



MODEL NUMBER:

XTT910-1-0-GB-XX IPS910-1-0-GB-XX

XTT920-1-0-GB-XX IPS911-1-0-GB-XX

XTT930-1-0-GB-XX XTT931-1-0-GB-XX

IMPROX iTT

ImproX (iTt) Intelligent Twin Antenna Terminal INSTALLATION MANUAL

SPECIFICATIONS

Working Environment

Plastic Housing (XTT910 and XTT920)	Designed to work in an indoor (dry) environment similar to IP40. The Terminal is not sealed against water.
Printed Circuit Board Only (XTT930 and XTT931)	Designed to work in an indoor (dry) environment. The Terminal is not sealed against water.
Power Supply Combo (IPS910 and IPS911)	Designed to work in an indoor (dry) environment similar to IP20. The Power Supply Combo is not sealed against water.

Power

Plastic Housing and PCB Only (XTT910, XTT920, XTT930 and XTT931)

Input Voltage	10 V DC to 30 V DC, polarity sensitive.	
Power Requirements	Current (mA)	Power (W)
Input Voltage 12 V DC with no Antennas attached	90	1.08
Input Voltage 24 V DC with no Antennas attached	50	1.20
Input Voltage 12 V DC with Antennas attached	100	1.20
Input Voltage 24 V DC with Antennas attached	60	1.44

Power Supply Combo (IPS910 and IPS911)

NOTE: The Power Supply Combo includes a 3 A Switch Mode Power Supply which provides power for the (optional) internal unit and for charging the (optional) backup Battery. As the Power Supply Combo needs no more than 1 A, you may power extra devices using up to 2 A continuous current from the provided connector block. DO NOT exceed this 2 A limit on continuous current draw. Devices with a high in-rush current demand, such as certain maglocks and other electromechanical devices, can momentarily draw more than 3 A. The Power Supply then effectively shuts down as directed by its built in protection as exceeding the 3 A rating is considered a short-circuit. Overcome this by installing the recommended 12 V 7 Ahr Battery to help supplement the in-rush current such a device may draw on activation.

Power Input

Input Voltage 85 V AC to 265 V AC at 50/60 Hz.

Power Output

Output Voltage 13.8 V DC \pm 0.3 V DC.
(Mains Power On)

Output Current..... 2 A continuous (Power Output Terminals).

System Battery

Battery Type..... 12 V 7 Ahr (Max) Sealed Lead Acid Battery.

Length 151 mm (6 in) (Max).

Width..... 65 mm (3 in) (Max).

Height..... 99 mm (4 in) (Max) including the terminals.

Charge Voltage 13.8 V DC.

The following specifications are common to all models of the ImproX iTT:

Relay Power Requirements An additional \sim 0.4 W per Relay in use.

Real Time Clock (RTC) Backup

Battery

Battery Type..... 1 x 3 V, CR2032, Lithium cell Battery.

Battery Life 1 Year with Power OFF,
5 years with Power ON,
5 years Storage with Battery Tab in place.

Terminal Communication

Ethernet Port..... Standard Ethernet RJ45 connector.
(XTT920 and IPS911 Only) 10/100 Base T, half or full duplex.

RS485 Terminal Port

Electrical Interface..... RS485.

Baud Rate 38 400.

Data Format 8 data bits, no parity, 1 stop bit.

Communications Protocol ImproX Secure Communications Protocol.

Line Termination (RS485) Provision is made for line termination.

Reader Options

Antenna Reader Ports 2 Fully functional Antenna Reader Ports.

Relays

Relay Output 2 Independent, single-pole, double-throw (SPDT) Relays, each with NO, COM and NC contacts.

Relay Contact Ratings..... 10 A at 28 V DC,
5 A at 220 V AC,
12 A at 120 V AC.

Operations..... 100 000 Minimum.

Digital Inputs

Type 2 Dry-contact inputs with End-of-line (EOL) Sensing and 2 Dry-contact inputs without End-of-line (EOL) Sensing.

Detection Resistance Range < 2 kOhm.

Protection Range..... +15 V continuous.

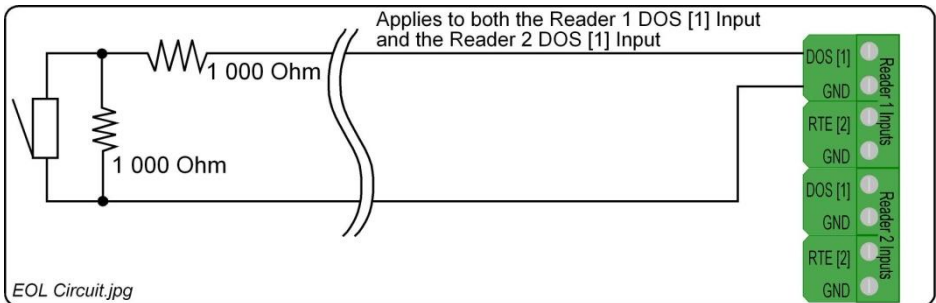


Figure 1: End-of-Line (EOL) Sensing Circuit

NOTE: *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 either Reader 1 Inputs DOS [1] or Reader 2 Inputs DOS [1] 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 Reader 1 Inputs DOS [1] or Reader 2 Inputs DOS [1] 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.

General

LED Status and Diagnostic Indicators

Status LED

Power On	Continuous Red.
Upgrade Mode	Flashing Red (Steady).
RS485 Communications Failure	Flashing Red (Intermittent).
Incoming RS485 Data	Flashing Green LED.
Outgoing RS485 Data	Flashing Red LED.
Digital Inputs (1-4)	Continuous Green on detected contact closure.
Relays (1 and 2)	Continuous Red on activation of the Relay.

Ethernet LEDs

(XTT920, XTT931 and IPS921 Only)

Ethernet Activity	Flashing Red LED.
Ethernet Speed	Continuous Red for 100 Mbps (Default) Off for 10 Mbps.
Ethernet Link	Continuous Red on connection to network.

INSTALLATION INFORMATION

Accessories

Find the following when unpacking the ImproX iTT Terminal:

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

Plastic Housing (XTT910 and XTT920)

- An ImproX (iTT) Intelligent Twin Antenna Terminal supplied in a Black, ABS Plastic housing. The housing consists of a Front Cover Assembly and a Mounting Plate. The Front Cover and Mounting Plate are held together with two Combi Screws (M4 x 10 mm) at the bottom of the housing.
- Two Metal-Oxide Varistors, 25 Vrms, 500 A, 77 V max clamping.
- A 3 V, CR2032, Lithium cell Battery.
- Two extra Combi Screws (M4 x 10 mm).
- An extra Fixed Address Label.

Printed Circuit Board Only (XTT930 and XTT931)

- Carton containing 20 ImproX (iTT) Intelligent Twin Antenna Terminal Printed Circuit Boards.
- Three Metal-Oxide Varistors, 25 Vrms, 500 A, 77 V max clamping per ImproX iTT Printed Circuit Board assembly.

- A 3 V, CR2032, Lithium cell Battery for each Terminal Printed Circuit Board.
- An extra Fixed Address Label for each Terminal Printed Circuit Board.

Power Supply Combo (IPS910 and IPS911)

- An ImproX (iTT) Intelligent Twin Antenna Terminal housed in a Black Mild Steel, powder-coated Cabinet. The Cabinet consists of a hinged Lid and a Base.
- Three Metal-oxide Varistors, 25 Vrms, 500 A, 77 V max clamping.
- A glass Fuse, Slow Blow, 3.15 A, 250 V (5 mm x 20 mm).
- A 3 V, CR2032, Lithium cell Battery.
- Four Combi Screws (No. 4 x 10 mm).
- An extra Fixed Address Label.

General

Remember the following when installing the ImproX iTT Terminal:

Communications Distance

- If using Ethernet, plug the Terminal into an Ethernet Switch or Hub (or other network device); cable runs must conform to Ethernet cabling specifications.
- The RS485 communications distance between the first ImproX iTT and the LAST ImproX unit in a cable run, MUST NOT exceed 1 km (1 090 yd). Achieve this by using good quality screened twisted 2-pair cable, with the screen EARTHED at one end.

Jumper Links

Long transmission lines or multiple “star” connections, may cause communication problems. Placing a Jumper Link across the jumper (See Figure 3 for position) in the LAST UNIT AT THE END OF THE CABLE RUN should solve the problem.

Antenna Reader Distance

The ideal cable distance between the ImproX iTT and its Non-keypad Antenna Reader ranges between 2 m to 25 m (7 ft to 82 ft). The ideal cable distance between the ImproX iTT and its Keypad Antenna Reader ranges between 2 m to 16 m (7 ft to 53 ft). Optimal performance is not guaranteed outside of this range. Achieve optimal performance using a good quality shielded multi-strand 3-pair twisted cable. The cable individual conductor cross-sectional area should not be less than 0.2 mm² (0.0003 in²).

Ensure that your cable specifications are similar to the following:

- Conductor Resistance: < 2 ohms.
- Capacitance, Core to Earth: < 160 pF/m.
- Capacitance, Core to Core: < 100 pF/m.

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 iTT Terminals can be mounted alongside each other.

EARTH Connection

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

Arc Suppression

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

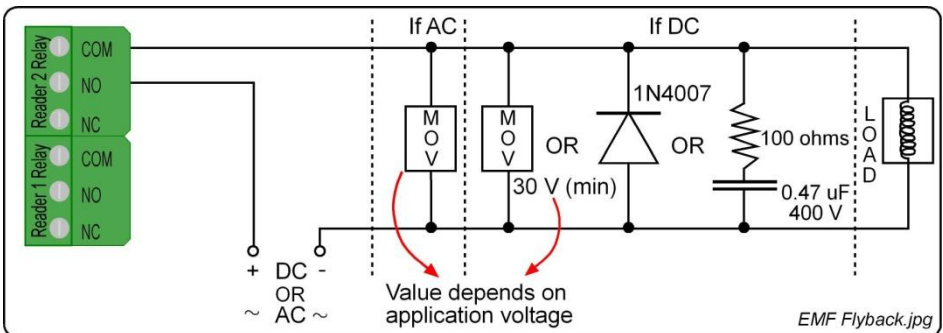


Figure 2: EMF Flyback and Arc Suppression

Installing the Real Time Clock (RTC) Backup Battery

CAUTION: Remove the Battery Tab for the Real Time Clock from the Battery Holder **IMMEDIATELY BEFORE** powering up the ImproX iTT. **DO NOT** remove the Battery Tab after applying power to the iTT.

First Time Use

1. Ensure that power is NOT applied to the ImproX iTT.
2. If using the Power Supply Combo (IPS910 and IPS911), open the Cabinet.
3. Locate the removable Battery Tab:
 - For XTT910 and XTT920, at the bottom of the Terminal's housing.
 - For XTT930 and XTT931, on the underside of the Printed Circuit Board.
 - For IPS910 and IPS911, on the underside of the Printed Circuit Board.
4. Pull the removable Battery Tab out of the Battery Holder.
5. If using the Power Supply Combo (IPS910 and IPS911), close the Cabinet.
6. Immediately apply power to the ImproX iTT.

Replacement

NOTE: Because of the delicacy of this procedure, we recommend you contact your distributor before trying to replace the Battery.

Installing the System Battery into the Power Supply Combo (IPS910 and IPS911)

1. Open the Lid of the Cabinet.
2. Slide the Lid in an upwards direction and unhinge.
3. Place the Battery into the Cabinet with the Battery Terminals in an upwards position.
4. Connect the Red Battery Terminal Lead to the Positive Battery Terminal.
5. Connect the Black Battery Terminal Lead to the Negative Battery Terminal.
6. Re-hinge the Lid and slide it in a downwards direction.
7. Close the Lid of the Cabinet.

Mounting the ImproX iTT

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

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



NOTE: During mounting, we recommend removing the Power Supply Combo's Earth Strap. As indicated in Figure 4, locate and disconnect the Earth Strap from the Lid of the Cabinet. This allows easy removal and replacement of the Lid during installation. After installation, we strongly recommend you reattach the Earth Strap to the Lid.

Select the mounting position of the ImproX iTT Terminal, considering accessibility, routing of wires and visibility of the LEDs. Secure the Terminal to the mounting surface, using suitable screws and wall plugs, nuts and bolts or rivets. Use the supplied Connection Leads for the low voltage connections to the Power Supply Combo. Using the supplied Quick Click Glands or Gland Breakouts, neatly lead the wires out of the Cabinet.

DIP-switch Settings

NOTE: Once the DIP-switch settings are modified reset the ImproX iTT to acknowledge the new settings.

Door Lock Select DIP-switch Settings

DIP-switch Position	Connections
0  DIP-switch 0 shows switches 2, 3 and 4 in the OFF position	Reserved for future use.
1 	Reserved for future use.





DIP-switch Position	Connections
2 	Reserved for future use.
3 	Reserved for future use.
4 	Reserved for future use.
5 	Returns Terminal to Factory Default Settings. CAUTION: When changing from an Ethernet to an RS485 connection, return the Terminal to factory default settings before continuing with normal operation. <i>NOTE:</i> Return Switch 1 to the OFF position to resume normal operation.

Table 1: Door Lock Select DIP-switch Settings

Blank Space

ELECTRICAL CONNECTIONS

Key Component Positions

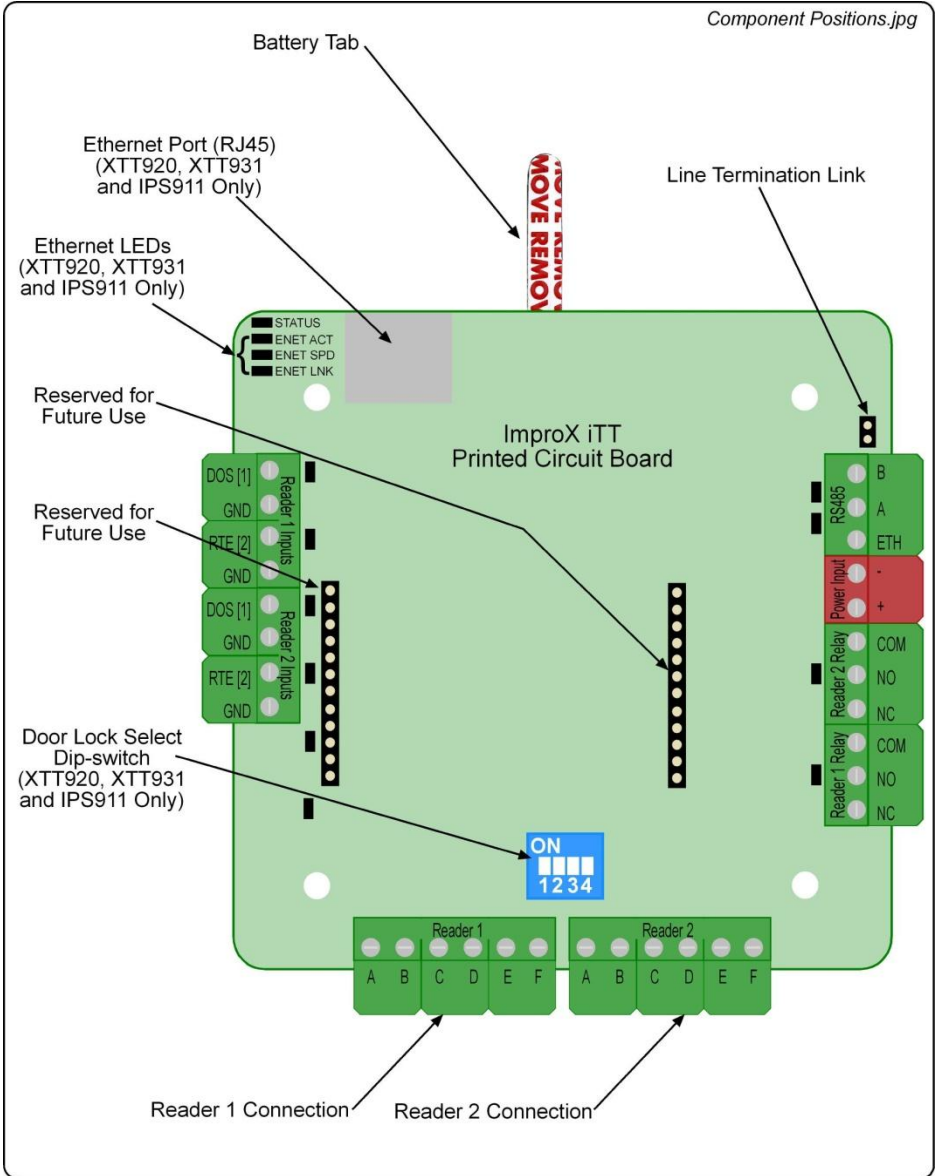


Figure 3: Key Component Positions

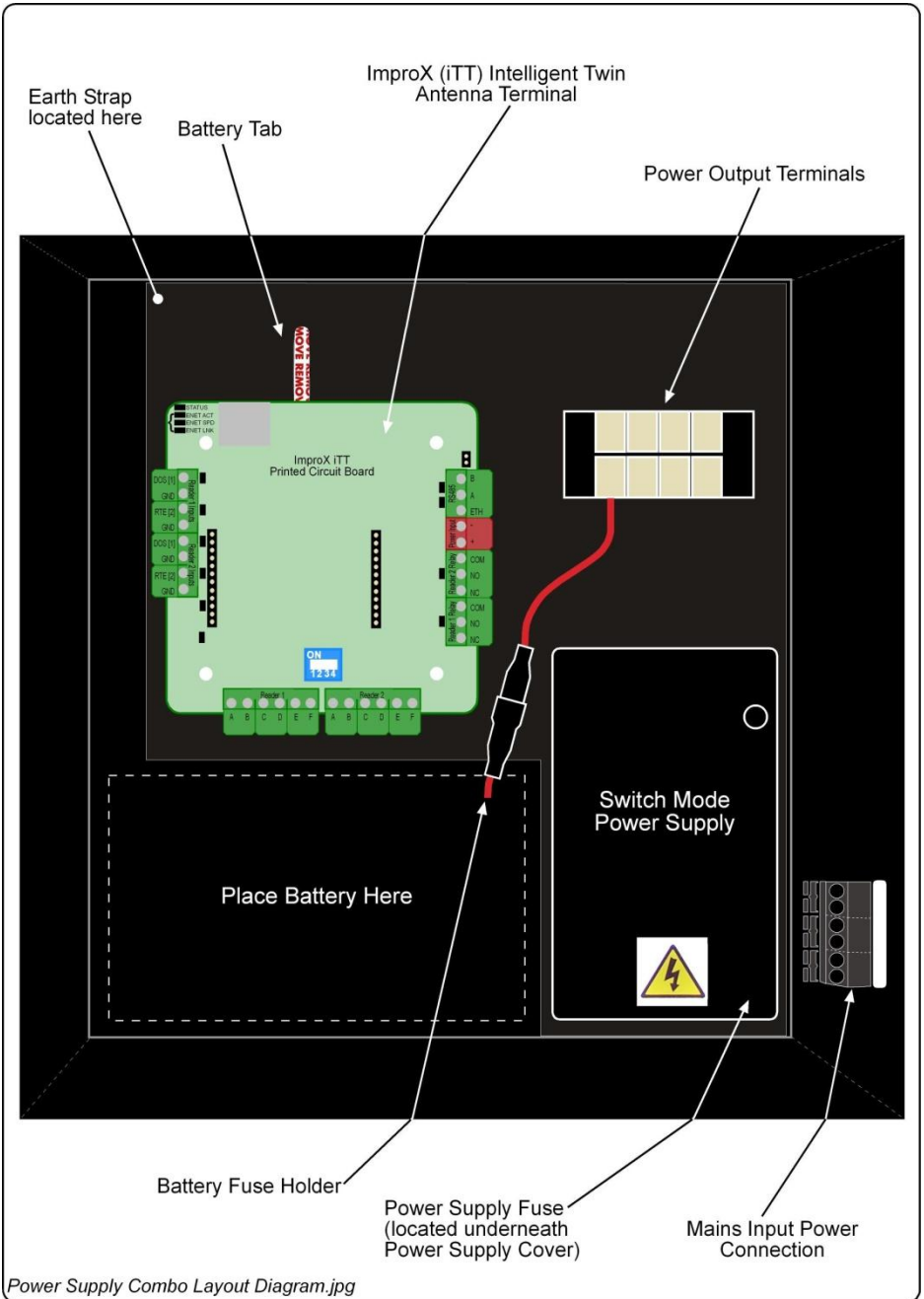


Figure 4: Power Supply Combo Layout Diagram – Top View

Connecting the ImproX iTT Terminal

Figure 5 shows a detailed electrical connection diagram for the ImproX iTT Terminal.

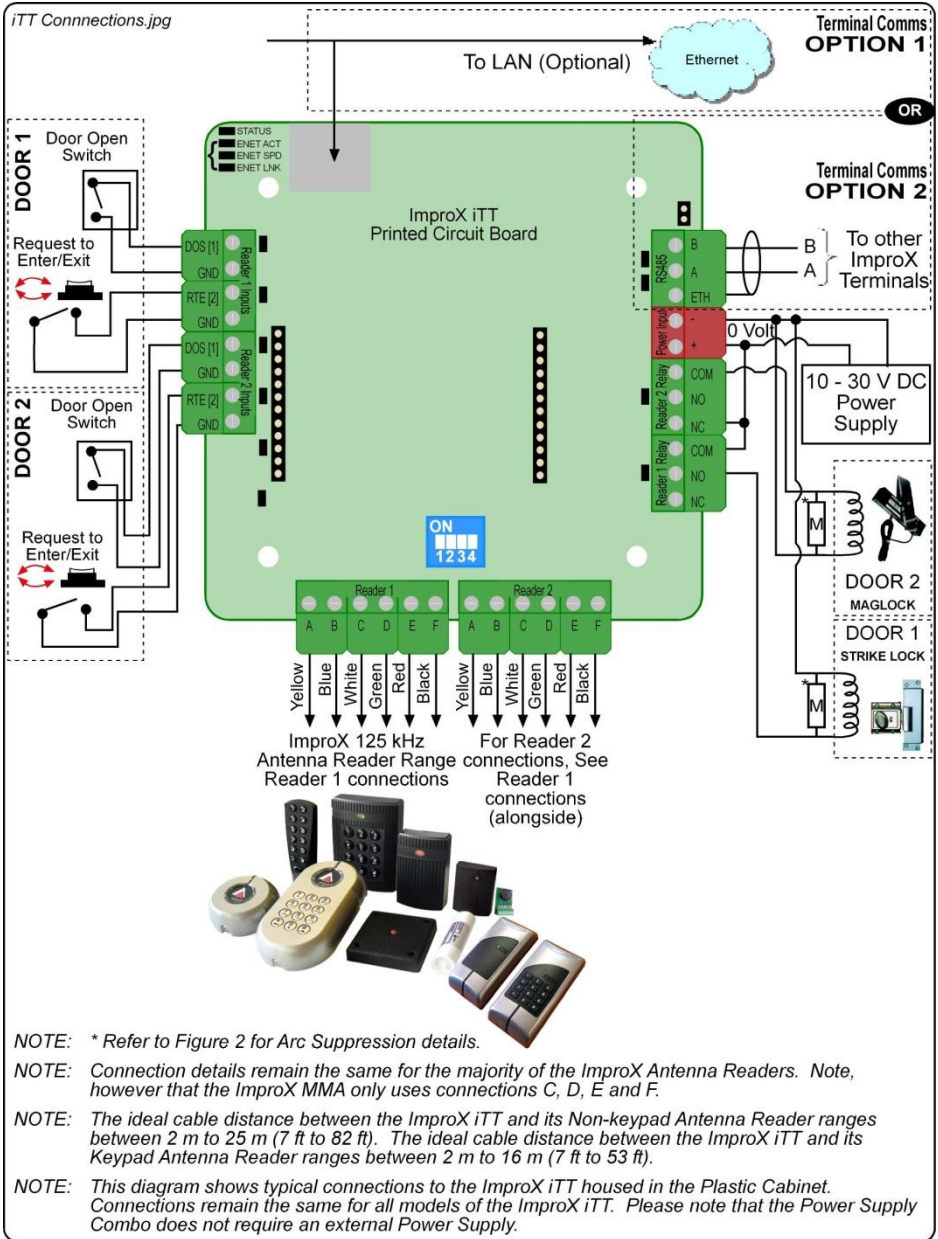


Figure 5: Typical ImproX iTT Terminal Electrical Connections

3. Insert the wire.
4. Release the Push-button.
5. Repeat steps 1 to 3 for each connection.
6. Attach a suitable Mains Input Power Plug using the following connections:
 - Live (Brown)
 - Neutral (Blue)
 - Earth (Yellow/Green)
7. Close the Cabinet.

Fuse Information

Fuse Type	Purpose	Rating
Battery Fuse	This fuse protects the Battery from overload as well as incorrect polarity connection.	3.15 A 250 V Slow-blow (5 mm x 20 mm)
Power Supply Fuse	This fuse protects the Power Supply from overload as well as incorrect polarity connection.	4 A 250 V Slow-blow (5 mm x 20 mm)

Table 2: Fuse Ratings

NOTE: *Because of the delicacy of the replacement procedure, we recommend you contact your distributor before trying to replace the Power Supply Fuse.*

Replacing the Battery Fuse

CAUTION: **Ensure that you have disconnected the mains power supply to the Power Supply Combo, and removed the Positive Lead from the Battery before replacing the fuse.**

1. Disconnect the mains power supply to the Power Supply Combo.
2. Open the Cabinet.
3. Disconnect the Positive Lead from the Battery.

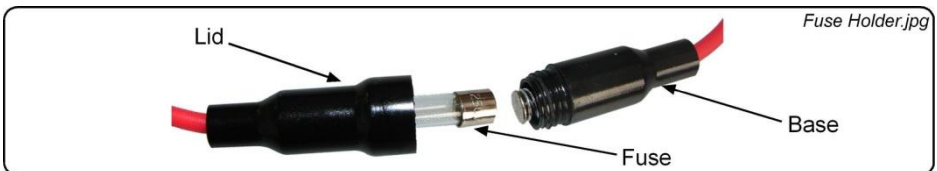


Figure 7: Battery Fuse Holder

4. Unscrew the Fuse Holder's Lid from the Base.
5. Remove the old fuse.
6. Insert a new fuse into the longer end of the Fuse Holder.
7. Screw the Fuse Holder's Lid onto the Base.
8. Reconnect the Positive Lead to the Battery.
9. Close the Cabinet.

10. Reconnect the mains power supply to the Power Supply Combo.

Power-on Self-test

The Power-on Self-test tests the RAM and Flash Checksums.

If any parameter in the Self-test fails, the Terminal emits a continuous beep for 2 seconds before the 2 short start-up beeps.

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

ImproX iTT Address Information

Each ImproX iTT 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 iTT is allocated two unique Fixed Addresses at the factory. These addresses are stored in the Terminal’s memory. When the Terminal is installed in an IXP220 or ImproNet System, the System allocates two separate Logical Addresses to the Terminal for Communication purposes.

The following rules are imposed:

- If you have no Antenna Reader connected to the ImproX iTT, the Terminal reveals both Fixed Addresses.
- If you connect only Antenna Reader 1, the Terminal reveals Antenna Reader 1’s Fixed Address.
- If you connect both Antenna Readers, the Terminal reveals both Fixed Addresses.
- If you connect only Antenna Reader 2, the Terminal reveals both Fixed Addresses.

NOTE: If you are only using one Antenna Reader then use Antenna Reader 1. The ImproX iTT will then reveal only one Fixed Address. In all other arrangements the Terminal reveals two Fixed Addresses.

Address Allocation – IXP220 and ImproNet Systems

IXP Software Suites allocate Logical Addresses to the Terminal, either on initial software start-up, or on request, depending on the system configuration.

Address Allocation OEM Systems

In an OEM system, the Terminal’s Logical Addresses are allocated individually using commands available in the ImproX Secure Communications Protocol. Details of this process are described in the ImproX Secure Communication Protocol Document.

Fixed Address Label

1. Once the ImproX iTT 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.

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.

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.

USER NOTES



This manual is applicable to the ImproX (iT) Intelligent Twin Antenna Terminal, XTT910-1-0-GB-09, XTT920-1-0-GB-09, XTT930-1-0-GB-01, XTT931-1-0-GB-01, IPS910-1-0-GB-05 and IPS911-1-0-GB-05.

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

XTT303-0-0-GB-05

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