

VM CONNECT T313 USER MANUAL

Version 0.07

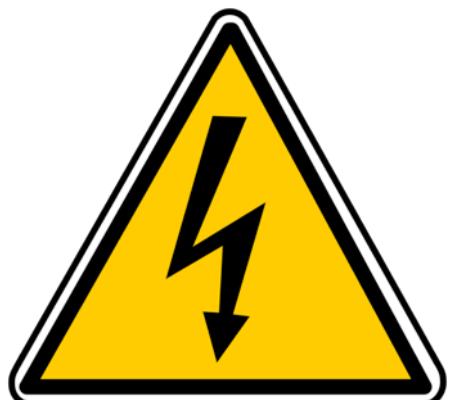
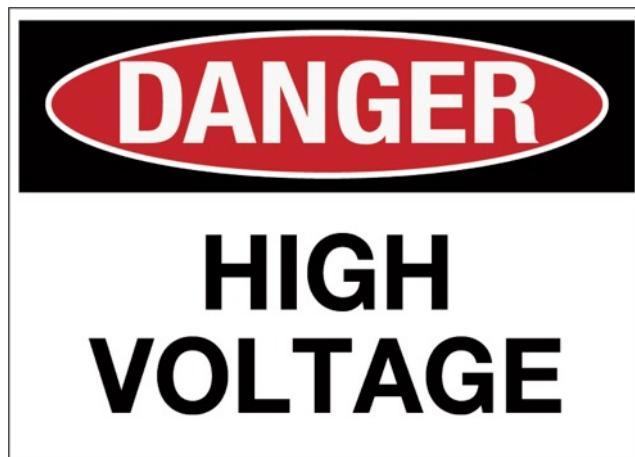
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| DATE | VERSION | CHANGES |
|----------------|---------|---|
| MARCH 12, 2016 | 0.01 | Initial Draft |
| MARCH 18, 2016 | 0.02 | Installation Feedback |
| APRIL 12, 2016 | 0.03 | Added EPay display status |
| JUNE 1, 2016 | 0.04 | Swapped the mounting brackets solely to magnets |
| JUNE 3, 2016 | 0.05 | Replaced picture of device with magnet-captive clips |
| JUNE 4, 2016 | 0.06 | Wiring Diagram, Door Switch “NO” and “NC” explanation |
| JUNE 15, 2016 | 0.07 | Improve Extension DWG |

PURPOSE

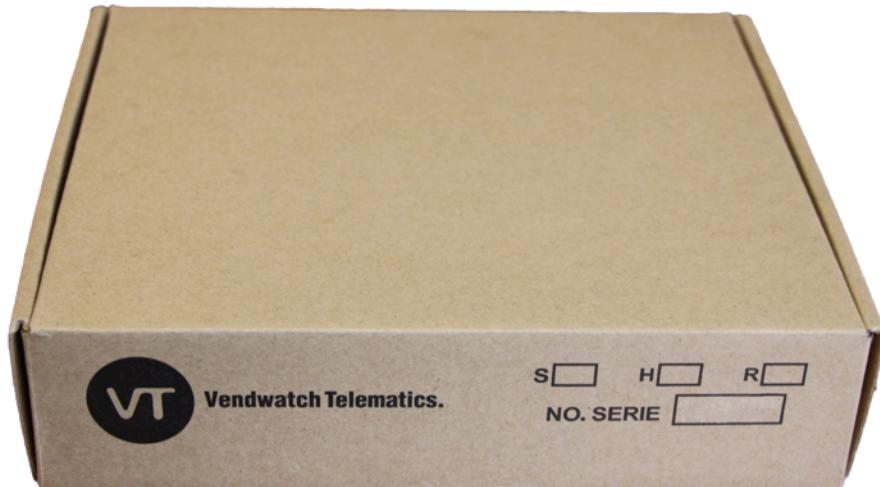
The sections that follow describes how to install the Vendwatch Telematics (VT) VendMine (VM) Connect T313 Telemetry Device in Vending Machines using general guidelines applicable to a universal principle of operation. Other documents would detail specific mounting location and cable routing for the various models available in the market from different manufacturers.

Before proceeding with the installation verify that the VM IS NOT POWERED and Alternating Current (AC) or High Tension Voltage is not connected to the vending machine.



UNPACKING THE UNIT

Each container includes the T313 Telemetry Device, the telemetry antenna and the accessories kit. Clips to mount the enclosure and splice connectors to connect the door switch are found inside the kit amongst other items necessary to complete the professional appearance of the installation.



MOUNTING THE DEVICE

VM come in a variety of versions, models and their respective revisions. Two magnet-captive mounting clips, included in the kit, provide flexibility of installation; the desired location is accomplished by inserting the clips right-to-left or left-to-right (see picture below), allowing the unit to be attached to any internal VM unused wall. The units is intended to be mounted with the LEDs facing the installer and the cables hanging to the floor.



RIGHT MOUNT



LEFT MOUNT

CONNECTING THE CABLES

The next step after the the unit is secured in the VM chassis is to connect the cables to their respective interfaces. The T313 Telemetry device has 6 distinctive cables connecting the unit to the VM controller Direct EXchange (DEX) port, the Electronic Payment (EPay) System, the Multi Drop Bus (MDB) serving the legacy payment system, the Door Switch and Temperature Sensors and the antenna cable.



From left to right the function of the cables protruding from the T313 Telemetry Device are: DEX, EPay, MDB, Door Switch Sensors (DSS), Temperature Control Sensors (TCS) and the Antenna.

MOUNTING THE ANTENNA

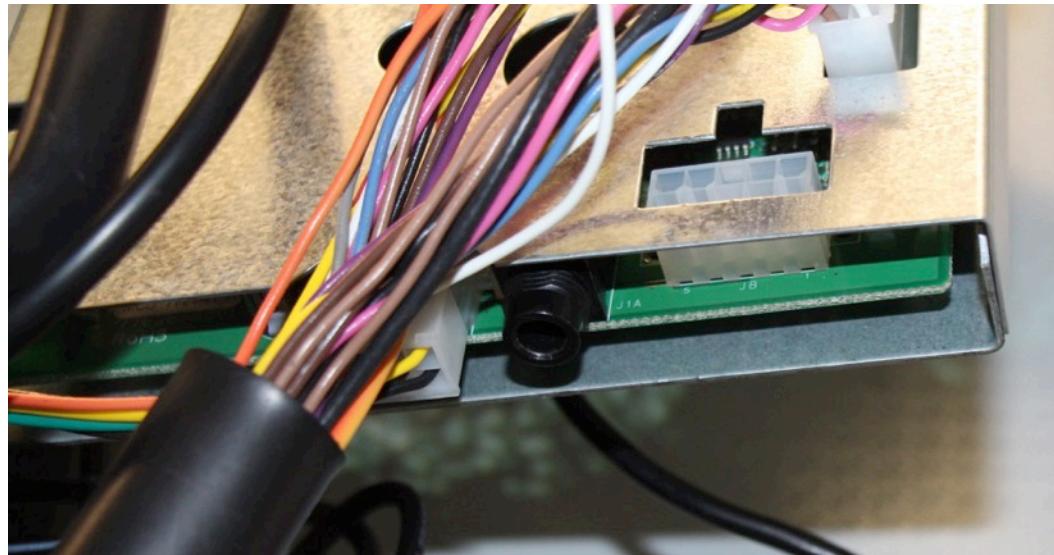
The External Antenna will be mounted on top right side of the door and on the same side of the machine where the T303 Telemetry Device is installed. To do this, you will need to drill a 5/8 hole using the conical drill bit as shown.



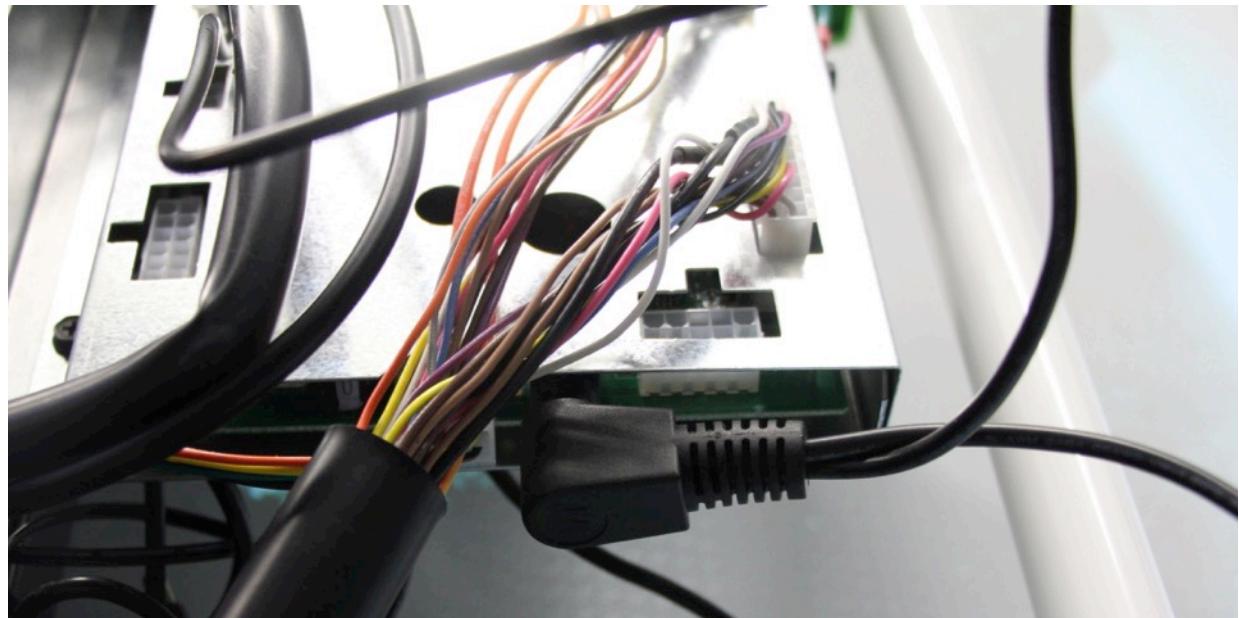
Once drilling is completed, remove the hex nut from the antenna and insert the cable into the hole from the outside, now tighten the nut from the inside of the machine. Connect the Antenna to the corresponding connector in the VM Connect Device.

CONNECTING THE DEX CABLE

The Telemetry T313 Device requests Sales, Health and Status of the VM by connecting to the Direct EXchange (DEX) connector. The VM Controller (VMC), the intelligence behind the VM functionality, provides a DEX interface connector, 1/4" phone jack, in some models solder directly on the board and other models as a dongle.



Find the DEX 1/4" phone jack and connect the T313 Telemetry Device 1/4" phone plug into it as illustrated below. The cable provides a spare 1/4" phone jack to facilitate connecting additional devices on the DEX port.



MOUNTING THE EPAY UNIT

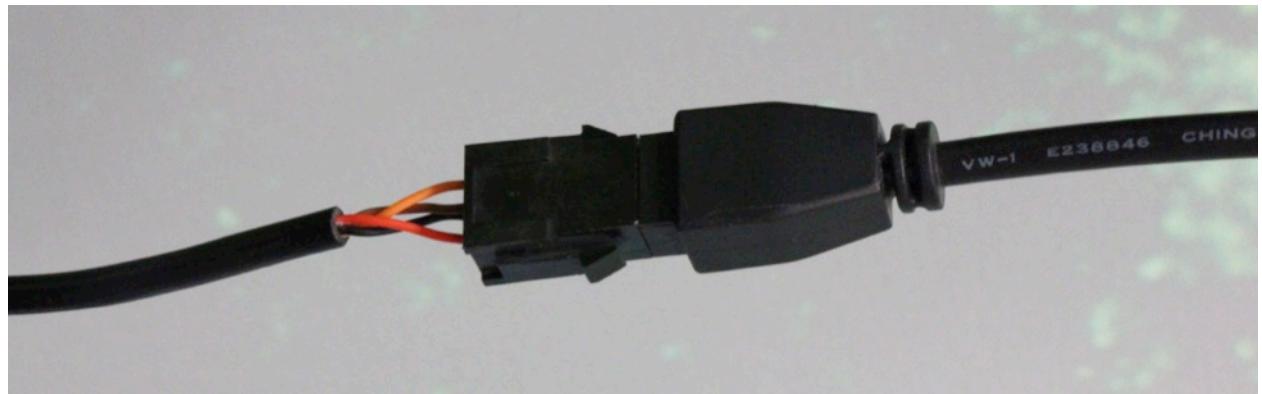
The Electronic Payment (EPay) unit should be mounted on the VM using, as a minimum, two of the mounting metal inserts in the back of the EPay unit.



When necessary, an additional perforation of the chassis is required to accommodate proper routing of the EPay interface cable.

CONNECTING THE EPAY UNIT

Find the EPay cable on the T313 Telemetry Device and connect the cables together. Additional 1 meter extension cables can be purchased if the distance between the T313 and the EPay devices exceeds 1.5 meters.



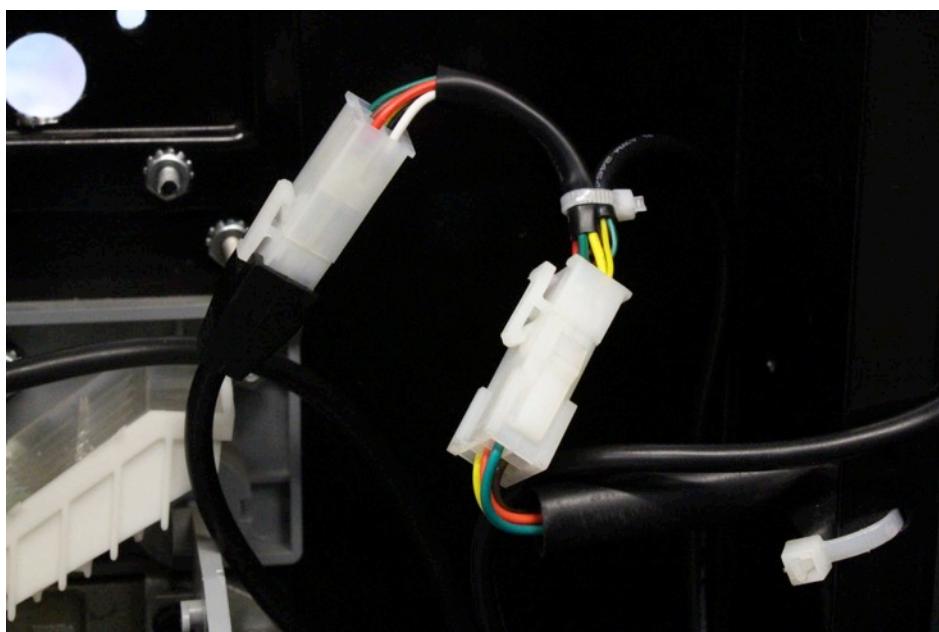
Upon powering up the unit the EPay unit will display “Reader Currently Disabled”, once initialized the legend changes to “Tap or Swipe Card t Vend”; during Dex reads, the legend would be “Processing Data Back Soon”.

CONNECTING THE MDB

The VMC provides power and controls the legacy payment system by allowing multiple devices to connect to the MDB bus. The installation would require to find the last device on the MDB bus and connect the T313 Telemetry Device at the end.



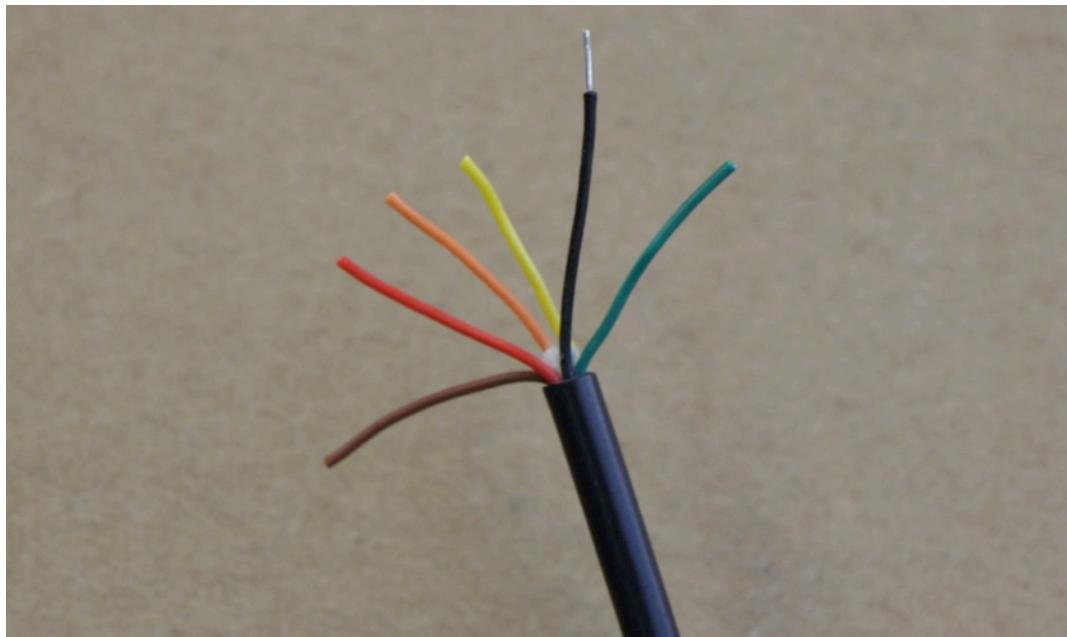
If the last device on the bus does not have a spare connector, the installation would require to disconnect the last device on the bus and connect the T313 Telemetry Device as second to last on the bus as illustrated below.



CONNECTING THE DOOR SWITCH

The cable used to connect the device to the VM door switch has 6 wires providing 3 separate functions; each using dedicated color wires based on VM instrumentation as follows:

- NC Pair: RED/ORANGE
- NO Pair: BROWN/BLACK
- VT NO Switch Kit available for sale: GREEN/YELLOW



The VM is equipped with a door switch connected to the VMC; typically, one of the poles is connected to what's universally referred as common (return, ground or shield); the other pole is commonly referred as the "hot wire" and reflects the state of the door. The door switch is determined to be in a "**NORMAL**" state when the plunger "**IS NOT**" retracted hence the term Normally Closed (NC) or Normally Open (NO).



Button Extended



Button Pressed

CONNECTING THE DOOR SWITCH

The switch is wired one of two ways, Poles are Normally Open (NO) or Poles are Normally Closed (NC). When the door is open and the switch plunger is fully extended, the **“NO” POLE and the “COMMON” POLE ARE NOT** making contact while the **“NC” POLE and the “COMMON” POLE ARE** making contact with each other.

To facilitate the integration of the VM door switch with the Telemetry device, a test tool universally known as a continuity tester would be used. The tool indicates when two points make contact when a led or a buzzer, instrumented in the tool, emanates light or sound as depicted below.

OPEN CIRCUIT



CLOSED CIRCUIT

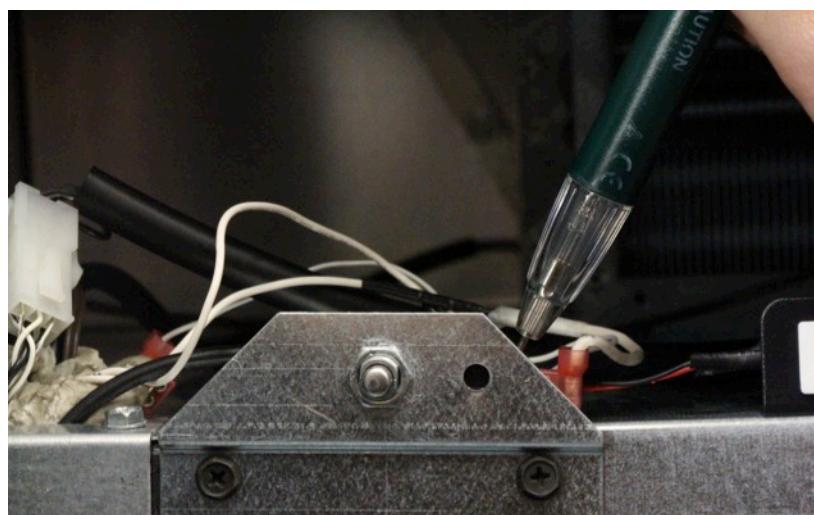


FINDING THE COMMON POLE

Connect the continuity test tool alligator clip to the shield of the Dex connector as shown



Locate the switch, it must have two wired poles, however it may have a third pole that would not be wired. After locating the door switch, use the tip of the the continuity tester tool to make contact with one of the wired poles. If the light of the Continuity Tester Tool turns ON, press and release the Door Switch button, if the light is still ON no matter what state the Door Switch is in, then you have found the Common Pole. The Dex port and the Common Pole are both ground, so stay connected to the Dex port



| | | |
|---|--------------------------|-------------------------|
| Switch in Normal state (Button Extended) | YES | YES |
| Touching Wired Pole | YES | YES |
| Light/Sound ON | NO | YES |
| Switch Type | NO (Normal y Open) | NC (Normal y Closed) |
| Wire Pair Color to be used | Brown/ Black | Red/Orange |

FINDING THE COMMON POLE

Now make contact with the the other pole to validate the switch model and the poles connectivity.



| DOOR SWITCH | LIGHT / SOUND | POLE TYPE | SWITCH TYPE |
|---------------------|---------------|-----------|-----------------|
| Extended or Pressed | YES | Common | Unknown |
| Extended | NO | NO | Normally Open |
| Pressed | YES | NO | Normally Open |
| Extended | YES | NC | Normally Closed |

Two distinctive connecting options, "NO" or "NC" are available based on the results of the continuity test.

CONNECTING THE T313 TELEMETRY WITH A NORMALLY CLOSED (NC) DOOR SWITCH

Following the results of the test above, cut the wire connected to the “NC” pole of switch.

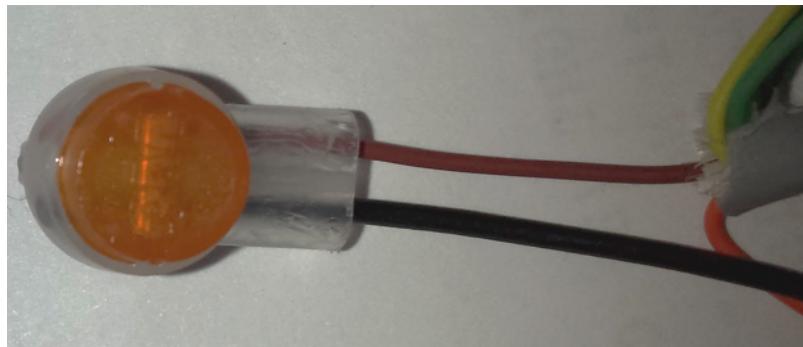
1. Locate the RED Wire in the Door Switch Cable of the T313 Telemetry and splice it with the wire still connected to the switch using one of the UY2 connector.
2. Locate the ORANGE Wire in the Door Switch Cable of the T313 Telemetry and splice it with the other side of the previously cut wire using one of the UY2 connector. This wire is now connected to the VMC controller.



CONNECTING THE T313 TELEMETRY WITH A NORMALLY OPEN (NO) DOOR SWITCH

Following the results of the test above, cut the wire connected to “NO” pole of the switch.

1. Locate the BLACK Wire in the Door Switch Cable of the T313 Telemetry and splice it with the wire still connected to the switch using one of the UY2 connector.
2. Locate the BROWN Wire in the Door Switch Cable of the T313 Telemetry and splice it with the other side of the previously cut wire using one of the UY2 connector. This wire is now connected to the VMC controller.

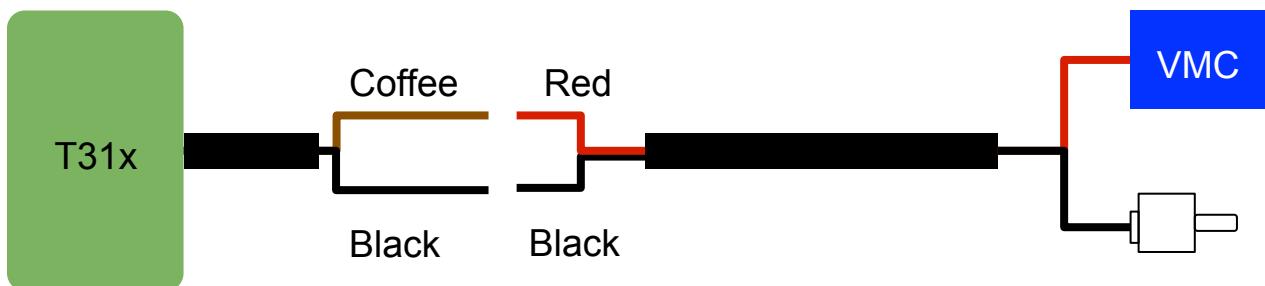


ADDING DOOR SWITCH EXTENSION CABLE

When the Door Switch is installed far from the VM Controller, an extension will be provided with two wires, BLACK and RED.

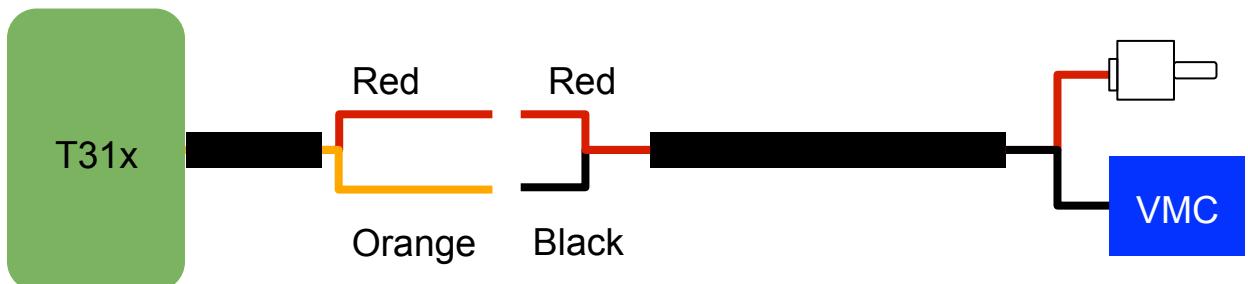
To connect the extension to a “NO” switch, using a Wire Connector join the T310 Black wire with the extension’s Black wire and the T310 Brown wire with the extension’s Red wire, now the Black and Red wires will be available. Cut the “NO” wire and join the Black one to the Door Switch and the Red one to the VMC.

NORMALLY OPEN (NO) WIRING DIAGRAM WITH EXTENSION

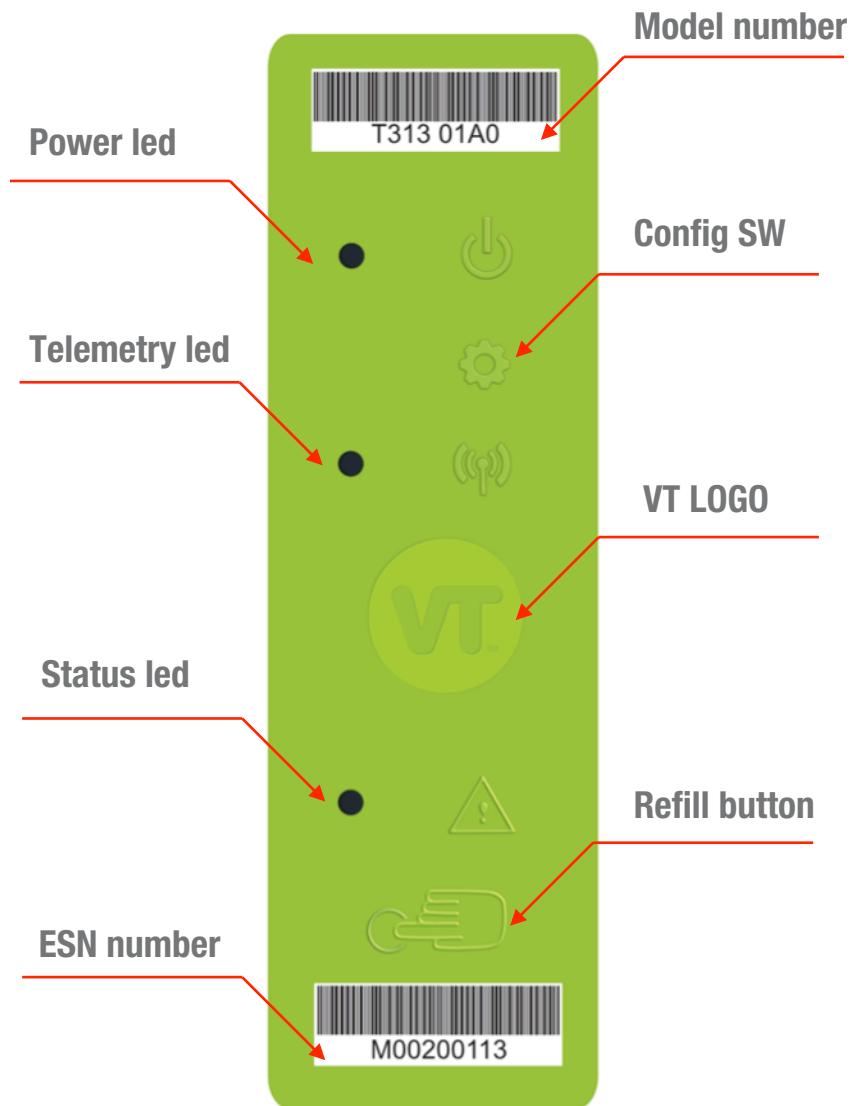


To connect the extension to a “NC” switch, using a Wire Connector join the T310 Red wire with the extension’s Red wire and the T310 Orange wire with the extension’s Black wire, now the Black and Red wires will be available. Cut the “NC” wire and join the Red one to the Door Switch and the Black one to the VMC.

Normally Closed (NC) wiring diagram with extension



THE DEVICE INDICATORS



The device has icons on the front of the device indicating different functions for ease of installation. The label at the front top of the unit contains the Model of the unit, the label at the front bottom of the unit houses the Electronic Serial Number (ESN).

The “GEAR”  icon illustrate the location of the configuration switch; a special key will be provided to qualified technicians who have been trained in the art of troubleshooting the device.

The “TOUCH”  icon illustrate the location of the “Refill Button”. By placing a finger, preferably the thumb, over the icon the device would determine that a button has been depressed. The behaviour of the device’s LEDs will be described in the following sections.

THE BEHAVIOUR OF THE POWER LED

| STATE | ILLUMINATION | DESCRIPTION |
|-------|--------------|---|
| On | Solid Green | VM is powered on AND the device is connected to MDB |
| Off | Off | VM is powered off OR the device is disconnected from the MDB; if the Telemetry or Status LED are illuminated solid or blinking, it is running on battery. |

THE BEHAVIOUR OF THE TELEMETRY LED

| STATE | ILLUMINATION | DESCRIPTION |
|-----------------|---------------|---|
| Radio On | Solid Green | Power was applied to the Telemetry module |
| Radio Off | Off | Power was removed from the Telemetry module |
| Radio Training | Green, On 50% | Radio is searching for available networks |
| Radio Connected | Green, On 87% | Radio is connected to selected network |

THE BEHAVIOUR OF THE STATUS LED

| STATE | ILLUMINATION | DESCRIPTION |
|-------------|----------------------|--|
| Off | Off | The device is off |
| Booting Up | Green, On 50% | The device is getting up to the normal state |
| Normal | Green, Solid | The device is in normal state |
| Programing | Purple, Blinking 50% | The device is being programmed |
| Alert | Orange, Solid | The device has detected issues |
| Handheld | Blue, Solid | The device is connected to VM Guide/Care |
| Battery | Red, Blinking 50% | The device is running on battery |
| Refill | White, Blinking 50% | The device is reading DEX |
| Mfg Testing | Purple, Blinking 50% | The device is running manufacturing test |

VENDWATCH EM-XB/2 REV 6

OPERATION FREQUENCY

| FREQ. BANDS 2G (MHz) | FREQ. BANDS 3G (MHz) | FEATURES |
|-------------------------|-------------------------|-----------|
| 850/1900 | 850/1900 | Data-only |

| MODE | FREQ. TX (MHz) | FREQ. RX (MHz) | CHANNELS | TX - RX OFFSET |
|---------|-----------------|-----------------|-----------|----------------|
| GSM850 | 824.2 ~ 848.8 | 869.2 ~ 893.8 | 128 ~ 251 | 45 MHz |
| PCS1900 | 1850.2 ~ 1909.8 | 1930.2 ~ 1989.8 | 512 ~ 810 | 80 MHz |

OUTPUT POWER

| BAND | POWER CLASS |
|------------------|------------------|
| GSM 850 | 4 (2W) |
| PCS 1900 | 1 (1W) |
| EDGE, 850 MHz | E2 (0.5W) |
| EDGE, 1900 MHz | Class E2 (0.4W) |
| WCDMA FDD B2, B5 | Class 3 (0.25 W) |

FREQUENCY STABILITY

The GSM system is made in a way that the RF transmission is not continuous, but it is packed into bursts at a base frequency of approx. 217 Hz, and the relative current peaks can be as high as about 2A.

MODULATION

| MODULATION | BAND |
|------------|------|
| GMSK | 2G |
| 8PSK | EDGE |
| QPSK | 3G |

SENSITIVITY

| MODULATION | BAND | NOTE |
|--------------|------------|---------------------|
| GSM 850 | -109.5 dBm | BER Class II <2.44% |
| PCS 1900 | -109.5 dBm | BER Class II <2.44% |
| WCDMA FDD B2 | -110 dBm | BER <0.1% |
| WCDMA FDD B5 | -111 dBm | BER <0.1% |

FCC DECLARATION OF CONFORMITY



EON Corporation - Vendwatch Telematics, LLC.
T313

This device complies with FCC part 15
Subclass B regulations.



WARNING: Use ONLY original  accessories and service parts.



Li-ion



Vending Information Unit

This device implements Vendwatch Telematics proprietary wireless technology and may incorporate one or more of the following United States Patents: 5,388,101; 5,481,546; 5,592,491.

Others patents covering this product are pending.

www.vendwatchtelematics.com/legal

DECLARATION OF CONFORMITY



This device complies with the 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 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCCID: 2ALVO-T313

TELIT UL865-NAD MODULE

The Vendwatch VIU contains the Telit UL865-NAD cellular module (FCC ID: R17UL865NA)



WHIP ANTENNA

| MODEL | TQC-800/1900B-2.15 |
|-------------------------------------|----------------------|
| MAIN TECHNICAL SPECIFICATION | |
| FREQUENCY | 824-960/1710-1990MHz |
| VSWR | <1.5 |
| GAIN | 2.15dBi |
| POLARIZATION TYPE | Vertical |
| RATED POWER | 50w |
| IMPEDANCE | 50Ω |
| CONNECTOR TYPE | SMA |
| DIMENSIONS | Φ 28.5X225(mm) |
| CABLE TYPE | RG174 |
| LENGTH | 3(m) |
| PATTERN | Onmi-directional |
| INSTALL THE WAY | Adsorption |
| WEIGHT | 64g |



HIGH GAIN ANTENNA

| MODEL | LBE-7-2-27-NJ |
|-------------------------------|--|
| ELECTRICAL DATA | |
| FREQUENCY RANGE (MHz) | 698-960 / 1710 - 2700 |
| VSWR | ≤2.5:1 |
| PEAK REALISED GAIN: ISOTROPIC | 700MHz - 3dBi 800 MHz - 3dBi 900 MHz - 4dBi 1800 MHz - 4dBi 1900 MHz - 5dBi 2100 MHz - 5dBi 2400 MHz - 5dBi 2600 MHz - 5dBi |
| VSWR | <2.5:1 |
| POLARISATION | Vertical |
| PATTERN | Onmi-directional |
| IMPEDANCE | 50Ω |
| MAX INPUT POWER (W) | 60 |

