IoT Wireless I/O Solutions

Providing IoT Wireless Smart Devices with Direct Cloud Accessibility

Publishing

Processing

Acquisition

ADVANTECH

WISE-4060

I/O	#	TYPE
DI	4	Dry Contact
		Wet Contact
RL	4	Form A

IP:

Status/Com
AP/Infra

DI 0 · DI 1 · DI 2 · DI 3 · DI COM · RL0+ · RL0- · RL1+ · RL1- · RL2+ · RL2- · RL3+ · RL3- · +Vs · -Vs

B+B SMARTWORX

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Selection Guide

IoT Wireless I/O

Model		WISE-4012E	WISE-4012	WISE-4050	WISE-4060
Description		6-ch Input/Output IoT Wireless I/O Module for IoT Developer	4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module	4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module	4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module
Wireless Network	IEEE Standard	IEEE 802.11b/g/n			
	Frequency Band	2.4GHz			
	Network Mode	Limited AP, Infrastructure			
	Wireless Security	WPA2 Personal, WPA2 Enterprise			
	Antenna Connector	Reverse SMA			
	Outdoor Range	100m			
Analog I/O	Channels	2	4	-	-
	Resolution	12-bit	16-bit	-	-
	Accuracy	1% of FSR	0.1% of FSR	-	-
	Sampling Rate	10Hz/Channel	10Hz/Total	-	-
	Voltage Input	0~10V	0~5V, 0~10V, ±5V, ±10V	-	-
	Current Input	-	0~20mA, 4~20mA	-	-
	Digital Input	-	Dry Contact	-	-
Digital I/O	Input Channel	2 (Dry Contact)	-	4	4
	Output Channel	2 (Form A Relay)	2	4	4 (Form A Power Relay)
	Counter Input	-	-	3k Hz	3k Hz
	Frequency Input	-	-	3k Hz	3k Hz
	Pulse Output	-	1k Hz	1k Hz	1 Hz
Isolation Protection		No	3,000 V_{rms}	3,000 V_{rms}	3,000 V_{rms}
LED Indicator		Status, Comm, Mode, Wireless Signal			
Power Requirement		5V_{DC} Micro-B USB	10~30V_{DC} (24V_{DC} Standard)	10~30V_{DC} (24V_{DC} Standard)	10~30V_{DC} (24V_{DC} Standard)
Power Consumption		2.5W @ 5V_{DC}	2.5W @ 24V_{DC}	2.2W @ 24V_{DC}	2.5W @ 24V_{DC}
Operating Temperature		-25 ~ 70℃ (-13~158°F)			
Storage Temperature		-40 ~ 85℃ (-40~185°F)			
Operating Humidity		20 ~ 95% RH (Non-condensing)			
Storage Humidity		0 ~ 95% RH (Non-condensing)			

Dimensions for WISE-4000 Series

Unit: mm

Front View

Side View

Mounting Kit

IoT Gateway Sensor Hub

Coming soon — IoT Gateway | Wi-Fi Sensor Hub | Coming soon — ZigBee Sensor Hub | Coming soon — Cellular Sensor Hub

Model	WISE-5000	WISE-4220	WISE-4230	WISE-4273
CPU / MCU	Intel Quark 400Mhz	ARM Cortex M4	ARM Cortex M4	ARM Cortex M4
Connectivity	2x LAN, 2x COM, 2x USB, 3G / Wi-Fi / Zigbee by mPCIs	IEEE 802.11b/g/n 2.4GHz	IEEE 802.15.4 2.4GHz	• 900/2100 MHz for WCDMA network • 900/1800 MHz for EDGE/GPRS/GSM network
Operation Temperature	-20~60ºC	-25~70ºC	-25~70ºC	-25~70ºC
Dimension (W x H x D)	70 x 90 x 100 mm	80 x 139 x 25 mm	80 x 139 x 25 mm	80 x 139 x 25 mm

Sensor Board

	Indoor Environment	Data Center Enclosure	Water Leak Detection	Control Room Status	Power Unit Monitoring
Model	WISE-S110	WISE-S210	WISE-S220	WISE-S230	WISE-S240
Sensor Type	Temperature / Humidity / Pressure	Temperature / Humidity / RTD / On-Off	Temperature / Humidity / Water Leak	Temperature/ Humidity / RS-485 / On-Off	Temperature / Humidity / Analog Input

IoT Ethernet I/O

Model		WISE-4010/LAN	WISE-4050/LAN	WISE-4060/LAN
Description		4-ch Current Input and 4-ch Digital Output IoT Ethernet I/O Module	4-ch Digital Input and 4-ch Digital Output IoT Ethernet I/O Module	4-ch Digital Input and 4-ch Relay Output IoT Ethernet I/O Module
Analog I/O	Channels	4	-	-
	Resolution	12-bit	-	-
	Accuracy	±0.2% of FSR	-	-
	Sampling Rate	10/100Hz/Channel	-	-
	Current Input	0~20 mA, 4~20 mA	-	-
Digital I/O	Input Channel	-	4	4
	Output Channel	4	4	4 (Form A Power Relay)
	Counter Input	-	3k Hz	3k Hz
	Frequency Input	-	3k Hz	3k Hz
	Pulse Output	1k Hz	1k Hz	1 Hz
Isolation Protection		No	3,000V$_{rms}$	3,000V$_{rms}$
LED Indicator		Status, Comm		
Power Requirement		10 ~ 30V$_{DC}$ (24V$_{DC}$ Standard)		
Power Consumption		1.2W @ 24V$_{DC}$	2.2W @ 24V$_{DC}$	2.5W @ 24V$_{DC}$
Operating Temperature		-40 ~ 70°C (-40~158°F)		
Storage Temperature		-40 ~ 85°C (-40~185°F)		
Operating Humidity		20 ~ 95% RH (Non-condensing)		
Storage Humidity		0 ~ 95% RH (Non-condensing)		

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WISE-4000 Series

IoT Wireless I/O Module

Main Features

- 2.4 GHz IEEE 802.11b/g/n WLAN
- Supports both wireless client and server modes that can be accessed directly without AP or router
- Supports mobile device web configuration with HTML5 without the platform limitation
- Supports file-based cloud storage (preliminary) and local logging with RTC time stamp
- Supports RESTful web API in JSON format for IoT integration
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP
- Supports 10~30V$_{DC}$ power with reverse protection
- Supports 3000 Vrms isolation protection with dual watchdog timer for system and communication

Introduction

The WISE-4000 series provide a cost-effective wireless solution for cloud applications. By supporting direct cloud access, new web services and datalogs, the WISE-4000 series can seamlessly connect to the cloud for a wireless solution.

Specifications

Universal Input

- **Channel**   WISE-4012: 4
- **Resolution**   16-bit
- **Sampling Rate**   Universal Input   10Hz (Total)
  - Digital Input   2Hz (Per Channel)
- **Accuracy**   ±0.1% of FSR (Voltage)
  - ±0.2% of FSR (Current)
- **Input Type and Range**
  - Analog Input   ±150mV, ±500mV, ±1V, ±5V, ±10V, 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA
  - Digital Input   Dry Contact 0: Open,   1: Close to GND
- **Input Impedance**   > 10M Ω (Voltage)
  - 120 Ω (External resistor for current)
- **Over Voltage Protection**   ±35 V$_{DC}$
- **Burn-out Detection**   Yes (4~20 mA only)
- **Supports Data Scaling and Averaging**

Digital Input

- **Channels**   WISE-4050: 4
  - WISE-4060: 4
- **Logic level**   Dry Contact 0: Open
  - 1: Close to DI COM
  - Wet Contact 0: 0 ~ 3 V$_{DC}$ (0.8 mA max.)
  - 1: 10 ~ 30 V$_{DC}$ (3 mA min.)
- **Isolation**   3,000 V$_{rms}$
- **Supports 3 kHz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports 3 kHz Frequency Input**
- **Supports Inverted DI Status**

Digital Output

- **Channels**   WISE-4012: 2
  - WISE-4050: 4
  - (Open collector to 30 V, 400 mA max. for resistance load)
- **Isolation**   3,000 V$_{rms}$
- **Supports 5 kHz Pules Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Relay Output

- **Channels**   WISE-4060: 4 (Form A)
- **Contact Rating**   250 V$_{AC}$ @ 5 A
  - (Resistive Load)   30 V$_{DC}$ @ 3A
- **Isolation (b/w coil & contacts)**   3,000 V$_{rms}$
- **Relay On Time**   10 ms
- **Relay Off Time**   5 ms
- **Insulation Resistance**   1 GΩ min. @ 500 V$_{DC}$
- **Maximum Switching**   60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Environment

- **Operating Temperature**   -25 ~ 70°C (-13~158°F)
- **Storage Temperature**   -40 ~ 85°C (-40~185°F)
- **Operating Humidity**   20 ~ 95% RH (non-condensing)
- **Storage Humidity**   0 ~ 95% RH (non-condensing)

General

- **WLAN**   IEEE 802.11b/g/n 2.4GHz
- **Outdoor Range**   110 m with line of sight
- **Connectors**   Plug-in screw terminal block (I/O and power)
- **Watchdog Timer**   System (1.6 second) and Communication (programmable)
- **Certification**   CE, FCC, R&TTE, NCC, SRRC, RoHS
- **Dimensions (W x H x D)**   80 x 148 x 25 mm
- **Enclosure**   PC
- **Mounting**   DIN 35 rail, wall, and stack
- **Power Input**   10 ~ 30 V$_{DC}$
- **Power Consumption**   WISE-4012: 2.5 W @ 24 V$_{DC}$
  - WISE-4050: 2.2 W @ 24 V$_{DC}$
  - WISE-4060: 2.5 W @ 24 V$_{DC}$
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**
- **Supports Data Log Function**   Up to 10000 samples with RTC time stamp
- **Supported Protocols**   Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Ordering Information

- **WISE-4012**   4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module
- **WISE-4050**   4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module
- **WISE-4060**   4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module

Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output
WISE-4012	4		2	
WISE-4050		4	4	
WISE-4060		4		4

IoT Wireless I/O Modules Key Features

DNA of IoT I/O and Sensing Devices

Advantech's new generation of remote I/O devices bring an IT oriented spirit to the market. With the advanced concepts of data A-P-P, data Acquisition, data Processing to data Publishing, fulfilling mobile monitoring and controlling needs under an IoT framework.

When acquiring the data, Advantech's WISE-4000 series offer high compatibility with sensors in the market in different format with I/O channel types and amounts. Broad adoptability has made WISE a reliable source of big data which benefits users in identifying their next steps and which action to take. With intelligent processing and publishing features, the time it takes to generate insightful reports can be shortened. Thus users can quickly notice and identify possible issues and system downtime can be minimized or even avoided.

DNA 1 ▶ Data Acquisition

Highly Compatible

High compatibility with sensors in different formats and with different I/O channel types and amounts

Robust Protection

The wide operating temperature with isolation protection ensures it can be deployed in even more environments
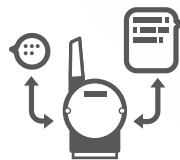
Easy Installation

New industrial design for quick hardware installation and new interface for module configuration

DNA 2 ▶ Data Processing

Data Logging

Data can be logged on WISE-4000 modules with time stamp for up to 10,000 samples

10,000 Samples

Data Conditioning

Built-in local intelligence includes filtering, scaling and several other several logic rules

Web Configuration

With a HTML web server, all the modules can be accessed for configuration and troubleshooting from any device with a browser

DNA 3 ▶ Data Publishing

Cloud Access

WISE-4000 can transmit the data to the cloud without using a gateway

RESTful Web Service

With RESTful web service, the I/O module can seamlessly integrated with IT system

Direct Access

Mobile devices can connect to WISE models via Wi-Fi, without needing any other devices in between

WISE-4012

4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module

Main Features

NEW

- 4-ch universal input and 2-ch digital output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

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Introduction

The WISE-4000 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4000 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be published to the cloud with security at anytime and anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.

HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.

RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved by internet media types like JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).

Wi-Fi WPA2 Encryption

HTTPS Secure Socket

User Authorized and White List

HTTPS

Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.

10,000 Samples

25°C 0405 14:20

28°C 0405 11:20

Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also been pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.

batch
push

File-based Public Cloud

Private cloud

Specifications

Universal Input

- **Channels** 4
- **Resolution** 16-bit
- **Sampling Rate** Universal Input 10Hz (Total)
  Digital Input 2Hz (Per Channel)
- **Accuracy** ±0.1% of FSR (Voltage)
  ±0.2% of FSR (Current)
- **Input Type and Range**
  Analog Input ±150mV, ±500mV, ±1V, ±5V, ±10V,
  0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V,
  0~20mA, 4~20mA, ±20mA

  Digital Input (Dry Contact) 0: Open, 1: Close
- **Input Impedance** > 10M Ω (Voltage)
  120 Ω (External resistor for current)
- **Over Voltage Protection** ±35 V_{DC}
- **Burn-out Detection** Yes (4~20mA only)
- **Supports Data Scaling and Averaging**

Digital Output

- **Channels** 2
  (Open collector to 30 V, 400 mA max.
  for resistance load)
- **Isolation** 3,000 V_{rms}
- **Supports 5 kHz Pules Output**
- **Supports High-to-Low and Low-to-High Delay Output**
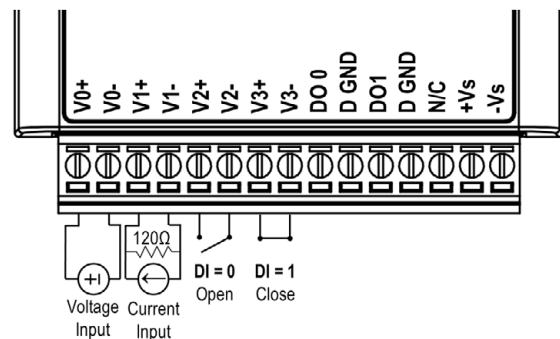
General

- **WLAN** IEEE 802.11b/g/n 2.4GHz
- **Outdoor Range** 110 m with line of sight
- **Connectors** Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** System (1.6 second) and
  Communication (programmable)
- **Certification** CE, FCC, R&TTE, NCC, SRRC, RoHS, KC
- **Dimensions (W x H x D)** 80 x 148 x 25 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, and stack
- **Power Input** 10 ~ 30 V_{DC}
- **Power Consumption** 2.5 W @ 24 V_{DC}
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**
- **Supports Data Log Function** Up to 10000 samples with RTC time stamp
- **Supported Protocols** Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP

- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

Environment

- **Operating Temperature** -25 ~ 70°C (-13~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

Pin Assignment

Ordering Information

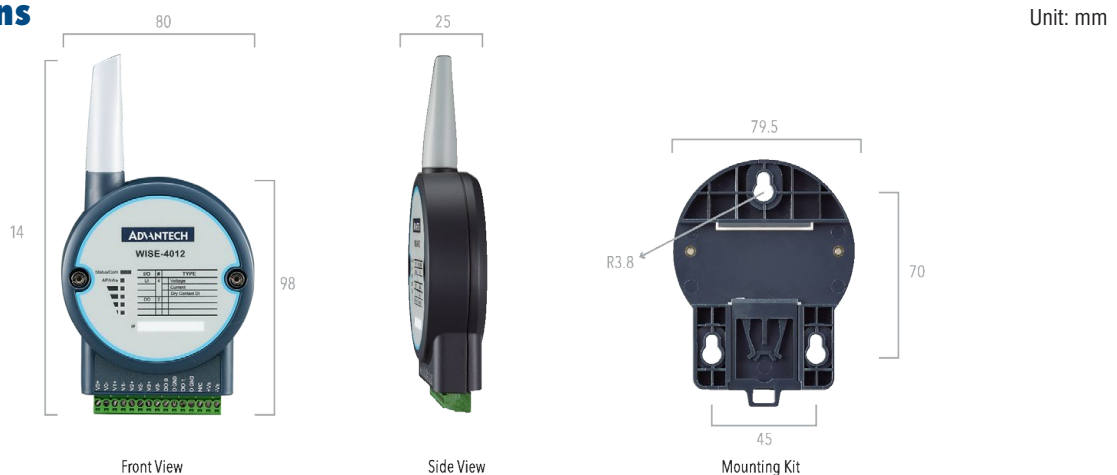- **WISE-4012-AE** 4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module

Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- **PWR-242-AE** DIN-rail Power Supply (2.1A Output Current)
- **PWR-243-AE** Panel Mount Power Supply (3A Output Current)
- **PWR-244-AE** Panel Mount Power Supply (4.2A Output Current)

Dimensions

Unit: mm

Front View

Side View

Mounting Kit

WISE-4050

4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module

Main Features

- 4-ch digital input and 4-ch digital output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

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Introduction

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Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.

HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.

RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved by internet media types like JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).

Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.

Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also been pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.

Specifications

Digital Input

- **Channels** — 4
- **Logic Level** — Dry Contact 0: Open
  1: Close to DI COM
  Wet Contact 0: 0 ~ 3 V_{DC}
  1: 10 ~ 30 V_{DC} (3 mA min.)
- **Isolation** — 3,000 V_{rms}
- **Supports 3 kHz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports 3 kHz Frequency Input**
- **Supports Inverted DI Status**

Digital Output

- **Channels** — 4
  (Open collector to 30 V, 400 mA max. for resistance load)
- **Isolation** — 3,000 V_{rms}
- **Supports 5 kHz Pules Output**
- **Supports High-to-Low and Low-to-High Delay Output**

General

- **WLAN** — IEEE 802.11b/g/n 2.4GHz
- **Outdoor Range** — 110 m with line of sight
- **Connectors** — Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** — System (1.6 second) and Communication (programmable)
- **Certification** — CE, FCC, R&TTE, NCC, SRRC, RoHS, KC
- **Dimensions (W x H x D)** — 80 x 148 x 25 mm
- **Enclosure** — PC
- **Mounting** — DIN 35 rail, wall, and stack
- **Power Input** — 10 ~ 30 V_{DC}
- **Power Consumption** — 2.2 W @ 24 V_{DC}
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**
- **Supports Data Log Function** — Up to 10000 samples with RTC time stamp
- **Supported Protocols** — Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Environment

- **Operating Temperature** — -25 ~ 70°C (-13~158°F)
- **Storage Temperature** — -40 ~ 85°C (-40~185°F)
- **Operating Humidity** — 20 ~ 95% RH (non-condensing)
- **Storage Humidity** — 0 ~ 95% RH (non-condensing)

Pin Assignment
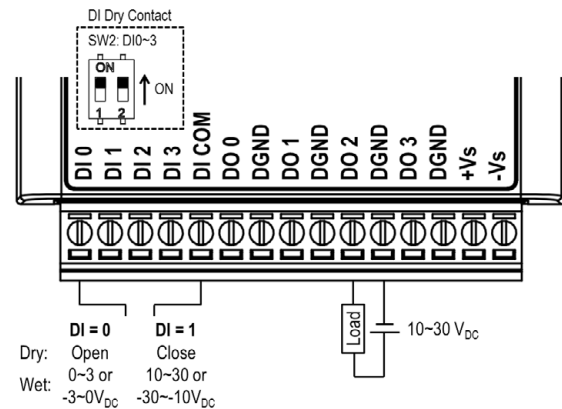
Ordering Information

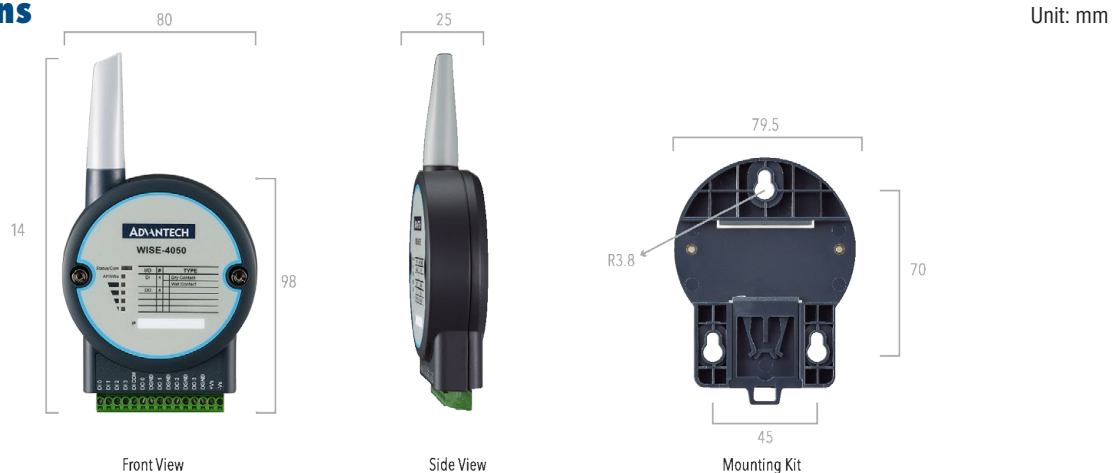- **WISE-4050-AE** — 4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module

Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- **PWR-242-AE** — DIN-rail Power Supply (2.1A Output Current)
- **PWR-243-AE** — Panel Mount Power Supply (3A Output Current)
- **PWR-244-AE** — Panel Mount Power Supply (4.2A Output Current)

Dimensions

Unit: mm

Front View

Side View

Mounting Kit

WISE-4060

4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module

Main Features

- 4-ch digital input and 4-ch relay output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4000 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4000 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be published to the cloud with security at anytime and anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.

HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.

RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved by internet media types like JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).

Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.

Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also been pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.

Specifications

Digital Input

- **Channels**   4
- **Logic Level**   Dry Contact   0: Open
                                 1: Close to DI COM
                  Wet Contact 0: $0 \sim 3\ V_{DC}$
                                 1: $10 \sim 30\ V_{DC}$ (3 mA min.)
- **Isolation** $3,000\ V_{rms}$
- **Supports 3 kHz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports 3 kHz Frequency Input**
- **Supports Inverted DI Status**

Relay Output

- **Channels**   4 (Form A)
- **Contact Rating** $250\ V_{AC}$ @ 5 A
  (Resistive Load) $30\ V_{DC}$ @ 3 A
- **Isolation (b/w coil & contacts)** $3,000\ V_{rms}$
- **Relay On Time**   10 ms
- **Relay Off Time**   5 ms
- **Insulation Resistance** $1\ G\Omega$ min. @ $500\ V_{DC}$
- **Maximum Switching**   60 operations/minute
- **Supports Pulse Output**
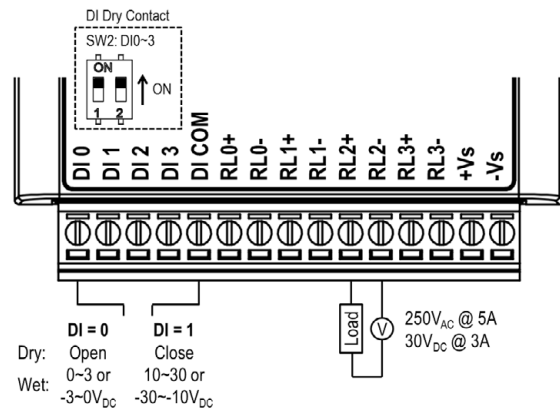- **Supports High-to-Low and Low-to-High Delay Output**

General

- **WLAN**   IEEE 802.11b/g/n 2.4GHz
- **Outdoor Range**   110 m with line of sight
- **Connectors**   Plug-in screw terminal block (I/O and power)
- **Watchdog Timer**   System (1.6 second) and
  Communication (programmable)
- **Certification**   CE, FCC, R&TTE, NCC, SRRC, RoHS
- **Dimensions (W x H x D)**   80 x 148 x 25 mm
- **Enclosure**   PC
- **Mounting**   DIN 35 rail, wall, and stack
- **Power Input** $10 \sim 30\ V_{DC}$
- **Power Consumption**   2.5 W @ $24\ V_{DC}$
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**
- **Supports Data Log Function**   Up to 10000 samples with RTC time stamp
- **Supported Protocols**   Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Environment

- **Operating Temperature**   -25 ~ 70°C (-13~158°F)
- **Storage Temperature**   -40 ~ 85°C (-40~185°F)
- **Operating Humidity**   20 ~ 95% RH (non-condensing)
- **Storage Humidity**   0 ~ 95% RH (non-condensing)

Pin Assignment

Ordering Information

- **WISE-4060-AE**   4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module
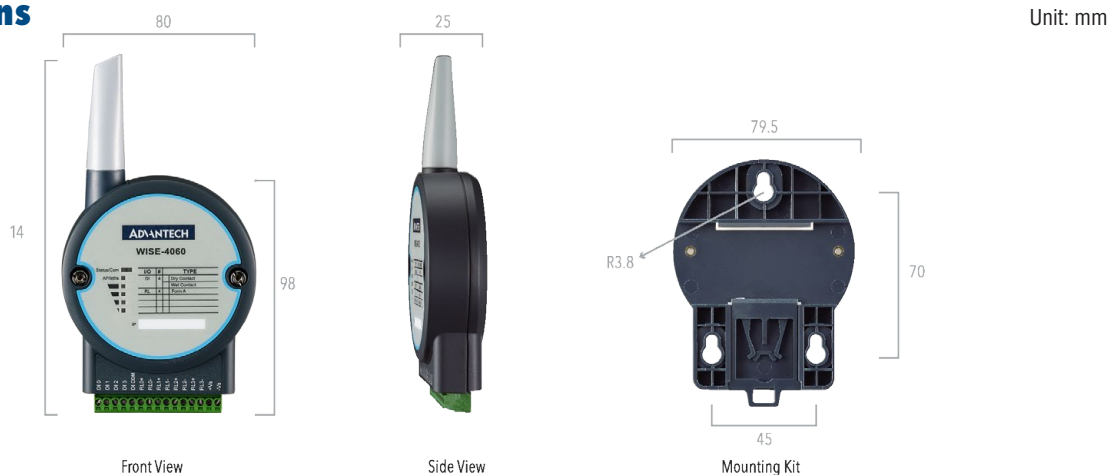
Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- **PWR-242-AE**   DIN-rail Power Supply (2.1A Output Current)
- **PWR-243-AE**   Panel Mount Power Supply (3A Output Current)
- **PWR-244-AE**   Panel Mount Power Supply (4.2A Output Current)

Dimensions

Unit: mm

Front View   Side View   Mounting Kit

WISE IoT Developer Kit
WISE-4012E

6-ch Input/Output IoT Wireless I/O Module for IoT Developers

Main Features

- 2.4 GHz IEEE 802.11b/g/n WLAN
- 2-ch 0~10V Input, 2-ch DI, and 2-ch Relay Output
- Includes WebAccess with demo project for developer
- Includes extension board for simulating sensor status
- Includes micro USB cable for power input
- Supports Modbus/TCP with RESTful web service
- Supports wireless client and server mode that can be accessed directly without AP or router
- Supports mobile device web configuration with HTML5 without the platform limitation
- Supports file-based cloud storage and local logging with time stamp

Introduction

The Advantech WISE IoT Developer Kit is a complete hardware & software solution to help users to develop IoT applications and simulate their projects in the simplest way. The WISE IoT Developer Kit provides everything you need to get going: a WISE-4012E 6-ch universal input or output wireless Ethernet I/O module, and developer kit including WebAccess 8.0 with open interfaces for intelligent application developer, extension board for simulating sensor status, a micro USB cable for power input, and a screwdriver for wiring. The WISE-4012E has an integrated Wi-Fi interface with AP mode and web configuration which can be accessed by mobile device directly. Data can be logged in the I/O module and then automatically pushed to the file-based cloud.

Your Smart Phone with WISE
Direct Cloud Accessibility, Easy Application, Instant Sensing

Product Concept: Data A-P-P

Data **A**cquisition

Data **P**rocessing

Data **P**ublishing

IoT Developer Kit

- WISE-4012E (x1)
- Extension Board (x1)
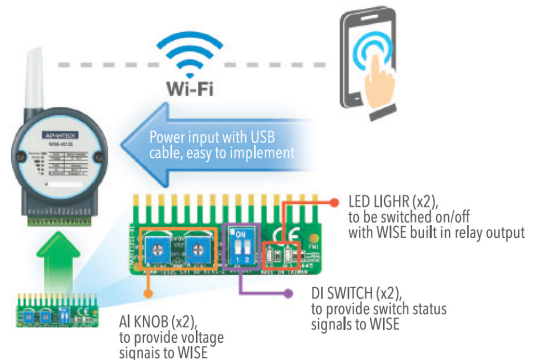- USB Cable (x1)
- Screwdriver (x1)
- WebAccess (x1)

Application Scenario
Connect to end devices

Wi-Fi

Power input with USB cable, easy to implement

<AI>   <DI>   <Relay>

PH SCALE | TEMP. SCALE | FLOW STATUS | VALVE STATUS | FAN SWITCH | CURTAIN SWITCH

Developer Scenario
Connect to an extension board

Wi-Fi

Power input with USB cable, easy to implement

LED LIGHR (x2), to be switched on/off with WISE built in relay output

DI SWITCH (x2), to provide switch status signals to WISE

AI KNOB (x2), to provide voltage signals to WISE

Specifications

Voltage Input

- **Channel**   2
- **Resolution**   12-bit
- **Sampling Rate**   10 Hz (Total)
- **Accuracy** ± 0.1 V$_{DC}$
- **Input Type and Range**   0~10 V
- **Input Impedance**   100 kΩ

Digital Input

- **Channels**   2
- **Logic level**   Dry Contact 0: Open
                                          1: Close to GND
- **Supports 3 kHz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports 3 kHz Frequency Input**
- **Supports Inverted DI Status**

Relay Output

- **Channels**   2 (Form A)
- **Contact Rating**   120 V$_{AC}$ @ 0.5 A
  (Resistive Load)   30 V$_{DC}$ @ 1A
- **Isolation** (b/w coil & contacts) 1,500 V$_{rms}$
- **Relay On Time**   10 ms
- **Relay Off Time**   7 ms
- **Insulation Resistance** 1 GΩ min. @ 500 V$_{DC}$
- **Maximum Switching**   60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Environment

- **Operating Temperature** -25 ~ 70°C (-13~158°F)
- **Storage Temperature**   -40 ~ 85°C (-40~185°F)
- **Operating Humidity**   20 ~ 95% RH (non-condensing)
- **Storage Humidity**   0 ~ 95% RH (non-condensing)

General

- **WLAN**   IEEE 802.11b/g/n 2.4GHz
- **Outdoor Range**   110 m with line of sight
- **Connectors**   Plug-in screw terminal block (I/O and power)
- **Watchdog Timer**   System (1.6 second) and
                             Communication (programmable)
- **Certification**   CE, FCC, R&TTE, NCC, SRRC, RoHS
- **Dimensions (W x H x D)** 80 x 148 x 25 mm
- **Enclosure**   PC
- **Power Input**   Micro USB 5 V$_{DC}$
- **Power Consumption**   1.5 W @ 5 V$_{DC}$
- **Supports User Defined Modbus Address**
- **Supports Data Log Function**   Up to 10000 samples with time stamp
- **Supported Protocols**   Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Ordering Information

- **WISE-4012E-AE-WA**   WISE-4012E IoT Developer Kit with WebAccess

WebAccess 8.0

WebAccess Cloud Architecture

WebAccess is a 100% web based HMI and SCADA software with private cloud software architecture. WebAccess can provide large equipment vendors, SIs, and Enterprises to access and manipulate centralized data and to configure, change/update, or monitor their equipment, projects, and systems all over the world using a standard web browser. Also, all the engineering works, such as: database configuration, graphics drawing and system management and the troubleshooting can be operated remotely. This can significantly increase the efficiency of maintenance operations and reduce maintenance costs.

Business Intelligence Dashboard

WebAccess 8.0 provides an HTML5 based Dashboard as the next generation of WebAccess HMI. System integrators can use Dashboard Editor to create the customized information page by using analysis charts and diagrams which are called widgets. Ample widgets have been included in the built-in widget library, such as trends, bars, alarm summary, maps…etc. After the dashboard screens have been created, end user can view the data by Dashboard Viewer in different platforms, like Explorer, Safari, Chrome, and Firefox for a seamless viewing experience across PCs, Macs, tablets and smartphones.

Open Interfaces

WebAccess opens three kinds of interfaces for different use. First, WebAccess provides a Web Service interface for partners to integrate WebAccess data into APPs or application system. Second, a pluggable widget interface has been opened for programmer to develop their widget and run on WebAccess Dashboard. Last, WebAccess API, a DLL interface for programmer to access WebAccess platform and develop Windows applications. With these interfaces, WebAccess can act as an IoT platform for partners to develop IoT applications in various vertical markets.

Google Maps and GPS Tracking Integration

WebAccess integrates real-time data on each geographical site with Google Maps and GPS location tracking. For remote monitoring, users can intuitively view the current energy consumption on each building, production rate on each field or traffic flow on the highway together with alarm status. By right-clicking on Google Maps or entering the coordinate of the target, users can create a marker for the target and associate the real-time data of three sites with a display label. Furthermore, this function also integrates with GPS modules to track the location of the marker in Google Maps and allows it to be used in vehicle systems.

Ample Driver Support

WebAccess supports hundreds of devices. In addition to Advantech I/Os and controllers, WebAccess also supports all major PLCs, controllers and I/Os, like Allen Bradley, Siemens, LonWorks, Mitsubushi, Beckhoff, Yokogawa etc. WebAccess can easily integrate all devices in one SCADA. All of these device drivers are integrated into WebAccess and free of charge. For a complete list of WebAccess drivers, refer to webaccess.advantech.com.

Distributed SCADA Architecture with Central Database Server

SCADA nodes run independent of any other node. Each SCADA node communicates to automation equipment using communication drivers supplied with Advantech WebAccess. The Project Node is a centralized database server of configuration data. A copy of the database and graphics of all SCADA nodes is kept on the Project Node. The historical data is also stored in the database in project node.

Open Data Connectivity

Advantech WebAccess exchanges online data with 3rd party software in real-time by supporting OPC UA/DA, DDE, Modbus and BACnet Server/Client. It supports SQL, Oracle, MySQL, and MS Access for offline data sharing.

Software Requirements

- **Operating System**   Windows XP (SCADA Node Only), Windows 7 SP1, Windows 8 Professional, Windows Server 2008 R2 or later
- **Hardware**   Intel Atom or Celeron. Dual Core processors or higher recommended
                             2GB RAM minimum, more recommended
                             30GB or more free disk space

WISE-4000/LAN Series

IoT Ethernet I/O Module

Main Features

- IEEE 802.3u 10/100Base-T(X)
- Industrial grade operating temperature -40~70°C
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP
- Supports RESTful web API in JSON format
- Supports local logging with RTC time stamp
- Supports mobile device web configuration in HTML5
- Supports 10~30V_{DC} power with reverse protection

Introduction

The WISE-4000/LAN series is a newly designed IoT Ethernet I/O module which supports new RESTful web API for IoT applications. A HTML5 web configure interface enables users to configure WISE modules without the limitation of a platform or operation system. The built-in data logger function logs data with time information, then be retrieved in a bundle. Wide operating temperatures enable the WISE series to be implemented in more IoT data acquisition applications. As well as the new functions, the new mechanical design can let users install the module and doing diagnostics in an easier manner than before.

Specifications

Current Input

- **Channel**   WISE-4010/LAN: 4 (differential)
- **Resolution**   12-bit
- **Sampling Rate**   10/100 Hz/channel
- **Accuracy**   ±0.2% of FSR @ 25°C
- **Input Range**   0~20 mA, 4~20 mA
- **Input Impedance** 120 Ω
- **Burn-out Detection** Yes (4~20 mA only)
- **Supports Data Scaling and Averaging**

Digital Input

- **Channels**   WISE-4050/LAN: 4
                       WISE-4060/LAN: 4
- **Logic level:**   Dry Contact 0: Open
                               1: Close to DI COM
                       Wet Contact 0: 0 ~ 3 V_{DC}
                               1: 10 ~ 30 V_{DC} (3 mA min.)
- **Isolation**   3,000 V_{rms}
- **Supports 32-bit Counter Input Function (Maximum frequency 3kHz)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Frequency Input Function (Maximum frequency 3 kHz)**
- **Supports Inverted DI Status**

Digital Output

- **Channels**   WISE-4010/LAN: 4
                       WISE-4050/LAN: 4
                       (Open collector to 30 V, 500 mA max. for resistance load)
- **Isolation**   3,000 V_{rms} (WISE-4050/LAN only)
- **Supports 1 kHz Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Relay Output

- **Channels**   WISE-4060/LAN: 4 (Form A)
- **Contact Rating**   250 V_{AC} @ 5 A
  (Resistive Load)   30 V_{DC} @ 3 A
- **Isolation** (b/t coil & contact)   3,000 V_{rms}
- **Relay On Time**   10 ms
- **Relay Off Time**   5 ms
- **Insulation Resistance** 1 GΩ min. @ 500 V_{DC}
- **Maximum Switching** 60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Environment

- **Operating Temperature**   -40 ~ 70°C (-40~158°F)
- **Storage Temperature**   -40 ~ 85°C (-40~185°F)
- **Operating Humidity**   20 ~ 95% RH (non-condensing)
- **Storage Humidity**   0 ~ 95% RH (non-condensing)

General

- **LAN**   IEEE 802.3u 10/100Base-T(X)
- **Connectors**   Plug-in screw terminal block (I/O and power)
- **Watchdog Timer**   System (1.6 second) and
                       Communication (programmable)
- **Certification**   CE, FCC, RoHS
- **Dimensions (W x H x D)** 80 x 98 x 25 mm
- **Enclosure**   PC
- **Mounting**   DIN 35 rail, wall, and stack
- **Power Input**   10 ~ 30 V_{DC}
- **Power Consumption** WISE-4010/LAN: 1.2 W @ 24 V_{DC}
                         WISE-4050/LAN: 2.2 W @ 24 V_{DC}
                         WISE-4060/LAN: 2.5 W @ 24 V_{DC}
- **Power Reversal Protection**
- **Supports Data Log Function**   Up to 10000 samples with time stamp
- **Supports User Defined Modbus Address**
- **Supported Protocols**   Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Ordering Information

- **WISE-4010/LAN**   4-ch Current Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4050/LAN**   4-ch Digital Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4060/LAN**   4-ch Digital Input and 4-ch Relay Output IoT Ethernet I/O Module
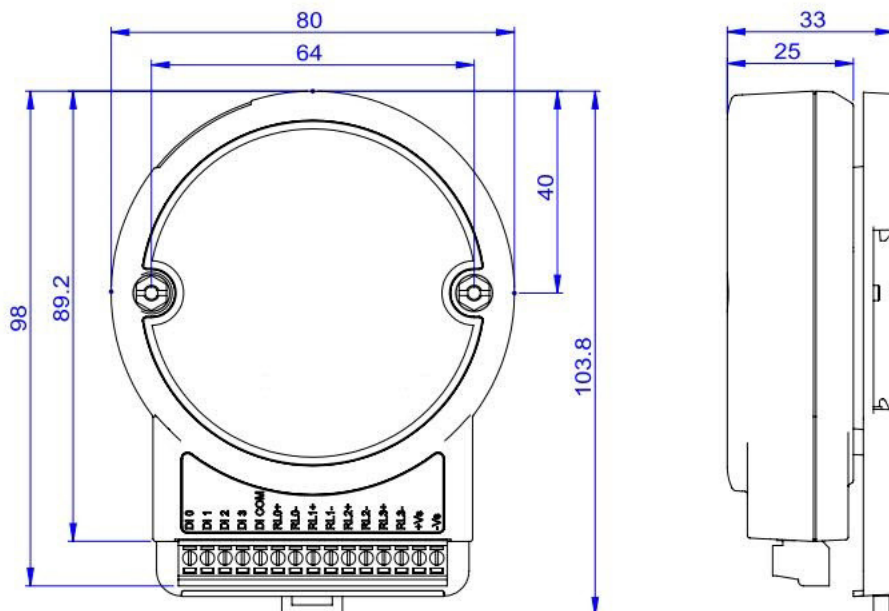
Selection Table

Model Name	Current Input	Digital Input	Digital Output	Relay Output
WISE-4010/LAN	4		4	
WISE-4050/LAN		4	4	
WISE-4060/LAN		4		4

Mechanical Design and Dimensions

WISE-4000 Wireless Series Dimensions
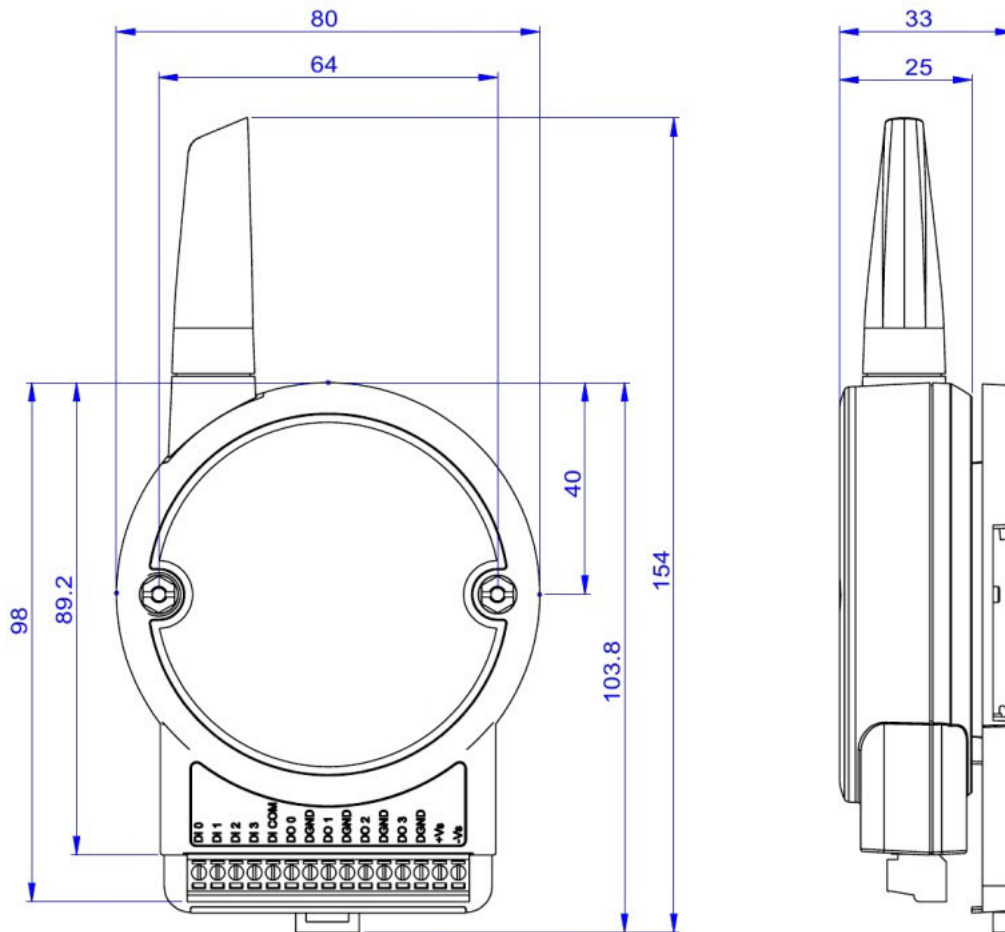
WISE-4000/LAN Dimensions

B+B SMARTWORX

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