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Contact our Customer Resource Center at either 1-248-681-0503 or www.humminbird.com. This operation manual carefully in order to get full benefit from all the features and applications of your Humminbird product. For complete details, see the separate warranty card included with your unit. We encourage you to read our one-year warranty. Free of charge during the first year after purchase, and available at a reasonable rate after the first year, we offer repair services for your Humminbird. In the unlikely event that your Humminbird does require repair, we offer the lowest cost repair available. Your Humminbird is designed for trouble-free use in even the harshest marine environment. Thank you for choosing Humminbird™, America's #1 name in fishfinders. Humminbird has built its reputation by design and manufacturing top quality, thoroughly reliable marine equipment.

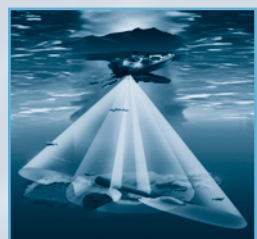


## How Sonar Works

Sonar technology is based on sound waves. The Matrix™ Fishing System uses sonar to locate and define structure, bottom contour and composition, as well as calibrate digital depth directly below the transducer.

Your Matrix unit sends a sound wave signal and determines distance by measuring the time between the transmission of the sound wave and when the sound wave is reflected off of an object; it then uses the reflected signal to interpret location, size, and composition of an object.

Sonar is very fast. A sound wave can travel from the surface to a depth of 240 ft (70 m) and back again in less than 1/4 of a second. It is unlikely that your boat can "outrun" this sonar signal.

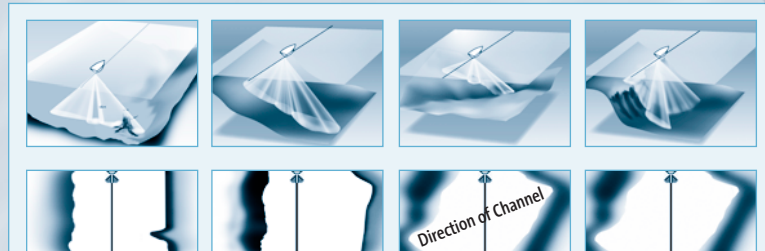


## QuadraBeam™ Sonar with DualBeamPLUS™ Technology

Your Matrix 35 uses QuadraBeam™ sonar with an extremely wide 90° area of coverage. QuadraBeam starts with two 45° 455 kHz beams for a continuous 90° of uninterrupted side to side coverage to 120 feet. These Side Structure locating beams reveal fish and structure to the left and right of your boat near the bottom.

For structure directly below your boat, QuadraBeam uses DualBeamPLUS™ technology with 20° 200 kHz and 60° 83 kHz downward looking beams. The DualBeamPLUS technology is optimized to show the greatest bottom definition with the narrow beam, and fish and structure over a wide area with the wide beam. DualBeamPLUS is ideal for a wide range of conditions – from shallow to very deep water in both fresh and saltwater.

## Understanding MultiBeam Sonar



Shows structure and fish the down beam may have missed due to the position of the boat relative to structure. Structure visible to the sonar will project from the bottom profile similar to down looking sonar, and you will be able to determine if it is to the left or right of your boat.

Helps to identify the slope of bottom which may lead to submerged channels or humps where fish hide. Sloped bottoms create a sonar image with a thinner, darker line on the shallow side, and a thicker, lighter line on the deep side. The greater the difference in depth between the right and left sonar image, the greater the slope.

Helps to identify the run direction and depth of submerged channels.

Detects the presence of a sharp drop off, and helps you to steer the boat so that the sonar return remains at a constant distance from the drop off. One sonar beam may not show a bottom return if the boat is over a sharp drop off.

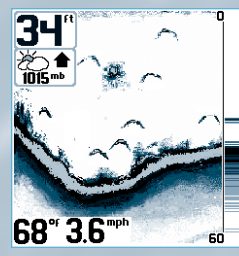
## Powering Up the Unit

Turn on the Matrix unit by momentarily pressing the POWER key. A startup screen is then displayed until the Matrix unit begins sonar operation. While the startup screen is displayed, you may press the MENU key for the other options listed below. If no key is pressed, the Matrix will begin Normal or Simulator operation, depending on the presence or absence of a transducer. The following operating states are available:

- Normal** – Use for on the water operation with transducer connected.
- Simulator** – Use to learn the features and functions of the Matrix unit. Simulates on the water operation.
- System Status** – Use to view system connections and conduct a unit self-test.
- PC Connect** – Use when upgrading Matrix internal software with a PC and PC Connect cable.

The Matrix unit uses advanced transducer detection methods to determine if a transducer is connected. If the transducer is not connected or is damaged, the unit will select the Simulator state automatically at startup. If a functioning transducer is connected, the unit will select the Normal operating state automatically and the unit can be used on the water.

**Note:** When operating in Simulator state with a transducer connected, Menu setting changes are saved to memory. If a transducer is not connected, changes will not be saved and Menu settings will revert to factory defaults every few minutes.



Barometer and Temp/Speed accessories are optional. Additional purchase required.

## Sonar Views

Sonar View presents a historical log of the stored sonar returns. The most recent sonar returns are charted on the right side of the window; as new information is received, the older information is moved across the display. A **Digital Depth Readout** is displayed in the upper left corner. A scale with **Upper and Lower Depth Range** readouts appears along the right edge of the Sonar View. The scale indicates the distance from the surface of the water to a depth range sufficient to show the bottom. Depth Range is automatically selected to keep the bottom visible on screen, although it can be manually adjusted by the user as well (see Sonar Settings - X-Press™ Menu). Up to five additional Digital Readouts display information from optional-purchase accessories such as Water Temperature, Trolling Speed, WeatherSense™ Barometric Pressure and more. These information boxes can be customized to show only the information desired (see Advanced User Mode - Select Readouts).

**MultiBeam Sonar View** presents sonar information from the left and right 90° 455 kHz beams and the 200 kHz down looking beam. In this view, the top portion of the display contains a history of sonar returns from the 200 kHz down looking beam. The bottom portion of the display contains a history of sonar returns from the 455 kHz right and left looking beams. New information appears at the top, and scrolls down the display. The sonar information from the side looking beams reveals bottom contour, structure and fish similar to the down looking beam, but the area covered is to the left and right of the information shown from the down looking beam, so you actually see more of the bottom. The displayed range of the left and right beams automatically follows that of the down beam to a maximum limit of 160 feet. With some practice in viewing the left and right beam information, you will be able to extract more information about the bottom than if you were viewing information solely from the down looking beam. The Understanding MultiBeam Sonar illustration will help you interpret information displayed by the left and right sonar beams. The left and right beams are only used in the MultiBeam Sonar View.

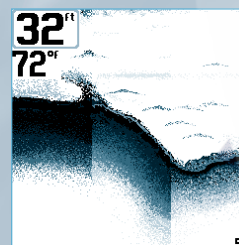


Temp/Speed Accessory is optional.

A **Real Time Sonar (RTS®)** window appears on the right side of the display. The RTS Window always updates at the fastest rate possible for depth conditions and shows only the returns from the bottom, structure and fish that are within the transducer beam(s). In the RTS Window, sonar returns are shown in shades of gray. The most intense returns are shown as a solid black band that indicates the bottom. The thickness of the bottom band indicates bottom type. Hard bottoms appear thicker and may appear with many gray tones.

Above the bottom band, less intense sonar returns shown as varying shades of gray indicate the sonar returns from fish or structure. The RTS Window can be turned on or off (see Sonar Settings - Main Menu Sonar Tab).

As the boat moves, the Matrix unit charts the changes in depth on the display to create a profile of the Bottom Contour. The default presentation highlights the bottom profile with a **Structure ID®** feature and gray tones. From the appearance of the gray tones in the bottom contour, the type of bottom can be determined. A **Hard Bottom** such as compacted sediment or flat rock appears as a thinner dark line across the display. A **Soft Bottom** such as mud or sand appears as a thicker line that contains a transition from darker to lighter grays. **Rocky Bottoms** have a broken, random appearance. In shallower water, a **Second Sonar Return** may appear as a bottom contour below the main bottom at twice the depth. The second return occurs when the sonar signal bounces between the bottom and the surface of the water and back again. Experienced anglers use the appearance of the second return to determine bottom hardness. Hard bottoms will show a strong second return, while soft bottoms will show a very weak one or none at all. The Matrix unit is capable of revealing layers of water with different temperatures called **thermoclines**. Thermoclines appear at different depths and different times of the year. A thermocline typically appears as a continuous band of many gray levels moving across the display at the same depth.



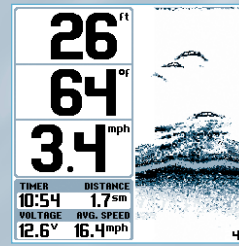
Temp/Speed Accessory is optional.

Due to the transducer beam angle, the distance to a fish decreases as the fish moves into the beam, and then increases as it moves out again, creating a **Fish Arch** when this distance change is graphed on the display. Boat speed, chart speed, and the position of the fish within the sonar beam greatly affect the shape of the arch. For optimum fish arching, it is important to mount the transducer so that it is pointing straight down.

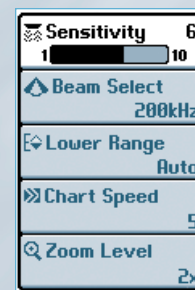
The Matrix unit has an advanced Selective Fish ID™ option that analyzes the sonar return to determine if the sonar return may contain a fish (see Sonar Settings - Main Menu Sonar Tab). When a target is detected, a Fish ID™ symbol appears on the display with the depth. The size of the symbol indicates the intensity of the sonar return. Targets detected in the narrow beam directly under the boat appear as Shaded Fish Symbols. Targets detected in the wide beam around the boat appear as Hollow Fish Symbols. The Matrix unit will clearly show schools of Bait Fish as "clouds" of different shapes and sizes, depending on the number of fish and boat speed.

**Sonar Zoom View** increases the display resolution to separate sonar returns that are very close together, such as those caused by fish suspended close to the bottom or within structure. In Zoom View, the display is split to show a full range view on the right and the zoomed view on the left. As the depth changes, the zoomed view updates automatically to display a magnified image of the bottom. The Zoom Preview Box shows where the zoomed view is in relation to the full range view. The Zoom Level, or magnification, is displayed in the lower left corner and can be changed to suit conditions (see Sonar Settings - X-Press Menu). Upper and Lower Zoom Depth Range numbers indicate the depth of the water which is being viewed.

**Big Digits View** provides digital data in a large, easy-to-see format. Depth is always displayed. Readouts for temperature, speed and Trilog information are displayed if the appropriate accessory is connected to the system. The Trilog shows distance traveled, average speed, and time elapsed since the Trilog was last reset (see System Settings - Main Menu Setup Tab).



Big Digits View shown with Bottom View set to WhiteLine



## Sonar Settings - X-Press™ Menu

The X-Press menu represents the settings most frequently-used to optimize the sonar performance of the Matrix unit. Press the MENU key once while in any of the Sonar Views, including Big Digits, to access the X-Press Menu. The following menu choices are view-dependent; only menu choices that apply to a specific view will be displayed:

**Sensitivity** provides advanced control over the sonar receiver. The Matrix unit optimizes Sensitivity based on depth and water conditions automatically; however, you also may change it manually to match your preferences or water conditions. Increasing the sensitivity shows more sonar returns from small bait fish and suspended debris in the water; however, the display may become too cluttered in some water conditions. When operating in very clear water or greater depths, increased sensitivity shows fainter returns that may be of interest. Decreasing the sensitivity eliminates the clutter from the display that is sometimes present in murky or muddy water. If Sensitivity is adjusted too low, the display may not show many sonar returns that could be fish.

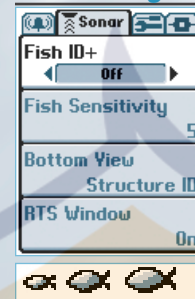
**Beam Select** selects the sonar beam used in the Sonar Views. When 200 kHz is selected, the sonar returns and Fish ID+ from the 200 kHz beam are displayed providing greater bottom detail (typically from 2 feet to 800 feet) at any boat speed. Using 83 kHz, the sonar returns and Fish ID+ from the 83 kHz beam are displayed, providing greater depth capability and showing more targets in its wider beam. The 83 kHz beam is not recommended for use when the boat is traveling at greater than trolling speeds. When 83/200 kHz is selected, the unit blends the sonar information from both beams together on the display to provide the best sonar image and Fish ID+. Beam Select is not available in MultiBeam View because only the 200 kHz and 455 kHz beams present information in this view.

**Lower Range** adjusts the lower depth range to a specific depth for the Sonar and Big Digits Views. Automatic is the default setting. Selecting a specific setting locks the depth range into manual mode. Advanced anglers use both Upper and Lower Range together to view a specific depth range manually when looking for fish or bottom structure. The Upper Range menu choice is available when User Mode is set to Advanced (see Advanced User Mode). will be displayed when you start manually adjusting the Lower Range to indicate that **M**re in Manual mode.

**Chart Speed** determines the speed at which the bottom information moves across the display, and consequently the amount of detail shown. A faster speed shows more information in the Sonar View and is preferred by most anglers; however, the bottom moves across the display quickly. The highest setting is an ultrafast mode that provides the highest chart speed possible by slowing down other system functions. A slower speed keeps the information on the display longer, but the bottom and fish detail becomes compressed and may be difficult to interpret. Regardless of the Chart Speed setting, the RTS® Window will update at the maximum rate possible for the depth conditions. Adjust Chart Speed to your personal preference. Chart Speed is not available in MultiBeam View.

**Zoom Level** sets the magnification level for the Sonar Zoom View.

## Sonar Settings – Main Menu Sonar Tab



Less frequently-adjusted menus are grouped into the Main Menu System. Press the MENU key twice to access the Main Menu System.

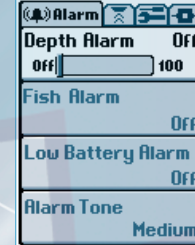
**Fish ID+™** uses advanced signal processing to interpret sonar returns and display a Fish Symbol when very selective requirements are met. A number above the fish icon indicates the depth of the fish. Three different fish size icons show the intensity of the sonar return, and provide an indicator of relative fish size. When Fish ID+ is turned off, the Matrix shows only the unprocessed sonar returns on the display. These returns will often result in "arches" forming on the display, indicating potential targets.

**Fish Sensitivity** adjusts the thresholds of the fish detection algorithms, thus enhancing your unit's ability to identify sonar returns as fish icons. Selecting a higher setting allows fainter returns to be displayed as fish icons and will increase the number of fish icons that appear on the display. This is useful for identifying smaller fish species or baitfish. Selecting a lower setting displays fewer fish icons from faint sonar returns. This is helpful when seeking larger species of fish.

**Bottom View** selects the method to display bottom and structure on the display. **Structure ID®** presents the graphical representation of the bottom and structure sonar returns using only grayscale to indicate the signal strength. **WhiteLine®** highlights the strongest sonar returns from the bottom to make a distinctive outline of the bottom contour, structure and fish. **Bottom Black** displays all pixels below the bottom contour as black, regardless of signal strength.

**RTS Window** turns the RTS window on or off in the Sonar View.

## Alarm Settings - Main Menu Alarm Tab



Various audible alarms can be triggered in the Matrix unit based on these menu settings. When an alarm is triggered, it can be silenced by pressing the EXIT key.

**Depth Alarm** sounds when the digital depth becomes equal to or less than the menu setting.

**Fish Alarm** sounds when the Fish ID+ feature displays fish symbols that correspond to the menu setting.

**Low Battery Alarm** sounds when the input battery voltage is equal to or less than the menu setting.

**Alarm Tone** selects the pitch of the alarm sound to improve audibility. As the menu is adjusted a brief tone will be produced so that you can select the tone that you can hear best.

## System Settings - Main Menu Setup Tab

**Units - Depth** selects the units of measure for all depth-related readouts.

**Units - Temp** selects the units of measure for all temperature-related readouts. This menu is only visible if temperature is available. *International Models Only.*

**Units - Distance** selects the units of measure for all distance-related readouts. *With Temp/Speed Accessory Only.*

**Units - Speed** selects the units of measure for all speed-related readouts. *With Temp/Speed Accessory Only.*

**User Mode** displays additional Advanced Menus within the menu system when set to Advanced. When set to Normal (default setting,) only the basic menu options are shown. See Advanced User Mode section.

**Trilog Reset** resets the Trilog to zero. *With Temp/Speed Accessory Only.*

**Language** selects the display language for menus. *International Models Only.*

**Restore Defaults** resets ALL menu settings to their factory defaults. Use this menu with caution!

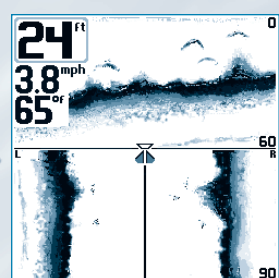
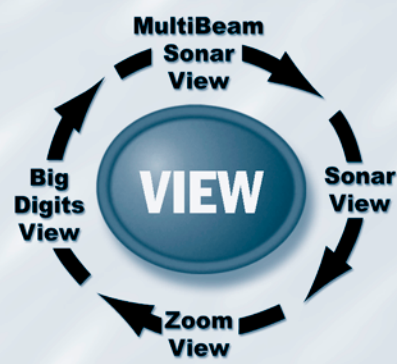


<b>Maximum Depth Capability</b>	1200 ft (400 m) 83 kHz: (1200 ft / 400 m); 200 kHz: (800 ft / 250 m) 455 kHz: (160 ft / 50 m)
<b>Power Output</b>	500 Watts (RMS) 4000 Watts (Peak to Peak)
<b>Target Separation</b>	2½ Inches (63.5 mm)
<b>Power Requirement</b>	10 to 20 VDC

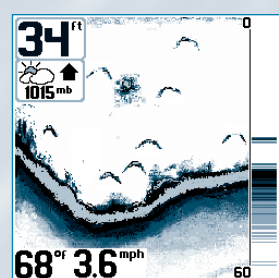
<b>Operating Frequency and Area of Coverage</b>	90° Total Coverage @ -10 dB 83 kHz: 60° @ -10 dB; 200 kHz: 20° @ -10 dB 455 kHz: Two 45° Beams @ -10 dB
<b>LCD Matrix</b>	240 V x 240 H
<b>Transducer (Standard Model)</b>	XT-6-TB-90-T
<b>Transducer (Plus Model)</b>	XT-6-TB-90
<b>Transducer Cable Length</b>	20 ft (6 m)

Product specifications and features are subject to change without notice.

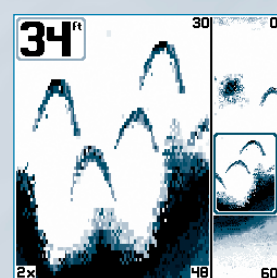




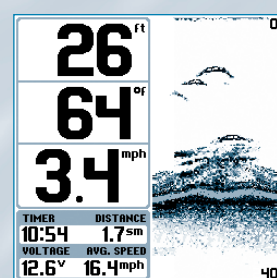
MultiBeam Sonar View



Sonar View



Zoom View



Big Digits View

**Power/Light**

Momentarily press POWER to turn the unit on. While the unit is on, momentarily press POWER to access Light and Contrast menus. Press and hold POWER for 3 seconds to turn the unit off.

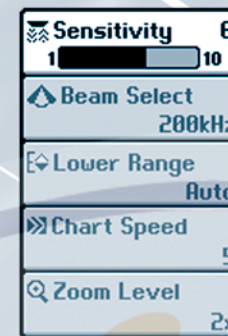
**View**

Press the VIEW key to advance to the next view. Repeatedly pressing VIEW cycles through all views available. Views can be hidden to optimize the system to your fishing requirements (see System Setup Menu - Advanced User Mode on the other side of this manual).



**X-Press™ Menu**

Press the MENU key once for the X-Press™ Menu. The X-Press menu allows you to access the settings that you change frequently without having to navigate through a menu system. Only the X-Press menu items associated with the current view are displayed.



**4-Way Menu Control**

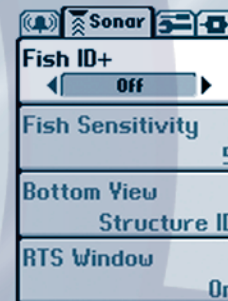
Use UP or DOWN to select a menu item. Use LEFT or RIGHT to make a menu choice.

*Note: Menu choices are implemented and saved immediately - no further action is required.*

**Main Menu System**

Press the MENU key twice for the Main Menu System. The menu system is organized under tab headings to help you find a specific menu item quickly. In the main Menu, first use the 4-Way Menu Control LEFT or RIGHT key to select a tab; then use the UP or DOWN key to select the menu item. The menu system is expandable; when you attach a supported accessory to the Matrix system, the Matrix menus may change to display new choices for those accessories that require menu access.

*Note: Instruction guides included with the accessory will detail accessory-specific features and functions.*



**EXIT**

**Exit**

The EXIT key has multiple functions, depending on the situation:

- If an alarm is sounding, pressing EXIT will cancel the alarm.
- If a menu tab is selected, pressing EXIT will exit the menu mode and return to the view.
- If a menu is active, pressing EXIT will return to the previous level in the menu system.
- If a cursor is active on the display, pressing EXIT will clear the cursor from the display.

**MATRIX MENUS**

**X-Press™ Menu**

Sensitivity	Adjusts the sonar Sensitivity (Low = 1, High = 10, Default=6)
Beam Select	Selects the sonar beam used in the Sonar View. (200 kHz, 83 kHz, Default=200 kHz)
Lower Range	Adjusts the Lower Depth Range (Auto, 10 to 1200 feet, Default=Auto)
Chart Speed	Adjusts the speed of the display movement (1 to 5 or Ultra, where 1=Slow, 5=Fast, Ultra=Fastest, Default=5)
Zoom Level	Adjusts the zoom magnification for Zoom View (2x, 4x, 6x, 8x, Default=2x)

*NOTE: The following additional menu items are available when Advanced User Mode is enabled: Upper Range, 83kHz Sensitivity and 455 kHz Sensitivity (depending on the current view). See Advanced User Mode section.*

**Sonar Main Menu**

Fish ID+™	Activates Fish ID+ target identification and fish symbols (On, Off, Default=Off)
Fish Sensitivity	Adjusts the fish detection sensitivity (Low = 1, High = 10, Default=5)
Bottom View	Selects style of bottom presentation for Sonar Views (Structure ID®, WhiteLine®, Bottom Black, Default=Structure ID®)
RTS® Window	Activates the Real Time Sonar Window on Sonar Views (On/Off, Default=On)

*Note: The following additional menu items are available when Advanced User Mode is enabled: Surface Clutter, Noise Filter, Water Type and Max Depth. See Advanced User Mode section.*

**Alarm Main Menu**

Depth Alarm	Sets the Depth Alarm point (Off, 1 to 100 feet, Default=Off)
Fish Alarm	Sets the Fish Alarm size (Off, All, Large/ Med, Large, Default=Off)
Low Battery Alarm	Sets the Low Battery Alarm point (Off, 8.5 to 17.5 Volts, Default=Off)
Alarm Tone	Sets the pitch of the alarms (Low, Medium, High, Default=Medium)

**System Setup Main Menu**

Units - Depth	Selects the unit of measure for depth (Feet, Meters®, Fathoms, Default=Feet)
Units - Temperature*	Selects the unit of measure for temperature (Fahrenheit/Celsius, Default=Celsius)
Units - Distance**	Selects the unit of measure for distance (sm, nm, km®, Default=sm)
Units - Speed**	Selects the unit of measure for speed (mph, kts, kph®, Default=mph)
User Mode	Selects the user mode menus (Normal, Advanced, Default=Normal)
Triplog Reset**	Resets the Triplog to zero
Language*	Selects the menu display language (Default: English)
Restore Defaults	Restores all settings to the Factory Defaults

*Note: The following additional menu items are available when Advanced User Mode is enabled: Select Views, Select Readouts, Depth Offset, Temperature Offset, Speed Calibration\*\* and NMEA Output. See Advanced User Mode section.*

*\*Note: Menu item available on International models only.  
\*\*Note: Menu item available with Temp/Speed Accessory only.*

**Tilt and Swivel Mount**

Your Matrix unit will tilt up to 90° and swivel up to 360° to accommodate your viewing preferences.



**Quick Disconnect Mounting System**

Press the button located to the rear of your Matrix unit to release the lock and remove the head unit from the base.

**Matrix Fishing System Advanced Accessories**

Your Matrix unit represents a revolutionary Fishing System that grows in capability with the addition of one or more accessories. Accessories customize the Matrix Fishing System to your needs and enable you to stay on the edge of new technology and to catch more fish. When an accessory is connected to the system, additional menus, readouts and views are added automatically to your Matrix menu system. Note that some accessories may require additional software to be loaded into the Matrix product. Accessories available today that are supported by your Matrix include:

**Temperature/Speed:** simply plugs into the Matrix unit and provides real time speed and temperature readouts, as well as a valuable Triplog function.

*Note: If an external Temperature/Speed (TS-W) or Temperature (TG-W) accessory is connected AND a transducer with temperature built in is connected at the same time, the TS-W or TG-W accessory will override the temperature which is built in to the transducer.*

**WeatherSense™ Fishing Condition Monitor:** simply plugs in to the Matrix unit and provides barometric pressure readout and trend data. Professional fishermen know that barometric pressure impacts fish behavior and they modify their tactics based on it. Now you can have access to barometric pressure data in real time, right on the boat.

**GPS Connection Cable:** adds GPS capability to the Matrix unit by connecting a handheld or other NMEA® GPS-compatible device. GPS capability instantly turns your Matrix into a Combo-Trackplotter to show position, breadcrumb trail and waypoints on the big, easy-to-read screen, all with big, easy-to-use buttons that handhelds do not offer. In addition, you can store up to 750 waypoints and 10 tracks inside the Matrix unit!

**PC Connect Cable:** links the Matrix unit to a PC to access product software updates and new features from [www.humminbird.com](http://www.humminbird.com). This accessory requires the MSWindows-compatible HumminbirdPC™ software from our Website to communicate with the Matrix unit. If you have upgraded to GPS, you can easily enter, annotate and exchange fishing spots with friends and download them into your Matrix unit using this cable.

Be sure to check out our website [www.humminbird.com](http://www.humminbird.com) for additional new and exciting accessories to grow your Matrix Fishing System!

*\*NMEA 0183 is a National Marine Electronics Association standard for data communication.*