



Matko XTP Wireless Setup Manual Rev 1.1



XTP Radio Modules: Transmitter/Receiver Sets or Bidirectional

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RF Exposure

WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter. The preceding statement must be included as a CAUTION statement in OEM product manuals in order to alert users of FCC RF Exposure compliance.

Section 1: Wiring Diagram



For a typical scale applications, Connect one XTP Module as the transmitter (using **BLACK** Terminal Block) to the indicator and wire the second unit as the receiver (using the **GREEN** Terminal Block) to the Remote Display

XTP as Transmitter (Indicator side) (Black Terminal Block)

	Indicator	Pin	XTP	Connector Pin Out
Indicators with Active 20 mA Output	+20mA	5	RX CL (+)	1 +9 VDC
	-20mA	4	RX CL (-)	2 GROUND
Indicators with Passive 20 mA Output	+20mA	1	+9 VDC	3 232 RXD
		2	GROUND	4 RX CL(-)
		4	RX CL(-)	5 RX CL(+)
	-20mA	5	RX CL(+)	6 RX 422A
Indicators with RS232 Output	TXD	3	232 RXD	7 RX 422B
	GROUND	2	GROUND	
Indicators with RS422 Output	TX 422A (+)	6	RX 422A	
	TX 422B (-)	7	RX 422B	

Figure 1.1: Wiring Diagram

The corresponding **green** LED will blink with every data transmission regardless of any wireless network being present or configuration settings. *

XTP as Receiver (Remote Display side) (**Green** Terminal Block)

All 3 loops (RS232, RS422, and Current Loop) transmit with every data wireless signal received. *

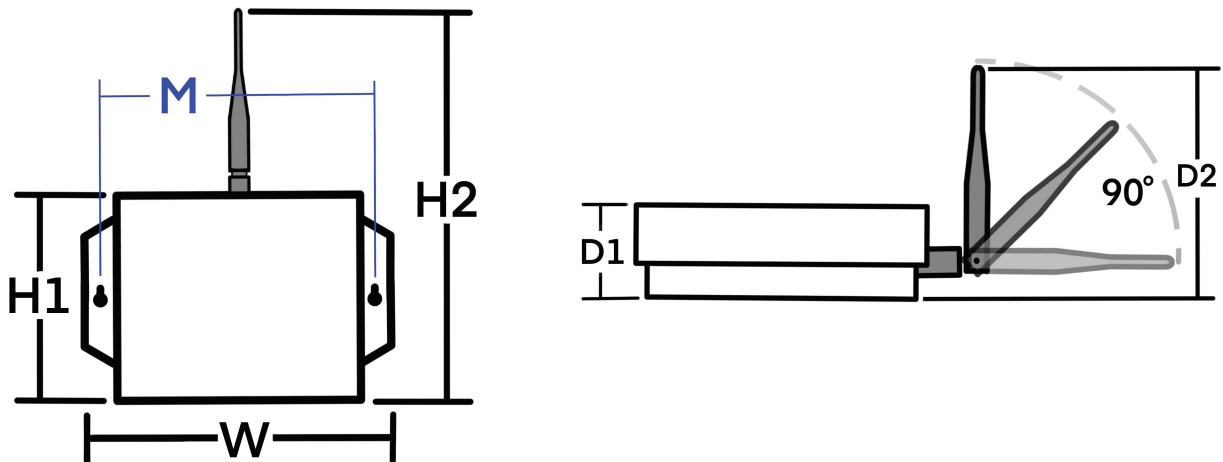
***DATA RELIABILITY in the following order:**

RS422/485 (Up to 4000 feet)
Current Loop (Up to 2000 feet)
RS232 (Up to 50 feet)

Section 2: Specifications



Physical Dimensions



Model	W	H1	H2	D1	D2	M (Mounting)
XTP	8.5"	5.75"	12"	1.75"	6.5"	7.85"
XTP-R2	8.5"	7.25"	13.5"	2.25"	6.5"	7.85"
XTP-R4	13.5"	7.25"	13.5"	2.25"	6.5"	12.85"
XTP-R8	13.5"	9.25"	15.5"	2.25"	6.5"	12.85"

Figure 2.1: Dimension Chart

Power

The XTP Module can run on any voltage source 7.5 VDC to 12 VDC with dedicated 250 mA. Power may be run off of Matko SBL and SSD Displays

Range

The XTP Module was designed under optimal conditions to run up to 2 miles outdoor **Line of Sight**. Environments vary and actual range will be less

Section 3: Configuration



Configuration

All units must be on the same ID to communicate with each other. There are 16 IDs available (IDs 0 through 15)

For each Radio in the system:

1. Set the **BLACK ID DIP** switch to the desired ID
2. Set the **BLUE BAUD RATE DIP** switch to match the serial device connected to the XTP unit.
*Any change in DIP Switch settings will cause the **RED CONFIG LED** to turn on. Transmission will be disabled until step 3 is performed. The **BLACK DIP** for TEST MODE must be off for normal operation.
3. Press the **CONFIG** button. The three **GREEN** configuration LEDs will illuminate as setup progresses.
When all three LEDs light up Configuration is complete. **

If there is a problem with configuration the **RED CONFIG LED** will blink every 5 seconds up to 6 times. **RED CONFIG LED** will then blink several times rapidly. Wait a minimum of 5 seconds before pressing the **CONFIG** button again.

** It may take up to 30 seconds after configuration before a link is established with other units and data is transmitted between units.

When the XTP has been properly configured and properly wired according to Section 1 the corresponding **GREEN LED** (RS232, CLOOP, or RS422) will blink with each data transmission. The **RED Receiving Wireless Signal** LED will blink with each data burst received from the matching transmitter. Ideally with each **GREEN** blink on the transmit side there will be a corresponding **RED** blink on the receiver side. If the receiver side is infrequent the signal is not reliably getting from one unit to the other. Reposition antennas for direct line of sight as much as is feasible.

Optional IO (Input Output) Cards

The XTP Module has the option to add up to 2 cards used for IO line passing for other XTP units on the same ID. Each card has either 4 input or 4 outputs. Each system can only have one **WHITE** input card on IO Card Slot 1 and 1 **WHITE** input card on IO Card Slot 2 (See Figure 3.1). These units may be in the same XTP unit or different units. Any system can have as many **BLACK** Output cards as required on any IO Card Slot without interference

Changing IO cards may require repeating step 3 above as indicated if the **RED CONFIG LED** turns on..

IO Card Slot 1 controls IO 1 through 4 and IO Card Slot2 controls IO 5-8 (Cards can be used in either slot.

Only IOs 0-7 are sent using IDs 0-5 and 12-15 (to maintain backwards compatibility with older XT Series models.

If 8 IOs are required use IDs 6-11

The XTP Built in Receiver has IO 1-3 tied into the stoplight controls on SSD series displays.

In 1 controls the red line

In 2 controls the green line

In 3 controls the amber line

Section 3: **Configuration** Continued



Optional IO (Input Output) Cards (Continued)

Connect a switch between GROUND and the desired input line on the **BLACK** Input Card. When the switch is closed the **GREEN** Input LED will light. When the loop is open the light will be off. On the corresponding **WHITE** Output Card the **RED** Output LED will match the state of the **GREEN** Input LED

Optional Output Relays

The XTP modules may be connected to 5 volt relays. The XTP-R2, XTP-R4 and XTP-R8 have larger versions of the case with built in relays. Any Output line may be connected to a relay. On the **WHITE** Output Card connect the +5 VDC line to one side of the relay coil and the desired output line to the other side of the relay coil.

The provided relays have connections for both NO (Normally Open) and NC (Normally Closed) circuits. This allows easy logic inversion if needed. The COM (Common) Line is used as the voltage input.

Relays Ratings

30/20 Amps (NO/NC) at 277 VAC
20/10 Amps (NO/NC) at 28 VDC
2/0.5 HP (NO/NC) at 250 VAC
1/0.25 HP (NO/NC) at 125 VAC

Maximum Switching Voltage: 277 VAC, 110 VDC

Section 3: Configuration Continued



Board Layout

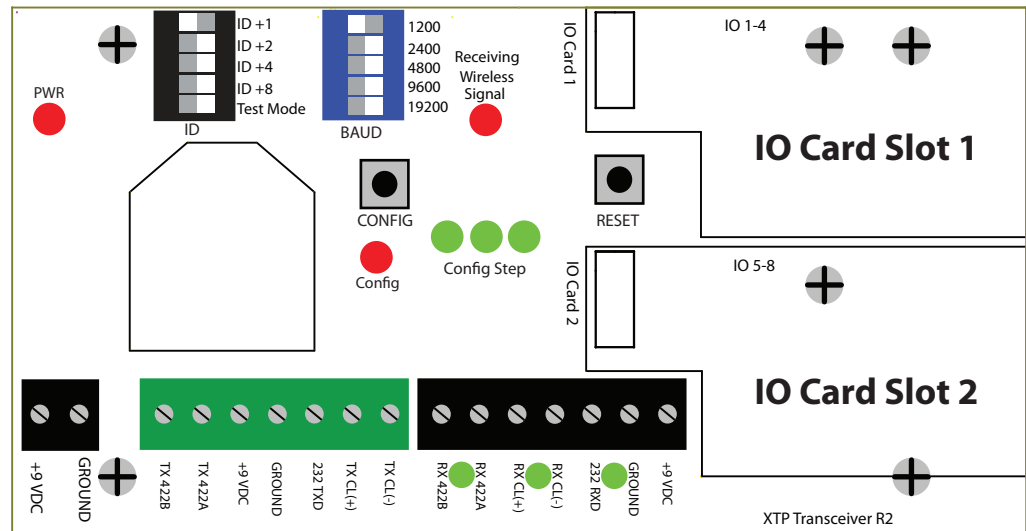


Figure 3.1: XTP Module (set to 1200 Baud ID1)

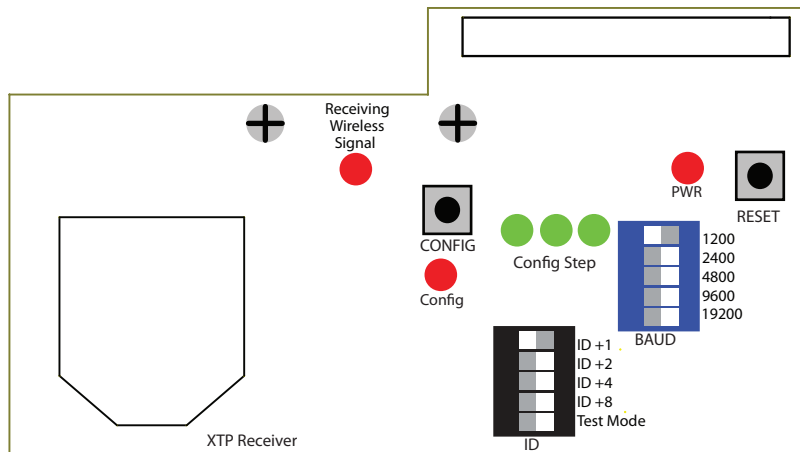


Figure 3.2: XTP Built in Receiver

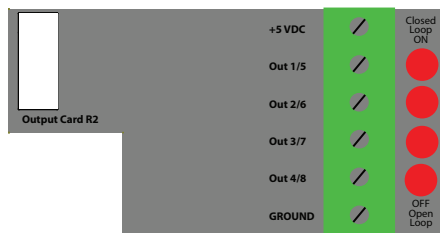


Figure 3.3: XTP Output Card

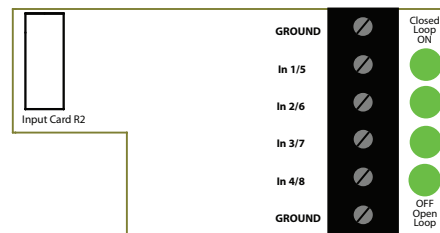


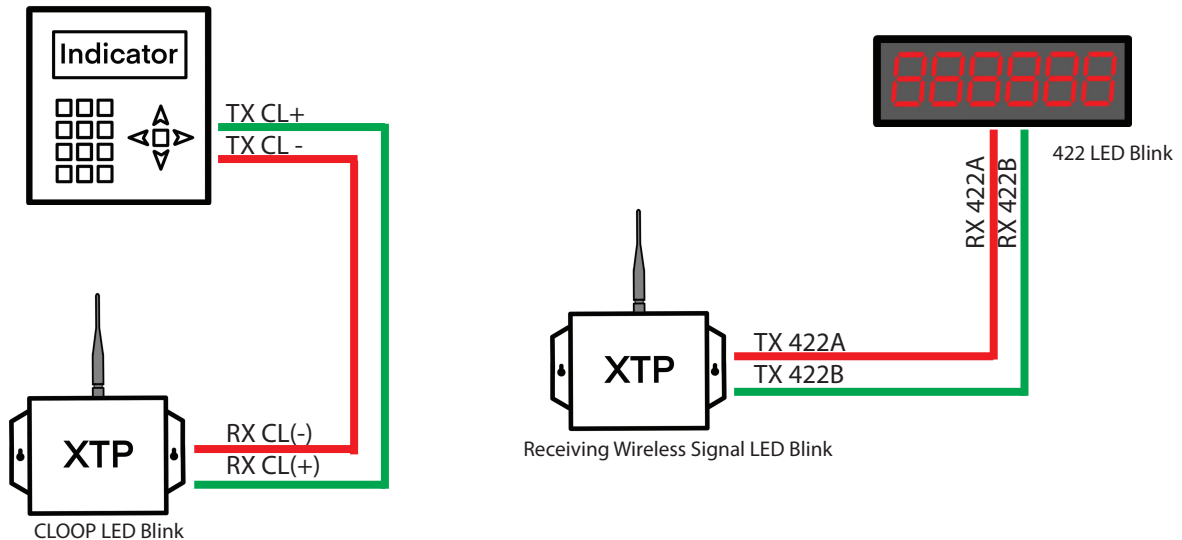
Figure 3.4: XTP Input Card

Section 4: Example Installations



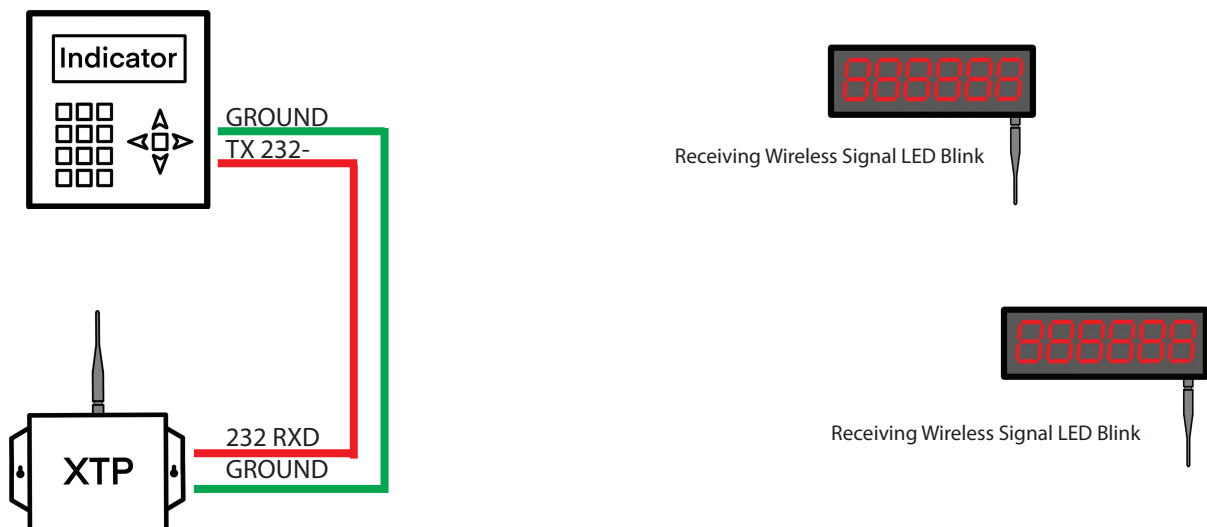
Case 1

Typical Setup: Indicator to remote using two XTP Radio Modules. (Indicator wired for Current Loop and Display wired for RS422)



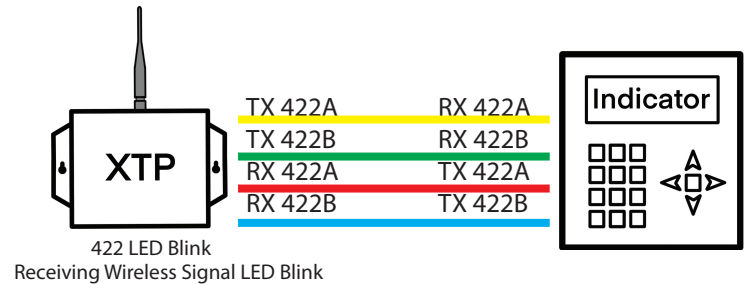
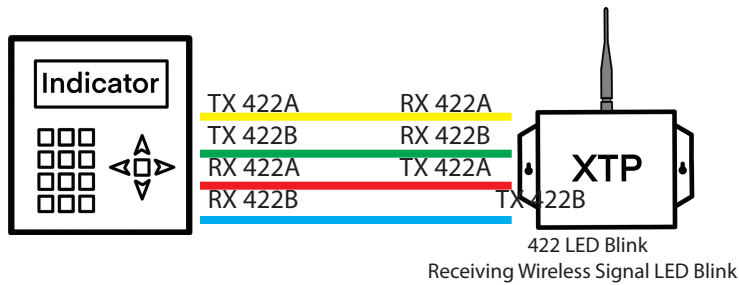
Case 2

An Indicator transmitting to one or more Remotes with built in XTP Receivers. (Indicator wired for RS232)

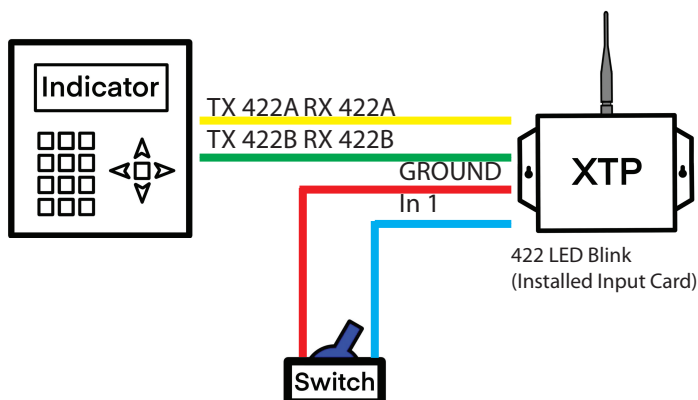


Section 4: Example Installations Continued

Case 3
Networked Indicators with Bi_Directional communication (RS422)



Case 4
Indicator with a closed contact switch to operate a stoplight

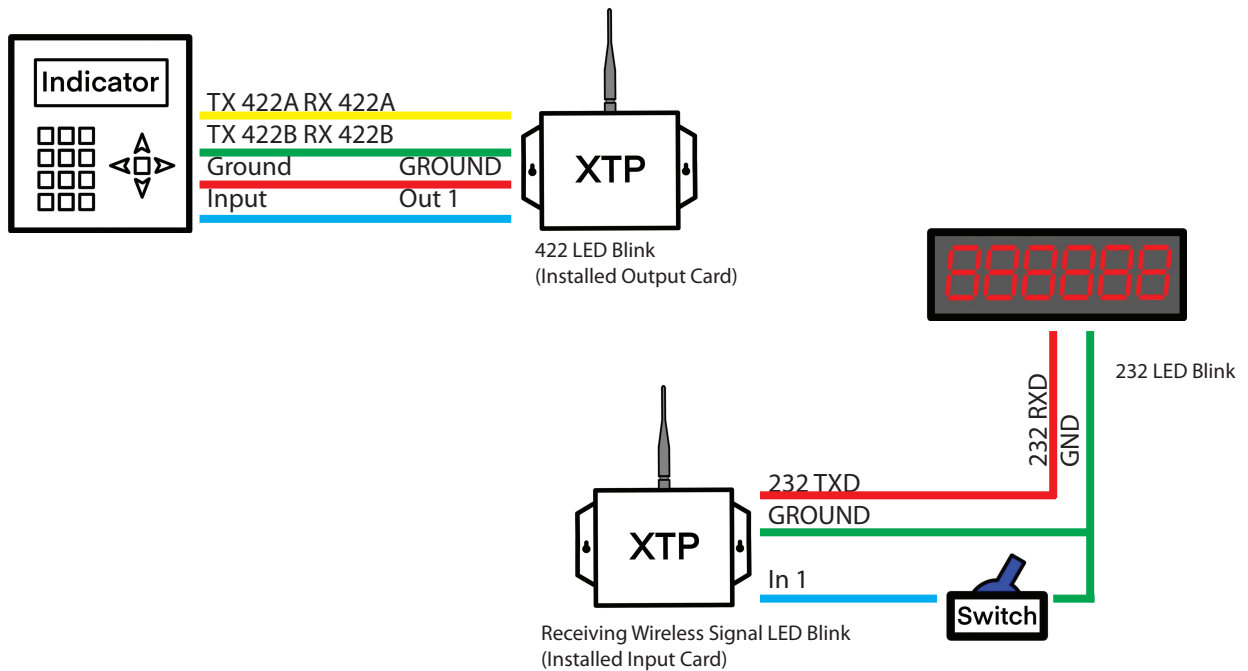


Section 4: Example Installations Continued



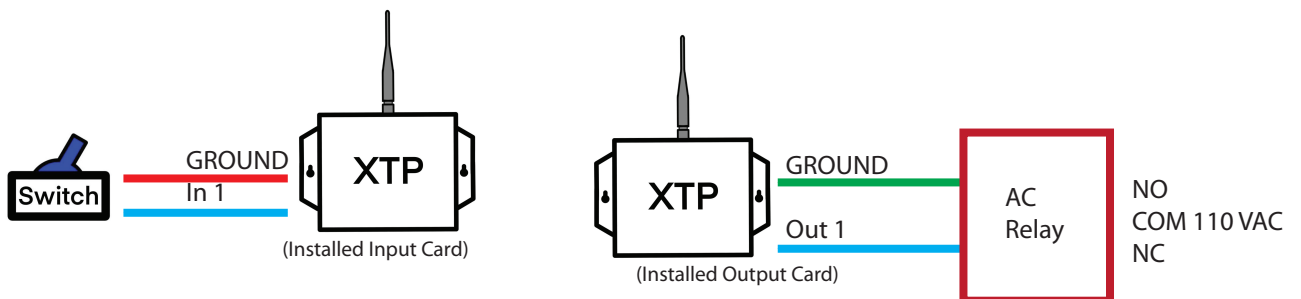
Case 5

Indicator with a remote zero/print and button near the receiving XTP. (Indicator wired for RS422 and Display wired RS232)



Case 6

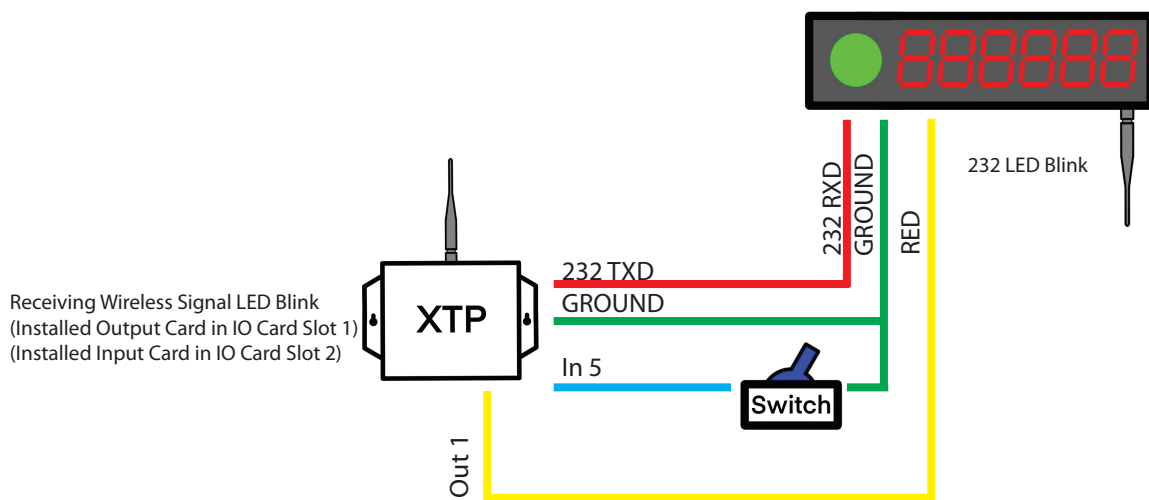
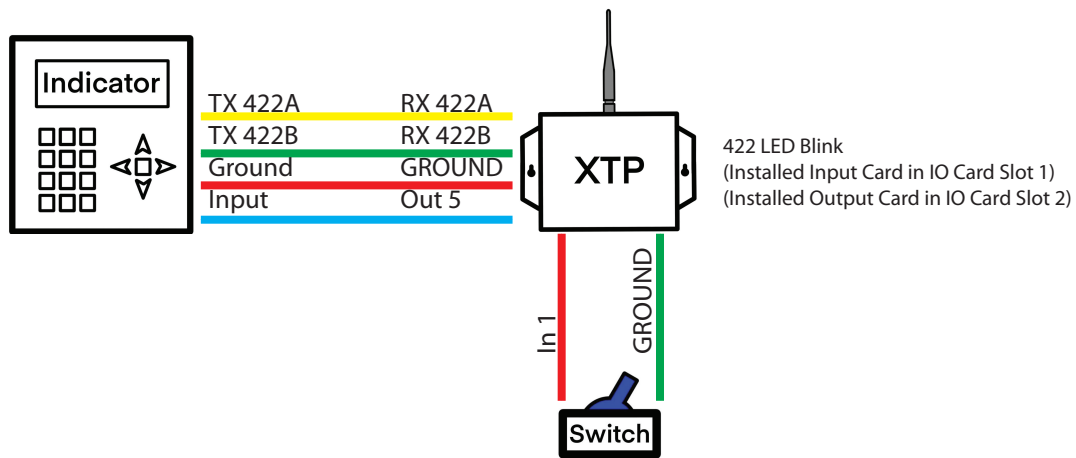
A switch remotely controlling an AC Relay



Section 4: Example Installations Continued

Case 7

Indicator with a nearby switch to manually control a stoplight.
The remote has a switch to remotely zero the indicator



Section 5: Trouble Shooting



BEFORE YOU CALL, please see if any of the below problems/solutions match your conditions.

The Red PWR LED doesn't come on

Verify the power supply is turned on and putting out 7.5 to 12 volts DC and that the wires are securely screwed into the terminals.

No LEDs are blinking on the unit connected to the indicator/Source Device

Make sure the indicator's port is enabled for continuous output and that the unit is wired according to section 1. The indicator's transmit should be wired into the XTP units receive terminals. The corresponding LEDs will blink with every data transmission.

No LEDs are blinking on the Receiver/unit connected to the remote display

Make sure there is an LED blinking on the side connected to the indicator first. If that side does not blink the receiving side will not blink. If the indicator side is blinking, then make sure both units are set to the same ID and reconfigure both units by pressing the CONFIG button on each side. Try unplugging one unit and plugging it back in to have the wireless units re-establish the network. If the remote display end still does not blink, then the problem may be distance/obstacle related. Try bringing both sides into an office and see if they communicate over a short distance. If they do, then reposition the units for better line of site or add a repeater to the system. Avoid mounting too close to any other RF transmitters including Ham and CB Radios.

The Receiving Wireless Signal LED blinks on the remote display side of my XTP, but the remote shows "NoData"

The problem is probably with the wiring. Make sure you are coming out a transmit on the XTP unit and going into a receive on the remote display. Try changing to a different transmit port. You do not have to use the same loop on the remote display side as you use on the indicator side. Try bringing both sides into an office and see if they communicate over a short distance. Try using TEST MODE. See next page

The RX LED is blinking on the remote display side, but the remote is blank or shows random numbers.

Verify the baud rate is correct on both ends and press the CONFIG button on both units. Reset the remote display to factory defaults by holding the LEFT and RIGHT buttons during countdown. After the unit starts to count down for the second time let go and the remote should display the correct baud rate. If still blank, try shift data over to the left or right.

The system is reliable except when weight is on the scale

Make sure that when a truck pulls on a scale it does not come between the two antennas. A truck acts as a solid metal wall blocking the signal

The system sometimes works and sometimes does not.

Make sure nothing has changed at the site such as trees growing into the line of sight or gravel piles growing to block the signal. If you are at the far edge of the maximum usable range then many things can degrade the signal including, temperature, humidity, or large equipment being run nearby. In general, make sure both antennas are pointing straight up and down, are as high above the earth as is reasonably possible and have a clear line of sight to each other. Other than that you may need a repeater added to the system to extend the range. See next page. Some Indicators will stop transmitting while the weight is in motion. **IDs 6 and 11 work at different frequencies than all other IDs, there may be too much noise/activity on your frequency . Try switching to one of these alternative frequency.**

**If you are still unable to get the unit working after going through this list, please call our tech support at 1-800-814-4053*

Section 5: Trouble Shooting Continued



Repeater

If the system is working but you cannot get the needed range for the job site you can try to add an extra XTP to the system as a repeater unit. Mount the unit roughly in the middle of the distance with line of site to both ends. You will need power at this location. Add a jumper wire from 232 RXD to 232 TXD. Any signal that can make it to this module will then be repeated out. The original transmitting unit will have the data echoed back to it, so this will not work for applications with bidirectional communication.

TEST MODE

The XTP Modules have a **TEST MODE** Option located on the bottom of the **BLACK** DIP Switch. This option will begin transmitting data out at the last configured ID and Baud Rate. It is recommended that you press the CONFIG button to verify all settings are known prior to entering **TEST MODE**.

While in **TEST MODE** the Module will transmit a data stream twice a second. If the receiving unit is within range and setup on the same ID the RED Receiving Wireless Signal LED should blink twice a second as well. If you connect the Receiving unit to a PC or Remote Display the Data Stream will be in the following format:

<STX><Counter>123456<Counter><CR><LF><ETX><CR-P><LF-P><ETX-P>

<STX> = Start of Text - Decimal 2

<Counter> incrementing 1 digit counter "0-9"

<CR> Carriage Return - Decimal 13

<LF> Line Feed - Decimal 10

<ETX> End of Text - Decimal 3

<CR-P> Carriage Return with parity bit - Decimal 141

<LF-P> Line Feed with Parity bit - Decimal 138

<ETX-P> End of Text with Parity Decimal 131

Both Transmitters and receivers can be set to **TEST MODE** to verify both units can see each other.

Section 6: Product Comparison



Product Comparison

	XT100 Legacy	XT300 Legacy	XT400 Legacy	XTP
Line of Sight Distance	Up to 1 mile	Up to 1 mile	Up to 1 mile	Up to 2 Miles
Baud Rate 1200 2400 4800 9600 19200	9600 (Fixed)	▲ ▲ ▲ ▲ ▲	▲ ▲ ▲ ▲ ▲	▲ ▲ ▲ ▲ ▲
Protocol RS232 20 mA Current Loop RS422 /485	▲	▲ ▲ ▲	▲ ▲ ▲	▲ ▲ ▲
Approvals US (FCC) Canada (IC) Europe (ETSI)	▲	▲ ▲ ▲	▲ ▲ ▲	▲ ▲ ▲
Network ID's	1	16	16	16
TTL Line Passing	0	0	Up to 4	Up to 8
Configuration	Fixed	In Field	In Field	In Field
Enclosure	NEMA 4 IP65	NEMA 4 IP65	NEMA 4 IP65	NEMA 4 IP65

Figure 4.1: Comparison Chart

Compatibility:

The XTP Module is compatible with the prior versions XT100/XT200/XT300/XT400 so long as they are on the same ID with the exception that ID #s 6-11 will not communicate. IDs 0-5 and 12-15 are compatible and should be used whenever intermixing modules.

Section 7: Part Numbers



Part Number	Description
XTP	Serial Data to Wireless Module
XTP-R2	Serial Data to Wireless Module in expanded case. Includes 1 Output Card and 2 Relays
XTP-R4	Serial Data to Wireless Module in expanded case. Includes 1 Output Card and 4 Relays
XTP-R8	Serial Data to Wireless Module in expanded case. Includes 2 Output Card and 8 Relays
XTP-INPUT	4 Input Expansion Card for XTP Module
XTP-OUTPUT	4 Output Expansion Card for XTP Module
RELAY	Replacement Relay
XTP-BIR	XTP Built in Receiver Card for SSD Series Displays only (Replacement Part)
XTP-ANT	XTP Standard antenna with u.fl cable
XTP-ANT-9DBI	9 dBi antenna with magnetic base
XTP-ANT-24DBI	24 dBi parabolic antenna with mounting bracket
PWR-9V	9 VDC power supply for XTP Module (Replacement Part)

SSD Series Displays can be equipped with wireless capability in 2 ways

- 1) Order a standard remote and 2 XTP modules
*This solution allows the most flexibility in the field for moving antennas to areas with the best line of sight, but adds a third device to the system. (Account for extra power and cabling)
- 2) Add "-XTP" to the end of the part number, i.e. SSD-5-XTP to get a package of a remote display with a built in receiver as well as the external XTP Module to connect to.
**This solution is a streamlined solution with only 2 devices, but does not allow for the flexibility of moving the remote display around easily for better line of sight.

Manual Revision

v.1.1 XTP Manual Initial Release