

TRECO∞IRNDT

# IR Scan

Ultrasonic Inspection System

User Manual

Ver 1.0 ~ 3/5/10

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# Overview

The IR Scan is a computerized package designed for ultrasonic inspection. It consists of:

1. Display Computer
2. Monitor (one or more)
3. UT Electronics Chassis (one or more)
4. Un-interruptible Power Supply (UPS)

The Display Computer is used to set up and control the system and displays the inspection graphs and data on the monitors.

The UT chassis contains one or more IR Quad Ultrasonic Pulser Receiver boards. The chassis may be set up to handle from 1 to 40 independent channels.

The monitors are used to display real time inspection graphs and data. Some systems may have multiple monitors to display the necessary information.

The UPS provides AC power conditioning to the system.

## Starting the System

Follow these steps to start the system:

1. Turn on AC power breaker if necessary.
2. Turn on UPS.
3. Turn on the Display Computer and Monitor(s).
4. Log onto the Display Computer by clicking on the desired user name. The default is “Operator”.
5. Open the front panel on the UT chassis and turn on the power switch.
6. Start the **IR** Scan software by double clicking the icon labeled “IR Scan”. This icon can be found on the desktop display of the Display Computer.
7. Allow the software to configure the UT chassis. The progress can be monitored by messages listed in the “Log Window”. If the configuration is successful, the last message displayed will be “System Ready”.
8. After the “System Ready” message is displayed, close the “Log Window”. The system is ready for use.

## The Main Screen

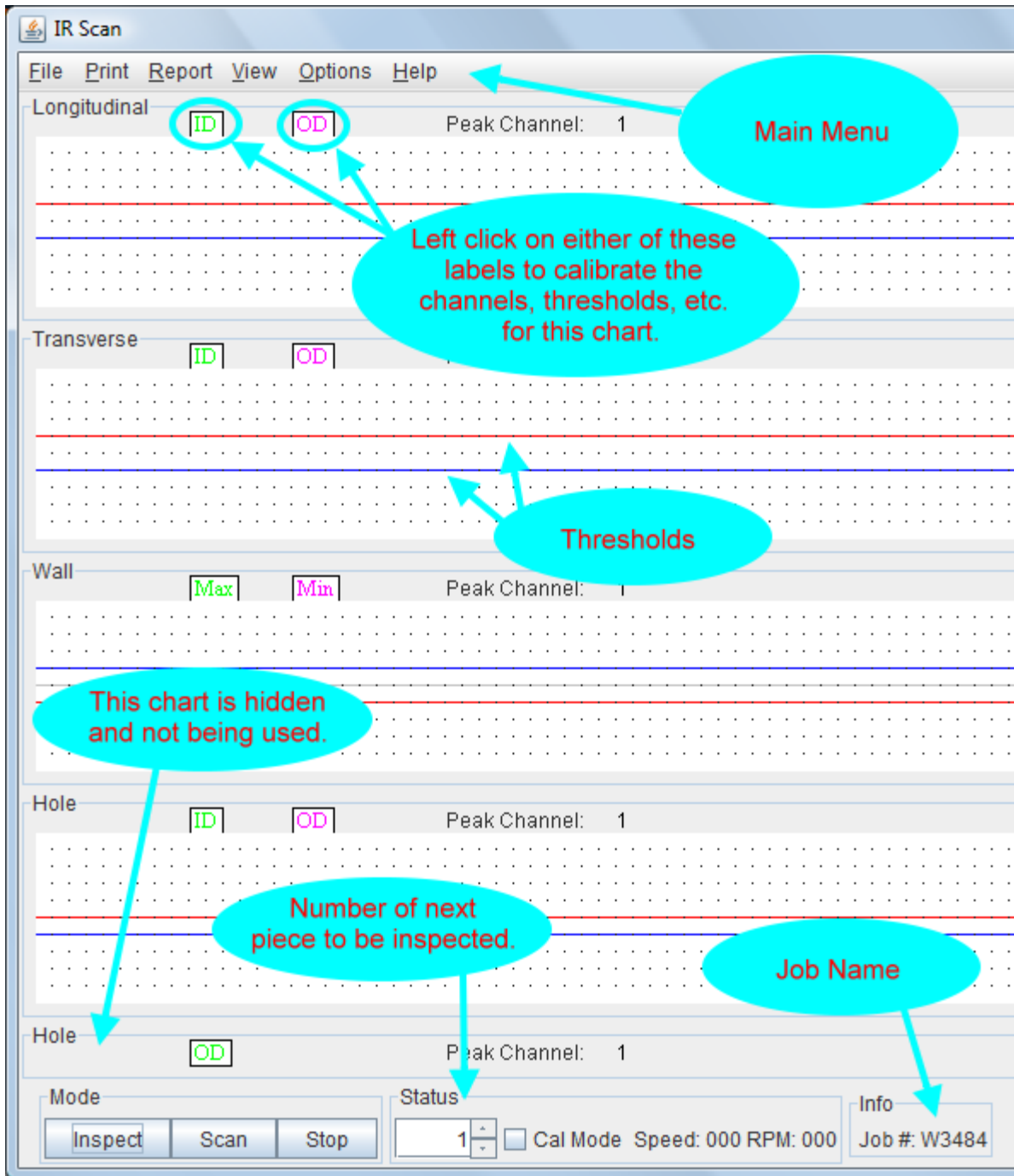


Figure 1: Main Screen

## **Creating or Switching Between Jobs**

Inspection data is separated into “Jobs”. A new job can be used for each purchase order, work order, heat, lot, etc. It is important to select the proper job for the inspection to be done.

### ***Creating a New Job***

1. From the main menu, choose **File** and then **New Job**. The **Create New Job** window will appear.
2. Enter the desired job name. This can be the work order, purchase order, heat, lot, etc. Each company will have a different procedure for determining the job name.
3. Select a configuration by clicking on the down arrow. The configuration should be appropriate for the type of scan head, number of channels, or other mechanical settings.
4. Select a preset by clicking on the down arrow. Presets are stored copies of the user settings such as gains, gates, thresholds, and such. Setup time can be reduced by using a preset stored from a similar setup.
5. Click the **Create** button.
6. The software will take a few seconds to create the new job and then will restart. The UT chassis will be configured again at this time.

### ***Switching Between Jobs***

The user may switch between jobs in order to accommodate scheduling or to access information and reports for a completed job:

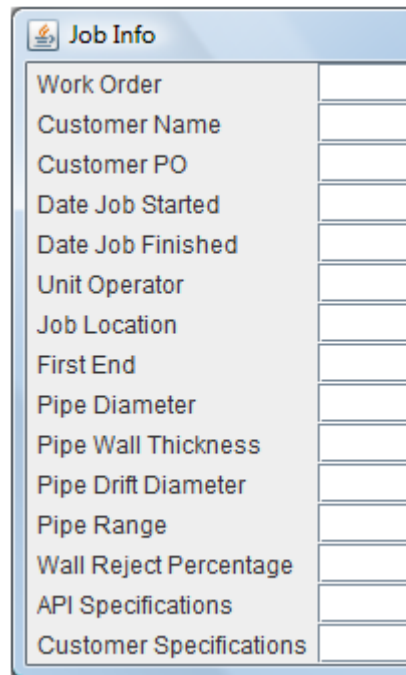
1. From the main menu, choose **File** and then **Change Job**. The **Change Job** window will appear after a few seconds.
2. Choose the desired job by clicking on the down arrow and clicking on the job in the list.
3. Click the **Change** button.
4. The software will take a few seconds to load the selected job and then will restart. The UT chassis will be configured again at this time.

## Job Info

The **Job Info** window is used to access information about the job such as purchase order, work order, customer name, inspection specifications, etc.

To access the **Job Info** window, from the main menu choose **File** and then **Job Info**. The **Job Info** window will appear. The information displayed may then be added or changed.

NOTE: Depending on the system, the **Job Info** window may have different entries available.



The screenshot shows a window titled "Job Info" with a list of fields for data entry. Each field is followed by a horizontal line indicating an input area. The fields are:

Work Order	
Customer Name	
Customer PO	
Date Job Started	
Date Job Finished	
Unit Operator	
Job Location	
First End	
Pipe Diameter	
Pipe Wall Thickness	
Pipe Drift Diameter	
Pipe Range	
Wall Reject Percentage	
API Specifications	
Customer Specifications	

*Figure 2: Job Info Window*

## Calibration

Each channel may be calibrated while viewing its signal on the **Calibration** window. This window is opened by left clicking on any trace label for the chart associated with the channel to be calibrated.

For example, to calibrate the **Longitudinal** channels in Figure 1, click on the “ID” or “OD” labels just above the **Longitudinal** chart. These labels are circled in Figure 1 for clarification.

Each chart will have trace labels just above it - clicking the labels above any chart allows the channels for that chart to be calibrated. Some channels may apply to more than one chart. Such channels can be calibrated by clicking on any chart for which the channel applies.

The **Calibration** window:

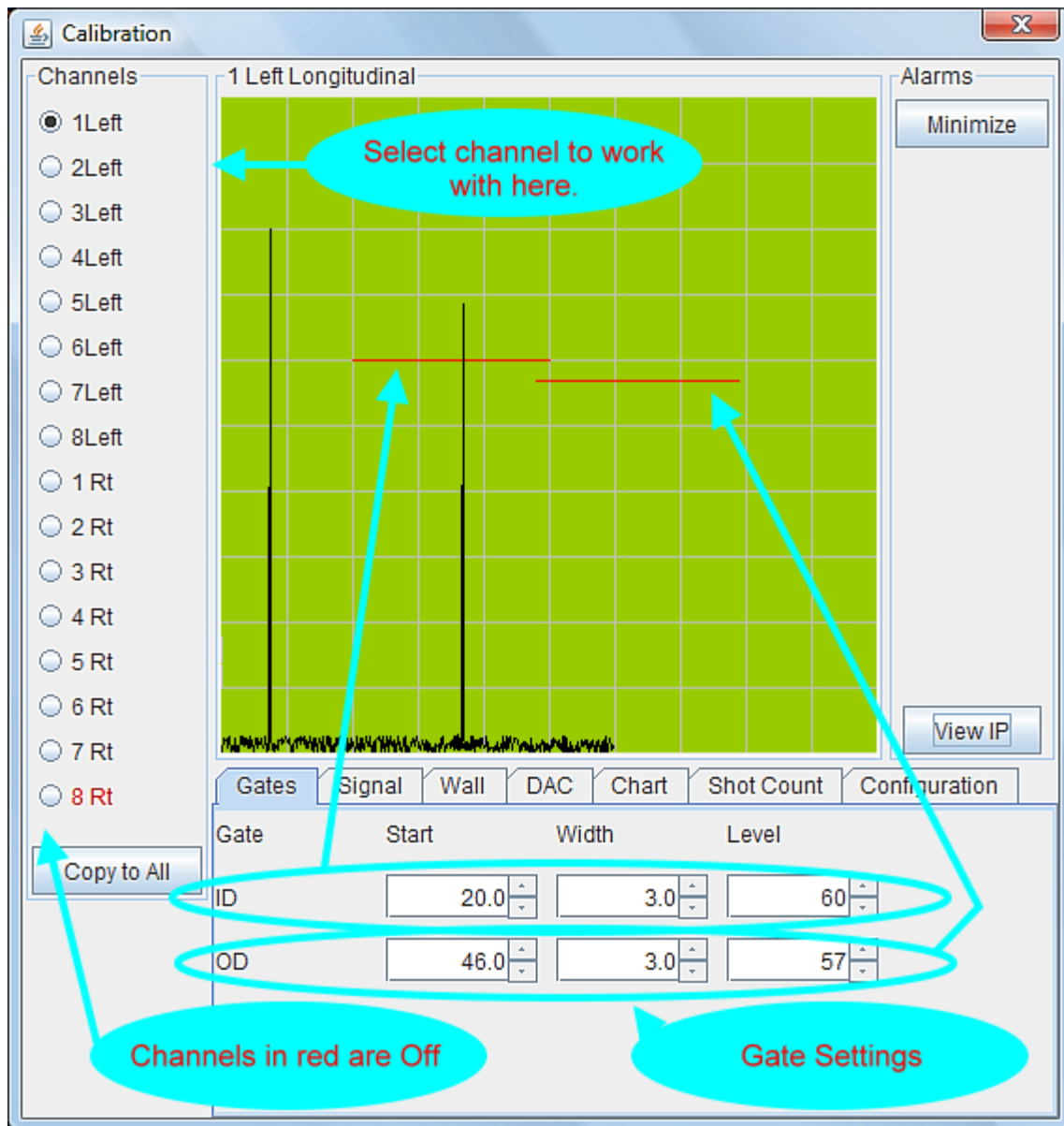


Figure 3: Calibration Window

Clicking on the different tabs (**Gates**, **Signal**, **Wall**, etc.) near the bottom of the **Calibration** window allows access to various settings.

### The Gates Tab

The **Gates** tab allows the user to adjust the starting position, width, and height of the gates. The number of gates and their names varies depending on the system.

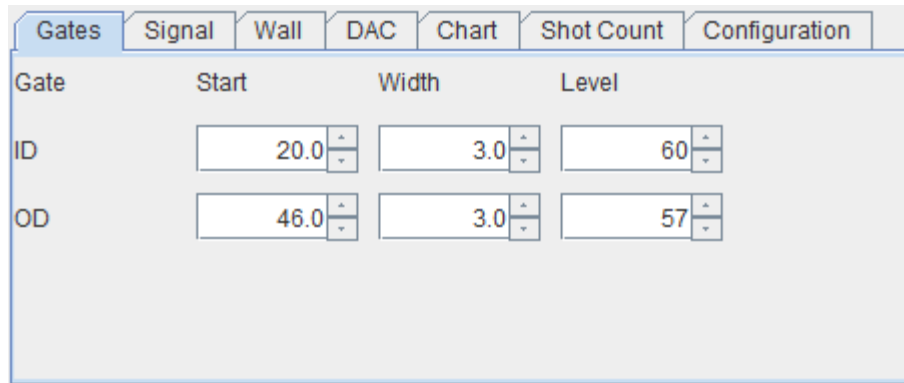


Figure 4: Gates Tab

### The Signal Tab

The **Signal** tab provides for adjustment to signal parameters such as delay, gain, range, mode (positive half wave, negative half wave, full wave, RF, off), and the measurement units (Imperial inches or metric mm). If the channel is turned off, its name will appear in **red** in the **Channels** list at the left of the **Calibration** window (see Figure 3).

The measurement units should be selected at the beginning of the job and not changed afterwards.

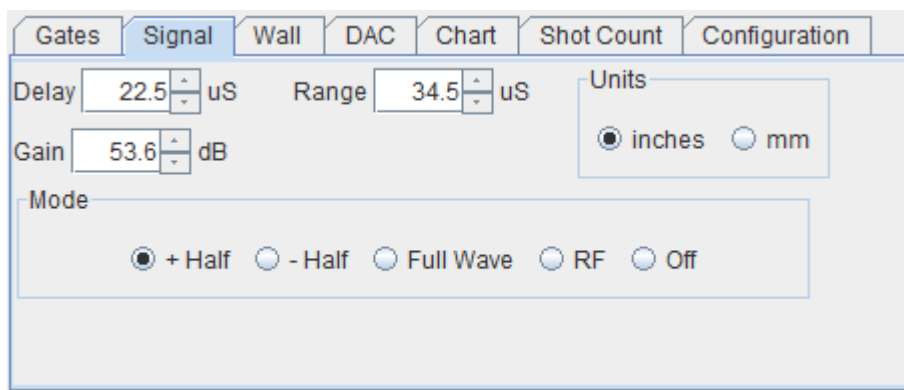


Figure 5: Signal Tab

## The Wall Tab

For systems which measure wall thickness, the **Wall** tab is used to set the related values such as nominal wall, nominal wall position on the chart, the chart scale, the velocity of sound in the material being inspected, and the number of reflections between the two wall gates.

Gates	Signal	Wall	DAC	Chart	Shot Count	Configuration
Nominal Wall <input type="text" value="0.430"/> inches						
Nominal Wall Position on Chart <input type="text" value="50"/> %						
Wall Chart Scale <input type="text" value="0.003"/> inches per 1%						
Velocity <input type="text" value="0.2330"/> inches/uS						
Multiples Between Wall Gates <input type="text" value="1"/>						

Figure 6: Wall Tab

## The DAC Tab

The **DAC** tab allows the use and adjustment of Distance Amplitude Curves. If the **Enable DAC** box is checked, the DAC outline will be shown on the calibration scope. If the **Lock DAC** box is checked, the DAC curve cannot be adjusted in order to protect it from accidental modification.

Gates	Signal	Wall	DAC	Chart	Shot Count	Configuration
<input checked="" type="checkbox"/> Enable DAC <input checked="" type="checkbox"/> Lock DAC <input type="button" value="Delete"/>						
Instructions						
Right click on the scope above to add a new DAC point.						
Left click on a circle to select or move a section.						
Use the Delete button to remove a highlighted section.						
x,y						
<input type="button" value="Delete All DAC Sections"/>						

Figure 7: DAC Tab

## The Chart Tab

The **Chart** tab is used to adjust settings such as threshold levels, end mask positions, the chart name, and whether or not the chart is hidden. A chart may be hidden if it is not used for the current inspection process. See the chart at the bottom of 5Figure 1 for an example of a hidden chart.

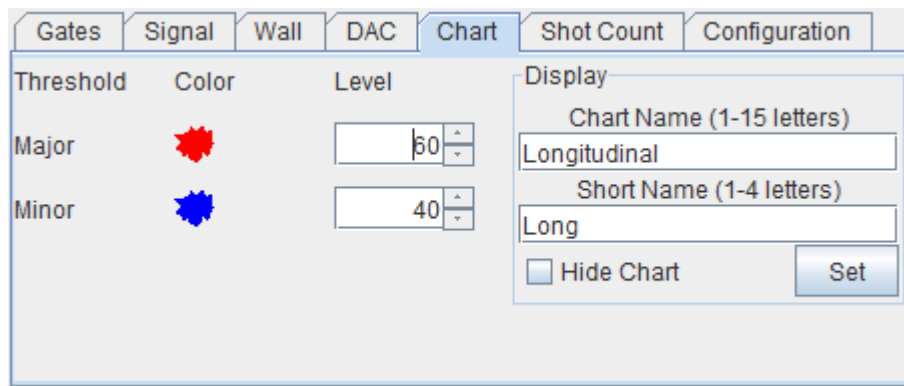


Figure 8: Chart Tab

## Shot Count Tab

The **Shot Count** tab is used to control:

1. how many consecutive hits must occur in a gate before it is registered as a flagged indication
2. how many consecutive misses must occur in a gate before an alarm is triggered - this is useful for flagging lost interface conditions

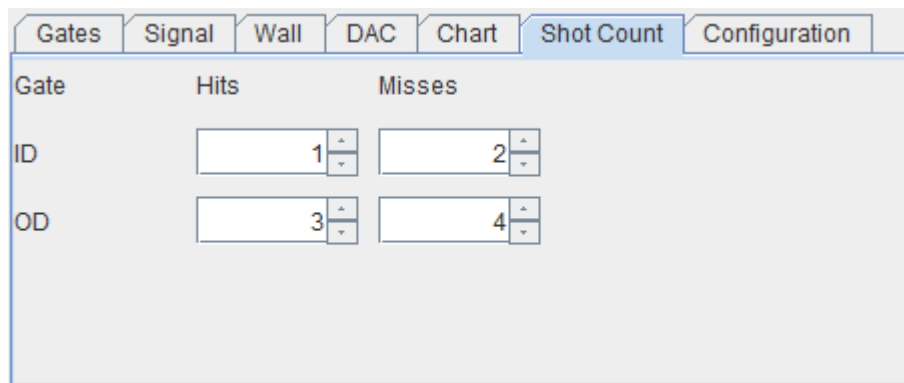


Figure 9: Shot Count Tab

## The Configuration Tab

The **Configuration** tab is used to adjust various features:

1. **Reject**: refer to the **System Specific Features** addendum for more info.
2. **AScan Smoothing**: this smooths the signal displayed in the **Calibration** window and is useful to dampen an excessively jittery display. The normal setting is **1 - no smoothing**.
3. **Hardware Gain**: this adjusts the hardware gain. It should be adjusted as high as possible for each channel such that the signal does not rail at the top. The software gain on the **Signal** tab should then be used to fine tune the amplitude.
4. **DC Offset**: this is used to adjust the entire signal up or down to account for any offset.

Gates	Signal	Wall	DAC	Chart	Shot Count	Configuration
Reject	15	%				
AScan Smoothing	1					
Hardware Gain	6	Vo/Vi				
DC Offset	0	mV				

Figure 10: Configuration Tab