

A large, light green stylized 'VW' logo is centered in the background of the page. The 'V' and 'W' are thick and rounded, with the 'V' having a small gap at the bottom. The 'W' is composed of two 'V' shapes joined together.

VM CONNECT T313 USER MANUAL

Version 0.07

TM

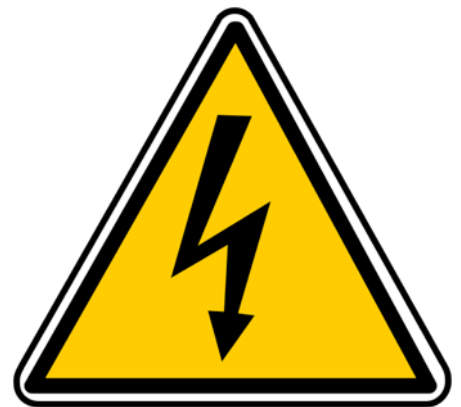
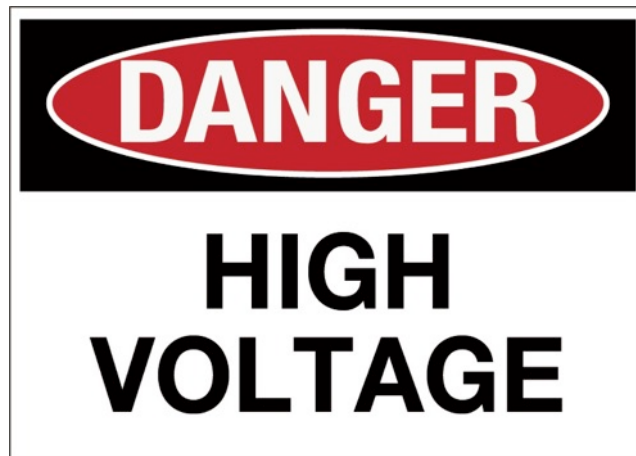


DATE	VERSION	CHANGES
MARCH 12, 2016	0.01	Initial Draft
MARCH 18, 2016	0.02	Installation Feedback
APRIL 12, 2016	0.03	Added EPay display status
JUNE 1, 2016	0.04	Swapped the mounting brackets solely to magnets
JUNE 3, 2016	0.05	Replaced picture of device with magnet-captive clips
JUNE 4, 2016	0.06	Wiring 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

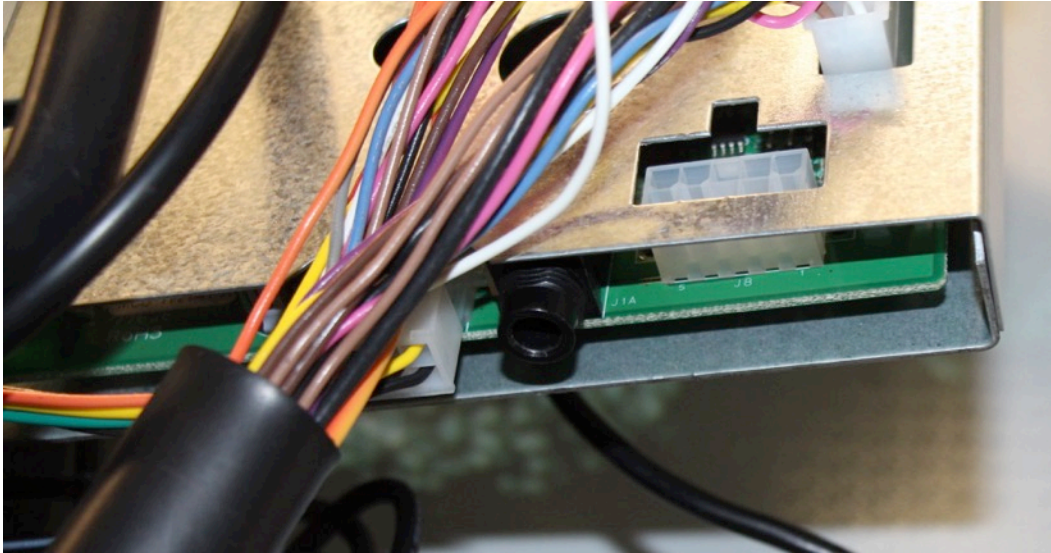
The External Antenna will be mounted on top right side of the door and on the same side of the machine where the T303 Telemetry Device is installed. To do this, you will need to drill a 5/8 hole using the conical drill bit as shown.



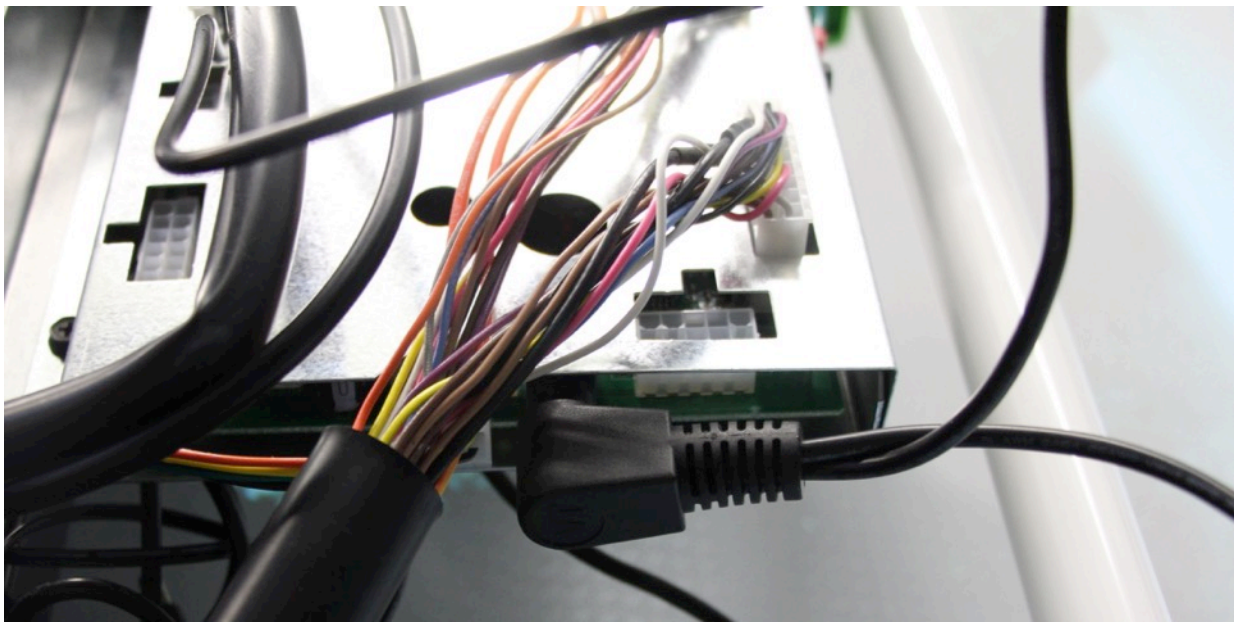
Once drilling is completed, remove the hex nut from the antenna and insert the cable into the hole from the outside, now tighten the nut from the inside of the machine. Connect the Antenna to the corresponding connector in the VM Connect Device.

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, ¼" phone jack, in some models solder directly on the board and other models as a dongle.



Find the DEX ¼" phone jack and connect the T313 Telemetry Device ¼" phone plug into it as illustrated below. The cable provides a spare ¼" phone jack to facilitate connecting additional devices on the DEX port.



MOUNTING THE EPAY UNIT

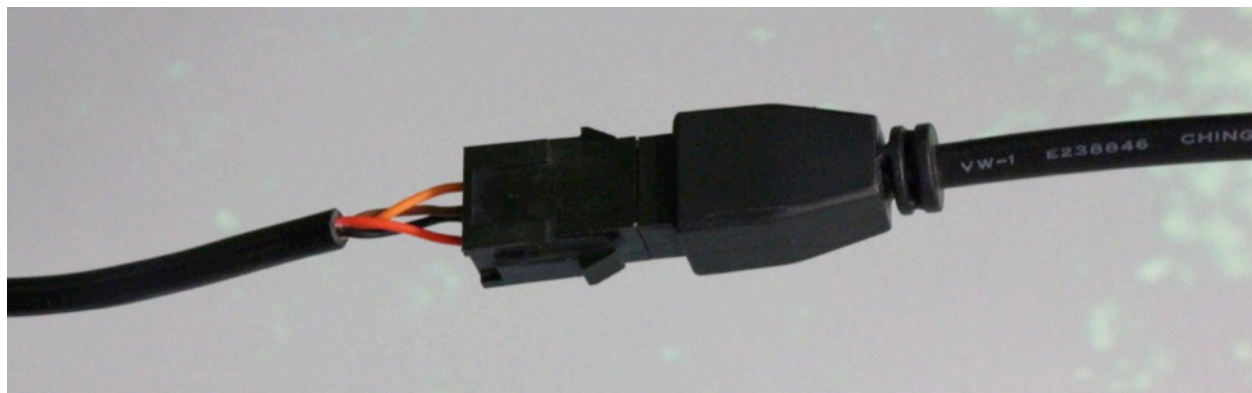
The Electronic Payment (EPay) unit should be mounted on the VM using, as a minimum, two of the mounting metal inserts in the back of the EPay unit.



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

CONNECTING THE EPAY UNIT

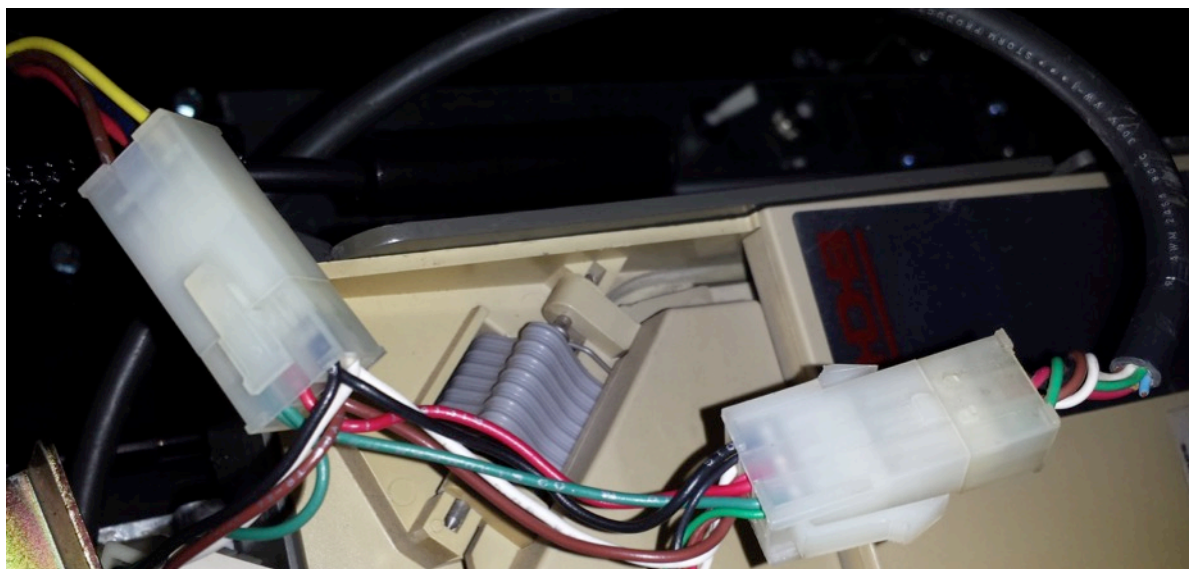
Find the EPay cable on the T313 Telemetry Device and connect the cables together. Additional 1 meter extension cables can be purchased if the distance between the T313 and the EPay devices exceeds 1.5 meters.



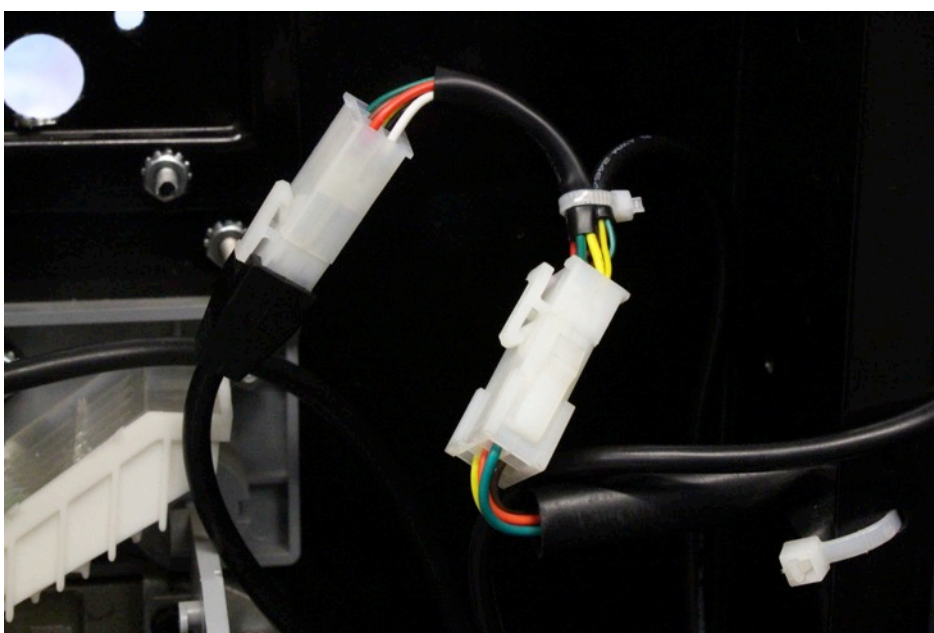
Upon powering up the unit the EPay unit will display “Reader Currently Disabled”, once initialized the legend changes to “Tap or Swipe Card to Vend”; during Dex reads, the legend would be “Processing Data Back Soon”.

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.



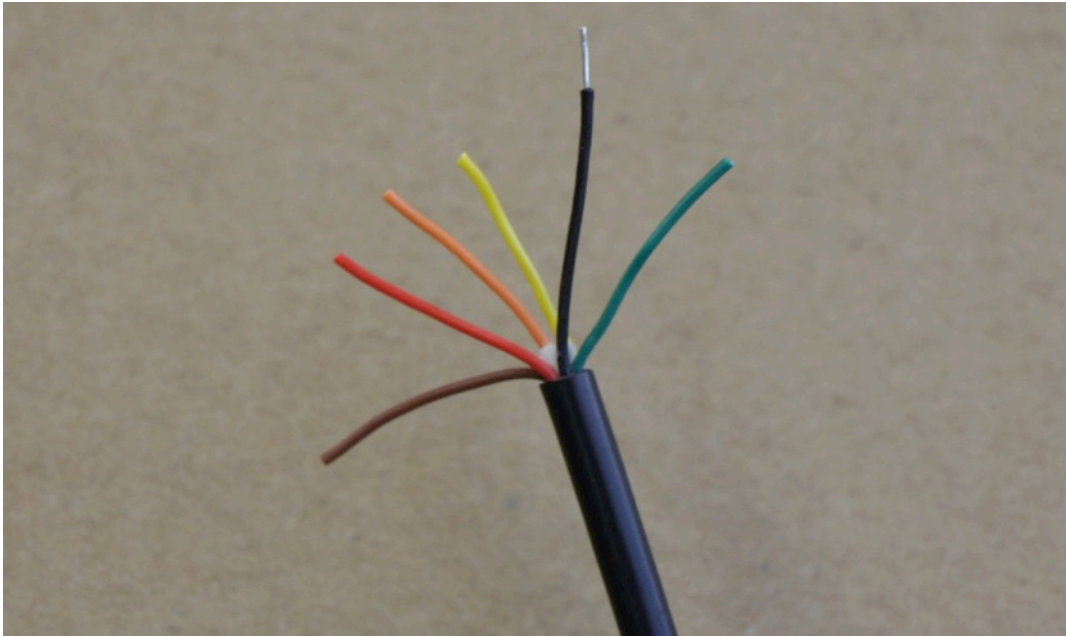
If the last device on the bus does not have a spare connector, the installation would require to disconnect the last device on the bus and connect the T313 Telemetry Device as second to last on the bus as illustrated below.



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).

Door Switch in its Normal state



Button Extended

Door Switch in a NOT Normal state



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

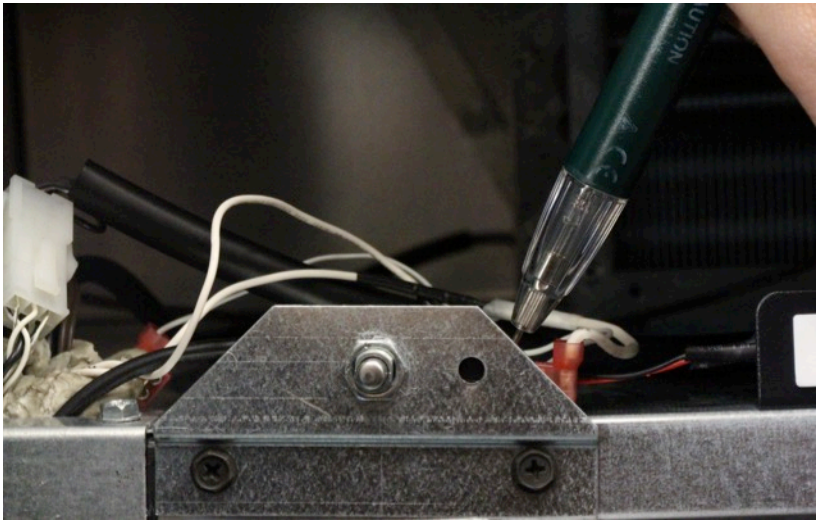


FINDING THE COMMON POLE

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



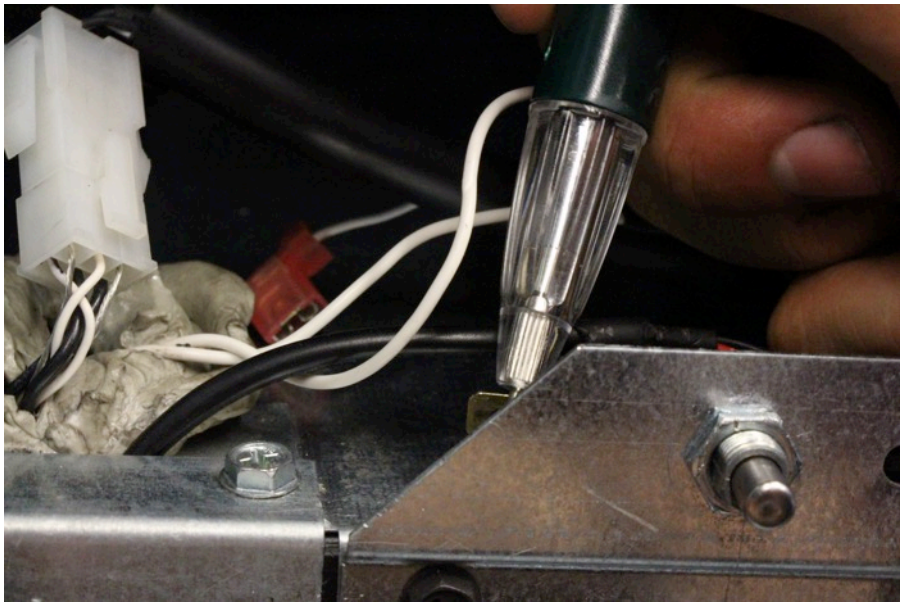
Locate the switch, it must have two wired poles, however it may have a third pole that would not be wired. After locating the door switch, use the tip of the the continuity tester tool to make contact with one of the wired poles. If the light of the Continuity Tester Tool turns ON, press and release 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 (Normally Open)	NC (Normally 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.

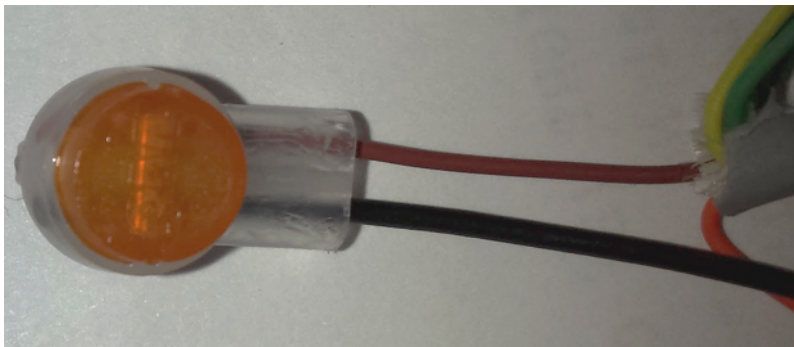
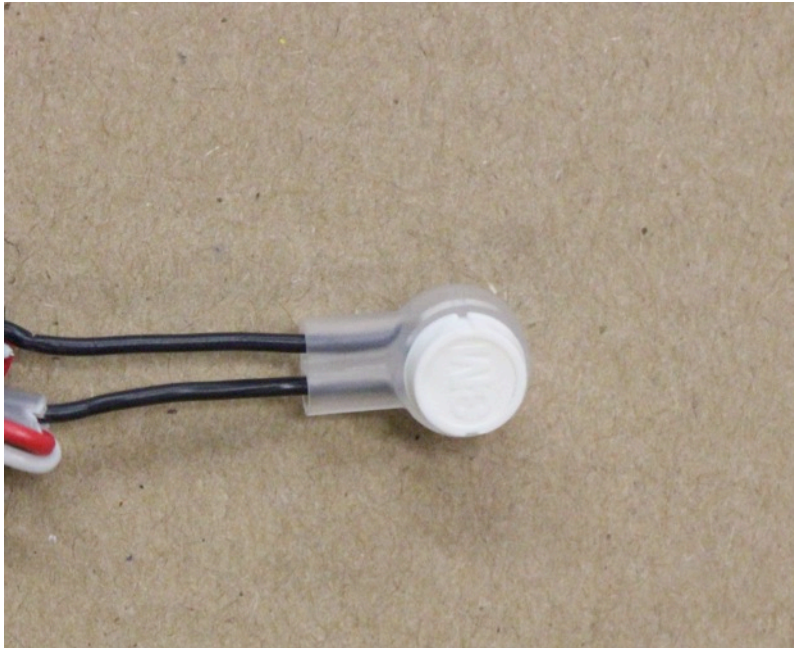
1. Locate the RED Wire in the Door Switch Cable of the T313 Telemetry and splice it with the wire still connected to the switch using one of the UY2 connector.
2. Locate the ORANGE Wire in the Door Switch Cable of the T313 Telemetry and splice it with the other side of the previously cut wire using one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

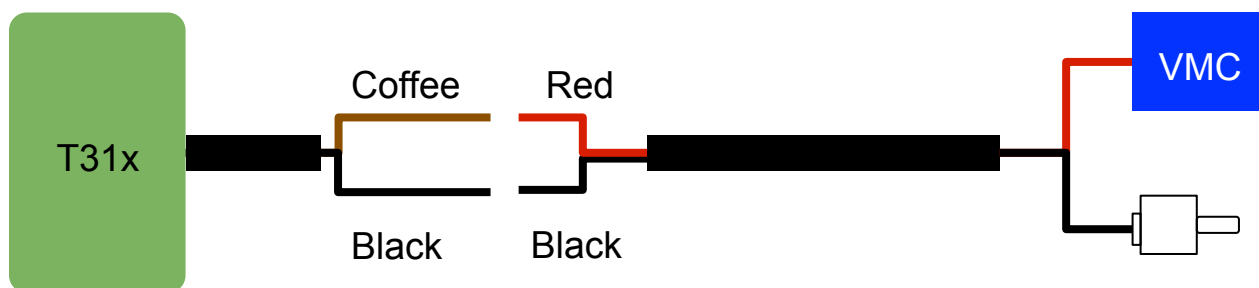


ADDING DOOR SWITCH EXTENSION CABLE

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

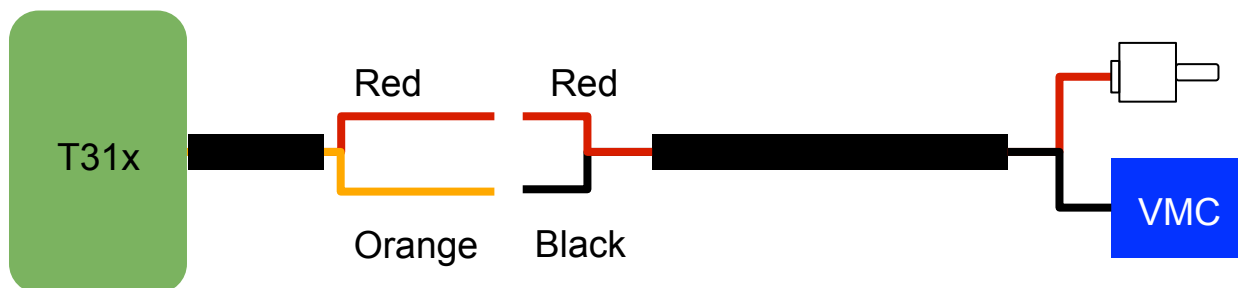
To connect the extension to a “NO” switch, using a Wire Connector join the T310 Black wire with the extension’s Black wire and the T310 Brown wire with the extension’s Red wire, now the Black and Red wires will be available. Cut the “NO” wire and join the Black one to the Door Switch and the Red one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

NORMALLY OPEN (NO) WIRING DIAGRAM WITH EXTENSION

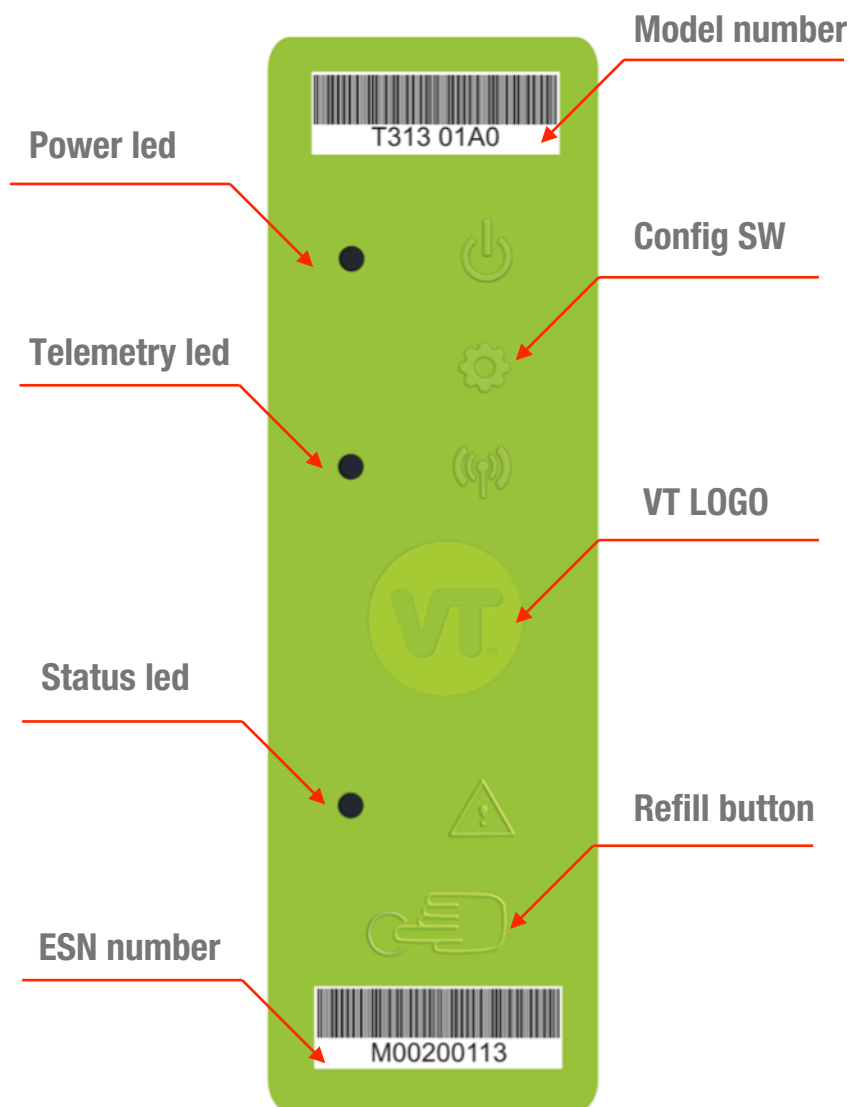


To connect the extension to a “NC” switch, using a Wire Connector join the T310 Red wire with the extension’s Red wire and the T310 Orange wire with the extension’s Black wire, now the Black and Red wires will be available. Cut the “NC” wire and join the Red one to the Door Switch and the Black one to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

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 tha 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 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

