

ImproX TT

ImproX (TT) Twin Antenna Terminal



Overview

Introduction

The **ImproX (TT) Twin Antenna Terminal** is a Tag Read/Write Terminal. The ImproX TT is designed to interface with the IXP120, IXP200, IXP300 and IXP400 Access Control Systems, or in OEM applications, via the RS485 Bus Connection.

The ImproX TT is a low-cost Terminal designed to provide access control to one door in Full Anti-passback Mode (APB) (using two Antenna Readers on the door), or two doors in Relaxed Anti-passback Mode (APB) (using one Antenna Reader per door). Impro offer a wide range of Antenna Readers suitable for most installations.

The ImproX TT has Read / Write capability using the following Impro Tags: Slim Tags (Read Only), Omega Tags (Read Only), WriTag 128 (Read/Write) and WriTag 2048 (Read/Write). The ImproX TT is also able to read selected Third-party Tags.

The ImproX TT offers 9 preset LED “Diagnostic Indicators” for the installer.

The Terminal is available in two models:

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- XTT900-1-0-GB-XX: ImproX (TT) Twin Antenna Terminal with an open-frame construction. The Printed Circuit Board (PCB) assembly is mounted on a Trivalent Passivated Mild Steel Mounting Plate. The terminal blocks and LEDs are mounted on the outside of the Printed Circuit Board (PCB). A raised protective Biaxially-oriented Polypropylene Cover Plate carries a diagram of the functions of the various terminal block connections and the LEDs.
 - XTT910-1-0-GB-XX: ImproX (TT) Twin Antenna Terminal housed in a Black, Aluminium extruded Cabinet. The Cabinet consists of a Top Cover, a Base and two End Plates. A label mounted on the inside of the Top Cover shows the functions of the various terminal block connections and the LEDs.
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The following accessory is available for the XTT910-1-0-GB-XX model:

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- XTT911-0-0-NN-XX: Security Accessory Pack.
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Key Features

- Can read selected Third-party Tags.
- Read/Write capability using the following Impro Tags: Slim Tags and Omega Tags (Read Only). WriTag 128 and WriTag 2048 (Read/Write).
- Connection to up to two Antenna Readers per ImproX TT, allowing Relaxed or Full Anti-passback (APB) access.
- An excellent user interface consisting of 9 LED “Diagnostic Indicators”.
- An external RS485 Terminal Communications Bus Interface.
- A Software utility to upgrade Firmware while installed on-site, without removal of the Terminal.
- XTT910-1-0-GB-XX includes a robust Aluminium Cabinet.

Antenna Reader Tag Read/Write Ranges

The range that the Antenna Readers can read from or write to a Tag is dependent on the type of Tag, type of Antenna Reader and material on which Antenna Reader is mounted.

Typical ranges are shown in Table 1.

Tag Type	Typical Range (Minimum) (Antenna Reader mounted on non-metallic surface)	
	(mm)	(in)
ISO Credit Card (Slim)	60	2.36
ISO Credit Card (Omega)	60	2.36
Tear Drop Tag	40	1.58
Key Ring Tag	40	1.58
Pico Tag	20	0.78
ISO Credit Card WriTag 2048	60	2.36
ISO Credit Card WriTag 128	60	2.36
Third-party Credit Card Tags	30-50	1.18-1.96

NOTE: Mounting the Antenna Reader on a metallic surface will reduce the Tag reading range slightly.

Table 1: Typical Read/Write Ranges

Approvals

- CE Approved.
- FCC Approved.

Specifications

Physical

XTT900-1-0-GB-XX (Open Frame Construction)

Dimensions	
Length	: 130 mm (5.11 in).
Width	: 108 mm (4.25 in).
Height	: 35 mm (1.37 in).
Approximate Weight	: 249 g (8.78 oz).
Housing Material	
Mounting Plate	: Mild Steel.
Colour	: Trivalent Passivated.
Cover Plate	: Biaxially-oriented Polypropylene.
Colour	: Charcoal Grey.

XTT910-1-0-GB-XX (Aluminium Extruded Cabinet)

Dimensions	
Length	: 104 mm (4.09 in).
Width	: 150 mm (5.90 in).
Height	: 53.70 mm (2.11 in).
Approximate Weight	: 502 g (17.70 oz).
Cabinet Material	: Aluminium.
Colour	: Black.

Environmental

Temperature	
Operating	: -25°C to +60°C (-13°F to +140°F).
Storage	: -40°C to +80°C (-40°F to +176°F).
Humidity Range	: 0 to 95% relative humidity at +40°C (+104°F) non-condensing.



Approvals (Test Information)

EMC	:	EN 55022: Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment. EN 55024: Immunity Characteristics, Limits and Methods of Measurement.
Electrostatic Discharge	:	IEC 61000-4-2: Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 2: Electrostatic Discharge Immunity Test. Basic EMC Publication.
Radiated Susceptibility	:	IEC 61000-4-3: Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 3: Radiated, Radio-Frequency, Electromagnetic Field Immunity Test.
Electrical Fast Transients	:	IEC 61000-4-4: Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 4: Electrical Fast Transients / Bursts. Basic EMC Publication.
Surge Immunity	:	IEC 61000-4-5: Surge Immunity.
Conducted Susceptibility	:	IEC 61000-4-6: Conducted Susceptibility.
Power Frequency Magnetic Field	:	IEC 61000-4-8: Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 8: Frequency Magnetic Field Immunity Test.

Dust and Splash Resistance

XTT900-1-0-GB-XX (Open Frame Construction)	:	Designed to work in an indoor (dry) environment. The Terminal is not sealed against water.
XTT910-1-0-GB-XX (Aluminium Extruded Cabinet)	:	Designed to work in an indoor (dry) environment, similar to IP40. The Terminal is not sealed against water.

Drop Endurance : 2 m (6.56 ft) drop (in packaging).

Electrical

Power Requirements

Input Voltage	:	10 V DC to 30 V DC, polarity sensitive.	
Power Requirements		Current (mA)	Power (W)
Input Voltage 10 V DC	:	180	1.8
Input Voltage 30 V DC	:	60	1.8
Permissible Input Supply Ripple Voltage (Max)	:	1 V _{PP} at 50 Hz.	
Power Input Protection	:	Reverse polarity, over-voltage and over-current protection are provided on the Terminal.	

Terminal Bus Port

Electrical Interface	:	RS485, ASCII with 16-bit CRC checking.
Baud Rates	:	1 200, 2 400, 4 800, 9 600, 19 200, 28 800, 38 400 (default), 57 600 and 76 800 selectable via the Communications Protocol.
Data Format	:	8 data bits, no parity, 1 stop bit.
Communications Protocol	:	ImproX Secure Communications Protocol.
Unit Status	:	Slave.



Relays	
Relay Output	: 2 x Relays, each with NO, COM and NC contacts.
Contact Rating	: 3 A at 24 V DC or 125 V AC. 1.5 A at 220 V AC.
Digital Inputs	
Input Type	: 4 x Dry-contact inputs.
Detection Resistance Range	: < 5 kOhm.
Protection	: + 50 V to – 50 V continuous, + 80 V to – 80 V surge.
Processor	
Type	: 16-bit CPU operating at 16 MHz.
Ram Memory	: 2 K Byte.
Flash Memory	: 64 K Byte.

Factory Default Settings

Default Baud Rate	: Factory-set to 38 400.
Default Mode	: Receive (Slave Mode).
Buzzer Volume	: Level 3 (maximum).
Beep Codes	
Fails Power-on Self-test	: Continuous beep for 2 seconds.
Passes Power-on Self-test	: Two short beeps of 200 ms duration, separated by a 200 ms inter-beep pause.

Operator or Installer Interfaces

LED “Diagnostic Indicators”	
Status LED	
Power On	: Continuous Red.
Upgrade Mode	: Flashing Red (Steady).
RS485 Communications Failure	: Flashing Red (Intermittent).
Relay [2]	: Continuous Red on activation of the Relay.
Relay [1]	: Continuous Red on activation of the Relay.
Reader 2, Inp 2	: Continuous Green on detected contact closure.
Reader 2, Inp 1	: Continuous Green on detected contact closure.
Reader 1, Inp 2	: Continuous Green on detected contact closure.
Reader 1, Inp 1	: Continuous Green on detected contact closure.
RS485 RX	: Flashing Green as per incoming data.
RS485 TX	: Flashing Red as per outgoing data.

Interface Details

RS485 Terminal Bus Port

The RS485 Terminal Bus Port lets you connect the ImproX TT to other ImproX Terminals and the Controller in your chosen IXP System. The interface is made by connecting the “A” and “B” lines on the ImproX TT to the “A” and “B” lines on the other ImproX units. Incoming and outgoing information on this Port is shown on the RS485 TX and RX LED “Diagnostic Indicators” on the ImproX TT.

Relays

The ImproX TT has two independent single-pole, double-throw (SPDT) Relay Outputs. These Relay Outputs let you interface to door strikes, magnetic locks and other third party devices (for example alarm panels or lighting).

Use in the IXP120 and IXP200 Systems

In the IXP120 and IXP200 Systems, the Relay functions are preset for access as follows:

- Relay [1] is dedicated to Antenna Reader [1].
- Relay [2] is dedicated to Antenna Reader [2].

Use in the IXP300/400 System

In the IXP300/400 Systems the Relay functions are user configurable.

Dry Contact Digital Inputs

The ImproX TT has four Dry Contact Digital Inputs. These Digital Inputs let you interface with a variety of devices such as reed switches, push-buttons and alarm panels.

End of Line (EOL) Sensing

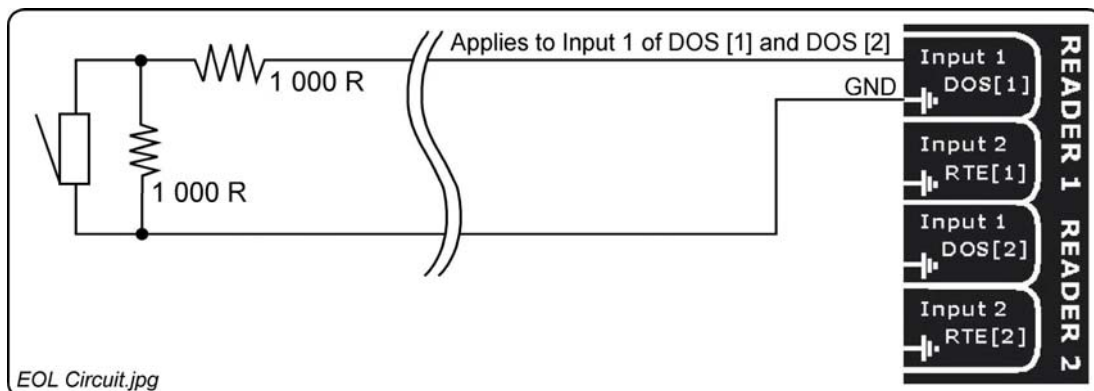


Figure 1: End of Line (EOL) Sensing Circuit

End of Line (EOL) Sensing enables the Terminal to raise an alarm when somebody tampers with the circuit (that is, cutting or shorting the wires) between Input 1 (of DOS [1] or DOS [2]) and ‘—|’ GROUND (GND). In other words the Terminal distinguishes between tampering on the circuit, and the door being in an actual ‘Normally Open’ state.

By placing Resistors into the circuit between the Input 1 (of DOS [1] or DOS [2]) and ‘—|’ GROUND (GND), the Terminal’s Digital Input monitors a constant resistance through the circuit. When the circuit is tampered with, the Resistors are bypassed; the Terminal detects the resistance change raising an alarm.

Use in the IXP120 and IXP200 Systems

In the IXP120 and IXP200 Systems, the Digital Inputs are preset for access as follows (two inputs are provided for each of the Antenna Readers):

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- Input 1 DOS [1] and Input 2 RTE [1] are dedicated to Antenna Reader [1].
 - Input 1 DOS [2] and Input 2 RTE [2] are dedicated to Antenna Reader [2].
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Their functions are as follows:

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- Input 2 RTE [1] and Input 2 RTE [2] are “Request to Exit” Inputs.
 - Input 1 DOS [1] and Input 1 DOS [2] are “Door Open Sensing” Inputs.
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Use in the IXP300/400 System

In the IXP300/400 System, the four Digital Inputs are user configurable (can perform specific tasks such as):

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- Door Open Sensing.
 - Request to Exit.
 - Scanner Inhibit.
 - Alarm Interface.
 - Action Request.
 - Mains Failure Sensing when interfaced to the ImproX 1 A Uninterrupted Power Supply (XUP900-0-0-GB-01 and XUP901-0-0-GB-01).
 - Battery Low Voltage Sensing when interfaced to the ImproX 1 A Uninterrupted Power Supply (XUP900-0-0-GB-01 and XUP901-0-0-GB-01).
-

Installation Information

Accessories

You will find the following when unpacking your ImproX TT Terminal:

- Either an ImproX (TT) Twin Antenna Terminal with an open frame construction. The construction consists of a Trivalent Passivated Mild Steel Mounting Plate and a Biaxially-oriented Polypropylene Cover Plate.
- Or an ImproX (TT) Twin Antenna Terminal housed in a Black, Aluminium extruded Cabinet. The Cabinet consists of a Top Cover, a Base and two End Plates. Each End Plate is attached with four Thread Cutter Screws (2.2 x 5 mm).

CAUTION: DO NOT use the Metal-oxide Varistors (25 Vrms, 500 A, 77 V max clamping) with mains power applications.

- Two Metal-Oxide Varistors, 25 Vrms, 500 A, 77 V max clamping.
- Four Brass Wood Screws (3.5 mm x 25 mm).
- Four Wall Plugs (7 mm).
- An extra Fixed Address Label.

You will find the following when unpacking the Security Accessory Pack (XTT911-0-0-N-XX):

- Two TORX® Fasteners (M3.5 x 10 mm).
- A T10 TORX® Key.

General

Remember the following when installing your ImproX TT Terminal:

Antenna Reader Distance

The ideal cable distance between the ImproX TT and its Antenna Reader ranges between 2 m to 16 m (7 ft to 53 ft). Achieve this by using good quality screened, twisted pair cable.

Distance between Antenna Readers from the SAME Terminal

To avoid mutual interference, install the Antenna Readers alongside each other at least 150 mm (6 in) apart.

Distance between Antenna Readers from DIFFERENT Terminals

To avoid mutual interference, install the Antenna Readers alongside each other at least 500 mm (20 in) apart.

NOTE: ImproX TT Terminals can be mounted alongside each other.

EARTH Connection

Connect the ImproX TT Terminal to a good EARTH point. Using the RS485 Port, connect the EARTH Lead to the 'E' Terminal. Mains EARTH can be used, but electrical noise may exist.

FCC Compliance (XTT910-1-0-GB-XX)

For FCC compliance:

- Ensure the comms cable is routed through a separate grommet to the power cable.
- Ensure that you use a CE approved Power Supply Unit.

Arc Suppression

Snubber devices are recommended for EMF Flyback and Arc Suppression when driving an inductive load with the Relay, see Figure 2.

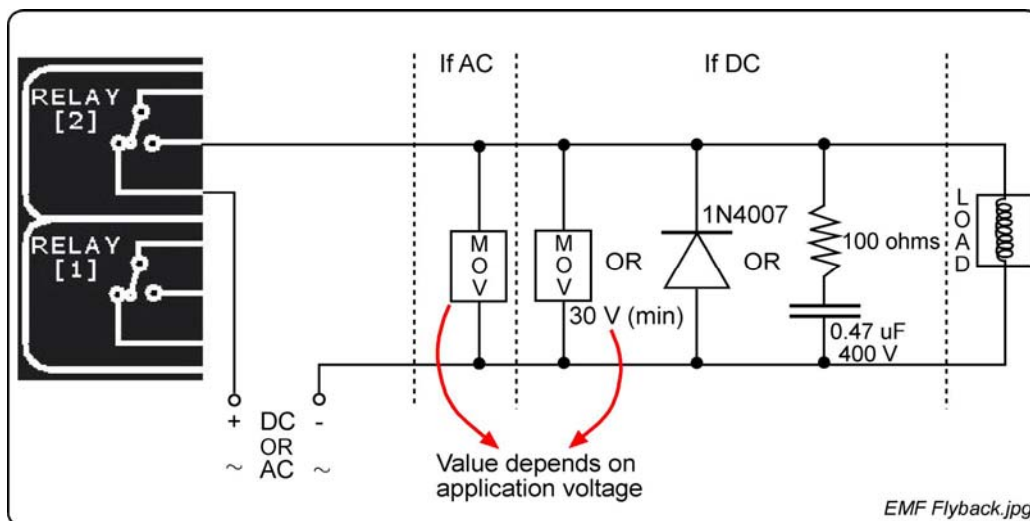


Figure 2: EMF Flyback and Arc Suppression

Mounting the ImproX TT

CAUTION: Make certain that you mount the Terminal on a vibration-free surface.

Select the mounting position of the ImproX TT Terminal, considering accessibility, routing of wires and visibility of the LEDs.

NOTE: The ImproX TT can be mounted onto virtually any surface including metal.

XTT900-1-0-GB-XX

Secure the Mounting Plate to the mounting surface, using four suitable screws and wall plugs (supplied), nuts and bolts or rivets.

XTT910-1-0-GB-XX

Secure the Base to the mounting surface, using four suitable screws and wall plugs (supplied), nuts and bolts or rivets.

Top Cover Release Mechanism

1. If installed, remove the two TORX® Fasteners, using the T10 TORX® Key (XTT911-0-0-NN-XX).
2. Remove the top two Thread Cutter Screws (2.2 x 5 mm) from each of the End Plates.
3. Insert a flat head screwdriver (maximum 7 mm) into the cut out in either of the two End Plates. Swivel the screwdriver until the Top Cover makes a click sound.
4. Insert the screwdriver in the gap (on the side of the ImproX TT) between the Top Cover and the Base. Swivel the screwdriver again, to release the Top Cover from the Base.

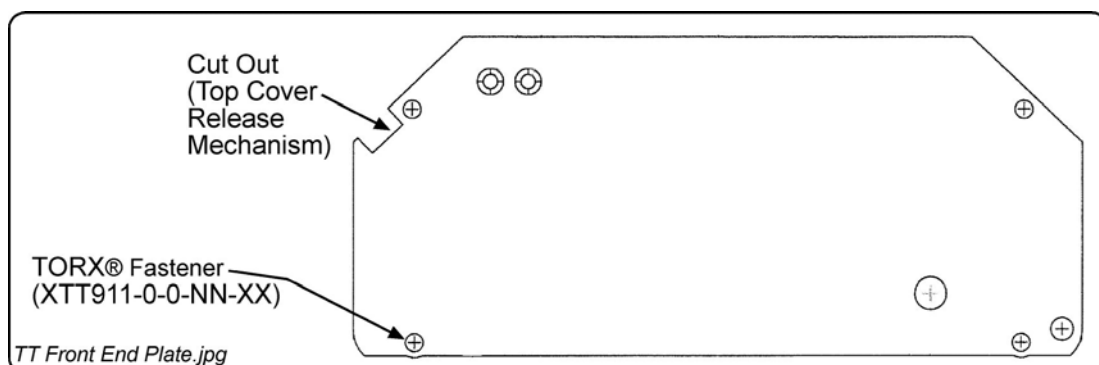


Figure 3: Front End Plate

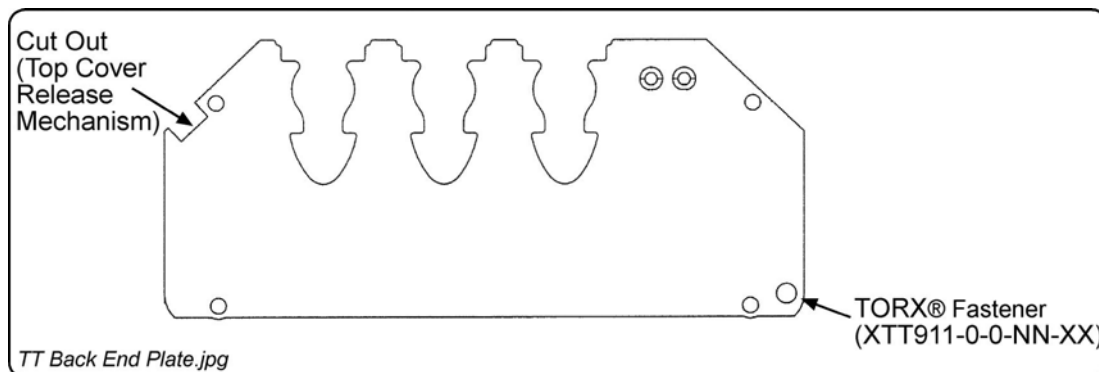


Figure 4: Back End Plate

Electrical Connections

Connecting the ImproX TT Terminal

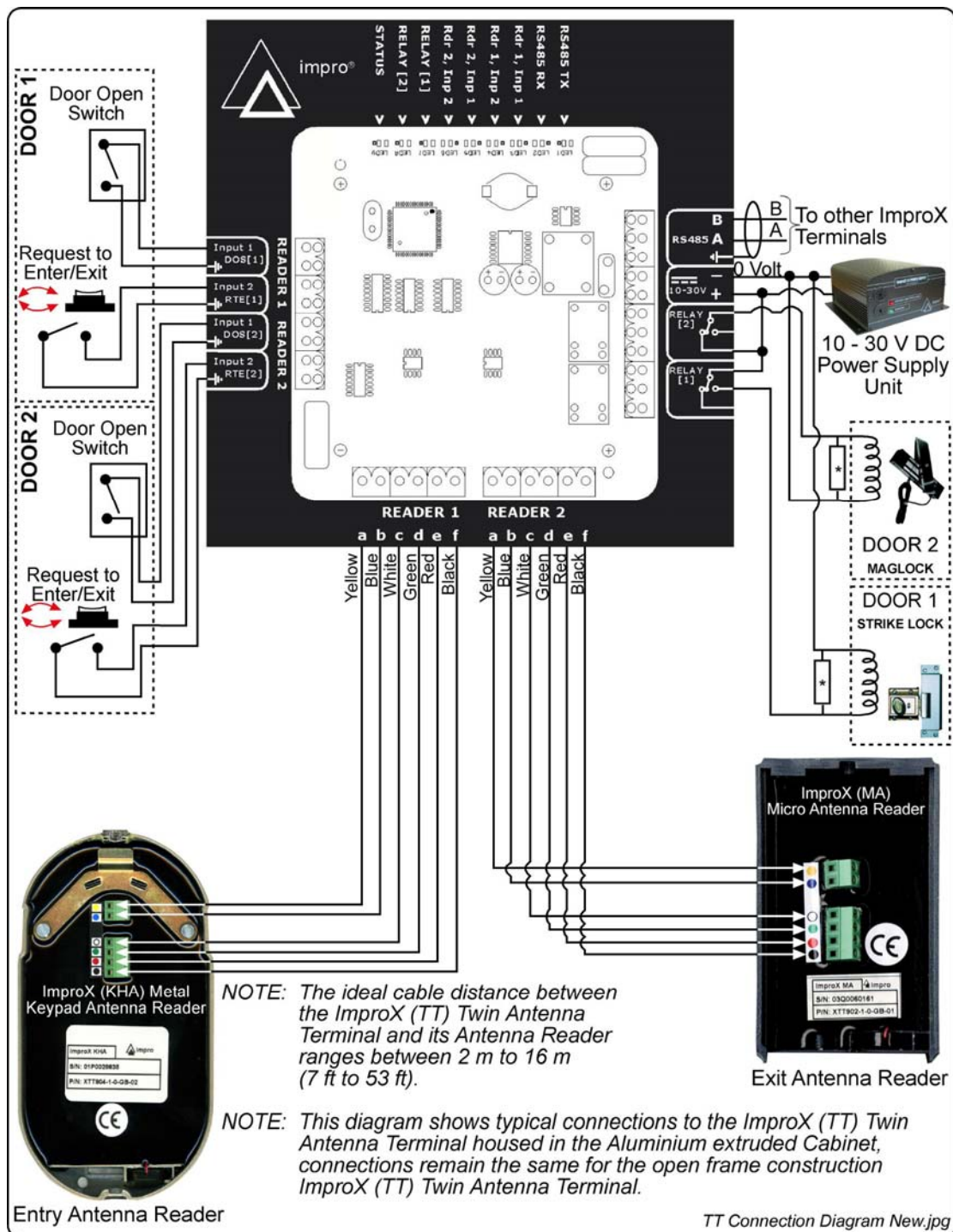


Figure 5: Typical ImproX TT Electrical Connections

Power-on Self-test

The Power-on Self-test tests the RAM and Flash Checksums and the Read/Write Circuitry. The results of the Self-test are available as diagnostic information from the Controller or PC.

If any parameter in the Self-test fails, the Antenna Reader** emits a continuous beep for 2 seconds.

When the Terminal passes the Self-test, the Antenna Reader** emits two short beeps, each 200 ms in duration, separated by a 200 ms inter-beep pause.

*NOTE: The **ImproX MMA Antenna Reader DOES NOT include a Buzzer.*

ImproX TT Address Information

Each ImproX TT Terminal is, in fact, two Terminals in one. The first "Terminal" Fixed Address is associated with Reader [1], and the second with Reader [2].

Each ImproX TT is allocated two unique Fixed Addresses at the factory. These addresses are stored in the Terminals memory. When the Terminal is installed in an IXP120, IXP200 or IXP300/400 System, the System allocates two separate Logical Addresses to the Terminal for communication purposes.

Address Allocation – IXP120, IXP200, IXP300 and IXP400 Systems

IXP Software Suites allocate Logical Addresses to the Terminal, either on initial software start-up, or on request, depending on the system configuration. Details of this process are included in the IXP200 and IXP300 Hardware Installation Manuals.

Address Allocation - OEM Systems

In an OEM system, the Terminals Logical Addresses are allocated individually using commands available in the ImproX Secure Communications Protocol. Details of this process are described in the ImproX Secure Communications Protocol document.

Fixed Address Label

1. Once the ImproX TT is installed, sketch a rough site plan.
 2. Attach the loose additional Fixed Address Label, packaged with the Terminal, in the position of the Terminal on the sketched site plan.
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When the system installation is complete and all the units are represented on the site plan by their Fixed Address Labels, file the site plan for future reference.



www.impro.net

Part Number: XTT900-1-0-GB-XX
XTT910-1-0-GB-XX
XTT911-0-0-NN-XX

Guarantee or Warranty

CAUTION: We reserve the right to nullify the products guarantee or warranty where you have not properly installed the Metal-oxide Varistors.

This product conforms to our Guarantee or Warranty details placed on our Web Site, to read further please go to www.impro.net.

Ordering Information

Order the ImproX (TT) Twin Antenna Terminal using the following Impro part numbers:

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- XTT900-1-0-GB-XX: ImproX (TT) Twin Antenna Terminal with an open-frame construction.
 - XTT910-1-0-GB-XX: ImproX (TT) Twin Antenna Terminal housed in a Black, Aluminium extruded Cabinet.
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Order accessories for the XTT910-1-0-GB-XX using the following Impro part number:

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- XTT911-0-0-NN-XX: Security Accessory Pack.
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Part Number: XTT900-1-0-GB-XX
XTT910-1-0-GB-XX
XTT911-0-0-NN-XX

This manual applies to the ImproX (TT) Twin Antenna Terminal, XTT900-1-0-GB-05, XTT910-1-0-GB-03 and XTT911-0-0-NN-00.

(The last two digits of the Impro stock code point to the issue status of the product).

XTT350-0-0-GB-06	Issue 07	May 2007	ImproX TT\Product Specification Catalogue\LATEST ISSUE\ImprX TT-psc-en-07.doc
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