LoRa Card Model FWL1600-01 User's Manual

Description – Installation – Technical Data

Hardware Revision: 1.0.0

Software Revision: 2.0.0

Manual Revision: 1.0.0

Technical specifications of the Analogcard

General	
Model	FWL1600-01
Dimensions	10 cm (length) × 5.6 cm (height) × 18.5 cm (depth)
Weight	0.2 Kg
Operating Temperature	-10°C to 45°C
Storage Temperature	-20°C to 60°C
Operating Humidity	0% to 60%
Warranty	2 years
Hardware	
Communication Type	LoRa Wireless communication
Number of Input	16 nodes
Minimum Data Transmission Interval	1 second
Data Logging Intervals	1s/5s/10s/30s/1m/2m/5m/10m intervals (can be configured using DIP switches)
API Data Interchange Formats	CAN
Architecture	ARM 32-bit
CPU Speed	32 MHz

SAFETY PRECAUTIONS

(Before using this product, read the precautions)

Please carefully read this manual before using the product and pay full attention to the mentioned points to use the product correctly. In this guide, safety measures are classified into two levels: '⚠ Warning" and "⚠ Caution"

⚠ **Warning**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

⚠ **Caution**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage

Follow the safety measures at both levels as they are crucial for personal and system safety. Ensure that users read this manual and then keep it in a safe place for future reference.

(Installation precautions)

⚠ Warning

● If you install or remove the LoRa card from the FIDAQUIRE data logger, be sure to disconnect the device's power supply. Failure to do so may result in electric shock or damage to the card and data logger.

● Before starting the FIDAQUIRE data logger, make sure to verify the quality of the incoming power voltage. Failure to do so may cause damage to the LoRa card.

⚠ Caution

● If additional LoRa cards need to be installed, fully insert the card into the card slot. After installation, check to ensure it is properly seated. Failure to do so may lead to poor contact and result in malfunction of the card.

● Use the LoRa card in an environment that complies with the general specifications provided in this manual. Using the LoRa card in any other operating environment

may result in electric shock, fire, malfunction, or damage, and degrade the quality of the module.

● Never directly touch the conductive parts or electronic components of the LoRa card. Doing so may cause malfunction or failure of the data logger.

Note: Never insert or remove cards while the device is powered on.

(Wiring precautions)

⚠ Warning

● Before wiring, be sure to check the integrity and quality of all input and output cables. Failure to do so may result in damage to the product.

⚠ Caution

● The network cable or RJ45 connected to the LoRa card of the FIDAQUIRE data logger must be properly installed. An incomplete connection may result in a short circuit, fire, or malfunction.

● When disconnecting the network cable or RJ45 from the LoRa card of the FIDAQUIRE data logger, do not pull the cable forcefully. Pulling the cable connected to the card may cause device malfunction or damage to the LoRa card or the cable.

Note: The manufacturer assumes no responsibility for the consequences of improper installation, incorrect equipment, or negligence during installation.

(Disposal precautions)

⚠ Caution

● Dispose of the LoRa card as industrial waste.

● When discarding the card, separate it from other waste in accordance with local regulations and dispose of it properly at the local waste collection/recycling center.

1. Introduction

The LoRa Data Card Model FWL1600-01 is one of the data reception cards for wireless sensors and is also compatible with the FIDAQUIRE Data Logger Model FCD6455-01. The data received from the sensors can be either analog or digital. The LoRa card has the capability to simultaneously receive data from all sensors connected to it. Using LoRa technology, data can be transmitted up to 5 kilometers.

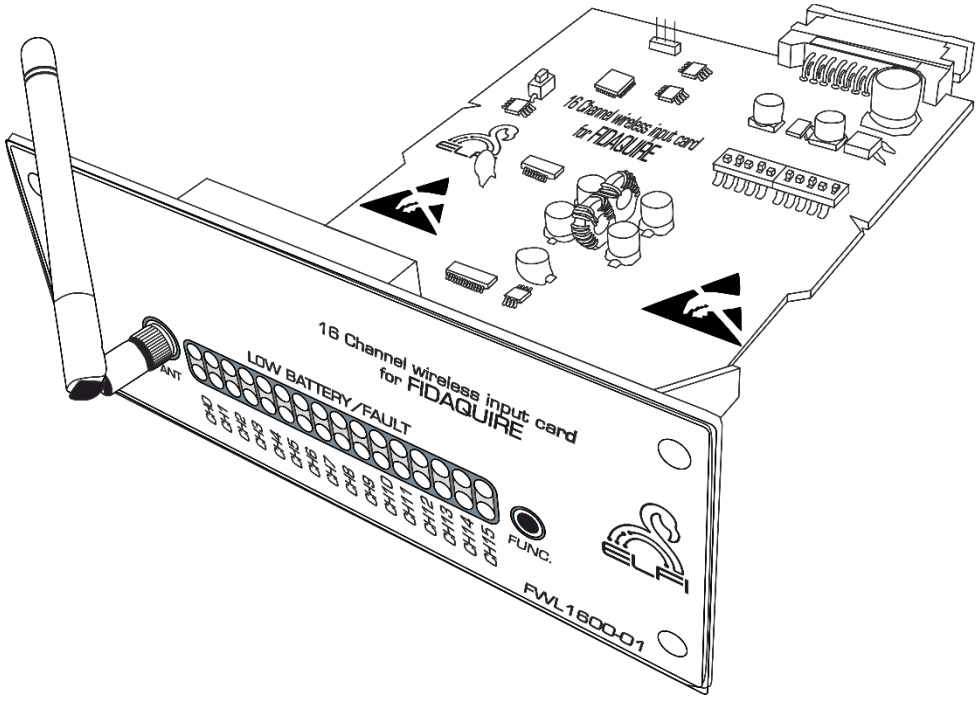

Figure 1: The LoRa data card

2. Indicators on the card

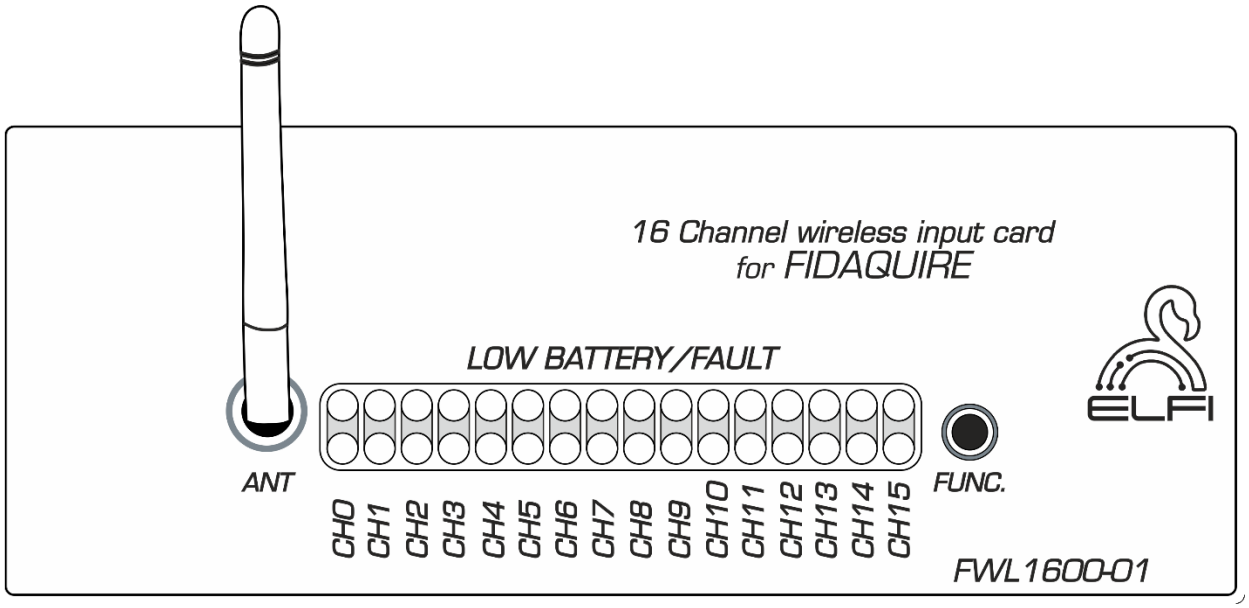

Figure 2: Cover card image

● The top row lights indicate the online and offline status of the channels. If no data is received from any channel for 30 seconds, the light corresponding to that channel will turn off.

● The bottom row lights flash once for each data they receive. In other words, the bottom row is constantly blinking.

3- Installing the LoRa card on the FIDAQUIRE data logger

The process of identifying and initial setup of the card is completely automatic, and after installing and setting up the data logger, the card will be displayed on the "Cards list" page. For initial configuration, refer to the FCD6455-01 product manual. After initializing the card, the input channels' information (input sensors) will also be displayed on this page (Figure *3*). Channels labeled "Error" indicate a data transmission error, and "Offline" mrans the connection between the device and the Node is lost.

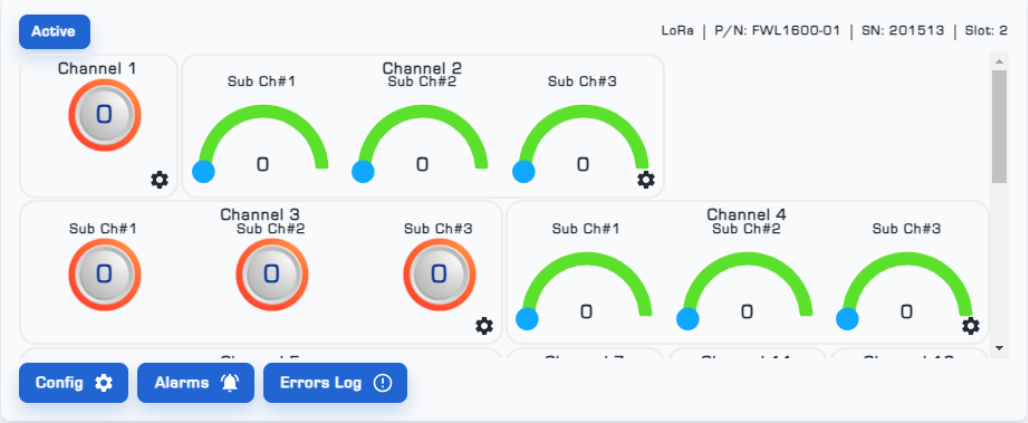

Figure 3: View of the LoRa Card Display Page in the Device's User Interface

Attention: If you remove the card from the device, the card will go offline. When the card is reconnected to the datalogger, the Nodes will also reconnect and start transmitting data. However, if you delete the card from the datalogger, all data stored by the Nodes will be erased, and you will need to re-identify and reconnect the Nodes from the beginning.

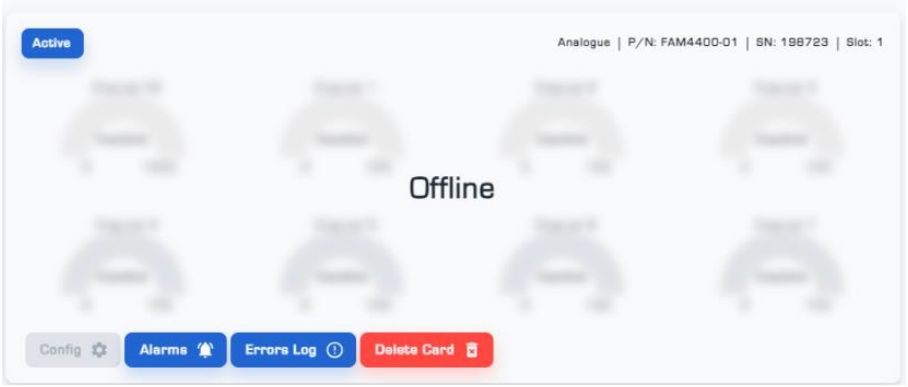

Figure 4: Image showing the removal of the card from the datalogger.

4- Card and Nodes settings

● To configure the LoRa card, follow these steps:

(1) Select the "Config" menu and enter the settings page (Figure *5*).

(2) Fill in the "Card Name" and "Card Description[1]" fields.

(3) In the Lora Setting section, the configurations for Bandwidth, Spread Factor, and Channel[2] can be adjusted.

Note: Changing the Spread Factor parameter depends on communication needs, environmental conditions (such as noise and physical obstacles), application type, and energy constraints. Generally, a higher Spread Factor is more suitable for applications requiring longer and more stable communications.

Note: The selection of the Channel value depends on environmental conditions and application needs. In urban environments with many obstacles, lower frequencies may be preferred. Additionally, if longer range is required, lower frequencies are a better choice.

Note: Frequency changes in the LoRa card are made through software settings on the device. These changes must comply with local regulations and be coordinated with other network parameters, such as Spread Factor and output power, to ensure stable and effective communication.

(3) Select "Save Config" to save and apply the settings (Figure 5).

[1] Filling out this field is optional.

[2] Frequency

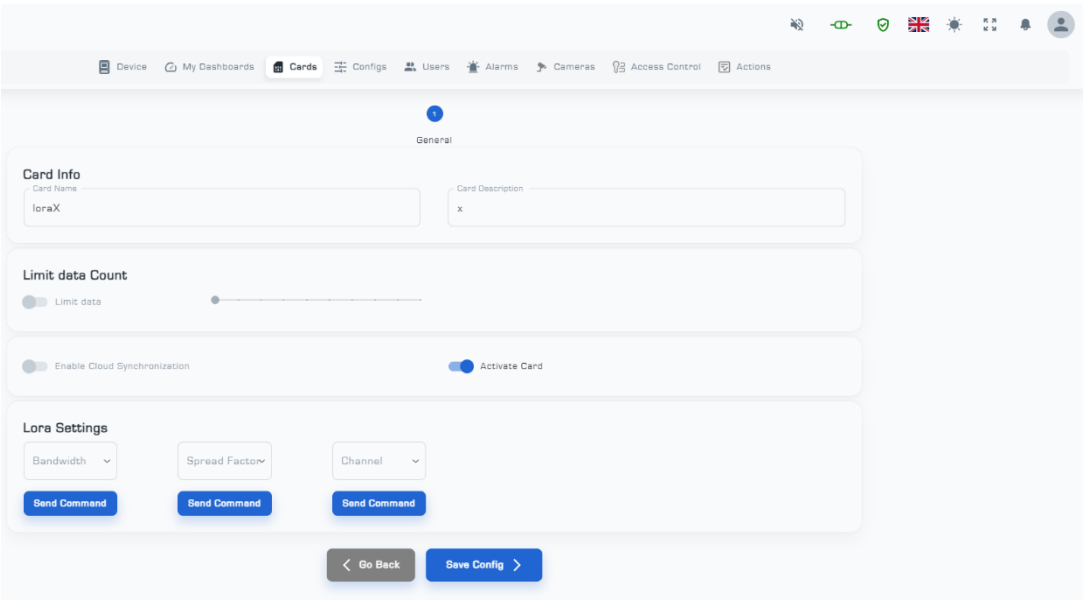

Figure 5: Card settings page

● The "Alarms" menu displays the list of alarms defined for each channel or subchannel. It allows for editing alarms, enabling or disabling them, and deleting alarm alerts. Additionally, the "Logs" menu provides a detailed list of alarm information and the time of occurrence (Figure 6).

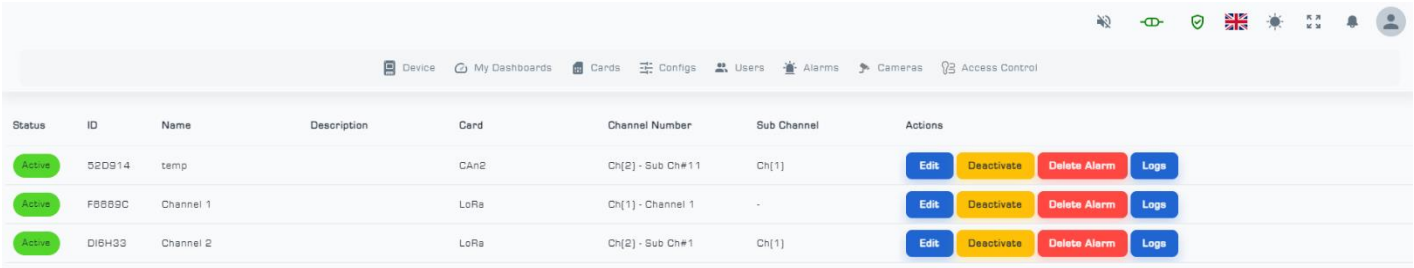

Figure 6: View page of alarms defined for the card

● The "Errors Log" menu displays a list of channels that have encountered errors in in data transmission (Figure 7).

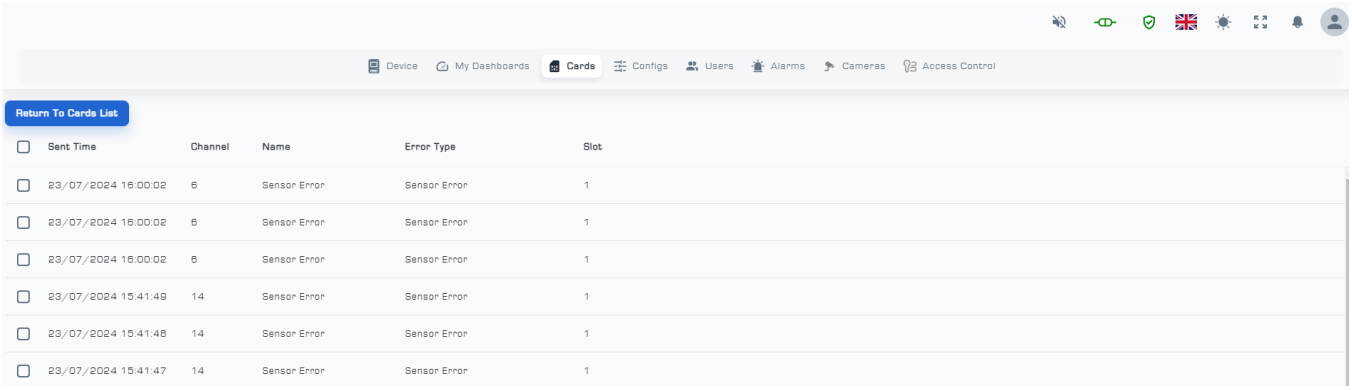

Figure 7: Errors Log Page for the Card

To apply further settings to each channel, click on any of them to display the Node settings page (Figure 8).

- The "General" menu includes information about the Node's status, model, serial number, input data type, and Node number. You can also choose a custom name for the Node and, if needed, deactivate it (Figure *8*).

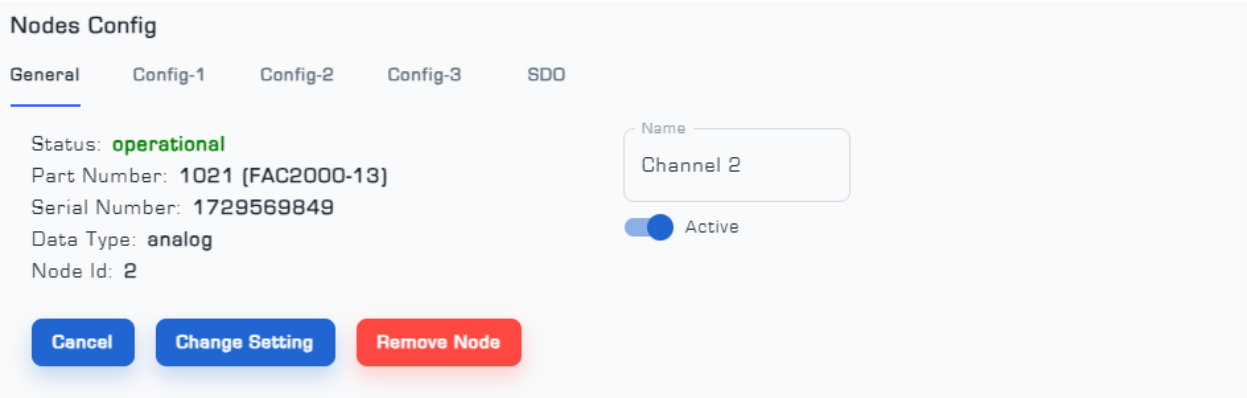

Figure 8: General Menu of the Node Settings Page

- The "Config" menu varies in number depending on whether the Node is single-channel or multi-channel, and you can add additional configuration settings for the Node on the "Config" page [1](Figure 9).

[1] For instructions on configuring each Node, refer to its specific manual.

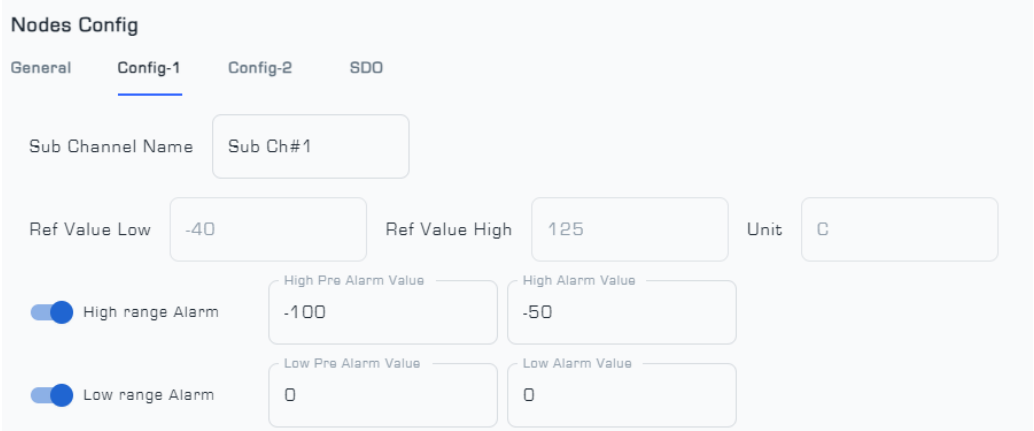

Figure 9: Config Menu of the Node Settings Page

● The "SDO" menu is used to modify the parameters of Interval[1], Bandwidth, Spread Factor and Channel. The "Write" sub-menu is used for changing settings, and the "Read" sub-menu is used for reading settings (Figure 10).

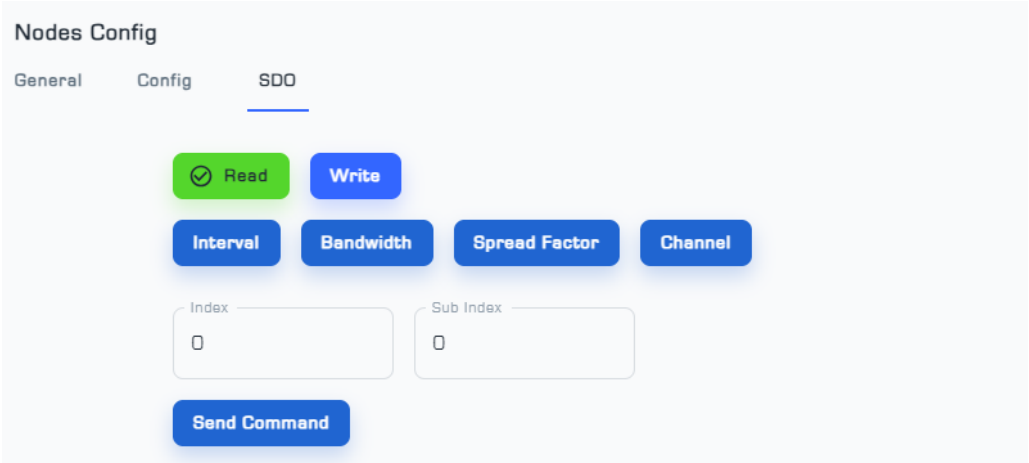

Figure 10: SDO Menu from the Node Settings page.

Note: The images provided in this manual from the channel settings menu are an example of a sample Node. For instructions on how to configure each specific Node, please refer to its dedicated manual.

[1] In milliseconds

● To read each of the Interval, Bandwidth, Spread Factor, and Channel parameters:

(1) Click on the "Read".

(2) Select the desired parameter.

(3) By selecting the "Send Command", you can view the information related to that parameter.

● To change any of the Interval, Bandwidth, Spread Factor, and Channel parameters:

(1) Click on the "Write".

(2) Select the desired parameter.

(3) Enter the desired value in the "Data" field.

(4) By selecting the "Send Command" option, the information related to that parameter will be saved.

● There are two methods to set the values for the above-mentioned parameters:

First Method:

Connect each Node individually to the card and change the parameter values through the SDO menu.

After configuring the Nodes, set the Bandwidth, Spread Factor, and Channel of the card to match the Node values.

Second Method:

(1) First, change the Bandwidth, Spread Factor, and Channel for the first Node, then for the card, and disconnect the Node from the card.

(2) Restore all three parameters of the card to their original state.

(3) Connect the next Node to the card and change its Bandwidth, Spread Factor, and Channel.

(4) Adjust the Bandwidth, Spread Factor, and Channel of the card to match the values set for the Node.

The second method is more efficient because it allows testing after each of the three parameters of the card and Node have been changed.

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