MODEL HLY-6000

BAR MOUNT
SPEEDOMETER/TACHOMETER
INFORMATION SYSTEM

Please read this before beginning installation or wiring.

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 loose power and reset itself.

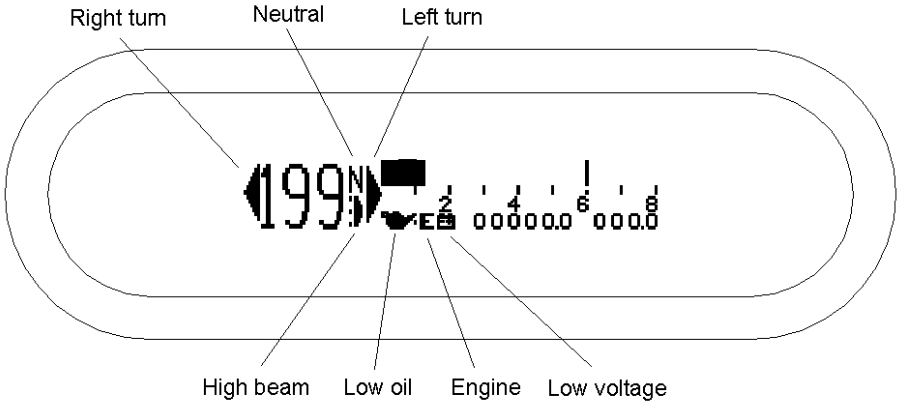
Never connect this to a battery charger alone. It needs to have a 12 volt battery connected to it. Battery chargers have an unregulated voltage output that will cause the system to not operate properly.

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.

NEUTRAL, 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.

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, an N will be lit up to the right of the speedometer.

TRIP RESET & FUNCTION SWITCH

The push button switch is found on the front face of the display. To reset the trip mileage, press and hold the switch in. Pressing the switch while turning power on will enter the setup menus.

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" course 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 color code for the three wire harness is as follows: red-sensor power, white-sensor signal, black-sensor ground.

The speedometer is fully adjustable and calibration is discussed below.

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.

The speedometer will provide a reading before it is calibrated, but it may not be accurate. If the speedometer will only show 00, then it is probably not getting a speed signal. Check all of the wiring and mechanical connections carefully. If you are using a stock electric transmission sensor, remove it and check for metal filings on its magnetic end. If you are using a cable-driven sensor, make sure the cable and sensor are turning. If you are using a gear-tooth or bolt-head sensor, check the spacing to the steel target (these sensors will not read aluminum or stainless steel targets).

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 "DISPLAY" " .. ".
4. Release the function switch. The display will switch between "AUTO" (auto cal), "AdJ" (adjust), "CYL", "SET", "BAR", and "VOLT". 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 trip display should still show "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 "DISPLAY" " .. ".
4. Release the function switch. The display will switch between "AUTO" (auto cal), "AdJ" (adjust), "CYL", "SET", "BAR", and "VOLT". 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.

SPEED OUTPUT FOR TURN SIGNAL CANCEL MODULES

The display system also has a speed output signal for cycles equipped with an automatic turn signal cancel module or cruise control. The white wire from the controller harness should be connected to the module where the wire from the original analog speedometer was connected. The wire from the original speedometer is usually a white/green wire.

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 – 15 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 "DISPLAY" " .. ".
4. Release the function switch. The display will switch between "AUTO", "AdJ", "CYL" (cylinder select), "SET" (shift bar), "BAR" (bar range), and "VOLT". 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 "1 C", "2 C", …, "15 C".
7. When the desired setting is displayed press the function switch. The display will show "DONE".
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 6000 rpm.

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

1. Make sure the key if 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 "DISPLAY" " .. ".
4. Release the function switch. The display will switch between "AUTO", "AdJ", "CYL" (cylinder select), "SET" (shift bar), "BAR" (bar range), and "VOLT". 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 "DONE" once the new setting is stored.

Release the function switch. The system will now start up normally with the new setting.

TACHOMETER BAR RANGE

The tachometer bar can be set to 0-5000, 0-8000, or 0-16,000 rpm full scale range. The bar is factory set to 8000 rpm full scale.

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

8. Make sure the key if off so the gauge is not powered.
9. Press and hold the function switch.
10. Turn the key on so the gauge is powered. The display will show "DISPLAY" " .. ".
11. Release the function switch. The display will switch between "AUTO", "AdJ", "CYL" (cylinder select), "SET" (shift bar), "BAR" (bar range), and "VOLT". The odometer will show "SELECT"
12. When "BAR" is displayed press the function switch. This will place the unit in the bar range set mode.
13. Release the function switch. The bar display will show the 5000 scale, the 8000 scale, then the 16000 scale.
14. When the desired rpm bar scale is displayed press the function switch. The display will show "DONE" once the new setting is stored.

Release the function switch. The system will now start up normally with the new setting.

LOW OIL PRESSURE, LOW VOLTAGE, AND ENGINE 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 11.5 volts and there is a tachometer signal or below 10.5 volts when there is no tachometer signal. The "ENGINE" indicator is activated when the white/red wire is grounded. Connect this to the ECM or ignition module black/yellow wire or leave it open on earlier systems.

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.

MOUNTING

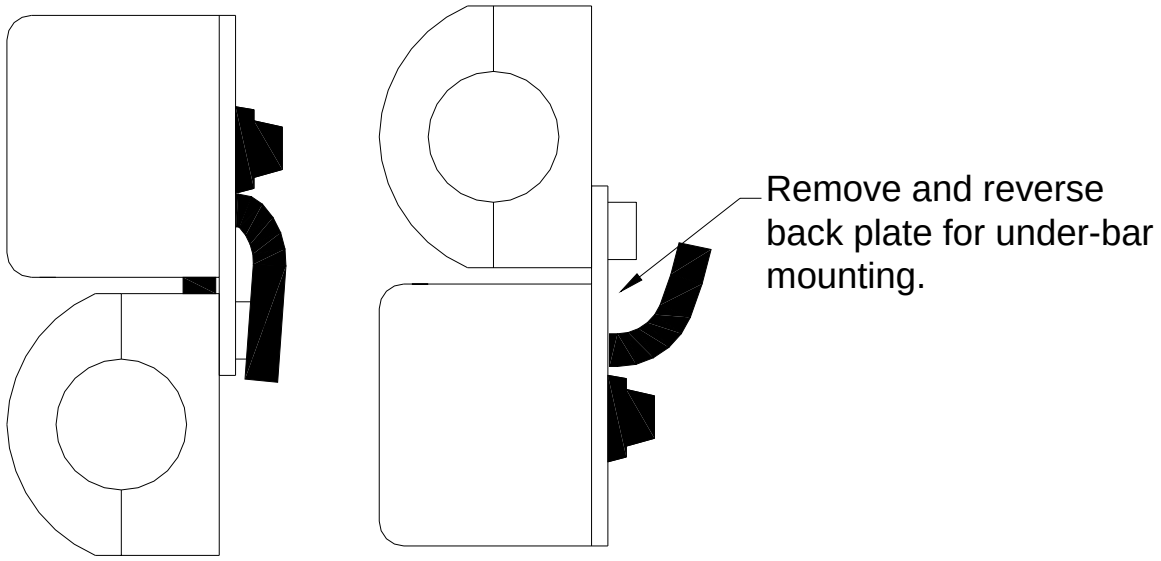
A mounting bracket must be purchased for your application. Some of the current brackets are: BKT-5001 1” bar mount, BKT-5002 flat triple-tree mount, BKT-5003 35° triple-tree mount, BKT-5004 1-1/4” bar mount, BKT-5005 1-1/2” bar mount, and BKT-5006 1” riser bar mount. The bar mount brackets can be used for above-the-bar mounting or below-the-bar mounting. The 35° triple-tree mounts are only available for above-the-bar mounting. The triple-tree mounting bracket replaces the original handle bar mount. The gauge attaches to the back side of the bracket with the supplied screws.

The bar mount brackets have a curved front bracket and two rear brackets. The longer screws attach the gauge to the back side of the bracket and the shorter screws go into the recessed openings on the rear brackets. The mount fits tight and will need to be pulled together by the screws.

To mount the gauge under the bar:

1. Remove the rear plate by unscrewing the four screws.
2. Remove the rubber cap from the switch.
3. Flip the rear plate over so the mounting tab is on the top. The hole for the switch should stay on the same side.
4. Place the switch through the hole and replace the rubber cap.
5. Reattach the rear plate using the four screws.
6. Place bar mount bracket on the handle bars so that the recessed screw holes are on the top.
7. Using the long screws, secure the gauge to the bottom side of the bar mount bracket.

Drawings for using bar mount brackets above the bar and below the bar.



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. **This control module does NOT plug directly into the stock connector on 2004 and newer motorcycles.** 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-6000	**Stock harness color**	**Function**
RED	ORANGE/WHITE	+12 volt with key on
BLACK	BLACK	ground (connect directly to battery negative)
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/RED	BLACK/YELLOW	“ENGINE” indicator
WHITE/BLUE	normally not used	for optional remote mount function 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 controller.

SPEED ADAPTER PART NUMBERS

SEN-6011: 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-6012: This is an extension harness for stock electric transmission speed sensor that will not reach the controller connector.

SEN-6017: Polished replacement transmission speed sensor. Replaces stock transmission speed sensor.

SEN-6018: 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-6019: The gear-tooth sensor kit consists of a three-wire 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.

Troubleshooting guide.

Problem	Possible cause	Solution
Gauge will not light up	Red wire does not have power.	Connect to a location that has power.
	Black wire is not getting a good ground.	Connect ground to a different location.
	Display is not connected to the controller.	Check cable between display and controller.
	Gauge or controller is damaged.	Return for repair. (see instructions)
Gauge lights up, but displays "ERROR" "SPD"	Speed calibration is invalid	Gauge must be recalibrated (see instructions).
Gauge lights up, but displays "ERROR" "TACH"	Tach calibration is invalid	Reset cylinder selection (see instructions).
Gauge lights up, but displays just "ERROR" only	Controller is damaged.	Return controller 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.
	Gauge is not calibrated	Gauge must be recalibrated (see instructions).
Speed reading is erratic or jumps around.	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 "199" 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.
	Gauge is not calibrated	Gauge must be recalibrated (see instructions).
Tach reading is erratic or jumps around.	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.
High beam, Left turn, or Right turn indicator does not work.	Loose or incorrect connection to indicator wire.	Check that the appropriate indicator wire has about 0 volts when the indicator should be off and about 12 volts when the indicator should be on.

Troubleshooting guide continued.

Problem	Possible cause	Solution
Neutral, low oil, or engine indicator does not work.	Loose or incorrect connection to indicator wire.	Check that the appropriate indicator wire has about 12 volts when the indicator should be off and about 0 volts when the indicator should be on.
Turn signals do not cancel automatically.	Output speed signal to stock cancel is loose or not connected properly.	Check the connections on the solid white wire coming from the gauge.
	Speedometer is not calibrated.	Calibrate the speedometer.
	Speed sensor is not working.	If the speedometer always shows zero, check speed sensor voltages.
	Turn signal cancel module is not working.	Test turn signal module according to the bike's service manual.

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).

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. **A note or letter must be included describing the problem.**

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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