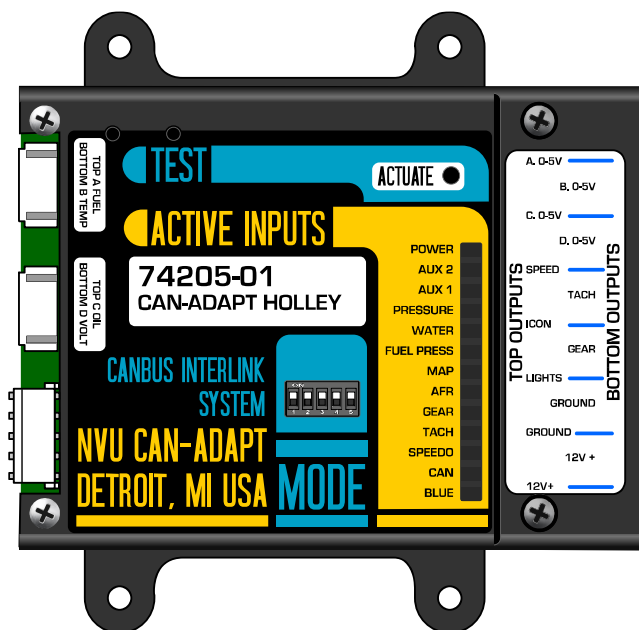




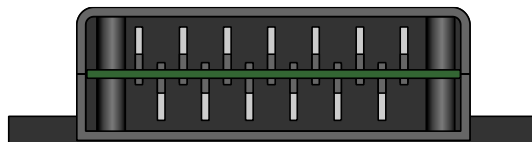
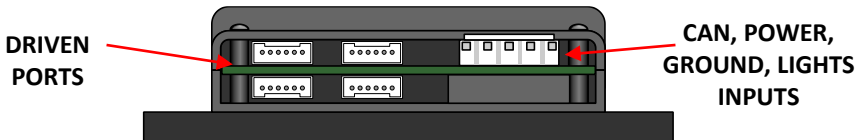
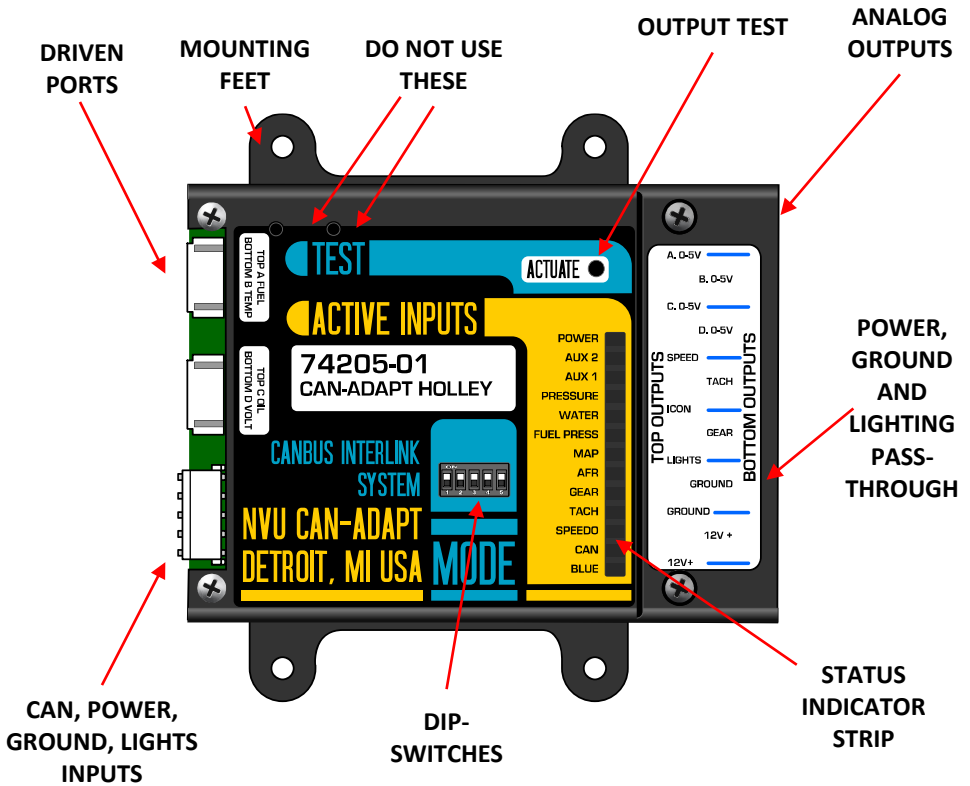
NVU CAN-ADAPT



PRODUCT INFO
AND GUIDES

CANBOX INTRO

The NVU CANBOX is designed to read directly from the PCM of a vehicle and then operate NVU gauges. Please review this manual thoroughly to avoid any misconceptions about how this device operates and what it can do.



END VIEW:

POWER, GROUND, LIGHTS PASS THROUGH AND ANALOG OUTPUTS.

USE STANDARD 1/4" SPADE CONNETTORS AS NEEDED (EASY)

CONNECTIONS

Disconnect the battery negative terminal.

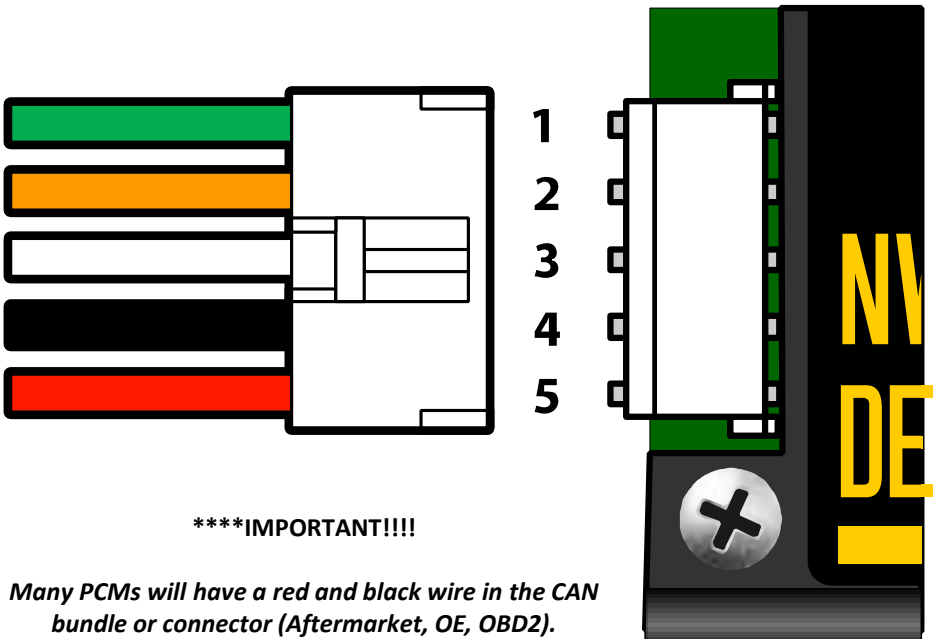
CAN-ADAPT should be part of your instruments circuit on your fuse block. Use a fuse no more than 5 Amps for the complete system.

Start by connecting your Power, ground and lighting. Wired to the INPUT plug. Some kits include a separate plug/adaptor harness to connect the CANBUS wires. Use that for the CAN communications and wire the rest as follows:

1. **GREEN:** CAN LOW (IF ADAPTER HARNESS NOT USED)
2. **YELLOW:** CAN HI (IF ADAPTER HARNESS NOT USED)
3. **WHITE:** LIGHTING PASS-THROUGH (SEE GAUGE INSTRUCTIONS FOR LED POWERING)
4. **BLACK:** GROUND ****
5. **RED:** 12V+ SWITCHED (accessory-IGN ON NOT DURING START) ****

Consult your PCM manufacturer for proper pin-outs for CAN Hi/Lo locations.

The pass-though is optional and you can also wire gauge power, ground and lighting separately, this pass-through is intended to simplify the wiring and reduce the potential for ground loops by using a common ground in the system.



******IMPORTANT!!!!**

Many PCMs will have a red and black wire in the CAN bundle or connector (Aftermarket, OE, OBD2).

DO NOT USE THIS FOR POWERING OR GROUNDING THE CANBOX OR GAUGES!!!!

This power/ground is for low-power items or diagnostic devices.

HOLLEY WIRING

Connect the NVU harness as shown.

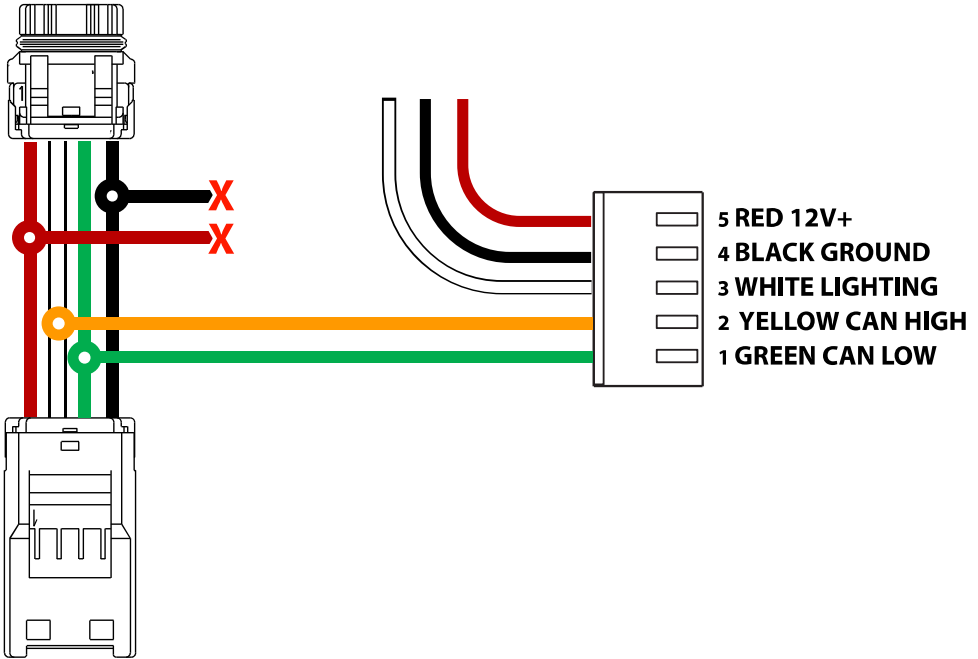
DO NOT USE THE POWER AND GROUND FROM THE CAN HARNESS AT ANY TIME. THIS IS A LOW POWER OUTPUT AND CONNECTING TO THIS MAY DAMAGE YOUR PCM.

CAN LO: Connect the NVU GREEN wire to the Holley GREEN wire

CAN HI: Connect the NVU YELLOW wire to the Holley White wire

HOLLEY HARNESS

CAN-ADAPT HARNESS



POWER: NVU RED: Connect to switched 12V+, instrument fuse no more than 5A

GROUND: NVU BLACK: Connect to a good ground

WHITE: Connect to gauge lighting source (see your NVU BIG BOOK for how to wire and dim LED bulbs in NVU gauges).

You can also use the optional NVU NVU Holley T-harness part number 14001-01 to avoid splicing into the PCM harness.

READING DATA FROM PCM

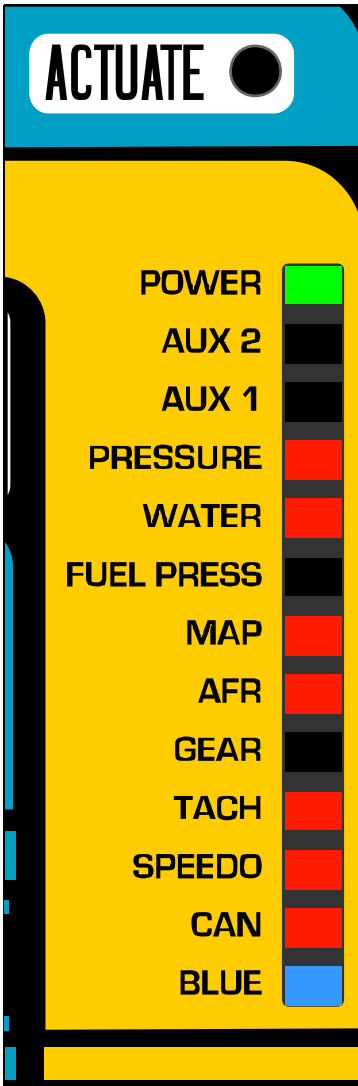
After connecting power, ground, lights and CAN SIGNAL wires, temporarily re-connect battery negative terminal.

Turn on vehicle and observe the STATUS INDICATOR STRIP. Next to each item there is a light.

LIGHT ON: RECEIVING DATA

LIGHT OFF: DATA NOT PRESENT.

NOTE: Not everything you expect is in the PCM. Some data like fuel level and oil pressure is often through the body control module or runs the gauge separately. If the light is not on, the data is not present in the PCM.



LATER:

The ACTUATE button will sweep the gauges to confirm the CANBOX driver is working properly. Covered later in this manual.

EXAMPLE:

The green power light indicates that the unit is powered.

Illuminated items are available to be read from the CANBOX and drive NVU gauges directly.

Un-lit boxes are not available on this PCM. If the light is not on, the function is not being broadcast by the PCM. It's not in there even though you hoped it would be.

Items not available can still be read by NVU gauges in the traditional sender/wired method.

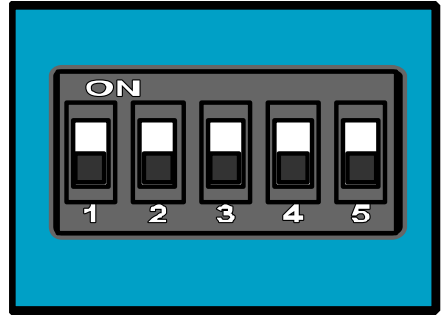
DIP-SWITCH SETUP

The DIP-switches are used to set up the outputs. This will tell the CANBOX which sweep to use and which outputs to use.

UP = ON

DOWN = OFF

Switch #1 to identify to the CANBOX if you have a NVU full sweep or short sweep gauge set.



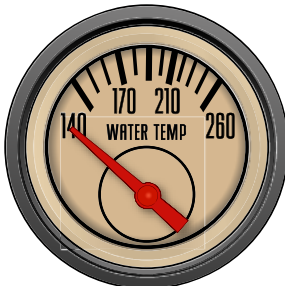
This is for NVU DIRECT-DRIVE gauges only, this will tell the CANBOX how far to sweep the DRIVEN 2-1/16" fuel, temp, oil and volts (if available on the CAN).

To identify if you have full sweep or short sweep, LOOK to the 2-1/16" FUEL, TEMP, OIL AND VOLTS.

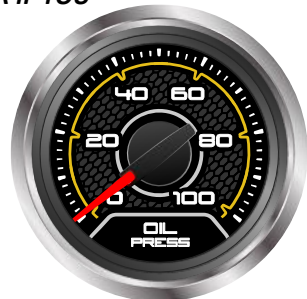
TO SET THE DIP SWITCHES: Power off the unit/key. Change the DIP switches to the desired settings. Power back up.



**LOOK ON THE BACK OF YOUR
SPEEDO AND TACH FOR FULL OR
SHORT SWEEP STICKER IF YOU
ARE UNSURE**



**SHORT SWEEP
PERFORMANCE
WOODWARD
1967 SERIES
M-102
1940 SERIES**



**FULL SWEEP
PERFORMANCE II
CFR
AVIATOR
1969 SERIES**

SWITCH #1 ON (UP)

SWITCH #1 OFF (DOWN)

DIP-SWITCH SETUP

The following sweeps are not currently supported by an off-the-shelf DIP-switch setting (too many options). **Contact NVU directly and we will send you out the item with the correct program for your gauges. Call us if you are not 100% sure and we will help figure out what you have to make sure everything is 100% compatible.**

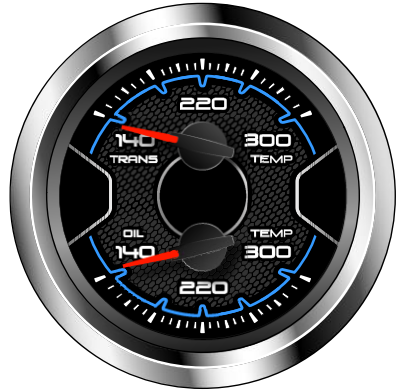
THE FOLLOWING SWEEPS REQUIRE CUSTOM PROGRAMS WHICH WE CAN GENERATE AT NO CHARGE.



**FIREBIRD
RETRO/LONG
SWEEP:
CUSTOM
PROGRAM**



**M-59 180 DEGREE
SWEEP
CUSTOM
PROGRAM**



**DUAL (DIRECT
DRIVE)
CUSTOM
PROGRAM**



**3-1 GAUGES:
SPEEDO AND TACH
SUPPORTED
MINOR GAUGES
ANALOG ONLY NOT
SUPPORTED**

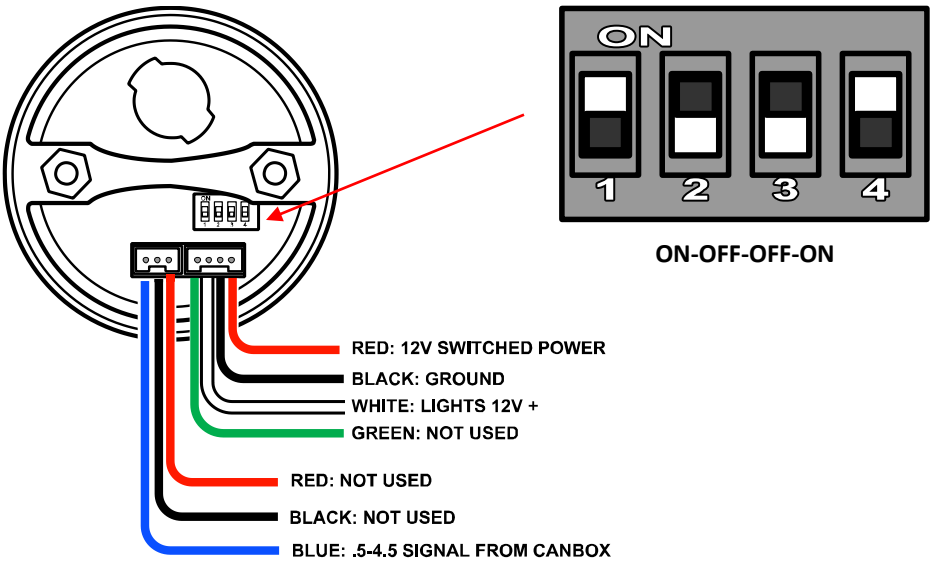


**QUAD GAUGE:
MINOR GAUGES
ANALOG ONLY,
NOT SUPPORTED**

DIP-SWITCH SETUP

ANALOG OUTPUT DIP-SWITCH SETTINGS: DIP switch settings for the analog outputs are used to drive any .5-4.5 output gauge. The position of the switches tells the CANBOX which CAN signal to send to which pin and therefore which gauge.

1. ANY A90 gauge on the following charts with a 0-5V or .5-4.5V input can be driven by the analog output pins. Full or short sweep does not matter, NVU A90 gauges are scaled to work properly with the outputs on the CANBOX.
2. Set your A90 gauge to accept a .5-4.5V input on the GREEN wire by setting the DIP switches on the **GAUGE to ON-OFF-OFF-ON**



3. Connect the BLUE wire directly to the appropriate ANALOG OUTPUT pin following the charts in the next pages. Do not use the wires listed as not used, they are not used in this application.

TO SET THE DIP SWITCHES: *Power off the unit/key. Change the DIP switches to the desired settings. . Power back up.*

FULL SWEEP MINOR GAUGES

ANALOG OUTPUTS			
A	B	C	D
NONE	NONE	NONE	NONE
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	OIL TEMP
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	OIL TEMP
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	RESERVED
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	RESERVED
VAC/BOOST	FUEL PRESS 0-100	TRANS TEMP	RESERVED
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	AFR
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	AFR
VAC/BOOST	FUEL PRESS 0-100	TRANS TEMP	AFR
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	RESERVED
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	RESERVED
VAC/BOOST	FUEL PRESS 0-100	TRANS TEMP	RESERVED
BOOST0-60	FUEL PRESS 0-30	RESERVED	RESERVED
BOOST0-60	FUEL PRESS 0-100	RESERVED	RESERVED
VAC/BOOST	FUEL PRESS 0-100	RESERVED	RESERVED
CUSTOM	CUSTOM	CUSTOM	CUSTOM

DIP SWITCHES					
MODE	1	2	3	4	5
1	OFF	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	OFF	ON
3	OFF	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON	ON
5	OFF	OFF	ON	OFF	OFF
6	OFF	OFF	ON	OFF	ON
7	OFF	OFF	ON	ON	OFF
8	OFF	OFF	ON	ON	ON
9	OFF	ON	OFF	OFF	OFF
10	OFF	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON	OFF
12	OFF	ON	OFF	ON	ON
13	OFF	ON	ON	OFF	OFF
14	OFF	ON	ON	OFF	ON
15	OFF	ON	ON	ON	OFF
16	OFF	ON	ON	ON	ON

TO SET THE DIP SWITCHES: Power off the unit/key. Change the DIP switches to the desired settings. . Power back up.

NOTE: Holley Terminator X-Max LINE TEMP is Trans Temp.

SHORT SWEEP MINOR GAUGES

MODE	DIP SWITCHES				
	1	2	3	4	5
1	ON	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	ON
3	ON	OFF	OFF	ON	OFF
4	ON	OFF	OFF	ON	ON
5	ON	OFF	ON	OFF	OFF
6	ON	OFF	ON	OFF	ON
7	ON	OFF	ON	ON	OFF
8	ON	OFF	ON	ON	ON
9	ON	ON	OFF	OFF	OFF
10	ON	ON	OFF	OFF	ON
11	ON	ON	OFF	ON	OFF
12	ON	ON	OFF	ON	ON
13	ON	ON	ON	OFF	OFF
14	ON	ON	ON	OFF	ON
15	ON	ON	ON	ON	OFF
16	ON	ON	ON	ON	ON

ANALOG OUTPUTS				
A	B	C	D	
NONE	NONE	NONE	NONE	
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	OIL TEMP	
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	OIL TEMP	
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	RESERVED	
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	RESERVED	
VAC/BOOST	FUEL PRESS 0-100	TRANS TEMP	RESERVED	
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	AFR	
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	AFR	
VAC/BOOST	FUEL PRESS 0-100	TRANS TEMP	AFR	
BOOST0-60	FUEL PRESS 0-30	TRANS TEMP	RESERVED	
BOOST0-60	FUEL PRESS 0-100	TRANS TEMP	RESERVED	
VAC/BOOST	FUEL PRESS 0-100	TRANS TEMP	RESERVED	
BOOST0-60	FUEL PRESS 0-30	RESERVED	RESERVED	
BOOST0-60	FUEL PRESS 0-100	RESERVED	RESERVED	
VAC/BOOST	FUEL PRESS 0-100	RESERVED	RESERVED	
CUSTOM	CUSTOM	CUSTOM	CUSTOM	

TO SET THE DIP SWITCHES: Power off the unit/key. Change the DIP switches to the desired settings. . Power back up.

NOTE: Holley Terminator X-Max LINE TEMP is Trans Temp.

DRIVEN PORTS

THE 4 DRIVEN PORTS are for plugging in your DIRECT-DRIVE 2-1/16" gauges. First check using the STATUS panel to see what is available to be run from the CANBOX.

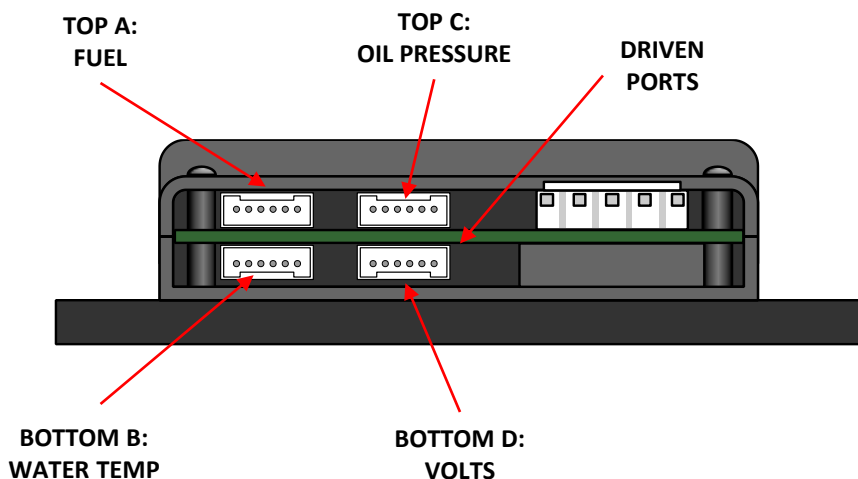
Some items may not be available, most of the time the fuel gauge is run from an analog sender and not through the PCM, connect to gauge as needed per the gauge instruction booklet.

To run the DRIVEN gauges, the CANBOX drives them directly and they are **not interfaced with the speedometer or tachometer in any way** when connected to the CANBOX.

Power everything off

Plug the appropriate gauge harness into the proper port. **IF YOU DO NOT PLUG THE RIGHT GAUGE IN THE CORRECT PORT THE GAUGES WILL NOT OPERATE PROPERLY.**

If you need longer cables NVU offers a Direct-Drive extension harness part number 99444-04. These are approximately 18" long.



DRIVEN PORTS

The driven ports will only operate NVU DIRECT-DRIVE gauges that are in a 5- or 6-gauge kit.

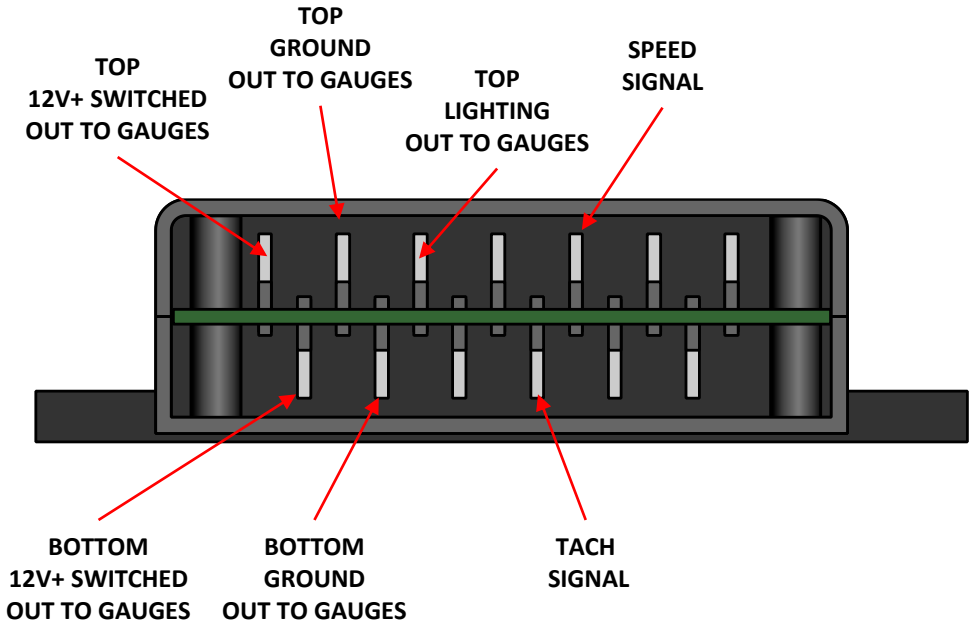
If the minor gauges do not sweep all the way at startup or they sweep far past the high limit, the DIP switches #1 for short sweep or full sweep are set incorrectly.

TO SET THE DIP SWITCHES: Power off the unit/key. Change the DIP switches to the desired settings. . Power back up.

PASS THROUGH POWER AND SPEEDO/TACH

The 4 pins on the left side of the box are pass-through power, ground and lights for the gauges. This is to make wiring cleaner and prevent ground loops.

You can wire the gauges separately if needed.



SPEEDOMETER AND TACHOMETER SIGNALS

SPEED SIGNAL: Connect speed signal wire to the pin as shown above. Typically, this goes to the **ORANGE** wire on NVU speedometers.

This outputs a 16,000 PPM (pulses per mile) hall-effect signal that NVU speedometers are shipped at, no calibration or settings need to be changed unless a “tune” has been done or a tire/wheel/gear change has been done without updating the PCM.

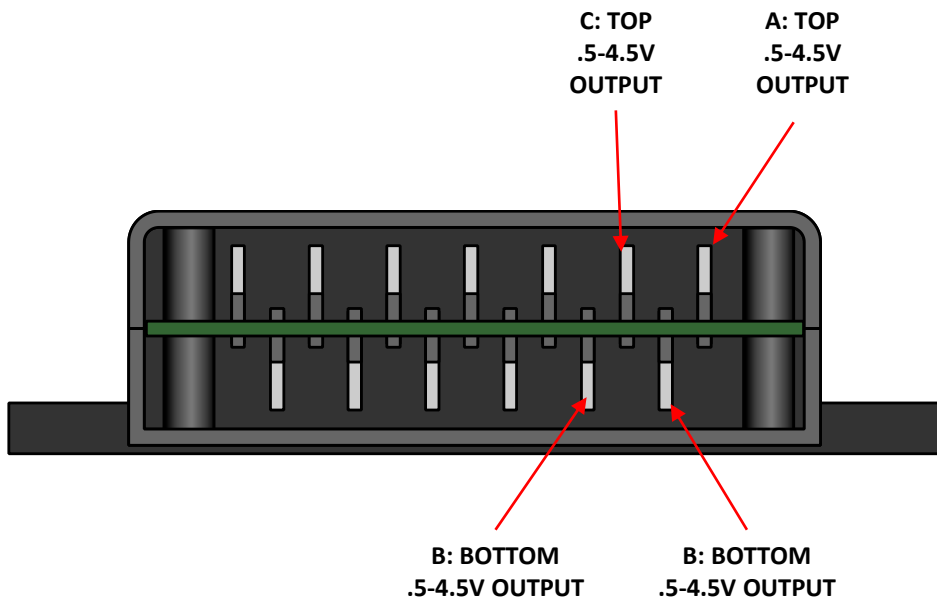
TACHOMETER SIGNAL: Connect the tachometer signal wire to the pin as shown above. Typically, this is the **VIOLET** wire on **GAS** tachometers, **ORANGE** wire on **DIESEL** tachometers.

This outputs an 8-cylinder hall-effect signal that NVU GAS tachometers are pre-set at when they ship, no additional settings require changing.

DIESEL TACHS: These are pre-set at 5PPR, to make the tachometer read correctly, set to 4 PPR per your Diesel tach instruction book.

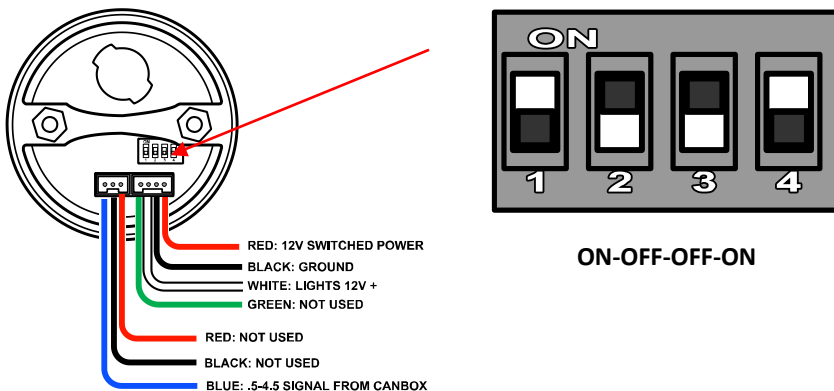
VOLTAGE DRIVEN NVU A-90 GAUGES

The 4 pins on the right side are for driving A90 gauges with a voltage input. Use the chart(s) to set these to the appropriate settings. Make sure you have the correct gauge to the proper pin, or they will not operate properly.



ANALOG OUTPUT DIP-SWITCH SETTINGS: DIP switch settings for the analog outputs are used to drive any .5-4.5 output gauge. The position of the switches tells the CANBOX which CAN signal to send to which pin and therefore which gauge.

1. ANY A90 gauge with a 0-5V or .5-4.5V input can be driven by the analog output pins. This is mainly for boost and AFR, Fuel Pressure and Trans Temp.
2. Set your A90 gauge to accept a .5-4.5V input on the GREEN wire by setting the DIP switches on the **GAUGE to ON-OFF-OFF-ON**



3. Connect the BLUE wire directly to the appropriate ANALOG OUTPUT pin following the charts in the next pages.

GEAR DISPLAY

If available on the CANBUS your transmission gear display can be shown as an AUX INPUT on the OLED screen. Please refer to your gauge instruction booklet for setting that part up.

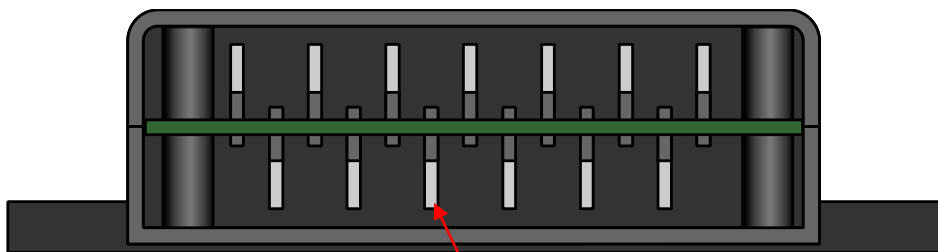
NOTE: Holley Terminator and Dominator do not show PRND, only the gear position in numbers, it does not display reverse at this time. The only thing that can be seen is what is on the 3.5" Holley display.

There are 2 types of Gear selection that can be shown. There are 8 positions available

AUTO MODE: P R N D 4 3 2 1

Manual mode: 1 2 3 4 5 6 7 8

You can switch between the two by re-setting the AUX INPUT as needed. This is done in the gauge itself in the AUX INPUT SCREEN and not handles by the CAN-ADAPT, the CAN-ADAPT only send the signal to the gauge.



GEAR OUTPUT

Notes:

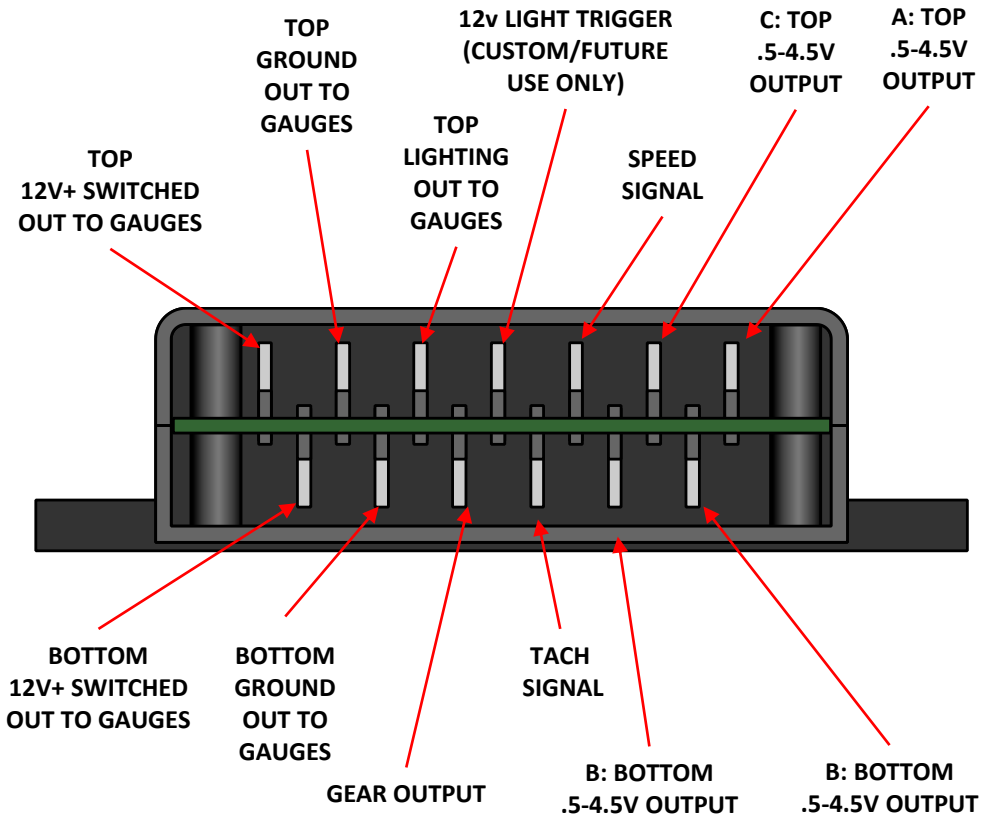
**HOLLEY SYSTEMS SHOW WHAT IS ON THE HANDHELD SCREEN, GEARS 1-6.
P,N,R,D ARE NOT AVAILBALE ON ANY HOLLEY SYTEM AT THIS TIME FROM HOLLEY.
THIS IS NOT A LACK OF NVU FEATURES, ITS SIMPLY IS NOT READ BY HOLLEY PCMS.**

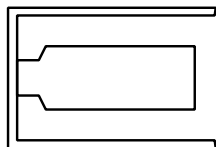
OBD2: P WILL BE DEFAULT

NOTE: If your NVU speedometer does not have the gear function, it was produced BEFORE the introduction of the CAN-ADAPT. NVU can flash it at no charge in just 1-2 days, just give them a call of send an email.

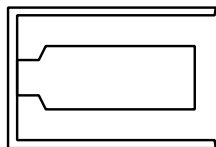
SPADE PLUG END

Below is a listing of all the connections available on the spade plug end. We use these connections as the board connectors have 2 robust solder joints and the connectors themselves are easy to find if you need additional plugs..





**Single wire:
fold over**



**Multiple
wires**

CRIMPING WIRES TO SPADE TERMINALS

We have included BLUE spade terminals for 18-20 ga wire. This is a larger size that can be used for 1 or 2 wires to be attached.

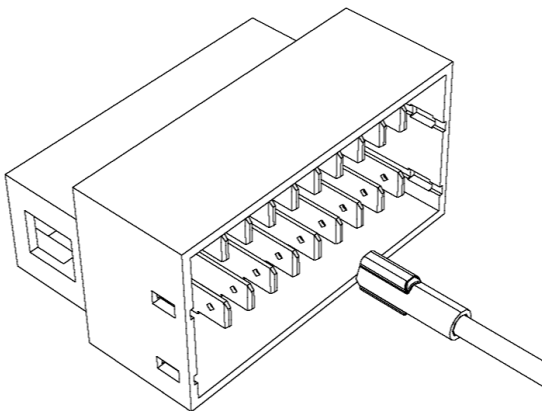
- When using one wire in the terminal, we find its best to strip off extra wire and fold it over to create a thicker piece for the crimp to attach to.
- 2 wires should fit in there nicely, be sure to strip off enough wire to extend full into the end of the terminal.



Use a quality crimper to ensure a good connection.

Connection should be tight and not be able to pull out. Make sure the crimp is in the same direction as the spade (red arrows) so that there is enough room between terminals.

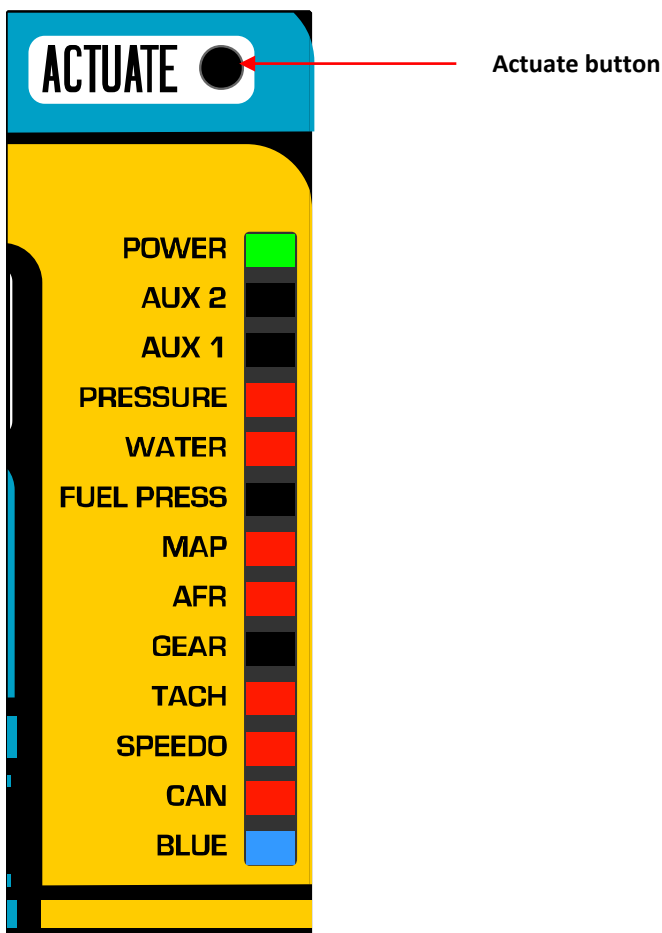
The spade terminals will bottom out on the male side in the plug making a good connection. Remember to hold the board in if you need to remove the spades afterward to not damage the housing or pull the board(s) out.



TESTING OUTPUTS

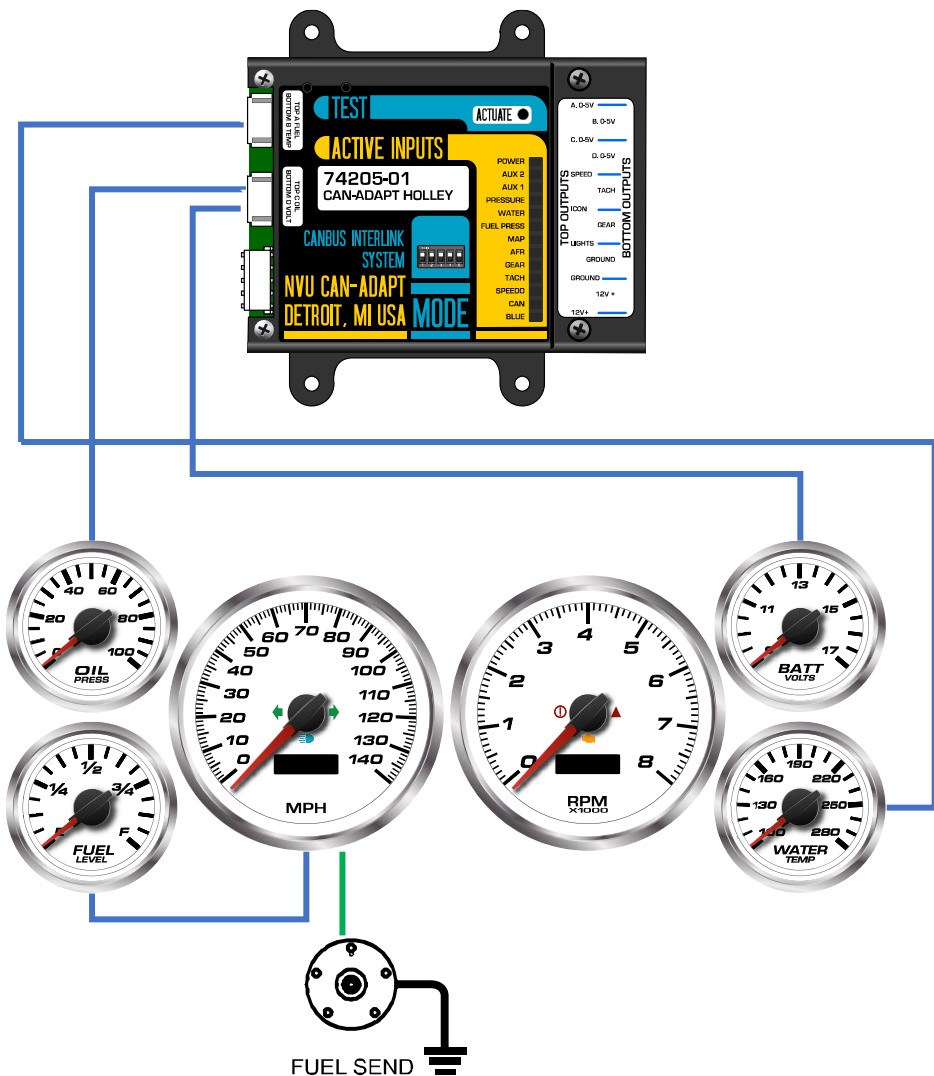
Another feature of the NVU CANBOX is that the box not only shows you what can be read from the CAN but it can also do a test output to confirm your connections and that the unit is outputting a signal to the gauges.

1. With everything connected, turn on the vehicle key. All of the gauges should sweep to zero, full scale and back again. They may change position after that depending on the inputs the gauges are receiving.
2. Press the ACTUATE button using a pen or paper clip. This will trigger the test function. All of the gauges will zero out and sweep. Depending on the function, some will sweep to full some to half. What is important is they move in a smooth cycle. This will ONLY work on the gauges with inputs connected to the CANBOX, all gauges that remain standalone will not sweep in this mode because they are not interfaced with the box.
3. If for some reason one or more does not sweep, check your DIP switch settings on the CANBOX and use a multimeter to check your connections on the gauge input wires.



WIRING EXAMPLES

Depending on what is read-able on the CANBUS, some items need to be picked up with an ANALOG sender. Some aftermarket PCMs will not have some items reading unless you set them up. Holley Terminator for example, you will need to install an oil pressure sender and run it to the PCM, then set it up and scale in the software, then to the gauge. OR just wire the sender to the gauge, its up to you how you want to wire up your build. We recommend keeping it as simple as possible.

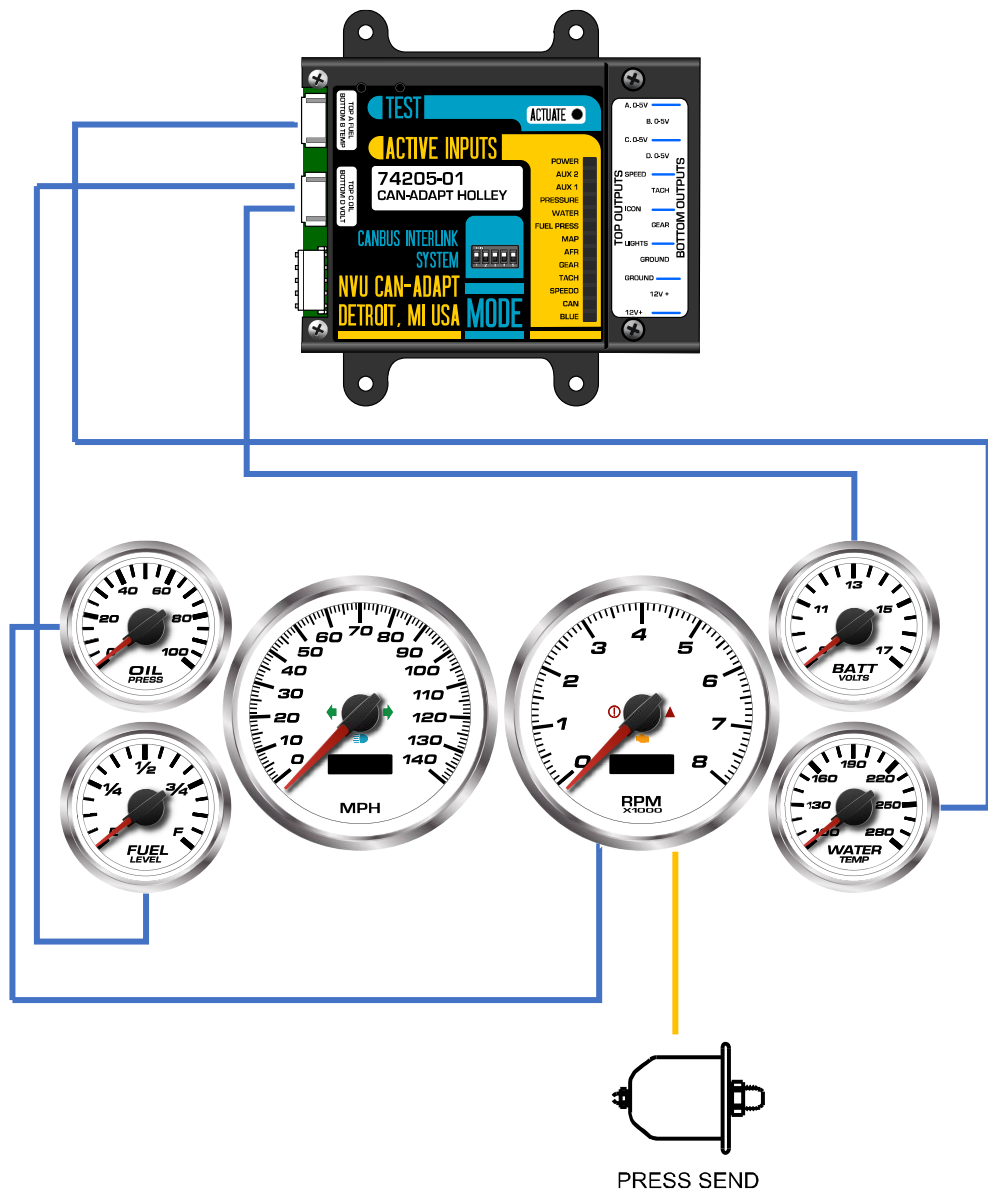


This is probably the most common scenario. Most of the time the fuel gauge is not connected to the PCM. Easy enough, NVU gauges handle most analog signals. Run the wires as in the instruction book for a fuel gauge. In this case the fuel gauge is driven by the speedometer.

The temp, oil and volts are driven by the CANBOX plugged into the appropriate ports.

WIRING EXAMPLES

Common on OBD-2 setups, the Oil pressure is not usually on the CAN but the fuel sometimes is. Install an oil pressure sender just as you would with a traditional gauge set (included already in your NVU kit). In this example the oil pressure is driven by the tachometer.





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