

BIM-17-2

Bus Interface Module for compass and outside temperature



**BIM-17-2
Module**

**394192
BIM Interface
Cable**



**SEN-15-1
Temp
Sensor**



- This Bus Interface Module has an internal compass sensor, and an input for the included digital air temperature sensor, SEN-15-1.
- There are two interface ports on the module; either one can be connected to the instrument system or to another module, allowing several units to be daisy chained together.
- Do not connect the I/O port to anything other than a Dakota Digital control box, or another BIM unit.
- If there are several modules being used, it would be best to attach this one as the last module in the series.
- A six-foot data cable is included for flexibility in the mounting location of the compass module and routing of the cable.

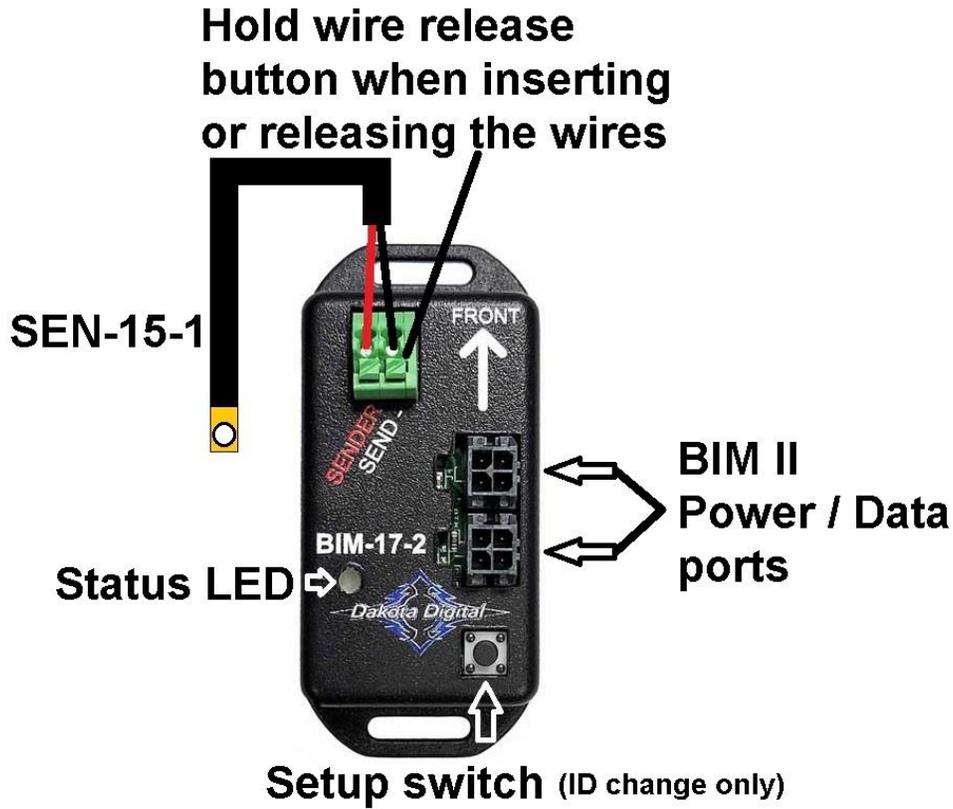
NOTE *The compass must be calibrated in the vehicle before it can begin reading properly.* The status light will flash between red and green until it has been calibrated in your vehicle.

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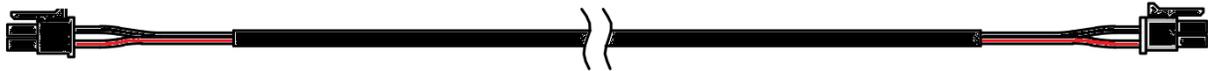
Basic BIM-17-2 Wiring



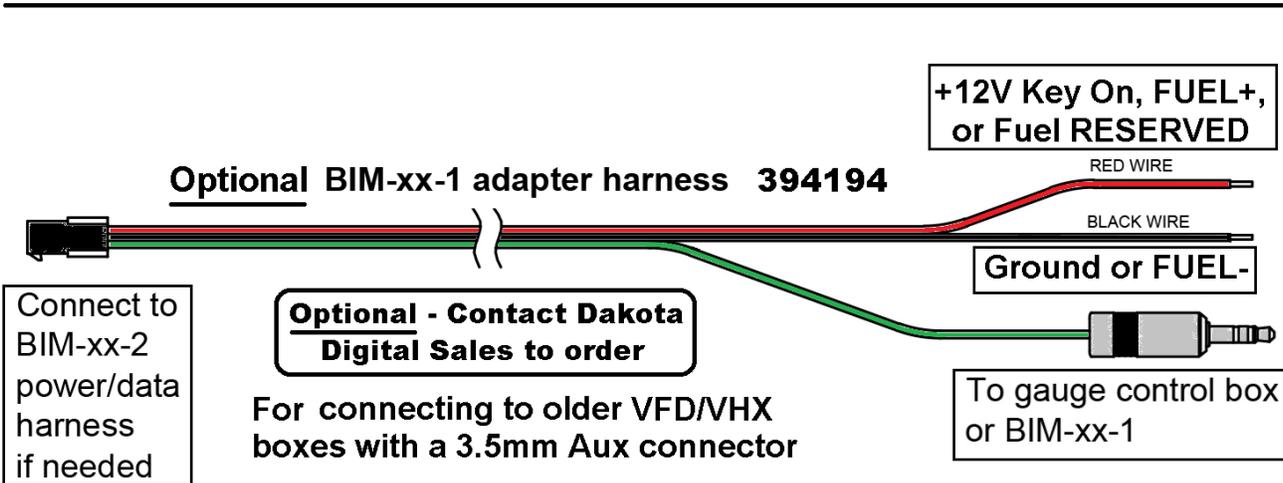
Connect to BIM-17-2

Included

Connect to: VFD/VHX/HDX/RTX box, or another BIM module, or to BIM-xx-x-1 adapter harness



BIM-xx-2 6 foot power/data harness 394192



Installation:

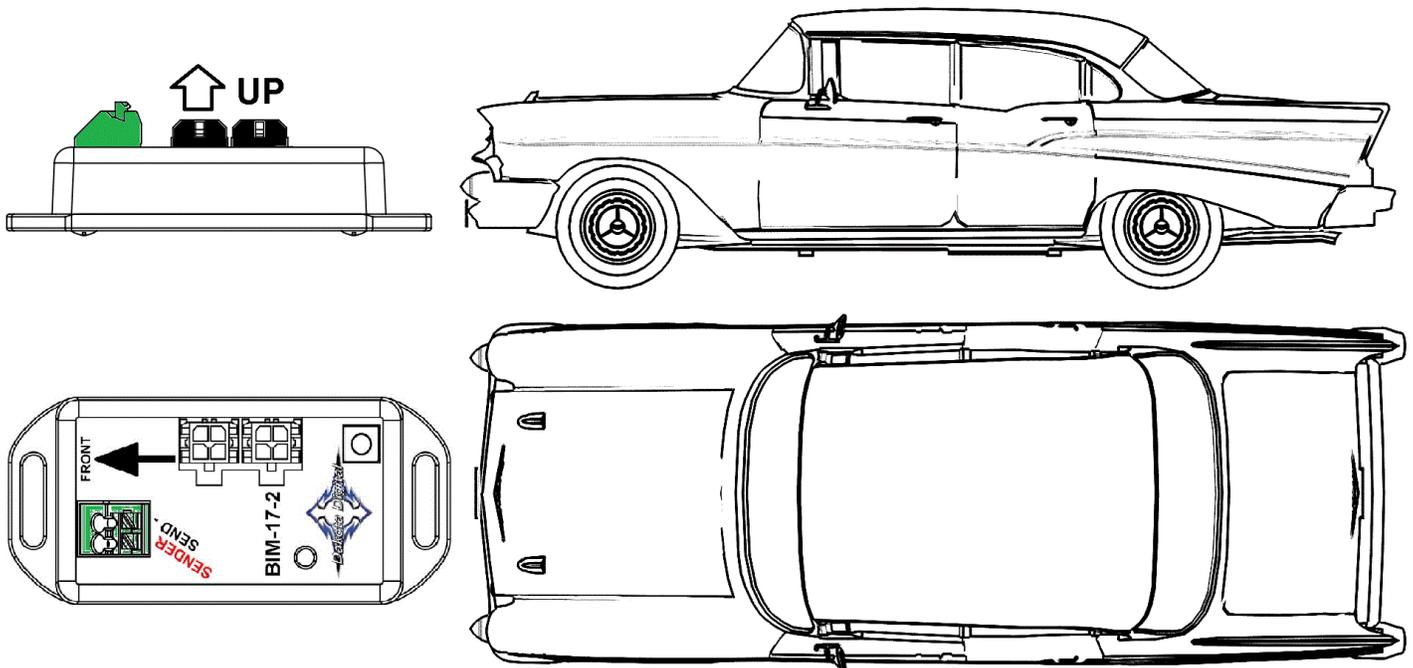
Air temperature sensor (SEN-15-1) mounting:

- For a better connection, add a bit of solder to bare leads (tinning leads), prior to insertion.
- Locate the temperature sensor probe to allow adequate air flow.
- For outside temperature measurement, the front grill area or above the front bumper may be a good location.
- It should be in a location that can get good air flow across it while the vehicle is moving.
- When you are sitting still for a long period of time after driving the temperature reading may begin to rise due to the engine heat radiating forward.

Compass module mounting:

- ✓ Do not mount the module in the engine compartment; it should be mounted in interior of the vehicle.
 - ✓ Avoid any strong magnets such as fan motors and speakers, high current wiring such as alternator or fan wires, or steel bars.
 - ✓ Sheet steel is much better than steel bars or brackets since the bars and brackets can bend the magnetic fields causing compass errors.
 - ✓ Mounting the module higher in the vehicle helps.
 - ✓ Magnetic interference drops off very rapidly with distance
 - Even small movements away from the interference can help significantly.
-
- The BIM unit should be mounted solidly so that it cannot move or shift.
 - The arrow on the BIM should point directly to the front of the vehicle, letters and plugs facing upward.
 - Any error in the mounting direction will cause an error in the compass heading.
 - If the BIM moves or shifts then the calibration will no longer be correct and the readings will be wrong.

Orientation of BIM-17-2 in relation to the car



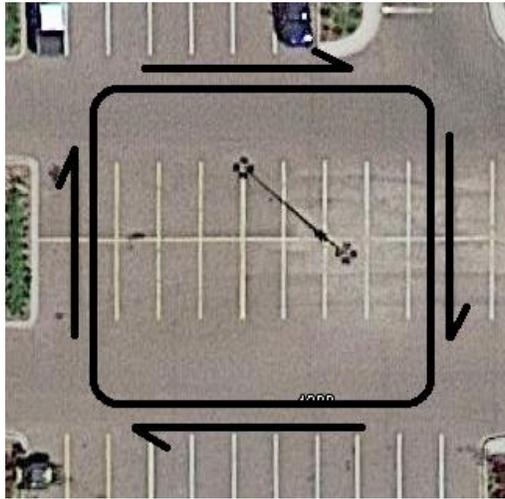
Setup:

To Set or Change ID number:

- ✓ Each BIM module (BIM-01-2 excluded) uses one or more ID channels to send data to the control box.
- ✓ The ID will not normally need to be changed.
- ✓ A green-red-red flash on the BIM-17-2 status light indicates an ID conflict with another connected BIM.
- ✓ The following procedure will allow the BIM-17-2 to automatically select a new, unused ID.
 - Hold the setup switch on the BIM-17-2 while turning the key on.
 - The BIM status light will rapidly flash RED.
 - Release the switch. The status light will flash a slow red.
 - When the status light begins flashing green, it is finished – turn the key off.

Programming notes:

- Calibration and warning points are set up through the instrument system (VFD/VHX/HDX/RTX) setup menu.
- Temperature unit will follow the unit set for the main water temp gauge.
- The calibration should be done in an open area such as an empty parking lot to avoid any external interference.



True North Magnetic Field Offsets for the US:

The magnetic field of the Earth does curve around the globe and the offsets can be entered into the setup to correct for slight offsets in directional headings.

True (magnetic)
north offsets for
United States



VFD3 and VFD3X setup:

****Only VFD3 & VFD3X systems with a plastic case support adding BIMs****

- ✓ Ensure all desired BIM units are connected to the control box with the appropriate data cables.
 - ✓ When doing the calibration, the car must be driven, so the engine must be started when entering setup.
1. Hold the SW1 (I) switch for the VFD3 control box while **starting the engine**.
 - a. The speed display will show “SEt” and the message display will show **SETUP**.
 2. Release SW1. The displays should show “SEt” and **SPEED**, respectively.
 3. Tap SW1 (I) until “SEt” and **BIM** is displayed.
 4. Press and hold SW1 (I) until “-” and **SCAN x** are displayed.
 - a. x = number of BIM channels found.
 - b. If **SCAN 0** is displayed, check connections of the BIM-03-2 to VFD3 control box.
 - i. If multiple BIM units are installed, follow the “Change ID” steps (pg 4) to correct conflicts.
 - ii. Then enter setup again and begin the BIM setup process again.
 - c. The BIM-01-2 OBDII has no channels and will not be found.
 5. Release SW1. The displays will show “SEt” and **SCAN**.
 - a. Scanning is not required if “SCAN x” equals the number BIM modules found.
 - b. If “SCAN x” does not equal the number of BIMs, follow the “Change ID” steps (pg 4) to correct conflicts.
 - i. Some BIMs can use more than one channel (BIM-19 = 5, BIM-22 = 4).
 - ii. Then enter setup again and begin the BIM setup process again.
 6. Otherwise, tap SW1 (I) until “SEt” and **SETUP** are shown.
 7. Press and hold SW1 (I) until “-” and **SETUP** is displayed.
 8. Release SW 1 (I).
 - a. The speed should display the default channel ID as **[B**.
 - b. The message center will display the label (default = **compass**).
 - c. With multiple BIM modules, tap SW 1 (I) until **[B** and the label (**compass**) are displayed.
 9. Press and hold SW1 (I) until “-” and **LABEL** are displayed.
 - a. The label cannot be changed.
 10. Release SW1 (I). Speed will display “SEt” and the message center will display **COMPASS**
 11. Hold SW1 (I) until “-” and **WARN** is displayed. This for the low temperature warning point.
 12. Release SW1 (I). The displays show “SEt” and **LO -40F**
 - a. If the low warning point had already been set, that previous value will be shown.
 - b. **SEt** and **LO -40C** if the water temp scale is set to Celsius the temp
 13. Tap SW1 (I) to change the temperature
 - a. The temperature will go up to **73F** before going back to **-40F**
 - b. Some like to set the low warning to 32F (0 C) to warn of possible icing conditions.
 14. Press and hold SW1 (I) when the desired low warning temperature is reached
 - a. The speed will display “-” and the message center will display your low temp
 15. Release SW1 (I). The displays will show “SEt” and **N -00**.
 16. Refer to the magnetic chart on page [4] – tap SW1 (I) to change magnetic offset.
 - a. The number will start at **00**, then goes up to **31** then cycles to **-32** and counts up.
 17. Press and hold SW1 (I) until “-” and **CAL** are displayed.
 18. The displays will display “**CAL**” and **SKIP**.
 - a. If only the offset had to be entered, press and hold SW1 (I) to skip the calibration
 19. Tap SW1 (I) once, to change the message center to **BEGIN**.
 20. Press and hold SW1 (I) until “-” and **CIRCLE** is displayed.
 21. Release SW1 (I) and the displays will show “**CAL**” and **CIRCLE**.
 22. Slowly drive the vehicle in a large circle, or square in a large parking lot
 23. Tap SW1 (I) after completing two circles.
 24. The displays will show SET and DONE.
 - a. If more BIM units need setup, tap SW1 (I) until SETUP is displayed.
 25. Press and hold SW1 (I) to save and exit.

The VFD3 will display both the compass and temp in teach side message center.
Tap SW2 until the display shows **N 72F** (sample).

VHX setup:

- ✓ Ensure all desired BIM units are connected to the control box with the appropriate data cables.
 - ✓ When doing the calibration, the car must be driven.
 - The engine must be started when entering setup.
 - One should be in an empty part of a parking lot
1. Hold SW1 (I) switch for the VHX control and start the engine.
 2. Release SW1 (I). The LCDs will display **SETUP SPEED** and **SETUP**.
 3. Tap SW1 (I) until the first LCD shows **SETUP BIM**.
 4. Press and hold SW1 (I).
 - a. The message display will show **SCANNING...** Release SW1 (I).
 - b. The display will scroll through the 16 possible channels used.
 - c. If **FOUND xx** and **00 ERRORS** is shown (X = should be the number of BIMs used):
 1. BIM-01-2 uses no channels
 - ii. Tap SW1 (I) until **BIM SCAN** is shown – jump to step 5
 - d. If **FOUND 00** and **XX ERRORS** is shown (X = a number):
 - i. If multiple BIM units are installed, the display may also show **FOUND 01** and **00 ERRORS**.
 - ii. Follow the “Change ID” (Page 4) to correct conflicts, the enter setup again start over.
 - e. If **FOUND 00** and **00 ERRORS** is shown:
 - i. Check and reset all BIM connections.
 - ii. Tap SW1 until **BIM SCAN** is displayed.
 - iii. Press and hold SW1 (I) to scan for modules again.
 5. Tap SW1 (I) until the display shows **BIM SETUP**.
 - a. The BIM setup options are **SCAN**, **SETUP**, and **DONE**.
 6. Press and hold SW1 until the message changes to **BIM CH 08** and **COMPASS**.
 - a. Default channel is 08 if not conflicting with another BIM.
 7. Press and hold SW1 (I) until **CH 08 LABEL** and **COMPASS**.
 - a. Label cannot be changed.
 8. Press and hold SW1 (I) until **CH 08 LOW** and **WARN SET** is displayed.
 9. Release SW1 (I) and the display will show **AIR TEMP -40F** and **N**.
 - a. **AIR TEMP -40C** if water sender was set to Celsius.
 10. Tap SW1 (I) to increase the temp reading to desired low temp warning.
 - a. Temp scale ranges from -32 to 72.
 - b. Many like 32F (0 C) to warn of possible icing conditions.
 11. Press and hold SW1 (I) to save low temp warning.
 12. Release SW1 (I), display will show **COMPASS N** and **ADJUST 00**.
 13. Refer to the magnetic chart on page [4] – tap SW1 (I) to change magnetic offset.
 - a. The number will start at **00**, then goes up to **31** then cycles to **-32** and counts up.
 14. Tap SW1 (I) to change the magnetic offset for your location.
 - a. Refer to the magnetic compass map on page [4].
 15. Press and hold SW1 to save, display will show **CAL COMPASS** and **BEGIN**, then release.
 16. Press and hold SW1 (I) until the display shows **CAL COMPASS** and **CIRCLE**, then release.
 17. Slowly drive two large circles, or a square in a parking lot.
 18. Come to a stop after completing two circles.
 19. Press and hold SW1 (I) until **BIM SETUP** and **DONE** is displayed.
 20. Press and hold SW1 (I) until a large **DONE** appears.
 21. Release SW1 (I) and the display will show **BIM DONE**.
 22. Press and hold SW1 (I) until a large **DONE** appears, release SW1 (I).
 23. If you have other BIM modules to setup, please follow the instructions for each BIM.

HDX and RTX setup:

****HDX/RTX systems can be configured with the Dakota Digital app for Apple and Android devices****

- ✓ Ensure all desired BIM units are connected to the control box with the appropriate data cables.
 - ✓ When doing the calibration, the car must be driven.
 - One should be in an empty part of a parking lot when going through BIM-17-2 setup
 - **Entering Setup:**
 - **HDX:** *AFTER* the engine is started, press and hold both switches to enter SETUP.
 - With external switches, hold SW2 while turning the ignition on.
 - Release the switch(es) when SETUP and RELEASE is shown.
 - **RTX:** With the ignition off, press hold SW2 while starting the engine to enter SETUP.
 - Release the switch when SETUP and RELEASE is shown.
1. Tap the right switch or switch 2 (II) until **BIM** is selected.
 2. Press and hold either switch to enter BIM setup menu. Release the switch when **RELEASE** is shown.
 3. If the BIM-17-2 is the only BIM, the upper LCD will show a direction and temp, with **CH8 BIM-17-2** below.
 - a. *Temp unit will the same as the engine water temp value is set.*
 4. If more than one BIM is attached the lowest channel BIM will be at the top of the list.
 - i. (BIM-01-2 will not be found, as it uses no channels).
 - b. If **NONE FOUND** is displayed then check connections to the BIM-17-2.
 - i. If using multiple BIM units, follow Change ID step on page [4].
 5. If multiple BIMs are installed with no errors, tap either switch until **CH8 BIM-17-2** is selected.
 - a. The status LED on the BIM will flash RED-GREEN on the BIM selected.
 6. Once **CH8 BIM-17-2** is highlighted, press and hold either switch.
 - a. Release the switch when **RELEASE** is displayed.
 7. The menu will show **WARN LO, N OFFSET, CALIBRATE, BACK**.
 - a. Any menu item that does not apply to this BIM will be grey and cannot be selected.
 8. To change the temperature low warning point, tap either switch until **WARN LO** is highlighted.
 9. Press and hold either switch to enter the **WARN LO** setting. Release when instructed.
 10. The message display will show the current low temperature warning.
 - a. Tap either switch to change the low temp warning point.
 - b. The values will range from -40F to 70F (-40C to 23C).
 - c. Many set the warning point to 32F or 0C, to warn of possible icing conditions.
 11. Press and hold either switch to save the low warning temperature point. Release when instructed.
 12. Tap either switch until **N OFFSET** is displayed to change the magnetic north offset.
 13. Press and hold either button to enter the **N OFFSET** menu. Release when instructed.
 14. Refer to the magnetic chart on page [4] – tap either switch to go up or down the scale.
 - a. The number will start at **00** and down to **-32** or up to **31**.
 - b. The upper display will show the offset, while the lower selection list will show **N+** and the offset
 15. Press and hold either switch to save the highlighted offset.
 16. Tap either switch to highlight **CALIBRATE**.
 17. Press and hold either button to enter calibration – release when instructed.
 18. The display will show **DRIVE IN CIRCLES**.
 19. Begin slowly driving two large circles, or square, in an open area like a parking lot.
 20. When done, press and hold either switch until the display shows **RELEASE**, and release.
 21. **BACK** will be highlighted when done.
 22. Press and hold either switch to exit – release when instructed
 23. Tap either button to highlight **BACK** at the end of the BIM menu.
 24. Press and hold either button until **RELEASE** is displayed, and release.
 25. Tap either button until **EXIT SETUP** is displayed.
 26. Press and hold either button to exit setup.

Displaying Compass/Temp:

- VFD3 – Single message center
 - Tap SW2 to switch to “tach” messages, and tap until compass/temp is displayed.
- VFD3 – Dual message centers.
 - Tap SW2 until the compass/tach is displayed underneath the tach display.

- VHX – Dual LCD screens.
 - Tap SW2 until the compass/temp is displayed.
- VHX – Single LCD screen.
 - The “DISPLAYS, LOCATION” section of setup must have the BIM-17-2 compass displayed in LCD1.
 - Once setup is done, tap SW1 (I) until the compass/temp is displayed.
- VHX – With separate digital clock.
 - Tap the clock button, or the third switch in the 70-72 Chevelle SS, to display compass/temp.

- HDX/RTX –
 - Single large 2.4” screens – the direction and temp will be at the top of the LCD.
 - Dual small screens – the direction and temp will be at the top of the right screen.
 - Single small 1.5” or 1.8” screens.
 - A section of a group screen must be designated to show the compass/temp.
 - Follow the HDX/RTX setup for group screens, or use the app to designate one for compass.
 - When done, tap the right, or SW2 (II) to change to the group screen with the compass.

Interference notes:

- Traffic light sensors mounted into the road can cause a temporary error in the compass heading.
 - The reading will correct itself once you have driven off the road sensor.
- Bridges can cause temporary interference due to the steel supports.
- Steel reinforced concrete can cause interference if the module is mounted too low in the vehicle.
- If the compass is always showing interference, even in open areas, then repeat the compass calibration.
 - If this does not resolve the problem then move the BIM-17 to a different location and then repeat the compass calibration.

Quick tips:

- While the BIM is operating, the status light will flash green.
- A steady green indicates it is powered up but not receiving any bus activity.
- The display will flash green-yellow-green-yellow-red-red (rapid red flash with slow green flash) until it has been calibrated in your vehicle. It cannot begin reading correctly until after this is completed.
- A flashing yellow-red (steady red with a flashing green) indicates an open or shorted temperature sensor connection.

Troubleshooting guide:

Problem	Possible cause	Solution
- No BIM data on instrument readout - BIM will not light up	- Power/data harness is not connected or is damaged - Module is damaged	- Inspect power/data harness and reseat - Return for service. (See page [10])
- No BIM data on instrument readout - BIM has a steady-lit green LED	- Interface cable is not connected - On VHX systems, the BIM data is not assigned to an LCD - Interface cable is loose, or green data wire is loose	- Connect the power/data cable to the BIM unit and the instrument system control box - Follow VHX instructions for Display / Locations to enable the BIM display screen. - Ensure both ends of the cable are properly seated
- BIM LED is flashing green-red-red - No BIM data on instrument readout	- Another BIM is set with the same channel ID	- Disconnect any other BIM and test alone - Change ID of BIM following steps on page [4]
- Compass shows interference (direction is flashing or inverted color)	- Compass is not calibrated correctly - Unit is picking up interference from nearby steel in vehicle or roadway	- Follow Compass calibration instructions on pages 5-7 - Move BIM unit to location away from steel and higher in vehicle
- Compass reads incorrectly	- Compass is not calibrated correctly True North offset is incorrect	- Follow Compass calibration instructions on pages 5-7. - Change the North offset (pages 5-7)
- Temperature does not read correctly	- Loose connection on sensor wires - Air temperature sensor is not getting proper air flow - Voltage or wiring problem in the vehicle wiring harness	- Inspect and reconnect wires. - Move the air temperature sensor to get clean air flow and avoid engine heat - Check wiring harness for loose or damaged wires
- Temperature reading displays "---"	- SND terminal is shorted to ground - Sender is damaged	- Check wire for damaged insulation. Repair/replace as necessary. - Replace sender
- Temperature reading displays "EEE" / status LED blinking yellow-red	- Sender is not connected to BIM-17-2 - Wire between BIM and sender is broken - Sender is damaged - Module is damaged	- Connect sensor to SND terminal. - Test and replace wire. - Replace sender. - Return module for service. (see instructions)
- Temperature is always "-40F" or "-40C"	- The temp sender is not connected - Sender is damaged	- Check wire connections to the temperature sender - Replace sender

Input specs:

Sensor	Range	Resolution	Warning
Internal compass	N-NE-E-SE-S-SW-W-NW	1° internally	When outside interference is present
SEN-15	-40 to 255 °F (-40 to 124 °C)	1°F	-40 to 73 °F (-40 to 23 °C)

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SERVICE AND REPAIR

DAKOTA DIGITAL offers complete service and repair of its product line. In addition, technical support is available to help you work through any questions or problems you may be having installing one of our products. Please read through the Troubleshooting Guide. There, you will find the solution to most problems.

For additional support, please visit www.dakotadigital.com. A “Product Support” link will be found at the bottom of the home page.

Should you ever need to send the unit back for repairs, please call our technical support line, (605) 332-6513, to request a Return Merchandise Authorization number.

- Package the product in a good quality box along with plenty of packing material.
- Ship the product by a common carrier with tracking abilities.
- Be sure to include the RMA number on the package.
- Include a complete description of the problem, with RMA number, your full name and address (street address preferred), and a telephone number where you can be reached during the day.
- Any returns for warranty work must include a copy of the dated sales receipt from your place of purchase.
- Send no money. We will contact you for payment.

Dakota Digital Limited Lifetime Warranty

DAKOTA DIGITAL warrants to the ORIGINAL PURCHASER of this product that should it, under normal use and condition, be proven defective in material or workmanship for the lifetime of the original vehicle it was installed in, such defect(s) will be repaired or replaced at Dakota Digital's option.

This warranty does not cover nor extend to damage to the vehicle's systems, and does not cover diagnosis, removal or reinstallation of the product.

This Warranty does not apply to any product or part thereof which in the opinion of the Company has been damaged through alteration, improper installation, mishandling, misuse, neglect, or accident.

Dakota Digital assumes no responsibility for loss of time, vehicle use, owner inconvenience nor related expenses.

Dakota Digital will cover the return standard freight once the product has been evaluated for warranty consideration, however the incoming transportation is to be covered by the owner.

This Warranty is in lieu of all other expressed warranties or liabilities. Any implied warranties, including any implied warranty of merchantability, shall be limited to the duration of this written warranty. No person or representative is authorized to assume, for Dakota Digital, any liability other than expressed herein in connection with the sale of this product.

⚠WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



4510 W. 61st St. North
Sioux Falls, SD 57107
www.dakotadigital.com
dakotasupport@dakotadigital.com

Phone (605) 332-6513
Fax (605) 339-4106

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