Matko Wireless Installation Manual

XT Series:
XT100, XT200, XT300, XT400

Wireless Manual v.2.4

Product Comparison

	XT100T	*XT200T*	*XT300T*	*XT400T*
Line of Sight Distance	Up to 1 mile	Up to 1 mile	Up to 1 mile	Up to 1 Mile
Baud Rate				
1200		▲	▲	▲
2400		▲	▲	▲
4800		▲	▲	▲
9600	9600 (Fixed)	▲	▲	▲
19200		▲	▲	▲
Protocol				
RS232	▲	▲	▲	▲
20 ma Current Loop		▲	▲	▲
RS422/485		▲	▲	▲
Approvals				
US (FCC)	▲	▲	▲	▲
Canada (IC)			▲	▲
Europe (ETSI)			▲	▲
Network ID's	1	2	16	16
TTL Line Passing	0	0	0	4(Transceiver)/2(Receiver)
Configuration	Fixed	In Field	In Field	In Field
Enclosure	NEMA 4 IP65	NEMA 4 IP65	NEMA 4 IP65	NEMA 4 IP65

Wiring Diagram

	Indicator	Pin	Display
Indicators with Active 20 mA Output	+20 mA	6	CL (+)
	-20 mA	5	CL (-)
Indicators with Passive 20 mA Output	+20 mA	1	+9 VDC
		2	GND -JUMP
		5	CL (-) -JUMP
	-20 mA	6	CL (+)
Indicators with RS232 Output	GND	2	GND
	TXD	3	232 RXD
Indicators with RS422 Output	TX 422A (+)	7	RX 422A
	TX 422B (-)	8	RX 422B

Figure 1 – Wiring Diagram

Compatibility:
All Matko XT Series transceivers and receivers are compatible with each other. An XT300 Transceiver can talk to an XT100 Receiver; however, the units must have been configured to the same ID (XT100 only works on ID 0)

Power:
The XT Series transceivers can operate with any voltage source from 7.5 VDC to 12 VDC. This includes running power directly off of an SBL Series remote VCC and GND.

Install Notes:
-Mount all units in a direct line of sight with each other with all antennas on the same plane (all pointed straight up or straight down).
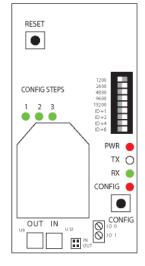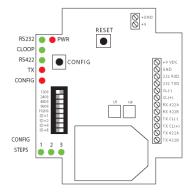
Figure 2 – XT300 Receiver

Configuration

All units must be on the same ID to communicate with each other. XT100 units are fixed on ID 0. XT200 units are selectable between ID 0 and 1. XT300/400 units have IDs 0 through 15 available.

1. Set the ID DIP switch to the desired ID
2. Set the baud rate DIP switch to match the serial device connected to the XT unit. XT100 units are fixed at 9600 baud RS232.
3. Press the CONFIG button on the transceiver to save the DIP switch settings. 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 as internal communication is re-established. The red CONFIG LED will then blink several times rapidly. Wait a minimum of 5 seconds before pressing CONFIG 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 transceiver has been properly configured and properly wired according to figure 1 the corresponding green LED (RS232, CLOOP, or RS422) will blink with each data transmission. This LED will blink regardless of whether the receiver side has been properly configured or even powered on. The red RX LED will blink on the receiver side with each data burst received from the matching transceiver. Ideally with each green blink on the transceiver 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.

XT400 IO (Input Output) Setup

The XT400 transceiver has the ability to pass up to 4 input lines to one or more XT400 Transceivers set for outputs. You may not have more than one unit set for input on the same system as the two units would conflict with each other. Each transceiver can either be an input device or an output. You cannot mix input and output on the same device. In addition to setting the DIP switches as mentioned above the unit will also need to have the removable jumper placed in the correct spot as well as two 8 pin chips.

    -For input lines, place the jumper on input and make sure the two MCT6 chips are inserted into the sockets to the right, labeled "IN"

    -For output lines, place the jumper on output and make sure the two MCT6 chips are inserted into the sockets to the left, labeled "OUT"

*Input and output are only in reference to the digital lines. Serial data is bidirectional regardless of jumper settings.
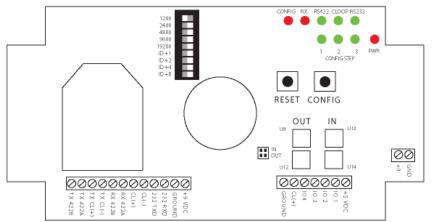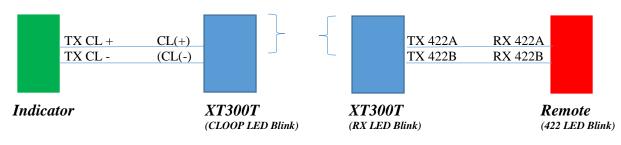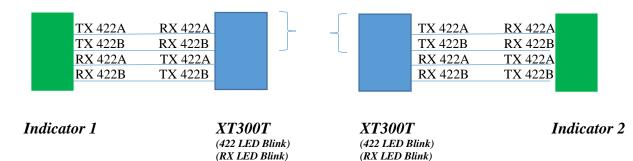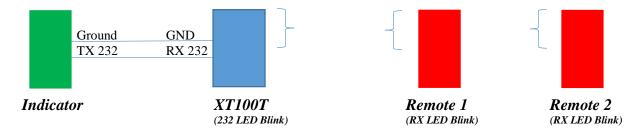

Figure 3 –XT300 Transceiver

Figure 4 –XT400 Transceiver

Example Installations

Case 1
Typical Setup: Indicator to remote using two XT300 Transceivers

Indicator		XT300T	XT300T		Remote
TX CL + → CL(+)		*(CLOOP LED Blink)*	TX 422A RX 422A		*(422 LED Blink)*
TX CL - → (CL(-)			TX 422B RX 422B		

Indicator *XT300T* *(CLOOP LED Blink)* *XT300T* *(RX LED Blink)* *Remote* *(422 LED Blink)*

Case 2
Networked Indicators

TX 422A RX 422A
TX 422B RX 422B
RX 422A TX 422A
RX 422B TX 422B

TX 422A RX 422A
TX 422B RX 422B
RX 422A TX 422A
RX 422B TX 422B

Indicator 1 *XT300T* *(422 LED Blink)* *(RX LED Blink)* *XT300T* *(422 LED Blink)* *(RX LED Blink)* *Indicator 2*

Case 3
An Indicator to two remote displays with built in receivers

Ground → GND
TX 232 → RX 232

Indicator *XT100T* *(232 LED Blink)* *Remote 1* *(RX LED Blink)* *Remote 2* *(RX LED Blink)*

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Case 4
Indicator with a closed contact switch to a SBL-4SG-XT400

TX 422A	RX 422A
TX 422B	RX 422B
	Ground
	IO 1

Indicator

Switch

XT400T
(422 LED Blink)
(Configured for Input)
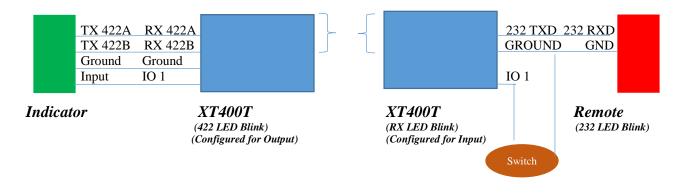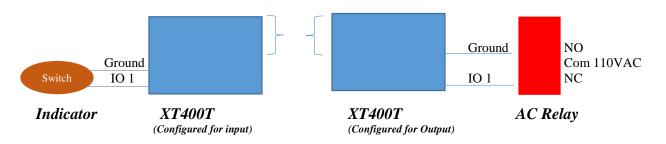
SBL-4SG
(RX LED Blink)
(Configured for Output)
(IO 1 jumper to 13 Green)

Case 5
Indicator with a remote zero/print switch near the Display

TX 422A	RX 422A
TX 422B	RX 422B
Ground	Ground
Input	IO 1

Indicator

XT400T
(422 LED Blink)
(Configured for Output)

XT400T
(RX LED Blink)
(Configured for Input)

232 TXD	232 RXD
GROUND	GND
IO 1	

Switch

Remote
(232 LED Blink)

Case 6
A switch remotely controlling an AC Relay for a traffic light

Switch

| Ground | |
| IO 1 | |

Indicator

XT400T
(Configured for input)

XT400T
(Configured for Output)

Ground	NO
	Com 110VAC
IO 1	NC

AC Relay

You can reverse the logic by connecting the coils of the AC relay to IO 0 and +5 VDC instead of ground

Repeater

If the transceivers/receivers are working but you cannot get the needed range for the job site you can try to add an extra transceiver to 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 transceiver will then be transmitted back out. The original transmitting unit will have the data echoed back to it, so this will not work for bidirectional communication.

Troubleshooting

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
Make sure the indicator's port is enabled for continuous output and that the unit is wired according to the wiring diagram. The indicator's transmit should be wired into the XT units receive terminals. The corresponding LEDs should blink with every signal regardless of the DIP settings or even if the signal is good or not.

No LEDs are blinking on the 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 sides 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.

The RX LED blinks on the remote display side of my XT transceiver, but the remote shows "NoData"
The problem is probably with the wiring. Make sure you are coming out a transmit on the XT unit and going into a receive on the remote display. Try changing to a different transmit port if you have any unit other than the XT100T. All other models have RS232, current loop and RS422 as options. You do not have to use the same loop on the remote display side as you use on the indicator side.

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 and press the configure button on both ends. 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, to 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

*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

Mounting Dimensions

XT100T, XT200T, XT300T

> There are (4) holes 0.156" diameter with spacing of 4.7" wide x 2.4" tall
> A second option is to use (2) mounting holes 4.7" wide with a maximum diameter of .175"

XT400T

> There are (4) holes 0.156" diameter with spacing of 6.75" wide x 2.4" tall
> A second option is to use (2) mounting holes 6.75" wide with a maximum diameter of .175"

Manual Revision

v.2.3

> Reworded all configuration procedures. Added wiring diagrams and troubleshooting pages. Added XT400 diagram

Replacement Part Numbers

Part Number	Description
XT-ANT	2.4 GHz antenna for all XT Series models
XT100 Receiver	XT100 Series receiver mounted internally to an SBL Series Remote Display. Fixed at 9600 Baud rate and 1 System ID
XT200 Receiver	XT200 Series receiver mounted internally to an SBL Series Remote Display. Selectable Baud Rate and 2 System IDs
XT300 Receiver	XT300 Series receiver mounted internally to an SBL Series Remote Display. Selectable Baud Rate and 16 System IDs
XT400 Receiver	XT300 Series receiver mounted internally to an SBL Series Remote Display. Selectable Baud Rate and 16 System IDs. 2 Digital output
XT100 Transceiver*	XT100 Series Transmitter/Receiver in a NEMA 4 case. Fixed at 9600 Baud rate and 1 System ID
XT200 Transceiver*	XT200 Series Transmitter/Receiver in a NEMA 4 case. Selectable Baud Rate and 2 System IDs
XT300 Transceiver*	XT300 Series Transmitter/Receiver in a NEMA 4 case. Selectable Baud Rate and 16 System IDs
XT400 Transceiver*	XT300 Series Transmitter/Receiver in a NEMA 4 case. Selectable Baud Rate and 16 System IDs. 4 Digital inputs or 4 digital outputs.
PWR-9V	9 Volt DC power supply for all XT Series Transceivers

*Any serial devices can be connected using XT Series Wireless transceivers. PCs can be connected to printers or multiple indicators can be networked together… Matko remotes are not required for a wireless system.

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.