

# SmartSwarm 351

## Quick Start Guide

### Introduction

The SmartSwarm 351 IIoT gateway is for operators of existing Modbus networks wishing to import a real time data feed from their process system into IIoT applications such as dashboarding, analytics or predictive maintenance.



### Safety

- Use the device in compliance with national and international law and in compliance with any special or additional restrictions regulating use of the Advantech B+B SmartWorx device in specific applications and environments.
- Use only the original accessories as provided by Advantech B+B SmartWorx. Using unapproved accessories can result in device damage, warranty termination, and/or violation of legal regulations.
- Unauthorized device or accessory modification can result in device damage, warranty termination, and/or violation of legal regulations.
- Do not open the device.
- When connecting the device to a power supply do not exceed the defined voltage.
- Do not expose the device to extreme ambient conditions. Protect the device against dust, moisture, and high temperature.

We declare that the SmartSwarm 351 (except for versions SG300) is in compliance with the essential requirements and other relevant provisions of direction 1995/5/EC. SmartSwarm 351 versions SG300 are in compliance with the essential requirements and other relevant provisions of directions 2014/30/EU and 2014/35/EU. The Declaration of Conformity is available on the company website or from technical support, on request.

### CE Product Disposal

The WEEE (Waste Electrical and Electronic Equipment: 2002/96/EC) directive has been introduced to ensure that electrical/electronic products are recycled using the best available recovery techniques to minimize the impact on the environment. This product contains high quality materials and components which can be recycled. At the end of its life this product **MUST NOT** be mixed with other commercial waste for disposal. Check with the terms and conditions of your supplier for disposal information.



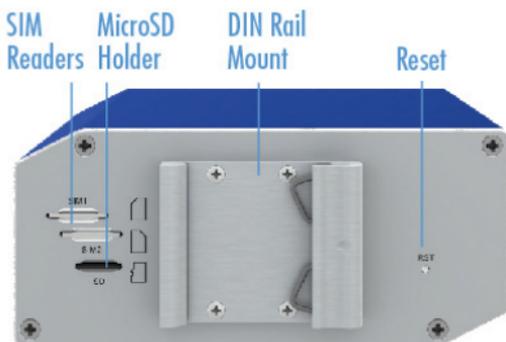
## 1. Connect Antenna

- Connect the main antenna to the device by screwing it into the ANT connector.
- A second diversity antenna should also be connected to the DIV connector to improve performance.



## 2. Install SIM Card

If you intend to use this device to communicate over a cellular network, place an activated data-provisioned SIM card into the SIM1 card reader.



**NOTE: SIM2 is not currently supported.**

### ! 3. Connect Power

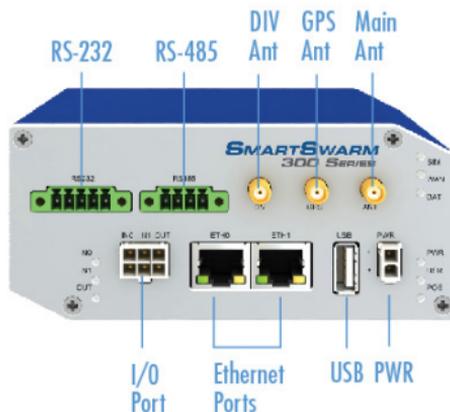
The device requires between +10 to +60 VDC power. 4W typical; 11 W peak.

### 4. Connect Ethernet

An Ethernet cable may be connected to the ETH0, and/or ETH1, connectors on the front panel. By default, the Ethernet ports are configured as follows:

PORT	PURPOSE	DEFAULT SETTING
ETH0	LAN port (default) Connect your laptop or PC to get a local web-server for device configuration and diagnostics.	<b>DHCP Server</b>  <b>IP Address:</b> 192.168.1.1 <b>NetMask:</b> 255.255.255.0
ETH1	WAN port (default) Connect this port to your WAN to allow the device to obtain access to the remote device management service, SmartWorx Hub, over Ethernet.	<b>DHCP Client</b>  The device will automatically obtain an IP address from your DHCP server.

### 5. Modbus RTU



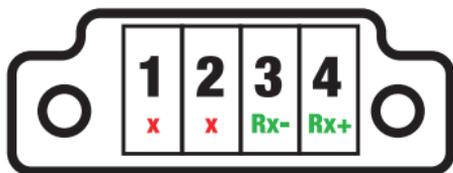
**NOTE:**

This device will only operate in Passive (receive-only) mode. It is not possible to configure it as a Modbus Master, or for it to transmit on the Modbus network.

The SmartSwarm 351 is designed to connect to a 2-wire RS485 bus. If your Modbus network uses 4-wire RS-485 or RS-232, consult the Configuration Manual for details about the recommended converters.

The RS485 port provides a transmitter and a receiver.

If you connect the transmitter to your Modbus network, you risk interfering with the Modbus communication should the transmitter ever become enabled by software.

**CONNECT ONLY TO THE RECEIVER, AS SHOWN:****RS-485 Connector**

PIN	SIGNAL	DESCRIPTION	DIRECTION
1	Tx-	Transmit - (Do not connect)	Output
2	Tx+	Transmit + (Do not connect)	Output
3	Rx-	Receive -	Input
4	Rx+	Receive -	Input

**RS-485 Pinout**

## 6. Configuration

By default, the device will make a secure connection to the cloud-hosted device management service: SmartWorx Hub. (<https://hub.bb-smartworx.com>)

This will automatically happen if there is an outbound WAN connection available via ETH1, with a route to the public Internet.

ALTERNATIVELY, you may want to use cellular. This requires a valid SIM card in SIM Slot 1.

In order to configure the cellular connection, connect your laptop or PC directly into ETH0, then point your web browser at **192.168.1.1**.

The screenshot shows a web browser window with the address bar containing **192.168.1.1**, which is circled in red. A blue callout bubble points to this address bar with the text "Local Web server on ETH0". The browser displays the SmartWorx web interface with a navigation menu including Home, Settings, Troubleshooting, Agents, Hub Client, Cellular, Logs, Debug, and Demo. The "Cellular" menu item is highlighted. Below the menu, a list of connection options is shown, with "Cellular (WAN)" circled in red. A blue callout bubble points to this option with the text "Configure the Cellular Connection". The "Cellular (WAN)" configuration page is visible, featuring fields for APN, Network (set to NONE), Authentication Type, Network Username, Network Password, and PIN Code. A note at the bottom states: "\*Cellular logs can be found on 'Logs' tab, file /var/log/messages".

Enter the APN name and optional credentials, as required by your SIM card provider / network operator.

The WAN LED will turn ON (yellow) when the cellular connection has been successfully established.

## 7. Verification

The USR LED will turn on (yellow) when the device successfully makes a secure connection with SmartWorx Hub (<https://hub.bb-smartworx.com>).

The SmartSwarm 351 must be configured via the SmartWorx Hub cloud-hosted device management service. To access this service, go to: <https://hub.bb-smartworx.com>

If this is your first time accessing this service, you will need a SmartWorx Hub account. Contact your device supplier to arrange this. If you have an account, please login to claim and manage your devices.

In order to verify the installation, please check that the device is shown as “Online” in SmartWorx Hub:

Dashboard > Devices > View Devices

MANAGE DEVICES IN LIST BELOW

Device ID	Name	Model	Owner	Status	Online
205-01-6200577	NewUser_SmartSwarm351	V3 LTE	BB-PaulC	Operational	Online
205-01-6200179	NewUser_Device1	V3 LTE	BB-PaulC	Operational	Online
205-01-6200344	NewUser_Device2	V3 LTE	BB-PaulC	Operational	Online

## 8. Factory Defaults

The unit may be reset to Factory Defaults at any time by pressing the Reset button on the back-panel of the device for more than 10 seconds.

## 9. Additional Documents

The User Manual and Configuration Manual for the SmartSwarm 351 can be found on the company web site:

<http://advantech-bb.com/product-technology/iot-and-network-edge-platforms/smartswarm>

## 10. LEDs

LED	COLOR	STATE	DESCRIPTION
PWR	Green	Off	No power
		On	Device is booting
		Blinking	Device is in normal operating mode
		Fast Blinking	Device is updating firmware. Do not power off
USR	Yellow	Off	The device does not have a working session established with SmartWorx Hub
		On	The device has a working secure session established with SmartWorx Hub
PoE	Not Used	Not Used	Not Used
DAT	Red	Off	There is no communication on the cellular interface at this moment
		Blinking	There is communication in progress on the cellular interface
SIM	Green	Off	Reset button pressed or the device is booting
		On	Ready for operation. SIM 1 is enabled

## 10. LEDs (Continued)

WAN	Yellow	Off	There is no cellular connection between the SmartSwarm device and the cellular service provider
		On	A cellular connection has been successfully established between the SmartSwarm device and the cellular service provider
IN0	Green	Off	The default state
		On	Binary input no. 0 is active (user defined)
IN1	Green	Off	The default state
		On	Binary input no. 1 is active (user defined)
Out	Yellow	Off	The default state
		On	Binary output is active (user defined)
ETH0 ETH1	Green	On	10 Mb/s
		Off	100 Mb/s
ETH0 ETH1	Yellow	On	The network cable is not connected
		Off	Network cable is connected
		Blinking	Data transmission in progress

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