impro®

MODEL NUMBER: XEA931-1-0-GB-XX

ImproX MfT

ImproX (MfT) Multi-function Terminal
INSTALLATION MANUAL

SPECIFICATIONS

Working Environment ..... Designed to work in an indoor (dry) environment similar to IP40. The Terminal is NOT sealed against water.

Input Voltage ..... 10 V DC to 30 V DC.

Power Requirements	**Current (mA)**	**Power (W)**
Minimum Supply Voltage 10 V DC	250	2.5
Maximum Supply Voltage 30 V DC	83	2.5

Third-party Port ..... 5 V DC (± 0.1 V) at maximum 200 mA can be supplied to power Third-party Readers connected to the Port.

NOTE: The Current and Power Specifications (above) were made with no load on the Third-party Port.

Relays

Relay Output ..... 3 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.

Digital Inputs

Type ..... 4 Dry-contact inputs.

Protection Range ..... +50 V and -50 V continuous.

Terminal Installer Interfaces

Status Indicator

Status LED ..... Blue LED (internally visible).

Terminal Installer Interfaces
(Continued)

Diagnostic Indicators

Incoming RS485 Data	Flashing Green LED (internally visible).
Outgoing RS485 Data	Flashing Red LED (internally visible).

Antenna Reader (x2) Installer Interfaces

Status Indicator

Status LED	Bi-colour, Red or Green LED.

Buzzer

Volume and Tone	4-Step adjustable volume, single tone.

INSTALLATION INFORMATION

Accessories

Find the following when unpacking the ImproX Multi-function Terminal:

- An ImproX MfT housed in a Black powder-coated Aluminium extruded Cabinet. The Cabinet consists of a Top Cover and Base, sealed at each end with a Mild Steel End Plate, secured with 8 Thread Cutter Screws (M3 x 8 mm).

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

- Three Metal-Oxide Varistors, 25 Vrms, 500 A, 77 V max clamping.
- A 3 V Lithium Battery (CR2032).
- Four Wood Screws (3.5 mm x 25 mm).
- Four Wall Plugs (7 mm).
- An extra Fixed Address Label.

General

Remember the following when installing your ImproX MfT:

NOTE: Where we specify a Remote Reader in this Manual, we imply that the same details apply to the Multi-mode Remote Reader.

Communications Distance

The RS485 communications distance between the ImproX Controller and the LAST ImproX Terminal in a cable run, MUST NOT exceed 1 km (1 090 yd). Achieve this by using good quality screened twisted 2-pair cable, earthed on one side.

Blank Space

Termination Resistors for RS485 Bus Communications

Long transmission lines or multiple “star” connections, may cause communication problems. Placing the Termination Resistor Jumper Link (see Figure 3) in the LAST IMPROX MULTI-FUNCTION TERMINAL AT THE END OF THE CABLE RUN should solve the problem (depending on the bus).

EARTH Connection

Connect the ImproX MfT to a good EARTH point. Using the RS485 Port, connect the EARTH Lead to the “SHD” Terminal. Mains EARTH can be used, but electrical noise may exist.

Antenna Readers

Antenna Reader Communications Distance

The ideal cable distance between the ImproX MfT and its Antenna Reader ranges between 2 m to 16 m (7 ft to 53 ft). Achieve this by using good quality screened, **3-pair twisted cable. The cross-sectional area of the cable must not be less than 0.2 mm^2 (0.0003 in^2).

*NOTE: **When installing an ImproX RA, use 1-pair twisted cable.*

The cable specifications should be 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 no closer than 150 mm (6 in) apart.

Distance between Antenna Readers from DIFFERENT Terminals

To avoid mutual interference Install the Antenna Readers no closer than 500 mm (20 in) apart.

Remote Readers

Remote Reader Communications Distance

The distance between the ImproX MfT and the Remote Reader can be extended to a maximum of 10 m (33 ft) using a good quality shielded multi-strand 2-pair twisted cable. The individual conductor cross-sectional area of the cable must not be less than 0.2 mm^2 (0.0003 in^2).

Distance between Remote Readers from DIFFERENT Terminals

To avoid mutual interference, install the Remote Readers no closer than 500 mm (20 in) apart.

Blank Space

Arc Suppression

Snubber devices are recommended for EMF Flyback and Arc Suppression when driving an inductive load with the Relay, see Figure 1.

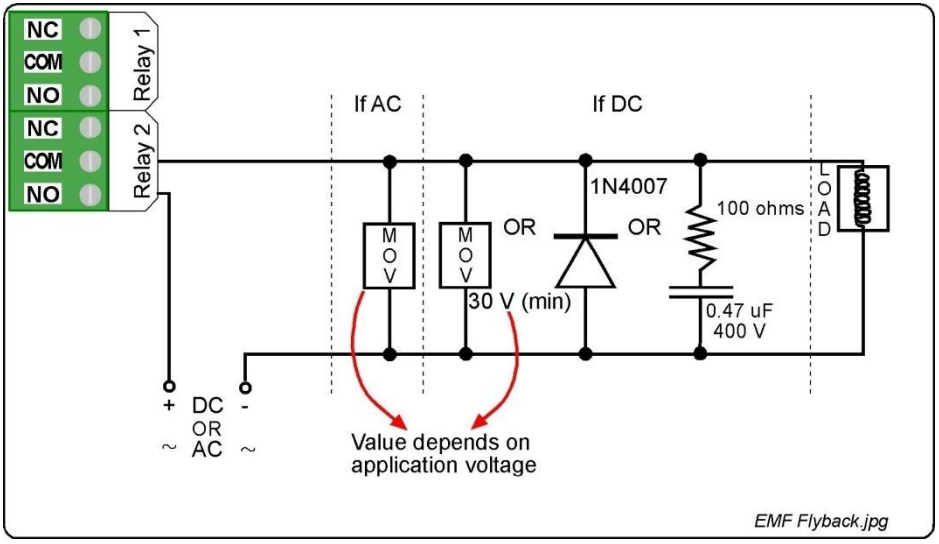


Figure 1: EMF Flyback

Installing the Battery

The Battery Holder is located in the top left-hand side of the ImproX MfT Terminals Printed Circuit Board (PCB), directly below the DIP-switch.

Slide the 3 V Lithium Battery into the Battery Holder, from left to right, with the "+" symbol facing UP.

Mounting the Terminal

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

NOTE: Do not mount the Terminal with double-sided adhesive tape.

Select the mounting position of the ImproX Multi-function Terminal, considering accessibility and routing of wires.

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

Blank Space

Communication Link Settings

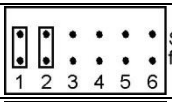
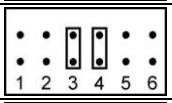
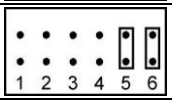
Communication Link Position		Setting
1.	 See Figure 3 for orientation	Reserved
2.		RS485
3.		Reserved

Table 1: Communication Link Settings

DIP-switch Settings (for the Third-party Port)

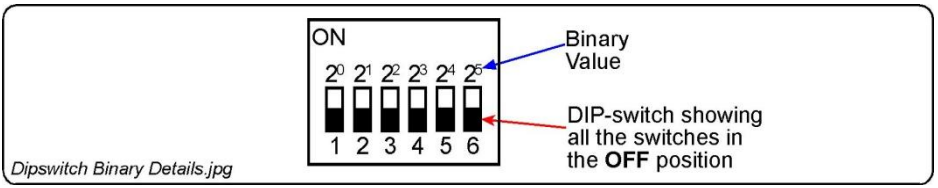
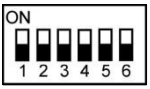
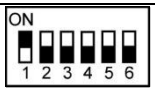
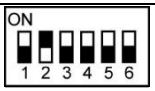
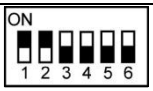
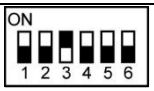
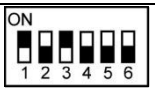
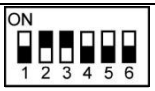
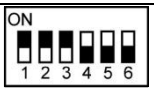
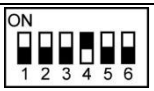
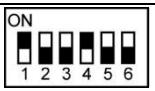
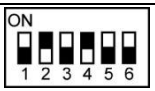
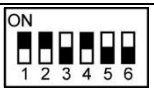


Figure 2: Binary Details for the DIP-switch

		UHR900-0-1-GB-XX	UHR903-0-1-GB-XX	
	 **Default**	 **ImproX RF/IR Receiver**	 **ImproX RF Button 1**	 **ImproX RF Button 2**
Input 1	DOS #1	DOS #1	DOS #1	DOS #1
Input 2	RTE #1	RTE #1	RTE #1	RTE #1
Input 3	DOS #2	DOS #2	DOS #2	DOS #2
Input 4	RTE #2	RTE #2	RTE #2	RTE #2
A	-	-	-	-
B	-	Data Line	Data Line	Data Line
C	-	DOS #3	DOS #3	DOS #3
D	-	RTE #3	RTE #3	RTE #3
Relay 1	Reader #1	Reader #1	Reader #1	Reader #1
Relay 2	Reader #2	Reader #2	Reader #2	Reader #2
Relay 3	Bell Button	Reader #3	Reader #3	Reader #3

	UHR903-0-1-GB-XX			
	 **ImproX RF Button 3**	 **ImproX RF Button 4**	 **ImproX RF Buttons 1 & 2**	 **ImproX RF Buttons 3 & 4**
Input 1	DOS #1	DOS #1	DOS #1	DOS #1
Input 2	RTE #1	RTE #1	RTE #1	RTE #1
Input 3	DOS #2	DOS #2	DOS #2	DOS #2
Input 4	RTE #2	RTE #2	RTE #2	RTE #2
A	-	-	-	-
B	Data Line	Data Line	Data Line	Data Line
C	DOS #3	DOS #3	-	-
D	RTE #3	RTE #3	-	-
Relay 1	Reader #1	Reader #1	Reader #1	Reader #1
Relay 2	Reader #2	Reader #2	Reader #2	Reader #2
Relay 3	Reader #3	Reader #3	Bell Button	Bell Button

	 **Magstripe ABA Track 2**	 **Barcode Code-39 + checksum**	 **Barcode Code-39**	 **Wiegand 26/44/40/37 (Sagem MA100, MA200 or MA300)**
Input 1	DOS #1	DOS #1	DOS #1	DOS #1
Input 2	RTE #1	RTE #1	RTE #1	RTE #1
Input 3	DOS #2	DOS #2	DOS #2	DOS #2
Input 4	RTE #2	RTE #2	RTE #2	RTE #2
A	DOS #3	-	-	DOS #3
B	Clock Line	Data Line	Data Line	“0” Data Line
C	RTE #3	DOS #3	DOS #3	RTE #3
D	Data Line	RTE #3	RTE #3	“1” Data Line
Relay 1	Reader #1	Reader #1	Reader #1	Reader #1
Relay 2	Reader #2	Reader #2	Reader #2	Reader #2
Relay 3	Reader #3	Reader #3	Reader #3	Reader #3

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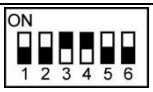
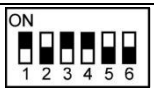
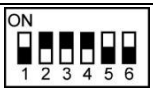
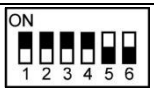
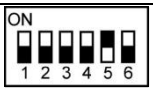
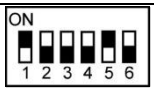
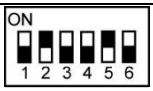
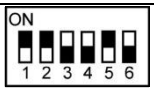
	 **Open Wiegand**	 **Motor Lock**	 **Repeating (Pulse) Lock**	 **Fail Safe/Fail Secure Solenoid Lock**
Input 1	DOS #1	DOS	DOS	DOS
Input 2	RTE #1	RTE	RTE	RTE
Input 3	DOS #2	Locked	Locked	Locked
Input 4	RTE #2	Unlocked	Unlocked	Unlocked
A	DOS #3	-	-	-
B	“0” Data Line	-	-	-
C	RTE #3	-	-	-
D	“1” Data Line	-	-	-
Relay 1	Reader #1	Motor Lock	Pulse Lock	Solenoid Lock
Relay 2	Reader #2	Motor Lock	-	-
Relay 3	Reader #3	Bell Button	Bell Button	Bell Button

	 **ImproX Remote Reader (Single)**	 **ImproX Remote Readers (Dual)**	 **Motor Lock** **(With Dual ImproX Remote Readers)**	 **Repeating (Pulse) Lock** **(With Dual ImproX Remote Readers)**
Input 1	DOS #1	DOS #1	DOS	DOS
Input 2	RTE #1	RTE #1	RTE	RTE
Input 3	DOS #2	DOS #2	Locked	Locked
Input 4	RTE #2	RTE #2	Unlocked	Unlocked
A	Tx Line	Tx1 Line	Tx1 Line	Tx1 Line
B	Rx Line	Rx1 Line	Rx1 Line	Rx1 Line
C	DOS #3	Tx2 Line	Tx2 Line	Tx2 Line
D	RTE #3	Rx2 Line	Rx2 Line	Rx2 Line
Relay 1	Reader #1	Reader #1	Motor Lock	Pulse Lock
Relay 2	Reader #2	Reader #2	Motor Lock	-
Relay 3	Reader #3	Bell Button	Bell Button	Bell Button

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	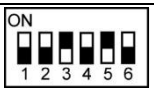 **Fail Safe/Fail Secure Solenoid Lock (With Dual ImproX Remote Readers)**	**Summary of Abbreviations:** DOS: Door Open Sensor. RTE: Request to Enter or Exit. Tx: Transmit. Rx: Receive.
Input 1	DOS	
Input 2	RTE	
Input 3	Locked	
Input 4	Unlocked	
A	Tx1 Line	
B	Rx1 Line	
C	Tx2 Line	
D	Rx2 Line	
Relay 1	Solenoid Lock	
Relay 2	-	
Relay 3	Bell Button	

Table 2: DIP-switch Settings (for the Third-party Port)

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ELECTRICAL CONNECTIONS

Terminal Layout

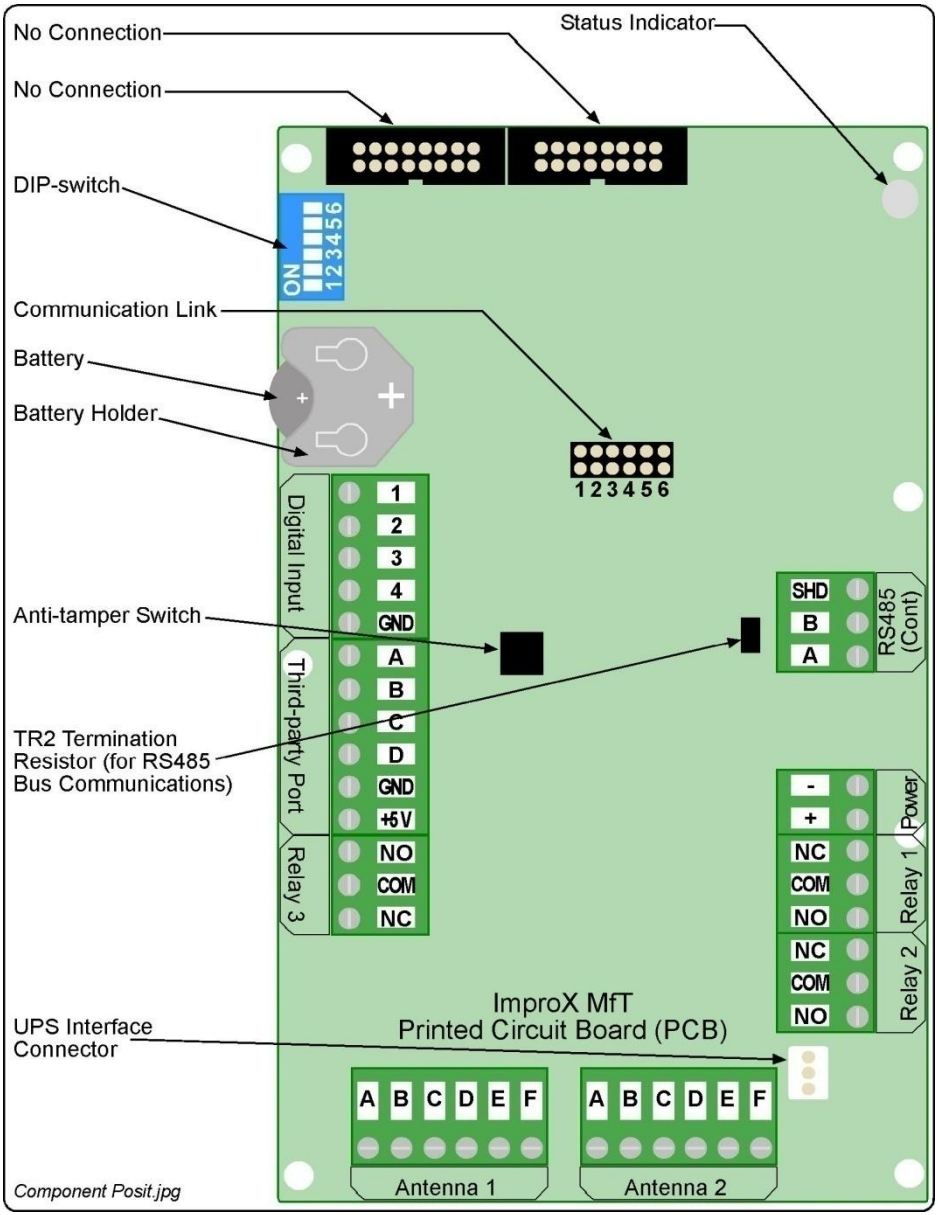

Figure 3: Key Component Positions

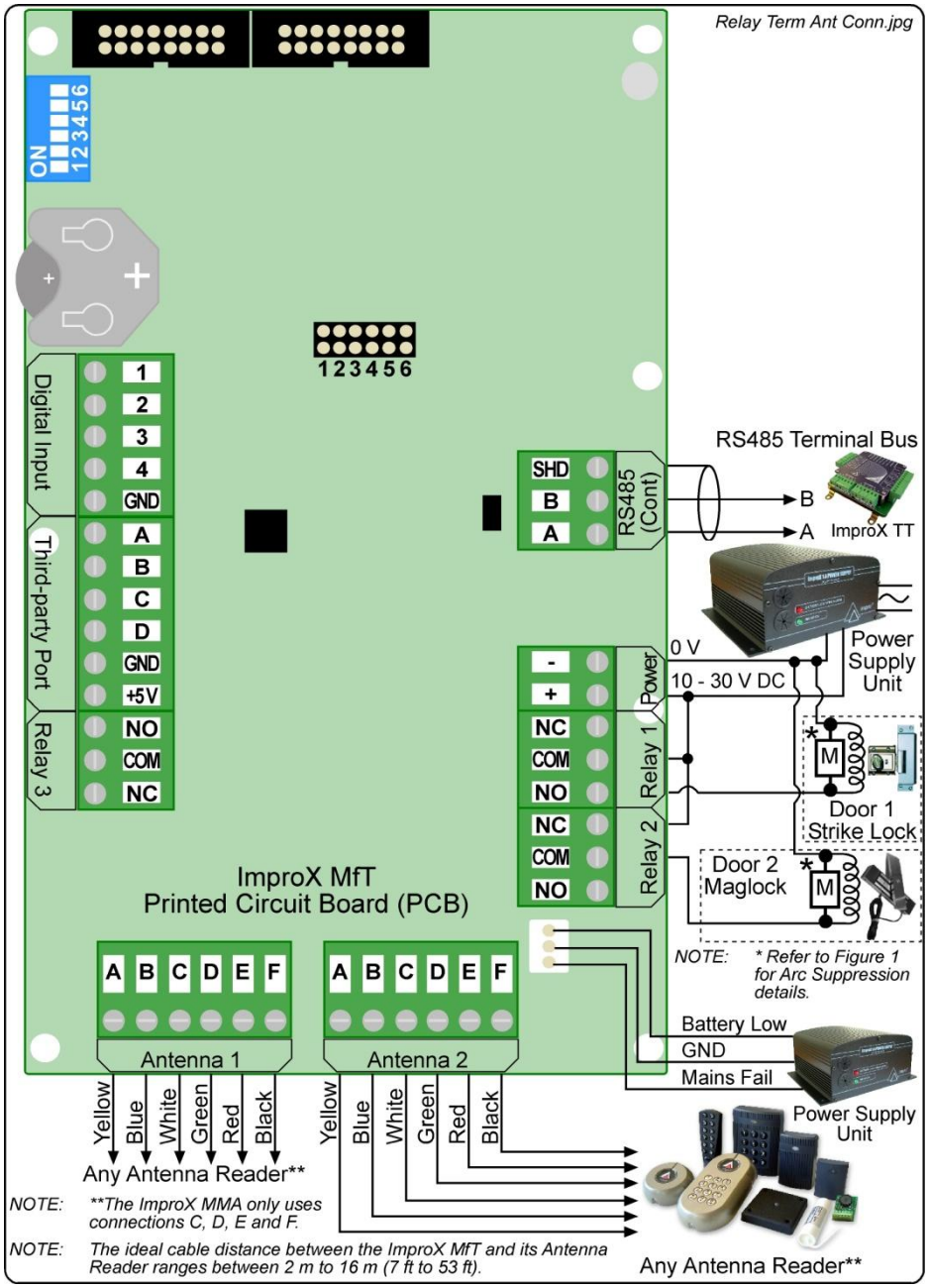

Figure 4: Typical Terminal, Relay and Antenna Connections

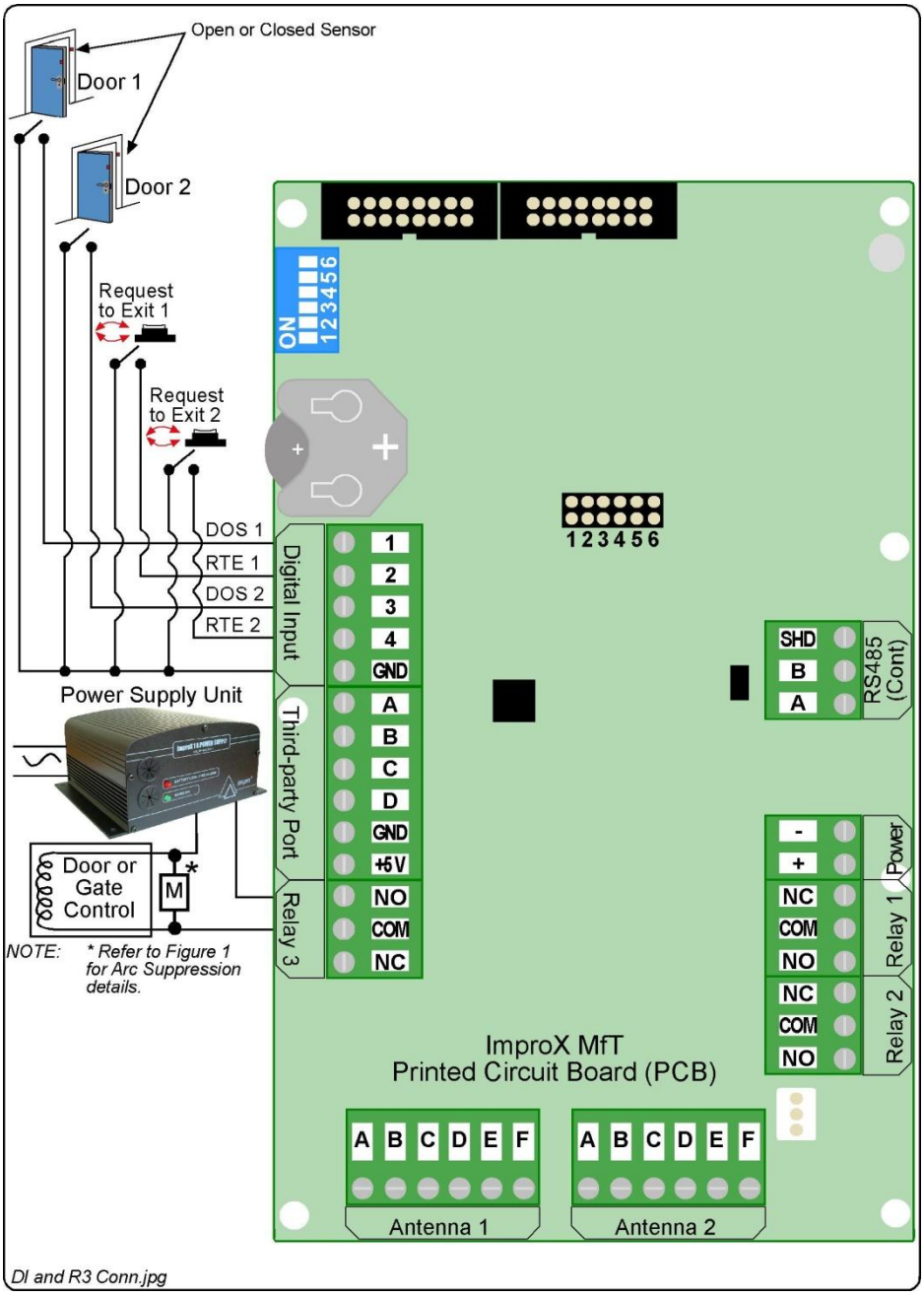

Figure 5: Typical Digital Input and Relay 3 Connections

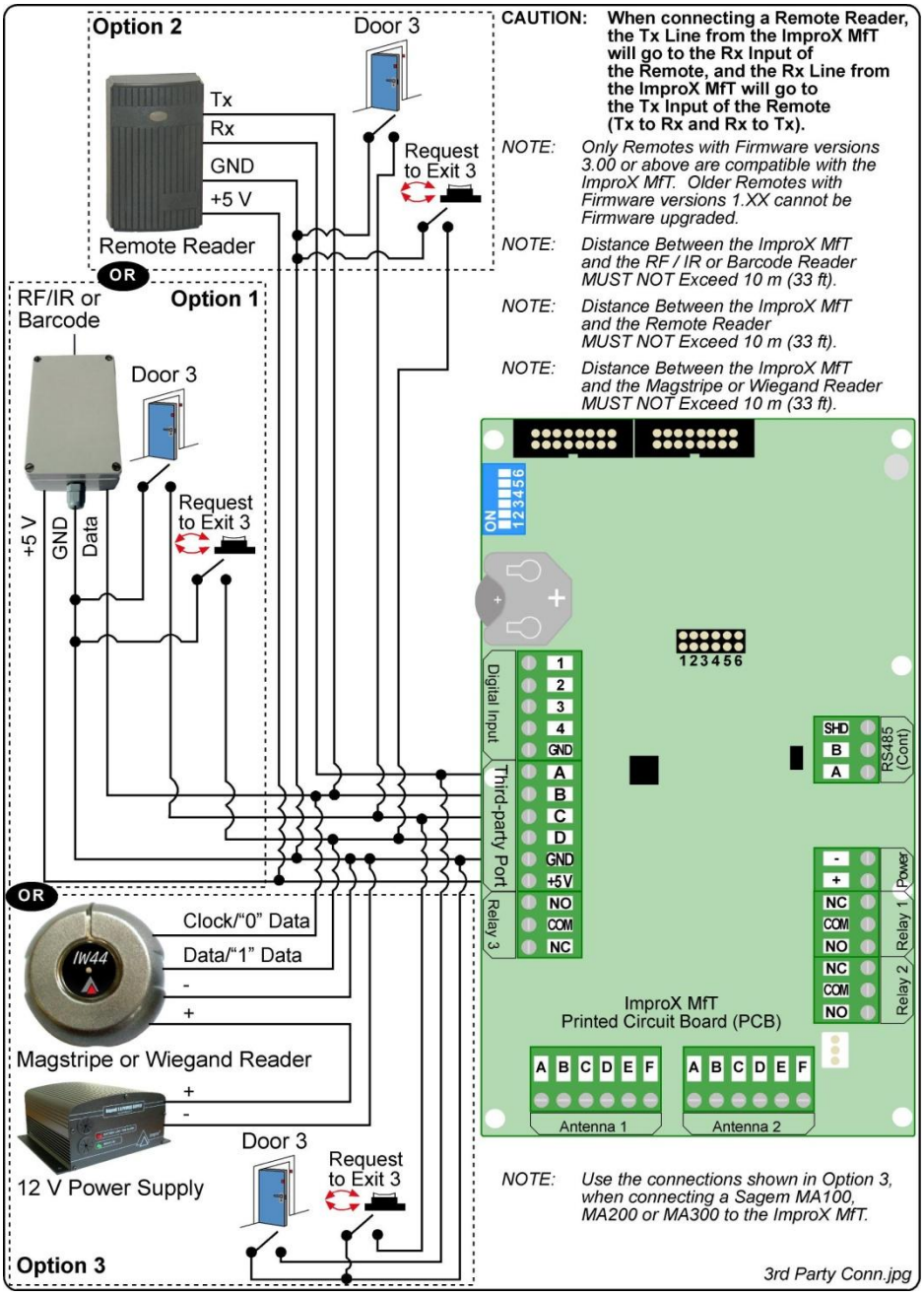

Figure 6: Typical Third-party Port Connections

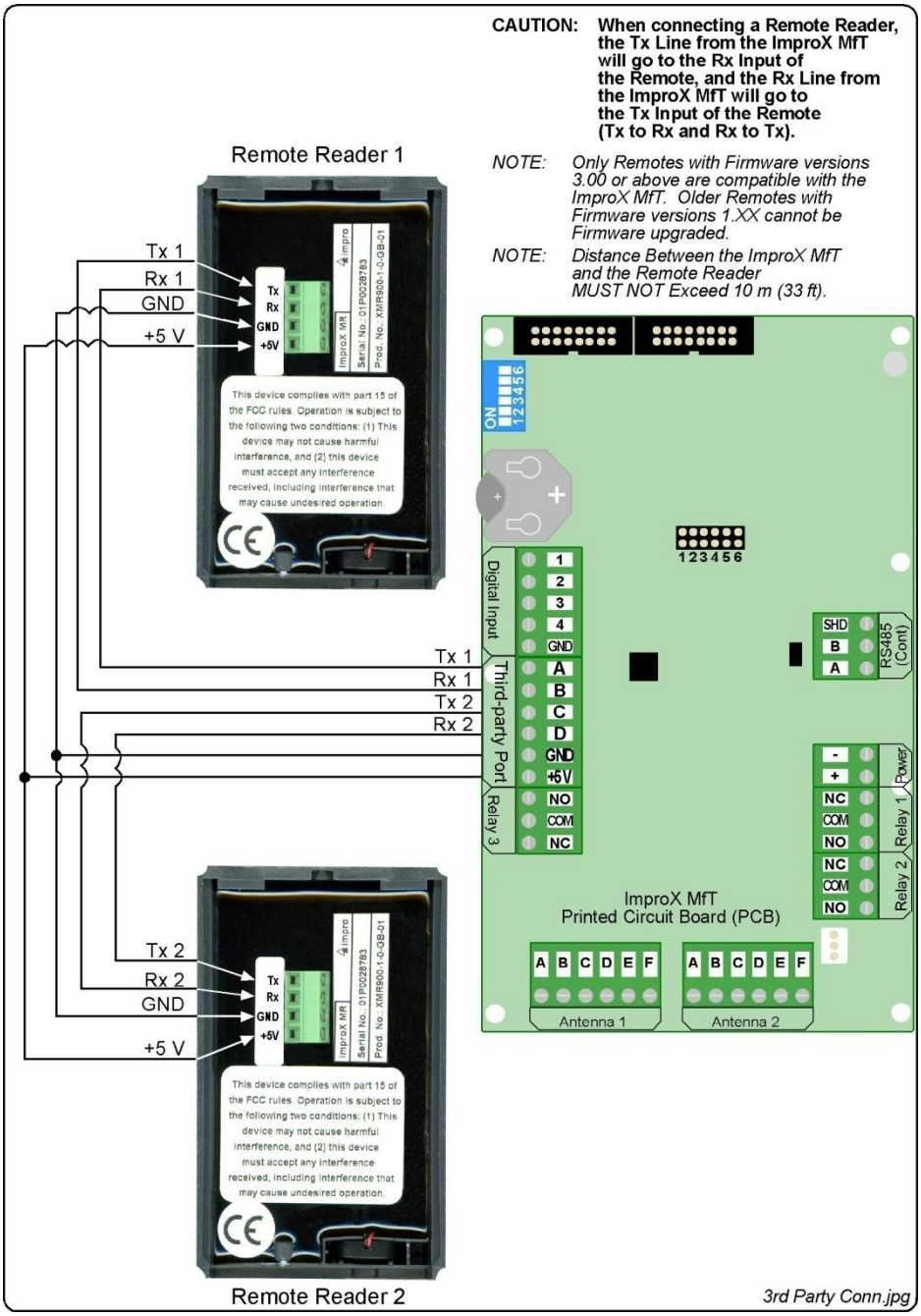

Figure 7: ImproX MfT Connected to two Remote Readers

Fixed Address Label

Once the ImproX MfT is installed, sketch a rough site plan. Attach the loose (additional Fixed Address Label packaged with the Terminal) Fixed Address Label 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.

The ImproX MfT reports up to three Fixed Addresses.

Antenna 1's Fixed Address is the Fixed Address shown on the Fixed Address Label. Antenna 2's Fixed Address is calculated using the Antenna 1's Fixed Address +1. And the Third-party Readers Fixed Address is calculated using Antenna 1's Fixed Address +2.

When the Third-party Port is set up for two Remote Readers, their Fixed Addresses are as per Antenna 1's Fixed Address and Antenna 1's Fixed Address +1 respectively.

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 (MfT) Multi-function Terminal, XEA931-1-0-GB-03. (The last two digits of the Impro stock code indicate the issue status of the product).			
XEA301-0-0-GB-08	Issue 09	Sep 2007	ImproX MfT\English Manuals\LATEST ISSUE\ ImprXMfT-insm-en-09.docx