SYNAPSENSE

Wireless Sensor Network Node

Installation Manual

This manual covers the general installation of the following SynapSense Wireless Sensor Network Nodes:

- 66-0002-001
- 66-0002-011
- 99-0039-001
- 99-0039-002
- 99-0039-011
- 99-0039-012

Regulatory Information

Notice to Users:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Antenna Statement:

Only the antenna supplied with this unit may be used. Any attempt to modify this antenna or substitute a different antenna by any means shall void the warranty and will void the FCC approval to operate this equipment. In the event an antenna is broken, a replacement antenna may be obtained by contacting the Product Support Center listed in the warranty section of this manual.

CE Statement:

This equipment has been tested and found to comply with the limits of the European Council Directive on the approximation of the law of the member states relating to electromagnetic compatibility (89/336/EEC) according to EN 55022 Class B.

Industry Canada Equipment Notice:

The Industry Canada certification identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Document(s). The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure, for their own protection, that the electrical ground connectors of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This presentation may be particularly important in rural areas.
Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician, as appropriate.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 2.2 dBi. Antennas not included in this list or having a gain greater than 2.2 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

SynapSense Antenna P/N78-0036-001

Warranty Information

Limited Two Year Warranty

Our company warrants that for two years from the date of purchase, it will replace this product if found to be defective in materials or workmanship. For a prompt, no charge replacement of equivalent product, return the defective product postage prepaid to the appropriate address.

Product Support Center

950 Iron Point Road, Suite 130

Folsom, CA 95682

United States of America

This replacement is the company's sole obligation under this warranty. SynapSense, Inc. will not be responsible for any incidental or consequential damages or for any loss arising in connection with the use or inability to use this product. Some states/provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty excludes defects or damage due to misuse, abuse, or neglect. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state/province to province.

1. Unpacking

a. Each Node is shipped with…

i. One pair Lithium AA batteries.
ii. One pair double sided mounting tape
iii. Installation Manual

b. Nodes with external antenna capability (part numbers 99-0039-001, -002 and -003)

i. One 2.4GHz duck antenna RP_SMA (78-0036-001-A)

Check the contents of the package. Contact SynapSense if there are any parts missing.

NOTE: Use of the equipment with any antenna other than the one provided is prohibited. Use of unauthorized equipment may void the warranty and void the regulatory certification of the equipment.

2. Operation

The SynapNet Node is designed to work in conjunction with a SynapNet Gateway device and the SynapSoft console. Please be sure you have correctly configured SynapSoft on the gateway computer prior to continuing.

SynapNet nodes can be added to an existing SynapSense Wireless Network (driven by a SynapNet Gateway) or be used to form a network. Note that battery life will be compromised if the SynapNet Node is not in range of an active gateway device or other SynapNet Node which is part of a running network.

Installing external antenna (for part numbers 99-0039-001, -002, -003):

a. Remove the antenna from the packaging, making sure the threaded base of the antenna is clear of any debris.
b. Screw the antenna into the antenna port on the top of the device via the metal base in a clockwise direction until it is snug. Do not use a wrench or other high-torque tool to tighten.

Installing batteries:

a. Remove the Lithium AA batteries from the packaging material.
b. Unscrew the two screws on top of the device holding the battery cover in place.
c. Insert the batteries into the marked positions in the orientation displayed on the device.
d. The device will blink an alternating blue/white and purple color for five seconds when the batteries are correctly inserted.
e. Replace cover on the device paying attention to the orientation (see: Battery Cover Orientation following).

f. The device will attempt to join any available SynapSense Wireless Sensor Networks. For more information on network formation, node placement, please see the SynapSense Wireless Network User Guide.

Battery Cover Orientation:

The battery cover can be orientated to allow either full weather sealing, or to allow for the correct operation of the internal temperature and humidity sensors. The cover contains an protrusion near the long edge which can be placed over a port near the battery compartment. For full weather sealing, place the cover so that this protrusion covers the gasketed port. To allow the operation of the sensor, leave the port uncovered.

[insert diagram here]

External Sensor Operation:

The SynapNet node allows for the connection of up to 4 external sensor interface devices. Please be sure to remove all batteries from the device prior to working on the SynapNet Node.

To access the sensor interface device mounting slots, the four corner Torx screws must be removed. Please use the correct size Torx driver (T10).

[screw diagram]

Consult the guide provided with the sensor interface device for specific instructions on mounting the card within the SynapNet

Node. The provided sensor interface cable is to be routed through the corresponding hole in the rubber gasket.

NOTE: Use of the equipment with any sensor interface device cable other than the one provided is prohibited. Use of unauthorized equipment may void the warrantee and void the regulatory certification of the equipment.

Troubleshooting and Diagnostics:

1. *No lights appear when batteries are inserted*
   Please be sure the battery orientation is correct and that the batteries are fresh and charged.

2. *A solid red light appears*
   The battery on the device has fallen below allowable operating level and the device has suspended its self to prevent network problems.

3. *The red light flashes briefly every 5 seconds*
   The node is currently not associated with an active wireless sensor network. Make sure the node is in range of either an active gateway device or another network-associated SynapNet Node. A node may take up to 20 minutes to fully join an existing network.

   Nodes may fall out of an active network if their signal strength is weak. Consider topology changes such as the addition of repeaters of the movement of other nodes in order to improve signal conditions. For more information, see the SynapSense Wireless Sensor Network User's Guide.

4. *The node appears to have stopped sending on the network*

   Check for the flashing red light (above) to see if the node has somehow fallen out of the network.

   The node can be reset without the removal of the battery comportment by the use of a magnetic reset tool, or any medium powered magnet. While watching the diagnostic light area, move the magnet along the long edge opposite the external sensor ports. The diagnostic lights will light and flash when the node has successfully reset.