

Dakota Digital

SERIES II

VFD DIGITAL INFORMATION SYSTEM

*The latest in digital technology for the
motorcycle enthusiast.*

INSTALLATION AND OPERATION MANUAL

Please read this before beginning installation or wiring.

MODEL HLY-2000

**SPEEDOMETER/TACHOMETER
INFORMATION SYSTEM**

Dakota Digital

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POWER

Connect the red wire from the main harness to accessory power from the ignition switch. In addition to powering the display system, this is also where the low voltage detection circuit monitors the electrical system voltage.

A good quality, solid state ignition switch should be used. The contacts on a mechanical “bar” switch can bounce due to the vibration and cause the system to momentarily lose power and reset itself.

Never connect this to a battery charger alone. It needs to have a 12 volt battery connected to it. Battery chargers have an unregulated voltage output that will cause the system to not operate properly.

GROUND

The black wire is the main ground for display system. This should be connected directly to the negative cable on the battery. Connecting to a tank or frame ground can cause a weak or intermittent ground connection. A poor ground connection can cause improper or erratic operation.

SPEEDOMETER

Failure to calibrate the speedometer may cause your odometer mileage to increase very rapidly.

The speed input connector plugs into the speed sensor to tell how fast you are traveling. On cable driven applications, the external sensor connects to the speedometer cable and provides the electric signal. The sensor is normally bolted directly to the bottom of the speedometer, but can also be remote mounted. The sensor has a 5/8” coarse thread fitting that accepts mid-80’s and earlier cables directly. For newer cycles the speedometer cable will need to be replaced with one having the correct fitting.

With transmissions having the built-in electric sensor, a three-wire harness adapter connects the transmission speed sensor to the speedometer. This system will also accept most after-market inductive, Hall-effect, or ground switch sensors.

The speedometer is fully adjustable and calibration is discussed in a later section.

SPEEDOMETER CALIBRATION

The speedometer calibration is done using the function (trip) switch. The speedometer can be calibrated two different ways. The first method is to place the unit in auto-cal mode and drive exactly one mile (one km for metric). The second method is to place the unit in adjust mode and the speed reading can be moved up or down while driving.

METHOD 1, AUTOCAL

1. Make sure the key is off so the gauge is not powered.
2. Press and hold the function switch.
3. Turn the key on. With the switch still held, start the bike. The display will show “--”.
4. Release the function switch. The display will switch between “AUtO” (auto cal), “AdJ” (adjust), “CYL” (cylinder select), and “SEt” (shift bar). The odometer will show “SELEct”
5. When “AUtO” is displayed press the function switch. This will place the unit in auto calibration mode.
6. Release the function switch. The odometer display will show all zeroes.
7. Drive exactly one mile (or 1km). The odometer will show the number of signal pulses received from the speed sensor and the speedometer should still display “AUtO”.
8. Press and release the function switch. The calibration value will be calculated and stored. The gauge will now restart in normal mode with the new speed calibration.

METHOD 2, ADJUST SPEED

1. Make sure the key is off so the gauge is not powered.
2. Press and hold the function switch.
3. Turn the key on. With the switch still held, start the bike. The display will show “--”.
4. Release the function switch. The display will switch between “AUtO” (auto cal), “AdJ” (adjust), “CYL” (cylinder select), and “SEt” (shift bar). The odometer will show “SELEct”
5. When “AdJ” is displayed press the function switch. This will place the unit in calibration adjustment mode.
6. Release the function switch. The display shows the speed and the odometer will show “AdJUST”
7. Drive at a known speed. Following another vehicle that is driving at a constant, known speed can do this.
8. Press the function switch. The speed reading will begin increasing until the function switch is released. The next time the function switch is pressed, the speed reading will begin decreasing until it is released.
9. Once the speedometer is reading correct release the function switch. The new calibration will be saved if no adjustments are made for 7-10 seconds.

TACHOMETER

The tachometer is used by connecting the yellow wire from the main harness to the negative side of the coil or to an ignition module tach output. The tachometer is adjustable for 1, 2, or 8 cylinder settings. The 1 cylinder setting is used for single-fire ignition systems without a buffered tach output.

The following instructions are used to set the tachometer calibration:

1. Make sure the key is off so the gauge is not powered.
2. Press and hold the function switch.
3. Turn the key on so the gauge is powered. The display will show "--".
4. Release the function switch. The display will switch between "AUtO" (auto cal), "AdJ" (adjust), "CYL" (cylinder select), and "SEt" (shift bar). The odometer will show "SELEct"
5. When "CYL" is displayed press the function switch. This will place the unit in the tach calibration mode.
6. Release the function switch. The display will switch between "1CYL", "2CYL", and "8CYL". The tach bar will light up two bars above the corresponding number.
7. When the desired setting is displayed, 1, 2, or 8, press the function switch. The display will show "tACH".
8. Release the function switch. The system will now start up normally with the new setting.

TACHOMETER RED LINE/SHIFT INDICATOR

A single bar will light up to indicate a shift point or red line. The rpm where the bar lights up is user selectable and can be turned off completely if desired. The bar is factory set to about 5000 rpm.

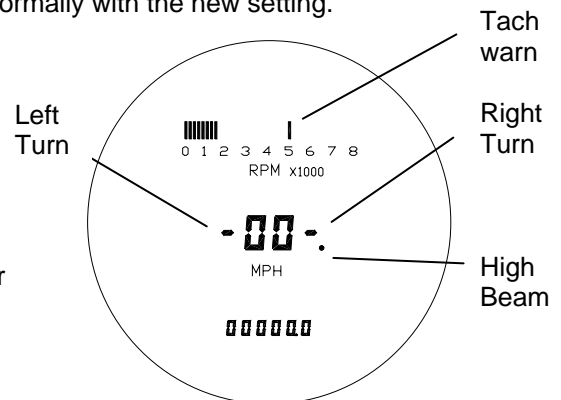
The following instructions are used to set the tachometer warning bar:

1. Make sure the key is off so the gauge is not powered.
2. Press and hold the function switch.
3. Turn the key on so the gauge is powered. The display will show "--".
4. Release the function switch. The display will switch between "AUtO" (auto cal), "AdJ" (adjust), "CYL" (cylinder select), and "SEt" (shift bar). The odometer will show "SELEct"
5. When "SEt" is displayed press the function switch. This will place the unit in the shift/red line set mode.
6. Release the function switch. The bar display will start at 2 and begin moving up. After it reaches the top it will go out and then start back at 2.
7. When the desired rpm setting is displayed press the function switch. To disable this feature, press the function switch while the bar is not displayed. The display will show "tACH" once the new setting is stored.
8. Release the function switch. The system will now start up normally with the new setting.

TURN SIGNAL & HIGH BEAM INDICATORS

The right turn, left turn, and high beam indicators are activated by 12 volts at their respective hook-up wires. The

right turn signal wire is green, the left turn signal wire is orange, and the high beam wire is purple. These can be connected to the same wires that the indicator lights are connected to. The display system wire colors may not match the wire colors in your electrical wire harness.



TRIP ODOMETER & FUNCTION SWITCH

The trip odometer is activated by the push button function switch supplied with your display system. The button mounts into the opening for the analog speedometer trip reset that is located on the right side of your speedometer housing (left side on 1995 and newer). Connect one wire from the function switch to a ground terminal and connect the other wire to the white/blue wire from the display system.

Pressing and releasing the button will toggle the display from the odometer to the trip odometer or from the trip odometer to the odometer. Pressing and holding the button while the trip odometer is displayed will reset the trip odometer. The trip odometer will read from 0 to 999.9 miles. When the trip odometer is displayed a "t" will show up on the left side of the numbers. "t 000.0"

The sealed push button function switch supplied with the system will operate the trip odometer. It can be mounted into the hole where the trip reset handle was on your original speedometer. The function switch goes on the inside and the sealed switch cap attaches from the outside.

NEUTRAL INDICATOR

The neutral indicator is activated when the blue wire is grounded. Connect this wire to the neutral switch or to the negative side of the neutral indicator light. When the indicator is activated, a bar on either side of the odometer display will move up and down as shown in the diagram.

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NIGHT DIMMING

Your display system has a dimming feature that dims the display intensity. Normally the system is at full brightness for daytime viewing. When the brown wire has 12 volts the display intensity will be reduced. A toggle or on/off push button switch can be connected to this wire if this feature is desired. To have the system at full brightness all of the time leave the brown wire disconnected.

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LOW OIL PRESSURE AND LOW VOLTAGE INDICATORS

The low oil pressure warning is activated when the gray wire is grounded. Connect this wire to the oil pressure switch or the negative side of the oil warning light. The low voltage warning is activated when the voltage at the red power wire drops below 11 volts and there is a tachometer signal. The warning message will be displayed in the odometer area. Press the function switch will clear the warning and return the mileage reading for 30 seconds. If there is both a low voltage and low oil warning at the same time, the low oil will be displayed.



TURN SIGNAL CANCEL OUTPUT

The display system also has a speed output signal for cycles equipped with an automatic turn signal cancel module. The white wire from the main harness should be connected to the module where the wire from the original analog speedometer was connected.

WIRING

In order to ensure that there are no problems with voltage drops causing the system to shut down, a heavy duty, solid state ignition switch is recommended. Also, the black wire should be connected directly to the negative battery terminal to avoid erratic operation due to a poor ground connection.

A complete description of the hookup for each wire is discussed in the previous sections of the installation manual. The typical color code for the stock wiring harness is provided to help in wiring. Dakota Digital does not guarantee that this is correct for all models and should only be used for reference. Not all wires will be found in all bikes. Some bikes may have the same color wire used in more than one place. The wire color code for the main display system harness is as follows:

HLY-2000	Stock harness color	Function
RED	ORANGE/WHITE	+12 volt with key on
BLACK	BLACK	ground (connect directly to battery negative)
ring terminal		connect to a case mounting screw
YELLOW	PINK	tachometer signal
PURPLE	WHITE	high beam indicator
ORANGE	VIOLET	left turn indicator
GREEN	BROWN	right turn indicator
BLUE	TAN	neutral indicator
GRAY	GREEN/YELLOW	oil warning indicator
WHITE/BLUE	use supplied switch	function (trip select/reset) switch
WHITE	WHITE/GREEN	output speed signal
BROWN	normally not used	night dimming

Speedometer connection varies depending on the year and model of the cycle. Using different speed adapter kits the speedometer can read a speedometer cable, a stock electric transmission speed sensor, or an aftermarket gear-tooth sensor. Each adapter kit connects to the speedometer using the three pin connector on the bottom of the system.

The cable adapter accepts a 5/8" thread fitting and can be mounted to the bottom of the system using the supplied bracket or remote mounted. Cycles that have a metric-threaded speedometer cable will need to have the cable modified or replaced.

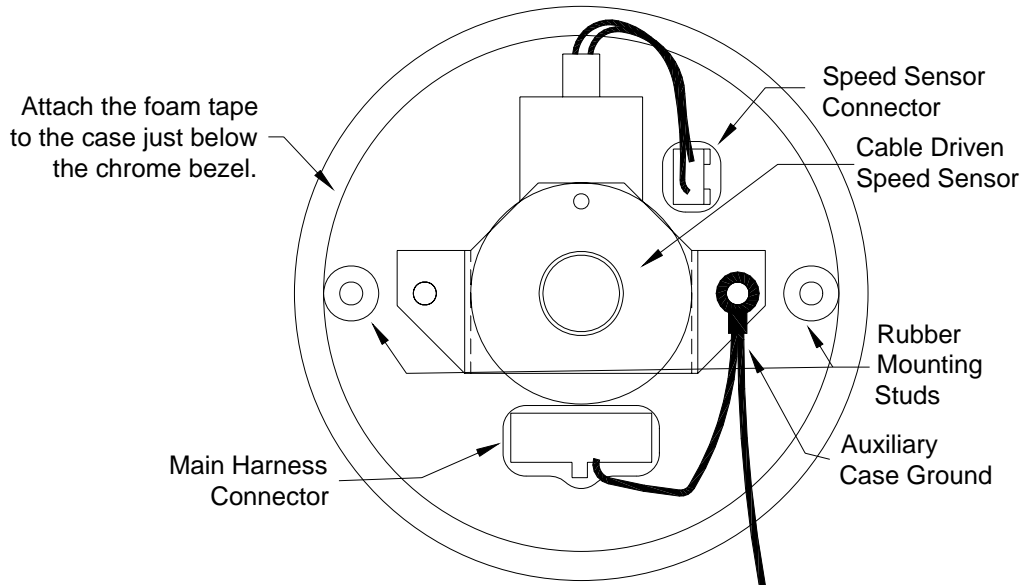
The adapter harness for using a stock transmission speed sensor converts the triangular connector to the in-line connector on the speed/tach system.

The gear-tooth sensor kit consists of a two-terminal sensor and a harness to connect it to the speed/tach system. The sensor needs to be mounted within 1/8" of the teeth on a final drive gear.

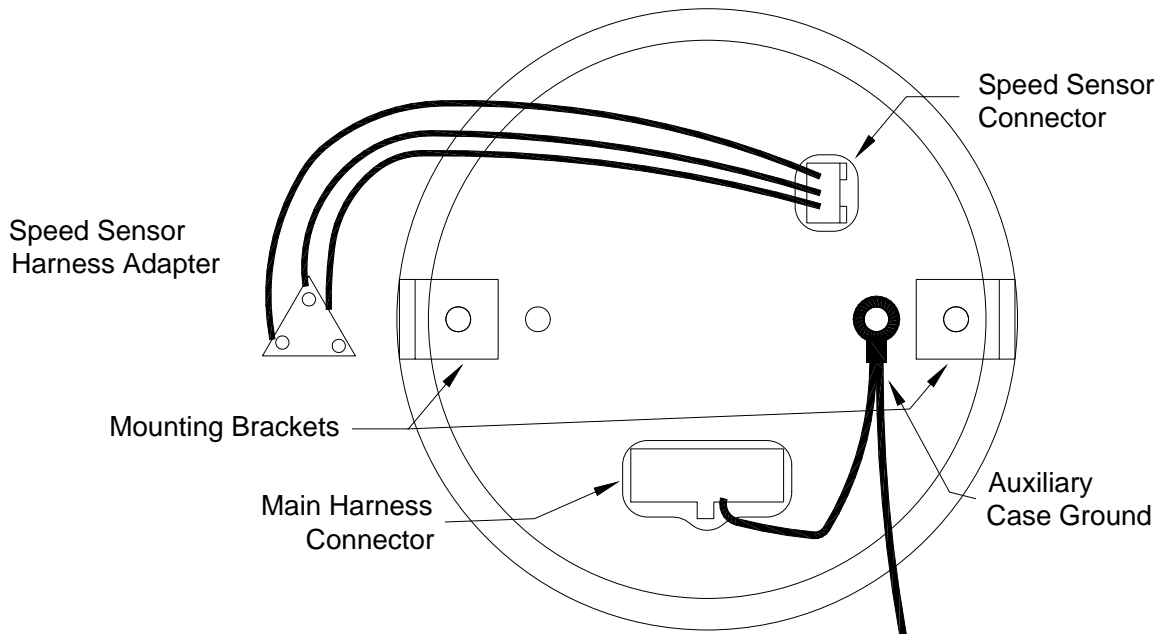
MOUNTING

The base system is universal enough to fit in either a new-style, clip-in (1995 or newer) or into the older style, bolt-in. The rubber mounts with studs on both sides are used for the bolt-in style. The L-brackets are used for the clip in style.

Mounting hardware and speed sensor connection for the bolt-in system with a speedometer cable.



Mounting hardware and speed sensor connection for the clip-in system with an electric, transmission speed sensor.



Troubleshooting guide.

Problem

Gauge will not light up

Possible cause

Red wire does not have power.

Solution

Connect to a location that has power.

Black wire is not getting a good ground.

Connect ground to a different location.

Gauge is damaged.

Return gauge for repair. (see instructions)

Gauge lights up, but displays "SPd" "Err"

Speed calibration is invalid

Gauge must be recalibrated (see instructions).

Gauge lights up, but displays "tCH" "Err"

Tach calibration is invalid

Reset cylinder selection (see instructions).

Gauge lights up, but displays just "Err" only

Gauge is damaged.

Return gauge for repair. (see instructions)

Gauge lights up, but speed will only show zero.

Speed harness is not connected properly to speedometer.

Check 3 pin connector on the bottom of the speedometer.

Speed harness is not connected properly to sensor.

Check connection from speed harness to the speed sensor.

Speed sensor not grounded properly.

Move ground to different location, preferably close to speedometer ground.

Speed sensor is not being turned by the cable.

Check cable connection at both ends
Sensor can be tested by spinning the cable with a drill.

Sensor is not sending a speed signal.

See speed sensor voltage checks listed below.

Speed reading is erratic or jumps around.

Gauge is not calibrated

Gauge must be recalibrated (see instructions).

Speed sensor wire is loose or broken.

Check all wire connections and inspect wire for breaks.

Cable is loose or broken.

Check cable between sensor and transmission.

Poor ground connection.

Check ground connection on speedometer and sensor.

Speed reading is incorrect.

Gauge is not calibrated correctly.

Gauge must be calibrated (see instructions).

Speedometer reads "255" while driving.

Gauge is not calibrated correctly.

Gauge must be calibrated using "auto cal" (see instructions).

Gauge lights up, but tach will only show zero.

Yellow wire is not connected properly.

Check connection from yellow wire to tach signal wire.

Ignition system not grounded properly.

Check engine and ignition system grounds.

Gauge is not grounded properly.

Check gauge and engine grounds.

Tach reading is erratic or jumps around.

Gauge is not calibrated

Gauge must be recalibrated (see instructions).

Tach signal wire is loose or broken.

Check all wire connections and inspect wire for breaks.

Poor ground connection.

Check ground connection on tachometer and engine.

Tach reading is incorrect.

Gauge is not calibrated correctly.

Gauge must be calibrated (see instructions).

Gauge remains dim at all times.

Brown wire is getting power all of the time.

Connect brown wire to location that can be turned off during the day.

Speed sensor voltage checks. All checks should be made with the sensor connected to the gauge and the key on. Checks should be done with a volt meter and not a test light.

3-wire sensor: Red wire should have 9-11 volts dc, slightly less than battery voltage.

Black wire should show ground, 0 volts dc at all times.

White wire should vary between 0 and 5 volts dc as the gear teeth pass by the sensor.

2-wire sensor: Measure the voltage between the two sensor wires. With the wheel spinning the voltage should be about 1-10 volts ac (make sure the meter is set to AC volts and not DC volts for this check).

SPEED ADAPTER PART NUMBERS

SEN-2011: The cable adapter accepts a 5/8" thread fitting and can be mounted in a concealed location. Cycles that have a metric-threaded speedometer cable will need to have the cable modified or replaced.

SEN-2012: The adapter harness for using a stock transmission speed sensor converts the triangular connector to the in-line connector on the speed/tach system. 18" length for speed connectors located by the speedometer.

SEN-2013: The adapter harness for using a stock transmission speed sensor converts the triangular connector to the in-line connector on the speed/tach system. 36" length for speed connectors located under the seat.

SEN-2018: The rear wheel sensor kit consists of a sensor mounted to the rear wheel spacer and a harness to connect it to the digital speedometer. The sensor reads the hub bolts. It will work with most softail® and rigid applications.

SEN-2019: The gear-tooth sensor kit consists of a two-terminal sensor and a harness to connect it to the speed/tach system. The sensor needs to be mounted within 1/8" of the teeth on a steel final drive gear.

WARRANTY

All DAKOTA DIGITAL instruments are warranted free of defects in material and workmanship for 2 years from the date of purchase. In the event of a problem with one of our products within the warranty period, DAKOTA DIGITAL will replace or repair the instrument at no charge. (The decision to repair or replace is solely that of DAKOTA DIGITAL. DAKOTA DIGITAL is not responsible for shipping costs of products returned under warranty or for labor charges for product installation and removal.) This warranty becomes invalid if the product is misused, altered or installed incorrectly.

For warranty coverage, you must first call to receive an RMA#. Ship the product transportation prepaid via UPS or insured Parcel Post. A copy of the original invoice or dated bill of sale along with a description of the defect is also required. Make sure that the RMA number is clearly visible on the outside of the package as well as inside on the paper work.

The above warranties, both expressed and implied, do not cover damages caused by improper installation, misuse, abuse, fire, unauthorized modifications, floods or acts of God, or reimbursement of customer or shop time. The extent of the warranty is limited only to the product and does not cover any loss or damage to vehicle, equipment, or non-DAKOTA DIGITAL products.

SERVICE AND REPAIR

DAKOTA DIGITAL offers complete service and repair of its product line. In addition, technical consultation is available to help you work through any questions or problems you may be having installing one of our units. You can contact our technicians at 605-332-6513 or by email at dakotasupport@dakotadigital.com.

Should you ever need to send the unit back for repairs, please package the product in a good quality box along with plenty of packing material. Ship the product by UPS or insured Parcel Post. Be sure to include your RMA#, a complete description of the problem, your full name and address (street address preferred), and a telephone number where you can be reached during the day. **A return authorization number (RMA#) for products being return for repair is required.** Do not send any money. We will bill you for the repair charges.

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