



V-MUX® Installation Practices

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Software

File Maintenance

Weldon recommends a FTP or other on-line location for the binary files that are downloaded into the V-MUX® nodes. History has taught us that burning a CD is a mistake. The V-MUX® system can be easily updated, plus many customers request changes upon receipt of their new equipment. A CD or other permanent media in the hands of a service center or the end user will result in a node or nodes being downloaded with outdated files months or years later. On-line storage will result in 24/7 support of your vehicles.

Training

Weldon provides OEM and Service training for the SystemDesigner™, Diagnostics and Downloader Software. **This training is required before Weldon will provide any software.**

Electrical

Circuit breakers or Fuse protection

Each V-MUX® node should have the appropriate sized fuse or circuit breaker depending on the load of the module. The nodes are protected for reverse polarity however without a circuit breaker; a wrench across the studs could cause excessive heat to the wiring between the node and batteries.

Power to Nodes

The power should be provided through a master switch direct from the batteries. After a download, power will need to be reset to all nodes as they go into a sleep state during downloads.

Ground to Nodes

All Datalink modules should have a common ground. This means: The system ground to any node should come direct from the batteries. This includes if the node has a ground stud or a pin in a connector. Do not run grounds from other devices to a node's ground stud. **Combining a device ground, such as a light or solenoid, with the Node's system ground can cause it to reset.**

Shield Ground

The shield ground is connected at one end of the network through each 'Y' connector along the way. The end you choose to ground the shield should be on a ground stud or other convenient ground. Do not put the shield into a node's connector that maybe labeled as a ground. Cover all exposed shield wires to prevent accidental shorts. If 12 volts touches a shield wire the communications



wire could become damaged. Be sure to splice the appropriate gauge jacketed wire to the end of each shield that needs to be sealed into a connector. **Failure to properly seal your 'Y' connectors and other places shields pass through may result in a loss of communications, due to moisture across the A and B communications contacts.**

Wiring Diagrams

Two wiring diagrams should be included with each vehicle, along with an Input/Output report and relationships report from the V-MUX® System Designer software. The wire diagrams should include node locations and communications wire diagrams as well. The communications wire should be color coded or numbered. All diagrams and reports should be included on a CD-ROM as well. The file formats for reports should be PDF. V-MUX® node binary files should not be placed on a CD or other permanent media that is distributed to a service center or end users.

Discrete Wires

Wiring used for inputs and outputs should meet SAE J-1128 specifications for high temperature (250 degrees F) and be color, number and function coded. Wiring must be of the proper gauge and jacket type as specified by Deutsch or any other connector used in conjunction with the V-MUX® system. For example; the Output connector on a Hercules node uses a Deutsch HDB36-24-23PN. 16 or 14 gauge wire with Normal jacket insulation thickness should be used with this part number.

Communications Cable

The only acceptable communications cable for V-MUX® is the Weldon communications wire, P/N: 0L20-1600-XX

Harnesses

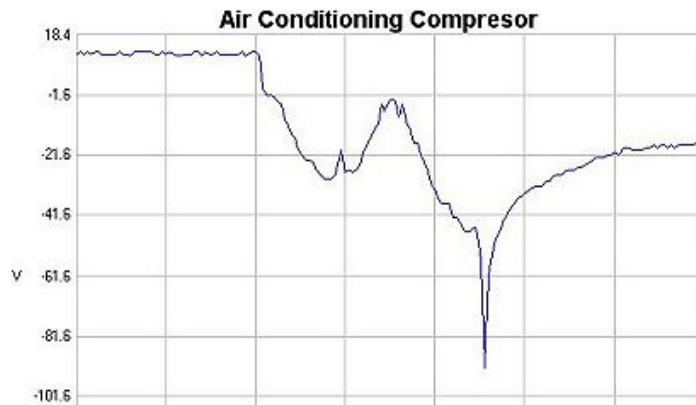
Weldon recommends wiring harnesses designed for the V-MUX system; this means there should be a separate harness for each node. Cutting and chopping existing harnesses to (hack) or splice in a V-MUX® system is not an acceptable practice. The drawings should reflect this and a copy should be present when the vehicle is delivered to the end-user.

Diodes

Fly-Back Diode

Fly-back diodes are recommended and sometimes required on devices that may generate a lot of transient voltage noise. Items that generate these noises are typically some type of inductive device. These devices include; air conditioning compressors, air horn relays, ladder rack solenoids, etc.

To the right is a scope trace that shows what happens to the 12 volt bus when the 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 you have an Oscilloscope, use it before adding diodes, so you can document what type of noise was present prior to and after adding a diode. A two channel scope can be purchased for approximately \$1,200.00 and is a great investment for chasing down electrical ghosts.

Blocking Diode (Hercules inputs 1-8)

A Blocking Diode is used when you need to block either a positive or negative source from reaching a circuit. In the case of V-MUX a blocking diode is needed on inputs 1-8 on the Hercules node IF, you have a circuit that has both a negative and a positive signal in it. For example – if you were connecting the backup lights from a Ford chassis to the input of a Hercules node, you would have a ground signal when the backup lights were off – it would come through the filament of the light bulbs. Once the backup lights are turned on, you would have a 12v signal.

Weldon recommends using inputs 9-12 on a Hercules node for such a circuit. Inputs 9-12 are 12v only inputs and will not switch when a ground signal is present. Inputs 13-16 are ground only inputs and will not switch with a 12v source. So a blocking diode is only required if you have to used inputs 1-8 and have the circuit has positive and negative signals within it.

Sometimes rocker switches will source ground through their indicator lights; this can cause you to have to use a diode. However, many switches will have alternative means of wiring, thus a diode may not be required.



Mechanical

Mounting:

Hercules Node (16 inputs / 26 outputs):

The screws used to mount a Hercules Node P/N: 6000-0000-02 is #10 x 1.00" aluminum or anodized steel. The length of screw can be changed when necessary. #10 nuts and bolts are acceptable as well. The torque value for the power stud is 192inch/lbs. The torque value for the ground stud is 62 inch/lbs. Both of these studs are nickel-plated brass. 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. The node should be mounted so that the LED indicator lights can be easily seen for trouble shooting purposes. When exposed to moisture the node 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.

Mini Node (4 inputs / 12 outputs):

The hardware used to mount a Mini Node P/N: 6010-0000-00 shall be 1/4" x 20 or a #12 screw. The appropriate torque values for the selected hardware should be adhered to. The Node should be mounted so that the LED indicator lights can be seen, and if exposed to moisture the connector should point down.

Gateway Module:

The hardware used to mount a Mini Node P/N: 6400-0000-00 shall be 1/4" x 20 or a #12 screw. The appropriate torque values for the selected hardware should be adhered to. The Node should be mounted so that the LED indicator lights can be seen, and if exposed to moisture the connector should point down.

Vista III Display Node:

The Vista III Display node shall be mounted with the supplied hardware, 1/4" x 20 studs with nuts or Pana-Vise mount. The Vista III 6231-0010-XX is not water resistant and should not be exposed to any spray testing. It can be cleaned with normal commercial cleaners.

6231-2020-11; external mount Vista III. This display can be mounted in external locations.



Vista I Display Node:

The Vista Display node shall be mounted with the supplied hardware, 1/4" x 20 studs with nuts. The torque value for the nuts is 80 inch/lbs. The display module should be not be sprayed with high-pressure water direct. This could result in the buttons activating functions on the vehicle. The enclosure however, is water resistant.

Location:

Although the nodes are splash proof it is recommended to locate a node in the most environmentally friendly location whenever possible. If a node is located in a pump compartment of a fire truck, put a splashguard of some type over the node to prevent excessive water from building up on the node.

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 of sorts is 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.

Redundancy:

Pump Shift:

Fire Truck pumps should include a manual pump override, so that a pump could be manually shifted into pump mode should any switches or electrical connections fail resulting in the 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:

It is our recommendation that any electrical oxygen valve have a mechanical backup so that oxygen can be delivered to a patient in an emergency. **Do not run the electric solenoid wires with the oxygen line, a short or other issue with the wiring can cause a fire or explosion.**