WELDON
A DIVISION OF AKRON BRASS

V-MUX® Installation Practices

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V-MUX® Installation Practices

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Software

File Maintenance

Weldon recommends V-MUX support file storage at an FTP or other on-line location, especially for the binary files that are downloaded into the V-MUX nodes. History has shown that storing files on a CD or similar physical storage medium is a mistake. The V-MUX online support system can be easily updated, plus many customers request changes upon delivery of new equipment. A CD or other permanent media with the end user may result in a node or nodes being downloaded with outdated files months or years later. On-line storage will result in 24/7 up-to-date file support of V-MUX systems.

Training

Weldon provides OEM and Service training for the V-MUX SystemDesigner™, Diagnostics, and Downloader software. Training (p/n 6190-0000-00) is required before Weldon will provide V-MUX support.

Electrical

Circuit breaker or fuse protection

Each V-MUX node should have an appropriately sized fuse or circuit breaker for power-side protection. Breaker sizing is dependent on the total load of the module. V-MUX nodes are protected against reverse polarity without a circuit breaker; however a mis-placed wrench or accidental dead short between the Power stud and Ground could cause heat damage to the node wiring and batteries.

Power to nodes

Power to V-MUX nodes shall be provided through a master switch direct from the batteries. After a program download to any node reset power to all nodes as they go into an operational sleep state.

Ground to nodes

All V-MUX nodes must share a single common ground. This means: The system ground return for any node shall run direct to the same vehicle battery negative terminal. This must happen whether the node uses a threaded ground stud or a ground pin in a connector. Do not share ground return wires from other devices with the V-MUX node ground. Combining a device ground, such as a light or solenoid, with a node's system ground can cause the node to behave erratically due to transient noise.

Network communications cable shield wire ground (drain)

The network cable shield wire shall be single-grounded at one end of the network. Use a ground stud isolated away from the V-MUX node grounds that return to the battery. Where each segment of the V-MUX network cable joins other network segments at the Tee junctions, the shield wires shall remain electrically common through each pin "C" at the Tees. Cover all exposed shield wires to prevent accidental shorts. If a voltage source touches an unprotected shield wire the resulting dead short can permanently damage the communications cable. At the Tees (pin C) splice appropriately gauged and jacketed wire to the end of each shield so as to seal into the Tee. Failure to properly seal Tee-connectors and other places the shield wire passes through may result in a loss of communications due to moisture infiltration across the A and B communications contacts.

Wiring diagrams

Two wiring diagrams should be included with each vehicle, along with a V-MUX Input/Output Relationships Report as generated by V-MUX System Designer. The wire diagrams should include node locations and communications wire layout. All communications wire should be identifiable by color code or number. V-MUX node files shall not be archived on a CD or other permanent media distributed for vehicle service purposes, as that can result in out-of-date files.

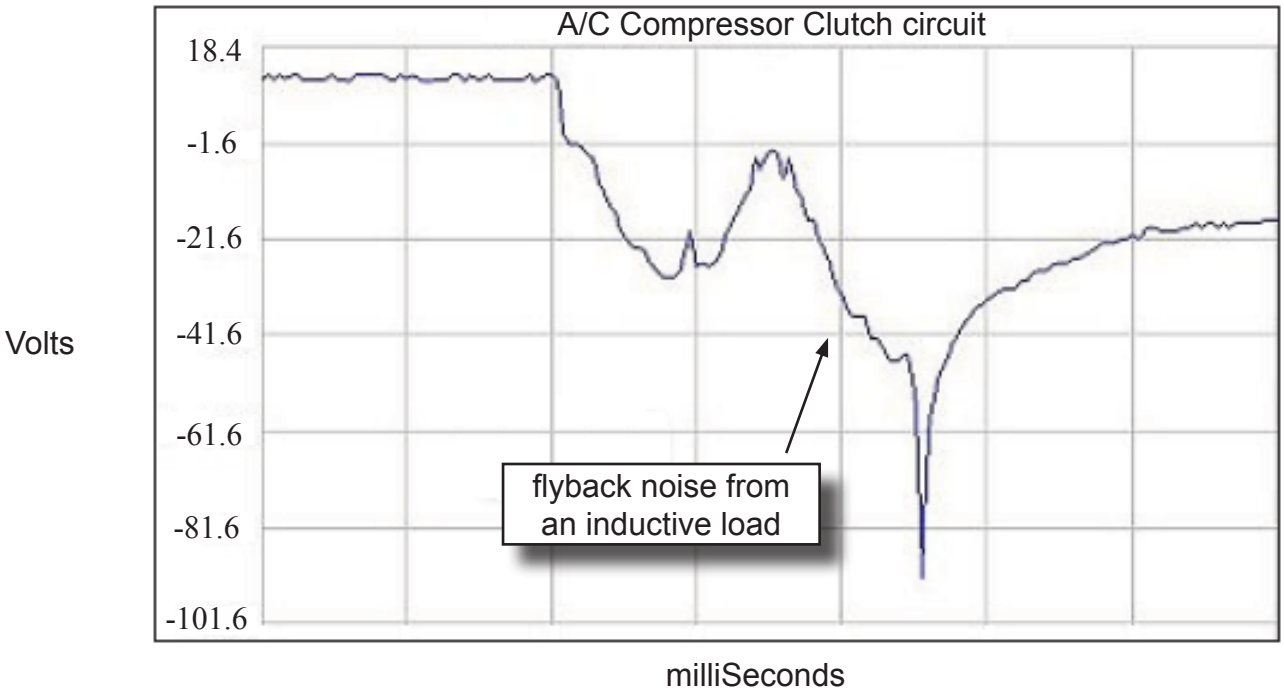
Discrete wires
Wiring used for inputs and outputs should meet SAE J-1128: “Low Voltage Primary Cable” specifications for high temperature (250 °F; 121 °C) and be coded for color, number and function. Wiring must be of the proper gauge and jacket type as specified by Deutsch (standard) or other connector manufacturer used in conjunction with the V-MUX system. Example: the Output connector on a Hercules node uses a Deutsch HDB36-24-23PN. 16AWG or 14AWG wire with Normal jacket insulation thickness should be used with this connector.

Communications cable
The only acceptable communications cable for V-MUX is Weldon twisted-pair #0L20-1600-xx.

Harnesses
Weldon recommends wire harnesses that have been designed specifically for use with the V-MUX system. This means there should be a separate harness for each node. Cutting and chopping existing harnesses to hack or splice into a V-MUX system is not an acceptable practice. Harness drawings should reflect this and a two copies should be present when the vehicle is delivered to the end-user.

Diodes -- Transient Voltage Suppression (TVS)
Fly-back diode protection is recommended and sometimes required on devices that may generate transient voltage noise. Sources that generate these noises are typically inductive load devices -- A/C Compressors, Air horn relays, Ladder rack solenoids, etc...

EXAMPLE: Below is a scope trace indicating flyback noise on the 12 volt bus when A/C is turned off. Notice the voltage is approaching -100 volts. Once a diode was added, the voltage flattened out and never went below zero again.



O-Scope
If using an oscilloscope, measure voltage transients with it before adding protection diodes -- so as to document what type of noise was present prior to and after adding a diode. A two channel scope can be purchased at a reasonable price and is a great investment for resolving electrical transients.

Installation:

#6000 series = Hercules Input/Output node:

Footpad fasteners:
Use (4) ANSI #12 or 1/4” screw fasteners at the footpad mounting locations of a Hercules node.

Node Power and Ground studs:
Nut fastener torque value for the 3/8”-16 Power stud (stainless steel) is 90 inch/lbs.
Nut fastener torque value for the 1/4”-20 Ground stud (stainless steel) is 50 inch/lbs.
The terminals that are placed over the studs shall be free from solder drip or other debris as to provide a clean surface for the nut to torque against. Burs or debris will wear away over time and cause the nut to loosen.

Status and Network activity LEDS:
The Hercules node should be mounted so that the LED indicator lights can be easily seen for trouble shooting purposes.

Power/Ground
at top

Moisture conditions:
If the Hercules node will be exposed to possible moisture conditions it should be mounted vertically with the power and ground studs pointing upward. The node is splash proof but exposure to water could result in a breach of the module. By pointing the power and ground studs upward any breached water will be captured in a cavity designed to keep the water away from the electronics. Failure to mount nodes in this manner will void the warranty if the node is returned due to water damage.

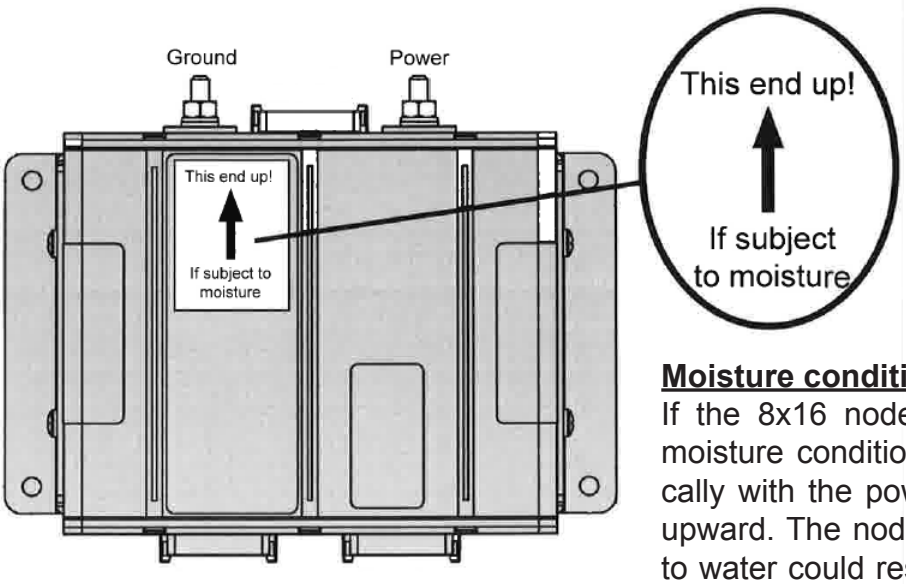
Installation:

#6030 series = 8x16 Input/Output node:

Footpad fasteners:
Use (4) ANSI #12 or 1/4” screw fasteners at the footpad mounting locations of an 8x16 node.

Node Power and Ground studs:
Nut fastener torque for the 1/4”-20 Power/Ground studs (stainless steel) is 55 inch/lbs each.
The terminals that are placed over the studs shall be free from solder drip or other debris as to provide a clean surface for the nut to torque against. Burs or debris will wear away over time and cause the nut to loosen.

Status and Network activity LEDS:
The 8x16 node should be mounted so that the LED indicator lights can be easily seen for trouble shooting purposes.



Moisture conditions:
If the 8x16 node will be exposed to possible moisture conditions it should be mounted vertically with the power and ground studs pointing upward. The node is splash proof but exposure to water could result in a breach of the module, by pointing the power and ground studs upward any breached water will be captured in a cavity designed to keep the water away from the electronics. Failure to mount nodes in this manner will void the warranty if the node is returned due to water damage.

Installation:

#6010 series
Mini 4x12

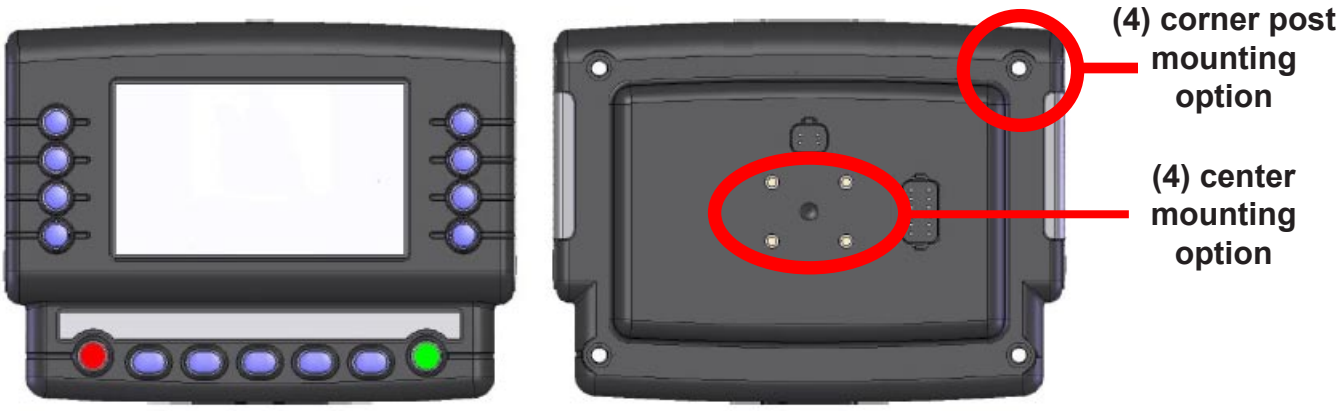
#6020 series
Mini 16x0

#6310 series
PODS controller

#6444 series
VDR/CAN Gateway

The smaller V-MUX node types all share the same Deutsch EEC-325X4B external housing. The hardware used to mount shall be (2) ANSI #12 or 1/4”screw fasteners. Mount so that the LED indicator lights can be seen. If exposed to moisture the connector should point down.

#6241 series Vista IV Display Node:



Corner post fasteners (if used)
(4) 1/4”-20 nut/fastener hardware to existing posts
Center mount fasteners (if used)
(4) #8-32 screw/fastener hardware, or use Pana-Vise™ arm mount (Weldon #0J50-1505-xx)

Moisture conditions:
6241 series Vista display nodes are splash resistant on the front and back but not along the sides. Locate the Vista display in the most environmentally friendly location whenever possible. If a Vista is located in the pump compartment of a fire truck, put a splashguard of some type over the node to prevent excessive water from building up along the node sides. Vista displays should never be exposed to pressurized water spray from hoses. They can be cleaned with normal commercial cleaners appropriate for plastic materials.

Installation:

Vista IV Touch rear panel mount
with #6311-0400-00
PODS buttons

Vista IV Touch
double-DIN kit

Vista IV Touch
panel mount with bezel

6241 series Touchscreen Vista IV

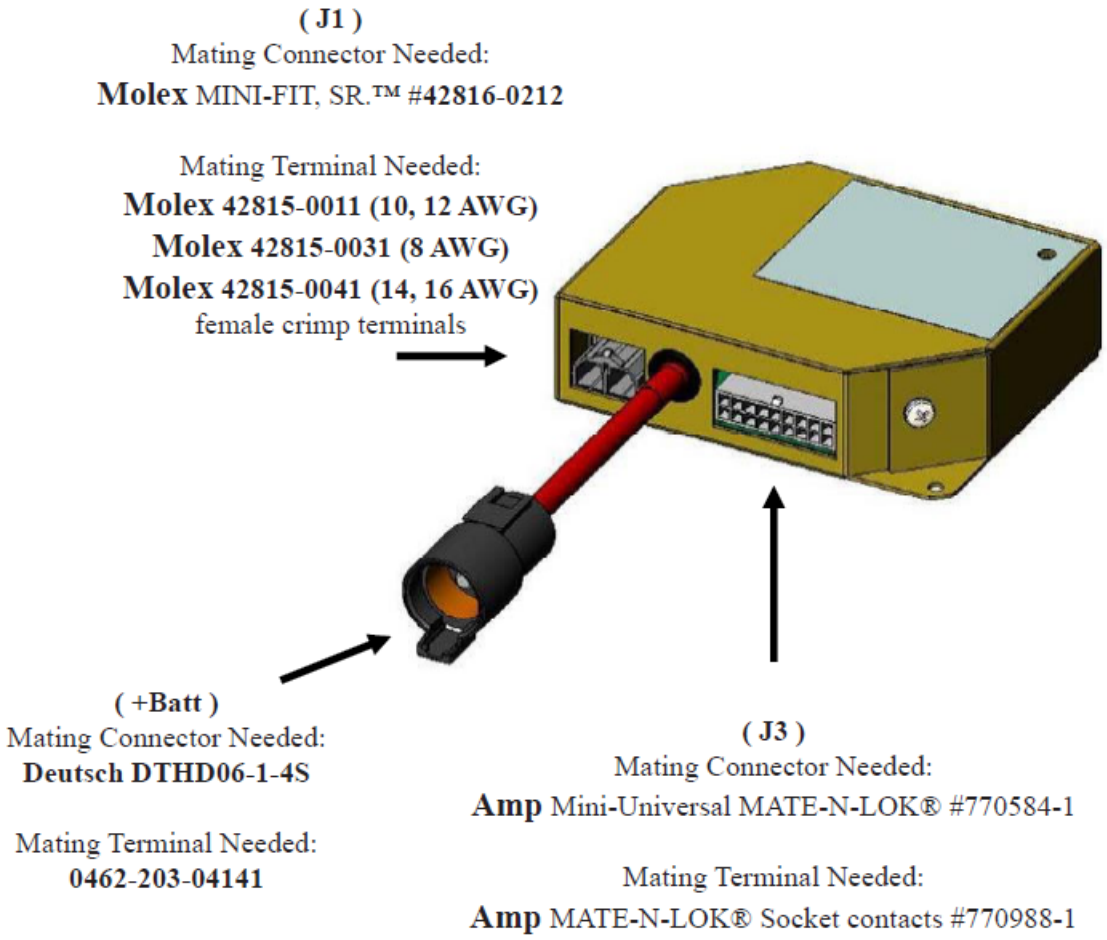
- The OEM builder is responsible for Touchscreen display housing. Contact Weldon for support.
- Be careful not to break the display screen when mounting. Any crack in the Touchscreen interface may make the entire display inoperable.
- No portion of the touchable area of the screen should make contact with the surrounding housing.

Part Number	Description
6241-0010-00	Standard Vista IV, replaces Standard Vista III
6241-0110-00	Standard Vista IV with Touch
6241-0115-00	Rear Panel Mount replacement for 0N30-2391 & 0N30-2392
6241-0144-00	double-DIN dash -- Ford (E-series and F150-F550)
6241-0144-02	double-DIN dash -- Chevy/GMC
6241-0144-03	double-DIN dash -- Sprinter vans
6241-0144-04	double-DIN dash -- Dodge RAM
6241-0130-00	Vista IV Touch only with bezel, panel mount

Moisture conditions:

The Vista IV Touchscreen as provided by Weldon is not water resistant. Do not install in an external or other location that is subject to water.

Installation:



#0N70-1519-xx Climate Control Module:

Footpad fasteners:
Use (2) ANSI #6 or #8 fastener hardware at the footpad mounting locations of a Climate Module.

Node Power and Ground:
Power to the Climate Module is by a Deutsch DTHD06-1-4S connector and 0462-203-04141 terminal. (Center plug-in; red #6 AWG cable feed)
Ground to the Climate module is by an Amp Mini-Universal MATE-N-LOK® #770584-1 connector and Amp MATE-N-LOK® terminal #770988-1 (location J3-9)

Status and Network activity LEDS:
The Climate Module should be mounted so that the LED indicator lights can be easily seen for trouble shooting purposes.

Moisture conditions:
The Climate Module is not water resistant and must not be installed in any location that presents the possiblity of moisture affecting the module. Failure to install the Climate Module away from moisture will void the warranty if the component is returned due to water damage.

Overall Recommendations

Vehicle "check-out" procedure:

Final Inspection:
It is highly recommended that the original functional and system specification be reviewed in detail during final vehicle inspection. At this point, all interlocks, switches and inputs, and overall system function must be validated and verified. It is recommended that a checklist be created and used for this important step. It is much easier to check-out the vehicle at the OEM's facility rather than after the vehicle has been delivered or is ready to be put in service.

Important Redundancy items:

Pump Shift:
Fire truck pumps should include a manual pump override, so that a pump can be manually shifted into pump mode should any switches or electrical connections ever fail, resulting in an inability to shift the truck into pump mode. A second pump shift switch can also be added to the pump area as a backup before manual pump would be required.

Oxygen:
Weldon recommends that any electrical oxygen valve have a mechanical backup so that oxygen can be reliably delivered to a patient in any emergency. DO NOT run electric solenoid wires in proximity with the oxygen hoseline, as an electrical spark or other issue with the wiring can cause a fire or explosion.