shall refer to the relevant release notes.
2 Introduction

Building and operating a WirelessHART network is made easy with ABB’s AWIN GW100 gateway. This guide provides a detailed procedure for setting up a WirelessHART network with AWIN GW100 along with a list of Minimum Recommended Settings (MRS, provided in Section 7) that all projects should consider when establishing and operating a WirelessHART network.

2.1 Product Overview

AWIN GW100 is a WirelessHART gateway that can connect up to 24 WirelessHART devices. It creates and manages WirelessHART network and converts HART data to ModbusTCP data for easy integration to automation controllers, such as System 800xA and Totalflow’s RTU, see Figure 1.

A WirelessHART network comprises of WirelessHART gateway, network manager, security manager, access point and field WirelessHART devices. AWIN GW100 incorporates the functionalities of WirelessHART gateway, network manager, security manager and access point. In short, it is referred to as a WirelessHART gateway.

![Figure 1: WirelessHART Integration to System 800xA via AC800M Controller or Totalflow RTU](image)

Client Server Network

Control Network

Field Network
2.2 Get Familiar with AWIN GW100

Figure 2 shows depiction of the AWIN GW100 WirelessHART gateway.

![AWIN GW100 Gateway and its Interfaces](image)

Figure 2: AWIN GW100 Gateway and its Interfaces

Table 3 shows the LEDs information of AWIN GW100 gateway.

<table>
<thead>
<tr>
<th>LEDs Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>Shows power and device status</td>
</tr>
<tr>
<td>MESH</td>
<td>Reports if WirelessHART devices connected</td>
</tr>
<tr>
<td>LINK</td>
<td>Shows LAN connection status</td>
</tr>
<tr>
<td>DATA</td>
<td>Indicates traffic on LAN port</td>
</tr>
<tr>
<td>ERR</td>
<td>Reports the device error</td>
</tr>
</tbody>
</table>

A HART maintenance port is available as shown in Figure 2 (HART programming tool connector) but is not supported in this release of the gateway firmware.
3 Engineering Workflow

3.1 Workflow of a WirelessHART Network Engineering

To setup a WirelessHART network the following activities are to be conducted:

- Configuration of WirelessHART gateway (AWIN GW100).
- Configuration of WirelessHART field devices.
- Configuration of Modbus registers for the WirelessHART gateway itself.
- Configuration of Modbus registers for WirelessHART devices.

AWIN GW100 gateway has built-in features that can help to simply and easily accomplish these activities. The detailed steps required to achieve them are presented in Figure 3. Once these steps are successfully completed, a standard host system that supports ModbusTCP protocol can read data from the WirelessHART devices including the gateway.

The detailed description of these steps is provided in the following sections. Here, they are presented for reference purpose only. The following sections should be executed in the order they are presented in this document.

Figure 3: Workflow of WirelessHART Network Engineering
4 Pre-configuration Checklist

4.1 Hardware Required

Table 4 shows the hardware required.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Item</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>AWIN GW100 Gateway</td>
<td>1</td>
<td>WirelessHART Gateway.</td>
</tr>
<tr>
<td>H2</td>
<td>WirelessHART Devices</td>
<td>1 (minimum)</td>
<td>Up to 24 devices can be connected. Devices can be: • WirelessHART instruments. • WirelessHART adapters.</td>
</tr>
<tr>
<td>H3</td>
<td>Engineering Workstation</td>
<td>1</td>
<td>PC for network configuration.</td>
</tr>
<tr>
<td>H4</td>
<td>Modbus Host</td>
<td>1</td>
<td>Up to 4 hosts can be connected. This can be a PLC or an automation controller.</td>
</tr>
<tr>
<td>H5</td>
<td>Ethernet Cables</td>
<td>1 (minimum)</td>
<td>For connecting Ethernet devices.</td>
</tr>
<tr>
<td>H6</td>
<td>Power Supply</td>
<td>1</td>
<td>Power supply for AWIN GW100 gateway.</td>
</tr>
<tr>
<td>H7</td>
<td>Ethernet Switch with Power Supply</td>
<td>1 (optional)</td>
<td>For connecting gateway to the controller.</td>
</tr>
</tbody>
</table>

4.2 Setup Required

To configure a WirelessHART network, any one of the following two setups can be used (as shown in Figure 4):

Setup1 [Figure 4(a)] - Direct connection of the AWIN GW100 to a PC.

Setup2 [Figure 4(b)] - Connection of the AWIN GW100 to a PC via Ethernet Switch. This setup is required for communication to control systems and RTUs. Engineering workstation is only required for configuration and can be removed afterwards.
5 Install and Power-up the Gateway

Follow the health and safety guidelines provided in the User Manual (3BNP102912) of AWIN GW100 gateway before installing, connecting and powering up the gateway.

Gateway should be installed on a DIN rail as shown in Figure 5.

Figure 5: DIN Mounting of the AWIN GW100 Gateway

AWIN GW100 is supplied with a test antenna, which should be mounted on the antenna connector. It should be installed vertically.

Connect power to AWIN GW100 Gateway, as shown in Figure 6. Recommended supply voltages are 12V DC or 24V DC. Refer to product datasheet (3BNP102906) or current ratings on the gateway’s side panel for details.

When powered-up, LEDs should blink, and ST LED should turn into solid green color after successful bootup. Power connectors are in the bottom of the unit whereas the power connection labels are printed on the front.

Electrical installation should be carried out only by qualified electricians.
6 Enable Connectivity of WirelessHART Devices

Some WirelessHART devices go into sleep mode if left un-operated over a long period. To force them to join the WirelessHART network will require a trigger such as a battery power cycle. It is different for each device, for some devices when a battery is inserted the device initiates the joining procedure. In other devices, there is a menu option. Refer to individual device’s User Manual for details.

Just as an Example:
For ABB WirelessHART temperature device (TTF300-W):
- Switch on the LCD display by “pressing down the button” on the backside of the transmitter.
- Select join now from the menu, Communication > Join now.

For ABB WirelessHART pressure instrument (2600T):
- Switch on the LCD display by “pressing down the Z button” on the top of the transmitter.
- Select join now from the menu, Network Setup > Join Mode > Join now.

This section does not contain last-minute product information and up-dates which might affect functionality. For information on last revisions, late changes and restrictions, the user shall refer to the relevant release notes and user manuals.

Default Network ID and Join Key of ABB WirelessHART Gateway (AWIN GW100) and ABB WirelessHART transmitters are same:
- Network ID: 0xABB (HEX)
- Join Key: 57495245 4C455353 4649454C 444B4559

The WirelessHART instruments should be in communication range of the WirelessHART gateway during this step.

In this section, the discussion is limited to ABB WirelessHART instruments only. For non-ABB WirelessHART instruments, the Network ID and Join Key should be changed accordingly.
7 Configure WirelessHART Network

7.1 Change Gateway Login Credentials

1. Log onto the AWIN GW100 gateway webpage by typing the following in the web browser: https://172.16.16.1

   **Note:** The computer you are trying to logon from must be on the same subnet. The subnet mask is 255.255.252.0.

   If a website security certificate warning appears then select continue to the website.

2. Login to the webpage using the admin account.

   Use the following account credentials:
   - **User name:** admin
   - **Password:** admin

3. Change admin and monitor accounts passwords. To do so, browse to Configuration > Usernames/Passwords.

   **Notes:**
   - If needed, you can even change the usernames.
   - Admin account privileges are required for accessing configuration options.
   - Monitor level privileges are required for accessing monitoring screens – read only.

   This document assumes that the admin user name is unchanged.
7.2 Change IP Address

1. Log onto the AWIN GW100 gateway as admin.

2. Browse to Configuration > Network Interface > IP Configuration.

3. Enter the desired IP Address and LAN subnet mask and select submit button.

Notes:
- After a new static IP address is assigned and submitted the web browser will automatically redirect the web browser session to the newly assigned IP address and the user will have to login again.
- If DHCP is used for assigning IP address then no redirection takes place. User needs to logon to the DHCP server to find out the newly assigned IP address of the gateway. Use this new IP address to log back on the gateway.

7.3 Change WirelessHART Network Credentials

1. Log onto the AWIN GW100 gateway as admin.

2. Verify that WirelessHART devices are connected to the gateway. To do so, browse to Configuration > WirelessHART > Devices. If Section 4 - Pre-configuration Checklist and Section 5 - Install and Power-up the Gateway were completed beforehand and wireless devices are in the range of the wireless gateway then they should appear in the Devices Information page. Continue when the devices are shown connected.
3. Change WirelessHART Network ID and Join Key to project specific settings. To do so, browse to Configuration > WirelessHART > Network Configuration and select Accept Common Join Key option. Afterwards, enter the new desired WirelessHART Network ID and Join Key followed by selecting Migrate Network button. The gateway will automatically migrate the entire network (i.e. itself and connected devices) to new user defined network credentials.

Note: During this time, the devices will leave the network and rejoin afterwards. Wait until the devices rejoin.

7.4 Provide General Details about the Setup

1. Log onto the AWIN GW100 gateway as admin.

2. Browse to Configuration > General and enter the required information on the page. As a minimum, provide the Device Name, Long Tag, New Time and New Date. If time is to be synced to NTP server then provide the server IP address and hit sync button. Let it complete. Afterwards, select submit button.
# 8 Validate Modbus Map

1. Log onto the AWIN GW100 gateway as admin.

2. Browse to Configuration > Modbus > Modbus Mappings. Here you can see the Modbus holding registers automatically assigned by the gateway to WirelessHART network statistics, referred to as Key Performance Indicators (KPIs), and the data from the connected WirelessHART devices.

Note: For details on manual Modbus mapping refer to the User Manual (3BNP102912).

Table 5 shows the data that is automatically mapped in the Modbus registers. For detailed description of the parameters refer to the User Manual (3BNP102912).

Table 5: Data Available on Modbus from AWIN GW100 Gateway and Connected Devices

<table>
<thead>
<tr>
<th>Target Device</th>
<th>Parameter</th>
<th>Register Length</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway</td>
<td>Reliability</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Gateway</td>
<td>Stability</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Gateway</td>
<td>Latency</td>
<td>2</td>
<td>Unsigned 32-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>Packets Lost Upstream</td>
<td>2</td>
<td>Unsigned 32-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>Gateway Time</td>
<td>2</td>
<td>Unsigned 32-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>Data Age</td>
<td>1</td>
<td>Unsigned 16-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>Status</td>
<td>1</td>
<td>Unsigned 16-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>WirelessHART Device Count</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>Total Device Count</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Gateway</td>
<td>Live Device Count</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>Loop Current</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Device</td>
<td>PV</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Device</td>
<td>SV</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Device</td>
<td>QV</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Device</td>
<td>TV</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Device</td>
<td>PVStale</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>SVStale</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>QVStale</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>TVStale</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>Device Status</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>Battery Life</td>
<td>2</td>
<td>Floating Point</td>
</tr>
<tr>
<td>Device</td>
<td>Device Variable Codes</td>
<td>8</td>
<td>8 Unsigned 16-bit Integers</td>
</tr>
<tr>
<td>Device</td>
<td>Extended Device Status</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>Communication Status</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
<tr>
<td>Device</td>
<td>Number of WirelessHART Neighbors</td>
<td>1</td>
<td>Unsigned 8-bit Integer</td>
</tr>
</tbody>
</table>
9  Test As-Built System

Before proceeding, it is recommended to disable webpages caching in the web-browser being used. This is to ensure that the web-browser shows the correct and current information from the gateway. The data is refreshed automatically approximately every 30s on the webpages.

9.1  Verify Connected Devices

After successful completion of previous sections, log onto the AWIN GW100 gateway’s webpage as “monitor” user. Default log in details are:

**User:** monitor  
**Password:** monitor

- Check that the gateway is operating as normal as shown through the traffic lights on the “Home” page.
- Check that all devices have joined the network in “Field Devices” tab and communicating.
- Check that the WirelessHART network statistics is available in “Network Information” tab.

**Note:** The user must wait at least 15 minutes before the network statistics appear first time.

- Check if there are any alarms and warnings reported in the “Logs” tab. If so, fix them.

![Figure 7: Logs Tab of AWIN GW100 Gateway’s Webpage](image)

9.2  Connect from Modbus Host

Any ModbusTCP based host system, such as, Totalflow RTU or AC800M controller can now communicate with the AWIN GW100 gateway and read connected devices data.

The host system should also map Modbus registers as configured in AWIN GW100 gateway. See section **Validate Modbus Map** for procedure on how to view the registers mapped in the gateway.

- The gateway only supports holding registers and function code 3 (read holding registers).
- Trying to read unmapped registers will result in exception notification.
- Byte order is in Big Endian format.
- AWIN GW100 gateway’s default Modbus ID is 255.
Cross check the data presented on the following two pages (shown in monitor account) matches that what is read through Modbus registers.

- Field Devices page (Figure 8)
- Network Information page (Figure 9)

Figure 8: Field Device Information

Figure 9: Network Information
10 Create System Backup

- Log onto the AWIN GW100 gateway’s webpage as admin user.
- Go to Configuration > Store Retrieve Settings.
- Type a Passphrase and Click Save Configuration To File button. Store this generated gateway configuration file. Remember to note passphrase, it is required when restoring gateway to backup configuration.

In this firmware release, Gateway backup configuration file does not store Modbus map explicitly. It must be backed up separately. For the procedure, refer to the User Manual (3BNP102912).

10.1 Document As-Built System

- Log onto the AWIN GW100 gateway’s webpage as admin user.
- Go to Configuration > Store Retrieve Settings.

Click Export as Built button (See Figure 11). Store this generated file. It provides a text document with current setup details.
Figure 11: Export as Built Functionality in the AWIN GW100 Gateway
Visit us

www.abb.com/oilandgas