

# REFERENCE



## FCC Compliance

**Labeling Requirements** CFR 47, FCC part 15, Sections 15, 19, 109.

A device shall bear the following label in a conspicuous location on the device.

**a) VST/PST Controller**

|   |                                  |
|---|----------------------------------|
| <b>OTI GMS</b>  | <b>FCC ID: JNX-13560M915MCON</b> |
| <b>Manufacturer: On Track Innovations Ltd.</b>                    |                                  |
| <b>This device complies with Part 15, of the FCC Rules.</b>       |                                  |
| <b>Operation is subject to the following two conditions:</b>      |                                  |
| <b>1. This device may not cause harmful interference, and</b>     |                                  |
| <b>2. This device must accept any interference received,</b>      |                                  |
| <b>including interference that may cause undesired operation.</b> |                                  |

**b) VST Tag**

|  |
|--|
| <b>FCCID -JNX-VSTTAG915M</b>               |
| <b>Manufacturer - On Track Innovations</b> |

**This device complies with Part 15, of the FCC Rules.**

**Operation is subject to the following two conditions:**

- 1. This device may not cause harmful interference, and**
- 2. This device must accept any interference received, including interference that may cause undesired operation.**

**NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15, subpart C of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:**

**Reorient or relocate the receiving antenna.**

**Increase the separation between the equipment and receiver.**

**Connect the equipment into an outlet on a circuit different from that to which this receiver is connected.**

**Consult the dealer or an experienced radio/TV technician for help**

**Changes or modifications in this equipment, not expressly approved by the party responsible for compliance (On Track Innovations Ltd,) could void the user's authority to operate the equipment.**



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# 1. safety Requirement

## 1.1 USA

Installation of 120VAC supply to the VST/PST Controller must be done in accordance with National Electric Code (NEC) requirements.

The VST/PST controller uses 120VAC power supply connected terminals in a partitioned area marked by a yellow triangle with lightning bolt indicating presence of hazardous voltage.



**Keep hand off this area!**

### **Warning!**

Unit is supplied with 120VAC plug-in power cord.

Do not connect the main supply before installation is complete.

Disconnect power from the main supply before attempting to replace 1A fuse in AC supply terminal.

Removal of VST/PST controller cover for inspection or maintenance is permitted for qualified personnel only.



## **2. VST/PST System ETU Product Overview**

### **2.1 Product Description**

The VST/PST Controller supports both long-range vehicle smart tags operating at 900 MHz and passive proximity transponders operating at 13.56MHz. It's main use is Smart Card/Tag Payment System.

It can serve as interface to a host computer or be used as a standalone unit.

At the heart of the VST/PST controller lies OTI's MCI2 PCB. The MCI2 is a microprocessor based smart transceiver supporting two 13.56MHz transmission channels, so as to enable communication with PST tags carried by users.

The plug in VST Transceiver mounted on the MCI enables communication with VST in the vehicle.

### **2.2 General description:**

The VST/PST system comprises three elements:

- VST/PST Controller
- VST tag
- PST tag

The VST portion of the system support communication between the VST tag and the controller over distances of up to few tens of meters, utilizing 915MHz communication frequency.

The PST portion of the system support communication of the PST tag and the controller over distances of up to 10cm, utilizing 13.56MHz frequency.

The Controller support one VST communication channel and two PST communication channels.

It also support RS232 communication to host channel and one signaling channel comprising two indication signals.

The system is used to perform "transaction" of data between the VST or PST tags and the controller for various applications.

### **2.3 Additional details:**

#### **2.3.1 Power supply:**

Controller – 110/220VAC.

VSR tag – 3.6V battery at few tens of mA.

PST tag – no independent power source. It draws its power from the controller's antenna transmitted power. Current consumption is in the range of few mA.



## **2.3.2 Communication:**

VST tag:

- 915MHz.
- Normal bi-directional, transmit/receive, half-duplex.
- Digital data, Binary FSK.

PST tag:

- 13.56 MHz.
- Special bi-directional, half duplex:
  - Controller to tag communication – AM.
  - Tag to controller communication – Load modulation.
- Digital data, pulse width coding.

## **2.3.3 Antennas:**

### **2.3.3.1 VST channel:**

Controller:

- Detachable directional antenna.

VST tag:

- Integral “L” antenna.

### **2.3.3.2 PST channel:**

Controller:

- Detachable loop antennas.

PST tag:

- Integral loop antenna.



### 3. Installation Requirements

- The intended application of the system is for the commercial and or industrial uses.
- The product can not be sold to the general public, but only to the system's Operating Company. When the system is sold by the Operating Company to the customers, the Product is installed only by the professional installers, qualified ("licensed") by the company for this purpose.
- The installation must be controlled and follow the requirement of "Installation Manual". Each potential installer receives special training, which is a condition for receiving the license from the Operating Company to become a "licensed" installer. The installation itself is a complex procedure, as described in the "Installation Manual". It includes not only the mechanical installation, but additional procedure of interconnection to the main computer via modem, software initialization, registration of the specific Product in the Operating Company's control center, performance of the initial test procedure. All these are the tasks of the Product installer, which can only performed by specially trained professional.

system requires installation of certain electrical equipment that must be performed by a licensed electrician.

120VAC supply to the VST/PST Controller must be done in accordance with National Electric Code (NEC) requirements.

Installation and wiring of VST antenna must be performed by a qualified technician. The VST antenna requires separate grounding Use 10AWG wire to connect between the antenna mounting bracket and ground.

*.Note: Outdoor units and antennas should be installed ONLY by experienced installation professionals who are familiar with local building and safety codes and, wherever applicable, are licensed by the appropriate government regulatory authorities. Failure to do so may void the OTI product warranty and may expose the end user or the service provider to legal and financial liabilities. OTI and its resellers or distributors are not liable for injury, damage or violation of regulations associated with the installation of outdoor units or antennas.*

**WARNING:** It is the responsibility of the installer to ensure that when using the outdoor antenna kits in the United States (or where FCC rules apply), only those antennas certified with the product are used. The use of any antenna other than those certified with the product is expressly forbidden in accordance with FCC rules CFR47 part 15.204."

The installer should configure the output power level of antennas, according to country regulations and per antenna type.



### **3.1 PST Antenna Wiring.**

The PST antenna in the window panel is wired to the VST/PST Controller via BNC connector near the window panel. Wiring should be performed by qualified technician only.

The PST antenna in the window panel has a 23" coax cable terminated with a BNC connector.

Connect this cable to a 22 foot long RG174 coax cable routed through protected conduit and connected to the VST/PST Controller MCI terminal strip (refer to Figure 3-2: VST/PST Signal Wiring).

**THE ANTENNA CABLES MUST NOT BE CUT!** They must be used in the length provided.

**Note:**

After connecting the PST antenna cable to the cable from the VST/PST controller, wrap 3M Scotch-Seal 2229 Mastic Tape over the BNC connectors to seal them against moisture

### **3.2 Supervisor Antenna wiring**

The Supervisor antenna should be placed near the payment window terminal printer. It is intended as interface between the Supervisor card and the system.

Secure antenna in place with mounting screws.

Make sure the antenna is not mounted over or placed near a metallic surface!

The antenna is supplied with a 23 feet 11 inch RG174 coax cable. The coax cable should be routed through protected conduit and connected to the VST/PST Controller MCI terminal strip (Refer to Figure 3-2: VST/PST Signal Wiring).

**THE ANTENNA CABLE MUST NOT BE CUT!** It must be used in the length provided.

### **3.3 VST Antenna wiring**

Use RG58 coax cable. The VST antenna is wired to the VST/PST controller. Both VST antenna and VST/PST Controller have SMA connectors. Wiring should be performed by qualified technician only.





### 3.3.1 Installation Guide Lines

The VST antenna should be mounted outside window counter. The antenna should be mounted horizontal facing down approximately 10 feet above road level.

Connect mounting brackets to VST antenna mounting bolts.

Anchor Mounting brackets to wall or ceiling using 6mm KS-Anchors. Drill and mount the anchors through the mounting bracket holes.

### 3.3.2 Wiring Guidelines

The VST antenna panel is supplied with an SMA connector. RG58 coax cable should be used. Cable length should not exceed 12 feet. The coax cables should be routed through protected conduit and connected to the SMA connector on the VST/PST controller box. Allow for a small downward loop in the cable before entering the wall to prevent water seepage into the wall.

### 3.3.3 Grounding

The VST antenna requires separate grounding Use 10AWG wire to connect between the antenna mounting bracket and ground.

## 3.4 VST/PST Controller

### 3.4.1 Safety

The VST/PST controller uses 120VAC power supply connected terminals in a partitioned area marked by a yellow triangle with lightning bolt

indicating presence of hazardous voltage.



Keep hand off this area!

#### **Warning!**

Unit is supplied with 120VAC plug-in power cord.

Do not connect the main supply before installation is complete.

Disconnect power from the main supply before attempting to replace 1A fuse in AC supply terminal.

Removal of VST/PST controller cover for inspection or maintenance is permitted for qualified personnel only.



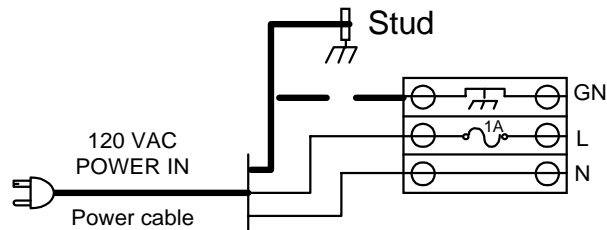
### 3.4.2 Installation Guidelines

The VST/PST Controller is supplied in a metal enclosure. The dimensions of the box are W = 200mm, H = 300mm, D = 80mm. Weight: 4.2Kg.

The VST/PST Controller should be mounted inside the the drive thru payment window counter. The unit should be mounted at least 3 feet above floor level.

### 3.4.3 Wiring Guidelines

#### *3.4.3.1 120VAC Power*



**Figure 3-1: 120VAC Power Wiring**

Do not apply power to the VST/PST controller until installation is complete!



3.4.3.2 VST/PST Signal Wiring

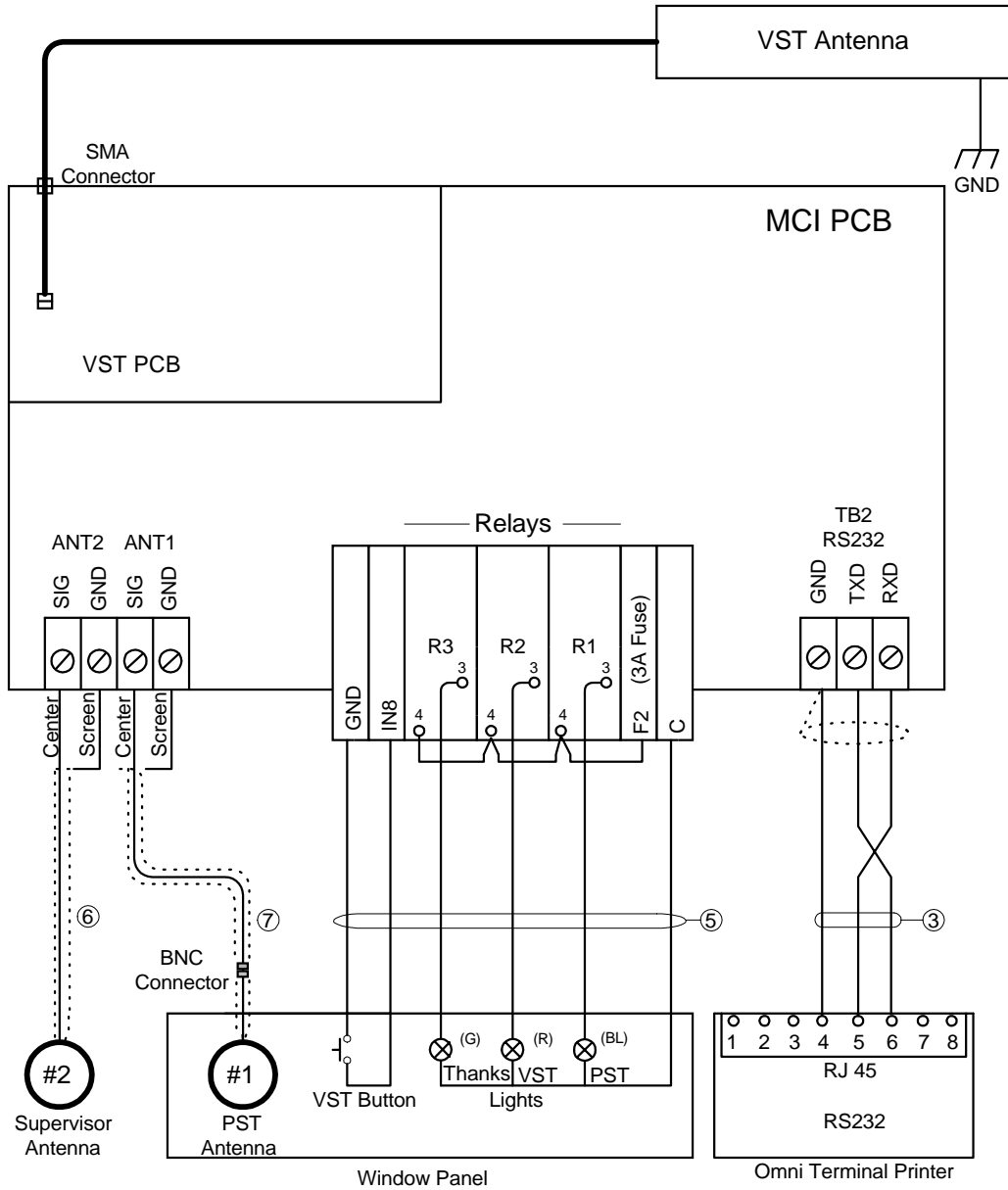
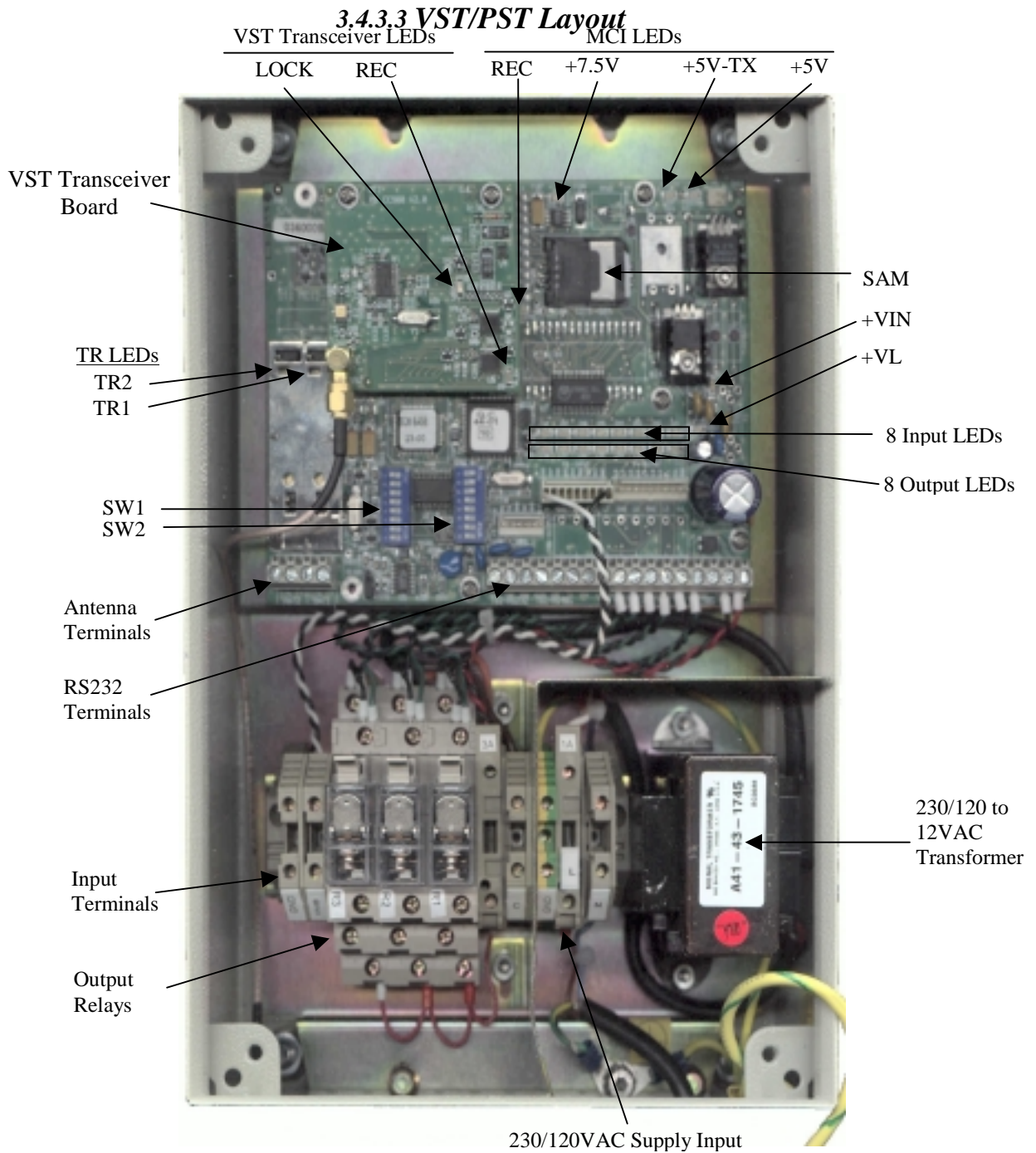


Figure 3-2: VST/PST Signal Wiring

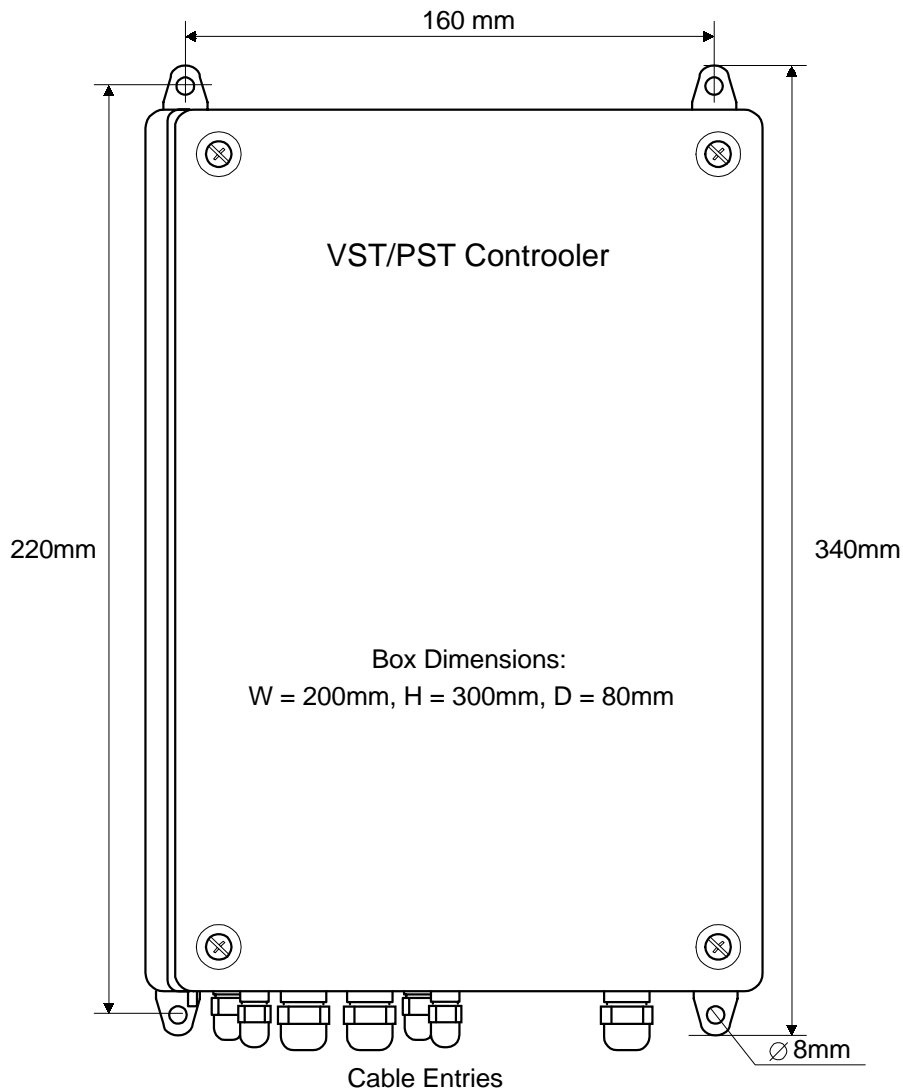




**Figure 3-3: VST PST - Interface Layout**



## 4. Mechanical Installation



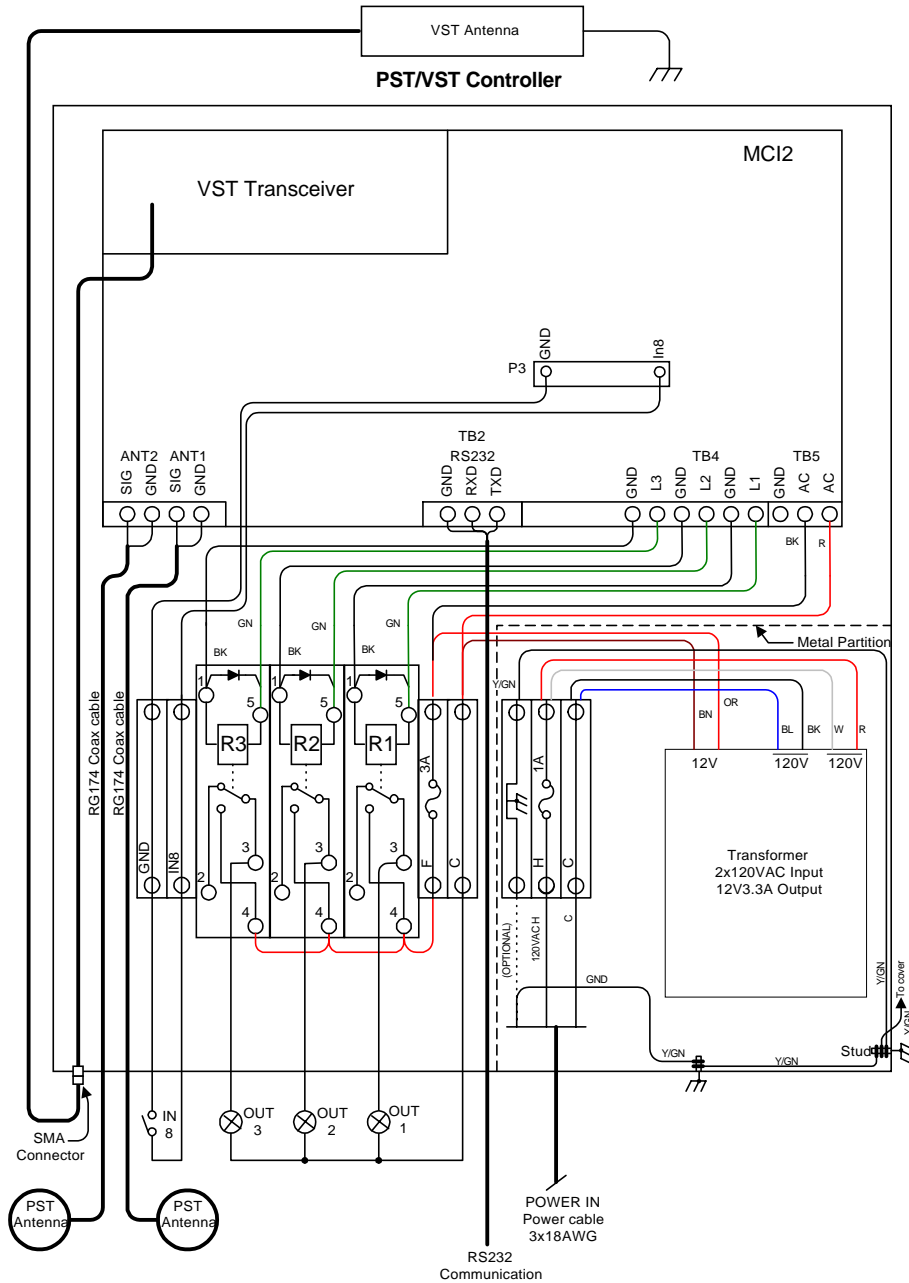
**Figure 4-1: VST PST - Enclosure Layout**

The VST/PST Controller is intended for wall mounting. The unit should be fixed to the wall with four mounting screws through the 4x 8mm mounting holes.

Unit can be mounted either indoors or outdoors. To prevent overheating the unit should not on a wall fully exposed to sunlight.



## 5. Electrical Installation



PST/VST Controller wiring

5-1: Wiring Diagram

