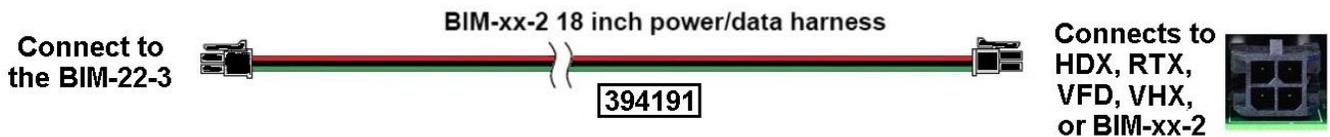
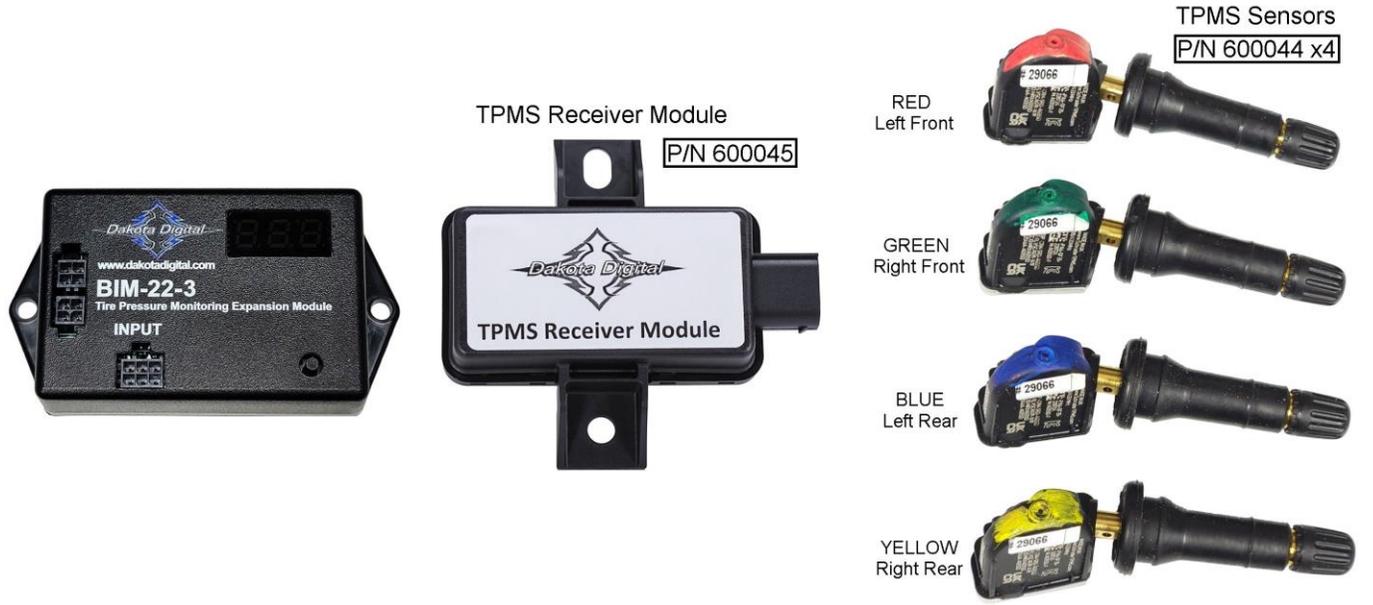


## BIM-22-3

### Bus Interface Module for TPMS (Tire Pressure Monitoring System)



\*Older VFD3 & VHX control boxes with a 3.5mm Aux port will **not** work with the BIM-22-3

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## Introduction

This Bus Interface Module (BIM) communicates with a TPMS Receiver Module which receives tire pressures and other information from four TPMS sensors installed in a vehicle's tires.

There are three interface (I/O) ports on the module. Two of these can be connected to a Dakota Digital instrument system or to another BIM, allowing several units to be daisy chained together. Do not connect these I/O ports to anything other than a Dakota Digital control box or BIM. Ensure all BIM units are connected properly. On appropriate VHX, VFD3, and VFD3X systems, use the BIM-XX-1 harness (not shown). On HDX, RTX, and other VHX, VFD3, and VFD3X systems, use the BIM-XX-2 harness.

The interface labeled "INPUT" on the BIM-22-3 is connected to the TPMS Receiver Module using the TPMS Receiver Module adapter harness.

The TPMS sensors transmit pressures and other information wirelessly through an RF signal. They are to be mounted inside the vehicle's tires; replacing normal valve stems. We recommend that the tires be rebalanced after TPMS sensors are installed.

**Do not mount the BIM-22-3, nor the TPMS Receiver Module, in the engine compartment;** they should be mounted in the interior of the vehicle.

The BIM-22-3 should be installed in a location where its display and switch are accessible in the event a new TPMS sensor needs to be installed in the system (see *BIM Learn Sensors Mode*). In situations where TPMS reception is not adequate inside the interior of the vehicle, the weatherproof TPMS Receiver Module can be mounted outside on the chassis near the center of the vehicle for better reception of the RF transmission signals from the TPMS sensors.

The BIM-22-3 system provides tire pressures in PSI (pounds per square inch) for each of the vehicle's four tires to a control box. When the vehicle is first turned on, dashes will be displayed on the gauge until the sensors have activated or "woken up" from their sleeping state. The sensors wake up by driving the vehicle or if a pressure change of at least 2 PSI has taken place. This behavior of going to sleep when the vehicle is not moving vastly prolongs a sensor's battery life. After the sensors wake up, they report pressures to the TPMS Receiver Module, which in turn are reported through the BIM-22-3 to the control box.

## Understanding the Different Sensor Modes

### **OFF/SHIPPING**

When sensors are shipped, they are in OFF/SHIPPING mode. In this mode the sensors will not take pressure readings or transmit any information. This prolongs the shelf life of the battery in the sensor.

### **STATIONARY**

When the sensors are installed into a tire and have pressure applied, the sensors will enter STATIONARY mode. In stationary mode the sensor will take pressure readings every 60 seconds. By taking pressure readings every 60 seconds the sensor can determine when it sees a change in pressure. When a sensor sees a change in pressure of greater than 2 PSI it will transmit its "Learn" information to the receiver.

### **ROLL**

Once a sensor is installed, under pressure and the vehicle is in motion the sensor will go into ROLL mode.

To ensure the sensors wake up and go into ROLL mode, the vehicle should be driven for at least 60 seconds at over 12.5 MPH (20 KPH).

In ROLL mode the sensors will regularly transmit data to the receiver once every 5 seconds.

### **SERVICE**

After the sensors have been in ROLL mode and then the vehicle comes to a stop the sensors will enter SERVICE mode and remain in this mode for 15 minutes.

In SERVICE mode the sensors will continue to sample and transmit pressure data every 5 seconds.

After the 15 minutes are up, the sensors revert back to STATIONARY mode.

The time required to do a sensor LEARN or LOCATE process can be greatly reduced, when the sensors are in SERVICE mode.

## Display Screens

Typical HDX/RTX Screens	Typical VHX Screens	Typical VFD3X Screen
		

Typical VFD3 Tire PSI Screens:	Note:
	Note: VFD3 systems can only display one tire pressure at a time on the message center. Pressure readings are displayed similar to other messages, and are preceded with LF, RF, LR, or RR.

## Setting Warning Levels and Sensor Locating

Low and high warning levels can be set individually for each tire/BIM channel.

Default low pressure warning is 25 PSI, and the default high pressure warning is 35 PSI.

The system will warn the driver when a tire's pressure has fallen below, or exceeded these levels.

On HDX and RTX systems, warnings are indicated to the user by red highlighted pressure values and an audible alarm (if buzzer is installed and enabled).

On VFD3 and VHX systems, warnings are indicated by the pressure values blinking on and off.

Follow the procedure that corresponds to your dash system.

### Locating Sensors

- The sensors shipped with your BIM-22-3 are pre-programmed to the receiver and BIM-22-3 module.
- Each sensor is color coded to be placed in a specific tire.

LOCATION	COLOR	BIM CHANNEL
Left Front	Red	3-BIM-22-3
Right Front	Green	4-BIM-22-3
Left Rear	Blue	5-BIM-22-3
Right Rear	Yellow	6-BIM-22-3

- However, in the event a sensor is installed in an incorrect location, or when tires are rotated, the system can be taught to "locate" the sensors without the need to move sensors to different tires.
- Use the **Locate** procedure which corresponds to your display system below for relocating sensor position.
- These procedures will only function properly if:
  - The original four TPMS sensors are mounted in tires on a vehicle.
  - The BIM-22-3 is picking up the sensors and all pressures are being displayed.
  - None of the sensors are replacements.
  - The BIM-22-3 is not a replacement or a serviced module.
- Separate sensor locating procedures for each of the following control systems are available on the Dakota Digital website for downloading and printing.
- The Locate feature in the setup of the dash menu, will not function:
  - If one or more sensors are replacement sensors
  - If the BIM-22-3 module was replaced or serviced
  - If the dash system will not display one or more pressures, as it does not understand the new parts.
  - The BIM-22-3 will have to be stepped through the Special Operating Modes **DP2** to learn all the sensors, on page XX.

## Setting Warning Levels on an HDX or RTX system:

1. **HDX** – Enter setup by holding both switches **after the key is turned on**.
  - a. Continue to hold until **RELEASE** is displayed. Release the switches.
2. **RTX** – Enter setup by holding Switch 1 (SW!) **then turn the key on**.
  - a. Release the switch when **SETUP** is displayed on the LCD.
3. Tap either switch to display **BIM**.
4. Press and hold either switch when **BIM** is highlight, wait until **RELEASE** is displayed – then release.
5. Tap either switch to highlight one of the four BIM-22-3 corners (**3 BIM-22-3**).
  - a. Each corner sensor is associated to a BIM channel.
  - b. If multiple BIMs are attached and there is conflict, hold the setup button on one of the smaller BIMs while turning the key on. That BIM will automatically adjust all BIM channels to avoid conflicts.
6. Press and hold either switch on a selected channel until the display shows **RELEASE** - then release.
7. New sub-menu options are **WARN LO, WARN HI, LOCATE, and BACK**.
8. Tap either switch to highlight **WARN LO** to set a low warning pressure.
9. Press and hold either switch until the display say **RELEASE** – then release.
10. The corner selected will display the low-pressure warning in highlighted red.
11. Tap SW1 or left switch to decrease pressure.
12. TAP SW2 or right switch to increase pressure.
13. Press and hold either switch to display **RELEASE** to save the desired low pressure warning point.
14. The menu will go back to **WARN LO, WARN HI, LOCATE, and BACK** in step 7.
15. You can set the **WARN HI** in the same manner as the **WARN LO**, or tap to highlight **BACK** to return.
16. Press and hold when **BACK** is highlighted to return to the four corners selection menu in step 5.
17. Repeat Step 5 for the remaining corner sensors, or go to **BACK** and hold to exit.

## Locating Sensors on an HDX or RTX system:

1. **HDX** – Enter setup by holding both switches **after the key is turned on**.
  - a. Continue to hold until **RELEASE** is displayed. Release the switches.
2. **RTX** – Enter setup by holding Switch 1 (SW!) **then turn the key on**.
  - a. Release the switch when **SETUP** is displayed on the LCD.
3. Tap either switch to display **BIM**.
4. Press and hold either switch when **BIM** is highlight, wait until **RELEASE** is displayed – then release.
5. Tap either switch to highlight one of the four BIM-22-3 corners (**3 BIM-22-3**).
6. Press and hold either switch on a selected channel until the display shows **RELEASE** - then release.
7. New sub-menu options are **WARN LO, WARN HI, LOCATE, and BACK**.
8. Tap either switch to highlight **LOCATE** to change sensor locations.
9. Press and hold either switch until the display shows **RELEASE** – then release.
  - a. If the message **FILL LOW TIRES** is displayed, fill tires to above the low pressure warning.
  - b. If no tire pressure(s) are being shown for a corner, deflate and inflate tires to display a pressure.
  - c. If one or more tire pressures do respond after several deflates and inflates over a couple of minutes, and the display shows “- -“, then stop and proceed to page 7.
10. **DEFLATE LEFT FRONT** will display – deflate a little pressure from that tire on the car.
  - a. If the car has been stationary for more than 15 minutes, it will take 60 seconds to see changes.
  - b. If the car was driven 5-10 minutes before starting **LOCATE**, the response time will be 5 seconds.
  - c. When the pressure sees a change, the instructions will say to change to another tire.
11. **DEFLATE RIGHT FRONT** will display – deflate a little pressure from that tire on the car.
12. **DEFLATE LEFT REAR** will display – deflate a little pressure from that tire on the car.
13. **FILL LOW TIRES** will appear as the Right Rear does not need deflating.
14. Inflate the three lower pressure tires to the proper tire pressure.
15. Tap either switch to return to the previous menu.
16. You may exit the menu as **BACK** is highlighted – press and hold until **RELEASE**, then release.

## Setting warning levels on a VHX system:

1. Hold the SW1 (I) switch from the instrument system control box while turning the key on.
  - a. The message display should show **SETUP**.
2. Release SW1 (I) - LCD1 should show **SETUP SPEED**.
3. Tap SW1 (I) until **SETUP BIM** is shown on the message display.
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.
5. If **FOUND 00** and **00 ERRORS** is shown:
  - a. Check and reseal all BIM connections.
  - b. Tap SW1 (I) to show **BIM DONE**. Tap SW1 (I) again to show **BIM SCAN**.
  - c. Press and hold SW1 (I) to scan for modules again.
6. If **FOUND 00** and **XX ERRORS** is shown (X= a number):
  - a. If multiple BIM units may be installed, the display may also show: **FOUND 01** and **00 ERRORS**.
  - b. Follow the "Change ID" for other BIM modules to correct conflicts, the enter setup again start over.
7. If **FOUND xx** and **00 ERRORS** shown (X=should be the number of BIM channels used):
  - a. One BIM-22-3 will read: **FOUND 04** and **00 ERRORS**.
  - b. If a BIM-22-3 is used with a BIM-19-2 the scan should read: **FOUND 08** and **00 ERRORS**.
  - c. Tap SW1 (I) until **BIM SCAN** is shown.
8. Tap SW1 (I) once so the display shows **BIM SETUP**.
  - a. The BIM setup options are **SCAN**, **SETUP**, and **DONE**.
9. Tap SW1 (I) once to display **SETUP**.
10. Press and hold SW1 (I) until the display will show **BIM CH 03 LF TIRE**.
  - a. If another BIM is present, you may see more BIM channels.
  - b. A BIM-04-2 will occupy **BIM CH 1 TEMP**.
  - c. Tap SW1 (I) to display **BIM CH 3 LF TIRE**.
11. Press and hold SW1 (I) to change display to **CH 03 LABEL LF TIRE**.
  - a. *The BIM-22-3 module will flash Err -02. It is **not** a problem during setup*
12. Press and hold SW1 (I) until **CH 03 LOW WARN SET** is displayed.
13. Releasing SW1 (I) will display the LF corner low air pressure warning point of 25 (factory default).
14. Tap SW1 (I) to increment the low-pressure warning point.
  - a. If 25 PSI is sufficient as a low-pressure point, press and hold SW1 (I) to save.
  - b. Low pressure range is from 05 to 99 PSI.
  - c. If you tap past your desired PSI, you must tap up 99 before it restarts at 05 PSI.
15. Press and hold SW1 (I) to save low pressure warning – **CH 03 HI WARN SET** will be display.
16. Releasing SW1 (I) will display the LF corner high air pressure warning of 35 (factory default).
17. Tap SW1 (I) to increment the high-pressure warning point.
  - a. If 35 PSI is sufficient as a high-pressure, point press and hold SW1 (I) to save.
  - b. Low pressure range is from 05 to 99 PSI.
  - c. If you tap past your desired PSI, you must tap up 99 before it restarts at 05 PSI.
18. Press and hold SW1 (I) to save high-pressure warning point.
19. When SW1 (I) is released, **TIRE LOCATE SKIP** will be displayed.
  - a. To do the **TIRE LOACTE** proceed to the next page.
  - b. To skip over Tire Locate press and hold SW1 (I) until **BIM CH 04 rF TIRE**.
  - c. Repeat step 11 to step 19 for remaining tires.
20. If done setting warning points and locations, tap SW1 (I) until **BIM SETUP DONE** is displayed.
21. Press and hold SW1 (I) until a big **DONE** is displayed. Release SW1 (I) and turn the key off.

## Locating sensors on a VHX system:

- ❖ From Step 19 of the previous page
- 1. Tap SW1 (I) once when the LCD displays **TIRE LOCATE SKIP**.
- 2. The display will switch to **TIRE LOCATE BEGIN**.
  - a. The second LCD will show the wheel location and possibly no pressure readings yet.
- 3. Make the tires are inflated to normal pressures (above low warning points).
- 4. Press and hold SW1 (I) to begin.
  - a. Tire pressures will show in LCD2.
- 5. If any corners show “- -“ a message of **FILL LOW TIRES** will be displayed.
  - a. If the message **FILL LOW TIRES** is displayed, fill tires to above low warning point.
  - b. Driving the car a few minutes will speed up the process and not show ‘Fill Low Tires’.
  - c. If no tire pressure(s) are being shown for a corner, deflate and inflate tires to display a pressure.
  - d. If one or more tire pressures do respond after several deflates and inflates over a couple of minutes, and the display shows “- -“, then stop and proceed to page 7.
- 6. Once tire pressures are being read and are at normal PSI, the message **DEFLATE LF** will appear.
  - a. Deflate that corner tire by only a few PSI, and wait a minute for the sensor to see the change.
  - b. If the car has been stationary for more than 15 minutes, it will take 60 seconds to see changes.
  - c. If the car was driven 5-10 minutes before starting LOCATE, the response time will be 5 seconds.
- 7. When a pressure drop is seen, **DEFLATE RF** will be displayed.
  - a. Deflate that corner tire by only a few PSI, and wait a minute for the sensor to see the change.
- 8. When a pressure drop is seen, **DEFLATE LR** will be displayed.
  - a. Deflate that corner tire by only a few PSI, and wait a minute for the sensor to see the change.
- 9. Once the LR sees a pressure drop **FILL LOW TIRES** will be displayed.
  - a. Fill the three tires back up to normal operating pressure.
  - b. The RR rear will not need to be deflated.
- 10. Tap SW1 (I) to exit the Locate menu.
- 11. **TIRE LOCATE DONE** will be displayed.
- 12. Tap SW1 (I) to go back to BIM pressure menu.
- 13. Tap SW1 (I) to display **BIM SETUP DONE**.
- 14. Press and hold SW1 (I) to exit BIM setup.

## setting warning levels on a VFD3 or VFD3X system:

1. Press and hold SW1 while turning the key on.
  - a. The message display will show **SETUP** while speed display will show **5E~~E~~**.
2. Release SW1 (I) to display **SPEED** and **5E~~E~~**.
3. Tap SW1 (I) several times to display **BIM** and **5E~~E~~**.
4. Press and hold SW1 (I) when **BIM** and **5E~~E~~** are displayed.
5. Keep holding to display **SCAN X** and **-**.
  - a. **X** = the number of BIM channels found, **4** will be displayed for only a BIM-22-3.
6. Release the SW1 (I) to display **SCAN** and **5E~~E~~**.
7. Tap SW1 (I) once, to display **SETUP** and **5E~~E~~**.
8. Press and hold SW1 (I) to display **SETUP** and **-**.
9. Releasing SW1 (I) will display **LF TIRE** and **[3]**.
  - a. *The BIM-22-3 module will flash **Err -02**. It is **not** a problem during setup.*
  - b. Each tire will have a different channel RF=C4, LF=C5, and RR=C6.
  - c. If a BIM-04-2 is connected, the displays will show **TEMP** and **C1**.
  - d. If a BIM-04-2 is connected, tap SW1 (I) once to change it to **LF TIRE** and **C3**.
10. Press and hold SW1 (I) until **LABEL** and **-** are displayed.
11. Release to display **LF TIRE** and **5E~~E~~**.
12. Press and hold SW1 (I) to display **WARN** and **-**. A second message center will display **LF TIRE**.
13. Release to display **L 25\*** and **5E~~E~~**. A second message will display **LF TIRE**.
  - a. **L** represents low pressure and the number is the PSI. **25** is the factory default.
  - b. A single message center will alternate between **L 25** and **LF TIRE**.
14. Tap SW1 (I) to increment the low-pressure warning point.
  - a. If **25** PSI is fine, then hold SW1 (I) until **L 25** and **-** are displayed.
  - b. The low-pressure range is **05** to **99** PSI.
  - c. If you tap past your desired PSI, you must tap up **99** before it restarts at **05** PSI.
15. Press and hold to save the low-pressure warning and **L XX** (XX=PSI value) and **-** are displayed.
16. Release SW1 (I) to display **H 35\*** and **5E~~E~~** are displayed. A second message center will display **LF TIRE**.
  - a. **H** represents high pressure and the number is the PSI. **35** is the factory default.
  - b. A single message center will alternate between **H 35** and **LF TIRE**.
17. Tap SW1 (I) to increment the high-pressure warning point.
  - a. If **35** PSI is fine, then hold SW1 (I) until **H 35** and **-** are displayed.
  - b. The low-pressure range is **05** to **99** PSI.
  - c. If you tap past your desired PSI, you must tap up **99** before it restarts at **05** PSI.
18. Press and hold to save the high-pressure warning and **H XX** (XX=PSI value) and **-** are displayed.
19. Release to display **SKIP** and **LDC**.
  - a. To do the Locate process see the next page.
20. Press and hold SW1 (I) to skip past the Location process, **SKIP** and **-** will display.
21. Release SW1 (I) to display **DONE** and **5E~~E~~**.
  - a. To change warnings more warnings, tap SW1 (I) to display another tire and repeat steps 6 to 21.
22. To exit: when **DONE** and **5E~~E~~** are displayed, press and hold SW1 (I) until **DONE** and **-** are displayed.

## Locating sensors on a VFD3 or VFD3X system:

- ❖ From Step 19: **SKIP** and **LOC** are displayed.
- Tap SW1 (I) once to change the display to **BEGIN** and **LOC**.
- Press and hold SW1 (I) to change the display to **FILL LO** and -. 2<sup>nd</sup> display = **TIRES**.
  - Release may show **X** (number of tires) **TIRES** and **LOC**. 2<sup>nd</sup> display = **FILL LO**.
  - A single message center will alternate between **X TIRES** and **FILL LO**.
  - The **FILL LO** message appears is because the sensors are not awake.
  - Driving the car a few minutes before doing the location process will awaken the sensors.
  - Deflating and inflating the tires could awaken sensors.
  - The VFD cannot display which sensor is low.
- If the sensors are awake the display would show **DEFLATE** and **LOC**. 2<sup>nd</sup> display = **LF TIRE**.
  - A single message center will alternate between **DEFLATE** and **LF TIRE**.
- Deflate that corner tire by only a few PSI, and wait a minute for the sensor to see the change.
  - If the car has been stationary for more than 15 minutes, it will take 60 seconds to see changes.
  - If the car was driven 5-10 minutes before starting Locate, the response time will be 5 seconds.
- When the LF sensor see a pressure drop **DEFLATE** and **LOC**. 2<sup>nd</sup> display **RF TIRE** will display.
  - A single message center will alternate between **DEFLATE** and **RF TIRE**.
- When the RF sensor see a pressure drop **DEFLATE** and **LOC**. 2<sup>nd</sup> display **LR TIRE** will display.
  - A single message center will alternate between **DEFLATE** and **LR TIRE**.
- When the RF sensor see a pressure drop **FILL LO** will display.
  - Fill the three tires back up to normal operating pressure.
  - The RR rear will not need to be deflated.
- Tap SW1 (I) once to display **DONE** and **SEt**.
- Press and hold SW1 (I) to display **DONE** and - to exit

## Special Operating Modes:

The BIM-22-3 has special operating modes that can be used for configuration or for reporting information on its display for trouble-shooting purposes. Note: **Display Pressures Mode** and **Display Battery Status Mode** will not function correctly until the sensors are in service mode. See **Understanding the Different Sensor Modes - Page 2** for information on how to get the sensors into service mode.

These modes can be selected using the following steps:

- Hold the switch on the BIM while turning the key on. The BIM display will show the current revision code while the switch is being held.  
Example: 321
- Release the switch. The display will show the characters -OP to indicate you have entered the Special Operating Modes menu.
- Press and release the switch to cycle through the available modes. OP1 through OP6 are displayed as you repeatedly press and release the switch.
- The *Special Operating Modes* are as follows:

OP1 **Auto ID Setup.** To select, press and hold until Ach is displayed. This mode auto selects BIM channels for each sensor. Upon releasing the switch, the BIM display will begin sequencing a bar across the display - - - while it auto detects channel IDs. After it is complete, the BIM will display the ID of the first auto-selected channel (example: C11). Turn the key off then back on to have the system start up with this configuration.

OP2 **BIM Learn Sensors Mode.** To select, press and hold until Lrn is displayed. This mode is used for learning new TPMS sensors in the event one or more is damaged. For more information concerning this mode, refer to the section **BIM Learn Sensors Mode – Page 11**.

OP3 **BIM Locate Sensors Mode.** To select, press and hold until Loc is displayed. This mode is used for locating sensors before installing the instrument system. For more information concerning this mode, refer to the section **BIM Locate Sensors Mode – Page 12**.

OP4 **Display Pressures Mode.** To select, press and hold until PrE is displayed. This mode continuously displays each sensor's location followed by its pressure. This will continue until the next key off/on cycle.

Example: LF 30 rF 29 Lr 31 rR 32

OP5 **Display Sensor IDs Mode:** To select, press and hold until IdS is displayed. This mode continuously displays each sensor's location followed by its sensor ID. This is an 8 digit alphanumeric number corresponding to the number located next to the label "ASIC" on the sensor itself. It is used by the TPMS Receiver Module to identify sensors. This display will continue until the next key off/on cycle. See the example below:

LF 45 IF 91 32 rF 45 31 d8 EF  
Lr 45 27 77 F7 rR 45 26 d2 27

OP6 **Display Battery Status Mode:** To select, press and hold until bAt is displayed. This mode continuously displays each sensor's location followed by its battery status. This will continue until the next key off/on cycle.

- - Is displayed if the sensor is inactive or missing.

-1- - Is displayed if the sensor's battery is OK.

-0- - Is displayed if the sensor's battery is low.

Under normal driving conditions, a low battery means you have approximately 2 months of battery life left.

Example: LF - rF -0- Lr -1- rR -1-

## **OP7 Select Sensor Set Mode.**

If one buys an additional set of sensors for replacement or for a different application, the BIM-22-3 must know which set of sensors it will be using. It can only work with four sensors at any one time. By default the sensors sent along are mated to the BIM-22-3 as sensor set A AND B.

If the sensors are mixed, then the Learn process on page 11 must be followed.

To select, press and hold until **SEL** is displayed.

This mode allows the user to select between 2 sets of sensors. When the switch is released, the display will show the currently selected sensor set. By momentarily pushing the switch the display will toggle between **A** and **b**. When the desired set is displayed hold the switch until **---** is displayed to select that set of sensors. When the switch is released the BIM-22-2 will return to normal operating mode using the selected set of sensors.

Note: When the BIM-22-2 is shipped it has both sets, A and B, set to the sensor ID's for sensors that are shipped with the system.

The second set of sensors will need to be learned.

Select the set, A or B, that you want to learn the new sensors to before doing a learn process.

## BIM Learn Sensors Mode:

Dakota Digital takes care of the initial configuration of the BIM-22-3 and associated TPMS Receiver Module and TPMS sensors so you should not have to go through this process. However, in the event a sensor is damaged during installation in a tire, upon tire replacement or if its battery has depleted, the module can “learn” new sensors. Make sure there are no other TPMS sensors similar to those provided with the BIM-22-3 in the surrounding area as the system could receive from them and have adverse effects on this procedure. This includes any sensors you are replacing. This mode will only function properly if all four TPMS sensors (including the new one(s)) are mounted in tires. If you want useful audible notification during this process (HDX and RTX only), enable the sound and increase its volume. For example, HDX or RTX: in the Setup->SW, Sound->Volume). Be sure to exit setup as alarms are not enabled while in the HDX/RTX setup menu. Follow the procedure below to configure the BIM-22-3 to detect and replace with new sensor(s):

- Have sensors installed into tires and pressurize. This will take a new sensor out of shipping mode so that the sensor will transmit its “Learn” information to the receiver when it sees a change in pressure. Note that the learn process requires you to learn all 4 sensors as the sensor ID’s are cleared out at the beginning of this process to avoid duplicate ID errors. See **Understanding the Different Sensor Modes – Page 2** for info on how to reduce the time required for this process by putting the sensors into service mode.
- Follow the steps in the section *Special Operating Modes* to get to the **[0P2]** - *BIM Learn Sensors Mode*. Once in this mode, the BIM will start displaying **[Lrn]** and alternately. This indicates the BIM-22-3 is ready to begin the learn process for the Left Front sensor
- To begin the learn process hold the switch on the BIM-22-3 for greater than one second or until the display shows a “-“, then release the switch. The “-“ should be blinking on and off indicating the learn process has started. You now have 45 seconds to change the pressure in the tire by more than 2 PSI to activate the sensor.
- The display on the BIM-22-3 will continue to display the blinking “-“ until it has learned the sensor. Once it has learned the left front sensor it will display **[Lrn]** and **[rF]** alternately. If there was a problem encountered learning the sensor it will display an error message by alternately displaying **[Err]** and the error code. An example would be **[Err]** then **[-03]**. A list of error codes is provided later for troubleshooting.
- To begin the learn process for the right front sensor press and hold the switch on the BIM-22-3 as you did for the left front above. Then reduce the pressure in the right front tire by greater than 2 PSI. The BIM-22-3 will continue displaying the blinking “-“ until it has learned the right front sensor. Once it has learned the right front sensor it will display **[Lrn]** and **[rR]** alternately.
- To begin the learn process for the right rear sensor press and hold the switch on the BIM-22-3 as you did for the sensors above. Then reduce the pressure in the right rear tire by greater than 2 PSI. The BIM-22-3 will continue displaying the blinking “-“ until it has learned the right rear sensor. Once it has learned the right rear sensor it will display **[Lrn]** and **[Lr]** alternately.
- To begin the learn process for the left rear sensor press and hold the switch on the BIM-22-3 as you did for the sensors above. Then reduce the pressure in the left rear tire by greater than 2 PSI. The BIM-22-3 will continue displaying the blinking “-“ until it has learned the left rear sensor. Once it has learned the left rear sensor it will display **[End]** momentarily and then exit the learn mode.

### Learn Error Codes:

Code	Description
-04	Wheel unit learn stopped without success
-05	Wheel unit learn timed out
-06	Duplicate ID
-07	Learn aborted
-08	Problem with wheel unit learn diagnostic session
-09	Problem with request new wheel unit ID message
-10	Problem sending wheel unit flow control message

## BIM Locate Sensors Mode:

Locating sensor positions on the vehicle can be done via a Dakota Digital instrument system or it can be done on the BIM-22-3 before the instruments are installed. The procedure below explains how to do this using the BIM-22-3. The sensors are shipped marked with colors indicating which tire on the vehicle they are to be mounted (LF = Red, RF = Green, LR = Blue, and RR = Yellow). However, in the event a tire is installed in an incorrect location or when tires are rotated, the module can be taught to “locate” the sensors. This mode will only function correctly if all four TPMS Sensors are mounted in tires and on a vehicle. If you want useful audible notification during this process (in HDX or RTX systems only), enable the sound and increase its volume in the gauge cluster. This setting is located in the Setup>SW, Sound>Volume. Be sure to exit setup as alarms are not enabled when in the HDX/RTX Setup menu. Follow the procedure below to use the BIM-22-3 to locate the sensors:

- Follow the steps in the section *Special Operating Modes* to get to the BIM Locate Sensors Mode.
- Once in this mode, the BIM needs to determine the initial pressures of the tires before going through the locate process. It will start by displaying and alternately to show the number of tires whose initial pressures still need to be determined. Each tire’s pressure has to change more than 2 PSI to wake up its sensor. This locate procedure requires the tires’ initial pressures be more than 10 PSI. The displayed number of sensors will decrease until all four tires’ initial pressures have been determined and will momentarily be displayed. If connected to an instrument system with a buzzer, a momentary alarm will sound each time the number decreases. See **Understanding the Different Sensor Modes – Page 2** for info on how to reduce the time required for this process by putting the sensors into service mode.
- After all four sensors have been awakened and initial pressures are determined in the previous step, the characters and will alternately be displayed to indicate it is time to locate the Left Front sensor. At this time, deflate the tire positioned at the Left Front of the vehicle at least 2 PSI or until the characters and are displayed. The alarm will momentarily sound (if enabled) when this happens.
- Follow the same procedure for the Right Front tire of the vehicle until and are displayed and the alarm sounds.
- Follow the same procedure for the Left Rear tire of the vehicle. Once this sensor’s location is determined, the Right Rear sensor’s location will automatically be determined. and are momentarily displayed then and will be displayed until the BIM switch is pressed, which puts the BIM in normal operation.

## Troubleshooting quick tips:

While the BIM is operating, the dot in the upper left corner of the display will indicate the status.

**On Steady:** indicates it is powered up but not receiving any bus activity.

**Flashing:** indicates it is communicating on the bus.

To see the channel and sensor status on the BIM display, with power on - press and hold the switch.

The display will cycle through three screens:

- Channel Status – The display will show the letter followed by the channel ID for the first sensor. is displayed to indicate Channel Error or a bus ID conflict on one of the channels.  
Examples:
- Active Sensors - The display will show a “-“ at the locations a sensor is active and awake. The center segment will be on regardless of which sensors are active and awake.  
Examples:  
All active: LF inactive or missing:
- Pressures - The display will show “-“ in each sensor’s location along with the sensor’s pressure. Dashes will be displayed if the sensor is not awake.  
Examples:  
LF: RF: LR: RR: LF inactive:

## Troubleshooting guide:

PROBLEM	POSSIBLE CAUSE(S)	POSSIBLE SOLUTIONS(S)
BIM-22-3 will not light BIM-22-3 is not recognized by control box BIM-22-3 has steady dot	BIM cable not connected  Bad data connection in BIM cable	Connect BIM cable  Reseat BIM cable, check continuity on green wires
BIM-22-3 displays <b>CHE</b>	Channel conflict with another BIM	Correct conflict – see <b>DP 1</b> on page 9
Gauge displays -- at all four corners at when starting car	Sensors have not woken up	Drive vehicle until sensors wake up and tire pressure is displayed. Change the associated tire's pressure by inflating or deflating with a pressure change of more than 2 PSI.
One or more sensors reads <b>--</b> on Tire PSI screen after extended period of driving time even though tire does have pressure.	TPMS Receiver Module is not receiving from the TPMS sensors  Sensor needs to be "learned"  If a sensor functioned previously but now it never wakes up, it is possible its battery has depleted.	Try moving the TPMS Receiver Module to a location outside the vehicle to see if it receives from the TPMS sensors.  If a sensor needs to be "learned", follow <b>QPC</b> <i>BIM Learn Sensors Mode</i> in the section <i>Special Operating Modes</i> to relearn the sensor(s).  Follow <b>QPB</b> - <i>Display Battery Status Mode</i> in the section <i>Special Operating Modes</i> to determine the sensor's battery status.  If sensor is still not detected, order replacement sensor(s) (see instructions).
Gauge repeatedly displays <b>--</b> then <b>EE</b> on all 4 Tire PSI locations.  BIM repeatedly displays <b>Err</b> then <b>-01</b> .	This error is a result of the TPMS Receiver Module not being detected by the BIM-22-3 on power up.  TPMS Receiver Module is not connected to the BIM.  TPMS Receiver Module is damaged.	Connect Input on BIM to TPMS Receiver Module (see wiring diagram).  Inspect and reconnect wires and power up again.  Return TPMS Receiver Module for service. (See instructions).
BIM repeatedly displays <b>Err</b> then <b>-02</b> .	This error message occurs when the BIM-22-3 does not receive vehicle speed from a control box or a BIM-01-2.  If this is displayed when the control box gauge is not in the SETUP menu, the BIM to control box interface harness is not connected or it is loose or faulty.	Note that this BIM display message will occur on VHX, VFD3, and VFD3X systems during the locate procedure because those systems do not send the vehicle speed while in the SETUP menu. This is normal and no solution is necessary.  Inspect and reconnect interface harness.  Replace BIM harness, 394191
Gauge displays "FILL LOW TIRES" during locate procedure	One or more TPMS sensors need to be woken up.  One or more tires do not have more than 20 PSI in them.	Inflate all tires with a 2 PSI change in pressure to wake up all sensors.  Inflate all tires until all of them contain more than 20 PSI.
Audio alarm (HDX/RTX only) is not heard during: Gauge LOCATE procedure or BIM Learn procedure or BIM Locate procedure	Alarm is not connected to the gauge cluster.  Gauge cluster is in SETUP menu.	Ensure alarm harness is connected to gauge cluster.  Exit the SETUP menu.
Tire pressure values do not agree with the location indicated on the instrument's TIRE PSI screen.	Sensors were installed in wrong location.  Locate procedure was not followed after a tire rotation.	Follow the gauge system's locate procedure or the BIM locate procedure.
Valve stem is damaged but sensor is OK.	Valve stem damaged during installation or during operation.	Rubber valve stems are universal, find a replacement that will accept any TPMS type sensor, and transfer our TPMS sensor.

## Technical specifications

Minimum operating voltage	9 volts
Maximum operating voltage	16 volts (operating over 15 volts for an extended time, can damage unit)
Typical current draw (@ 13.8V)	< 0.10 A for BIM-22-3 and associated TPMS Receiver Module.
Maximum pressure reading	99 psi
Gauge Resolution	1 psi
Low / High Warning Level range	5 – 99 psi
Default Low Warning	25 psi
Default High Warning	35 psi
Number of BIM ID numbers used	4 (one for each sensor)
Default BIM ID numbers	3 - 6

**Control Box Compatibility** - The following versions of software (or newer) are required to function with the BIM-22-3 (Note: All RTX systems support this option):

Control Box / Dash	Minimum Software Version Required
VFD3 Control Box	<i>SE4B</i>
VFD3X Control Box	<i>SE5A</i>
VHX Control Box	<i>VX0A (10)</i>
VHX Gauge Cluster	<i>####.010</i> (Example: VJ90.010)
HDX Control Box	<i>HX02 or RX01</i>
HDX Gauge Cluster	<i>Any</i>
RTX Control Box	<i>RX01</i>
RTX Gauge Cluster	<i>Any</i>

**NOTES:**

## **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](http://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 24 Month 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 within 24 MONTHS FROM THE DATE OF PURCHASE, 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 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.

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.

Any action for breach of any warranty hereunder, including any implied warranty of merchantability, must be brought within a period of 24 months from date of original purchase.

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](http://www.P65Warnings.ca.gov)



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