

DIGITRAK[®]

Series Display

AURORA[®]

Operator's Manual

Panel Mounted AP8
Freestanding AF8 and AF10

403-2800-21-C, metric, printed on 2/11/2019. For software v2.0 and later.

© 2013–2019 Digital Control Incorporated. All rights reserved.

Trademarks

The Aurora logo, the DCI® logo, DigiTrak®, F2, F5®, MFD®, SE®, SST®, Target Steering®, and TensiTrak are U.S. registered trademarks. Bluetooth® is a registered trademark of Bluetooth SIG Inc.

Patents

U.S. and foreign patents apply to the product covered by this manual. For details, please visit digital-control.com.

Limited Warranty

All products manufactured and sold by Digital Control Incorporated (DCI) are subject to the terms of a Limited Warranty. A copy of the Limited Warranty is included at the end of this manual; it can also be obtained at digital-control.com.

Important Notice

All statements, technical information, and recommendations related to DCI products are based on information believed to be reliable. However, DCI does not warrant or guarantee the accuracy or completeness of such information. Before using any DCI product, the user should determine the suitability of the product for its intended use. All statements herein refer to DCI products as delivered by DCI for use with horizontal directional drilling in the ordinary course, and do not apply to any user customizations, third-party products, or any usage of the DCI product outside of the ordinary course. Nothing herein shall constitute a warranty by DCI nor will anything herein be deemed to modify the terms of DCI's existing Limited Warranty applicable to all DCI products. DCI may update or correct the information in this manual from time to time. You may find the most recent version of this manual on DCI's website, digital-control.com.

Compliance Statement

This equipment complies with Part 15 of the Rules of the FCC and with Industry Canada license-exempt RSS standards and with Australia Class License 2000 for LIPD (low interference potential devices). Operation is subject to the following two conditions: (1) this equipment may not cause harmful interference, and (2) this equipment must accept any interference received, including interference that may cause undesired operation. DCI is responsible for FCC compliance in the United States: Digital Control Incorporated, 19625 62nd Ave S, Suite B103, Kent WA 98032; phone 425.251.0559 or 800.288.3610 (US/CA).

Changes or modifications to any DCI equipment not expressly approved and carried out by DCI will void the user's Limited Warranty and the FCC's authorization to operate the equipment.

CE Requirements: Telemetry Use Restrictions

DigiTrak receivers may not be legal to operate or may require a user license to operate in some countries. The list of restrictions by country and declarations of conformity are available at digital-control.com.

Contact Us

United States
DCI Headquarters

19625 62nd Ave S, Suite B103
Kent, Washington 98032, USA
1.425.251.0559 / 1.800.288.3610
1.425.251.0702 fax
dcidigital-control.com

Australia

2/9 Frinton Street
Southport QLD 4215
61.7.5531.4283
61.7.5531.2617 fax
dciaustralia@digital-control.com

China

368 Xingle Road
Huacao Town
Minhang District
Shanghai 201107, P.R.C.
86.21.6432.5186
86.21.6432.5187 (传真)
dcichina@digital-control.com

Europe

Brueckenstraße 2
97828 Marktheidenfeld
Deutschland
49.9391.810.6100
49.9391.810.6109 Fax
dcieurope@digital-control.com

India

DTJ 203, DLF Tower B
Jasola District Center
New Delhi 110025
91.11.4507.0444
91.11.4507.0440 fax
dcindia@digital-control.com

Russia

Молодогвардейская ул., д.4
стр. 1, офис 5
Москва, Российская Федерация 121467
7.499.281.8177
7.499.281.8166 факс
dcirusssia@digital-control.com

Dear Customer,

Thank you for choosing a DigiTrak guidance system. We are proud of the equipment we have been designing and building in Washington State since 1990. We believe in providing a unique, high-quality product and standing behind it with world-class customer service and training.

Please take the time to read this entire manual, especially the section on safety. Please also register your equipment online at www.MyDigiTrak.com. Or, fill in the product registration card provided with this equipment and either fax it to us at 1.800.288.3610 or mail it to your regional DCI office.

Product registration entitles you to free telephone support (in the USA and Canada), notification of product updates, and helps us provide you with future product upgrade information.

Our Customer Service department is available 24 hours a day, 7 days a week in the U.S. to help with problems or questions. International contact information is available in this document and on our website.

As the horizontal directional drilling industry grows, we're keeping our eye on the future to develop equipment that makes your job faster, easier, and safer. Visit us online any time to see what we're up to.

We welcome your questions, comments, and ideas.

Digital Control Incorporated
Kent, Washington
2019

Watch our DigiTrak Training Videos at www.YouTube.com/DCIKent

For system component name and model information, refer to [Appendix A](#) on page 35.

Table of Contents

- Important Safety Instructions** **1**
- General 1
- Safety 1
- Care and Maintenance** **3**
- Touchscreen Interface 3
- Cleaning 3
- Heat and Sunlight 3
- General 4
- Introduction** **5**
- Getting Started** **6**
- Freestanding AF10 6
- All Models 6
- Peripheral Connections** **7**
- Telemetry Antenna 7
- Multi-Function Cable Box 7
- Installing Your Display** **7**
- Main Menu** **8**
- Power On 8
- Applications 9
- Settings 10
- Device 11
- Network 12
- Alarms 14
- Pitch History 15
- Receiver 16
- Peripherals 17
- Update 17
- Help 19
- Drilling with the Home Screen** **20**
- Telemetry Signal Strength 20
- Roll Offset 21
- Temperature 21
- Fluid Pressure Transmitter 22
- Depth Readings 22
- Predicted Depth 23
- Target Steering** **25**
- Steering to the Target 25
- Target Steering in Interference Areas 28

Understanding the Steering Indicator Ball28
Classic View 29
Turning Target Steering Off29

Working with TensiTrak 30
Setting Warning Levels 30

Working with the MFCB 31
Enabling the MFCB 31
Using a Cable Transmitter32
 Applying Power to the Transmitter 32
Using a Steering Tool Transmitter (SST) 33
 Setting a Heading Reference33

Appendix A: System Specifications 35
Power Requirements35
Environmental Requirements 35
Networking Requirements35
Storage and Shipping Requirements35
 Temperature35
 Packaging35

Standard Warranty



Product drawings in this document contain distinctly different colors to help the reader distinguish components. These colors are for illustration purposes only and do not represent actual product colors.

Important Safety Instructions



All operators must read and understand the following safety precautions and warnings and must review this operator's manual and the operator's manual for their DigiTrak® guidance system before using the Aurora display. If you have any questions about the operation of Aurora, please contact DCI Customer Service for assistance.

General

The following warnings relate generally to the operation of DigiTrak® guidance systems. This is not an exhaustive list. Please review the operator's manual for your DigiTrak guidance system for additional safety precautions and warnings relating to its use.



Serious injury and death can result if underground drilling equipment makes contact with an underground utility such as a high-voltage electrical cable or a natural gas line. DigiTrak guidance systems *cannot* be used to locate underground utilities.



Work slowdowns and cost overruns can occur if drilling operators do not use the drilling or guidance equipment correctly to obtain proper performance.



Substantial property damage and liability can result if underground drilling equipment makes contact with an underground utility.



This symbol on equipment indicates that the equipment must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of such equipment at a designated collection point for the recycling of electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service, or the shop where you purchased the equipment.

Safety

Aurora is for use solely with DigiTrak Horizontal Directional Drilling guidance systems. The warnings in this section relate specifically to the operation of an Aurora display with DigiTrak guidance systems.

The Aurora display does not eliminate the need for human judgment by a drill rig operator. Danger may arise at the job site at any time even without an alarm or warning from the Aurora display. Drill rig operators must maintain close attention to the drilling operation at all times.

Do not view training videos or help files on Aurora while drilling.

DCI does not warrant or guarantee the accuracy of data or information displayed or generated by Aurora. The accuracy of such data or information may rely on the accuracy of

input from third-party sources, such as drill rigs or other equipment manufactured by third parties, GPS data, or bore plan or other data input by a user. DCI cannot be responsible for the accuracy of such third-party input.

The accuracy of data generated by a DigiTrak Guidance System may be affected by a variety of factors, including (but not limited to) interference (passive or active) or other environmental conditions, improper use of the DigiTrak guidance system by the end user, failure to follow instructions found in the operator's manual for the DigiTrak guidance system, and failure to properly calibrate the DigiTrak Guidance System. Always perform a background noise check prior to drilling.

Aurora transmits radio signals. Accordingly, maintain a minimum distance of 20 cm between the user's torso and the Aurora display during operation to ensure compliance with RF exposure requirements.

Because this equipment may generate radio frequency energy, there is no guarantee that interference will not occur at a particular location. If this equipment does interfere with radio or television reception, which can be determined by powering the equipment off and on, try to correct the interference using one or more of the following measures:

- Reorient or relocate the Aurora antenna.
- Increase the separation between the Aurora and affected equipment.
- Consult the dealer or DCI Customer Service for help.

In the event of electrostatic shock, the touchscreen may act as if it has been touched. No data loss will occur but windows may open or close randomly. User intervention is required to return the screen to the previous state.

An Aurora display is GPS-ready. Review local regulations governing the use of GPS before using any applications that employ this technology.

Failure to properly care for and maintain your Aurora display may result in malfunction or inoperability of the unit. If your Aurora malfunctions or ceases to operate for any reason, stop drilling immediately and contact DCI Customer Service.

An Aurora display contains no user serviceable parts. Contact your local HDD dealer or DCI customer service if you believe service is required.

Care and Maintenance

Touchscreen Interface

Avoid operating Aurora while wearing gloves not specifically designed for use with touchscreens, as the response will be poor and foreign material on the gloves may damage the touchscreen. Use the soft pad of your fingertip to tap the display, or use gloves with a touchscreen-compatible fingertip. Never use a fingernail or foreign object.

Cleaning

Use only a glass cleaner that is specifically tested to not harm the protective coatings on touchscreen glass. Use the power button to lock the screen for cleaning (see [Power On](#), page 8).

A non-abrasive soap and water mixture is suitable for both the display and case.

Wipe the screen gently with a microfiber or soft cotton cloth, as hard rubbing may remove or damage the anti-reflective coating. Avoid salt water, which is abrasive.

Do not use household or commercial window cleaning products that include chemicals such as ammonia, alcohol, or any acidic liquid. These cleaners can contain microscopic abrasive granules that will damage the anti-reflective film and may cause the display to spot.

Use all provided connector covers when connectors are not in use. Ensure connectors are free of debris before making connections.

The Aurora is IP66-rated to be resistant to water jets with pressure up to 1.0 bar at a distance of 3 m. Avoid using pressure washers or steam cleaners that exceed this level.

Heat and Sunlight

It is normal for the display to get warm. The housing functions as a cooling surface that transfers heat from the inside. In hot environments, you can help your Aurora stay cool by providing shade and/or lowering the touchscreen brightness.

In extreme heat and direct sunlight conditions, the maximum internal operating temperature of the Aurora unit may be exceeded. One of the first symptoms of overheating is an unresponsive touchscreen. To restore functionality in this case, shade the display from direct sunlight, turn down the screen brightness, and allow it to cool. If possible, turn the display completely off using the power button or by removing power from the display. After sufficient cooling time, full functionality will return.

If Aurora senses it is overheating, it will slow processing tasks to minimize heat and protect internal components. If overheating continues, it will shut down before any damage can occur. If this happens, stop drilling immediately, keep the Aurora off and in shade, and allow fifteen minutes for it to cool before restarting.

If excessive heat causes the touch function to become unresponsive, you can still use a USB mouse to make selections, such as accessing the Settings window to lower the screen brightness.

General

Turn off the display when not in use.

Store the display in its case, away from extremes of heat, cold, and moisture. Test to confirm proper operation prior to use.

Inspect the display daily and contact DCI if you see any damage or problems. Do not disassemble or attempt to repair.

Introduction



Panel Mounted AP8



Freestanding AFB



Freestanding AF10

DigiTrak Aurora Displays

The Aurora® DigiTrak® Series Display is a multifunction touchscreen device that is compatible with SE®, F Series™, and Falcon DigiTrak guidance receivers. A receiver is used during horizontal directional drilling operations to locate and track a transmitter installed in the drill head. Aurora provides the drill rig operator information from the receiver about the depth, orientation, and status of the transmitter. Aurora's multi-tasking ability allows it to (for example) simultaneously track and graph fluid pressure and monitor Target Steering®.

Aurora is powered through the drill rig's DC power supply. The supplied external 33 cm telemetry antenna enhances signal reception up to 550 m with line of sight to the receiver (dependent on local regulatory constraints). An optional antenna is available to increase reception for even longer bores.

A complete system consists of an Aurora display, handheld receiver (locator), transmitter, power cable, battery charger, and battery packs for powering the receiver. Depending on how you purchased your Aurora, you may or may not have received all of these components.

This manual discusses only operation of the Aurora display. For additional information on the other components of a DigiTrak guidance system, as well as helpful information on drilling and locating, please see the corresponding DigiTrak Operator's Manual, available at digital-control.com.

This manual assumes the use of a Falcon F5® receiver. When using the Aurora display with other DigiTrak receivers, small differences in screen elements or behavior will exist, but the primary functionality remains the same, within the capabilities of your receiver.

Getting Started

Following are the basic steps for setting up your Aurora display for drilling. For complete details on the safe setup, operation, and features of your Aurora, please review the rest of this manual.

Keep the separate Quick Start Guide (QSG) that came with your Aurora with you while you drill. The QSG is also available on your Aurora through the Help menu.

Remember to register your Aurora at www.MyDigiTrak.com so you can stay informed about important updates to your display and apps.

Freestanding AF10



1. Thumb screw
2. Power
3. Locking knob

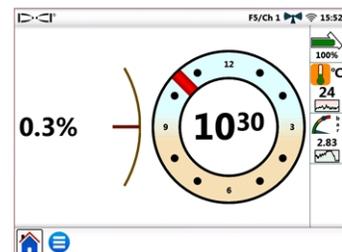
AF10 2-inch ball mount

1. Install the docking station in a solid location and tighten the locking knob firmly.
2. Connect the round keyed connector on the power cable to the docking station and the other end to a 12-24 VDC accessory port.
3. Connect your Aurora to the docking station using the thumb screw on the back.

Continue below.

All Models

1. Connect the telemetry antenna.
2. Connect Aurora to a power source; it displays the **Home** screen.
3. Tap **Main Menu** , then **Receiver**  to select your type of receiver, telemetry channel to match that of the receiver, and region.
4. Tap **Home**  to return to the Home screen. If the receiver is receiving data from a transmitter, that data will now display on the Aurora.



For more information on [Settings](#), see page 10.



Aurora Panel Mounted AP8

Peripheral Connections

Telemetry Antenna

Connect the whip antenna to the bulkhead coaxial connector on your drill rig. If you are using the optional long whip antenna for extended range, refer to the separate installation guide for important installation and safety information.

Multi-Function Cable Box

A Multi-Function Cable Box (MFCB) is required when drilling with an SST[®] Steering Tool or cable transmitter. For details on connecting the MFCB, refer to the MFCB Operator's Manual, available at digital-control.com. For more information on using Aurora with these transmitters, please see [Working with the MFCB](#) on page 31.

Installing Your Display

An 8-inch panel mounted Aurora (model AP8) should be installed by your DigiTrak dealer. To install the AP8 yourself, refer to the MFD/Aurora Installation Guide, available at digital-control.com. After your panel mounted Aurora is installed, continue with the next section, [Main Menu](#).

For installation of the freestanding model AF10, please refer to the separate Installation Guide included with your display.

For the freestanding model AF8, simply find a suitable location for the magnetic base to attach to and connect the power/data wire and antenna.

Main Menu

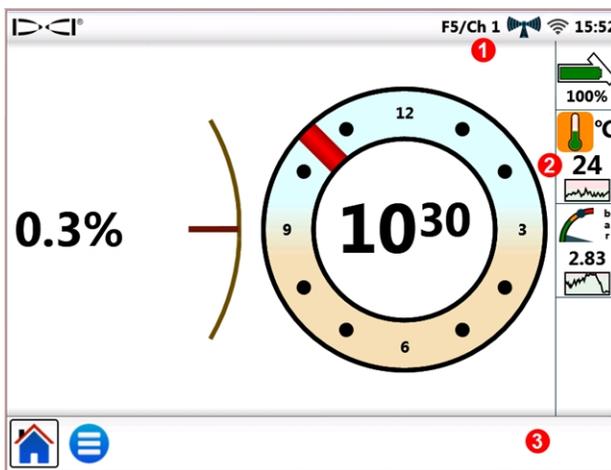
Power On

Aurora automatically turns on and displays the Home screen when it receives power.

To temporarily lock the screen so you can wipe it clean without making selections, press and release the power button on the back. A padlock displays beside the DCI logo in the upper left of the screen to indicate the screen is locked. Press and release the power button again to unlock the screen.



To put the Aurora into a low-power state with the screen off and processor halted, hold the power button in for approximately two seconds. Press and release the power button again to resume.



1. Telemetry channel
2. Transmitter temperature
3. Taskbar

Home Screen

The Aurora touchscreen features a taskbar at the bottom and shortcuts directly to key features. For example, to change the telemetry channel, simply tap and hold the telemetry channel label at the top of the screen (here **Ch 1**) and Aurora opens the appropriate Settings

window in the **Main Menu** . Similarly, to view temperature alarms, tap and hold on the transmitter temperature icon .

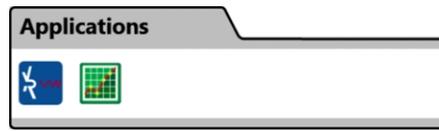
Use the soft pad of your fingertip to tap the display, or use gloves with a touchscreen-compatible fingertip. Never use a fingernail or foreign object.

The main menu is divided into three tabs:

- [Applications](#) (next section)
- [Settings](#) (page 10)
- [Help](#) (page 19)

Applications

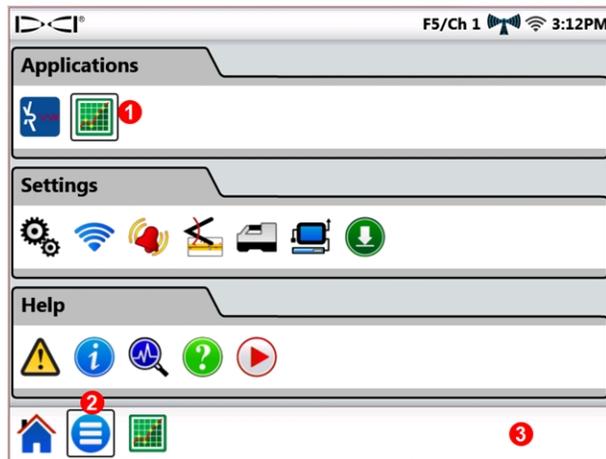
From the Home screen, tap **Main Menu**  once. Application icons appear in the top tab.



Main Menu, Applications Tab

Notice how the **Main Menu** icon in the taskbar below now has a frame around it. The frame shows which application or screen is currently displayed.

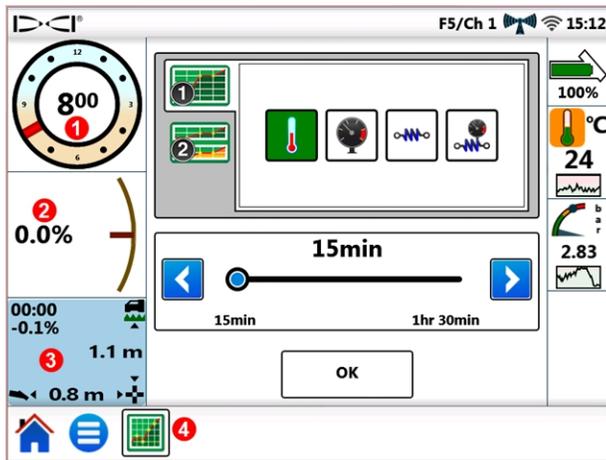
To start an application, tap the icon to place it in the taskbar. For example, tap the pre-installed **Strip Chart**  application icon.



1. Strip Chart icon; frame indicates application is loaded
2. Currently displayed window is framed
3. Taskbar

Main Menu with Strip Chart Application Loaded

Aurora frames the **Strip Chart** icon in the main menu to indicate the application is now loaded and also places it in the taskbar. Tap **Strip Chart**  in the taskbar to open the application. Drilling information from the Home screen such as transmitter roll and pitch, and even predicted depth, minimizes to the left side of the screen as the Strip Chart setup screen appears.



1. Roll remains visible
2. Pitch remains visible
3. Predicted depth remains visible
4. A frame indicates Strip Chart is the currently displayed window

Strip Chart Setup Window

Strip Chart monitors and graphs fluid pressure¹, temperature, and pullback tension² data over time.

To leave Strip Chart running and return to the Home screen, tap **Home** .

To close the Strip Chart application, tap **Main Menu**  and then the framed Strip Chart icon  on the Applications tab. The icon becomes unframed in the apps list and is removed from the taskbar.

For details on using this or other applications, view the app sheet (AS) available in the Aurora documentation section at digital-control.com.

Settings

From the Home screen, tap **Main Menu**  once. Settings icons appear in the middle tab. All system setup begins here.

Aurora requires a minimal amount of configuration to work with your particular DigiTrak receiver (locator). At minimum, set the receiver type, telemetry channel, and region (see [Receiver](#) on page 16).



Main Menu, Settings Tab

¹ Requires a fluid pressure transmitter (FPT).

² Requires TensiTrak pullback and pressure monitoring system.

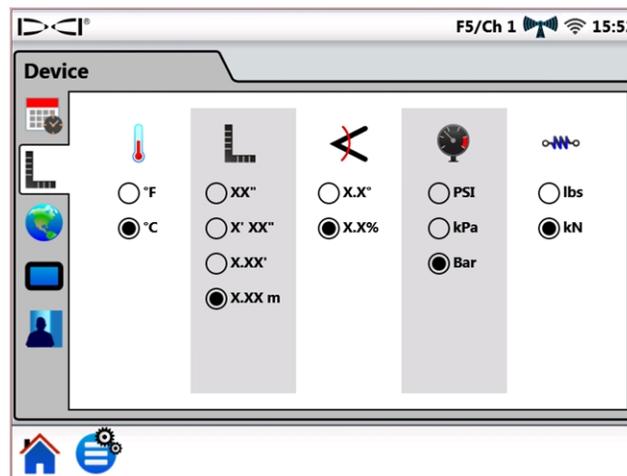
Icon	Operation	Page
	Device	11
	Network	12
	Alarms	14
	Pitch History	15
	Receiver	16
	Peripherals	17
	Update	17

To exit each Settings window described in the following sections, tap **Main Menu** or **Home** in the Taskbar.

Device

On the **Settings tab**, tap **Device** and select from the tabs on the left to set the following:

- Date, time, and time zone
- Units: temperature, distance, pitch angle, fluid pressure, and pull force (shown below)
- Language
- Screen brightness and speaker volume
- Profiles



Settings, Device – Units

Once you have your Aurora set just the way you like it, use Profiles to save your own personal profile. Or, set different profiles for typical drilling jobs. Names may not contain the following special characters: " < > , : * / \ _ - ? |.

Aurora has preset profiles for each of its onboard languages; select your language profile to quickly set Aurora for your region, language, and units of measure. Note that selecting one of these presets will also return alarm settings to default values.



Menu shortcut Tap and hold the **TIME** (15:52 above) on the Home screen.

Network

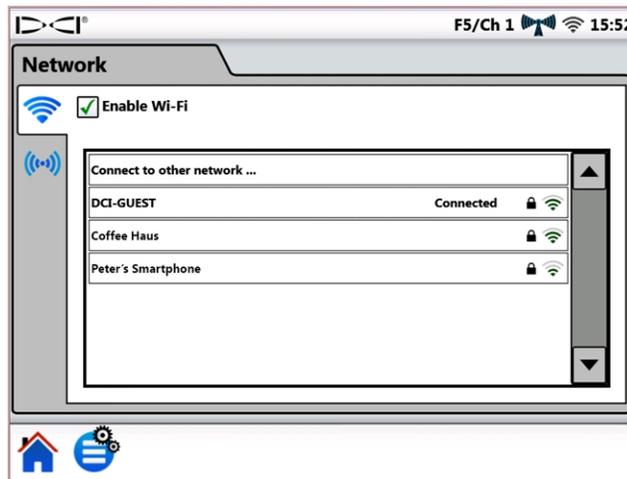
On the **Settings** tab, tap **Network** and select from the tabs on the left to enable and connect with the following:

- Wi-Fi
- Bluetooth

Wi-Fi

Use Wi-Fi to download updates and new applications.

To turn Wi-Fi on, select **Enable Wi-Fi**.



Network Settings - Wi-Fi

Choose a listed Wi-Fi network from the table and follow on-screen prompts as necessary to connect. Aurora remembers passwords for networks it has connected to previously.

To connect to a known network that is not publically broadcast, tap **Connect to other network...** and follow the onscreen prompts.

When Aurora powers on, it will not automatically reestablish previous Wi-Fi connections. To reconnect, select **Enable Wi-Fi** and choose a network. To disconnect, choose a **Connected** network, then tap **OK**. To turn Wi-Fi completely off, clear the **Enable Wi-Fi** check box.

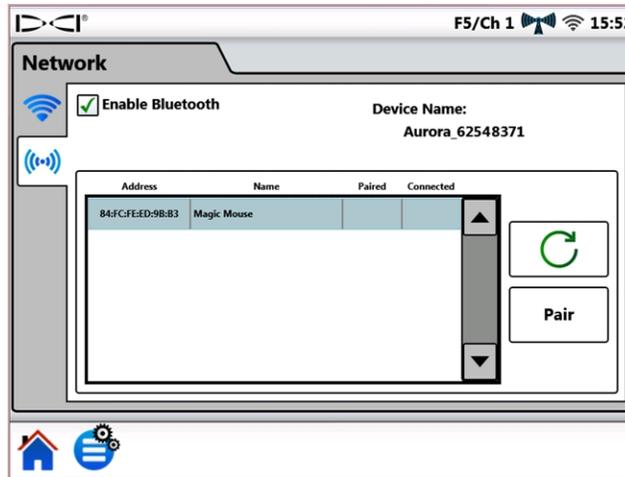
Aurora is compatible with the mobile "hot spot" feature provided by many smartphones. If you are unsure if this feature is available on your phone, how to use it, or what additional cost its use may incur, contact your mobile phone service provider.

Aurora Wi-Fi is not compatible with public networks that require an "I Agree" terms of service acknowledgement typically made in a web browser (known as a captive portal). Compatible networks must be open or only require a password.

Bluetooth

Use Bluetooth to connect a wireless mouse or similar input device.

To turn Bluetooth on, select **Enable Bluetooth**.



Network Settings - Bluetooth

Tap **Refresh**  to search for available Bluetooth Human Interface Device (HID) devices.

To connect with a device, select it from the table of compatible interface devices, then tap **Pair**. If the device requests a passcode, consult your device's user manual, or try 0000 or 1234. Aurora remembers passcodes for devices it has connected to previously.

When Aurora powers on, it will automatically attempt to reestablish Bluetooth connections that were enabled the last time it was on.

To disconnect a Bluetooth device, select it from the table and tap **Forget** on the pop-up window (this will require re-pairing to reconnect later). To turn Bluetooth completely off, clear the **Enable Bluetooth** check box.

Alarms

On the **Settings** tab, tap **Alarms** and select from the tabs on the left to set warning and critical levels for temperature, fluid pressure, and pullback tension alarms. Excessive temperature, pressure, or tension typically indicates a drilling problem that should be resolved immediately to avoid damage to equipment and/or infrastructure. These settings will activate visual and audible warnings if the levels you set are reached.

Transmitter temperature (shown below)

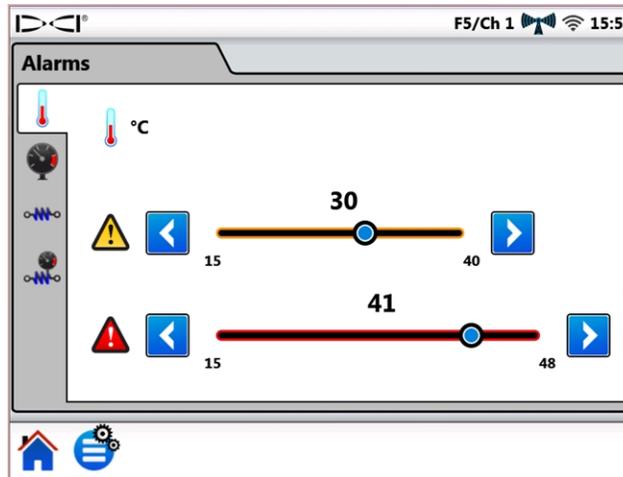
Transmitter fluid pressure¹

TensiTrak Pullback tension²

TensiTrak Pullback fluid pressure²

Warning levels are marked yellow, critical levels are marked red. Aurora comes preset with suggested alarm settings. Tap the blue arrow buttons or drag the slider control to change alarm settings. Set speaker volume on the [Device](#) tab (see page 11) using the screen and volume icon.

Temperature alarms have maximum warning (yellow) and critical (red) levels of 40° C and 48° C, respectively.



Alarm Settings

Pressure and tension alarms have maximum warning and critical levels of 17.2 bar or 445 kN, respectively. Readings exceeding the maximum value will display on the Home screen as **+OL** (Overload).

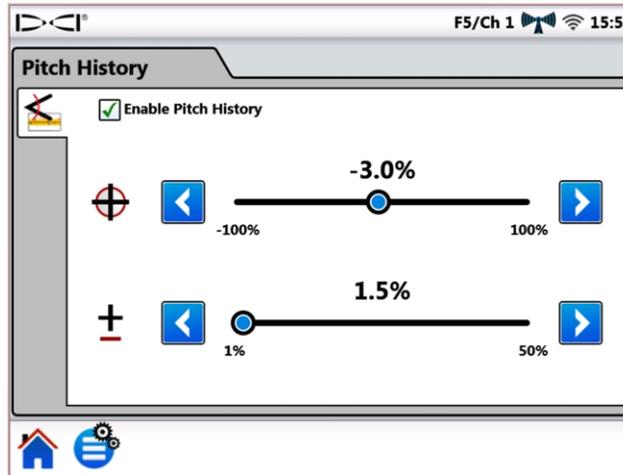
Menu shortcut	Tap and hold the temperature °C, pressure bar, or TensiTrak tension readings on the Home screen.
---------------	---

¹ Requires a fluid pressure transmitter (FPT).

² Requires TensiTrak pullback and pressure monitoring system.

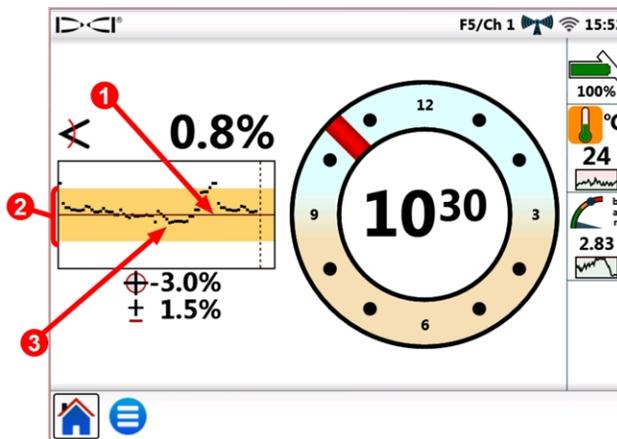
Pitch History

On the **Settings** tab, tap **Pitch History** , then select **Enable Pitch History**.



Pitch History Settings

Tap the blue arrow buttons or drag the slider control to adjust the values for **Target Pitch**  and **Pitch Tolerance**  up or down. When you return to the Home screen, you will see a pitch history graph has replaced the regular pitch indicator.



1. Target pitch
2. Pitch tolerance
3. Pitch readings

Home Screen With Pitch History Graph

Target Pitch  is the pitch at which you want to drill. This is represented by the horizontal line in the center of the graph. Keep the black plot line near the center to maintain the target pitch, shown here at -3.0%. Target pitch is adjustable in 0.1% increments. Due to the normal underground drilling motion of the drill head, it is normal for the plot line to continually range above and below the target pitch line as shown. Make pitch corrections based on your visual analysis of the entire graph, not just the latest single data point. The graph displays up to 90 seconds of pitch history, depending on model of receiver and transmitter and the current display mode.

Pitch Tolerance  is the amount of deviation from the target pitch that you want to define as acceptable. This is represented by the yellow band above and below the red target pitch line on the graph. Stay within the yellow band to remain within the defined tolerance, shown here at $\pm 1.5\%$. The minimum tolerance is 1.0%, adjustable in 0.1% increments.

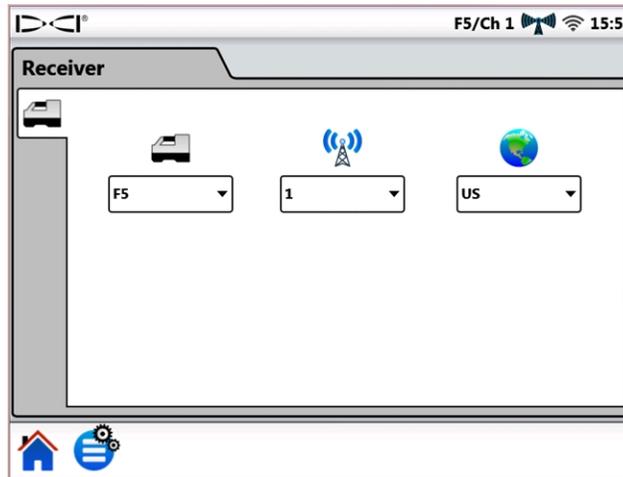
Menu shortcut	Tap and hold the pitch value on the Home screen to open the pitch history settings tab.
---------------	---

The Pitch History function and its settings will remain in effect even after a power cycle. To turn Pitch History off, return to the [Pitch History](#)  tab (see beginning of this section) and clear the **Enable Pitch History** check box.

Receiver

On the **Settings** tab, tap **Receiver**  to set the following:

-  **Receiver model:** Select your model of receiver.
-  **Telemetry channel:** Choose the channel that minimizes interference; this will change from jobsite to jobsite. More bars in the telemetry signal strength icon  means a stronger reception. The telemetry channel settings on Aurora and your receiver must match.
-  Recent updates to Aurora software include an enhanced telemetry option called **Tele-B**. It is the default and recommended selection for Falcon systems, classic F2, and most classic F5. However, for classic F5 receivers on software v1.01-1.03 (see Info > Tele SW ver), select Classic F5 for **standard** telemetry.
-  **Region:** Select the region of operation; your receiver must be factory-set for use in the same region.



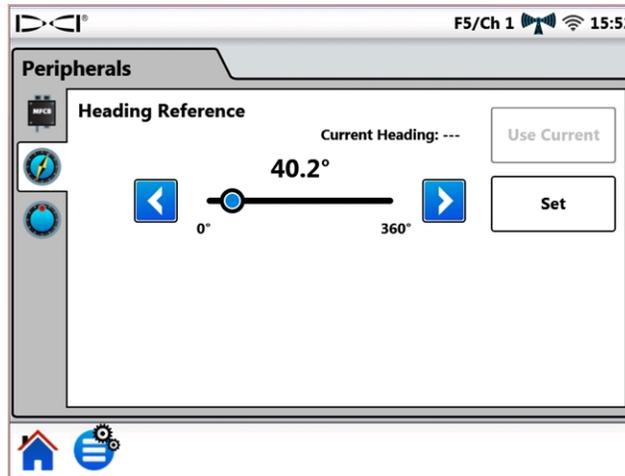
Receiver Settings

Menu shortcut	Tap and hold the receiver/telemetry label F5/Ch1 on the Home screen.
---------------	---

Peripherals

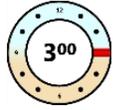
On the **Settings** tab, tap **Peripherals**  to set the following:

-  Enable or disable a Multi-Function Cable Box (MFCB) used for cable and SST[®] steering tool transmitters
-  Set SST heading reference (shown below)
-  Set cable transmitter roll offset



Peripherals Settings

For detailed information on using the MFCB or SST transmitter, see the appropriate operator's manual, available at digital-control.com.

Menu shortcut	For MFCB  , tap and hold MFCB in the Status bar.
Menu shortcut	For SST Heading Reference  , tap and hold the heading reference 74.8° (example) on the Home screen (see Using a Steering Tool Transmitter (SST) on page 33).
Menu shortcut	For cable transmitter roll offset  , tap and hold the roll indicator on the Home screen. 



This roll offset tab is for a cable transmitter only; when roll offset is enabled on the receiver for a standard transmitter, it will display on Aurora automatically. See [Roll Offset](#) on page 21.

Update

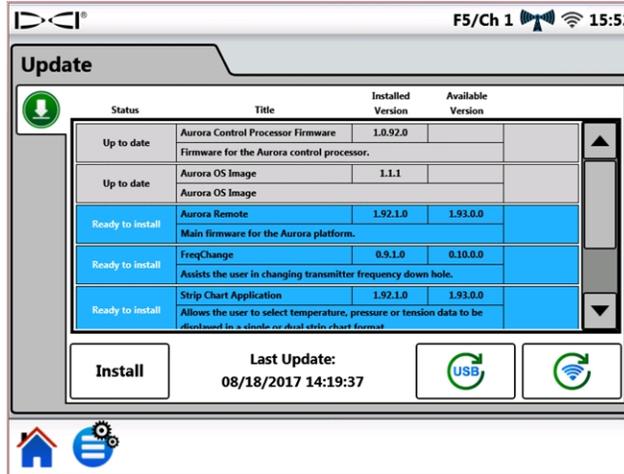
On the **Settings** tab, tap **Update**  to view and download software updates to your system and applications. Updated applications are shaded grey.

To Update Your Aurora

To check for updates over a wireless network, tap **Network Refresh**  ¹.

If a DCI representative has provided updates on a USB flash drive, insert the drive in the USB port and tap **USB Refresh**  to view available updates.

After Aurora searches the flash drive or remote location, it displays available updates shaded in blue. To install all available updates, tap **Install** (updates cannot be selected or installed individually). To cancel the update, tap **Home**  or **Main Menu**  to exit.



Update Screen - Updates Available

Aurora displays a final confirmation message. Note that the mention of a “reset” does not mean the Aurora will reset to factory defaults, only that it will restart after installation of the updates. Tap **OK** to install the update(s), or **Cancel** to discontinue.



Update Confirmation Screen

When the system returns to the Home screen, updating is complete.

¹ **Network Refresh**  requires a wireless connection to the Internet; see [Network](#) on page 12.

To Delete an Application

To delete an existing application, tap **Delete**  in the appropriate row.

Up to date	FreqChange	0.9.1.0	
	Assists the user in changing transmitter frequency down hole.		

Application with Delete Icon

Help

From the Home screen, tap **Main Menu**  once. Help icons appear in the bottom tab.



Main Menu, Help Tab

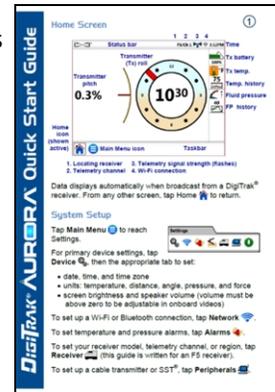
 **Safety Warnings** provides important information on the cautions and responsibilities associated with horizontal directional drilling.

 **Information** provides detailed version information on the display's software and firmware, as well as contact information for DCI Customer Service.

 **Power On Self-Tests** describes tests Aurora completed when powering up. This is useful for troubleshooting a particular component that may not be properly connected, powered on, or enabled.

 **Help** displays an onscreen version of the Quick Start Guide (QSG) that was included with your Aurora. The QSG provides the basic information you need to know about operating your Aurora.

 **Instructional Videos** lets you watch tutorials on topics such as using TensiTrak, off-track locating, and setting up an F5 system. These videos are also available on DCI's YouTube channel at www.YouTube.com/DCIKent. All telemetry is disabled while the video player is running.



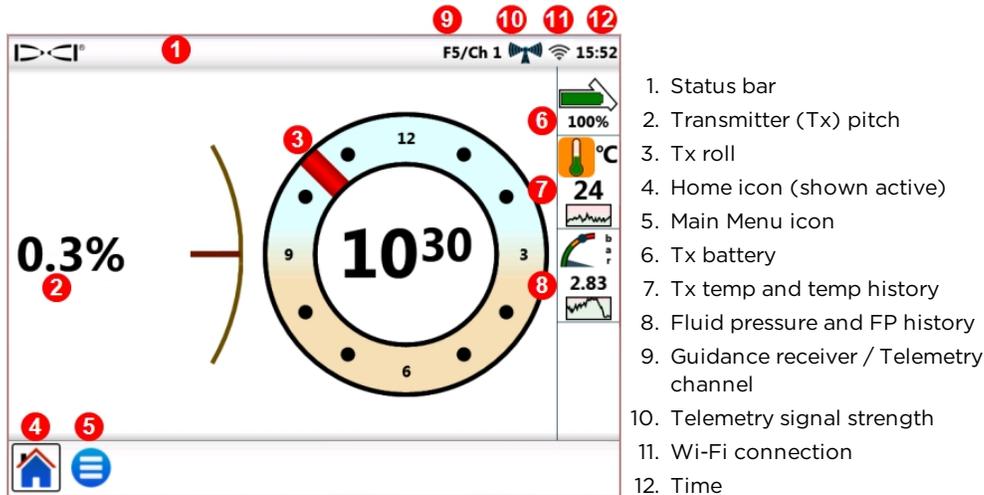
If the master volume setting (see [Device](#) tab on page 11) is zero, all video volume will be muted, regardless of the video volume  slider setting.



Do not view training videos or help files on Aurora while drilling.

Drilling with the Home Screen

The Home screen appears automatically when Aurora powers on. It shows all the information needed for drilling, such as transmitter pitch and roll, telemetry channel, and Target Steering data (when active).



Home Screen - Locating

Data displays on the Home screen as soon as the guidance receiver, such as the F5, receives data from a transmitter.

This sample screen also shows a high temperature caution  for the drill operator. Pressure data only displays when drilling with a fluid pressure transmitter (FPT).

Telemetry Signal Strength

The number of bars in the telemetry signal strength icon indicates the strength of signal reception from the receiver. If the receiver is far away from the Aurora, fewer signal bars may display on the icon.

A grey icon  indicates no reception from a receiver, and all transmitter information will disappear (a cable transmitter will only lose depth). A steady black icon  indicates Aurora is connected to a receiver that is not sending data. A flashing blue background behind the icon  indicates Aurora is receiving new data from the receiver.

If Aurora is not showing telemetry data, check the following:

- Does the transmitter have batteries correctly installed?
- Has the transmitter gone to sleep due to inactivity?
- Is the receiver showing transmitter data?
- Is the receiver set to the correct transmitter and frequency?
- Are the receiver and Aurora set to the same telemetry channel?
- Verify the region setting matches that of the receiver

Roll Offset

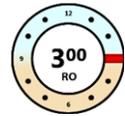
Roll offset (RO) is an electronic compensation to match the transmitter's 12 o'clock position to the drill head's 12 o'clock position.

Roll offset enabled on the receiver for a standard transmitter will display on Aurora automatically.

To enable roll offset for a cable transmitter, tap **Main Menu** , **Peripherals** , and then the **Roll Offset**  tab.

Menu shortcut	Tap and hold the roll indicator.
---------------	----------------------------------

The letters **RO** on Aurora's roll indicator indicate when it is compensating for roll offset.



Temperature

All DigiTrak transmitters, including TensiTrak, are equipped with an internal digital thermometer. Drill head temperatures typically range from 18 to 40° C during drilling. The temperature icon on the Home screen will flash orange slowly when the temperature reaches the warning level and flash red quickly when it reaches the critical level. These warnings are accompanied by audible beeps. Suspend drilling when drill head temperature exceeds 48° C to permit cooling.

Because the digital thermometer is inside the transmitter, temperature increases due to external drilling conditions will take time to transfer to the transmitter and then the thermometer. Resolve increases in temperature quickly to avoid irreversible damage.

Warning and critical values are user-defined as specified on the [Alarms](#) screen (see page 14).

The Temperature History graph below the temperature value shows a graph of the last four minutes of temperature readings. Use this history to determine if temperature is trending up or down.



Fluid Pressure Transmitter

Using a fluid pressure transmitter (FPT) or TensiTrak will show instantaneous fluid pressure on the right side of the screen. The pressure icon on the Home screen will flash yellow slowly when the pressure reaches the warning level and flash red quickly when it reaches the critical level. These warnings are accompanied by audible beeps. A blue ball on the gauge marks the maximum recorded pressure; it resets when Aurora restarts.

Readings exceeding the maximum value of 17.2 bar will display as **+OL**.

Warning and critical values are user-defined as specified on the [Alarms](#) screen (see page 14).

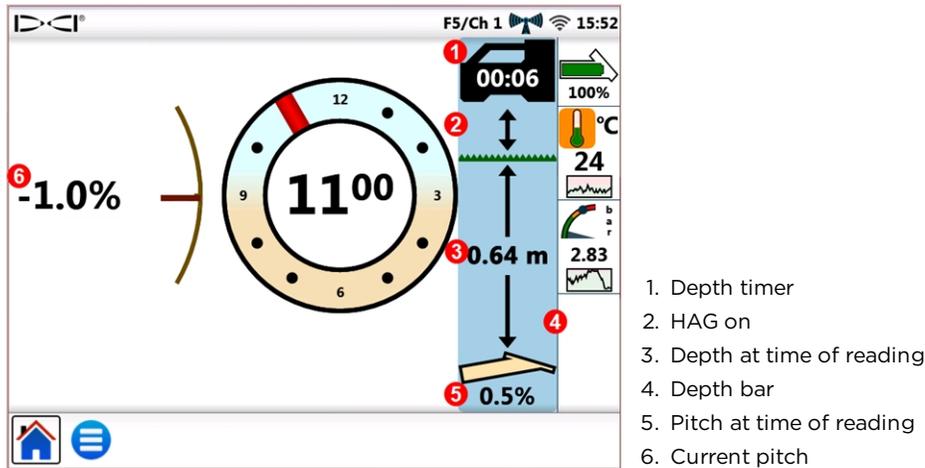
The Fluid Pressure History graph below the pressure value shows a graph of the last four minutes of fluid pressure readings. Use this history to determine if pressure is trending up or down.

If you are not using an FPT or TensiTrak transmitter, pressure data will not display.



Depth Readings

When the receiver takes a depth reading at the locate line (LL), Aurora adds the blue Depth Bar, which provides transmitter depth and pitch information beside the roll indicator:



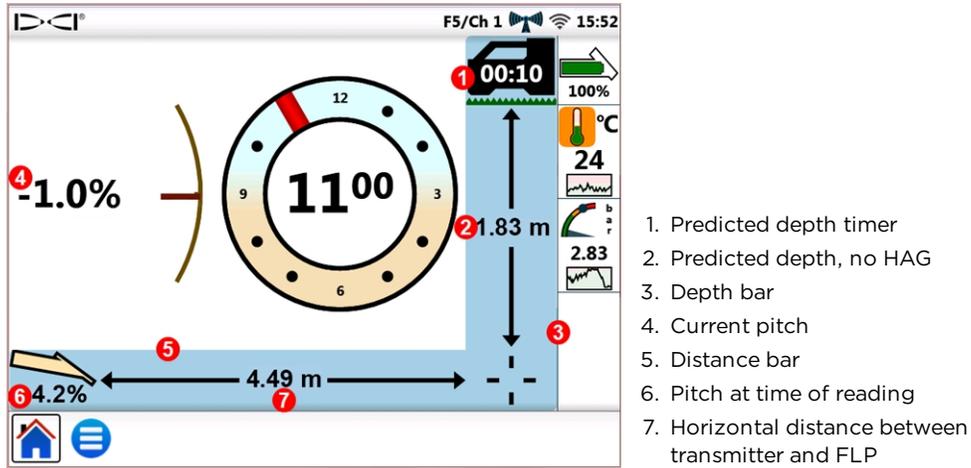
Home Screen – Depth Reading

The blue highlighting remains for ten seconds to indicate the information is recent. After ten seconds the blue reverts to white, but the depth bar data remains for five minutes, which is counted by the depth timer located in the receiver icon. A new depth reading from the receiver will redraw the depth bar blue and restart the depth timer.

The Depth Bar will also reflect if Height-Above-Ground (HAG) is set on the receiver. In the above image, the arrow between the receiver and ground level indicates HAG is on.

Predicted Depth

The predicted depth display appears when the receiver takes a depth reading at the front locate point (FLP). The predicted depth screen shows arrows pointing to the receiver and the predicted depth point ahead of the transmitter.



Home Screen – Predicted Depth Reading



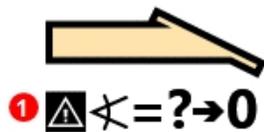
A depth reading taken at the rear locate point (RLP) will still cause the predicted depth to display, since the receiver does not distinguish between the FLP and RLP, however, the data will be inaccurate.

When the receiver takes a predicted depth reading at the FLP, the screen adds the blue Depth and Distance Bars, which provides transmitter pitch and predicted depth and distance information beside and below the roll indicator.

The blue highlighting remains for ten seconds to indicate the information is recent. After ten seconds the blue reverts to white, but the depth and predicted distance bars remain for five minutes, which is counted by the predicted depth timer located in the receiver icon. A new predicted depth reading from the receiver will redraw the predicted Depth and Distance Bars blue and restart the predicted depth timer.

The Depth Bar will also reflect if Height-Above-Ground (HAG) is set on the receiver. In the above example, HAG is off.

When transmitter pitch is unavailable at the receiver due to range restrictions or interference, Aurora will assume the transmitter has a pitch of zero for depth and predicted depth readings. In this case, it will display Pitch Assumed Zero beneath the transmitter icon.



1. Pitch assumed zero

Transmitter Pitch Unavailable

If the drilling angle prior to loss of pitch was at or near zero, a predicted depth reading can still be fairly accurate. If the last known pitch was not near zero, the predicted depth calculation will not be accurate. In either case, the predicted depth calculation will become increasingly inaccurate with each rod drilled with no pitch data.

The safest course of action is to stop drilling until pitch data is restored. Options available to the receiver operator to increase signal reception between the transmitter and receiver include changing the transmitter frequency (if compatible), off-track locating, and target steering.

Target Steering

Instructions for setting up the receiver for Target Steering® can be found in the operator's manual for your system. Most of the setup for Target Steering is done by the receiver operator. This section discusses how to use Target Steering data on the Aurora display.

DigiTrak SE guidance systems use a simpler form of steering called Remote Steering that provides only left and right steering information. Refer to the SE operator's manual for instructions on Remote Steering.

In general, Target Steering should be used to maintain a bore path, not to bring a significantly off-course bore back on track. If the drill head is already significantly off course, use front and rear locate methods as described in your DigiTrak system operator's manual to get back on course.



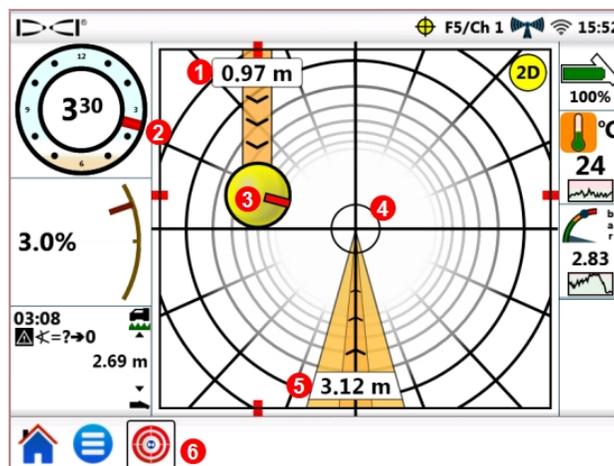
After learning the concepts of Target Steering, practice its use before using on a jobsite where time and money are at a premium. A Look-Ahead Locating animation is also available on our YouTube channel at www.YouTube.com/DCIKent. If you need further assistance, please contact DCI Customer Service.

Target Steering requires a stable signal from both the transmitter and receiver.

Steering to the Target

Once the target depth has been entered on the receiver, Aurora automatically displays the Target Steering screen. The flashing Target Steering icon  displays in the Status bar as long as Aurora is receiving target steering information. To hide the Target Steering screen,

tap Home .

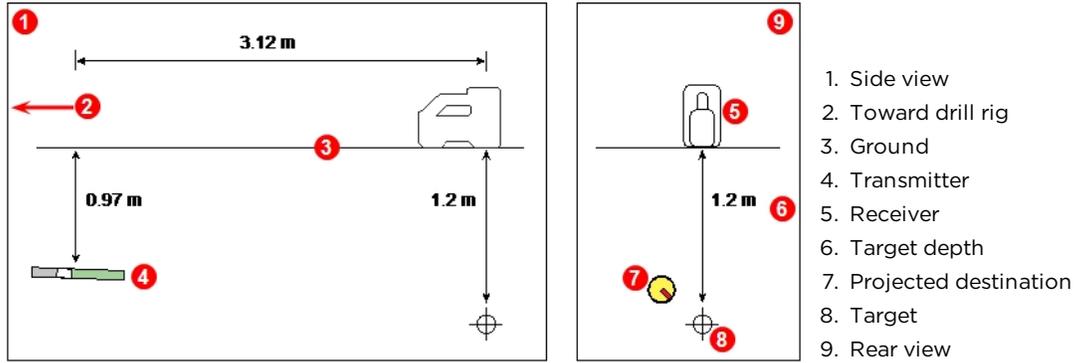


1. Current depth below receiver
2. Current roll
3. Projected destination on current heading
4. Target
5. Horizontal distance to target
6. Target steering icon

Target Steering Screen, Steering Toward Target

The target in the center of the previous image represents the target depth entered in the receiver for a point directly below it. The yellow steering indicator ball represents the projected destination or current “aim point” of the drill head in relation to the target. The red marker  inside the steering indicator indicates the current roll position of the drill head. This screen shows that the drill head is *currently* estimated at 1.0 m below the horizontal plane of the receiver and the target is 3.1 m ahead.

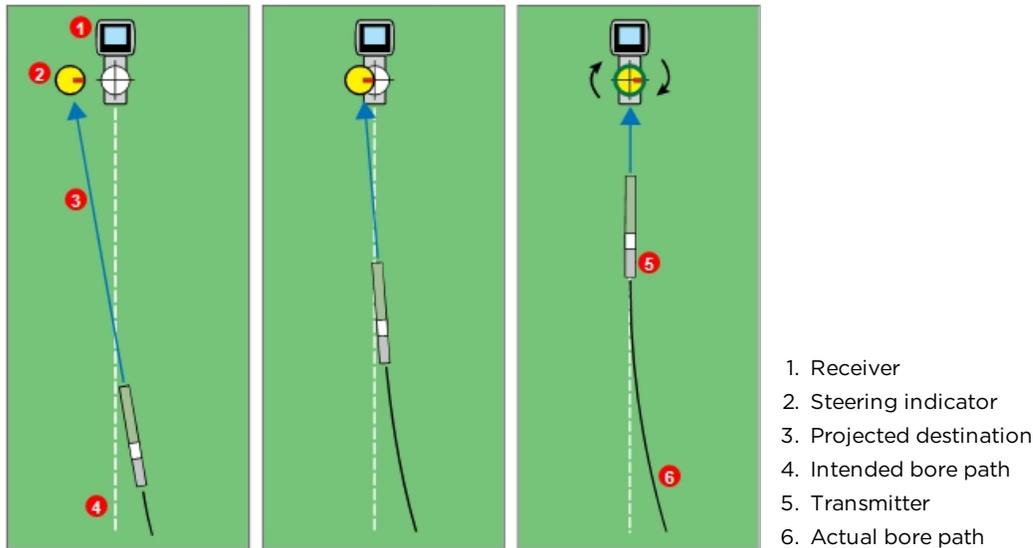
This Target Steering screen shows the following scenario:



Transmitter, Target, and Receiver

The steering indicator shows that the drill head is heading above and to the left of the target. To bring the ball back on target, rotate the drill head so the red marker in the ball points toward the target. The drill head is then steering correctly to reach the intended bore path (see following figure) to reach the target.

As shown in the example below, the steering indicator will help you line up the drill head with the receiver before it reaches the target.



Turning the drill head to center the yellow steering indicator ball

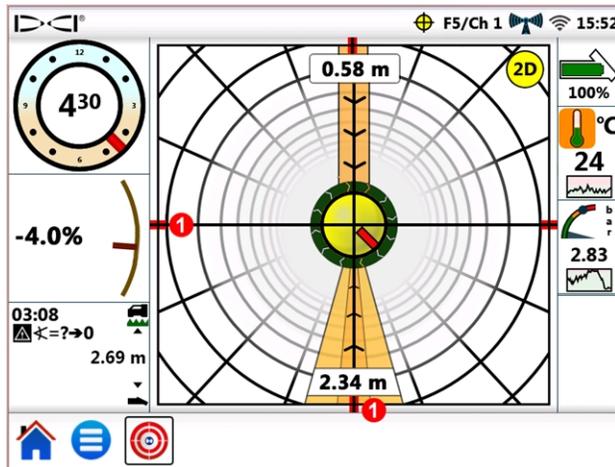
Reducing the turn as the steering indicator approaches the target

Drilling (rotating) directly toward the target

Target Steering and the Steering Indicator, Overhead View

The left panel of the target steering scenario above suggests that on the current heading, with no further steering corrections, the drill head will arrive to the left of the target below the receiver (depth is not reflected on this 2-dimensional drawing). However, as the drill head moves in relation to the target (center panel), the steering indicator will also move. The right panel shows the transmitter (drill head) having reached the intended bore path and drilling directly toward the target.

While drilling, monitor the yellow steering indicator ball closely, make small steering adjustments, and watch and wait for the results. The closer the drill head is to the receiver, the more sensitive the steering indicator becomes. As it approaches the target, reduce the amount of the turn. When the indicator is centered on the target and surrounded by a green ring, the drill head is correctly positioned on the intended bore path to drill toward the target.



1. Alignment marks

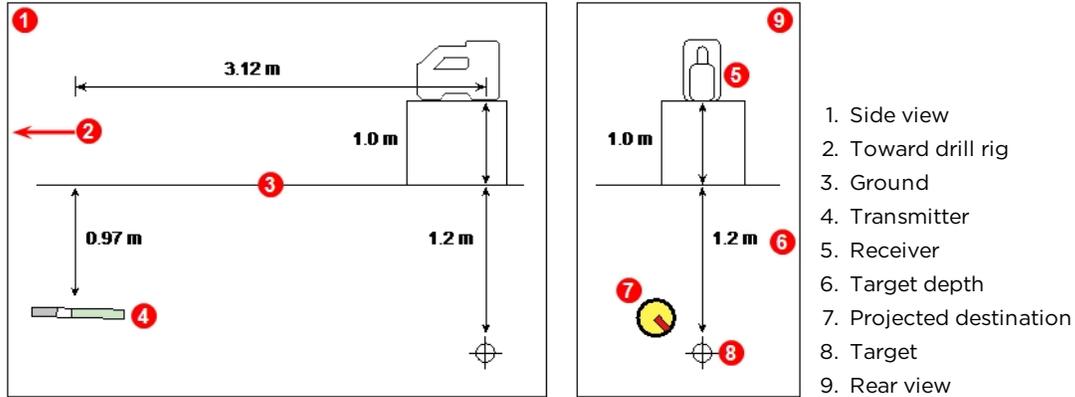
Target Steering Screen, Drill Head Aligned On Intended Bore Path

This screen shows the drill head correctly aligned to reach the target at 2.3 m ahead, and the drill head is currently 0.6 m below the horizontal plane of the receiver. At this point, the closer the pitch is to zero, the less the indicator will tend to move above or below the target. The red alignment marks help show when the drill head is aligned with the target.

The yellow steering indicator ball can only show steering corrections within the limits of the target steering screen. Once the ball nears the edge, or has "pegged", drilling farther off course will not be reflected on the remote display. Make the necessary steering corrections and when the ball begins moving closer to the target, be prepared to reduce the amount of the turn.

Target Steering in Interference Areas

In areas of passive and/or active interference, it may help to elevate the receiver above the ground. In the example below, the receiver is placed 1 m above the ground. To compensate, the target depth value must include the elevated height; 1 m plus 1.1 m equals 2.1 m.

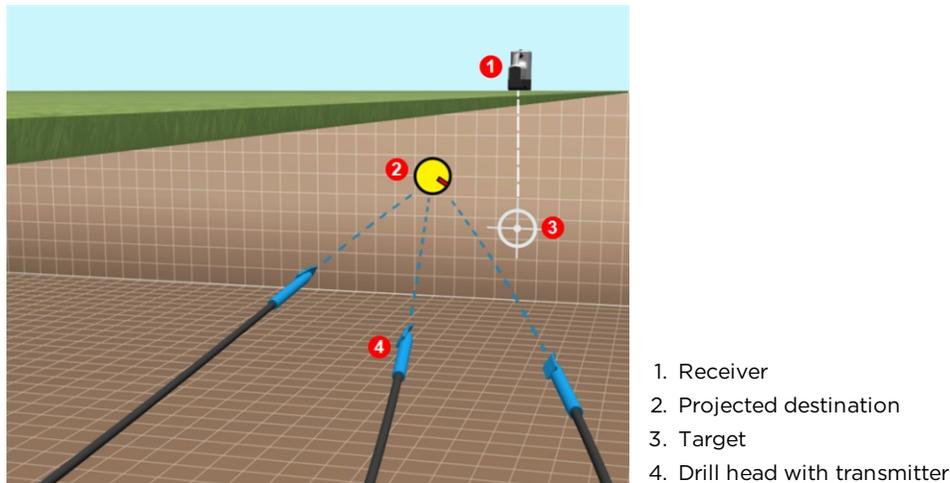


Transmitter, Target, and Raised Receiver

Understanding the Steering Indicator Ball

As shown previously, the yellow steering indicator ball (projected destination) being to the left of the target does not necessarily mean the drill head is also currently to the left of the target. While each example below requires a different amount and duration of steering correction, all need to move the same direction: right and down.

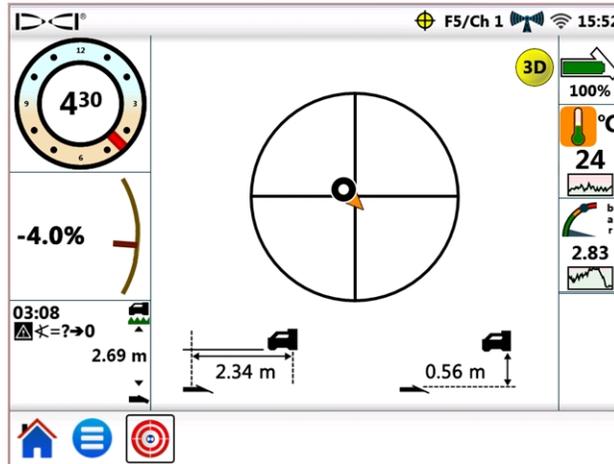
It is important to take into consideration the steering over the last few rods before making additional adjustments; you may already be drilling in the direction Target Steering is instructing.



Sample Target Steering Drill Head Locations

Classic View

In addition to the three-dimensional target steering screen, Aurora can also display the classic two-dimensional Target Steering view from previous versions of DigiTrak remote displays. Tap either  or  at the upper right of the screen to switch to 2D or 3D views at any time.



Target Steering, Classic Two-Dimensional View

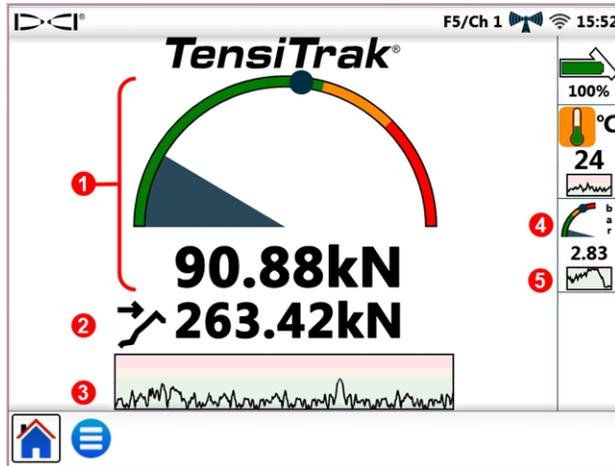
Turning Target Steering Off

The flashing Target Steering icon  in the Status bar indicates when Target Steering data is being received, even if you are on a different screen. If you are viewing the Target Steering screen when Aurora stops receiving Target Steering information from the receiver, the display will stop showing data.

Until Aurora is powered off, the Target Steering function remains loaded so if Target Steering data resumes, Aurora can continue processing it without interrupting your current task.

Working with TensiTrak

When Aurora detects tension data provided by a TensiTrak pullback and pressure monitoring system, it automatically displays the TensiTrak tension gauge.



1. Current pullback tension
2. Maximum pullback tension
3. Tension history
4. Fluid pressure
5. Fluid pressure history

TensiTrak Gauge

A TensiTrak system provides both product pullback tension and annular fluid pressure. The maximum recorded tension (in this case, **263.42 kN**) also displays on the gauge as a blue circle.

The tension history graph displays about 30 minutes of historical data; new data plots on the right, pushing older data to the left.

For details on working with TensiTrak, please refer to the operator's manual, available at digital-control.com.

Setting Warning Levels

To set TensiTrak tension or fluid pressure warning and critical levels, go to the **Main Menu** , tap **Alarms** , then select either the **TensiTrak Pullback Tension**  or **TensiTrak Pullback Fluid Pressure**  tab.

Menu shortcut	For tension  alarms, tap and hold the pullback tension gauge.	
Menu shortcut	For fluid pressure  alarms, tap and hold the fluid pressure gauge.	

Working with the MFCB

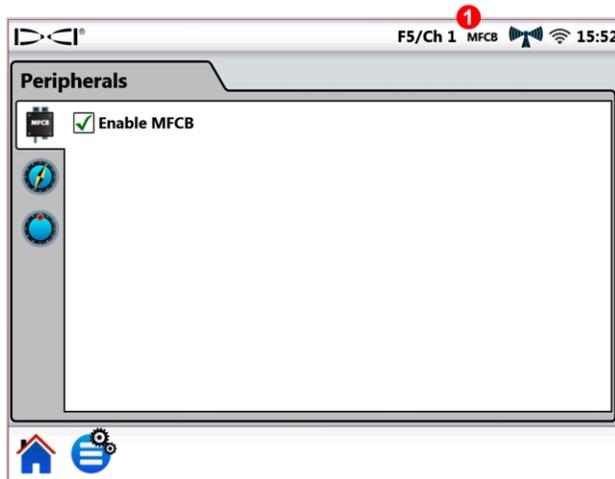
For instructions on making the power and data connections between the Multi-Function Cable Box (MFCB) and Aurora, please read the MFCB Operator's Manual, available at digital-control.com.

Enabling the MFCB

Until you have made the proper power and data connections between the MFCB and Aurora, the check box to **Enable MFCB** on the **MFCB** tab of the **Peripherals** screen (shown below) will be grayed out as unavailable.

Once the MFCB is properly connected to Aurora, an **MFCB** icon displays in the Status bar. If the MFCB appears as disabled , enable it as follows:

1. Tap **Main Menu** , then tap **Peripherals** .
2. Tap the **MFCB** tab (shown below).
3. Tap the check box to **Enable MFCB**. This selection will remain in effect even after a power cycle.
4. Tap  to return to the Home screen.



1. MFCB is connected

Enabling MFCB on the Peripherals Screen

Menu shortcut	Tap and hold MFCB in the Status bar.
---------------	---



To use a standard battery-powered transmitter while the MFCB is connected, simply clear the **Enable MFCB** check box. Aurora will now receive drilling data from the receiver.

After the MFCB is correctly connected and enabled, Aurora replaces the transmitter battery icon at the top right of the screen with a display of the voltage and amps at both the MFCB and transmitter. This new portion of the screen functions as an on/off button for using the MFCB. Upon first use after Aurora is turned on, this MFCB button will be bordered and shaded in red, indicating the MFCB is not yet sending power to the transmitter.



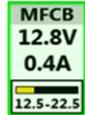
 Before making any changes to the wire in the drill pipe, ensure the voltage/amp icon is red—indicating the MFCB is off—to avoid electric shock. If it is green, tap to turn it off.

Using a Cable Transmitter

Connect and enable the MFCB as described in [Enabling the MFCB](#) on page 31.

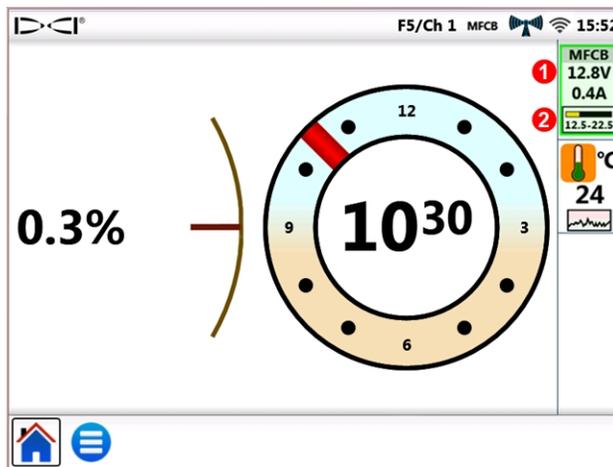
Applying Power to the Transmitter

To send power to the transmitter, tap the red button; it turns green to indicate the transmitter is now powered, and current voltage and amperage information displays along with other transmitter data such as roll and pitch.



In this example for a cable transmitter, the MFCB is supplying 12.8 VDC and 0.4 A of power to the transmitter. The voltage at the transmitter  is in the range of 12.5-22.5 VDC.

Other information displayed on the Home screen is the same as when using a standard battery-powered transmitter.



1. Volts and amps at MFCB
2. Voltage range at transmitter

Home Screen with MFCB Power Readings

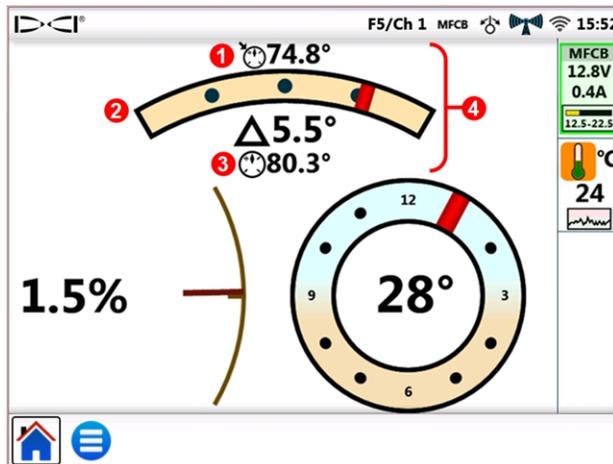
Monitor the voltage at the transmitter closely, since the length of cable or quality of connections may cause the voltage to drop below the level necessary for the cable transmitter to function.

Using a Steering Tool Transmitter (SST)

For instructions on using the Steering Tool transmitter, please read the SST[®] operator's manual, available at digital-control.com.

Connect and, if necessary, enable the MFCB as described in [Enabling the MFCB](#) on page 31.

When Aurora detects that a steering tool is connected to the MFCB, it adds a heading indicator to the display.



1. Heading reference (tap and hold to set)
2. Deviation from heading reference
3. Current heading
4. Heading indicator

Home Screen with SST Heading Indicator and MFCB Power Readings

As shown in the above image, roll accuracy for SST changes from a 24-position to a much more accurate 360° indicator.

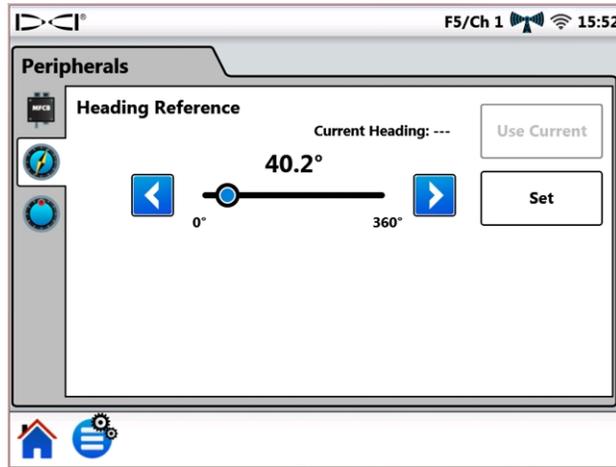
Setting a Heading Reference

To set the desired heading reference:

1. Tap **Main Menu** , then tap **Peripherals** .
2. Tap the **Heading Reference**  tab (shown below).
3. Tap the blue arrow buttons or drag the slider control to select the desired heading reference.
4. Tap **Set** to set the heading reference and return to the Home screen.

The **Set** button is unavailable until the heading reference changes.

If Aurora is detecting a valid heading from the SST, this value will display beside **Current Heading:** and the **Use Current** button will be available. In this case, you can tap **Use Current** to set this value as the heading reference.



SST Heading Reference Screen

<p>Menu shortcut</p>	<p>Tap and hold the heading indicator on the Home screen.</p>	 <p>Heading Indicator</p>
----------------------	---	--

Appendix A: System Specifications

Power Requirements

Device	Operational Voltage	Operational Current
DigiTrak Aurora AF10 Display	10-28 V (nominal)	2.10 A max
DigiTrak Aurora AP8/AF8 Display		1.75 A max

Environmental Requirements

Category	Value
Relative humidity	<90%
Operating temperature	-20 to 60° C
Dust and water ingress	IP66
Handling drop (1 meter)	IEC 61010-1
Vibration	SAE J1455
Electromagnetic interference	EN 55024/CISPR24, IEC 61000-4-3,4,6,8
Electromagnetic compatibility	EN 55022/CISPR22 (Class B)
Electrostatic discharge	IEC 61000-4-2
Operating altitude, maximum	2000 m

Networking Requirements

Connection Type	Requirement
Wi-Fi	IEEE 802.11 b/g/n
Bluetooth	2.1+EDR, Power Class 1.5

Storage and Shipping Requirements

Temperature

Storage and transportation temperature must remain within -40 to 65° C.

Packaging

Ship in original carrying case or packaging of sufficient durability to prevent mechanical shock to equipment during transportation.

DCI Standard Warranty

DCI warrants that it will either repair or replace any product that fails to operate in conformity to DCI's published specifications at the time of shipment due to a defect in materials or workmanship during the warranty period for that product, subject to the terms set forth below.

Category	Warranty Period
Falcon Transmitters (19" and 15")	Three years from date of purchase or first 500 hours of use, whichever occurs first.
All Other Transmitters	Ninety days from date of purchase
Receivers, Remote Displays, Battery Chargers and Rechargeable Batteries	One year from date of purchase
Software*	One year from date of purchase
Other Accessories	Ninety days from date of purchase
Service/Repair	Ninety days from date of repair

* For software products, in lieu of the warranty set forth above, DCI warrants that it will either update any defective software to bring it into material compliance with DCI's specifications for such software, or refund the purchase price paid for the software.

Terms

- The 3-yr/500-hr warranty period for a Falcon transmitter is conditioned on registration of the purchase with DCI within 90 days of the date of purchase. *If the customer fails to register the purchase during this time frame, the warranty period for the transmitter will instead be ninety days from date of purchase.*
- Warranty coverage for a warranty **replacement** transmitter shall tie back to the original transmitter(s) submitted for warranty coverage. For example, if a Falcon transmitter is owned for one year and used for 250 hours, the warranty coverage for the replacement will be an additional two years or an additional 250 hours of use, whichever comes first.
- "Hours of use" for purposes of the Falcon transmitter warranty means active run-time hours, as measured internally by Falcon transmitters.
- In the event of a valid warranty submission, the choice of remedy (for example, to repair or replace a defective product or, in the case of defective software, to update or refund), shall be at DCI's sole discretion. DCI reserves the right to use remanufactured replacement parts for repairs.
- The above warranties only apply to new products purchased directly from DCI or from a DCI-authorized dealer.
- The ultimate determination of whether a product qualifies for warranty replacement shall be at DCI's sole discretion.

Exclusions

- Transmitters that have exceeded the maximum temperature, as indicated by the system.
- Defect or damage caused by misuse, abuse, improper installation, improper storage or transport, neglect, accident, fire, flood, use of incorrect fuses, contact with high voltages or injurious substances, use of system components not manufactured or supplied by DCI, failure to follow the operator's manual, use other than that for which the product was intended or other events beyond the control of DCI.
- Any transmitter used with an improper housing, or damage caused to a transmitter from improper installation into or retrieval from a housing.
- Damage during shipment to DCI.

Any modification, opening up, repair or attempted repair of a product, or any tampering or removal of any serial number, label or other identification of the product, will void the warranty.

DCI does not warrant or guarantee the accuracy or completeness of data generated by HDD guidance/locating systems. The accuracy or completeness of such data may be impacted by a variety of factors, including (without limitation) active or passive interference and other environmental conditions, failure to calibrate or use the device properly and other factors. DCI also does not warrant or guarantee, and disclaims liability for, the accuracy and completeness of any data generated by any external source that may be displayed on a DCI device, including (without limitation) data received from a drill rig.

DCI may make changes in design and improvements to products from time to time. DCI shall have no obligation to upgrade any previously manufactured DCI product to include any such changes.

THE FOREGOING IS THE SOLE WARRANTY FOR DCI PRODUCTS (OTHER THAN THE 5-YR/750-HR EXTENDED WARRANTY FOR FALCON 15/19" TRANSMITTERS). DCI DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IMPLIED WARRANTY OF NON-INFRINGEMENT, AND ANY IMPLIED WARRANTY ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING, OR USAGE OF TRADE, ALL OF WHICH ARE HEREBY DISCLAIMED.

In no event shall DCI or anyone else involved in the creation, production, sale or delivery of the DCI product ("partners") be liable for any damages arising out of the use or inability to use the DCI product, including but not limited to indirect, special, incidental, or consequential damages, or for any cover, loss of information, profit, revenue or use, based upon any claim for breach of warranty, breach of contract, negligence, strict liability, or any other legal theory, even if DCI has been advised of the possibility of such damages. In no event shall DCI or its partners' liability exceed the purchase price for the product.

This warranty is not assignable or transferable. This warranty is the entire agreement between DCI and purchaser, and may not be expanded or amended in any way other than in writing by DCI.

Product demonstrations

DCI personnel may be present at a job site to demonstrate basic usage, features, and benefits of DCI products. DCI personnel are present only to demonstrate a DCI product. DCI does NOT provide locating services or other consulting or contracting services. DCI does not assume any duty to train the user or any other person, and does not assume responsibility or liability for the locating or other work performed at a job site at which DCI personnel or equipment are or have been present.

Translations

This document may be a translation of the original English language version. The purpose of this translation is to assist the product user. However, in the event of any discrepancy in meaning or interpretation between the translation and the original English language version, the original English language version shall control. A copy of the original English language version of this document may be found at digital-control.com.

END-USER PRODUCT LICENSE AGREEMENT: AURORA®

IMPORTANT: PLEASE READ THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT CAREFULLY BEFORE USING THE AURORA PRODUCT.

This End-User License Agreement ("license") is an agreement between DIGITAL CONTROL INCORPORATED ("DCI") and the entity or individual ("you") that purchases the AURORA® product from an authorized distributor of DCI products. By using the AURORA product, you agree to be bound by the terms of this license.

1. Definitions

- a. "AURORA" means color touchscreen display and intelligent platform for use with horizontal directional drill rigs that is manufactured by DCI.
- b. "DCI GUIDANCE SYSTEM" means any horizontal directional drilling guidance system manufactured by DCI that is, at any given time, designated by DCI as being interoperable with AURORA (as indicated in the associated product documentation for AURORA).
- c. "SOFTWARE" means the software and firmware embedded into AURORA upon purchase of the AURORA unit and related documentation, including any bug fixes, modifications and updates to such software provided by DCI to you under this license. SOFTWARE shall also include any software application for AURORA, whether installed upon initial purchase or purchased or validly obtained by you in the future, that is expressly authorized by DCI for use with AURORA.
- d. "TERRITORY" means the United States, Canada, each member state of the European Union, Australia, New Zealand, China, India and Russia.

2. **Grant of Non-Exclusive License.** DCI grants you a nonexclusive, royalty-free (other than royalties or fees specifically identified with respect to applications purchased separately in the future), non-transferable and non-sublicensable license to use the SOFTWARE in object code form, solely for your use with the AURORA unit on which the SOFTWARE came originally installed (as a single integrated product), for ordinary course horizontal directional drilling purposes, together with any applicable DCI GUIDANCE SYSTEM in the TERRITORY.

3. **License Restrictions.** This license is subject to the following restrictions:

- the SOFTWARE may not be used with any device other than the particular AURORA unit on which the SOFTWARE came originally installed;
- you agree not to make any copies of the SOFTWARE;
- neither the SOFTWARE nor the associated AURORA unit may be used in any geographic territory other than the TERRITORY; and
- neither the SOFTWARE, the associated AURORA unit nor any associated DCI GUIDANCE SYSTEM may be repaired by, or submitted for repair to, any person or entity other than a person or entity expressly authorized by DCI to perform such repairs (as of the date of this license, DCI is the only person or entity authorized to perform such repairs).

4. **Ownership.** The SOFTWARE is licensed, not sold, and nothing in this license shall be construed to convey any title or ownership rights. You expressly acknowledge that, as between you and DCI, DCI owns all worldwide right, title and interest in and to the SOFTWARE, including all copyrights and other intellectual property rights therein. All rights not expressly granted by this license are hereby reserved by DCI and its licensors.

5. **Intellectual Property.** You acknowledge that the SOFTWARE constitutes and contains trade secrets of DCI, and in order to protect such trade secrets and other interests that DCI may have in the SOFTWARE, you agree not to disassemble, decompile, reverse engineer or otherwise attempt to derive source code from the SOFTWARE or the associated AURORA unit, nor to permit any other person or entity to do so, except to the extent such restrictions are prohibited by law. Except as expressly provided in this license, this license does not grant you any rights to patents, copyrights, trade secrets, trademarks or any other rights with respect to the SOFTWARE.

6. **Data Rights.** Future upgrades to the SOFTWARE, or future software applications for AURORA, may enable you to store HDD locate data generated by a DCI GUIDANCE SYSTEM locally on the AURORA unit and/or in remote data storage. DCI may seek to collect this HDD locate data solely to provide aggregate industry data summaries or reports, to provide customer service to you, or for use with AURORA software applications or other DCI products or services, subject in each case to the following limitations. You may "opt out" of any such data collection by DCI by indicating this decision on DCI's product registration website at www.MyDigiTrak.com. You hereby grant DCI a perpetual, irrevocable, worldwide, royalty-free, assignable, sublicensable, non-exclusive license to use, reproduce, display, modify and distribute any data generated by the SOFTWARE, the associated AURORA unit and each DCI GUIDANCE SYSTEM used in conjunction therewith; provided that DCI will not disclose your project-specific data to any third party (excluding any service provider of DCI subject to similar confidentiality obligations) without your consent (for purposes of clarity, the foregoing shall not restrict

DCI from disclosing aggregate data incorporating your data) other than as required by law; provided further, that such license shall terminate if and immediately upon your election to “opt out” of such data collection as specified above. You agree not to sell, lease or otherwise provide such data to any third party nor to authorize any third party to use, reproduce, display, modify or distribute any such data without DCI’s consent.

7. **Support Services.** This license does not obligate DCI to provide you with any support services related to the SOFTWARE. However, registering your AURORA with DCI through www.MyDigiTrak.com will entitle you to one year of free upgrades for the SOFTWARE.
8. **Limited Warranty.** DCI provides a limited warranty for the SOFTWARE. Please refer to the section of your AURORA manual titled “Limited Warranty”, or to digital-control.com, for the terms and limitations of this warranty.

AURORA ACCEPTS DATA FROM MULTIPLE SOURCES. DCI DOES NOT WARRANT OR GUARANTEE, AND DISCLAIMS LIABILITY FOR, THE ACCURACY AND COMPLETENESS OF ANY DATA GENERATED BY ANY EXTERNAL SOURCE OR DERIVED FROM DATA GENERATED BY ANY EXTERNAL SOURCE, INCLUDING (WITHOUT LIMITATION) FROM ANY HDD DRILL RIG. DCI DOES NOT WARRANT OR GUARANTEE THE ACCURACY OR COMPLETENESS OF DATA GENERATED BY HDD GUIDANCE SYSTEMS. THE ACCURACY OR COMPLETENESS OF SUCH DATA MAY BE IMPACTED BY A VARIETY OF FACTORS, INCLUDING (WITHOUT LIMITATION) ACTIVE OR PASSIVE INTERFERENCE (INCLUDING FROM SALT WATER) AND OTHER ENVIRONMENTAL CONDITIONS, FAILURE TO CALIBRATE OR USE THE DEVICE PROPERLY AND OTHER FACTORS.
9. **LIMITATION OF LIABILITY.** DCI’S TOTAL CUMULATIVE LIABILITY TO YOU FROM ALL CAUSES OF ACTION AND UNDER ALL THEORIES OF LIABILITY WILL BE LIMITED TO THE VALUE OF THE SOFTWARE. IN NO EVENT WILL DCI BE LIABLE FOR ANY DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS, BUSINESS INTERRUPTION, OR LOST INFORMATION) ARISING OUT OF OR RELATED TO YOUR USE OF OR INABILITY TO USE THE SOFTWARE, WHETHER SUCH LIABILITY ARISES FROM ANY CLAIM BASED UPON CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, AND WHETHER OR NOT DCI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. DCI SHALL HAVE NO LIABILITY WITH RESPECT TO THE CONTENT OF THE SOFTWARE OR ANY PART THEREOF, INCLUDING BUT NOT LIMITED TO ERRORS OR OMISSIONS CONTAINED THEREIN, LIBEL, INFRINGEMENTS OF RIGHTS OF PUBLICITY, PRIVACY, TRADEMARK RIGHTS, BUSINESS INTERRUPTION, PERSONAL INJURY, LOSS OF PRIVACY, MORAL RIGHTS OR THE DISCLOSURE OF CONFIDENTIAL INFORMATION.

ONE OR MORE REPRESENTATIVES OF DCI OR OF A RESELLER OF DCI MAY ARRIVE AT YOUR JOB SITE FOR PURPOSES OF DEMONSTRATING THE FEATURES AND BENEFITS OF THE AURORA PRODUCT WITH A DCI GUIDANCE SYSTEM. YOU HEREBY EXPRESSLY ACKNOWLEDGE AND AGREE THAT, AS A RESULT OF THE PRESENCE OF SUCH DCI REPRESENTATIVE AT A JOB SITE AND DEMONSTRATION OF SUCH DCI PRODUCTS (AND ASSOCIATED ADVICE REGARDING THE USE OF SUCH DCI PRODUCTS), DCI DOES NOT ASSUME ANY DUTY TO TRAIN YOU OR ANY OTHER PERSON AT A JOB SITE AND DCI SHALL HAVE NO LEGAL RESPONSIBILITY OR LIABILITY FOR DRILLING, INSTALLATION, HDD GUIDANCE OR OTHER WORK PERFORMED AT ANY SUCH JOB SITE.
10. **Infringement.** DCI will defend or settle, at its option and expense, any suit against you alleging that the SOFTWARE and/or the associated AURORA unit infringes any United States patent(s), trademarks or copyrights or misappropriates any trade secrets, when used for its normal purpose. As a condition to such obligation, you agree to (a) notify DCI promptly in writing of such suit or infringement, (b) provide DCI all information and assistance reasonably necessary to settle or defend the suit, and (c) grant DCI sole authority and control of the defense or settlement of the suit. DCI’s obligations under this section will not apply, however, to any claim based on (i) any modification to the SOFTWARE or AURORA by anyone other than DCI, (ii) any use of the SOFTWARE or AURORA that is outside the ordinary course intended use of the product, (iii) any use of the SOFTWARE or AURORA as part of an infringing process, and (iv) any combination of the SOFTWARE or AURORA with any product or technology not supplied by DCI (or methods combining use of the SOFTWARE or AURORA with any product or technology not supplied by DCI), except for combinations where you establish by clear and convincing evidence that the SOFTWARE or AURORA is the primary cause of the infringement. In addition, DCI’s obligations under this section will not apply to consequential or other damages excluded under Section 9 above. To settle or resolve any such claim, DCI may, at its sole option and expense, either replace or modify the SOFTWARE or AURORA so that it becomes non-infringing or procure a license for you to continue using the SOFTWARE and AURORA; if DCI determines that neither of such alternatives is financially or otherwise practical, DCI may repurchase the AURORA unit at its depreciated value based on a 5-year linear depreciation schedule.
11. **Export and Compliance with Law.** You agree not to export or re-export the SOFTWARE, the associated AURORA unit, or accompanying documentation, in violation of any applicable laws or regulations, including without limitation the U.S. Export Administration Regulations, as well as end-user, end-use and destination restrictions issued by the U.S. and other governments. You further agree to comply with all other laws and regulations applicable to the SOFTWARE and the associated AURORA unit. Without limiting the foregoing, you agree to review local laws and regulations governing the use of GPS before using any AURORA applications that employ GPS technology.
12. **Termination.** In the event that you breach any provision of Section 3 or Section 13(a), this license shall immediately terminate and become null and void. DCI may terminate this license if you fail to comply with any other terms and conditions of this license by sending written notice of such termination to you. The exercise by DCI of any remedy under this license will be without prejudice to its other remedies under this license or otherwise.

13. **General**

- a. You may not assign, sublicense or otherwise transfer this license, in whole or in part, by operation of law or otherwise, without DCI's express prior written consent. Any attempt to assign this license without such consent will be void. In the event you wish to resell, lease or otherwise transfer the AURORA unit on which the SOFTWARE is installed, such transfer will render this license null and void, and such purchasing person or entity will be required to obtain a separate license from DCI.
- b. This license represents the entire agreement concerning the program between you and DCI, and it supersedes any prior proposal, representation, or understanding between the parties. If any provision of this license is held by a court of competent jurisdiction to be void, invalid, unenforceable or illegal, then such provision will be construed, limited or, if necessary, severed to the extent necessary to eliminate such invalidity and unenforceability. The other provisions of this license will remain in full force and effect. This license may only be modified in writing, signed by an authorized representative of you and DCI (which will require a new registration on www.MyDigiTrak.com by such purchasing person or entity).
- c. This license shall be governed by and construed in accordance with the laws of the State of Washington (without regard to its or any other jurisdiction's choice of law principles). All disputes arising out of or in relation to this license shall be submitted to the exclusive jurisdiction of the state and federal courts of Washington, USA. Nothing in this license shall restrict DCI's right to bring an action against you in the jurisdiction where your place of business is located. The United Nations Convention on Contracts for the International Sale of Goods does not apply to this license.