

Quick Start Guide

A set-up guide for Konnekt™ wireless systems



Introducing the Konnekt™ Wireless System

This wireless system provides reliable monitoring without the burden of wiring or conduit installation and can operate independently of or in conjunction with a Powerit Energy Management System.

The network is a deterministic system — the network identifies when the radio signal is lost and drives relevant outputs to user-defined conditions. Once the radio signal is reacquired, the network returns to normal operation.

Each wireless network system consists of one Gateway and one or more Nodes that ship with factory defined inputs and outputs. Devices may be all discrete I/O, analog I/O, or mixed discrete and analog I/O.

A Gateway device acts as the master device within each radio network system. The Gateway initiates communication and I/O reporting with the Nodes. A radio network contains only one Gateway, but can contain many Nodes. Each Node device can be connected to sensors or output devices and report the I/O status to the Gateway.

A Gateway and Node can be arranged to extend the range of the network or to avoid obstacles in the transmission path. The Gateway receives a transmission from one Node and forwards it to another Node positioned to avoid the obstacle.

Host-connected systems can contain up to 15 Nodes (legacy addressing) or 56 Nodes (extended addressing mode) within a single network and may be all discrete, all analog, or a mix of discrete and analog I/O. Host-connected systems allow for logic and calculations to be applied to the I/O. Inputs from Nodes within the network are transmitted to the Gateway, which communicates the information to a host device for processing. While the Gateway is the master device within the radio network, the Gateway may be a slave to the Modbus network.

The Konnekt Battery Pac™ allows for a true wireless solution when a Node can be powered by line power (10 to 30V dc) or battery power (3.6 to 5.5V dc). A battery pack and unique power management system runs the Node and a device for up to five years, depending on the power requirements of the device. Battery life is application specific. Contact our application engineers for a battery life calculation for your specific application.

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Need Support?

Call Toll Free (866) 499.3030 or contact us at support@poweritsolutions.com.

WARNING . . . Not To Be Used for Personnel Protection

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These devices do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A device failure or malfunction can cause either an energized or de-energized output condition. Consult your catalog for safety products that meet OSHA, ANSI, and IEC standards for personnel protection.

Gateway and Node Front Panel Interface

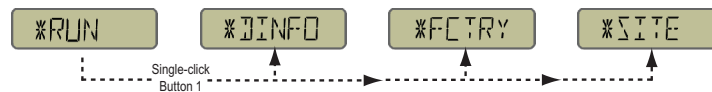


1 Port, NPT Gland, or Plug - If unused, install the provided plug into the 1/2 NPT threaded port. Refer to the *Installation* section of the product manual if an IP67 seal is required.

2 Rotary Switch 1 (left) - Sets the Network ID (NID) to a hexadecimal value from 0 to F, for a total of 16 Network IDs. A Gateway and its corresponding Nodes must be assigned the same Network ID.

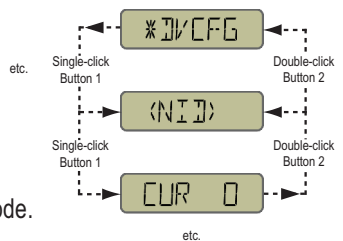
Rotary Switch 2 (right) - Gateway: Sets the Gateway's LCD viewing device address. The Gateway is predefined as Device Address 0. Node: Sets the Node's Device Address (hexidecimal 1 to F). Each Node within a network must have a unique Node Device Address.

3 Push Button 1 - Single-click to advance across all top-level menus.



Single-click to move down interactive menus, once a top-level menu is chosen.

4 Push Button 2 - Double-click to select a menu or to enter/exit manual scrolling mode. Double-click to move up one menu level at a time.

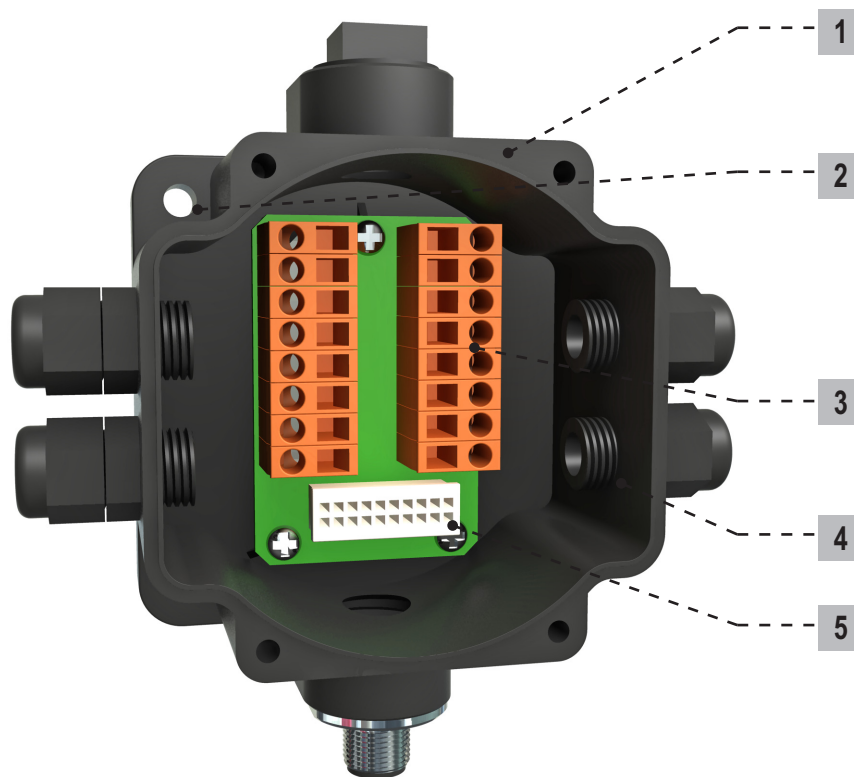


5 LED 1 and 2 - Provide real-time feedback to the user regarding RF link status, serial communications activity, and the error state.

6 LCD Display - Six-character display provides run mode user information and shows enabled I/O point status. This display allows the user to conduct a site survey (RSSI) and modify other configuration parameters without the use of a PC or other external software interfaces. On the Node, after 15 minutes of inactivity, the LCD goes blank. Press any button to refresh the display.

7 5-Pin M12 Euro-style quick-disconnect serial port

Gateway and Node Wiring Chamber



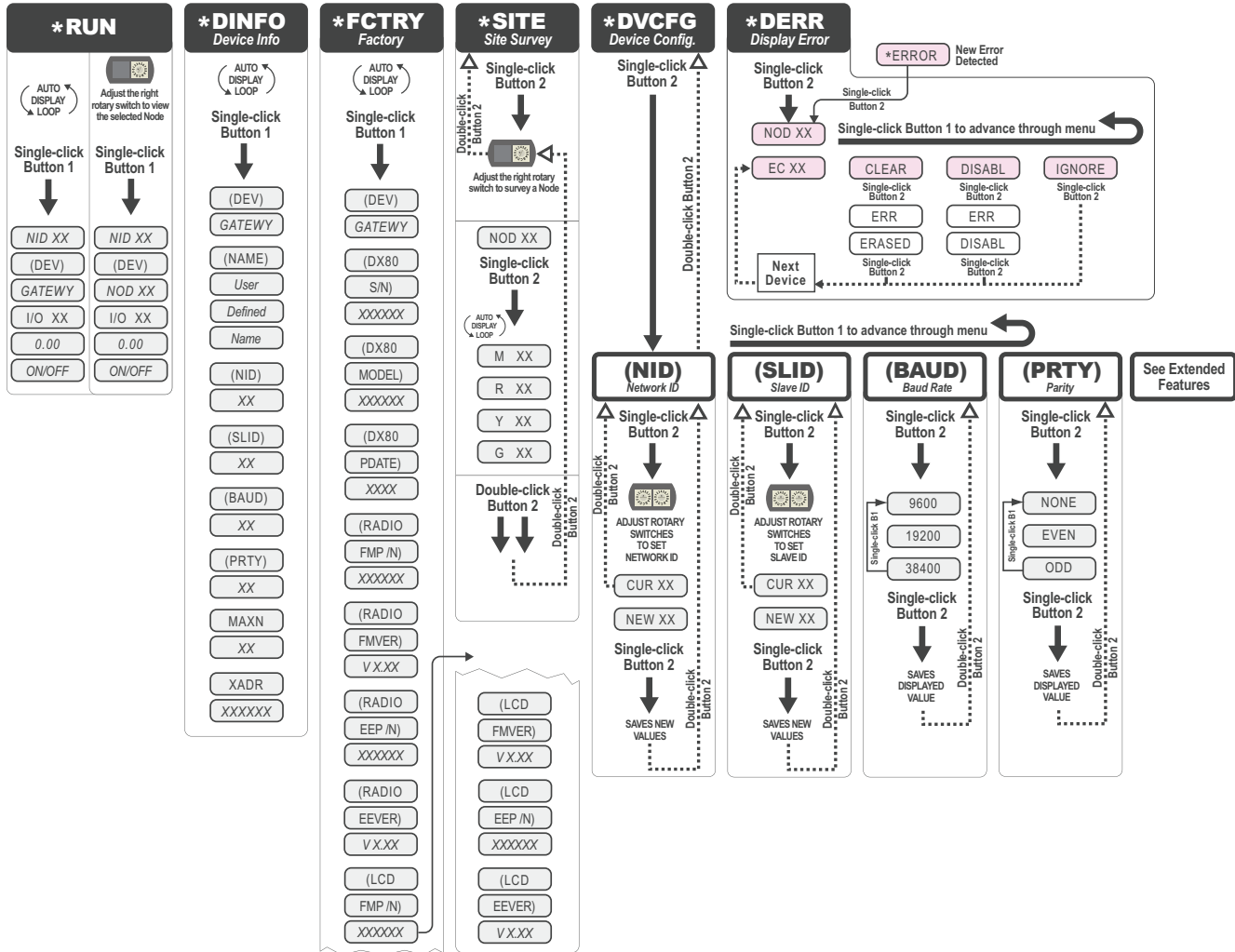
- 1 Housing** - The rugged, industrial housing meets IEC IP67 standards.
- 2 Mounting Hole, #10/M5 Clearance** - Mounting holes accept metric M5 or UNC/UNF #10 hardware. A DIN rail mount adapter bracket is available.
- 3 Wiring Terminal Strip** - The 16 spring-clip type wiring terminals accept wire sizes: AWG 12-28 or 2.5 mm²
- 4 Port, PG-7 Gland or Blank** - The PG-7 threaded ports can accept provided cable glands or blanks.
- 5 Ribbon Connector** - Ribbon cable connects the wiring base to the LCD.

Gateway Setup Menu

When power is applied, the device immediately begins running. The display screen autoscrolls through the *RUN menu and communication begins between the Gateway and Node(s). Autoscrolling through the *RUN menu is the normal operating mode for all devices on the wireless network.

From the *RUN Menu (or any menu), single-click button 1 to advance through the top-level menus.

To return to the top level menus and autoscrolling mode, double-click button 2 twice. To enter and exit manual scrolling mode, double-click button 2 at the top level menu. The device autoscrolls through the *RUN, *DINFO, and *FCTRY menus if paused on those menu headings. If the device is paused on the *SITE, *DVCFG, or *DERR menu options, the display does not autoscroll.



The Network ID (NID) can be set at any time from the left rotary switches. Once changed, allow five seconds for the devices to update to the new NID.

From any point in the menu system, double-click button 2 twice to return to the top level menu.

Navigating the menu:

* indicates a top level menu option

() indicates a sub-menu item

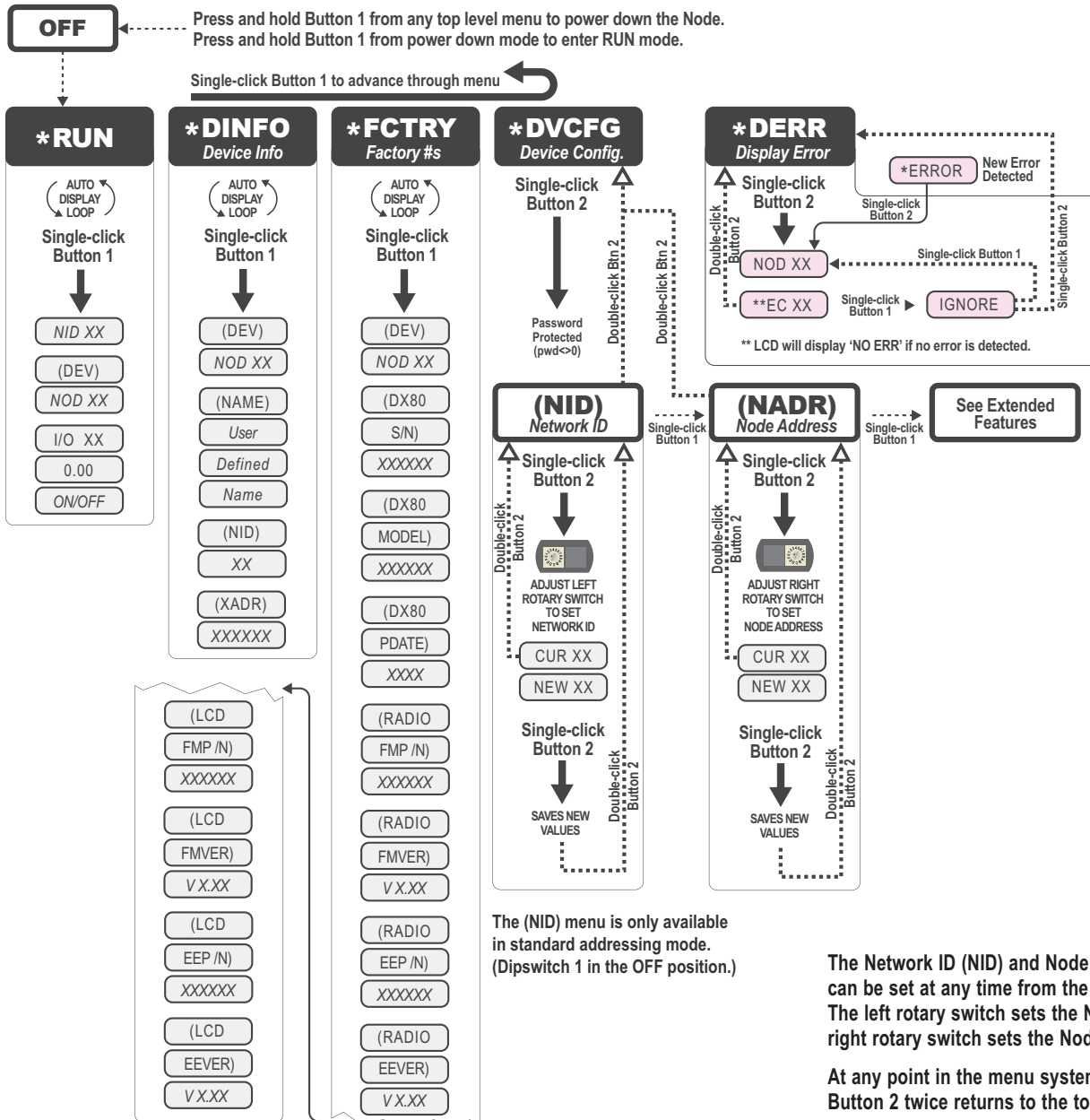
No characters indicate the value of the previous item

Node Setup Menu

When power is applied, the device immediately enters *RUN mode. *RUN mode is the normal operating mode for all devices on the wireless network.

From the *RUN Menu (or any menu), single-click button 1 to advance through the top-level menus.

To return to the top level menus and autoscrolling mode, double-click button 2 twice. To enter and exist manual scrolling mode, double-click button 2 at the top level menu. The device autoscrolls through the *RUN, *DINFO, and *FCTRY menus if paused on those menu headings. If the device is paused on the *DVCFG or *DERR menu options, the display does not autoscroll.



Navigating the menu:

* indicates a top level menu option

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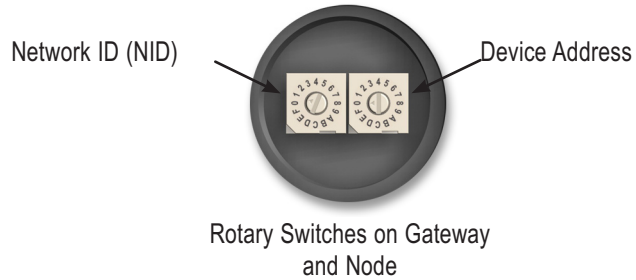
No characters indicate the value of the previous item

Node LCD Timeout: After 15 minutes of inactivity, the LCD screen stops displaying information. Press any button to refresh the display if the Node has entered this energy-saving mode.

Quick Start: STEP 1 > Set Network ID & Device/Node Address

The wireless RF network is defined by the network ID (NID) assigned to the Gateway and its Nodes. Each device within this common network must have a unique device address assigned.

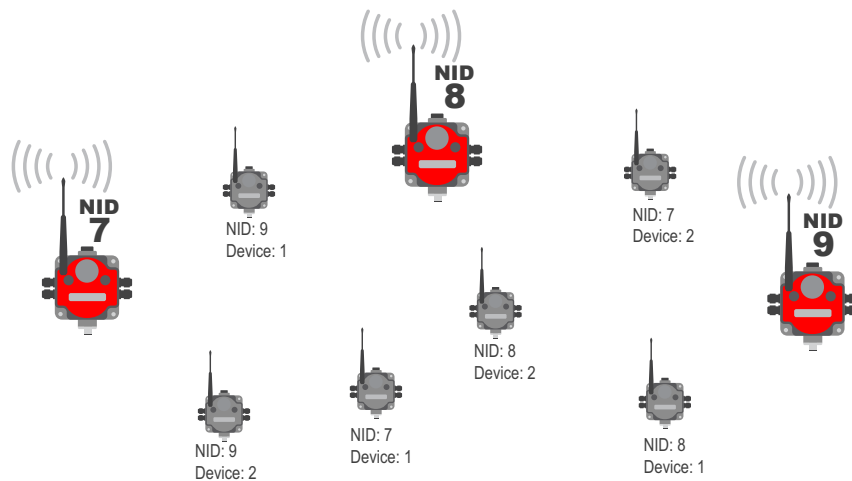
For factory configured kits, the network ID and device addresses have been assigned. Otherwise, use the rotary switches (shown right) to define both the NID and device address for each device. Follow the steps below to set up your network.



| | User Action | Display/Status | Notes |
|--------------------|--|----------------|--|
| Set Network ID | Remove rotary switch access covers. | | Turn counterclockwise to remove and clockwise to tighten |
| | On the Gateway, set the left rotary switch to 1. | | The factory default NID setting on all devices is 1. Set to another network ID when operating more than one network in the same area. |
| | On all Nodes (within the same network), set the left rotary switch to 1. | | Assign the same NID to all devices within a single network (hexadecimal 0-F). |
| Set Device Address | On the Gateway, set the right rotary switch to 0. | | A device address of 0 on the Gateway displays settings for the Gateway itself. To view settings for another device on the network, adjust the right rotary switch on the Gateway to the respective device address. |
| | On the first Node (device address = 1), set the right rotary switch to 1. | | Do not change the device ID for configured kits as this would affect the factory mapping of the I/O. |
| | On the second Node (device address = 2), set the right rotary switch to 2. | | |
| | Continue setting the device address for each additional Node using a unique number (.3,4,5). | | |
| | Install rotary switch access covers. Please refer to the installation section of the product manual for IP67 instructions. | | A successful RF link is identified by a blinking green LED 1 on each Node. |

Multiple Networks

When more than one network is operating in the same space, assign a unique network ID (NID) to each network (shown right).



Quick Start: STEP 2 > Apply Power, Gateway

To apply power to the **Gateway**, connect the 10-30V dc cable as shown.



Gateway Pinout Diagram



| Wire Color | Function |
|------------|---------------------|
| 1 Brown | +10 to 30V dc Input |
| 2 White | RS485 / D1 / B / + |
| 3 Blue | dc common (GND) |
| 4 Black | RS485 / D0 / A / - |
| 5 Gray | Comms grnd |

Wiring: 5-pin Euro pinouts for 485+, 485- and Comms ground

| User Action | Display/Status | Notes |
|--|----------------|---|
| Apply power... | POWER | This reading occurs only when power is applied to the Gateway. |
| The LCD display shows the current I/O status of the Gateway. | *RUN | The Gateway starts in *RUN mode. |
| | NID 1 | Displays current network ID (NID) |
| | (DEV) | Device is ... |
| | GATEWY | ... Gateway (device address = 0) |
| | I/O 9 | Indicates the current status of the I/O. The display cycles through each I/O point of the device, then returns to *RUN. |
| OFF | | |

Quick Start: STEP 3 > Apply Power, Node

To apply power to the **Node**, connect the 10-30V dc cable or battery module as shown.



Line Powered Node Pinout Diagram



| | | |
|---|-------|--------------------|
| 1 | Brown | 10 to 30V dc Input |
| 3 | Blue | dc common (GND) |

| User Action | Display/Status | Notes |
|---|----------------|---|
| Apply power... | POWER | This reading occurs only when power is applied to the Node. |
| The LCD display shows the current I/O status of the Node. | *RUN | The Node starts in *RUN mode. |
| | NID 1 | Displays current network ID (NID) |
| | (DEV) | Device is ... |
| | NOD 1 | ... Node 1 (device address = 1) |
| | I/O 1 | Indicates the current status of the I/O. The display cycles through each I/O point of the device, then returns to *RUN. |
| OFF | | |

Quick Start: **STEP 4** > Verify Communications, Gateway

Verify LED 1 is on and green.

| Status | LED 1 | LED 2 |
|-----------------------------|-------------|----------------|
| Power ON | ● Green ON | — |
| System Error | ☀ Red Flash | ☀ Red Flash |
| Modbus Communication Active | — | ☀ Yellow Flash |
| Modbus Communication Error | — | ☀ Red Flash |



> Verify Communications, Node

Verify LED 1 is flashing green and LED 2 is off. Until communication is established with the Gateway, the Node's LED 2 flashes red. When communication is established, the Node's LED 1 flashes green.

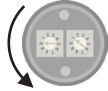







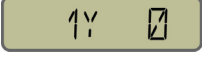








| Status | LED 1 | LED 2 |
|---------------|---------------------------|---------------------------|
| System Error | ☀ Red Flash | ☀ Red Flash (1 per sec) |
| RF Link Ok | ● Green Flash (1 per sec) | — |
| RF Link Error | — | ☀ Red Flash (1 per 3 sec) |



When testing the Gateway and Node before installation, verify the Gateway and Node are at least two meters apart or the communications may fail.

Quick Start: STEP 5 > Site Survey (optional)

A site survey analyzes the radio signal between a Gateway and a specified Node and reports the number of data packets missed or received. Perform the site survey before permanently installing your network to ensure reliable communication. Use the Gateway to initiate a site survey analysis.

| | User Action | Display/Status | Notes |
|--------------------|---|---|---|
| Site Survey Menu | Remove Gateway rotary switch access cover. |  | |
| | To check the status of Node 1, change the Gateway's right rotary switch setting to 1 |  | The Gateway is now enabled to read the status of Node 1; the display scrolls through the Node's I/O status. |
| | Single-click Gateway push button 1 |  | Device Information menu |
| | Single-click Gateway push button 1 |  | Factory Settings menu |
| | Single-click Gateway push button 1 |  | Site survey menu |
| | Single-click Gateway push button 2 |  | The site survey will be conducted with Node 1 |
| Survey Readings | Single-click Gateway push button 2 |  | The Gateway analyzes the quality of the signal from the selected Node by counting the number of data packets it receives from the Node. G = GREEN excellent signal Y = YELLOW good signal R = RED marginal signal M = Percentage of missed packets When possible, install all devices to optimize the percentage of YELLOW and GREEN data packets received. MISSED packets can affect the network response time. |
| | Examine reception readings (G,Y,R,M) of the Gateway at various locations. Note that the numbers displayed are a rolling average of the last 12.5 seconds of radio communication. M displays the number of missed packets while G, Y, and R display the number of received packets at those signal strengths. |  | |
| | |  | |
| | |  | |
| | Double-click Gateway push button 2 |  | End site survey |
| Return to RUN Mode | Change right rotary switch back to 0 (Gateway) |  | Change the device readings back to the Gateway |
| | Double-click Gateway push button 2 |  | Move back to the top level menu |
| | Single-click Gateway push button 1 |  | Return to RUN mode |
| | Single-click Gateway push button 1 |  | |
| | Single-click Gateway push button 1 |  | |
| | Install Gateway rotary switch access cover. |  | Refer to the installation instructions in the product manual to create an IP67 seal. |

Quick Start: STEP 6 > Installation

Avoid Direct Sunlight

To minimize the damaging effects of ultra-violet radiation, avoid mounting the Gateway or Node facing intense direct sunlight.

- Mount within a protective enclosure,
- Mount under an overhang or other source of shade,
- Install indoors, or
- Face the unit north when installing outside.

Avoid Collecting Rain

When possible, mount where rain or snow will drain away from the unit.

- Mount the units vertically so that precipitation, dust, and dirt do not accumulate on permeable surfaces.
- Avoid mounting the units on flat or concave surfaces, especially if the display will be pointing up.

Reduce Chemical Exposure

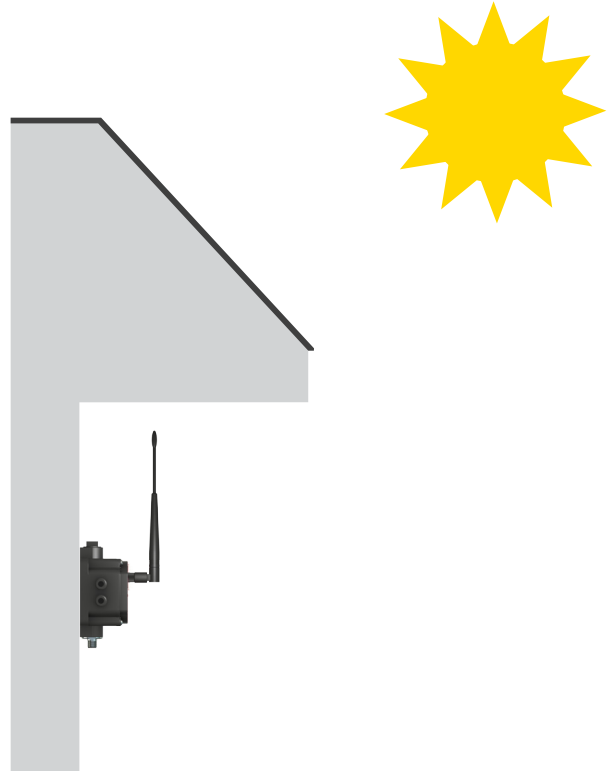
Before installing the units in a chemically harsh environment, contact the manufacturer for more information regarding the life-expectancy. Solvents, oxidizing agents, and other chemicals will damage the devices.

Minimize Mechanical Stress

While the device is very durable, it is a sophisticated electronic device that is sensitive to shock and excessive loading.

- Avoid mounting the units to an object that may be shifting or vibrating excessively. High levels of static force or acceleration may damage the housing or electronic components.
- Do not subject the devices to external loads. Do not step on the device or use it as a handgrip.
- Do not allow long lengths of cable to hang from the glands. Cabling heavier than 100 grams should be supported instead of allowed to hang from the housing.

Avoid Direct Sunlight



Notes

It is our intent to fully comply with all national and regional regulations regarding radio frequency emissions. Customers who want to re-export this product to a country other than that to which it was sold must ensure that the device is approved in the destination country. Consult with us for a list of approved countries.

The manufacturer does not take responsibility for the violation of any warning listed in this document.



CAUTION . . .

Make no modifications to this product.

Any modifications to this product not expressly approved by the manufacturer could void the user's authority to operate the product. Contact the Factory for more information.

Always use lightning arrestors/surge protection with all remote antenna systems to avoid invalidating any warranties. No surge protector can absorb all lightning strikes. Do not touch the radio device or any equipment connected to the device during a thunderstorm.

WARRANTY: We warrant this product to be free from defects for one year. We will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of our products. This warranty is in lieu of any other warranty either expressed or implied.