TRAXALL

Multi-source Magnetic Pipeline Pig Location and Tracking System
Models 770 & 720

USER GUIDE

CDI

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C E   PIGGING PRODUCTS &
SERVICES ASSOCIATION
member

QUALITY SYSTEM CERTIFICATION
DNV·GL
ISO 9001

<table>
<tr><td colspan="3" align="center">⚠️   WARNING   ⚠️</td></tr>
</table>

WARNING

Any operation involving work on pipelines containing gases or liquids under pressure is potentially hazardous. It is necessary, therefore, to follow correct procedures in the use of this equipment to maintain a safe working environment.

No person should use this equipment unless fully aware of potential hazards of working with pressurized pipelines and trained in the procedures stated in this manual.

The purchaser of this equipment is responsible for the training and competence of operators and the manner in which it is used.

Contact CDI immediately should any difficulty arise in the use of this equipment.

CONTENTS

ABOUT THIS USER GUIDE

Conventions used in this publication

▲ ▼ ► ◄ and ↵ indicate you are to press Up, Down, Right, Left, or Enter on the keypad (pg. 10):

Menu options will appear in this guide exactly as displayed. For example, "REC PASSES" and "SEL VISIBLE DATA" refer to *Record Passages* and *Select Visible Data* options.
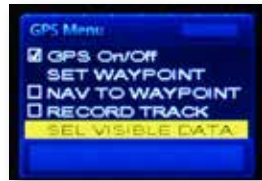
Solid arrows indicate sequence, progression, or transition:
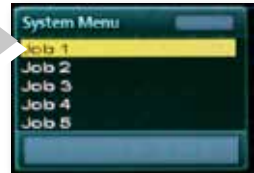
Outlined arrows point out specific items or details:

Segmented arrows indicate physical movement:

OVERVIEW

Features and Capabilities

TRAXALL is CDI's latest and most powerful pig locating and tracking receiver.

This formidable array of tracking and locating technologies is complemented by a large number of useful new features:

- Multi-frequency[1] transmitter, "Legacy" (22 Hz[2]) transmitter, and Magnetic-flux leakage (MFL) "smart pig" detection capability
- Three viewing modes
- Pinpointer® precision locator
- Built-in Global Positioning Satellite receiver
- Built-in Bluetooth® for remote communication
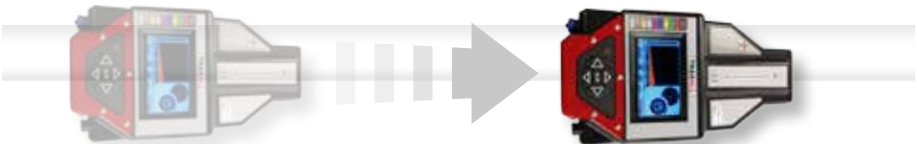- Programmable relays
- USB port

These features will be explained as you read through the GETTING STARTED and OPERATION sections of this user guide. Details can be found in the APPENDIX (pg. 40).

[1] TRAXALL 770 and 720 are identical in design, function, and operation, differing only in multi-frequency capability. The 720 can identify and record two transmitter frequencies simultaneously, the 770 can process as many as seven plus the 22 Hz Legacy frequency.

Because of the similarity of the two models, this User Guide will generally refer to and show the TRAXALL 770.

[2] The industry-standard ("Legacy") transmitter frequency is actually 21.768 Hz; however, for the sake of familiarity, the nominal term *22 Hz* will be used for this publication.

Devices Supported by TRAXALL

Multi-frequency Transmitters

The TRAXALL 770 can separate, identify, and record as many as seven transmitter frequencies* simultaneously. Transmission pulse rate of each color-coded CDI X-Series transmitter can be customized with CDI's special *FieldLink Configurator* application.

* TRAXALL 720: two frequencies.

Single-frequency (Legacy) Transmitters

CDI T-series single-frequency 22 Hz transmitters are available in various sizes, pressure ranges, and pulse rates.

<div style="background:red;color:white;">

WARNING

Always use caution when opening any CDI transmitter that has been in a pressurized environment.

It is possible for pressurized liquid or gas to leak into a transmitter and remain there even after the transmitter has been removed from the pipeline.

Always point the transmitter away from yourself or others when opening a cover or end cap.

</div>

Magnetic Flux Leakage (MFL) Pigs

Magnetic Flux Leakage is a form of nondestructive inline inspection that detects corrosion, pitting, missing metal, cracks, and/or other defects in steel pipelines.

An MFL "smart pig" such as shown here is a common inline inspection tool:
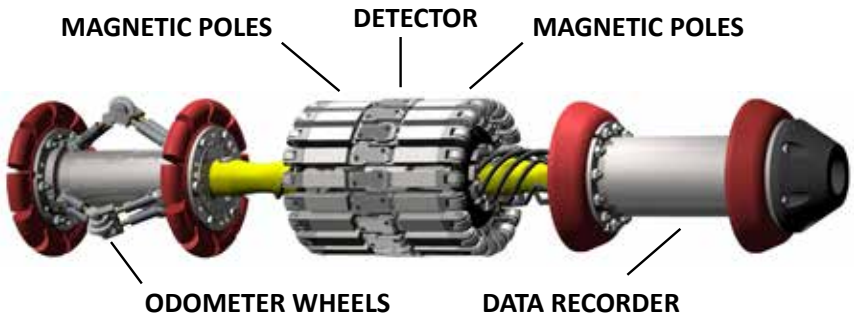
As it travels through a pipeline, the magnetic array magnetizes the steel. When defects are encountered, the magnetic field "leaks" from the steel. This leakage field is sensed by the magnetic detector.

Field intensity and defect locations are usually stored by the unit's on-board recorder.

Inline Inspection (ILI) Tool Transmitters

ILI transmitters are similar in performance and function to the T-series transmitters, but in lieu of pressure housings, are designed to work in conjunction with MFL pigs.

Components

TRANSMITTER AND MFL SENSOR ANTENNAS

PIPE ALIGNMENT LEGEND

LCD DISPLAY

MAGNETO-RESITIVE (MR) PINPOINTER SENSOR ARRAY

CONTROLS

SHOULDER STRAP

HANDLE

BATTERY COMPARTMENT

The Pipe Alignment legend is a guide to help you position your TRAXALL receiver for best passage detection results.

The handle and shoulder strap support the TRAXALL receiver during portable tracking/searching operation, such as "walking a line" during Pinpointing (pg. 33).

Controls

AUTOMATIC
LIGHT SENSOR

KEYPAD

POWER
ON/OFF

RELAY PORT
FOR SATELLITE RADIO
& RELAY CONTACTS

USB
CONNECTION

Power ON/OFF
Depress button for 3–5 seconds to power up the TRAXALL receiver
(same to power down).

Automatic Light Sensor (ALS)

The ALS will automatically adjust LCD backlighting brightness for optimal
visibility and battery life. Backlighting can also be adjusted manually via
the SYSTEM menu.

Keypad

The keypad is where TRAXALL controls are accessed.
Use the

    Up   ▲
    Down ▼
    Right ▶
    Left ◀

and

    Enter ↵

keys to cycle through the mode and menu options.

I/O Connections

Relay Port

A 12-pin connector provides CDI LineStat satellite radio connection, I/O, and programmable relay contacts which are programmable to varying patterns.

USB

When connected to a laptop or PC, TRAXALL will register as a mass storage device on the host PC.

At connection, the TRAXALL may display a 'Syncing' message. All other TRAXALL functionality is off during a PC–USB connection.
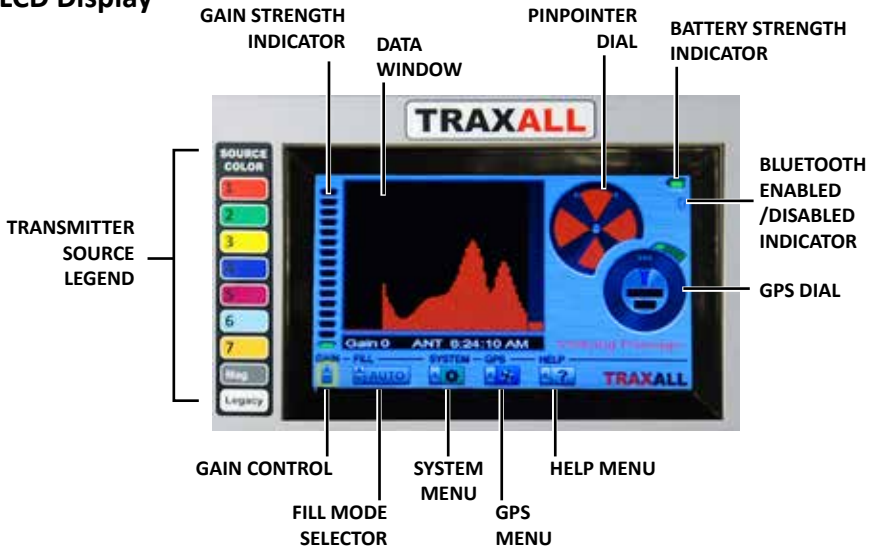
Bluetooth

TRAXALL'S built-in Bluetooth will let you monitor and operate your TRAXALL receiver from a remote location (for example, a vehicle cab or shelter during inclement weather) on a laptop or PC over an approximate maximum distance of 330 ft [100 m].

LCD Display

GAIN STRENGTH INDICATOR

DATA WINDOW

PINPOINTER DIAL

BATTERY STRENGTH INDICATOR

BLUETOOTH ENABLED /DISABLED INDICATOR

TRANSMITTER SOURCE LEGEND

GPS DIAL

GAIN CONTROL

SYSTEM MENU

HELP MENU

FILL MODE SELECTOR

GPS MENU

Data Window

This is where detected transmitter passage signals are displayed in X-Y graphic form. Display modes include Transmitter History (default), Transmitter Fast Fourier Transform (FFT) spectral plot, or Axis History. See pgs. 15, and 42-45 for details of these display modes.

Transmitter Source Legend

This is a decal to help you identify signal source displayed in the History Window.

1–7: TRAXALL X-Series transmitters, color-coded across seven different frequencies (Transmitter 1 and 2 for the TRAXALL 720 model)

Legacy: Traditional CDI CD42 T-Series single-frequency (22 Hz) transmitters
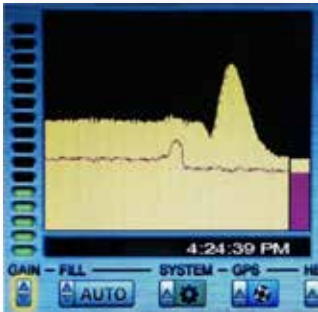
Mag: used to detect a magnetic flux leakage (MFL) "smart pig."

GAIN Control & Indicator

▲▼ to increase/decrease TRAXALL receiver sensitivity. **Green**/**red** LED stack indicates current sensitivity level

Usually, advancing gain about 1/3 up the scale –indicated by the stacked **green** LED array on left–will be adequate to start with.

This image shows a normal gain setting.

Reception graph shown here is clipped, and LED stack is now **red**, both which indicate gain has been set too high.

MR Reset

When exposed to a very strong varying magnetic field, the magneto-resistive (MR) sensor array used in Pinpoint and MAG modes can lose sensitivity until it is reset.

Press Enter ↵ while GAIN is highlighted will restore sensitivity. This realigns the magneto-resistive magnetic dipoles.

When TRAXALL is in MAG mode the array is automatically reset.

FILL Menu

This is where the transmitter type (or magnetic flux pig) is selected.
Use ▲▼ to cycle through

- AUTO Select – displays all detected transmitters
- Manual Select – TRAXALL multi-frequency color-coded
  transmitters 1–7
- Mag (MFL)
- Legacy – 22 Hz single-frequency transmitter
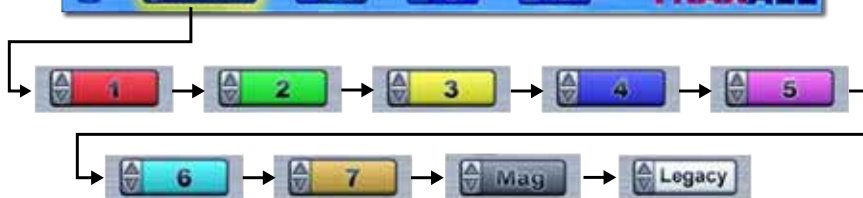
When desired transmitter is highlighted, press Enter ↵ to select.

AUTO Mode

AUTO is the default mode. If specific TRAXALL transmitter type is
unknown, passage will be recorded in this mode. TRAXALL will detect
and display all active electromagnetic transmitters within range,
regardless of Fill setting.

The Magnitude History displays pig passages in a right-to-left real time progression which can also be recorded and replayed later. (See pgs. 22-32.) The dominant (strongest) signal is represented in a solid graph while other signals are shown in outline. The Pinpointer will also indicate the strongest signal.

The Instantaneous Magnitude Bar displays relative signal strength of all detected transmitters in real time.

Here, Transmitter Frequencies 1 and 2 are both detected and displayed in AUTO fill mode. As Transmitter 1 (red) has the stronger signal, it is shown as a solid fill while Transmitter 2 (green) appears in outline.
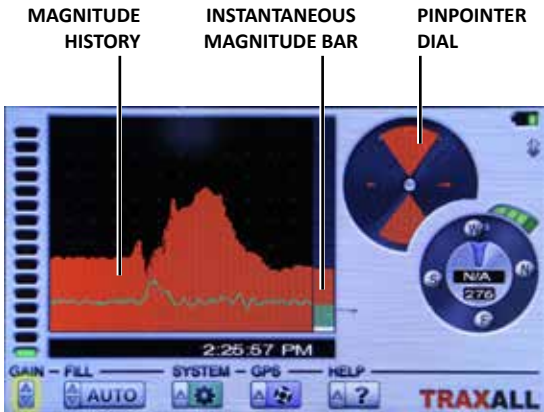

Note that the Magnitude Bar and Pinpointer Dial confirm signal dominance of Transmitter 1.

Here, Transmitter 2 is passing out of range just as Transmitter 4 is detected. Meanwhile, Transmitter 1 is still within range and remains the dominant signal.
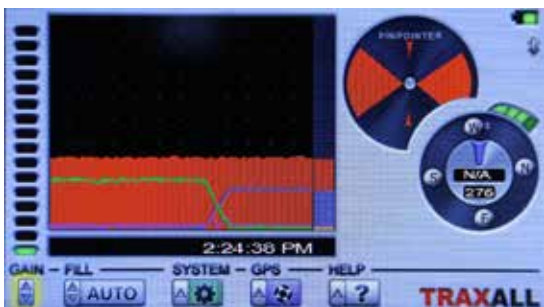
Manual Mode

If Fill 1 through 7* or Legacy are selected, TRAXALL will detect and display all active electromagnetic transmitters within range just as with Auto mode, but display priority will be given to transmitter selected, regardless of signal stength. Here, Fill 2 has been selected. Therefore, the Transmitter 2 graph is now solid and Transmitter 2 has been picked up by Pinpointer.
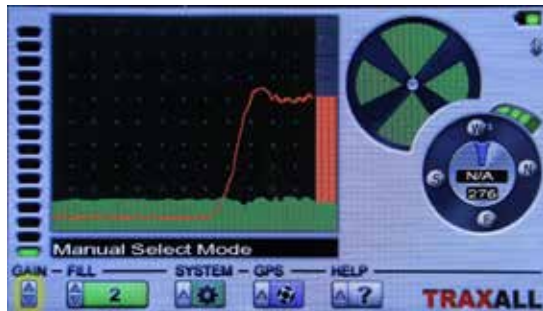
If Fill 4 is selected, both Transmitter 1 and 2 are outlined, but Transmitter 4 is undetected therefore has no graph.

*Consult your *Configurator Quick Start Guide* or *TRAXALL Transmitter User Guide* for more information about TRAXALL transmitter operating frequencies.

MAG Mode

This is for detecting Magnetic-flux leakage (MFL) "smart pigs" that are not equipped with electromagnetic tranmitters. (See pg. 29)

SYSTEM Menu

Use the SYSTEM menu to

- Set up a recording method
- Manage job lists
- Enable Bluetooth communication
- Program the relays
- Select transmitter history display (graph, FFT, or axis)
- Pause data display
- Assign to and manage job lists
- Set GMT and Daylight Savings Time offsets
- Adjust LCD backlighting
- Set units to either Standard or Metric

Press ▶ until SYSTEM is highlighted, then ↵ to access options.

Though your TRAXALL may be operated "out of the box," it is suggested that GMT OFFSET and UNITS be set before use. These and other SYSTEM menu options are covered in the APPENDIX section of this User Guide, beginning on pg. 40.

HELP Menu
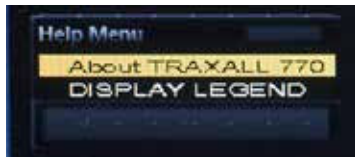
About TRAXALL displays your TRAXALL's serial number, firmware version, CDI contact information, and system free storage capacity. (You may need this information should you contact CDI for operational or service-related questions.)

DISPLAY LEGEND is a handy quick-reference to LCD controls and indicators.

GETTING STARTED

Unpacking

The TRAXALL is shipped preassembled. It is only necessary to insert the batteries (included).

Batteries

Open the TRAXALL battery compartment. A screwdriver is included for this purpose.

D-cell batteries are also included. Insert six–positive side to **red** contacts–as shown here.

Close the compartment. Make sure screws are firmly seated to maintain a weatherproof seal.

Startup

Hold down the Power button about 3–5 seconds.

TRAXALL firmware and serial number will momentarily appear. (This information is also available in the HELP menu. See pg. 18.)

OPERATION

Passage Detection

Using your TRAXALL to detect and record data for a moving pig, and/or confirm successful launch and recovery.
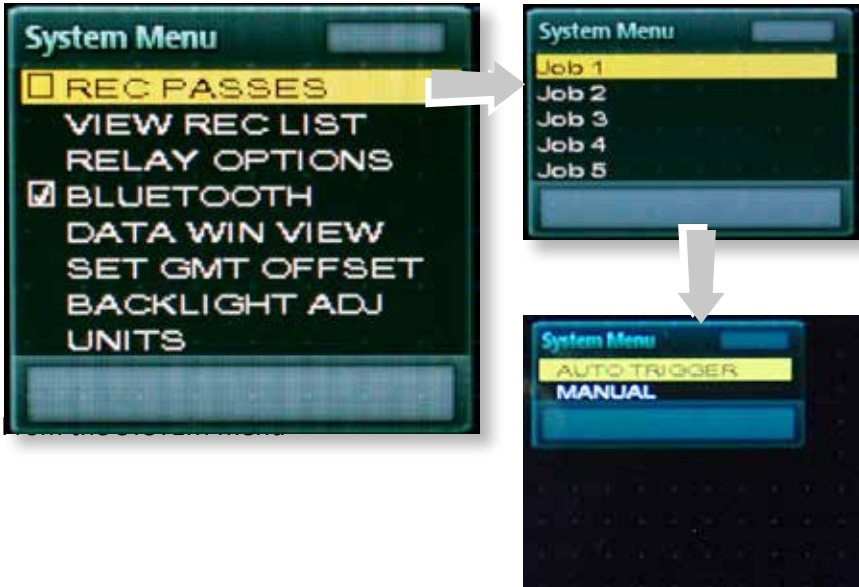
Align the TRAXALL along pipeline as shown.

Position TRAXALL on a pig trap to confirm pig has cleared a valve.

Record mode and job assignment

You may monitor in real time, record, or monitor *and* record depending on how you configure the REC PASSES options in the SYSTEM menu.

To record:

- – Access the SYSTEM menu.

- – Press ↵ when REC PASSES is highlighted (box default is unchecked).

- – Use ▶ to select Job 1 through 5 from the SYSTEM Job List menu

- – Select either AUTO TRIGGER* or MANUAL.

REC PASSES box will be checked and you will be ready to record. (If REC PASSES box is checked and you do *not* want to record, simply ↵ to uncheck.)

*NOTE: Place TRAXALL in position before selecting AUTO TRIGGER.

AUTO TRIGGER mode keeps TRAXALL in a passive state until a passage is detected. (Note **Waiting for Trigger** prompt.)
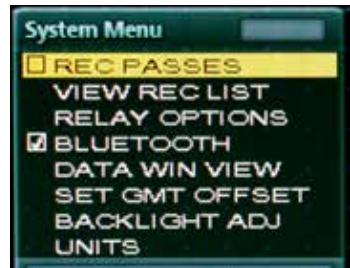

AUTO TRIGGER will record ten passage events per job folder.

MANUAL begins data logging as soon as selected. "Logging Data" will appear in **red**. ▶begins logging.

Stop logging by cycling back to REC PASSES and unchecking the box.

(Recording, if not manually stopped, will continue for three minutes before halted by the system.)

Tracking Example 1

Here are some typical tracking applications:

SETTINGS:

> Transmitter: CDI X100
> Fill setting: AUTO
> Record mode: AUTO TRIGGER

Once settings are entered, your TRAXALL is ready to record a passage.

Waiting for Trigger

As you are in AUTO TRIGGER, TRAXALL will remain in a wait-state until a pig transmitter reaches the sensor antenna

Verifying Passage

The pig has passed through this location, and TRAXALL is now verifying and logging passage
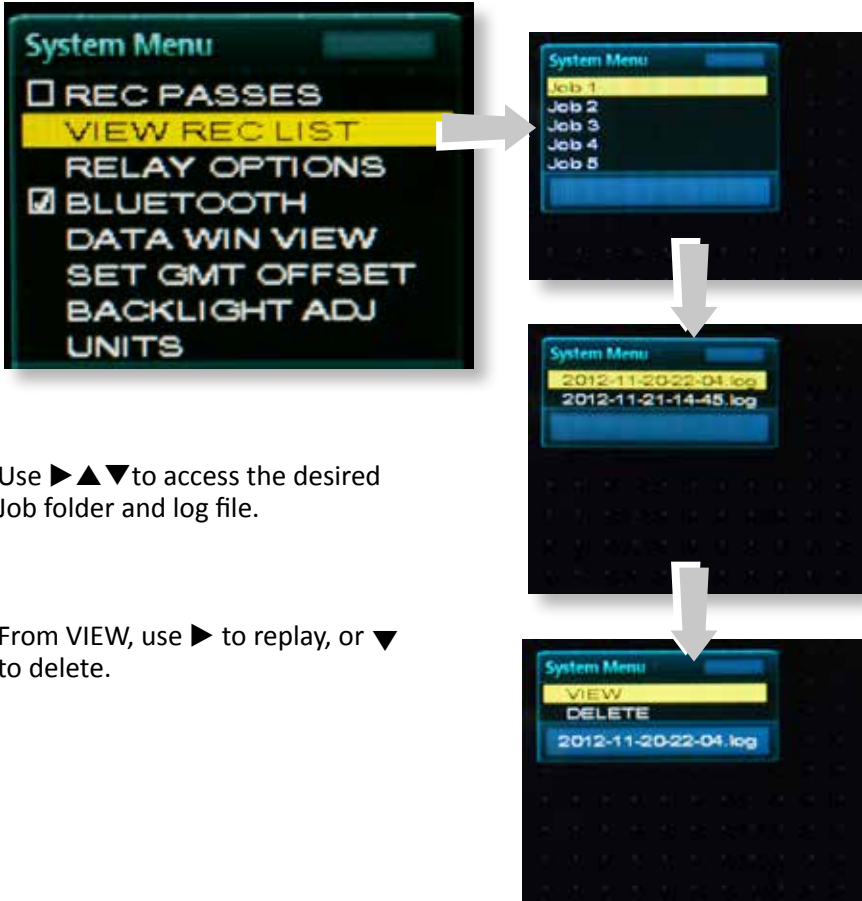

Passage Logged

TRAXALL is writing passage information to the Job 1 folder of system memory. (You may review this passage at any time via VIEW REC LIST menu.) TRAXALL is ready for the next passage.

Playback

Replay recorded passes by accessing the log files as shown here.

Use ▶▲▼to access the desired
Job folder and log file.

From VIEW, use ▶ to replay, or ▼
to delete.

NOTE: You may pause (freeze) data display by ▼ while SYSTEM is highlighted.

Playback (cont.)

Viewing a recorded logfile works in the same manner as a video player.
Use the arrow keys to control playback:

◀ ▶	Forward/Reverse
▶	Increase replay speed
◀	Decrease replay speed
▼	Pause
▲	Unpause
↵	Stop

When log file is replayed the graphic timeline will scroll from right to
left. The first object to appear will be a vertical beginning-of-file (BOF)
marker, followed by the graph itself.

Playback (cont.)

Recorded passage is indicated by graph peak. Note Pinpointer is also confirming passage (see pg. 33).
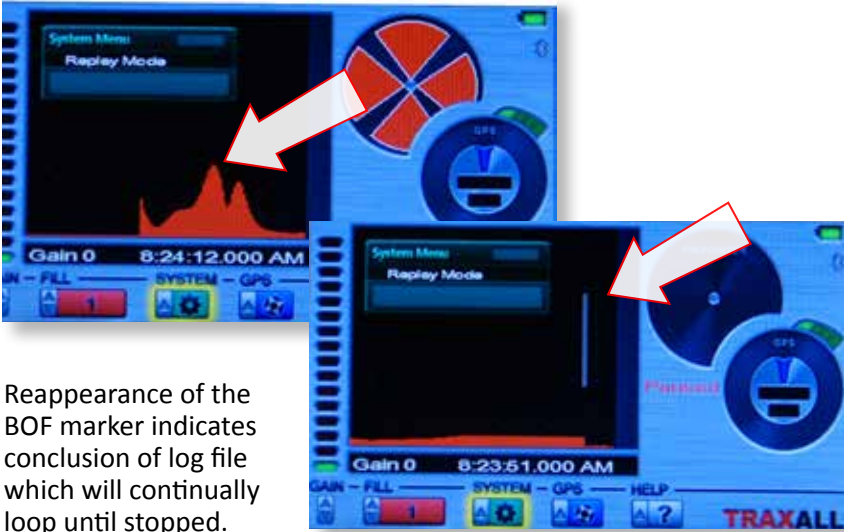
Reappearance of the BOF marker indicates conclusion of log file which will continually loop until stopped.

Recorded passage can be viewed in TRANS HISTORY (default) or AXIS HISTORY modes. However, TRANS FFT display is available in real time only. (See pg. 42–45 for more information on these display modes.)

To change view mode from TRANS HISTORY to TRANS AXIS, go to the DATA WIN VIEW system menu before entering the VIEW REC LIST menu.

Here Job 1 is shown in TRANS AXIS view.

Tracking Example 2

SETTINGS:

Pig:	Magnetic Flux Leakage (MFL)
Fill setting:	Mag
Record mode:	Manual

NOTE: Unless the MFL tool is configured with an ILI transmitter,* Fill mode must be set to Mag when manually tracking/recording magnetic flux leakage devices. Standalone MFL detection is somewhat different from transmitter detection; as there is no active transmitter, effectiveness will depend upon variable factors including proximity, pipe material and wall thickness, etc. Preliminary field testing indicates effective MFL-to-TRAXALL proximity is within 4.5 meters.

Logging Data

Unlike AUTO TRIGGER mode, TRAXALL begins recording as soon as you enter manual mode.

Automatic MR reset

Here, transmitter proximity is indicated. Polarity shift indicates point of passage (**Red** triangle indicates automatic MR reset.)
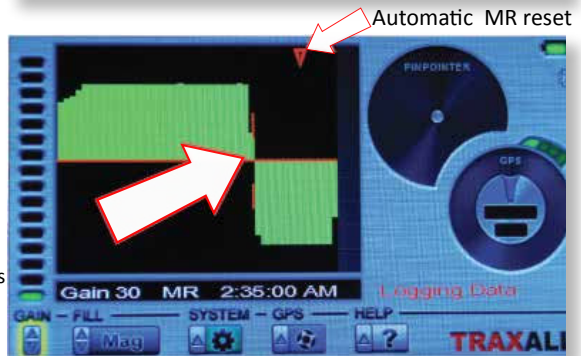
* Inline inspection (ILI) transmitters are tracked in Legacy mode (see following example on pg. 31)

TRAXALL will continually write passage data to the logfile until REC PASSES is unchecked.

Playback

Replay recorded passes in the same manner as Job 1 (pg. 24).

TRANS HISTORY

AXIS HISTORY

Tracking Example 3

SETTINGS:

> Transmitter: CD42-T0
> Fill setting: Legacy
> Record mode: Auto

Waiting for Trigger

As you are in AUTO TRIGGER, TRAXALL will remain in a wait-state until a pig transmitter reaches the sensor antenna

Verifying Passage

The pig has passed through this location, and TRAXALL is now verifying and logging passage
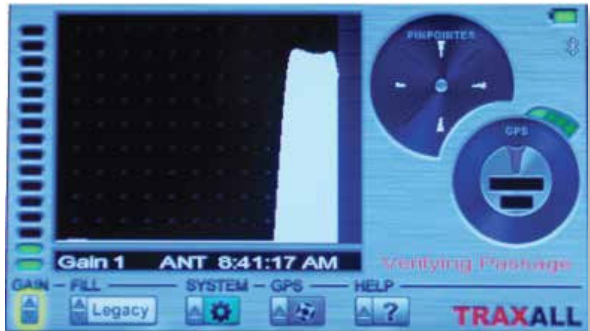
Passage Logged

TRAXALL is writing passage information to the Job 1 folder of system memory. (You may review this passage at any time via VIEW REC LIST menu.) TRAXALL is ready for the next passage.

Playback

Replay recorded passes in the same manner as Job 1 (pg. 24).

TRANS HISTORY

AXIS HISTORY

Pinpointing

Using your TRAXALL to find a stationary pig. The Pinpointer will help you find TRAXALL and or Legacy transmitters.*

Known:
>	pipeline
>	last recorded position ("A")
>	flow direction ("A" to "B")
>	transmitter type (CDI X100)

Unknown:
>	present location of obstructed pig

*MFL pigs are not located with the Pinpointer; rather, you use the tracking capability to locate the magnetic passage detection (see Tracking Example 2, pg. 29)

"Walking a Line" (X100 transmitter shown)

Pinpointing is similar to passage detection except there will likely be no need for recording, as pinpointing is a "hands on" operation.

From last known position, proceed downline, keeping TRAXALL as closely aligned with pipeline as practical.

Observe History Window closely. As you approach the transmitter, the graph "climbs." When you see the peak, you have just passed the transmitter.

"Walking a Line" (cont.)

When you have passed the transmitter, turn and retrace your steps back toward the transmitter while watching the Pinpointer dial. The four "pie wedge" shaped markers in the dial function as precision sighting cross hairs.

As you return to the transmitter, the upper and lower markers will increase in size as signal strength along the axis of magnetic flux lines increases.

"Walking a Line" (cont.)

The markers will continue to increase in size as you reach the transmitter.

Here, your TRAXALL's pinpoint MR sensor is directly over the X100 magnetic null zone. The pinpointer markers are full size and outlined. You have located the X100 transmitter!

"Walking the Line" (Legacy Transmitter firmware < V0.0096)

If your TRAXALL firmware release version is prior to V0.0096,* the upper and lower markers will ***decrease*** in size as you re-approach a 22 Hz single-frequency (legacy) transmitter.

* See pgs. 76-78 for firmware update instructions

Note peak in History Window graph, and diminished vertical pinpointer markers. Both indicate that the TRAXALL is over the magnetic "null" zone of a legacy transmitter.

APPENDIX

System Menu Tree

Relay Options

Set up and program the two RELAYS for various pulse train behavior. The relay contacts can be used for passage annunciation (lights, horns, etc.), a very useful feature where an unmanned passage must be monitored.
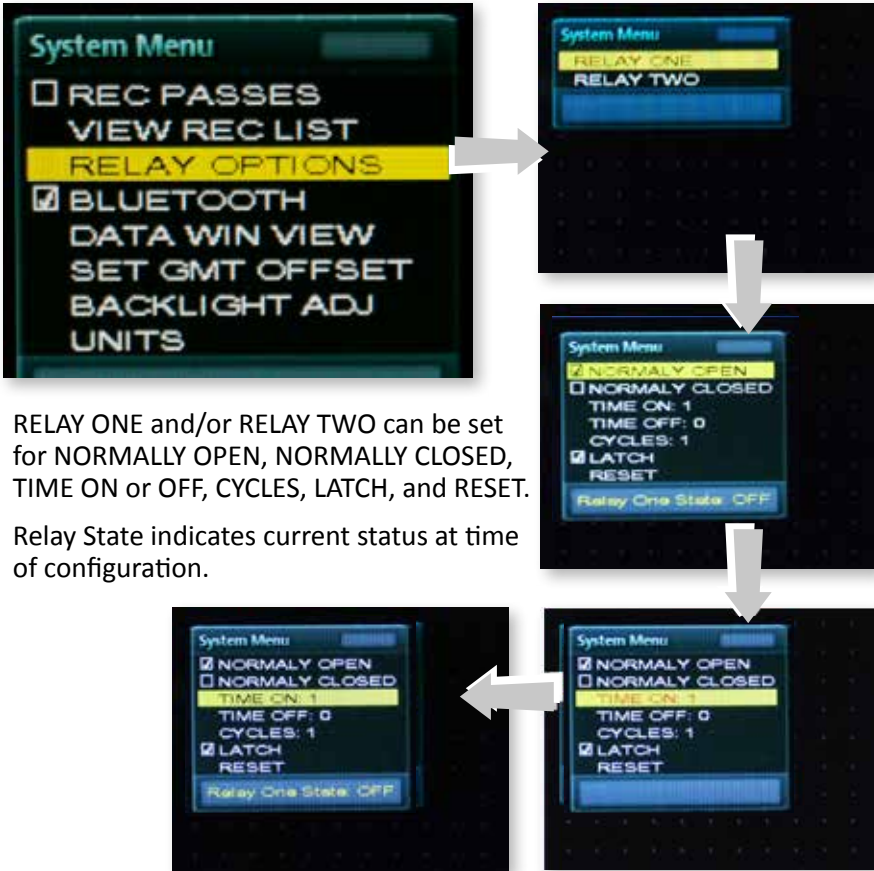
RELAY ONE and/or RELAY TWO can be set for NORMALLY OPEN, NORMALLY CLOSED, TIME ON or OFF, CYCLES, LATCH, and RESET.

Relay State indicates current status at time of configuration.

TIME ON/OFF dwell times can be set from 1 to 60 second duration. Values are displayed in **red** until confirmed by ↵ , at which point values are shown in black.

Relay Options (cont.)

CYCLES can be set for 1 to 10 relay repetitions.

When LATCH* is checked, relay will stay tripped until RESET is selected.

Example: if NORMALY OPEN is checked, the relay will close when activated by passage, and stay closed until reset. Conversely, a NORMALY CLOSED relay will open when triggered and stay open until reset.

NOTE: Selecting LATCH will override TIME ON/OFF settings.

RESET deactivates a triggered relay. (It does not change relay settings.)

* LATCH option available only with firmware release V0.0096 and beyond. See pgs. 76-78 for firmware update instructions.

Data Win View

DATA WIN VIEW offers three ways of graphing transmitter passage.
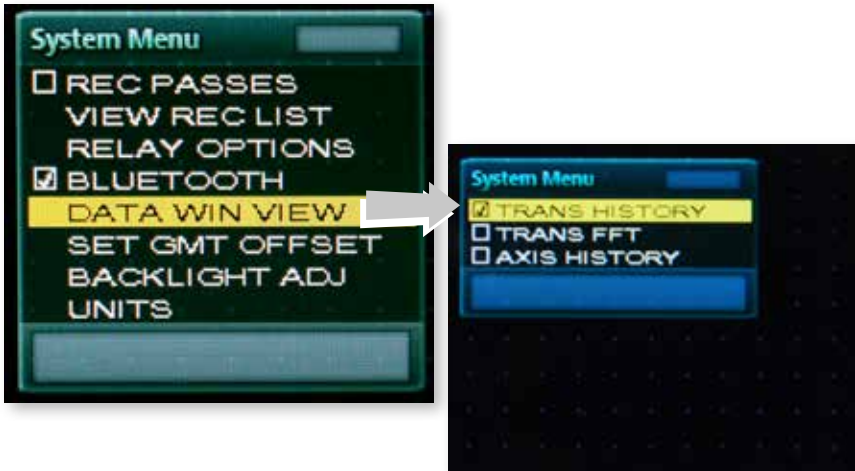
TRANS HISTORY is the default data display mode. It is an X–Y graph, where X=Time and Y=Signal Magnitude. When TRAXALL is set to TRANS HISTORY, passage data can be viewed in real time, or, if recorded, the log file can be replayed at a later time.

Data Win View (continued)

TRANS FFT (Fast Fourier transform), or Spectral mode, is a time-to-frequency conversion algorithm where X=Signal Frequency and Y = Signal Magnitude. When TRAXALL is set to TRANS FFT, passage data can be viewed in real time only.

Here, the unfiltered signal is represented by the white graph line; the red line represents the same signal after enhancement by the TRAXALL DSP (digital signal processor).
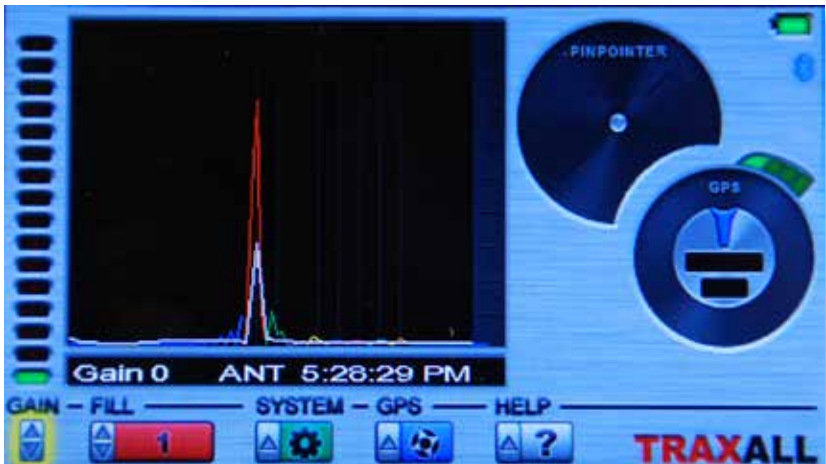
X = Signal Frequency   Y = Signal Magnitude

The FFT view mode can also be used to survey a tracking environment for ambient electromagnetic noise. Ambient noise is electromagnetic activity which could be misinterpreted as a passage. Sources can include power lines, machinery, and passing motor vehicles or railroad trains.

Here, the white graph line represents signals detected across an electromagnetic spectrum including the TRAXALL transmitter range(17.5 to 29.29 Hz). The vertical grey lines indicate TRAXALL and Legacy transmitter frequencies.

Note the signal spikes on both ends of the spectrum which could create false triggers. In this situation, it would be advisable to deploy transmitters configured for TRAXALL frequencies 1, 2, 3, or Legacy as their signals are relatively removed from the noise frequencies.

Data Win View (continued)

AXIS HISTORY plots a signal's relative field magnitude where red = X, green = Y, and blue = Z. When TRAXALL is set to AXIS HISTORY, passage data can be viewed in real time, or, if recorded, the log file can be replayed at a later time.
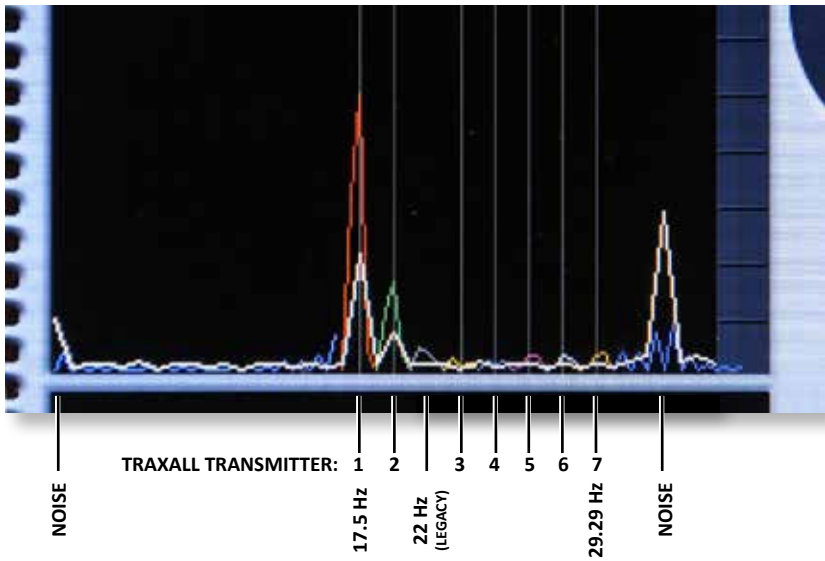

When TRAXALL is aligned with the pipeline as shown here, the pipe legend decal will match the Y axis (green) plot, the X axis (red) plot will represent magnitude perpendicular to the pipeline, and the Z axis (blue) will represent an up/down measurement.
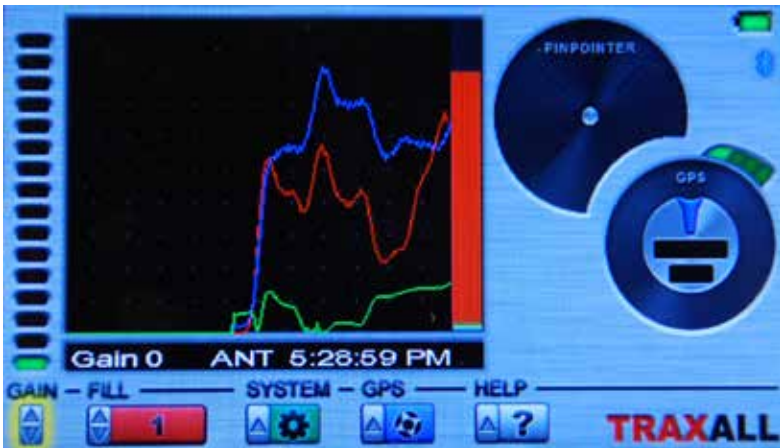
X = Time   Y = Axis Magnitude

Set GMT Offset

This menu sets TRAXALL to your local Time Zone and/or Daylight Savings Time (DST).

With SET GMT OFFSET highlighted, ▶ to highlight GMT OFFSET, then ▶ again (GMT OFFSET text will turn red).
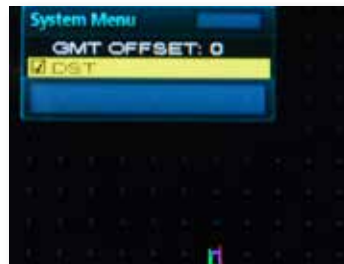
Default is 0. Use ▲▼ to advance or set back according to your local time zone. Press Enter to confirm and set.

If Daylight Savings Time is being observed in your area, use ▶ to check the DST box. Pressing ▶ again will uncheck the box.

Backlight Adjustment

TRAXALL LCD brightness is automatically adjusted for optimal visibility and battery life by the built-in Automatic Light Sensor (ALS). The LCD will also "go blank" (turn off) after one minute of non-use. But you can override the ALS by controlling both brightness and blanking intervals through this menu.

Use the ▲▼to access MAN LEVEL to adjust LCD brightness to your preferred (1–5) level.*

Values selected for change are displayed in **red** until confirmed by pressing ↵ , at which point values are shown in black.

Blanking delay can be set in ten-second increments from 10–60 seconds, or None.

* ALS levels are 1 through 4. Level 5 is accessible only in manual mode and should be used only when necessary (i.e., when working under bright sunlight) as it can draw extra battery current.

Global Positioning System (GPS)

TRAXALL's fully-functional GPS receiver provide precise timing for benchmarking passage events. The TRAXALL position is updated five times per second. The GPS almanac and real-time clock are on battery backup while TRAXALL is off. The GPS can also provide heading information, provided the TRAXALL is moving over ground at least three meters/second.

GPS ROOT MENU

SIGNAL STRENGTH INDICATOR

GPS DIAL

GPS status may be checked at any time by pressing ▲ when GPS is highlighted. Acquired GPS satellites are displayed in **red**.

GPS Setup and Operation

From the GPS menu, use ▲▼ to access GPS On/Off checkbox, then ▶ or ↵ to check. This will enable the GPS.

Once enabled, it will begin searching for GPS satellites. When three satellites are acquired, the signal strength indicator bars will change from dark green to light green and the GPS dial will become active.

The GPS is now ready for

- Setting waypoints
- Navigating to waypoints
- Recording a traverse

"GOLF TEE" POINTER

CLOSING DISTANCE

HEADING
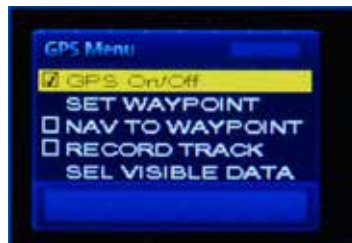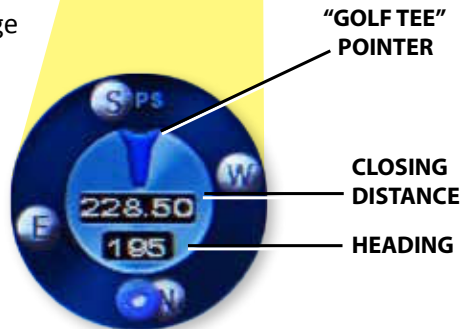
GPS Setup and Operation

When you have selected a function, you will be prompted to assign your task to one of five Job folders.

The Job folders are where waypoint (*.wpt) and tracking (*.nmea) files are stored.

GPS Setup and Operation (cont.)

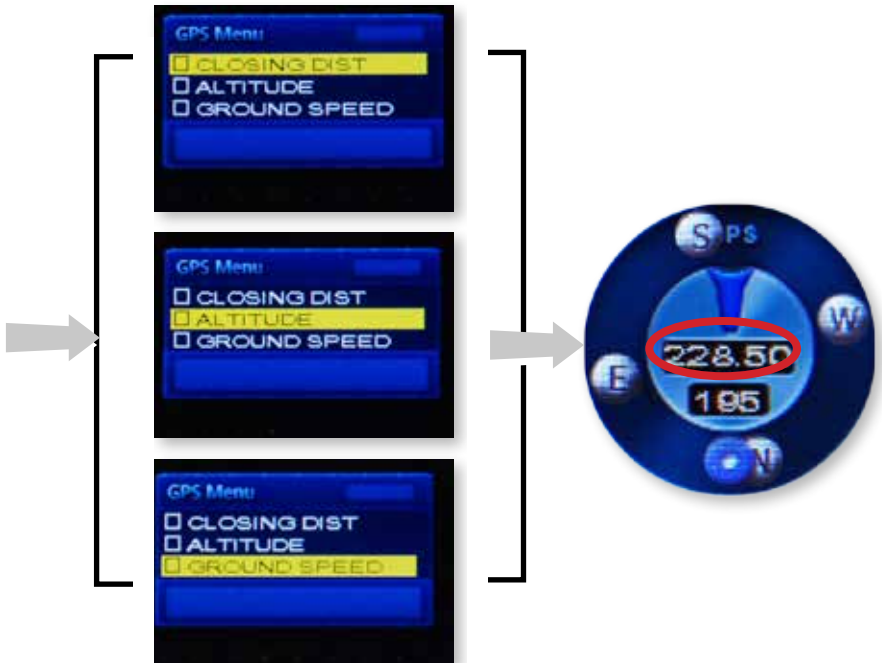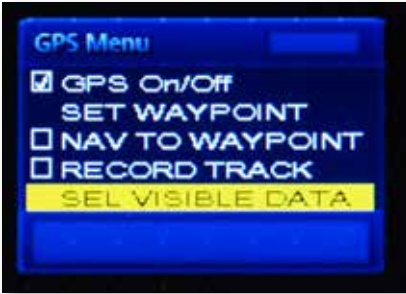SELect VISIBLE DATA to choose either CLOSING DISTance, ALTITUDE, or GROUND SPEED values in the range portion of the GPS dial.

Setting Waypoints

Waypoints record GPS latitude and longitude data at the current Traxall position. They can be saved provided the GPS signal strength indicator has three or more bars. (Waypoint data is most accurate if four bars are present.)

While Waypoints can be set anywhere, they are usually features or landmarks directly related to pipeline pigging operations; for example, signaler locations, launching/receiving stations, valves, manifolds, etc.

When the TRAXALL receiver is positioned at the desired waypoint:

1. ▲▼ to access SET WAYPOINT option
2. ► or ↵ to select a Job folder
3. ► or ↵ again to record the waypoint

Waypoints are stored in the Job folders as *.wpt files.

Each waypoint file contains

- Date   • Time
- Latitude   • Longitude
- Elevation

Once set, recorded waypoints may be displayed, navigated to, or deleted.

Recording Tracks

In addition to storing waypoints, you may record an entire traverse for later viewing and analysis in Google Earth. Track recording may be done along with other TRAXALL operations such as passage detection and/or pinpointing.

1. ▲▼ to access RECORD TRACK option
2. ▶ or ↵ to begin logging
3. ▶ or ↵ to stop logging
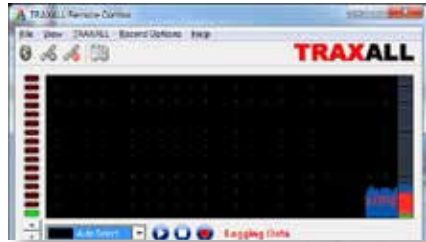
Downloading to Google Earth

After recording your track(s), connect TRAXALL to a laptop or PC.

When connected, TRAXALL will
register as a mass storage
device.
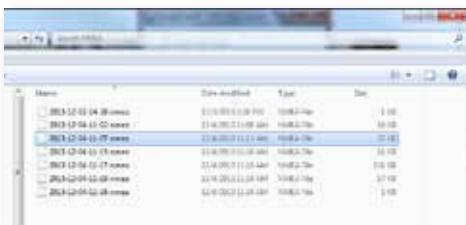
Open Google Earth on your
laptop/PC, and "drag and drop"
an NMEA file from the file list
over to the Google Earth application.

Google Earth will import and
superimpose track path, points, and
other information onto its satellite
imagery.
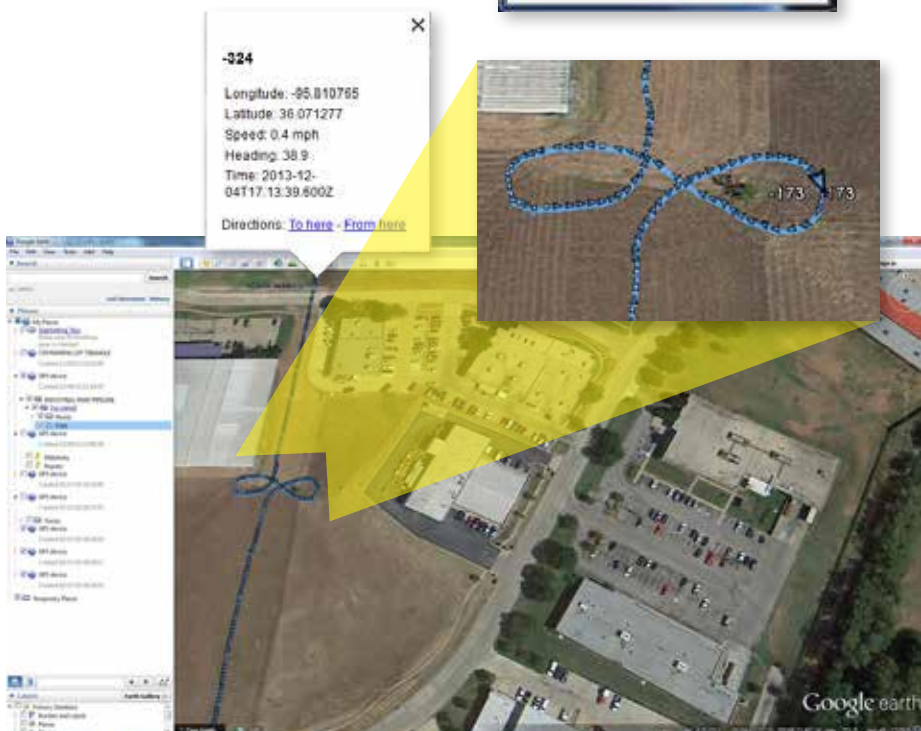
Remote Operation

TRAXALL Remote Control is a Windows application that will let you monitor and operate your TRAXALL receiver from a remote location (for example, a vehicle cab or shelter during inclement weather) on a laptop or PC.

With TRAXALL Remote Control, you can

- Set gain
- Set tracking/recording mode
- Manage job folders
- Reset the TRAXALL MR sensor

Under normal conditions, these tasks may be performed over an approximate maximum distance of 330 ft [100 m].

1. START BLUETOOTH

From your TRAXALL receiver SYSTEM menu, highlight BLUETOOTH option
and select Enter ⏎ key to enable Bluetooth communication.
The Bluetooth icon will change from **grey** to **blue*** to confirm.

       * **GREY** = Bluetooth disabled
           BLUE = Bluetooth enabled
          GREEN = Bluetooth connected

Start Bluetooth (cont.)

A "BTooth Discoverable" prompt means that TRAXALL Bluetooth is active, but it is still necessary to establish communication with your PC or laptop and then launch the TRAXALL Remote Control application. (See following pages.)

NOTE: only Microsoft Bluetooth drivers are supported by TRAXALL. Contact CDI *support@pigging.com* or 1-800-580-4234 if you require Bluetooth connectivity assistance.

2. LAUNCH TRAXALL REMOTE CONTROL APPLICATION [1]

A USB Micro Bluetooth Adapter ("dongle")[2] is included with your TRAXALL. Insert adapter into your PC or laptop USB port as shown here.[3]

[1] Contact CDI *support@pigging.com* or 1-800-580-4234 to obtain and install TRAXALL Remote Control to your PC.

[2] CDI Part # 81-03-0041-00

[3] If your PC has built-in Bluetooth, it will be necessary to disable it via Windows Device Manager.

Launch TRAXALL Remote Control (cont.)

Click the TRAXALL Remote Control application icon on your PC desktop.

The TRAXALL Remote Control application will open.
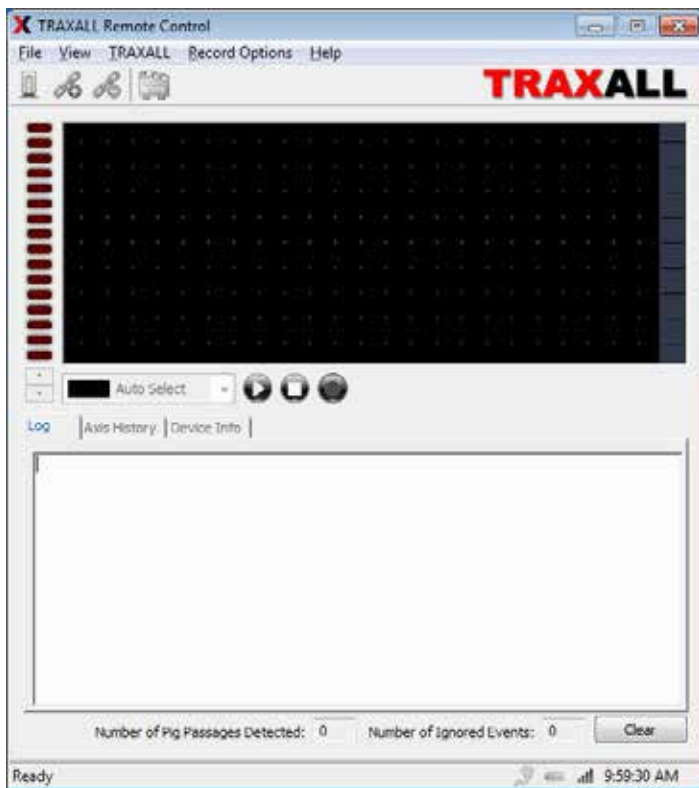
3. SELECT DEVICE

Click on the **Select Device** button to open the Device Survey Window

The Device Survey Window will display all previously-paired TRAXALL devices

If your device is not listed, you will need to pair it through the Windows Bluetooth settings application.

NOTE: Access to the Windows device discovery screen will vary depending upon your version of Windows.

"Clock" icon indicates that TRAXALL Remote Control is verifying connectivity for a TRAXALL unit.

Green check mark icon indicates TRAXALL unit or units are configured for use on your PC.

Warning icon indicates the TRAXALL unit is not communicating with TRAXALL Remote Control.

If the Device Survey Window indicates a non-reachable device, and you are certain the TRAXALL unit in question has Bluetooth enabled and is within communication range, remove the device through the Windows Bluetooth settings application, then rediscover and pair the device.
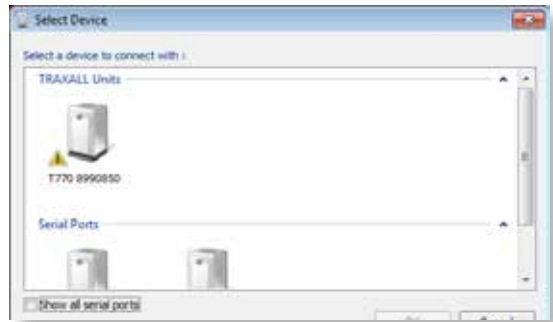
Select Device (cont.)

When prompted, enter
a pairing code for
the TRAXALL. The pairing
code will be the last
four numbers of your
TRAXALL's serial number.
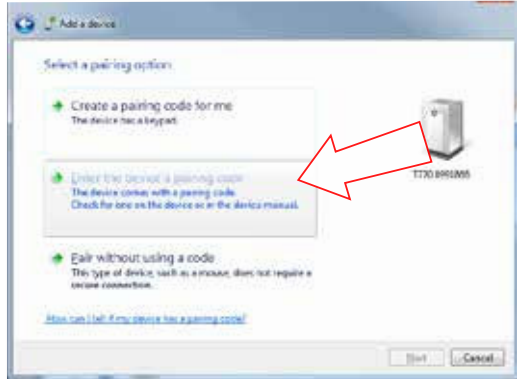
NOTE: This screen will vary depending upon your version of Windows.

The serial number may be accessed via the TRAXALL HELP menu.

Select desired device.

Click OK button to begin connection.

Select Device (cont.)

When communication is established, the Bluetooth icon will change
from **blue** to **green**.*
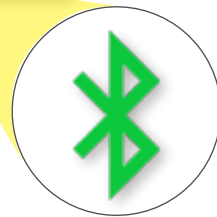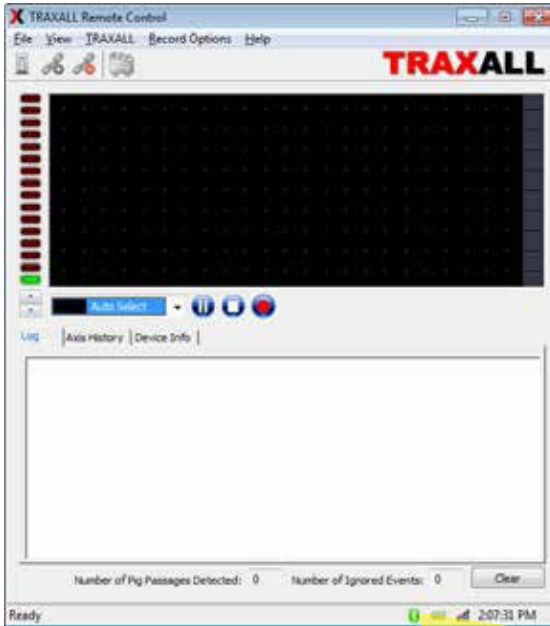
   * **GREY** = Bluetooth disabled
     BLUE = Bluetooth enabled
     GREEN = Bluetooth connected

4. LINK DEVICE

If the TRAXALL Remote Control application window on your PC shows TRAXALL activity you have communication.
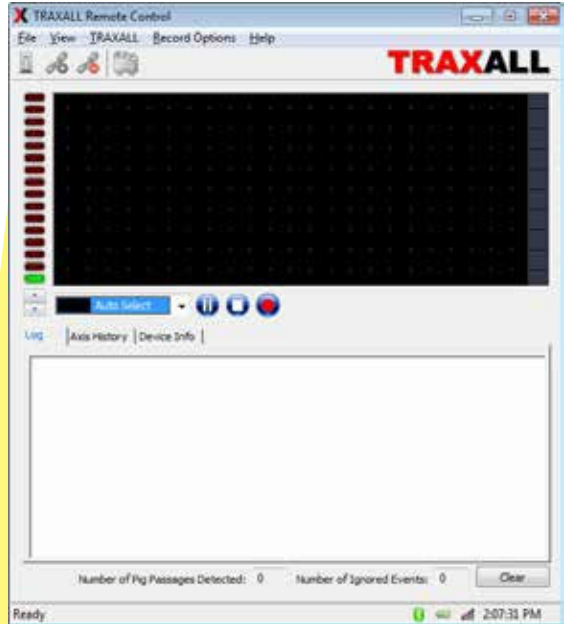
5. OPERATE TRAXALL REMOTE CONTROL

TRAXALL Remote Control functions can be accessed by menus, icons, and/or tabs.
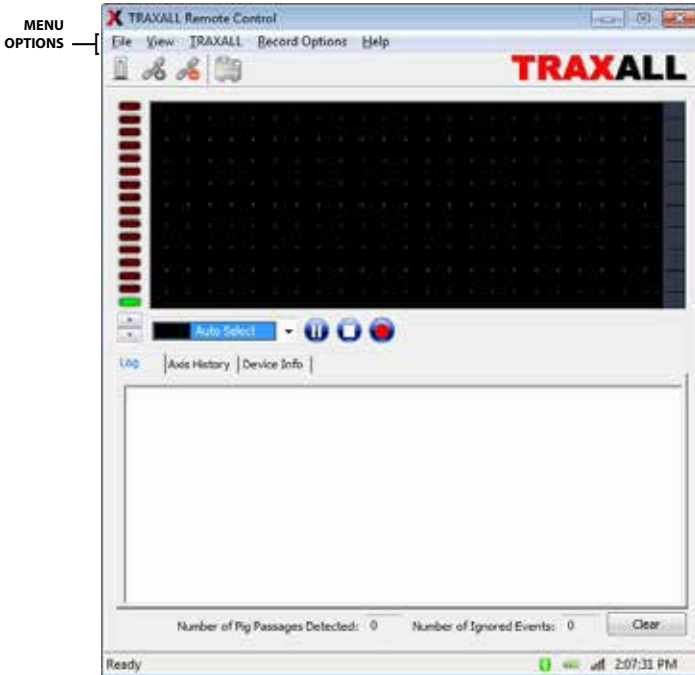
MENU OPTIONS

File
Save
Saves text in Log Window to a file
Exit
Closes the TRAXALL Remote Control application

View
Tool Bar
Check/uncheck to show
Status Bar
Check/uncheck to show

MENU OPTIONS

TRAXALL
Reset Sensor
Restores MR sensor sensitivity*
Transport
  Live
  Pause
  Stop
These commands control History Window data stream from TRAXALL receiver. They do not control TRAXALL functions, but control only the real-time display seen at the PC end.

Gain
Controls TRAXALL receiver sensitivity.
  Increase +
  Decrease –

Record Options
These commands function exactly as on the TRAXALL receiver unit.

Working Folder
Assign passage recordings to any of five job folders for later review
Automatic
TRAXALL will remain in a wait-state until a pig transmitter reaches the MR sensor
Manual
Prepares TRAXALL for user-controlled Start/Stop recording (see Record Control buttons)

Help
Software Version and Build information

* When exposed to a very strong varying magnetic field, the magneto-resistive (MR) sensor array used in Pinpoint and MAG modes can lose sensitivity until it is reset. This option restores MR sensitivity by realigning the magneto-resistive magnetic dipoles.

When TRAXALL is in MAG mode the MR array is automatically reset.

Operate TRAXALL Remote Control (cont.).

HISTORY
WINDOW

TOOL BAR

GAIN STRENGTH
INDICATOR

GAIN
CONTROL

TRANSMITTER
SELECTOR

PASSAGE
PROMPT

MANUAL
RECORD
CONTROL

DATA
STREAM
CONTROLS
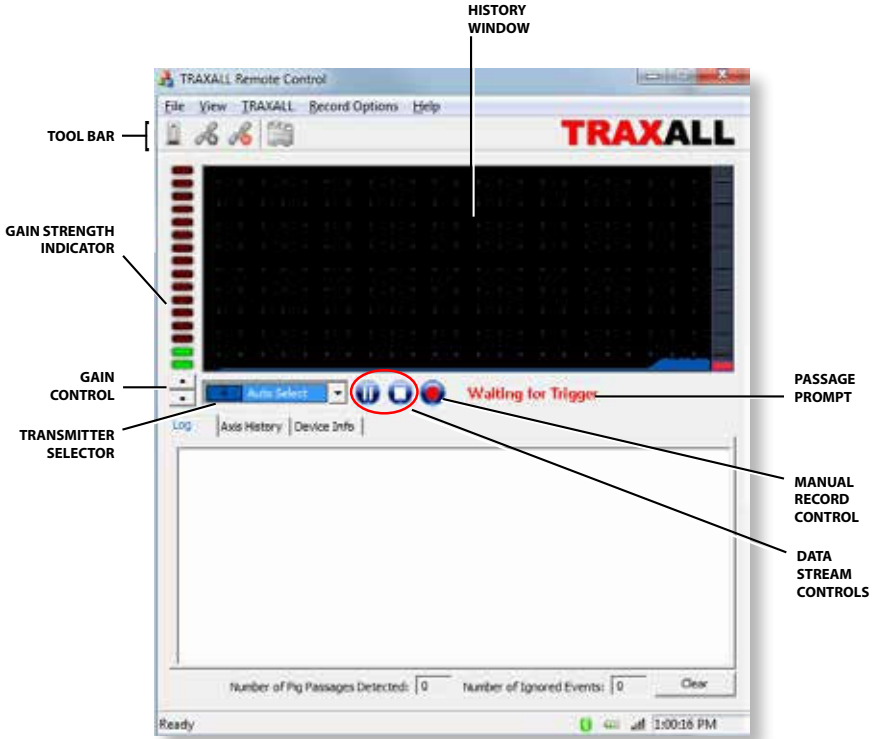
TOOL BAR
> **Bluetooth Wizard**
> **Connect**
> **Disconnect**

HISTORY WINDOW
Real-time graphic plot of transmitter passage

PASSAGE PROMPT
When TRAXALL receiver is recording, these prompts will show in successive order

> **Waiting for Trigger.**
> **Verifying Passage**
> **Logging Data**

MANUAL RECORD CONTROL
Start/Stop recording when in Manual mode

DATA STREAM CONTROLS
Same function as TRAXALL>*Transport* options (pg. 69) These commands control the display stream from the TRAXALL History Window.

Live   **Pause**   **Stop**

TRANSMITTER SELECTOR
Similar to the TRAXALL receiver FILL menu.
Use the drop-down menu to select transmitter type.

> **Auto Select**
> **Transmitter 1–7**
> **Mag**
> **Legacy**

	Transmitter 1 ▼
	Auto Select
	Transmitter 1
	Transmitter 2
	Transmitter 3
	Transmitter 4
	Transmitter 5
	Transmitter 6
	Transmitter 7
	Mag
	Legacy
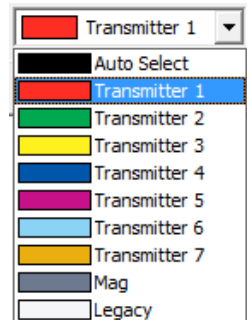
Selection of one type excludes others.

GAIN CONTROL & INDICATOR

> ▲▼ to increase/decrease TRAXALL receiver sensitivity.
> **Green**/**red** LED stack indicates current sensitivity level.

Operate TRAXALL Remote Control (cont.).

INFO DISPLAY TABS

INFO DISPLAY WINDOW

CLEAR BUTTON

PASSAGE & EVENT COUNTERS
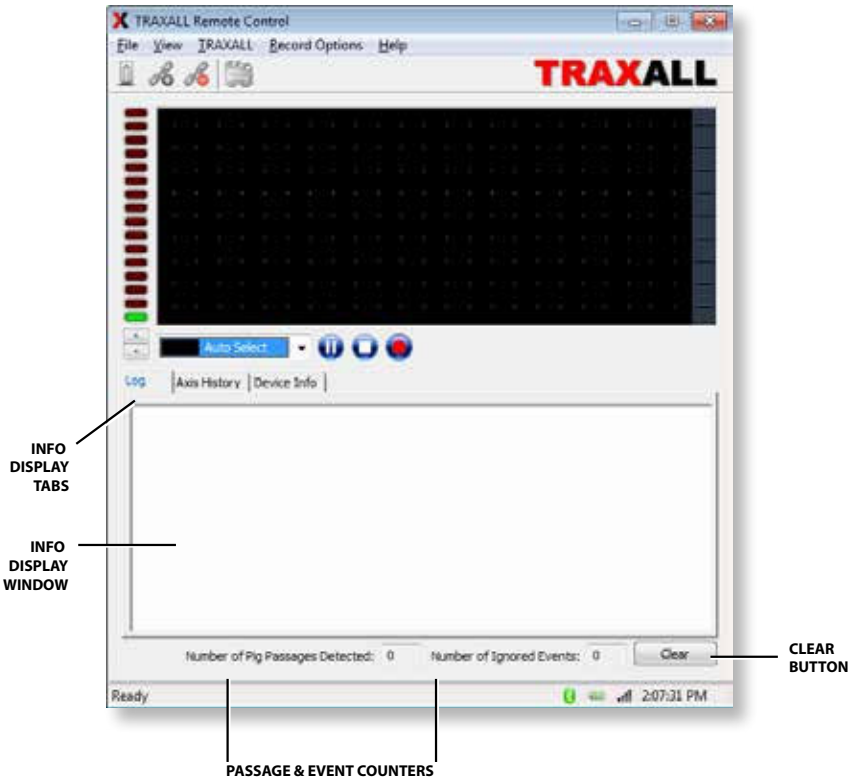
INFO DISPLAY WINDOW & TABS

Choose between:

Log
Tracking information in text format

Axis History
Real-time plots of signal relative field magnitude
where red = X, green = Y, and blue = Z

Device Info
TRAXALL unit and GPS information
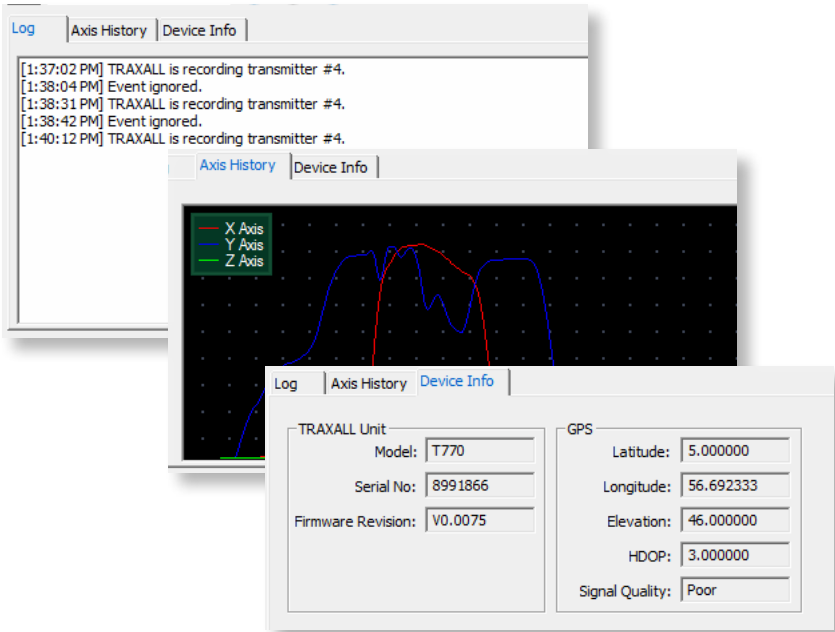
Passage and Event Counters
Number of pig passages/Ignored events

Clear
Clears Log Window and Passage and Event counter entries

Operate TRAXALL Remote Control (cont.).

STATUS BAR

APPLICATION STATUS

CONNECTION STATUS

BATTERY STATUS

SIGNAL STRENGTH
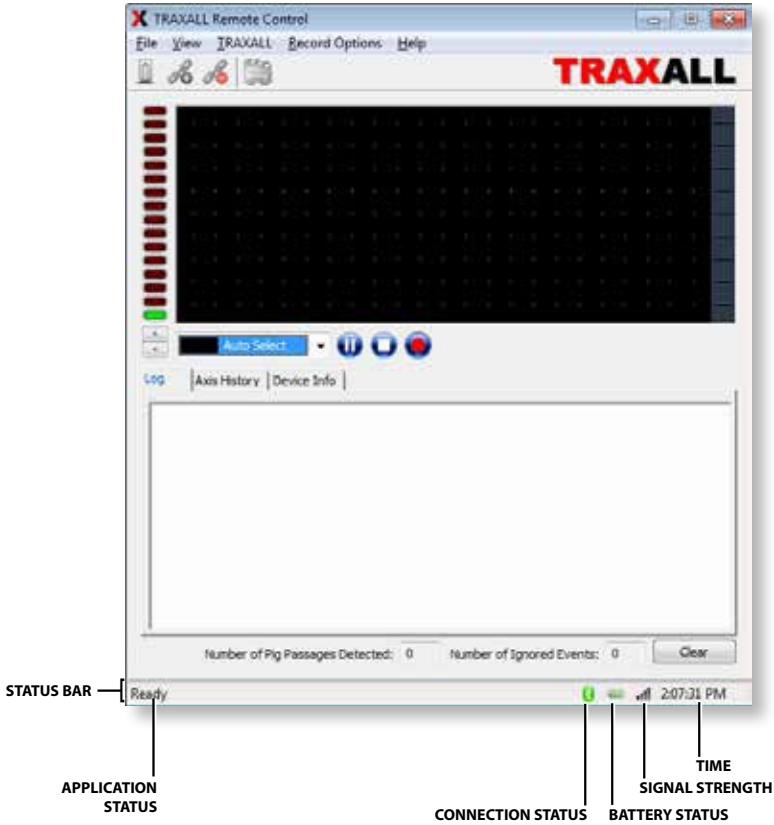
TIME

STATUS BAR

Application Status
Displays current state of TRAXALL Remote Control application

Connection Status
Color = connected; Grey = disconnected

Battery
TRAXALL battery charge status

Signal Strength
TRAXALL-PC Bluetooth link

Time
Local time-of-day

TRAXALL Firmware

TRAXALL firmware is stored in the TRAXALL flash ROM. It may, at the discretion of CDI Engineering, require occasional updating. This is done by either factory or field upgrade, depending on your TRAXALL's current firmware version.

Determine firmware release by accessing the HELP menu, then About TRAXALL 770.
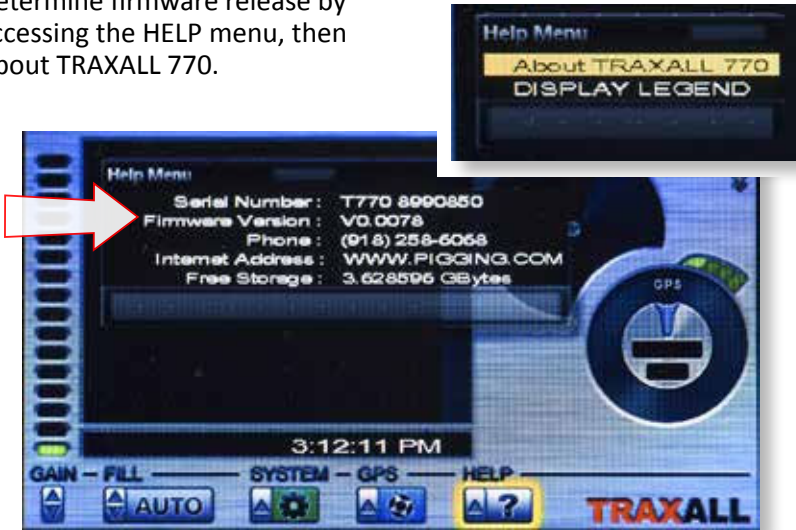
Firmware Release V.0070-0082

A firmware release of V.0082 or older will require an upgrade at CDI. Contact CDI at 1-800-580-4234, ext 143 for *CDI RMA Form FM-03-0089.*

Firmware Release V.0083 and Newer

A firmware release of V.0083 or newer can be upgraded by uploading and installing a firmware file to your TRAXALL.

Required Items:

- Firmware loader file (supplied by CDI)
- USB Type A – Mini B cable
- PC or Laptop

Firmware Release V.0083 and Newer (continued)

To upload and install this file to your Traxall:

1. POWER UP TRAXALL

2. CONNECT TRAXALL TO PC

Windows AutoPlay window will indicate the TRAXALL as a Mass Storage Device and assign the next available drive letter to it. The TRAXALL may display a 'Syncing' message and all other TRAXALL functionality will be disabled during connection.

Firmware Release V.0083 and Newer (continued)

3. COPY LOADER FILE TO TRAXALL ROOT DIRECTORY

Locate the firmware loader file (Traxall770.ldr or Traxall720.ldr)
on your PC. Copy this file to your
Traxall root directory.

When file transfer is complete, "eject" the
Traxall from the PC as you would any USB
device. Remove USB cable.

4. POWER DOWN TRAXALL

5. RESTART TRAXALL

The screen will remain white/light grey for about three minutes, then
shut down.

6. RESTART TRAXALL AGAIN

Verify the new version is displayed in
startup screen. The Firmware update is
now complete.

Contact CDI *support@pigging.com* or
1-800-580-4234 if you require Firmware upgrade assistance.

OPTIONAL EQUIPMENT

TRAXALL LineStat

CDI's LineStat radio system provides your TRAXALL 770/720 with the ability to autonomously monitor pig passages and send remote notifications as emails or text messages.

LineStat requires no cellular telephone network, and functions anywhere in the world. Retrofitting your TRAXALL 770/720 requires only a subscription to LineStat service (available through your CDI distributor) and a conversion kit.

CDI Part # 81-05-0100-00

Remote Passage Flasher

The Remote Flasher is useful for at-a-glance passage confirmation where an unmanned passage must be monitored.

When the 15 ft [4.5 m] cable is attached, the flasher is automatically activated when a transmitter is detected.

CDI Part # 81-05-0130-00

Bulkhead-to-Client Device Cable

Special cable for connection of a user-provided device to the TRAXALL 720 or 770 Programmable Relay Port. Typical devices include lights, horns, and other audio/visual equipment used where an unmanned passage annunciation must be monitored.

CDI Part # 80-02-0082-00

Warranty

All equipment sold by Control Devices, Incorporated (CDI) is warranted for a period of one (1) year from the date of shipment to Purchaser, providing the instrument or equipment has not been modified, abused, or used for purposes which it was not designed for.

Batteries, probes, leads, magnets, and other consumables subject to wear are not covered by this warranty. CDI will repair or replace faulty equipment during the warranty period when the cause is a defect arising from faulty design, materials or workmanship.

Making a Warranty Claim

Equipment being considered for warranty repair, or a representative sample thereof, must be returned to CDI at the Purchaser's expense. The equipment must be accompanied by the Purchaser's written order* describing the defect(s) and authorizing CDI to invoice the Purchaser for any charges not covered by the warranty.

Upon receipt of the equipment and Purchase Order, CDI will examine the equipment and make a determination of the nature and cause of the defect. If the defect is not covered by the warranty, CDI will quote to Purchaser the cost for replacement or repair equipment, and will not proceed until Purchaser delivers a written acceptance of the quotation.

During the one year warranty, CDI will bear the cost to return units repaired under the warranty back to the Purchaser's domestic premises. CDI will return units to foreign countries at Purchaser's expense.

* Contact CDI at 1-800-580-4234, ext 143 for *CDI RMA Form FM-03-0089*

Care and Maintenance

Equipment designed by CDI is protected against the environment in which it is intended to operate. Much of the equipment is designed for prolonged use in the field without any special maintenance other than routine battery replacements. It is the Purchaser's responsibility to insure that proper precautions are taken during installation and operation so that weather seals are in place, routine maintenance occurs, etc. Failure to perform these operations nullifies this warranty.

CDI equipment should only be operated by qualified personnel who are familiar with any and all manuals and procedures for said equipment's operation.

Service and Repairs

Cost for repairs not covered by the warranty or carried out after the warranty period has expired will be charged at the current hourly or set service rate, plus the cost of materials, upon approval by Purchaser.

Equipment for repair must be sent at the Purchaser's expense and be accompanied by the Purchaser's written order describing the defect and authorizing CDI to invoice the Purchaser for labor, materials and return delivery cost.

No service or repair will be undertaken until an approved written order is received from the Purchaser.

Operating equipment while in a damaged condition nullifies this warranty.

NOTES

ABOUT CDI

CDI is a family-owned and operated business located in Broken Arrow, Oklahoma, just 12 miles from downtown Tulsa. Incorporated in 1982, CDI has proudly been manufacturing products in the United States for more than 32 years. CDI currently employs 45 people in the areas of electronics and mechanical design, software and firmware programming, electronics manufacture, machining, and more.

All CDI products are designed and built completely in-house utilizing an on-premises machine shop boasting six fully-automated CNC machines as well as full-time electronics assembly personnel.