Operator's Guide

LinkMate™
Wireless Switch Router

Transmitter

Receiver

Intrinsically Safe for use in Class 1 Division 1 Group C and Group D Hazardous Locations

Introduction

The LinkMate™ wireless switch router's TxD (transmitter) and RxD (receiver) pair provide a wireless solution for switch sensors such as plunger arrival sensors, pressure switch gages and tank level switches, eliminating the need for on-site installation of costly cables and electrical conduit.

LinkMate™ uses a Bluetooth 2.4GHz wireless RF system that incorporates secure data transmission and frequency hopping to minimize potential RF interference. The reliable operating range is approximately 1000 feet Line-of-Sight (LOS) without requiring an external antenna.

The LinkMate™ TxD unit has four (4), single-ended, Normally Open (NO) switch inputs and provides operating power for 3-wire type plunger arrival sensors. Switch types include dry contact and 0-30 Vdc logic signals.

The LinkMate™ RxD unit has four (4) wirelessly linked, Normally Open (NO) switch outputs. Switch outputs are Open-Collector, Low-Side NPN transistors that control power loads of up to 30 Vdc @ 2 Amperes non-continuous peak current.

LinkMate Features

Low Cost Wireless Pair	*LinkMate sold as a wirelessly linked Transmitter and Receiver pair.*
LED Status Indicators	*Indicators for Power status, wireless Link status and Switch Sense events.*
Long Battery Reserve	*LinkMate's low power requirements yield a 10+ day battery reserve.*
Four (4) Switch Input/Output	*Four switch configuration allows use in many diverse applications.*
Built-In Solar Charge System	*Integral solar charger provides a single compact product configuration.*
Long Wireless Link Range	*Wireless 1000 ft. Line-of-Sight link range further extends applications.*
3-Wire Sensor Power	*The TxD unit supplies low current +6.6 Vdc power for 3-Wire sensors.*
Intrinsically Safe C1D1	*Intrinsically Safe design for use in C1D1 Hazardous Locations.*

First Time Install

Each LinkMate™ TxD/RxD pair is pre-configured to automatically link and go to work upon power up. It does not matter which unit is powered first, they will find each other and link automatically.

Installation is the same for both LinkMate™ TxD and RxD units. Follow these 4 simple steps:

1. Mount the units using the dual-purpose mounting bracket (flat or 2" pipe mount).
2. Make wire connections to the screw terminal block according to the terminal block labeling.
3. Remove cover and press the "Power" button.
4. Replace and secure the front cover in place.

The RED led will blink once upon Power Up and then blink every 2 seconds until the units are linked. Once linked, the YELLOW Link led will blink every 2 seconds and the RED Power On led will shift to a 10 second blink rate.

To test, short any TxD DI input to GND observing the GREEN led blink(s) on both TxD and RxD units that acknowledge the switch sense event.

LED Indicators

LED indicators are color coded and programmed to provide the user with a wide range of status information. The RED Power led lets the user know the product is alive and functioning. The YELLOW Link led informs the user of Link status which is very useful for testing wireless range. The GREEN I/O led lets the user know when a switch event has occurred and which switch was associated with the event. The summary below explains what the various led blink rates mean.

PWR *Red LED:*
Blinks when Power On button pressed.
Blinks every 2 seconds when NOT "Linked".
Blinks every 10 seconds when "Linked".

Link *Yellow LED:*
Blinks when Wireless Link updates.
Link update occurs every 2 seconds.

I/O *Green LED:*
Blinks on Input or Output event.
1 blink - DI1 or DO1 event.
2 blinks - DI2 or DO2 event.
3 blinks - DI3 or DO3 event.
4 blinks - DI4 or DO4 event

TxD Digital Inputs

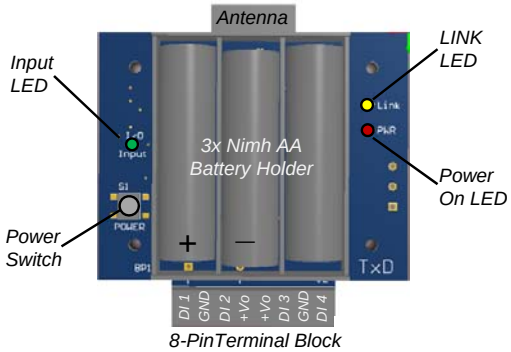
Each TxD transmitter input senses switch closures on any one of it's four digital switch inputs. The switch closure event triggers the TxD to transmit a status update to the RxD receiver. Both the TxD and RxD units blink their GREEN I/O led indicator to acknowledge the event.

TxD switch sensors incorporate 15 kV static discharge protection and a switch debounce feature that eliminates multiple switch triggering when an input switch closes. Each input switch sensor can tolerate input switch resistances up to 50k ohms and logic input voltages up to 30 Vdc.

Both the TxD and RxD units sleep for 2 seconds, wake up and update switch event status before going back to sleep. This process may delay the switch update notification to the RxD unit for up to 2 seconds.

The TxD sleep feature also requires the switch input be held low (On) for a minimum of 1 second to ensure reliable switch closure detection. The RxD unit time synchronizes the TxD unit's sleep period so that both units always wake up at the same time.

TxD Components



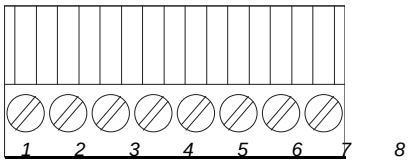
8-PinTerminal Block

TxD components include status LED indicators, a 3x AA battery holder, a Power On/Off button and an 8-Position screw terminal block. LED's are color coded and provide short duration, high intensity blinking. The Power button is a "toggle" function that alternates between On and Off status. The AA batteries are replaceable, but should perform well over the life of the product. Note that the product label covers the 3x AA battery pack.

TxD Hook-Up

Removable, 8-Position Screw Terminal Block.

Top View – x4 Digital Inputs



a. Unplug the removable screw terminal block.
b. Observe label on back of the terminal block
c. Make sensor wire connections as required.
d. Plug terminal block back into bottom of unit.

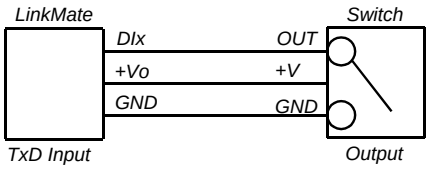
Input	Ground	Power
1 – DI1	2 – GND	
3 – DI2		4 – +Vo
6 – DI3		6 – +Vo
7 – DI4	8 – GND	

Note: +Vo is a 6.6 Vdc power source for 3-Wire Plunger sensors.

#22 AWG wire is recommended for sensor wire hook up. A complimentary screwdriver is provided for your convenience.

Input Switch Sensing

Shown with 3-Wire power hook-up.



This switch sensing configuration represents a typical hookup for a 3-Wire plunger arrival sensor. The Vo (+6.6 Vdc) power output is used to power the arrival sensor. TxD switch inputs accept dry contact or 0-30 Vdc logic signals and are protected from static discharge levels as high as 15k Volts.

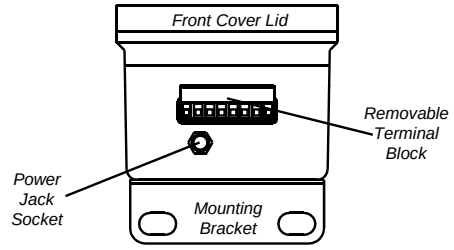
The TxD inputs incorporate an internal input pull-up resistor and sense a high-to-low input level transition from a normally open (NO) switch or normally high logic signal. A switch event only acknowledges the initial level transition and does not continue to report long period low input levels.

Power Connections

LinkMate TxD and RxD units are equipped with an integral solar battery charging system. The integral 0.4 Watt solar panel provides a charging rate 20 times higher than the average battery discharge rate and ensures internal battery charge status is maintained at optimal levels under all weather conditions.

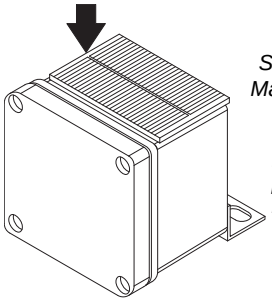
An external power jack is also provided for initial battery charging using an OKC wall socket charger or an external 2 Watt solar panel if needed or desired.

Power Jack Location



Bottom View

Two-Season Solar Panel

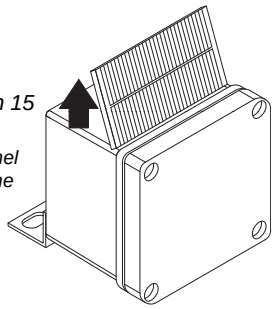


Spring – Summer – Fall
March 16 – November 14

Press down on the solar panel to lock it into the horizontal position.

Winter Charging
November 15 – March 15

Pull up on the solar panel to allow it to spring to the vertical 45° position.



RxD Digital Outputs

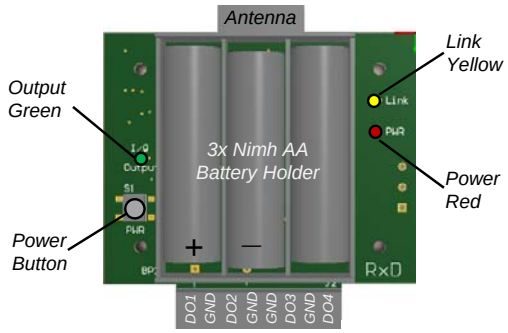
The RxD receiver incorporates four independent, common ground switch outputs. Each switch output employs a NPN low-side, power transistor capable of switching power loads up to 30 Vdc at 2 Amperes of current. Output switch characteristics are close to an ideal switch with less than 0.5 ohms closed (On) resistance and infinite open (Off) resistance.

The four (4) RxD switch outputs do share a common ground (GND) connection. Each output has its own positive (DO) terminal for connection to a power load or logic input device. This output configuration works best when used as a low-side switch or connected to a normally high (open) input logic device.

Although the RxD's output Open-Collector NPN power transistors are rated for 30 Vdc at 2 Amperes, care must be taken to limit continuous current drawn to reduce heat dissipation in the output transistors.

Note that the RxD output event pulse is internally set to short the output to ground and hold the output LOW for 2 seconds.

RxD Components



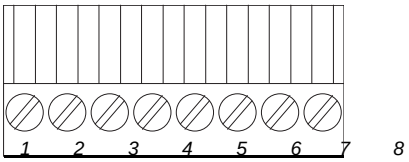
8-PinTerminal Block

RxD components include status LED indicators, a 3x AA battery holder, a Power On/Off button and an 8-Position screw terminal, hook-up block. LED's are color coded and provide short duration, high intensity blinking. The Power button is a "toggle" function that alternates between On and Off status. The AA batteries are replaceable but should perform well over the life of the product. Note that the product label covers the 3x AA battery pack.

RxD Hook-Up

Removable, 8-Position screw terminal block.

Top View – x4 Digital Outputs



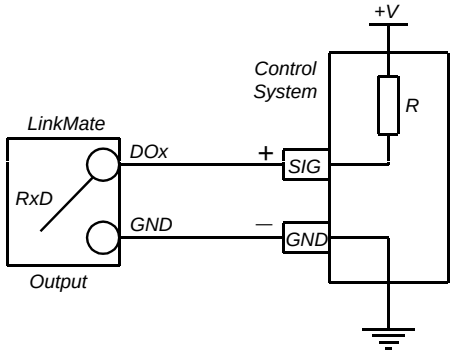
DO1 GND DO2 GND GND DO3 GND DO4

a. Unplug the removable screw terminal block.
b. Observe label on back of the terminal block
c. Make sensor wire connections as required.
d. Plug terminal block back into bottom of unit.

Output	Ground
1 – DO1	2 – GND
3 – DO2	4 – GND
6 – DO3	5 – GND
7 – DO4	8 – GND

#22 AWG wire is recommended for sensor wire hook up. A complimentary screwdriver is provided for your convenience.

Output Switch Control



This output connection is typically used as an input to a control system to sense the closing of a normally-open (NO) switch sensor. The Control System applies a positive voltage through pull-up resistor R to the SIG terminal. The RxD switch output appears as a logic 1 (high) state in the Open position and as a logic 0 (low) state in the Closed position. The R value should be 10k ohms or more for best performance.

Accessories

Part Number	Accessory Description
4008-0121500	*Nimh AA Battery (1250 mA-Hr). Used in the AA battery holders. Recommend charging before use.*
4022-1206300	*115 Vac Wall Socket Charger. 6 ft. molded power jack cable. Output 6 Vdc @ 300 mA (1.8 W).*
6016-PJ22206	*Power Jack Cable w/ alligator clips. 6 ft. 2-Conductor #22 AWG wire. White stripe marks positive lead.*
9200-0490560	*Ext. 2 W Solar Panel w/ stand. 4.1 Vdc @ 520 mA charging. 6 ft. Power Jack cable provided.*
1980-2664500	*Wireless networking module. Bluetooth 802.15.4, 2.4 GHz. 1000 ft. LOS connection range.*
9304-3042150	*Power Jack assembly. Auto-switching 3-Terminal. Nickle Plated 2.5mm Post.*