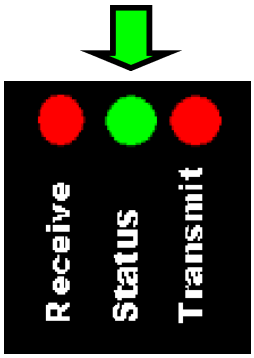
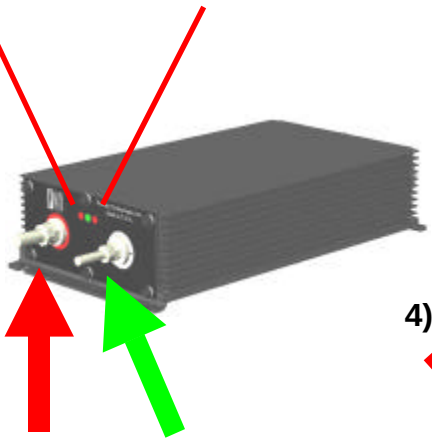
Common sense V-MUX troubleshooting starts with 6 questions…

1) Have you reviewed and understood the V-MUX relationships reports?
2) Did you check for power and communications on the network?
3) Have you reviewed the status lights on the V-MUX nodes?



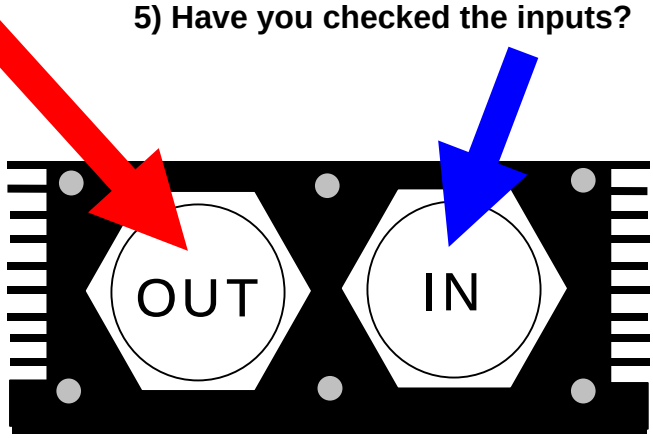
High Capacity Outputs			Node 1		Location: Center-Front
CH #	Pin #	OEM Wire	Name	Priority Shedding	Relationships
1	R		Output 1	No Shed	(None)
2	S		Output 2	No Shed	(None)
3	F	LHF/SP380	HIGH IDLE	No Shed	<ON> Auto Throttle <AND> Park Brake <AND> Ignition <AND> <NOT> PT (Hot Shift) <AND> <NOT> Service Brake
4	T	LHT	L SIDE DC SCENE	2 (12.1 V)	<ON> Ignition <AND> Scene Left <AND> Park Brake
5	G	LHG	R SIDE DC SCENE	2 (12.1 V)	<ON> Ignition <AND> Park Brake <AND> Scene Right
6	U		Output 6	No Shed	(None)
7	H	LHH/WT118	PTO REQUEST	No Shed	<ON> PTO Switch (Hot Shift) <AND> Ignition <AND> Park Brake <AND> Park/Neutral
8	V	LHV	WARN FRONT ROCKER	No Shed	<ON> E Emergency Master
9	L	LHL/SP323/SP	L LT BAR RED RELAY	No Shed	<ON> E Emergency Master <AND> E Front Lightbar Red
10	B	LHB/SP324/SP	R LT BAR RED RELAY	No Shed	<ON> E Emergency Master <AND> E Front Lightbar Red
11	M	LHM/SP325/SP	PTO ENGAGE SOLENC	No Shed	<ON> PTO Switch (Hot Shift) <AND> Park Brake <AND> Park/Neutral <AND> Ignition
12	C	LHC/SP326/SP	REAR DIRECTIONAL LT	2 (12.1 V)	<ON> E Emergency Master <AND> Park Brake
13	N	LHN/SP327/SP	LT BAR CLEAR RELAY	No Shed	<ON> E Emergency Master <AND> E Front Lightbar Red <AND> <NOT> Park Brake
14	D	LHD/SP328/SP	MARS LIGHTS RELAY	0 (No Load	<ON> E Grill Lights <AND> <NOT> Park Brake
15	O		Output 15	No Shed	(None)
16	P		Output 16	No Shed	<ON> E Emergency Master <AND> E Strobes Low

Low Capacity Outputs					
CH #	Pin #	OEM Wire	Name	Priority Shedding	Relationships
17	Q	LHO/SP329/SP	OPTICOM RELAY	No Shed	<ON> E Emergency Master <AND> E Front Lightbar Red <AND> <NOT> Park Brake
18	E	LHP/SP330/SP	WW STROBE SUPPLY	No Shed	<ON> E Emergency Master <AND> E Strobes Low
19	A	LLA	AC LOAD MGT RELAY	1 (12.5 V)	<ON> Ignition
20	J		Output 20	No Shed	(None)
21	W		Output 21	No Shed	(None)
22	X		Output 20	No Shed	(None)
23	K		Output 23	No Shed	(None)
24	7		Output 24	No Shed	(None)



power / ground

4) Have you checked the outputs?
5) Have you checked the inputs?



6) Have you checked the analog sensor inputs?

And a warning…

NEVER weld on a V-MUXed vehicle without first removing all connectors from each V-MUX node. This includes input, output, power, and ground.

1) Review and understand the V-MUX input/output reference documents for your specific vehicle included with the electrical service packet. These may be printed out in booklet form or be on CD-ROM for you to retrieve and distribute electronically. See the V-MUX Diagnostics Manual for a full explanation of how to use the I/O sheets.

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21	W		Output 21	No Shed	(None)
22	X		Output 20	No Shed	(None)
23	K		Output 23	No Shed	(None)
24	7		Output 24	No Shed	(None)

Example: Nodal Relationships Specification

2) Check for power and communications on the network.

DO be sure that all communications taps are plugged and sealed with the proper Deutsch connectors. May be ordered from LADD Industries. (www.laddinc.com) ph: 800-223-1236

DO check communications cable (Weldon #0L20-1600-00 or Belden #8760)

3-pin tee-receptacle for inter-nodal communications

DT04-3P-P007

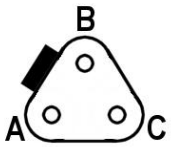
3-pin receptacle

DT04-3P

3-pin plug

DT06-3S

A = comms A
B = comms B
C = comms ground



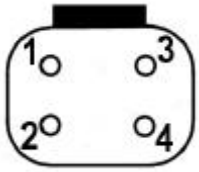
4-pin receptacle for general vehicle communications tap

DT04-4P

4-pin plug

DT06-4S

1 = comms A
2 = comms B
3 = comms ground
4 = transceiver power



pin (16-18 AWG)

0460-201-1631

socket (16-18 AWG)

0462-201-16141

Sealing plug: For use with all open 3 and 4-pin plug sockets

type 114017

Images courtesy of LADD INDUSTRIES

3) Check the indicator lights on all Hercules and/or Mini nodes.

Green Status LED – NORMAL: will blink like a steady heartbeat

-- PROBLEM: LED repeats 3 or 4 rapid blinks with pause (this means “no memory”)
STEP 1: Get Diagnostic kit and hook up to node. Use the Downloader program.
STEP 2: Reprogram node with files provided by vehicle manufacturer

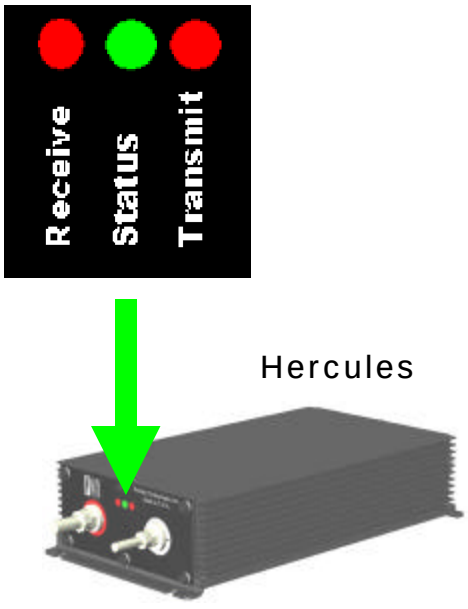
-- PROBLEM: LED remains steady (on or off) with +12VDC power applied
STEP 1: Meter check DC power for purity, no AC component! Check alternator diode.
STEP 2: If welding on vehicle disconnect all nodes (power, ground, and both Deutsch)

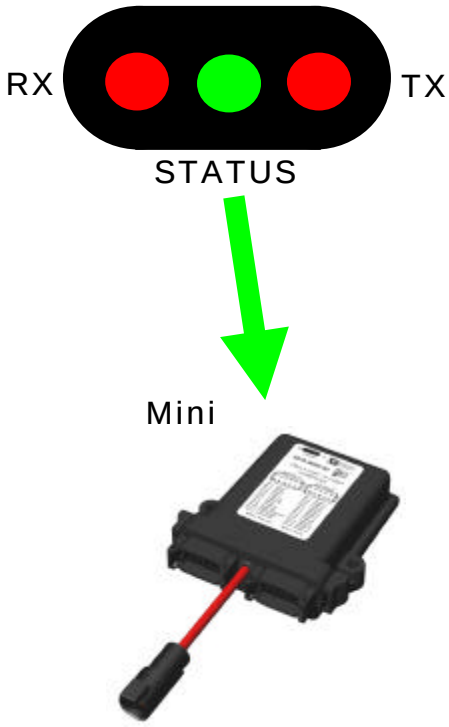
Red Transmit LED – NORMAL: flashes intermittently for data traffic

-- PROBLEM: LED remains on solid as if continuously sending data without a pause.
STEP 1: Get Diagnostic kit and hook up to node. Use the Diagnostic program.
STEP 2: See what data, if any, the node is transmitting. Check for network collisions.

Red Receive LED – NORMAL: flashes intermittently for data traffic

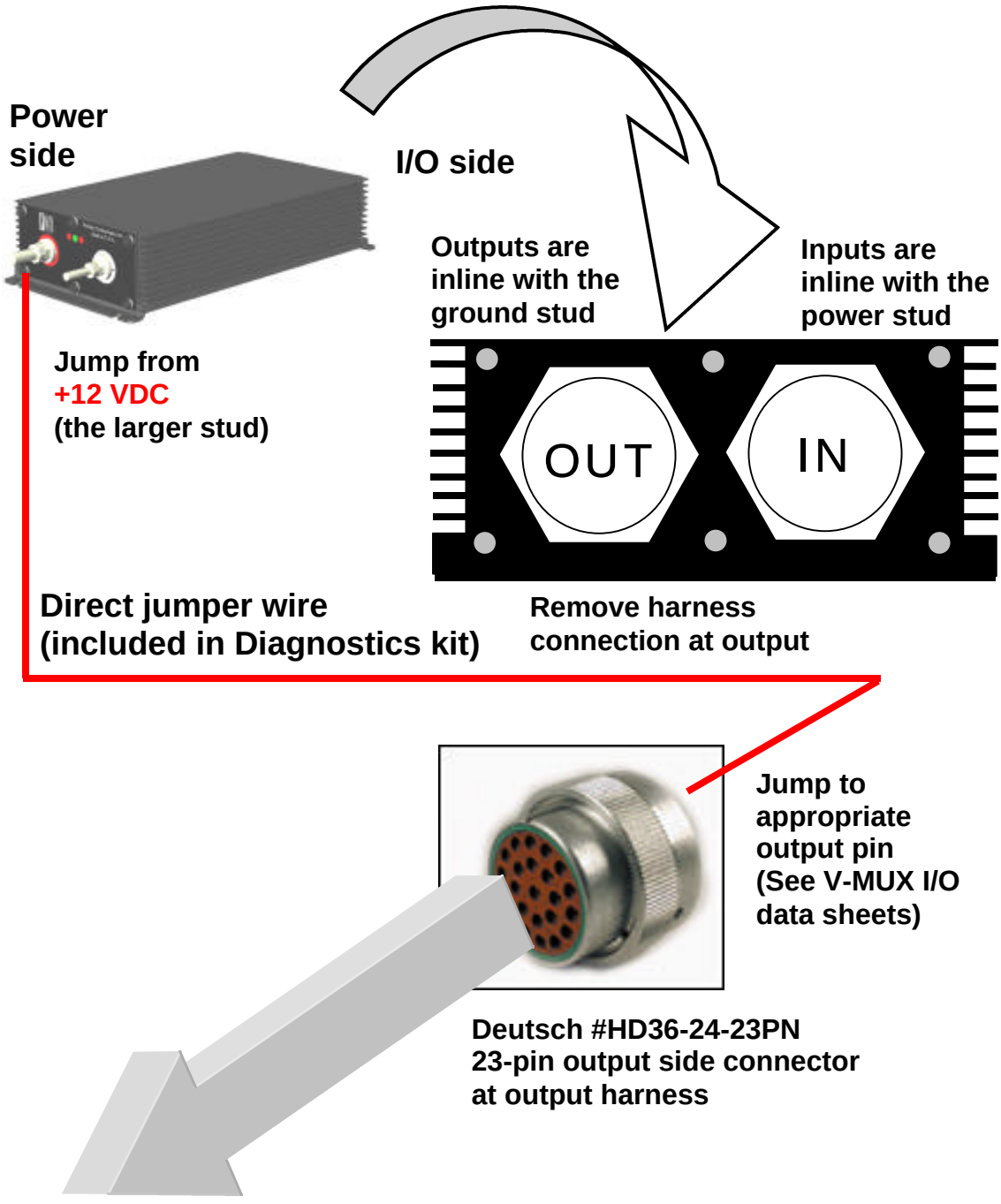
-- PROBLEM: LED remains on solid as if continuously receiving data from another node.
STEP 1: Visually check if another node is transmitting data continuously. That’s the culprit.
STEP 2: Get Diagnostic kit and see if any other type of V-MUX node, like a Vista or CAN Gateway is sending the data. If so try to isolate them out of the network.





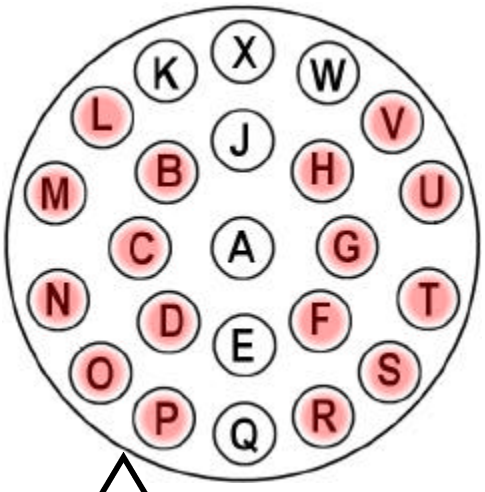
4) Check the outputs

Bypass the node using a direct jumper
(jumper included in Diagnostic kit)



To output devices via harness (All outputs this connector are hot: +12VDC)

4) Hercules output connector reference (looking into node):



16 High load outputs
+12VDC (10.5 Amp / channel)

V-MUX channel (ch#)
= Deutsch pin assignment

---

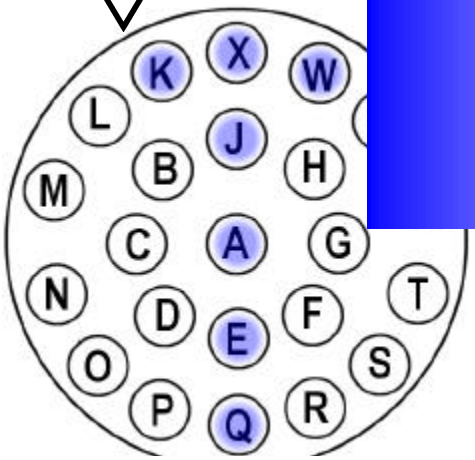
ch1 = "R", ch2 = "S"
ch3 = "F" , ch4 = "T"
ch5 = "G" , ch6 = "U"
ch7 = "H" , ch8 = "V"
ch9 = "L", ch10 = "B"
ch11 = "M", ch12 = "C"
ch13 = "N", ch14 = "D"
ch15 = "O", ch16 = "P"

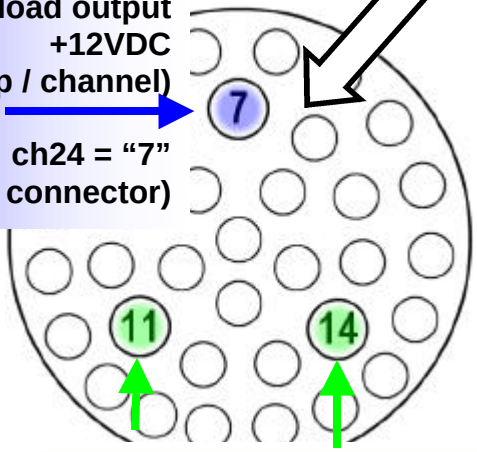
Deutsch #HD36-24-23PN
23-pin output side connector

Deutsch #HD36-24-35PN
35-pin input side connector

1 Low load output
+12VDC
(2 Amp / channel)

ch24 = "7"
(on input connector)





ch25 = "11", ch26 = "14"

2 Ground outputs
GND (2 Amp / channel)

ch17 = "Q", ch18 = "E, ch19 = "A",
ch20 = "J", ch21 = "W", ch22 = "X"
ch23 = "K"

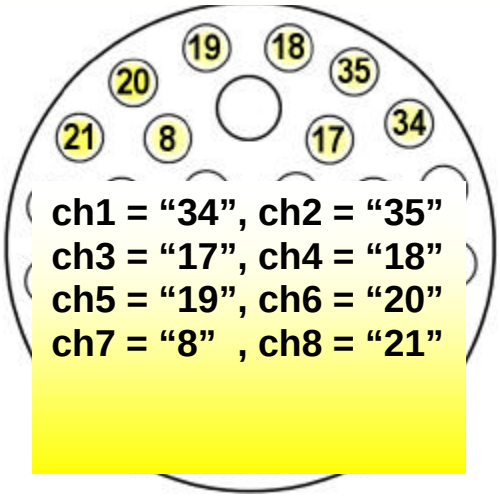
7 Low load outputs
+12VDC (2 Amp / channel)

AND 1 extra on input side

5) Hercules input connector reference: (looking into node)

Deutsch #HD36-24-35PN
35-pin input side connector

8 Bi-directional input channels
(can be wired to +12VDC or ground)

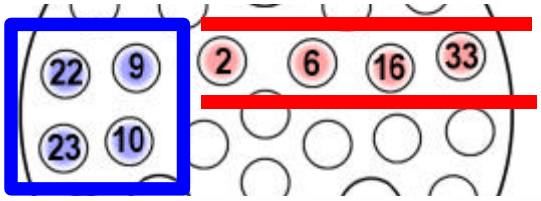


ch1 = “34”, ch2 = “35”
ch3 = “17”, ch4 = “18”
ch5 = “19”, ch6 = “20”
ch7 = “8” , ch8 = “21”

4 One-directional wired “hot-only” inputs:

---

ch9 = “33”, ch10 = “16”
ch11 = “6”, ch12 = “2”



ch13 = “9” , ch14 = “10”
ch15 = “22”, ch16 = “23”

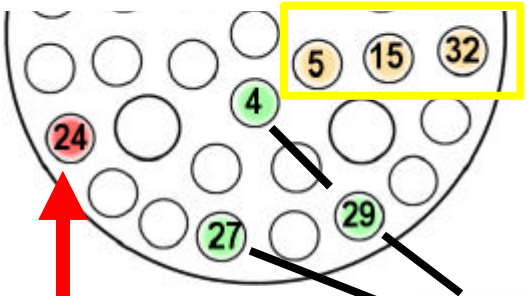
---

4 One-directional wired “ground-only” inputs:

3 Analog sensor channels:

---

analog 1 = “32”
analog 2 = “15”
analog 3 = “5”



+5VDC source for analog = “24”

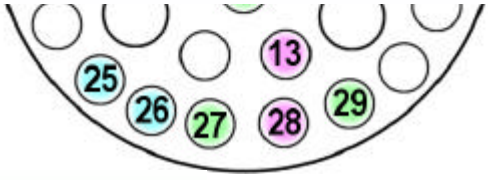
Grounds = “4, 27, 29” (all common)

COM and VFD ports:

COM: 1A = “25”, 1B =”26”

VFD: 2A =“13”, 2B (not used)

Grounds = “4,27,29” all common



6) Analog sensor devices translate physical readings into an electrical voltage. As the readings change, so does the voltage.

All V-MUX sensors are three wire devices as shown.