



MODEL MLX-5X00 series
Bar mount digital speedometer with indicators.

Please read this before beginning installation or wiring.

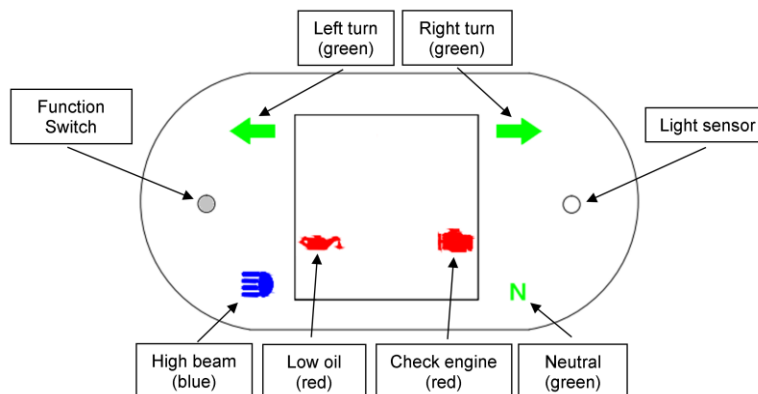


***To avoid damage to motorcycle**, please see Speedometer and Indicators sections for details on locating VSS and indicator wires for **most motorcycle applications**
****The Check Engine indicator will not function using this gauge on 2004+ HD models** due to the signal being fed through the 'data bus', however the HD diagnostic tool can still check and clear codes through the diagnostic connector.

Operation
FUNCTION SWITCH

The switch built into the face of the gauge allows adjustments to the gauge. During normal operation, the function switch allows access to information including mileage, trip meters, and performance data within the message area. Tap the switch during normal operation to scroll through the information available within the message area.

To clear or reset information such as Trip A, Trip B or performance readings, press and hold the function switch until you see the status bar filling. Continue to hold the switch as the bar empties and then displays "HOLD TO CLEAR". Hold until you see "RELEASE" displayed above the status bar. The information will now be reset.



MOUNTING:

A mounting bracket must be purchased for your application. Any BKT-50xx series bracket may be used. 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.

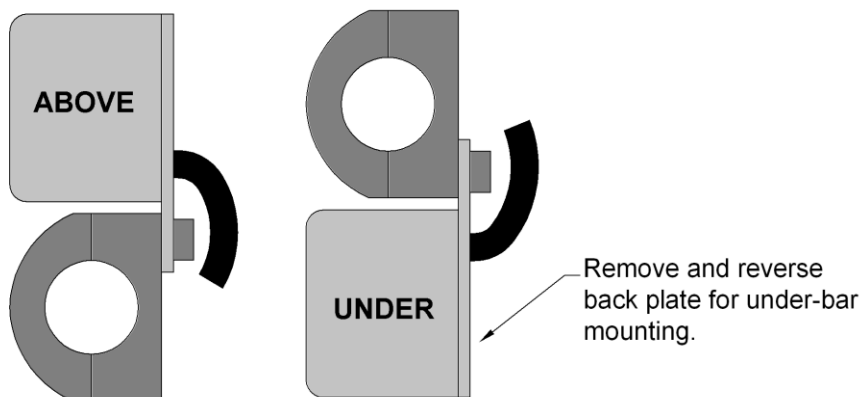
The triple-tree mounting bracket replaces the original handle bar top clamp. The gauge attaches to the back side of the bracket with the supplied screws.

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. Rotate the rear plate so the mounting tab is on the top.
3. Reattach the rear plate using the four screws.
4. Place bar mount bracket on the handle bars so that the recessed screw holes are on the top.
5. 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.



POWER

Connect the red wire from the main harness to +12V accessory power from the ignition switch.

GROUND

The black wire is the main ground for the gauge. A poor ground connection can cause improper or erratic operation.

STATUS AND WARNING INDICATORS

The following indicators are activated by a **12-volt input signal**: Right turn, left turn, and high beam. The indicator harness can be connected to the same wires that the stock indicator lights would be connected to.

The following indicators are activated by a **Ground input signal**: Neutral, low oil, and check engine.

WIRING COLOR CODE FOR GAUGE:

MLX-5000 8-wire	Function
BLACK	Ground (connect directly to battery negative)
RED	+12 volt with key on
GREEN	Right Turn indicator
PINK	"ENGINE" indicator
ORANGE	Left Turn indicator
WHT/GRN	Neutral indicator
PURPLE	High beam indicator
BROWN	Low oil pressure indicator

MLX-5000 3-wire	Function
RED	Speed sensor power
BLACK	Speed sensor ground
GREEN	Speed sensor input

Please consult service manual for correct wire colors.

1996-2003 Harley Davidson wiring

All signal wires should be found behind the speedometer along with power and ground. Indicators should be at the indicator panel.

Signal	Bike	Harness
Power	Orange	Red
Ground	Black	Black
Right Turn	Green	Green
Neutral	Tan	White/Green
Oil	Green/Yellow	Brown
Engine	Black/Yellow	Pink
Left Turn	Purple	Orange
High Beam	White	Purple
VSS		
Power	Red	Red
Ground	Black	Black
Signal	White	Green

2004-2010 Harley Davidson wiring

The power and ground can be found behind the speedometer. Speed signal will need to be run to the ECU or cruise control module where you should find the wire colors listed here. This is due to the data bus configuration. Indicators should be at the indicator panel.

Signal	Bike	Harness
Power	Orange	Red
Ground	Black	Black
Right Turn	Brown	Green
Neutral	Tan	White/Green
Oil	Green/Yellow	Brown
Engine	N/A	Pink (not used)
Left Turn	Purple	Orange
High Beam	White	Purple
VSS		
Power	N/A	Red (not used)
Ground	N/A	Black (not used)
Signal	White/Green	Green

* 2011 – 2013 Most Softtail and Dayna models used Lt Green / Yellow as the VSS signal wire.

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 SEN-6011 (sold separately) connects to the speedometer cable and provides the electric signal. This sensor has a 5/8" coarse thread fitting that accepts mid-80's and earlier cables directly. For 16mm cables, the nut on the end of the cable can be changed. For cycles with smaller metric ends, the speedometer cable will need to be replaced with a cable having the correct fitting. Custom cables can be made, or stock cables can be modified for many of the Metric applications.

With transmissions having the built-in electric sensor, the supplied 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.

For 3-wire Hall-effect sensors, refer to the installation instructions for the sensor to determine wire color code. Most 3-wire sensors use the following color code: RED – power, BLACK – ground, WHITE – speed signal. Connect the sensor signal wire to the GREEN wire from the 3-wire harness, connect the sensor power wire to the red wire from the 3-wire harness, and connect the sensor ground wire to the black wire from the 3-wire harness.

For speed sensor integrated into a vehicle wiring harness (most **Metric Cruisers** w/factory VSS utilize a 3-wire Hall-effect sensor), consult a service manual to determine the color code and location of the speedometer signal. **If the factory harness supplies +5V to the sensor, utilize the factory connection in place of the red power wire.**

For 2004+ Harley and 2003+ V-Rod applications, make sure to simply "Tee" into the white (or white/green) wire on the speed sensor to make certain the ECM will still receive its proper VSS signal from the sensor. Disconnecting the speed signal from the ECM may cause the bike to run poorly.

2006+ Sportsters utilize a black/blue wire for the VSS.

The speedometer is fully adjustable and calibration is described in the following pages. VSS wires should be isolated from the ignition system. Coils, plug wires, or tachometer signal wires routed near or with the VSS wire can cause: erratic speedometer operation, speed reading at a standstill, incorrect or difficult calibration.

Programming

SETUP MENU

The function switch is used to enter setup mode. To get into setup, press and hold either switch while turning the key on. Press and release the switch to advance through the menus below, press and hold to enter each menu.

<u>Main Menu</u>	<u>Sub Menu</u>	<u>Description</u>	
LIGHTING	COLOR THEMES	Set factory defined color themes	
	SET ALL COLOR	Set all areas to one color	
	DISPLAY COLOR	Set main display reading color	
	LABEL COLOR	Set colors for all labels	
	MESSAGE COLOR	Set message location color	
	DIMMING	Set dimming method	
		OFF	
		AUTOMATIC	Uses built in sunlight sensor to increase or decrease backlight
	SUNLIGHT		Set sunlight brightness method
		OFF	
		NORMAL	Increases backlight intensity when in direct sunlight
		INVERT	Increases backlight intensity and changes background white and text black for highest contrast.
		RESET	Returns all colors and settings to factory default
		YES	
	NO		
	BACK		
SPEED	ADJUST	Adjust speed reading up or down while riding	
	AUTO	Ride one mile (or km) to calibrate speed	
	UNIT	Select MPH or km/h unit	
	SERVICE RESET	Set miles to service reset value or turn off	
	PRESET ODO	Odometer preset (Can only be set within the first 100 miles)	
	BACK		
MESSAGES	PERFORM HIDE	Hide performance readings on screen message area	
	PERFORM SHOW	Show performance readings on screen message area	
	BACK		
FACTORY RESET	NO	Resets all settings except odometer to factory defaults	
	YES		
VERSION		Displays software codes of each controller	
EXIT SETUP			

Setup

PRESS AND HOLD FUNCTION SWITCH WHILE TURNING THE KEY TO THE ON POSITION. Release the switch.

Press and release the switch to move through the different setup menus.

Press and hold the switch to enter a setup menu.

Press and hold to also save an option.

Current selections within a sub menu are denoted with an asterisk (*).

Exiting Setup

At the end of every setup section, steps must be taken to properly exit the setup and return to normal operation.

When a section in this manual says "**Exit setup**", please refer to these steps.

- Press and release the function switch until you see ">BACK".
- Press and hold the switch until you see "RELEASE", and release the switch.
- Press and release the function switch until you see ">EXIT MENU".
- Press and hold the function switch until you see "RELEASE", then release the switch.

LIGHTING

Lighting menu for color changes

- When ">LIGHTING" is displayed hold until "RELEASE" is displayed, and release the switch.
- The color menu options are: "COLOR THEMES", "SET ALL COLOR", "DISPLAY COLOR", "LABEL COLOR", "MESSAGE COLOR", "DIMMING", "SUNLIGHT", "RESET" or "BACK".
- Since the color options are so expansive the selection process is the same in all sections.
 - Press and release the switch to change the selection.
 - Hold the function switch to enter the selected setup menu, until "RELEASE", and release the switch.
 - The display will show the available options. Press and release the switch to move through the available options.
 - An asterisk* will appear next to the option indicating it's set as the current setting.
 - Press and hold to select an option, until "RELEASE" is displayed.
 - Exit setup.
- COLOR THEMES: offers preset colors for the display color, label colors and message colors.
- SET ALL COLOR: can set the entire gauge to one of 31 color choices.
- DISPLAY COLOR: independently sets the speed color to one of 31 color choices.
- LABEL COLOR: independently sets the MPH or km/h label color to one of 31 color choices.
- MESSAGE COLOR: independently sets the message area, color to one of 31 color choices.
- DIMMING: offers two options, AUTOMATIC night dimming, or "OFF".
- SUNLIGHT: special feature to enhance viewing of the TFT LCD in *bright daylight* with a high contrast display.
This works independently from the night dimming
If enabled, this will temporarily override the color choices made, to offer a visible display during the day. The color will revert back when the sunlight is less intense, (light overcast days can trigger this mode).
 - NORMAL: in daylight the background will stay black as the speed and messages will turn white.
 - INVERT: in daylight the background will turn white as the speed and messages will turn black.
 - OFF: your color choices will not change.
- RESET: This will reset all color choices and options back to original factory colors.

SPEED

Speed setup menu

- >> **Speed calibration requires hold both function switches after the engine is running <<**
- When ">SPEED" is displayed, hold until "RELEASE" is displayed, and release the switch.
- The selectable options are "ADJUST", "AUTO", "UNIT", "SERVICE RESET", "ODO PRESET", or "BACK".
- Press and release the switch to change the selection. Press and hold the switch to select it.

ADJUST Selection

- **This requires riding a known speed with a GPS, or following another vehicle at a known speed.**
- When ">ADJUST" is displayed, press and hold the switch until "RELEASE" is displayed - release the switch.
- The options will be "FASTER", and "SLOWER", to adjust the speed.
- Press and release the switch to choose "FASTER" to increase speed, or "SLOWER" to decrease speed.
- Press and hold the switch until "RELEASE" is displayed to begin adjusting.
- When riding a known speed, the speedometer will display a speed reading.
- When your speed is correct, hold the switch until "RELEASE" is displayed, release the switch.
- If you go past your target speed, enter ">ADJUST" again and repeat the process until correct.
- Exit setup.

AUTO Selection

- **This requires riding a one mile (or kilometer) distance, which must be determined before starting.**
- When ">AUTO" is displayed, hold until "RELEASE" is displayed, and release the switch.
- The display will show ">BEGIN". You should be at the beginning of your measured distance to ride.
- When ready, hold the switch until "RELEASE" is displayed, and release the switch.
- When you see "PPM", you may ride the distance at any speed, and may stop and start.
 - The PPM numbers will increase while riding. If they remain at 000000 please check your speed sensor wiring.
- When you reach the end of the distance, press and release the switch.
- Exit setup.

UNIT MPH / km/h Selection

- **It is very important to set the speed unit PRIOR to setting the odometer!**
- When ">UNIT" is displayed, press and hold the switch until "RELEASE" is displayed, release the switch.
- The display will show UNIT and ">*MPH" for miles and "km/h" for kilometers.
- MPH is default. Press and release the switch to choose between MPH or km/h.
- Hold the switch until you see "RELEASE" and release the switch.

SPEED Continued...

SERVICE RESET miles or km to next service setup

Service is a countdown odometer. The service odometer display can be disabled or can be set to count down from 500 – 7500 miles, (800 to 12,000 kilometers). If the service odometer is enabled and display reaches 0 miles/km, it will display "SERVICE DUE" each time the key is turned on.

- When ">SERVICE RESET" is displayed, press and hold the switch until "RELEASE" is displayed and release the switch.
- The current setting will be displayed. The default is ">*OFF", but it could be a value in miles or kilometers.
- The miles begin at 500 and go up to 7,500 miles in 500 mile increments.
- The kilometers begin at 800 and go up to 12,000 KM in 800km increments.
- To change the service odometer, press and release the switch until the desired setting is displayed.
- Hold the switch until you see "RELEASE", and release the switch.
- Exit setup.

PRESET ODO Odometer preset

- ✓ The odometer starts at zero, but can be preset by the customer within the first 100 miles (161 km) of riding.
- ✓ After riding more than 100 miles (161 km), the menu option will no longer be displayed.
- ✓ Correctly select the units to be either MPH or km/h **FIRST**, as the odometer will be set in the selected units.
- ✓ The preset is in full miles or kilometers only, **no** tenths.
- ✓ The odometer preset can be reset multiple times within the first 100 miles (161 km) of riding.
- When ">PRESET ODO" is displayed, press and hold the switch until "RELEASE" is displayed and release the switch.
- The current miles will be displayed with the left most digit flashing.
- To change the flashing number, press and release the switch to the desired number.
- Press and hold the switch until "RELEASE" is displayed, then release the switch.
- Repeat the process of until the right most digit has been set.
- With the far right number flashing, press and hold the switch and the display will show ">SAVE ODO? NO".
- Verify the small odometer at the bottom is what you want set.
 - If incorrect hold the button until "RELEASE" is displayed, then release the switch.
 - You can now step through the process again and correct your readings.
 - Turning the key off at any time will discard any attempted odometer settings.
- If the odometer is correct at the ">SAVE ODO? NO" screen, press and release the switch to change the display to "SAVE ODO? YES".
- When ">SAVE ODO? YES" is displayed, press and hold the switch until "RELEASE" is displayed and release the switch.
- Exit setup.

MESSAGES

Message display option menu

- When ">MESSAGES" is displayed, press and hold the switch until "RELEASE" is displayed, and release.
- The display will show "PERFORM SHOW" and "PERFORM HIDE" or "BACK".
- Press and release the switch to change the selection:
 - PERFORM HIDE: does not allow any performance option displays to be show while riding.
 - PERFORM SHOW: turns on the following options, which can toggled through while riding.
 - HIGH Speed (MPH – km/h), 0-60 time, ¼ mile speed with ¼ mile time.
 - Press and hold the switch to select the option, once "RELEASE" is displayed, release the button.

FACTORY RESET

- In the event you would like to start over with your settings, preferences and display locations, this will reset all settings back to the out-of-the-box configuration.
- This includes message locations, color selections and speedometer calibration but **DOES NOT** include the odometer.
- When you see ">FACTORY RESET", press and hold the switch until "RELEASE" then release the switch.
- The options will be "NO" and "YES".
- By pressing and holding on ">NO" it will exit the reset menu.
- When you select ">YES", press and hold the switch until "RELEASE" is displayed, then release the switch.
- The screen will "YES" and "RESET". Tap the switch once to return to the main menu.

VERSION

- For technical support assistance, this screen can display the model number, and the software versions loaded for the two processors.

EXIT SETUP

Exits the setup menu and returns to normal gauge operation. Press and hold the function switch to exit.

NOTE: The installer must consult the service manual, verify wire locations, and check voltages prior to making any connections. Dakota Digital makes no representation or warranty with respect to the above information including its accuracy, completeness, or its freedom from third parties proprietary rights. Dakota Digital disclaims all liability or responsibility for errors or omissions therein or any decision made by the recipient in reliance there on.

Troubleshooting guide.

Problem	Possible cause	Solution
Gauge will not light up	Red wire does not have power. Black wire is not getting a good ground. Gauge is damaged.	Connect to a location that has power. Connect ground to a different location. Return gauge for repair.
Gauge lights up, but displays "### Speed Power Shortage"	Speed power out wire is shorted to ground.	Check wire connections from red wire to speed sensor.
Gauge lights up, but displays "Too Low"	Speed calibration is invalid	Gauge must be recalibrated.
Gauge lights up, but speed will only show zero.	Harness is not connected properly. Speed sensor not grounded properly. Speed sensor is not being turned by the cable. Sensor is not sending a speed signal. Gauge is not calibrated	Check connection from speed harness to speed sensor and gauge. Move ground to different location, preferably close to the speedometer ground. Check cable connection between sensor and cable drive. The sensor can be tested by spinning the cable with a drill. See speed sensor voltage checks listed below. Gauge must be calibrated, see instructions on page 2.
Speed reading is erratic or jumps around.	Speed sensor wire is loose or broken. Cable is loose or broken. Poor ground connection. Poor power connection.	Check all wire connections and cables for breaks. Check cable between sensor and transmission or front wheel. Check ground on speedometer and sensor. Check that power is not connected to a noisy source such as ignition coil power.
Speed reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated.
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.
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.

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).

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 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



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