

xTPRA & xTPRS INSTALLATION AND USER GUIDE

Revision History

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01	1/10/2013	Brian Piquette	Initial release

Document Approvers & Sign-Off

Date	Approver	Role	Document Accept/Reject
	Patrick Stanko	Project Manager	
	Brian Piquette	Electrical Engineer	
	Richard Criado	Product Owner	

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1 Introduction

The xConnect xTPra Short Range Reader is part of a proprietary data acquisition and tracking system. It provides an HF RFID reader (TX/RX) to read RFID tag data from proprietary RFID media. This RFID tag data can be then sent over an Ethernet connection to a data collection/concentration object. The xTPra is designed to be mounted in harsh environments.

The xTPrs is a derivative model of the xTPra that adds support for being powered by 24VDC and interfacing to an external sensor through its peripheral interface connector.

1.1 Purpose

This document provides basic installation and user instructions for the Synapse xTPra Short Range Reader and the xTPrs Sensor Monitor.

1.2 Definitions

Term	Definition
RFID	Radio Frequency Identification
OTS	Off the shelf
cULus (NRTL)	Canadian & US Underwriters Lab recognition (Nationally Recognized Testing Laboratory)

2 Safety Warnings

2.1 Important Safety Instructions

When using this device, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons.

Do not use this product near water. For example, do not use:

- near a bath tub
- near a wash bowl
- near a kitchen sink or laundry tub
- in a wet basement
- near a swimming pool

2.2 Explosive Safety Warning

Warning! Do not operate this device near explosive devices, unshielded blasting caps or in an otherwise explosive environment unless the device has been approved for such use by qualified personnel.

Warning! Do not disconnect the power or any other cabling in an explosive environment until such qualified personnel, trained specifically in explosive environment handling, have determined it is safe to do so.

2.3 Lightning Warning

Warning! Do not connect or disconnect cables or otherwise work with the device hardware during periods of lightning activity.

Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

3 Regulatory Compliance

3.1 Federal Communications Commission (United States)

Regulatory Compliance Information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

Caution:

Any changes or modifications not expressly approved by Walt Disney Parks and Resorts U.S. (WDPR) could void the user's authority to operate this equipment. These products have been certified to be used with the following set of RFID Antennae:

RFID Antenna Description	Vendor	Part Number
Octagon	Walt Disney Imagineering	WMKPLFMND0201
Circular	Synapse Product Development	600-0286-00
Large Rectangle	Skyetek	18362-900-00003
Small Rectangle	Feig Electronics	1967.00.00

3.2 UL Certification

The xTPra has been certified as a UL Listed Product to the UL 60950-1 standard.

The xTPrs has been certified as a UL Recognized Component to the UL 60950-1 standard.

4 Features

The following two images show the external interfaces to the xTPra/xTPrs. Detailed descriptions of each follow. The xTPra and xTPrs are identical physically except the xTPrs has a blue label. The Peripheral Interface on the xTPra is not connected internally.

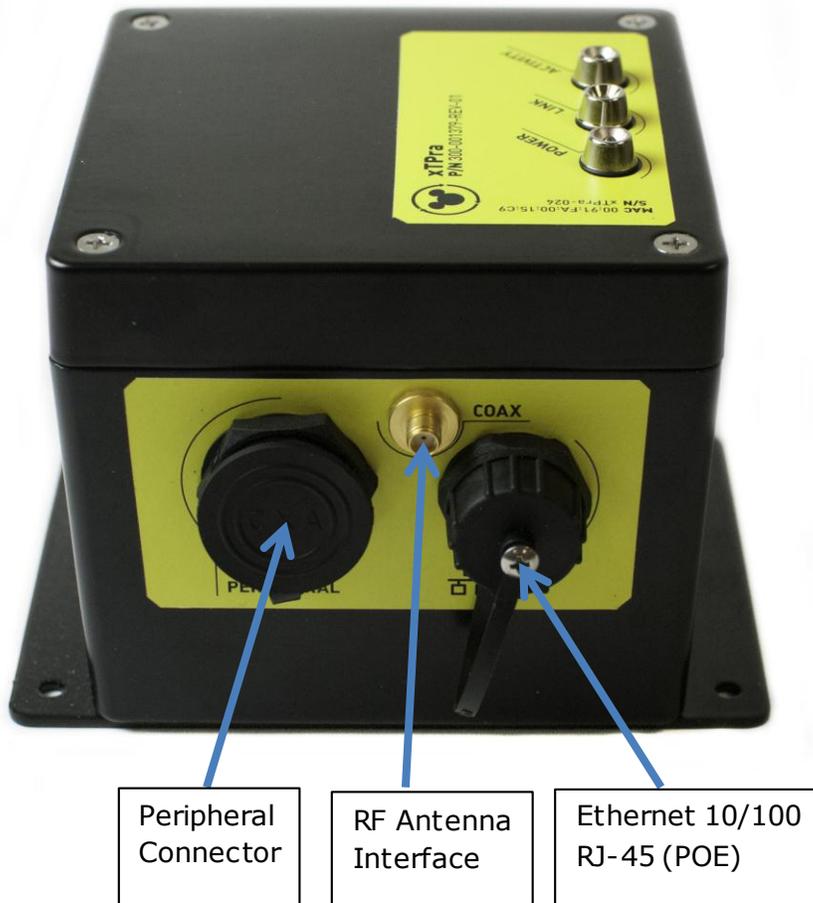


Figure 1 – xTPra/xTPrs Interfaces, Side View



Figure 2 – xTPra/xTPrs Interfaces, Top view

4.1 Detailed Interface Descriptions

4.1.1 Ethernet 10/100 RJ-45 (PoE):

The Ethernet interface is standard 802.3af PoE interface. The external connector is an IP67 rated connector. This connector is from L-Com, Part number WPRJ-FTCAT5E. Cable Assemblies in the L-Com TRD5WP and WPRJ series will mate with this connector of an IP67 rated connection.

With external DC power applied to the xTPrs through the peripheral interface, that power source will be internally selected over the PoE interface.

4.1.2 RF Antenna Interface

The RF interface provides a 50 SMA connection to an external 13.56MHz antenna.

4.1.3 Peripheral Connector

On the xTPrs the peripheral interface connector is available. The Peripheral Connector on the xTPra model is not connected internally.

The 18 pin Peripheral connector provides the DC input power source for the xTPrs as well as an opto-coupled input signal.

The pinout of this connector is as follows:

Pin	Function
4	+24VDC Power Input
5	+24VDC Return
10	Optically isolated input, Current sinking or Current Sourcing options, 24VDC max. See "xTPrs Configuration Options" for more details.
1-3,6-9, 11-18	All other pins are reserved for future use. DO NOT CONNECT.

The part number of the peripheral connector is 14282-18SG-300. This is a Switchcraft/Conexall part.

Synapse cable Part number 604-0029-00, the xTPrs Sensor Peripheral Cable, can be ordered and incorporated into an installation for the xTPrs Sensor Input use case.

4.1.4 LED Indicators

There are 3 LED indicators on the top of the xTPra:

- **Power:** Indicates if the unit is powered by either PoE or the DC input via the peripheral connector.
- **Link, Activity:** These two LEDs reflect the state of the Ethernet port.

4.2 RFID Capabilities

- **TX/RX:** 13.56 MHz
- ISO 14443A, with support for proprietary security protocols

4.3 Operating Conditions

Temperature:

- **Operating:** -10°C to 50°C

- **Storage:** -20°C to 60°C
- **Operating Relative Humidity:** 90% condensing/non-condensing
- **Altitude:** 8,000 ft @28°C (82.4°F)

4.4 Power

The xTPra's power source is via the PoE capable Ethernet port. This port supports the IEEE 802.3at-2009 standard.

The xTPra's rated power consumption is less than 6W.

The xTPrs' power source is the DC power input through the peripheral connector interface.

DC Input: 24Vdc, 1A max

NOTE: This product must be used with a DC power source that is cULus (NRTL) Listed, with an output rated 24VDC +/- 20% maximum, minimum 1A, Marked "LPS" or "Class 2", output rated SELV, non-energy hazardous.

4.5 Physical

4.5.1 xTPra, xTPrs

xTPra, PN: 300-001379-01

xTPrs, PN: 300-001379-02

- **Material:** Aluminum
- **Dimensions:**
Height: 4.090"
Width: 4.75"
Length: 5.874" (including mounting plate)
- **Unit Weight:** 360 grams



Figure 2 – xTPra Unit

5 Installation

5.1 Trained Installation and Service Personnel Warning

Warning! Installation and service of this product is to be performed by trained installation and service personnel only. Read and follow all warning notices and instructions marked on the product or included in the documentation. Before installing the product, read the rest of this document and follow specific product instructions.

When installing, the placement of the device must also satisfy the following installation requirements:

- Placement must allow for easily disconnecting the power cord/adapter of the device from the AC wall-outlet.
- Keep the device away from excessive heat and humidity and keep the device free from vibration and dust.
- Installation must at all times conform to local regulations.
- Network Connections can be made with either Unshielded Twisted Pair (UTP) or Shielded Twisted Pair (STP) cabling.

5.2 Electrostatic Discharge Warning

Warning! Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.

5.3 Telecom Warning

Note: This unit is intended for local (intra-building) connections only and is not designed or evaluated for direct connections to the public telecommunications/cable distributions systems. Cable and Ethernet connections should be made in accordance to the National Electrical Code (NEC). For example, one of the following should be true*:

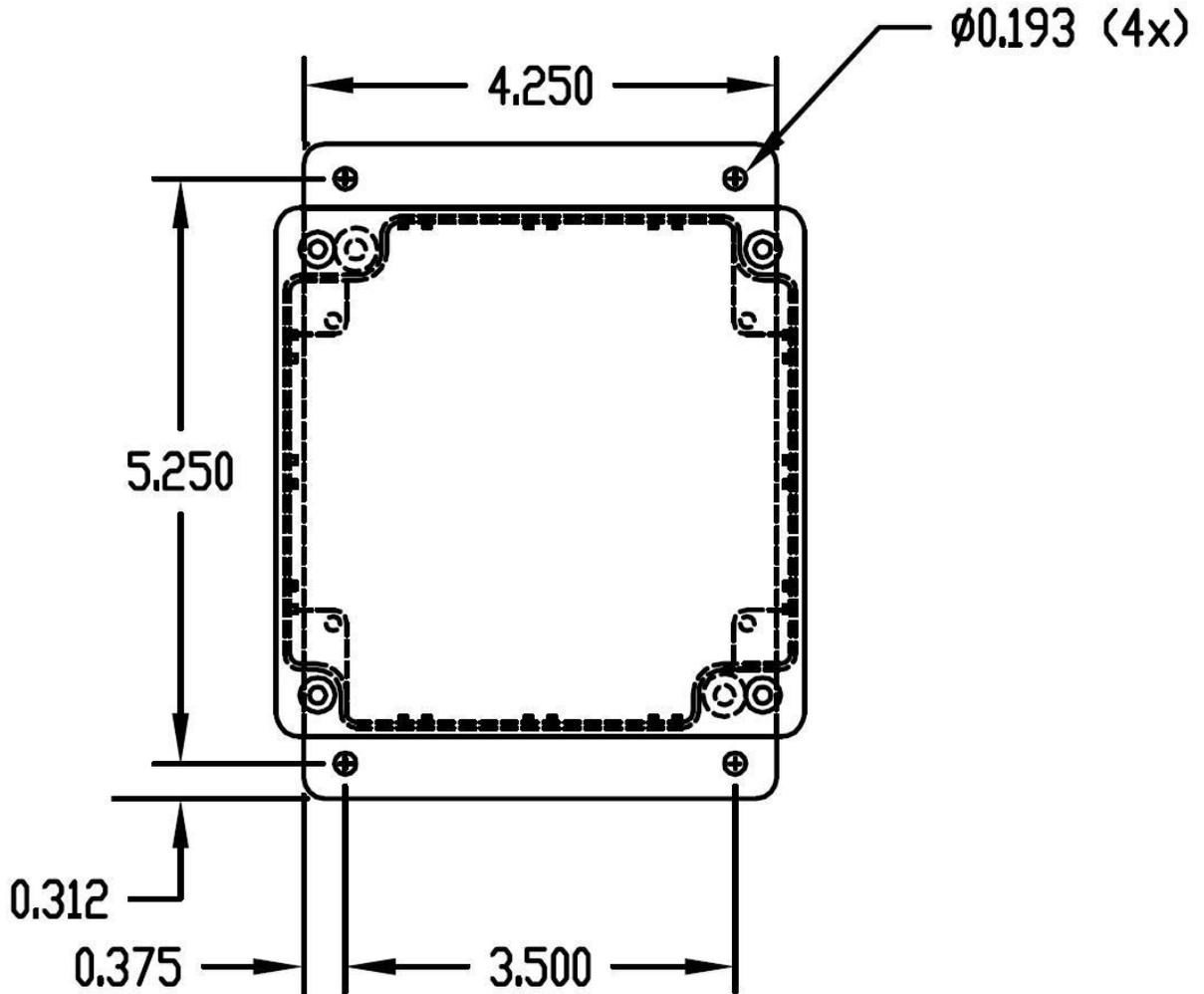
- Cable runs are located in the same building as this unit.
- Cable runs through air between buildings are less than 42m (140ft).
- Cable runs between buildings are directly buried.
- Cable runs between buildings are in underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

*These options are from the US National Electrical Code, Sections 800.10, 800.12, 800.13, 800.31, 800.32, 800.33, and 800.40.

5.4 Installation Instructions

The xTPra/xTPrs can be mounted via the 4 holes in the base plate. The base plate is 0.090" thick. The hole dimensions are shown below.

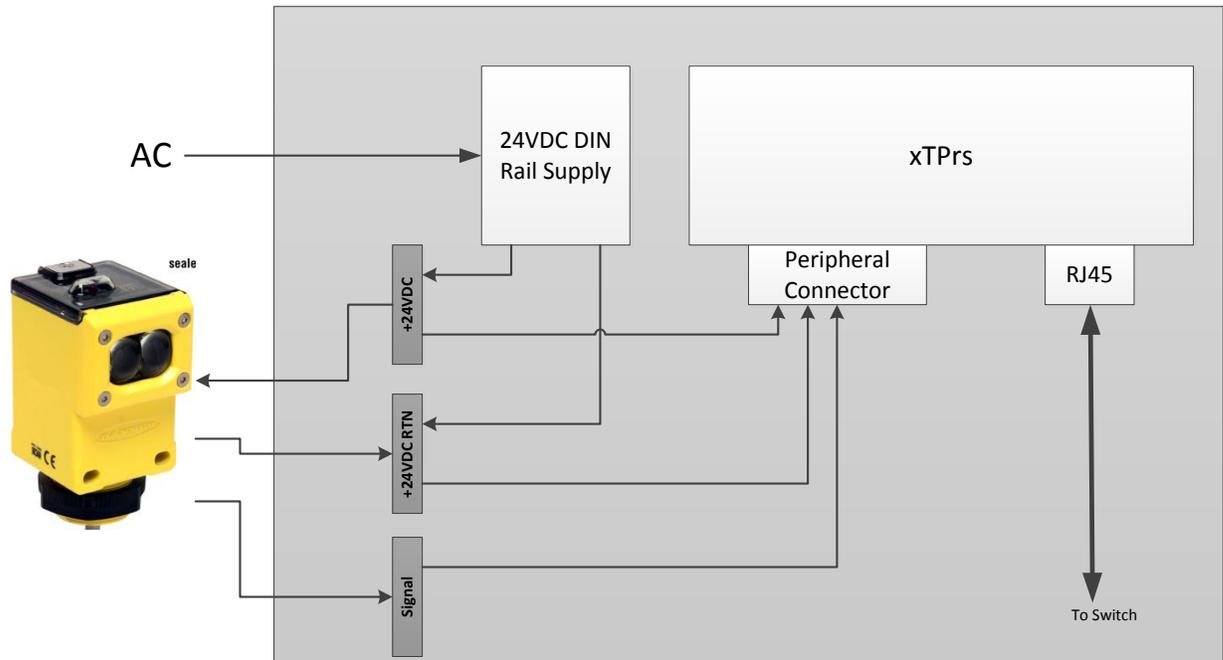
It is important that this device be mounted in a secure manner. When attaching to a wall always mount to a wall stud or similar structural component using appropriate mounting screws.



5.5 xTPrs Wiring

The xTPrs is intended to be used with a wide variety of Industry standard discrete output proximity detectors that provide a Normally Open, PNP or NPN output.

The xTPrs should be connected to the sensor as shown in the diagram below.



6 Operation and Configuration

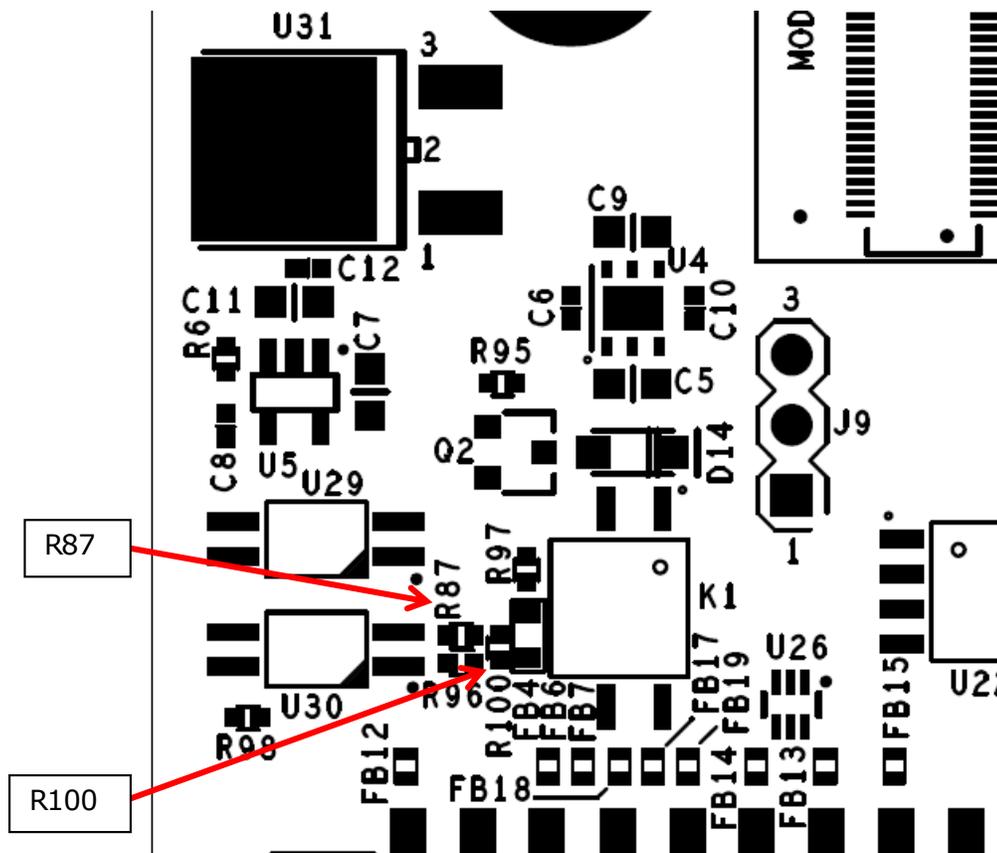
For more detailed configuration and operational instructions, please refer to document 900-0060, xBRC User Interface User Guide.

6.1 xTPrs Configuration Options

The default configuration of the xTPrs sensor interface input is current sinking which supports PNP (current sourcing) type sensors.

This interface can be reconfigured to support NPN (current sinking) type sensors by modifying a PCB component installation.

To change the configuration to NPN Sensor, remove R100 and install a 0402, zero ohm resistor at R87.



7 Supply Chain Information

This section provides part numbers for xTPra, xTPrs and related components created by Synapse:

Component	Features and Part Numbers	Vendor
	<ul style="list-style-type: none"> • xTPra: 300-001379-01 • xTPrs: 300-001379-02 	Synapse
Octagon RFID Antenna	WMKPLFMND0201	Walt Disney Imagineering
Circular RFID Antenna	600-0286-00	Synapse Product Development
Large Rectangle RFID Reader	18362-900-00003	Skyetek
Small Rectangle RFID Reader	1967.00.00	Feig Electronics
xTPra Sensor Peripheral Cable	604-0029-00	Synapse