(((MiWSN)))

Wireless Sensors Network

Mi-Sensor-1 and Mi-Gateway-1

User Manual

Contents

Certifications (FCC and IC)

Contains Mi-Sensor-1 FCC ID: AUF-S1 and Mi-Gateway-1 FCC ID: AUF-G1
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.

Contains Mi-Sensor-1 IC: 10170A-S1 and Mi-Gateway-1 IC: 10170A-G1
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

1   Mi-Sensor-1

1.1   Sensor Introduction

 The Mi-Sensor-1 is a multifunction battery powered wireless sensor that is capable of simultaneously monitoring Temperature, Motion, and Moisture present or Contact closure

1.2   Battery Installation

 Open sensor by prying case open by hand. Insert CR2032 battery in holder ensuring to observe polarity indicator on battery and battery holder.

WARNING – Incorrect installation will damage sensor and void warranty.

1.3   Sensor Installation

Configure sensor using gateway CONFIGURE page. See gateway sensor configuring section for details.

Test sensor signal strength at the location the sensor is intended to be use by pressing the test button on the sensor and viewing the sensor message signal strength (RSSI) on the gateway STATUS page. If signal strength is too low or the gateway is unable to receive the sensor test message, try adjusting the sensor and gateway orientation, and location.

For temperature and motion sensing, the sensor only needs to be placed in a suitable location.

If the sensor is being use to sense the presence of a liquid or contact closure, attach the supplied sensing wire to the sensor moisture/contact terminal block. Each of the two wires of one end is inserted into the two larger terminal block holes. You may use your own supplied 18-24 AWG wire if the supplied wire is not suitable for your application. To release the wire from the terminal block, insert a pin into the two smaller slots of the terminal block.
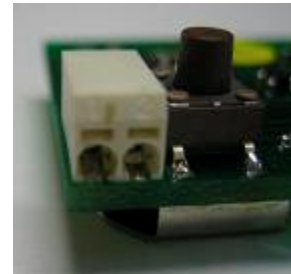
For moisture sensing, the other ends of the wire should be spaced about 3mm (1/8 inch) apart and placed in a location they can come in contact with the liquid.
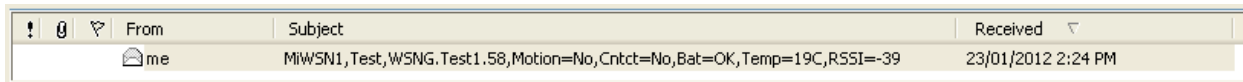
For contact sensing, the other ends of the wire should be attached to a dry contact closure element such as a door open/close contact containing a reed switch.

Attach double sided tape to sensor and attach sensor in final sensing location.

1.4   Sensor Notifications

The sensors will send notifications to the email account specified in the gateway Setup page. Notifications consist of alarm conditions or periodic reports as defined in the Configure Page of the gateway and configured into the sensor. Notifications are delivered as emails or phone texts with the subject line fields separated by comas and formatted as follows:

!	0	♥	From	Subject	Received ▽	
			✉me	MiWSN1,Test,WSNG.Test1.58,Motion=No,Cntct=No,Bat=OK,Temp=19C,RSSI=-39	23/01/2012 2:24 PM	

Field	Description
1	Indicates the message is from a **MiWSN1** network.
2	Indicates the message type. Types are; **Test** – the test button on the sensor was pressed. **Alarm** – an alarm notification condition exists with Motion, Cntct, Bat, or Temp **Report** – send periodically if configured. **Reset** – the sensor battery was inserted, or a battery is very low.
3	The gateway name plus the sensor name plus an event number signifying where the message came from. The event number is incremented each time the sensor sends a message.
4	**Motion =** indicates Yes there is motion or No motion.
5	**Cntct =** indicates Yes if there is moisture or contacts are closed and No if the contacts are dry or open.
6	**Bat =** indicates if the battery is OK or Low. A low battery should be replaced.
7	**Temp =** indicates the current temperature. C indicates Celsius and F indicates Fahrenheit.
8	**RSSI=** indicates the signal strength of the message received by the gateway. The farther away from the gateway the sensor gets, the low the signal strength will be. Signal strength is measured in dBm units.

1.5   Sensor Precautions

Do not place the sensor in liquid.

Do not expose the sensor to heat in excess of 85 degrees Celsius,

Do not drop the sensor to a hard surface.

2   Mi-Gateway-1

2.1   Gateway Introduction

The Mi-Gateway-1 receives wireless messages from multiple Mi-Sensor-1 and sends them to an email account or text phone using your Local Area Network (LAN) to Internet connection. The Mi-Gateway-1 has a build in web server that you connect to with a browser to configure all parameters of the Mi-Gateway-1 and Mi-Sensor-1. The Mi-Gateway-1 plugs into your LAN and is powered from an AC outlet.

2.2   Gateway Installation

Connect gateway to your router or local area network using supplied CAT-5 cable. If required, a CAT-5 cable up to 30m (100 feet) maybe used. Your network should have a DHCP server connected to it in order for the gateway to get its initial IP address.

Connect the gateway to an AC outlet using the supplied AC/DC adapter. The green link LED on the gateway should turn on. You should see periodic pulses on the orange activity LED.

Place the gateway in a location that provides best reception of the sensors. The gateway has the best reception when attached to a vertical surface using the provided adhesive pads. Other orientations will work, but be less sensitive to sensor messages.

Access the gateway management interface using your web browser to configure the gateway and sensors.

2.3   Gateway Reset

If you need to set the gateway parameters to the original factory settings perform the following steps. All previously stored gateway settings are lost. The sensors will retain their configured settings.
   a) Remove power from the gateway.
   b) Press the Reset button.
   c) Applying power to the gateway.
   d) Hold the Reset button for 5 seconds.
   e) Release the Reset button.

2.4   Gateway Repeater Function

The gateway may be used as a repeater to extend the range of the gateway that is connected to the local area network (LAN). When in this mode the gateway does not need to be connected to LAN and can be placed in any location that power is available.

2.5   Gateway Web Management Interface

The gateway management interface may be accessed using your web browser. Type the name of the gateway in your web browser address bar. The default name of the gateway is http://wsng.

If your network does not support name resolution, you can type the IP address of the gateway into your browser. You may find this address in your DHCP server's active client list.

After successful login to the gateway you will be presented with the Setup Page.

2.6   Gateway Login Authentication

By default the gateway does not require you to provide a login name and password. If you have enabled login authentication you will be presented with a login authentication dialog similar to the following. Enter the User ID and User Password parameters specified in the SETUP page. If you forget your User ID and Password, you may Reset the gateway to default settings.

2.7   Setup Page

This page has one time setup parameters needed to specify the local IP network, RF network, and SMTP email. Enter and test the parameters, and press the Save button. The setup parameters are described in the following paragraphs.

User ID and User Password - provides secure access to gateway web interface. Leave blank for no authentication.

MAC Address - the 6-byte hex MAC address of the gateway. Each gateway must have a unique MAC address on the IP network.

Host Name - the name of the gateway. You enter this in the web browser to access the web interface. This is the network name reported in Emails. The default is WSNG.

RF Channel - the network operates on. Valid channels are 0 to 15. Channel 0 is 2405 MHz and Channel 15 is 2480 MHz. Channel spacing is 5 MHz.

RF Key - a 2 byte hex key used to encrypt RF messages. Only messages encrypted with the correct key will be processed.

RF Repeat - this will enable the gateway message repeater function. When this is set to "Yes" the gateway will retransmit valid sensor messages. This retransmission allows the gateway to be used as a repeater to extend the range of sensor transmissions. When acting as a repeater the gateway does not need to be plugged into a LAN.

Temp Units - specifies Fahrenheit or Celsius temperature units.

IP Type - the gateway can use Static or Dynamic IP addressing to join the local network. If dynamic addressing is used, the gateway gets then next 5 parameters from the local DHCP server. If static addressing is used, the user specifies the next 5 parameters.

IP Address - of the gateway.

Subnet Mask - of the gateway.

Gateway - IP address the gateway uses for external access.

Primary DNS - IP address gateway uses to resolve Internet names.

Secondary DNS - IP address gateway uses to resolve Internet names.

Enable Emails - Enable sending Emails for messages reported by sensors.

SMTP Server - Name of the outgoing Email server.

SMTP Port - port number.

Use SSL - encrypt email use SSL.

SMTP Account - name for authentication.

SMTP Password - for authentication.

Notify Email Address – to send messages to. Messages are formatted in the subject line of the Email. Multiple email addresses separated by a coma may be used.

Save-Reboot – selecting this button will save all Setup parameters and reboot gateway if needed.

Test Email – selecting this button will send a test email to the Notify Email Address to verify Email parameters are setup correctly. A success or fail message will be displayed after the send is complete. This can be as quick as less than a second, to about 60 seconds if incorrect parameters are set. The received email subject will indicate it is from the MiWSN network, indicate it is a "TestEmail", and indicate which gateway it came from.

!	0	▽	From	Subject	Received ▽	
			me	MiWSN1,TestEmail,WSNG	23/01/2012 2:24 PM	

2.8   Rebooting Page

When parameters are changed that affect the network operation, the gateway will automatically reboot and the web browser will present the Setup Page after successful boot. If wrong network parameters were saved and the gateway does not respond, you can reset to factory defaults by holding down the button on the gateway for 5 seconds when turning power on.

2.9   Configure Page

This page is used to enter parameters needed for the operation of a sensor. The sensor will hold these parameters. Sensor defaults will be loaded by holding the sensor test button for 5 seconds when the gateway in not on the Configuring page. The defaults are to do no monitoring and report nothing (power savings when not in use). The Configure parameters are described in the following paragraphs.

Sensor Name - to identify the sensor messages displayed on the Status page and in Email messages.

Motion Alarm - the sensor has an accelerometer that indicates Yes when motion is present and No when no motion is present. The sensor can send an alarm on detecting Yes, No, or Ignore either.

Motion Threshold - The sensitivity to motion. 1=most sensitive, 99=least sensitive.

Moisture/Contact Alarm - the sensor has Moisture/Contact input that indicates Yes when contacts have moisture across them or are shorted and No when the contacts are open. A length of wire can be attached to the contacts to bring the end points close to the moisture to monitor. The sensor must not get wet.

Battery Alarm - occurs when the sensor battery needs replacing.

Temp High Alarm - occurs when the sensor temperature becomes greater than the specified temperature in degrees. Leave blank to ignore. Range is -30C to +60C.

Temp Low Alarm - occurs when the sensor temperature becomes less than the specified temperature in degrees. Leave blank to ignore. Range is -30C to +60C.

Report Period - the sensor will send a periodic report every N minutes. Enter 0 to disable reports. A non-calibrated clock is used.

Configure – selecting this button will place the gateway in the Configuring mode. When in this mode, sensors can be configured with the above parameters by holding the sensor test button for 5 seconds.

2.10   Configuring Page

This page allows sensors to be configured with the Configure parameters. Sensors should be close to the gateway when performing this operation.

Selecting the OK button will cancel the Configuring mode and take the user to the STATUS screen were if a sensor is correctly configured a Config Report Type will be displayed for the configured sensor. If you do not see a Config Report Type, the sensor test button was not held for greater than 5 seconds, or the sensor is out of range.

2.11   Status Page

This page displays most recent messages reported by sensors. The Status parameters are described in the following paragraphs.

Name	Report Time	Report Type	Motion	Temp (C)	Moisture /Contact	Battery	Voltage	RSSI
Test1	-0:00:11:10	Test	No	18	No	OK	2.72	-37
Test1	-0:00:10:55	Alarm	Yes	19	No	OK	2.72	-37
Test1	-0:00:09:54	Alarm	No	21	Yes	OK	2.72	-58
Test1	-0:00:09:27	Alarm	No	-7	No	OK	2.73	-65
Test1	-0:00:08:30	Alarm	No	31	No	OK	2.73	-71
Test1	-0:00:06:40	Report	No	22	No	OK	2.73	-40
Test1	-0:00:01:53	Report	No	20	No	OK	2.75	-40
Test1	-0:00:00:51	Reset	No	21	No	OK	2.68	-75
s4	-0:00:00:10	Test	No	18	No	OK	2.44	-38

Name - of the sensor.

Report Time - in Days:Hours:Minutes:Seconds since the sensor sent the message.

Report Type - of message sent by the sensor. Config is sent after successful sensor configure, Test is sent when the sensor test button is pressed quickly, Reset is sent on very low battery or replacement, Alarm is sent when an alarm condition is detected, and Report is sent every N minutes if the Report Period is not zero. Test, Reset, Alarm, and Report messages will cause an Email to be sent to the Notify Email Address.

Motion - state of Motion sensor. No or Yes.

Temp - current sensor temperature in units specified in the Setup page.

Moisture/Contact - state of sensor Moisture/Contact input. Yes for wet/shorted and No for dry/open.

Battery - state of sensor battery condition. OK or Low.

RSSI - Received Signal Strength Indicator measurement in dBm from the message sent by the sensor. This is an indication of signal quality with, -7 is the best and -91 is the weakest.

Refresh – selecting this button refreshes the messages displayed.

Clear – selecting this button deletes all status messages.

2.12   Help Page
The gateway has a basic help page built in to aid the user when the User Manual is not handy.

Warranty Information

(a) Gorko warrants that Gorko-branded products will be free from defects in materials and workmanship for a period of one (1) year from the date of delivery with respect to hardware and will materially conform to their published specifications for a period of one (1) year with respect to software. Gorko does not warrant that the software or any portion thereof is error free. Gorko will have no warranty obligation with respect to Products subjected to abuse, misuse, negligence or accident. If any hardware component of any Product fails to conform to the warranty in this Section, Gorko shall, at its option, refund the purchase price less any discounts, or repair or replace nonconforming Products with conforming Products or Products having substantially identical form, fit, and function and deliver the repaired or replacement Product to a carrier for land shipment to customer within a reasonable period after Gorko receives from Customer (i) notice of such non-conformance, and (ii) the non-conforming Product provided; however, if, in its opinion, Gorko cannot repair or replace on commercially reasonable terms it may choose to refund the purchase price. Repair parts and replacement products may be reconditioned or new. All replacement products and parts become the property of Gorko. Repaired or replacement products shall be subject to the warranty, if any remains, originally applicable to the product repaired or replaced. Customer must obtain from Gorko a Return Material Authorization Number (RMA) prior to returning any Products to Gorko. Products returned under this Warranty must be unmodified. Customer may return all Products for repair or replacement due to defects in original materials and workmanship if Gorko is notified within ninety (90) days of customer's receipt of the product. Gorko reserves the right to repair or replace products at its own and complete discretion. Customer must obtain from Gorko a Return Material Authorization Number (RMA) prior to returning any products to Gorko. Products returned under this Warranty must be unmodified and in original packaging. Gorko reserves the right to refuse warranty repairs or replacements for any products that are damaged or not in original form. For products outside the ninety-day warranty period repair services are available at Gorko at standard labor rates for a period of one year from the Customer's original date of receipt.

(b) As a condition to Gorko's obligations under the immediately preceding paragraphs,
Customer shall return Products to be examined and replaced to Gorko's facilities, in
shipping cartons which clearly display a valid RMA number provided by Gorko. Customer acknowledges that replacement products may be repaired, refurbished or tested and found to be complying. Customer shall bear the risk of loss for such return shipment and shall bear all shipping costs. Gorko shall deliver replacements for Products determined by Gorko to be properly returned, shall bear the risk of loss and such costs of shipment of repaired products or replacements, and shall credit Customer's reasonable costs of shipping such returned Products against future purchases.

(c) Gorko's sole obligation under the warranty described or set forth here shall be to repair or replace non-conforming products as set forth in the immediately preceding paragraph, or to refund the documented purchase price for non-conforming Products to Customer. Gorko's warranty obligations shall run solely to Customer, and Gorko shall have no obligation to customers of Customer or other users of the Products.

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