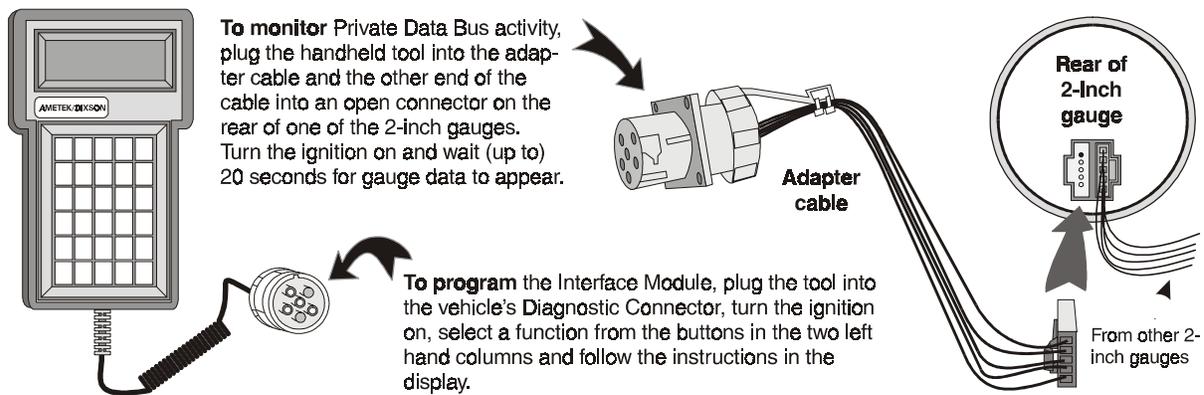


Subject: User Guide for the SmartGage Handheld Tool	Initial Release Date: 02/25/98	Revision Date:	Revision: -
	Product Group: Heavy Duty Instrumentation		Page: 1 of 2

1. Introduction

The handheld tool is designed for use with the SmartGage instrumentation system (Model 320 truck) with either Mechanical or Electronic engine installations. The tool lets you program the Interface Module (IM) and monitor the data to the gauges without additional equipment. It obtains its power from the vehicle and can be connected while the ignition is on or off. A four-line liquid crystal display guides you through the programming and monitoring steps. The tool “clicks” when a button is pressed and beeps three times if an invalid selection is made.



2. Programming the Interface Module via the Public Data Bus

To program the vehicle's Interface Module, connect the tool to the vehicle's Diagnostic Connector and switch on the ignition. The tool will display data about itself and the Interface Module. When it is ready to accept your input, it will display **SELECT A FUNCTION**. Available functions are printed on the buttons in the first two columns. The following table lists the functions and steps that can (or must) be programmed based on the type of engine installed in the vehicle. If unsure which type is installed, refer to your ECAT system.

Keypad Functions	Mechanical IM Part Numbers	Electronic IM Part Numbers
Tach Full Scale (Freq)	Must be programmed (See step 1)	Not applicable
Speedo Full Scale (Freq)	Must be programmed (See step 2)	Not applicable
Tire Revs per Mile	Must be programmed (See step 3)	Not applicable
Rear Axle Ratio	Must be programmed (See step 4)	Not applicable
Pressure Port 2A	Not applicable	Optional (See step 5)
Pressure Port 2B, 3A, and 3B	Optional (See step 5)	Optional (See step 5)
Pressure Port 4A and 4B	Not applicable	Optional (See step 5)

Note - For common values required in the following steps, refer to drawing SK26022 in the Smart Gage Service Manual (22-01570).

1. Calculate the Tachometer Full Scale Frequency using the following formula, then press the Tach Full Scale button and enter the result (follow the instructions in display):

$$\text{TACH FULL SCALE FREQUENCY} = \# \text{ of Flywheel Teeth} \times 3000 / 60$$

2. Calculate the Speedometer Full Scale Frequency using the following formula, then press the Speedo Full Scale button and enter the result (follow the instructions in the display):

$$\text{SPEEDO FULL SCALE FREQUENCY} = \text{Tire Revolutions per Mile} \times \text{Transmission Sender Pulses per Revolution} \times \text{Rear Axle Ratio} \times 80 \times \text{Transmission Outlet Ratio} / 3600$$

3. Press the Tire Revs per Mile button and enter the correct value.
4. Press the Rear Axle Ratio button and enter the correct value.
5. Press the appropriate pressure port button and choose the port to be programmed by following the instructions in the display. Note that not all interface modules use these option ports. You only need to program those ports that are actually used. After programming a port to a particular gauge, make sure no other ports are programmed to that gauge. If one is, program the unused port to an unused gauge. To help determine the vehicle's configuration, refer to your ECAT system.

3. Monitoring Gauge Data via the Private Data Bus

The tool's ability to monitor data to the gauges is useful for checking gauge operation and general accuracy, and for checking the operation of the Private Data Bus. To monitor the Private Data Bus and view the data it sends to the gauges, attach the adapter cable to the tool's connector. Then locate an empty connector on the rear of a 2-inch gauge and plug the adapter into it (gauge may vary).

Once the tool is connected and the ignition is on, the tool should display a version number followed by **ANALYZING DATA BUS**. A few (up to 20) seconds later it will start displaying gauge data. You may view gauge data by following the instructions in the display.

4. Diagnostic Messages

TRYING TO GET VERSION # and IM TIMEOUT! - If the display alternates between these two messages, the tool has detected a problem with the Public or Private Data Bus. Check the wiring between the Interface Module and the Diagnostic Connector (or 2-inch gauges if monitoring gauge data).

NA - Either the gauge is being told to read zero, or the signal into the Interface Module is out of range for that particular gauge.

NO DATA - The tool has not yet received data (the process may take up to 20 seconds).

***Note** - Data for all possible gauges is displayed, even for those not installed in the vehicle. You only need to be concerned with those gauges that are actually installed.*

5. For Additional Support...

Troubleshooting assistance is available from our Service Department Monday through Thursday (7 a.m. to 5:30 MST) and Friday (7 a.m. to 3:30 p.m.), at (970) 244-1243.