Define Instruments

P2P Remote Monitoring Transceiver

User Manual

V1.0

Index

LED Indication

- **PWR LED** – Light up after power is supplied;

- **STACK LED** – Flash when wireless message is transmitting or receiving;

- **NTWRK STATUS 1 LED:**
  1. Stay on means this is P2P Output node and it is booting;
  2. Flashing means this is P2P Output node and it is running and forming the network;

- **NTWRK STATUS 2 LED:**
  1. Stay on means this is P2P Input node or P2P Repeater node and it is booting;
  2. Flashing means this is P2P Input node or P2P Repeater node and it is running and searching for the network;

- **NTWRK STATUS 1 and 2 LEDs:**
  1. Both stay on means the plug-in input or output module is faulty;
  2. Flashing together means cannot find the network for P2P Input node and P2P Repeater node; or the maximum available node number is reached for P2P Output node;
  3. Toggling means the wireless link is established and ready to transmit or receive for P2P Input node and P2P Repeater node; or the network has been formed and it is ready to work with other joined nodes for P2P Output node;

- **Four Yellow Color HIGH to LOW LEDs:**
  1. For P2P Input node or P2P Repeater node, it means Link Quality between it and the nearest node it can reach. Each yellow color LED represents 25% reliability of receiving packet intact. So "HIGH" indicates 75 to 100% of Link Quality, which means it can provide a stable and reliable wireless connection. "LOW" represents only 0 to 25% of Link Quality. So you have to make sure this Link Quality LED indication is as close to the "HIGH" side as possible to provide a good and reliable wireless link. This Link Quality LED indication is automatically updated in a period of time.
  2. For P2P Output node, it means signal level around it. The signal can come from all sorts of source working in the same frequency range, such as WiFi, Bluetooth, Cordless phones or even another P2P node working closely. So it

does not play a key role to the network reliability, it only provides an indication for the wireless environment around this node. This indication is also automatically updated in a period of time during its operation.

Installation Procedure

1. Supply power to P2P Output node first (Please note P2P Input node or P2P Repeater node can also be powered up first, but it is not recommended);
2. Wait until “NTWRK STATUS 1 and 2” LEDs on P2P Output node start toggling;
3. Wire Channel 1 and 2’s loop-powered 4-20mA outputs to your equipments as the wiring diagram shown on the P2P Output node’s label;
4. Channel 1 and 2 output 3mA initially when the P2P Output node is powered up or after reset (Please note they will output 3.6mA as a fault signal to indicate the wireless link between P2P Output node and P2P Input node is broken during normal operation);
5. Supply power to P2P Input node;
6. Wait about 2 minutes and until “NTWRK STATUS 1 and 2” LEDs start toggling, or refer to the above “LED Indication” for fault diagnose;
7. Check the 4 yellow color “HIGH” to “LOW” LEDs for the Link Quality, place a P2P Repeater node in the middle if it is needed;
8. Wire up the 4-20mA Input Channels 1 and 2 following the wiring diagram on its label;
9. Now the P2P Input node will start to update the P2P Output node once a change is presented at its input ports;

Following steps are only needed when there is a need to change the input type, enable or disable the alarm/control modes, or change the mesh ID (please note that the main board stops updating the plug-in input or output board automatically, while the P2P Input or Output nodes is connected to your PC):

10. Connect Define Instruments’ USB Bridge Key between your PC’s USB port and the “PROG” port on the P2P Input node;
11. Run Define Instruments’ Tool Box on your PC and follow the instructions to program it;
12. Wire up the Input Channels 1 and 2 according to the wiring diagram for the input type you selected;
13. Disconnect the P2P Input node from the Bridge Key, once you finished the programming;

Health and Safety

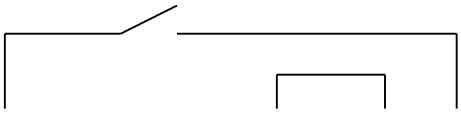
Our P2P units comply with CFR 47, Section 1.1307(b)(1). For your safety, please observe a minimum safe distance of 20cm.

Notice to Users

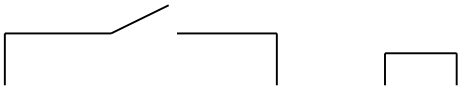
Define Instruments has not approved any change or modification to this device by users. Any modification or change could void users' authority to operate this equipment. Please refer to CFR 47, Section 15.21.

Wiring Diagram

- **Digital Inputs (for simple ON/OFF switch application)**



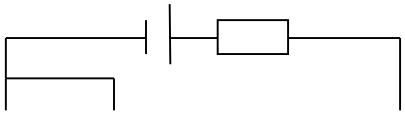
Input1 Input2 Input3 Input4 GND SINK/SRC 3V OUTPUT1 OUTPUT2



Input1 Input2 Input3 Input4 GND SINK/SRC 3V OUTPUT1 OUTPUT2

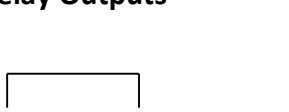
Please note: in this situation, all outputs on another node are ON initially.

- **Open-Drain Outputs**



Input1 Input2 Input3 Input4 GND SINK/SRC 3V OUTPUT1 OUTPUT2

- **Relay Outputs**



GND SINK/SRC NO1 COM1 NO2 COM2

- **Analog Inputs**

  Isolated 4-20mA (shown on label)

- **Analog Outputs**

  Isolated and Passive Loop-Powered (shown on label)

Specification

- Power Supply: 9-36V DC
- Power Consumption: 2.5VA Max
- Operating Temperature: -20 ~+55 Degrees
- RF Data Rate: 250Kb/s
- RF Frequency Range: 2405MHz – 2475MHz
- Number of RF Channels: 15
- Spreading Method: Direct Sequence
- Modulation: O-QPSK
- Maximum Node Number Per Network: 17 nodes (1 x P2P-Output unit, 1 x P2P-Input unit, 15 x P2P Repeater units)
- RF Tx Power: +20dBm Max
- RF Rx Sensitivity: -110dBm
- Tx Range: ~4Km (line of sight)
- Serial Port: Bridge Key Programming
- Protocols: Modbus RTU
- Serial Data Rate: 9600 baud, 8-N-1
- Digital Input: 4 (0 – 1Hz, 1.4 – 64V DC)
- Excitation: 1 (+3V DC, 200mA Max)
- Digital Output: 2 x Open-Drain
- Relay Output: 2 x Form A Relay (5A, 277VAC, 250V DC Max)
- Analog Input: 2 x Isolated (no counter function)
- Analog Output: 2 x Isolated and Loop-Powered (passive)