METTLER TOLEDO

IND310drive
Terminal
User's Guide

PRECAUTIONS

- READ this manual BEFORE operating or servicing this equipment and FOLLOW these instructions carefully.

- SAVE this manual for future reference.
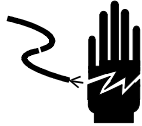
	⚡ **WARNING!**
	FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.

⚠ **WARNING!**

TO AVOID DAMAGE TO THE PCB OR LOAD CELL, REMOVE POWER FROM THE IND310drive TERMINAL AND WAIT AT LEAST 30 SECONDS BEFORE CONNECTING OR DISCONNECTING ANY HARNESS.

⚡ **CAUTION**

BEFORE CONNECTING/DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO OR DESTRUCTION OF THE EQUIPMENT AND/OR BODILY HARM.

⚠ **CAUTION**

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

	⚡ **WARNING!**
	THE IND310drive TERMINAL IS NOT INTRINSICALLY SAFE! DO NOT USE WITHIN AREAS CLASSIFIED AS HAZARDOUS DIVISION 1 OR ZONE 0/1 BECAUSE OF COMBUSTIBLE OR EXPLOSIVE ATMOSPHERES.
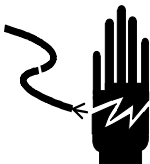
	⚡ **WARNING!**
	WHEN THIS EQUIPMENT IS INCLUDED AS A COMPONENT PART OF A SYSTEM, THE RESULTING DESIGN MUST BE REVIEWED BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF ALL COMPONENTS IN THE SYSTEM AND THE POTENTIAL HAZARDS INVOLVED. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

Contents

Chapter 1.0

Introduction

This chapter covers

- Operating Overview
- Installation and Programming

The IND310drive Industrial Scale Terminal incorporates the latest design innovations in vehicle weighing applications. The terminal contains functionality not available in previous generations of terminals; it employs a simple setup logic tree that will be carried across future generations of METTLER TOLEDO terminals.

The simplicity of setup and operation coupled with specific configurations for multiple applications reduces training costs and operation setup time. The enhanced software capabilities enable database storage of key information, which reduces operator error and time-consuming entries.

Information on installing, programming, and servicing the IND310drive terminal is located in the IND310drive Installation Manual and the IND310drive Technical Manual. Review all instructions and safety precautions carefully. Only authorized personnel should perform installation and service procedures. Please contact an authorized METTLER TOLEDO representative to resolve any questions not covered in this manual or associated manuals.

Operating Overview

See Appendix A, Basic Weighing Concepts for more information about basic weighing terminology.

To successfully use the IND310drive terminal's various functions, one must understand

- Basic weighing terminology
- Differences between gross and net states
- The terminal's various operating modes and weighing processes

Gross State

The IND310drive terminal is in the gross state when a tare (the weight of a container holding the product to be weighed) has not been taken. The full weight of the items on the scale displays on the terminal.

Net State

The IND310drive terminal is in the net state after a tare has been taken. Only the weight of the items on the scale after the tare is deducted displays, and the net cursor is lit.

Operating Modes

Routine operations with all vehicle features enabled in setup include four modes of terminal operation:

- **Vehicle ID Weighing**—Uses a permanent stored Vehicle ID table to identify the tare value of the vehicle, and then follows the steps defined by the outbound process to complete the procedure, which is also called a transaction. Vehicle ID Weighing enables the accumulation of totals based on vehicle ID.

- **Temporary ID Weighing**—Coordinates the inbound and outbound processes for vehicles that are not permanently stored in the Vehicle ID table through the use of a Temporary ID table. Temporary ID Weighing stores the vehicle information in the Temporary ID table and follows the inbound process. It also removes this temporary entry when the vehicle returns and follows the outbound process. Because the entry is temporary, no accumulation of totals occurs.

- **Index Weighing**—Enables the Vehicle ID Weighing mode and Outbound process to be condensed through the use of a special Index table that provides a single ID reference for quick multiple ID look-ups.

- **Transient Weighing**—This mode enables weighing of vehicles that are not part of normal operation in a manner similar to the Vehicle ID Weighing mode. Transient Weighing does not use the Vehicle ID table, so the operator must enter vehicle data. Transient Weighing transactions are not included in any totals.

Weighing Processes

There are two weighing processes:

- **Outbound**—Completes the vehicle transaction. The gross, tare, and net weight values are now known. Other transaction information may be collected (A1–A4 table data, Variable 1, and/or Variable 2 data). The completed transaction information is stored and can be printed.

- **Inbound**—Enables the vehicle identification information and a stored weight value to be collected. Other transaction information may be collected (A1–A4 table data). The inbound transaction information is stored and can be printed.

Installation and Programming

The IND310drive Installation Manual provides detailed information about installation. This manual is included in printed format and on a CD with the initial delivery of the terminal. Installation information for the IND310drive is also available in the IND310drive Technical Manual, Appendix A.

The IND310drive Technical Manual contains advanced information for IND310drive setup and programming.

METTLER TOLEDO

For your notes

Chapter 2.0

Operating Instructions

This chapter covers

- Security
- Display Operation
- Default Screen
- No Application Operation
- Application Operation
- Clear and Reset Functions
- Table Searches
- Table Reports

The IND310drive Terminal is a simple to use, yet sophisticated terminal with flexibility of configuration to meet a variety operating requirements. The setup menu system provides the power of configuration in a user-friendly operational environment.

While reading this manual and operating the terminal, keep in mind that various functions may or may not be available and that the screens shown in this manual may vary from terminal-to-terminal based on the setup configuration.

This User Manual provides instructions for performing typical vehicle weighing operations on the IND310drive terminal. Detailed information about terminal configuration and setup is provided in the IND310drive Technical Manual.

Security

The IND310drive supports two levels of users/passwords for setup security: Administrator and Limited. An administrator-level user can access all setup areas of the terminal. A limited-access-level user can access all areas of the setup except for the Scale and Diagnostics blocks.

The terminal is pre-configured at the factory with a user name of "ADMIN" and a user name of "Operator". The pre-configured users (ADMIN and Operator) cannot be changed, only the passwords can be added or modified. The factory default passwords are null (no password). The unit as configured at the factory requires no login or password entry to enter the setup mode. All functions of the terminal will be available to all users until a password is entered. Be sure to remember the password configured for the ADMIN user. If the password is changed or forgotten, access to the setup menu will not be available. Be sure to protect the password from access by unauthorized personnel. The password provides access to the entire setup menu, unless the metrology switch is placed in the approved position.

◄ Ensure that a password has been configured for the ADMIN user prior to configuring any passwords for other users. Failure to configure the ADMIN user password before configuring other user passwords could result in being blocked from access to the entire system.

Metrology Switch

The metrology switch (Figure 2-1), which is sealed per Weights and Measures, controls access to the scale submenu of the setup menu tree. This submenu includes functions such as calibration, filter settings, tare settings and others.
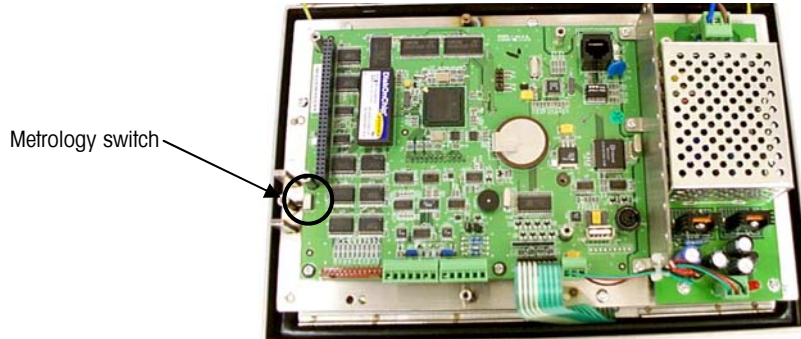
Metrology switch

Figure 2-1: Metrology Switch Location

The Scale submenu is accessible (may be expanded) only when the Metrology switch is in the non-approved position. If the metrology switch is in the approved position (Figure 2-2) the user may enter setup, but will be unable to enter the scale setup submenu. See the IND310drive Technical Manual for further information about the metrology switch and accessing the setup menu tree.
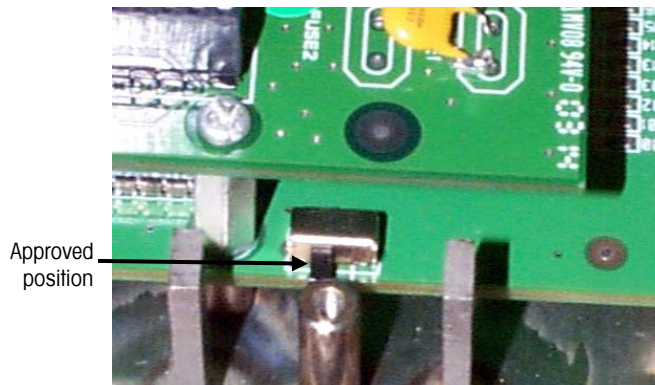
Approved position

Figure 2-2: Metrology Switch in the Approved Position

Legal for Trade Settings

Legal for Trade settings are accessed through the Scale submenu in the menu tree. The IND310drive operates within the weights and measurement rules associated with the Legal for Trade settings. Ensure that the appropriate legal for trade approval type is selected so that the IND310drive will display weight values in accordance with specific local weights and measures rules. See the IND310drive Technical Manual for information on how to change the Legal for Trade settings.

Display Operation

Application operation and setup display screens include the following basic sections:

- Status bar

- Application area

- Softkeys

Figure 2-3 shows the location of each of these sections.
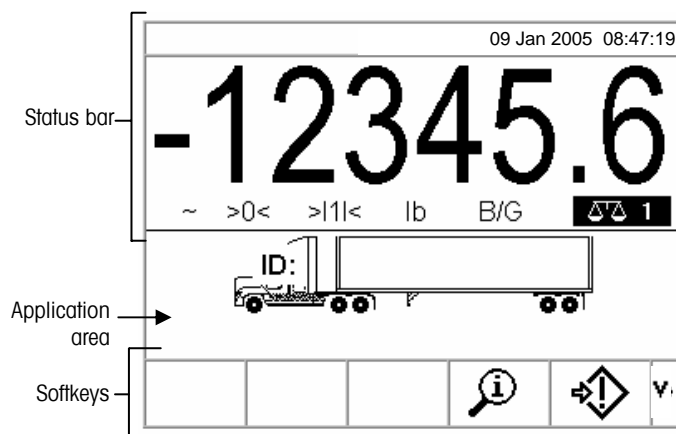
Figure 2-3: Default Weighing Operation Screen

Status Bar

The status bar shows the terminal's status, including the active scale, weight, weighing units, date, and time.

Application Area

The application area displays the current application. For example, the application area shown in Figure 2-3 indicates that a current vehicle ID needs to be entered.

Softkeys

Softkeys are used to select application operation modes. The positioning of softkeys can be changed and functions enabled or disabled through the softkey setup page.

General Navigation

Navigate in the applications and configure the IND310drive using

- Softkeys
- Application keys
- Scale function keys
- Navigation keys
- Numeric keys
- External Keyboard
- Alpha keys

The locations of the above listed keys and the default weighing operation screen are shown in Figure 2-4.

Softkeys

The softkey setup page is used to

- Change softkey positions
- Enable softkey functions
- Disable softkey functions

For example, a contrast softkey can be enabled for making quick adjustments to the terminal screen's contrast setting.

Five softkeys are located along the bottom of the display screen (see Figure 2-4). Some screens might have up to three pages of softkeys for a total of 15 possible functions. A DOWN ARROW icon ⩒ displayed on the lower-right corner of the screen (to the far right of the softkey icons) indicates that more softkey selections are available. Press the DOWN arrow navigation key to display additional softkey screens. Press the UP arrow navigation key to display the previous softkey screen.
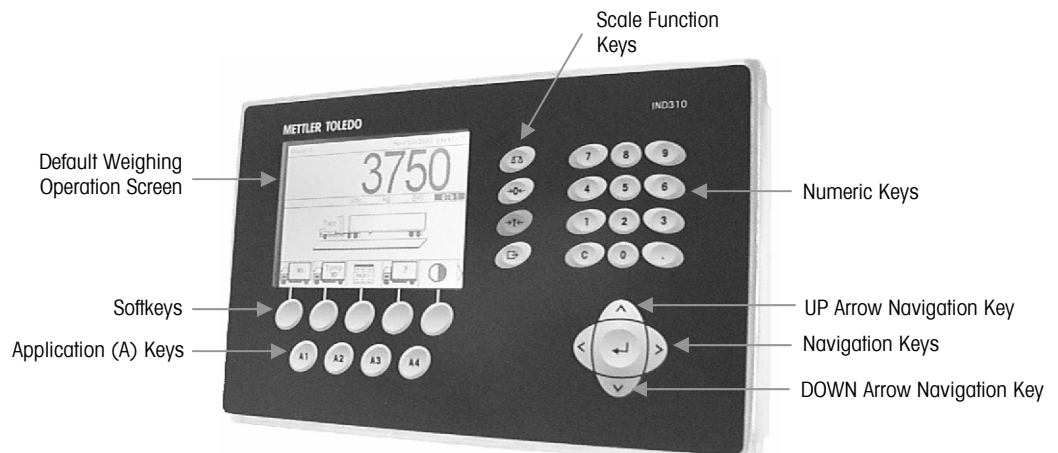
Figure 2-4: Key Locations and Default Weighing Operation Screen

Application Keys

Application keys (A keys) are located below the softkeys (see Figure 2-4) and are labeled

- A1

- A2

- A3

- A4

The application key setup screen is used to assign specific functions to the application keys. For example, application keys could be configured to magnify the display ten times, adjust contrast, or select user-defined table information.

Scale Function Keys

Scale function keys (see Figure 2-4) are:

△△ **Select Scale**—Enables the operator to select a specific scale. Press the SELECT SCALE key to switch between available scales.

→0← **Zero**—Zero is the weight of the scale platform or weighbridge when it is empty. The gross zero reference is recorded during calibration. Press the ZERO scale function key to capture a new gross zero reference point if pushbutton zero is enabled in configuration and the weight is within the zero range.

→T← **Tare**—Tare is the weight of a vehicle when it is empty. Tare is normally used to determine the net weight of the contents of a vehicle. Press the TARE scale function key when an empty vehicle is on the scale. The terminal then displays a zero weight. The vehicle is loaded and driven back onto the scale. The terminal then displays the net weight of the contents. Pushbutton tare must be enabled to use this key in this manner.

When the empty weight of the vehicle is a known value, enter the tare weight using the numeric keys and then press the TARE scale function key. The terminal will display the net weight of the contents of the vehicle. Keyboard tare must be enabled in order to use this key in this manner.

⊏→ **Print**—Press the PRINT scale function key to generate a hard-copy printout of a report or of information displayed on the screen or to initiate a demand print of an assigned print template. A printer must be connected to a serial port and the terminal must be configured to match its serial port settings to the printer's. Communication connection and configuration is necessary to connect a template or report to the selected serial port, and to define the selected template or report in configuration.

Navigation Keys

Navigation keys (see Figure 2-4) enable navigation within the setup menu tree, setup screens, and application screens. Navigation keys include:

- **Λ Up and V down arrows**—move the focus up or down to different setup options within the menu tree or to different fields within setup pages. Focus is indicated by highlighted text. These keys are also used to switch to another page of softkeys.

- **< Left and > right arrows**—expand (right arrow) or collapse (left arrow) the setup options in the menu tree. These arrows also move the cursor position to a specific character in text areas, and enable left and right scrolling to view all information available on a screen.

- **⏎ Enter**—opens the setup page for viewing and editing setup parameters. The Enter key moves the focus from a field label to a setup value for that field. After entering a value, the enter key is used to accept new values and the focus moves to the next field label.

Numeric Keys

Use the terminal's 12-key numeric keypad (see Figure 2-4) to enter data and commands.

To use numeric keys, position the cursor in the field (see Navigation Keys) and press the numeric keys to enter the appropriate data. Press the DECIMAL key (. key) to enter decimal points where necessary.

The CLEAR key (C key) functions like a backspace key. Position the cursor at the end of data to be deleted and press the C key. Press the C key once for each character to be deleted.

Alpha Keys

On some setup pages, softkeys and application keys function as alpha keys (see Figure 2-5) that are used to enter alphabetic characters for setup parameters such as passwords.
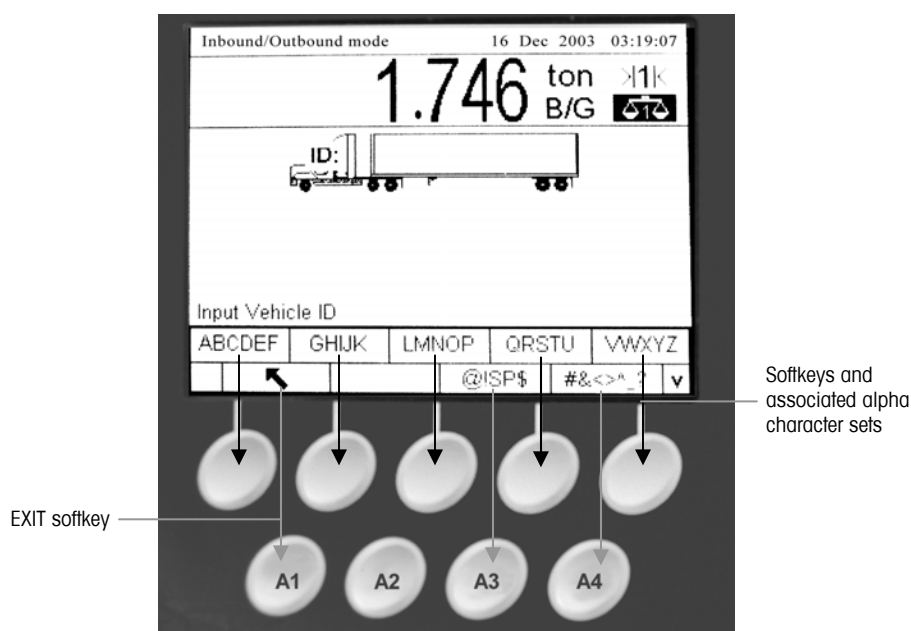
Figure 2-5: Alpha Keys

To use alpha keys, position the cursor in the data entry location (see Navigation Keys), press the softkey or application key associated with the desired set of alpha characters as shown in Figure 2-5. The softkeys change to display each alpha character included in the selected set of alpha characters. Use the UP and DOWN arrow navigation keys (see Figure 2-4) to switch between upper-case and lower-case characters. Press the key associated with the specific alpha character desired for data entry. Use the EXIT softkey ↖ to return to the main alpha key menu. Repeat this process until all alpha characters have been entered.

From the main alpha key menu, press the EXIT softkey to escape from alpha entry without saving data. Use the CLEAR (C) key (see Numeric Keys, Figure 2-4) to delete unwanted alpha characters.

External Keyboard

See the IND310drive Installation Manual for more information on connecting an external keyboard.

An external keyboard can be connected to the IND310drive at the PS/2 port. The keys on an external keyboard perform the following functions

- **F1 through F5**—Perform the same functions as the softkeys, with F1 being the softkey on the left and F5 being the softkey on the right.

- **Alt F1 through Alt F4**—Perform the same functions as the A1 through A4 application keys.

- **F6 through F9**—Perform the same functions as the SELECT (F6), ZERO (F7), TARE (F8), and PRINT (F9) scale function keys.

- **Keyboard numeric and alphabetic keys**—Function independently of the softkeys and can be used to enter alphabetic letters and numerals. The Enter key on the keyboard functions the same as the ENTER navigation key. The Backspace key functions the same as the CLEAR (C) key. The arrow keys function the same as the navigation keys.

- **Number keys**—Function the same as the keys on the terminal's numeric keypad when the number lock function is engaged.

Keystroke Functions
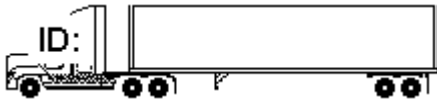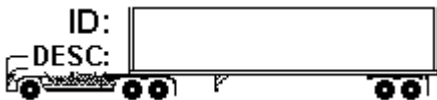
Key names and commands are identified in this manual by upper- and lower-case letters. Key names, such as ENTER, are in all upper-case letters, and commands, such as "select," are in lower-case (unless they begin a sentence, in which case the first initial is upper-case). For example:
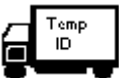
- "Press INDEX…" means to press the INDEX softkey.

- "Select an option…" means to use the UP or DOWN arrow navigation keys to select a setting, then press ENTER.

Softkeys and application displays use graphic images for identification. Table 2-1 shows graphic images and their functions.

Table 2-1: Graphic Images and Functions

Graphic Image	Function
→|▾|←	Capture Span
→0←	Capture Zero
C	Clear
C✳	Clear Total
◐	Contrast
▣1	Current "Var1" Value
▣2	Current "Var2" Value
▤ A1	Current A1 Value
▤ A2	Current A2 Value
▤ A3	Current A3 Value

Graphic Image	Function
	Current A4 Value
ID:	Current Vehicle ID
ID: DESC:	Current Vehicle Description
	Custom Report
	Darker
	Database Files
	Database Query (search)
Defrag	Defragment
	Delete
	Edit
ESC	Escape (exit without storing)
	Exit (return to previous screen)
ID	Vehicle ID Weighing
INDEX	Index Weighing
i	Information
	Information/Recall
	Lighter
	Metrology (Weight) Information

Graphic Image	Function
∨ ∧∨ ∧	More Softkey Selections
	New/Insert
	Repeat Print
	Report
	Reset
000	Reset Counter
A1-A4	Return to A1-A4 File Entry
1&2	Return to Var1-2 Entry
	Setup Menu
	Start
	Start Search
	Stop
Temp ID	Temporary ID Table
Temp ID	Temporary ID Weighing
	Time & Date
?	Transient Vehicle Weighing
	Unit Switching
OK	Validate Entry/Transaction
ID	Vehicle ID Table

Default Screen

See the
IND310drive
Technical Manual,
Chapter 3.0,
Configuration, for
details about
terminal setup.

The default screen can be configured to display No Vehicle Application, Vehicle ID, or Temporary ID as the default weighing mode. At power up, when exiting setup, or upon completion of a transaction the IND310drive will automatically display the input screen associated with the selected default auto start mode. Figure 2-6 shows an example of a Vehicle ID Weighing default screen.
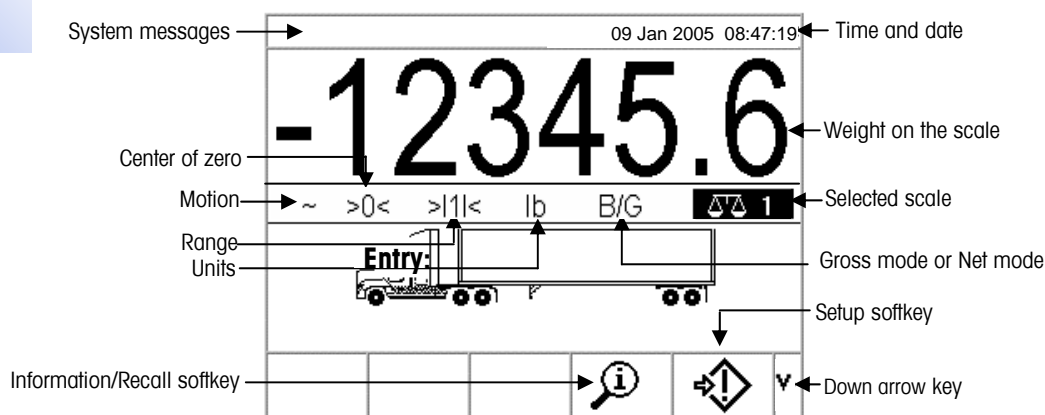
Figure 2-6: Default Vehicle ID Weighing Operation Screen

No Application Operation

No vehicle application operation mode enables operation of the terminal without any vehicle application. The IND310drive functions as a weighing terminal only with no transaction functions. This mode of operation can be used for weighing tanks, rail cars, or other large items not associated with transaction weighing. See the IND310drive Technical Manual, Chapter 3.0, Configuration for information about setting up the terminal for no vehicle application operation.

Application Operation

Routine operations with all vehicle features enabled in setup include four modes of terminal operation:

- **Vehicle ID Weighing**—Uses a permanent stored Vehicle ID table to identify the tare value of the vehicle, and then follows the steps defined by the outbound process to complete the procedure, which is also called a transaction. Vehicle ID Weighing enables the accumulation of totals based on vehicle ID.

- **Temporary ID Weighing**—Coordinates the inbound and outbound processes for vehicles that are not permanently stored in the Vehicle ID table through the use of a Temporary ID table. Temporary ID Weighing stores the vehicle information in the Temporary ID table and follows the inbound process. It also removes this temporary entry when the vehicle returns and follows the outbound process. The entry is temporary, so accumulation of totals does not occur.

- **Index Weighing**—Enables the Vehicle ID Weighing mode and Outbound process to be condensed through the use of a special Index table that provides a single ID reference for quick multiple ID look-ups.

- **Transient Weighing**—This mode enables weighing of vehicles that are not part of normal operation in a manner similar to the Vehicle ID Weighing mode. Transient Weighing does not use the Vehicle ID table, so the operator must enter vehicle data. Transient Weighing transactions are not included in totals.

There are two weighing processes:

- **Outbound**—Completes the vehicle transaction. The gross, tare, and net weight values are now known. Other transaction information may be collected (A1–A4 table data, Variable 1, and/or Variable 2 data). The completed transaction information is stored and can be printed.

- **Inbound**—Enables the vehicle identification information and a stored weight value to be collected. Other transaction information may be collected (A1–A4 table data). The inbound transaction information is stored and can be printed.

Direct Entry Option

An alternative method to initiate a transaction is direct entry of known data. To use this option, enter any type of known data, such as a tare weight on the main weighing screen to initiate a transaction. Press a softkey or scale function key to select how the terminal uses the information. For example, enter a tare weight and press the TARE scale function key. The data entered becomes a manually-entered tare.

Vehicle ID Weighing

See Appendix B, Application Operation Flowcharts for a quick reference flowchart that illustrates Vehicle ID Weighing.

Vehicle ID Weighing uses the Vehicle ID Table where vehicle IDs, descriptions, and permanent stored tares are entered prior to operation. Totals of vehicle weights are also maintained in the Vehicle ID Table (if enabled in setup). To view or edit the

Vehicle ID Table, press the VEHICLE ID TABLE softkey [**ID**] at any time.

To use Vehicle ID Weighing:

1. From the default weight screen (Figure 2-6), press the DOWN arrow key to display all available softkeys (see Figure 2-7).

Figure 2-7: Default Weighing Screen

◀ This screen may appear differently depending on setup configuration. If the VEHICLE ID softkey does not appear, see the IND310 Technical Manual, Appendix F, Softkey and Application Key Mapping.

2. Once the vehicle is on the scale, press the VEHICLE ID softkey. A vehicle ID prompt displays with a cursor in the Vehicle ID entry field. The softkeys and application keys become alpha keys (see Figure 2-5).

3. Use the alpha keys and the numeric keypad to enter the vehicle ID. Press the ENTER key to complete the entry. The ID value entered is the look-up key for the vehicle in the Vehicle ID table and then in the Temporary ID table.

◀ If an external keyboard is connected, it can be used to enter information.

4. If the vehicle's ID is located in the Vehicle ID or Temporary ID tables, the terminal uses the stored data (including tare weight) and continues with the outbound process. To continue the transaction, see Outbound Process.

5. If the vehicle's ID is located in the Vehicle ID table and the vehicle ID tare weight was entered as zero or left blank, then the first transaction with that vehicle ID is taken as an inbound transaction. During the inbound transaction, the IND310drive will prompt the user with "Save this tare weight in the Vehicle ID Table?" Since the transaction is inbound, the user should answer YES. The tare weight is stored permanently in the Vehicle ID table. During the outbound transaction, the IND310drive will prompt the user a second time with "Save this tare weight in the Vehicle ID Table?" Since the transaction is now outbound, the user should answer NO.

If the vehicle's ID is not located, the display will read ID NOT FOUND (see Figure 2-8).
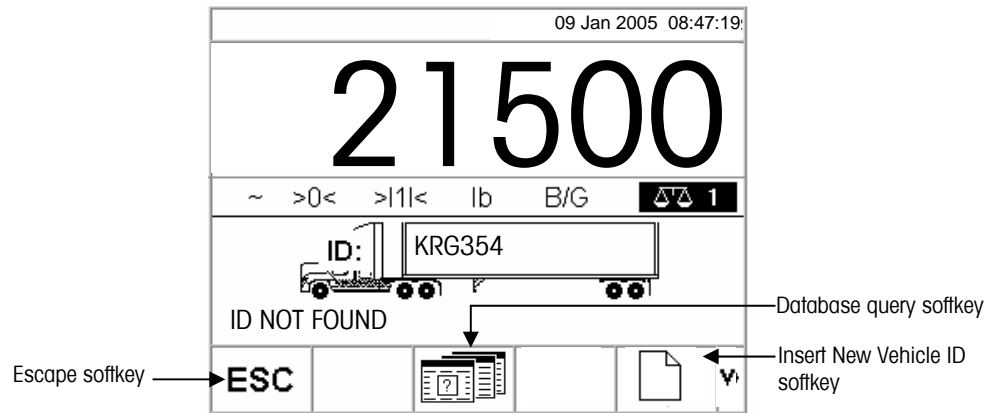
Figure 2-8: Default Weighing Screen

When a vehicle ID is not located, the user has three options:

See the Table Searches section for more information about how to search for a vehicle ID.

- **Escape**—Press the ESCAPE softkey (see Figure 2-8) to return to the main Default Weight Screen.

- **Search for the vehicle ID**—Press the DATABASE QUERY softkey (see Figure 2-8) to search for the vehicle ID. Once the correct ID is located, continue with the outbound process (see Outbound Process).

- **Insert New Vehicle ID**—Press the Insert New Vehicle ID softkey (see Figure 2-8) to store the ID in the temporary ID table (see Temporary ID Weighing).

New Vehicle ID

Pressing the softkey to insert a new vehicle ID opens the Vehicle ID setup page.

1. Edit the page with the information for the vehicle

2. Select the tare type.

3. If tare is weighed, press the tare key.

4. If the IND310drive has both a Scale1 and a Scale2 then it will ask the user to select which scale to use.

5. Press the "OK" softkey when finished to store the vehicle ID information.

Temporary ID Weighing

See Appendix B, Application Operation Flowcharts for a quick reference flowchart that illustrates Temporary ID Weighing.

Temporary ID Weighing involves the use of the Temporary ID Table to record tare weights for inbound transactions and to recall these weights on outbound transactions. Manually-entered tare weights can also be used for Temporary ID Weighing. To view or edit the Temporary ID Table, press the TEMPORARY ID TABLE softkey ⌗ at any time.

Following an outbound transaction, the vehicle ID is removed from the Temporary ID Table. The totals for these types of transactions are not recorded in the Temporary ID Table, but are recorded in the A1, A2, A3, and A4 Tables if enabled.

To use Temporary ID Weighing:

1. Once the vehicle is on the scale, press the TEMPORARY ID softkey (see Figure 2-7). If enabled in the Temporary ID setup, an automatic ID number between 001 and 999 displays, which can be used as the Temporary ID. (See the IND310 drive Technical Manual, Chapter 3.0, Configuration for information about enabling the automatic ID numbering in the Temporary ID Table.) To use the automatic number as the ID, press ENTER. To enter more detailed information:

    A. Enter the ID information at the temporary ID prompt that displays with a cursor in the ID field. The softkeys and application keys become alpha keys (see Figure 2-5).

    B. Use the alpha keys and the numeric keypad to enter the vehicle ID. Press the ENTER key to complete the entry.

    C. If the vehicle ID is found in the Temporary ID Table, the terminal uses the stored data and continues with the outbound process. To continue the transaction, see Outbound Process.

       When a vehicle ID is not located, the user has three options:

    - **Escape**—Press the ESCAPE softkey (see Figure 2-8) to return to the main Default Weighing Screen.

See the Table Searches section for more information about how to search for a vehicle ID.

    - **Search for the vehicle ID**—Press the DATABASE QUERY softkey (see Figure 2-9) to search for the vehicle ID. Once the correct ID is located, continue with the outbound process (see Outbound Process).

    - **Insert an ID in the Temporary ID Table**—Press the INSERT softkey ⌗ . The vehicle ID is inserted into the Temporary ID Table. To continue the transaction, see Inbound Process.

Using Manually-Entered Tare Weights for Temporary ID Weighing

Operators can use manually-entered tare weights rather than stored tare weights in the Temporary ID Weighing mode (if enabled in setup).

To manually enter a tare weight:

1. From the default weight screen (Figure 2-9), use the numeric keypad to enter the tare value in the tare entry field **BEFORE** pressing the TEMPORARY ID softkey.
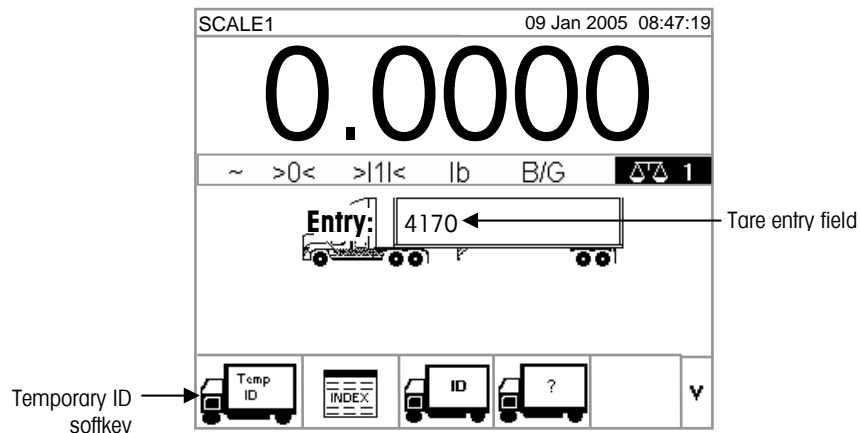
Figure 2-9: Default Weight Screen

2. Press the TEMPORARY ID softkey.

3. Press ENTER to use the automatic ID number (001–999) assigned as the Temporary ID or enter the Vehicle Description using the alpha keys. To continue the transaction, see Outbound Process.

Index Weighing

Index Weighing uses the Index Table, which enables a relational ID to be used to locate values for enabled table information, including the Vehicle ID and A1–A3 Tables (if configured in setup). Index Weighing requires the use of the A4 Table as the Index Table, which is configured in the application memory setup.

To use index Weighing

1. Once the vehicle is on the scale, press the INDEX softkey (Figure 2-10).
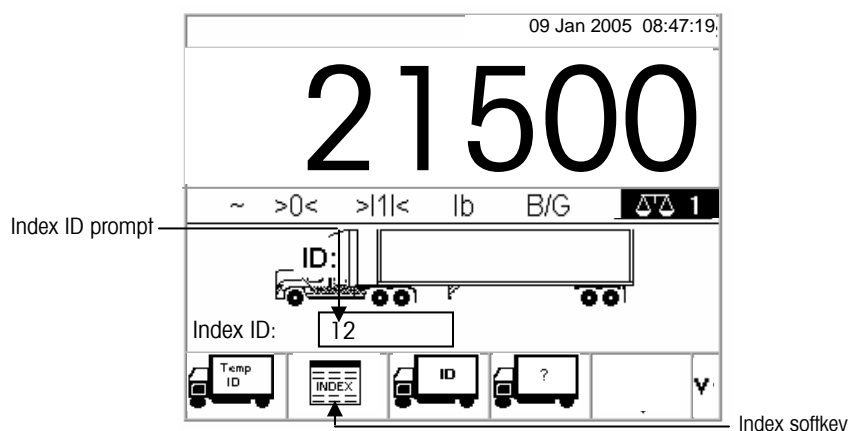
Figure 2-10: Weight Screen With Index ID Prompt

2. An Index ID prompt displays with a cursor in the ID field (see Figure 2-10).

3. Use the numeric keypad to enter the Index ID. Press the ENTER key to complete the entry.

4. If the ID is found in the Index Table, the terminal uses the relational ID data to locate corresponding data in the vehicle ID and A1–A3 tables. To continue the transaction, see Outbound Process.

    When an Index ID is not located, the user has two options:

*   **Escape**—Press the ESCAPE softkey ESC to return to the main Default Weight Screen.

*   **Search for the Index ID**—Press the DATABASE QUERY softkey to search for the index ID. Once the correct ID is located, continue with the outbound process (see Outbound Process).

Transient Vehicle Weighing

See Appendix B, Application Operation Flowcharts for a quick reference flowchart that illustrates Transient Vehicle Weighing.

Use Transient Vehicle Weighing for vehicles that should not be included in totals or in the terminal's memory.

To use Transient Vehicle Weighing:

1. Once the vehicle is on the scale, press the TRANSIENT VEHICLE WEIGHING softkey (see Figure 2-11).
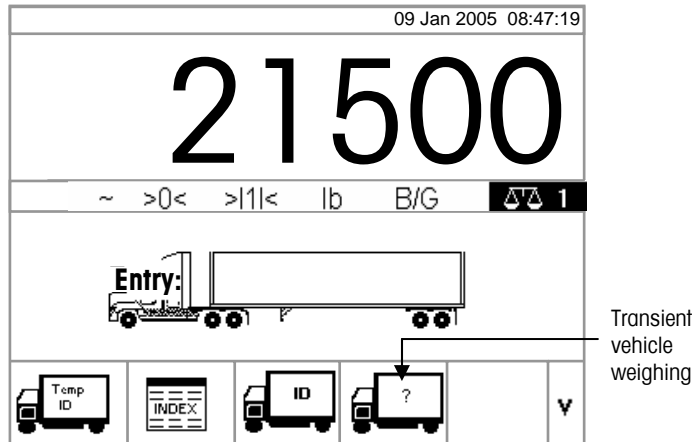
Figure 2-11: Default Weighing Screen

2. A prompt displays with a cursor in the description field. The softkeys and application keys become alpha keys (see Figure 2-12).
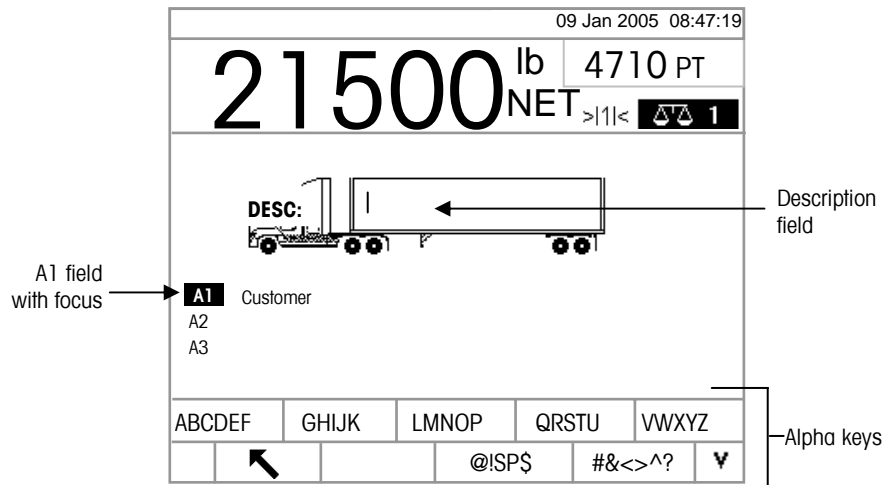
Figure 2-12: Transient Weighing ID Prompt

3. Use the alpha keys and the numeric keypad to enter the description. Press the ENTER key to complete the entry. To continue the transaction, see Outbound Process.

Outbound Process

Completing the Outbound Process involves:

- Entering Database Information
- Validating the Transaction
- Printing and Storing

Entering Database Information
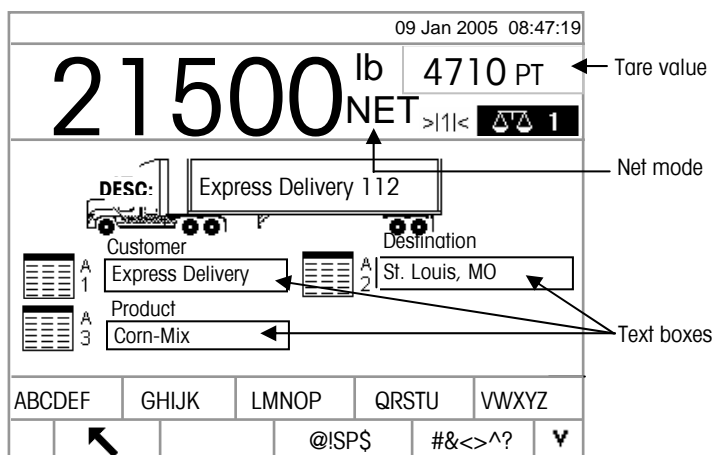
Database files must be enabled in the setup menu for the different types of weighing operations in order to enable the collection of database information during transactions. If enabled, totals are maintained for the database information.

◀ Entry of database information is not obligatory. Press the OK softkey ✓ to continue a transaction without entering data.

To enter database information:

1. The A1 field has focus (is highlighted) when the screen displays. Press the ENTER key to access the A1 field. The softkeys and the application keys become alpha keys

See the IND310drive Technical Manual, Appendix C, Database Structure and Use for more information about how to use Short A/N IDs.

2. Use the alpha keys and the numeric keypad to enter the Short A/N (alpha/numeric) ID of the desired database information in the text boxes that correspond to the A1, A2, A3, and A4 (if enabled) tables (see Figure 2-13).

◀ If the A4 Table is not enabled as the index table, it can be a user-defined entry field that functions like the A1–A3 Tables.

Figure 2-13: A1–A3 Tables Data Entry Screen

3. Press the ENTER key. The description that corresponds to the Short A/N ID displays in the text box.
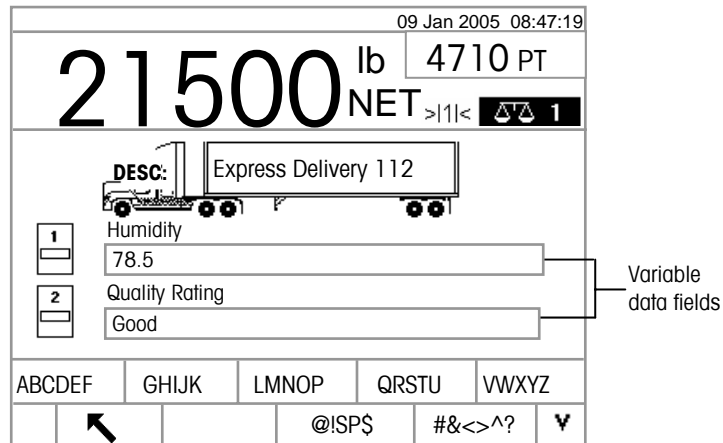
4. If the Short A/N ID is not found in the database, the message "A1 ID NOT FOUND" displays. Search the database by pressing the

   DATABASE QUERY softkey .

5. Once all table entries are complete, press the OK softkey to accept the entries.

◄ For Index Weighing, the A1, A2, and A3 table fields (if enabled) will display the database values as referenced in the Index Table. If necessary, change the values by following steps 1–3. A1, A2, and A3 table values that are changed during Index Weighing will not be changed in the Index Table.

6. If variable data entry has been enabled, variable data fields display. Variable data field names are enabled in the application setup. For example, in Figure 2-14 humidity is enabled as Variable 1 and quality is enabled as Variable 2. Use the alpha keys and the numeric keypad to enter variable data.

Figure 2-14: Variable Data Entry Screen

7. Once all table entries are complete, press the OK softkey to accept the entries.

◄ Entry of data here is not obligatory. Variable data is not stored. Press the OK softkey to continue without entering data.

Validating the Transaction

After entering all data for the database and variable data, the validation screen displays (Figure 2-15). This screen shows all database table entries.

Figure 2-15: Validation Screen

To validate the transaction

1. Verify that the information displayed for the database entries (A1–A3) and the variable data entries (Var1–Var2) is correct.

2. If any information is not correct, press the RETURN TO A1–A3 ENTRY softkey or the RETURN TO VARIABLE ENTRY softkey to go back to the appropriate entry screen to correct the information. Press the ESCAPE softkey to clear all data and re-start the transaction.

3. Once all information is correct as displayed, press the OK softkey to validate the transaction.

◀ If the A4 Table is not enabled as the index table, it can also be a user-defined entry field that functions like the A1–A3 Tables, and information will display and should be validated for this database entry as well.

Printing and Storing

1. Once the transaction is validated, the information related to the transaction is stored in the Transaction Table and the outbound transaction prints (if enabled in setup).

2. After storing and/or printing, the display returns to Gross mode and the terminal is ready for the next transaction.

Repeat Printing

Anytime the IND310drive prints, a buffer is created that retains a copy of what was printed. The information in the buffer can be printed repeatedly as needed. To

initiate the Repeat Print function, press the REPEAT PRINT softkey .

Inbound Process

Completing the Inbound Process involves:

- **Entering Database Information**—The same procedures as listed under Entering Database Information for the Outbound Process.

- **Validating the Transaction**—The same procedures as listed under Validating the Transaction for the Outbound Process.

- **Printing and Storing**—The same procedures as listed under Printing and Storing for the Outbound Process, except ID, description, and inbound weight information related to the transaction are also stored in the Temporary Table.

Commodity Function

The commodity function enables the use of custom units on a per commodity basis (up to 25 different commodities). For example, an operator might want to use a custom unit of bushels for corn rather than kilograms or pounds. The commodity table enables the creation of a table (the A1 Table) that defines the multiplication or division factor that converts kilograms or pounds of corn to bushels. When the commodity (corn) is weighed, the output shows the converted amount and custom unit (bushels).

See the IND310 Technical Manual, Chapter 3.0, Configuration, Application, Memory for further information about configuring the commodity function.

Clear and Reset Functions

Clear and reset functions enable users to clear the Alibi & Transaction table and to reset specific parameters or all IND310drive parameters back to the factory default settings.

Clearing the Alibi & Transaction Table

The user may want to clear the transaction table after the terminal has first been installed or in North American applications, where the user has downloaded the existing data and wishes to continue with a clear table. Clearing the Alibi & Transaction table may take up to three minutes. In addition to clearing the data, the process runs a database defragmentation routine. Further information about clearing the Alibi & Transaction table is available in the IND310drive Technical Manual, Chapter 2.0, Operation.

To clear the Alibi & Transaction table:

1. Go to the setup menu and select Application/Memory/Alibi & Transaction Table. The Alibi & Transaction Table screen displays (Figure 2-16).

Figure 2-16: Alibi & Transaction Table

2. Press the CLEAR softkey. A "Please Wait" message displays while the operation is running. The task is complete when the "Please Wait" message no longer displays.
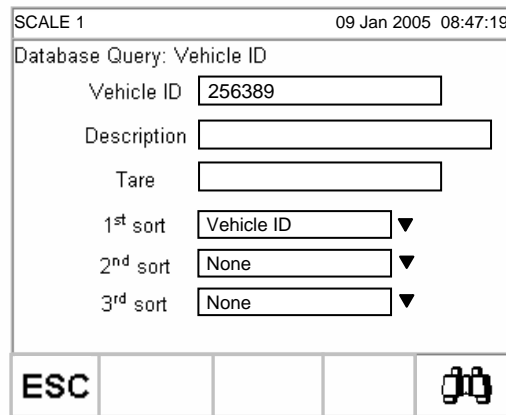
Reset

Reset appears in each submenu: Scale, Application, Terminal, Communication, and Maintenance/Configure and is used to reset specific parameters for that submenu back to the factory default settings. Reset All resets all IND310drive parameters back to factory default settings. Reset and Reset All do not affect Scale Type, Capacity, Increment, and Scale Calibration Data. The configuration of data tables is reset, but the data within tables (Vehicle ID, A1–A4) are not cleared by the reset function. Data within the tables can only be cleared within the Table Editing screens. Further information about the Reset and Reset All functions is available in the IND310drive Technical Manual, Chapter 2.0, Operation.

Table Searches

To search database tables:

1. Press the DATABASE QUERY softkey to search the database table associated with the current operating mode or active table. For example, if the current operating mode is Vehicle ID Weighing, the Database Query screen for the Vehicle ID Table displays when the DATABASE QUERY softkey is pressed (see Figure 2-17).

Figure 2-17: Database Query Screen—Vehicle ID Table

◄ If the search is done with the search fields left blank, the entire table in the database file displays. Use the UP and DOWN arrows to scroll through the table to locate the desired entry. Proceed to Step 7.

2. Use the UP and DOWN arrow keys to scroll among the data field labels.

3. Press the ENTER key to select a data field. The softkeys and application keys become alpha keys.

4. Use the alpha keys and the numeric keypad to enter information in the field to search on.

5. Press the ENTER key to accept the entry.

6. Press the START SEARCH softkey . If the information entered is found in the database, it will display with focus (highlighted). If the information is not found, the result screen will list no entries. Press the DATABASE QUERY softkey to return to the main search page and try again.

7. To select an entry from the database search results, press the OK softkey .

◄ The search results for an Index Table search will show data for the A2 and A3 values (if enabled) even though these values cannot be used as part of the query's sort.

Table Reports

Reports are generated from database tables including:

- **Transaction Table**—Stores weighing transaction information

- **Vehicle ID Table**—Stores specific vehicle information, including vehicle IDs, descriptions, and tare weights

- **Temporary ID Table**—Temporarily stores vehicle descriptions and tare weights for inbound vehicles to enable the recall of these weights for outbound transactions

- **A1, A2, A3, and A4 Tables**—Store descriptions of vehicle information defined in the application setup to meet specific operational requirements. The A4 Table can be configured as an Index Table, which is comprised of ID keys that reference data located in other tables.

The RUN REPORT softkey ⬛ must display on the operational screens to generate table reports. Otherwise, table reports can only be generated from setup screens.

To generate a table report:

1. Press the RUN REPORT softkey ⬛ . The Reports Run/Full screen displays (see Figure 2-18).
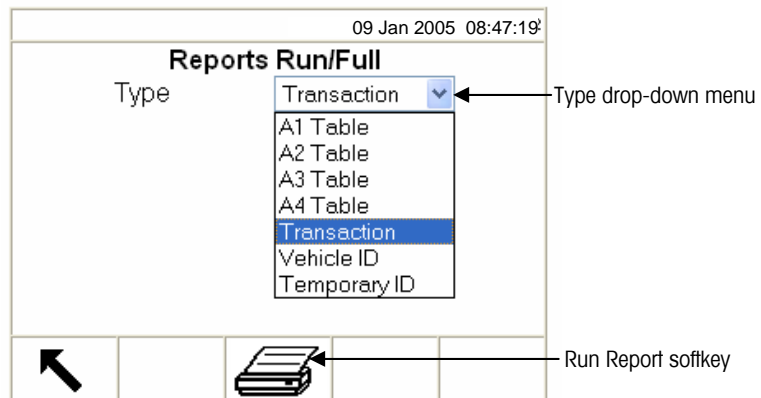
Figure 2-18: Reports Run/Full Screen

2. Use the Type drop-down menu to select the desired type of database table report. Press the ENTER key to accept the selection.

3. Press the RUN REPORT softkey. The Report Setup Screen for the selected report type displays (see Figure 2-19).
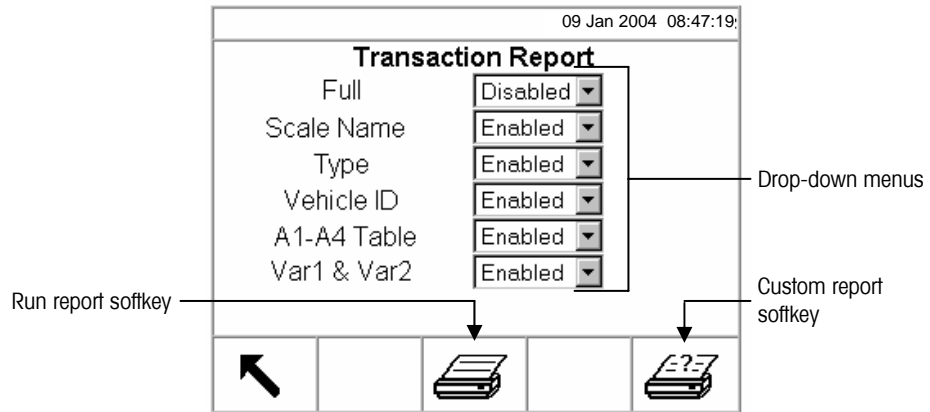
Figure 2-19: Report Setup Screen (Transaction Report)

4. Use the drop-down menus on the Report Setup Screen to enable or disable the defined table fields within the structure of the table report.

◄ If Full is enabled for the transaction table report, other selections do not display.

◄ If the A4 table is configured as the Index Table, the fields that display change to enable set up of the Index Table report structure.

5. Press the RUN REPORT softkey to run a standard table report that includes data from all enabled fields.

To configure and run a custom report:

1. Press the CUSTOM REPORT softkey to limit the records included within the report fields and run a custom report. See Figure 2-20 for an example of a custom report setup screen.
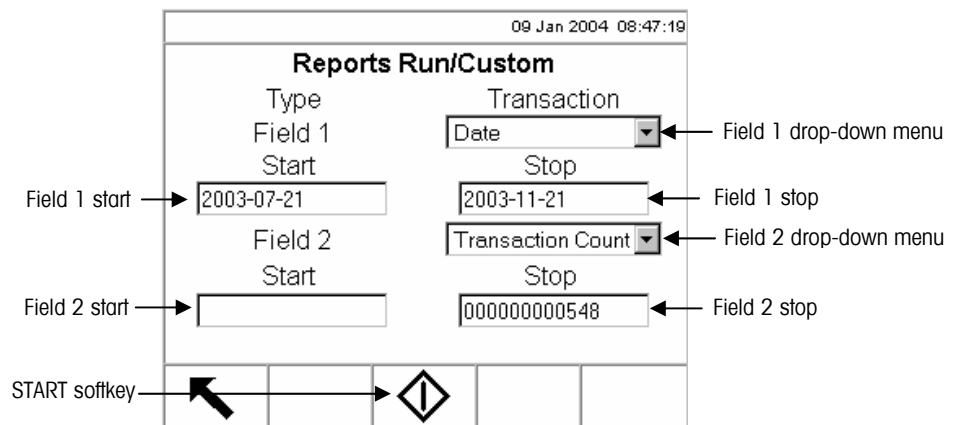
Figure 2-20: Example Custom Report Setup Screen

2. Use the Field 1 and Field 2 drop-down menus to select fields to be used to limit records that are included in a report.

3. Specify the range of reported field values by entering start and stop values for the selected fields. The example in Figure 2-20 shows Date for Field 1, with a start value of 2003-07-21 and a stop value of 2003-11-21. Therefore, only records with dates between July 21, 2003 and November 21, 2003 will be included in the report.

   If the stop value is left blank, then any records with values that fall after the start value are included in the report. If the start is left blank, then any records with values that fall before the stop value are included in the report. The example in Figure 2-20 shows Transaction Count for Field 2 with a blank start value and a stop value of 548. All records with transaction counts between 1 and 548 and dates between July 21, 2003 and November 21, 2003 will be included in the report.

   ◄ The date format is fixed at YYYY-MM-DD for these fields. (This date format might not match the terminal's date configuration.)

4. Press the START softkey to run the custom report.

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For your notes

Chapter 3.0

Service and Maintenance

Service

Information on installing, programming, and servicing the IND310drive terminal is available in the IND310drive Terminal Installation and Technical Manuals. Only qualified personnel should perform installation, programming, and service. Please contact a local METTLER TOLEDO representative for assistance.

In general, once the IND310drive is installed, programmed, and calibrated for a given application, no other routine service is required.

	⚡ WARNING!
	ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THE TERMINAL. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

Cleaning and Maintenance

Clean the IND310drive terminal's keypad and cover with a clean, soft cloth dampened with a mild glass cleaner. Do not use any type of industrial solvent such as toluene or isopropanol (IPA) that could damage the terminal's finish. Do not spray cleaner directly on the terminal.

Regular maintenance inspections and calibration by a qualified service technician are recommended. The IND310drive is a rugged stainless steel-enclosed instrument; however, the font panel is a vinyl covering over sensitive electronic switches and a lighted LCD display. Take care to avoid any punctures to this surface or any vibrations or shocks to the instrument. Should the front panel become punctured, ensure that steps are taken to prevent dust and moisture from entering the unit.

Updating Software

IND310drive software updates are performed with a USB memory stick. Only a METTLER TOLEDO provided USB memory stick (available as CIMF number 71208113) should be used to perform this activity. Refer to the IND310drive Technical Manual, Chapter 4.0, Service and Maintenance, for detailed procedures for updating software.

Basic Weighing Concepts

This appendix explains some of the specialized terminology and concepts that are commonly used in the weighing industry, as well as the features of the IND310drive that can be used to make the weighing process more efficient.

Zero

Zero is the empty weight of the scale platform or weighbridge. The gross zero reference is recorded during calibration.

Pushbutton Zero is a way for the operator to capture a new gross zero reference point. The weight on the scale must be stable and be within the pushbutton zero capture range, typically ±20% of full scale capacity. The zero of the scale can change because material builds up on the scale or because the temperature changes.

Auto Zero Maintenance (AZM) is a way for the terminal to gradually rezero itself in order to compensate for small changes in zero. Class IIIL legal-for-trade vehicle scales use an AZM range of ±3 displayed increments above/below gross zero. AZM is active any time the weight on the scale is stable and is within the AZM range.

Tare

Tare is the empty weight of a vehicle. Tare is normally used to determine the net weight of the contents of a vehicle. There are several different ways tare is used: autotare, keyboard tare, and additive tare.

Autotare

An autotare is taken by pressing the TARE key when an empty vehicle is on the scale. The terminal then displays a zero weight with the net cursor lit. The vehicle is loaded and driven back onto the scale. The terminal then displays the net weight of the contents. If the TARE key is pressed while the terminal is in the net mode, the current weight on the scale becomes the new tare value. Tare interlocks inhibit replacement autotare.

Keyboard Tare

Keyboard entered tare is used when the empty weight of the vehicle is a known value. The known tare weight is entered using the numeric keys, and the TARE scale function key is pressed. The terminal will then display the net weight of the contents of the vehicle.

Additive Tare

Additive tare is a rarely used mode of keyboard entered tare. If a tare is entered using the numeric keypad while the terminal is in the net weight mode, the tare value entered is added to the existing tare weight value. Tare interlocks inhibit this mode.

Tare Interlocks

Tare interlocks are a set of restrictions on how tare can be used. They are required by some local weights and measures regulations. If tare interlocks are enabled, the terminal must be at gross zero to clear a tare weight or to enter a keyboard tare. Tare interlocks also prevent the terminal from replacing an existing tare with a new tare.

Sections

Vehicle scale weighbridges are normally divided into what are called "sectional pairs" or sections. A section is a pair of load cells that are side by side in the weighbridge (see Figure A-1). Sections are important when dealing with shift errors.

Section 1	Section 2	Section 3	Section 4	Section 5
1	3	5	7	9
2	4	6	8	10

Figure A-1: Load Cells and Sections in a Typical Vehicle Scale

Setpoints

Setpoints are on/off outputs that indicate whether the weight displayed on the scale is greater than or less than a preprogrammed weight value. Setpoints are typically used in material filling applications in order to fill a vehicle to a preset weight.

Inbound/Outbound Weighing

Vehicle scales are often used in an inbound/outbound mode of operation where the vehicle is loaded or unloaded at the user's site. In the inbound/outbound mode the vehicle empty (tare) weight is not known, so the vehicle must be weighed twice (once empty and once loaded). In the past this was normally done by printing the inbound weight, printing the outbound weight, and then calculating the difference (net weight) by hand.

A IND310drive terminal simplifies inbound/outbound weighing by permitting the operator to store the inbound vehicle weight in memory and then recalling that weight at a later time. Once the inbound weight is recalled, the terminal calculates the net weight and prints an outbound ticket.

Net Sign Correction

Net sign correction is a feature that permits the IND310drive terminal to be used for both shipping (inbound empty) and receiving (inbound loaded) operations. If net sign correction is enabled, the terminal will swap the gross and tare weight fields on the printed ticket, if necessary, so that the larger weight is the gross weight, the smaller weight is the tare weight, and the difference is always a positive net weight.

One-Pass Weighing

One-pass weighing is a mode where the user has a fleet of vehicles with known empty (tare) weight. The tare weight is recalled by ID when the loaded vehicle is on the scale.

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For your notes

Application Operation Flowcharts

The following pages contain quick reference flowcharts that illustrate the IND310drive terminal's four modes of operation.

Vehicle ID Weighing

Use the Vehicle ID Weighing mode when both of the following are true:

• Vehicle ID Weighing has been enabled in setup

• The ID of the vehicle and its associated tare weight have been pre-entered in the Vehicle ID Table in setup mode

Do not attempt to use the Vehicle ID Weighing mode if any of the following are true:
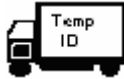
• Vehicle ID is unknown

• Tare weight of the vehicle has changed

• The VEHICLE ID softkey does not display on any available weighing operations softkey screens

Temporary ID Weighing

Use the Temporary ID Weighing mode when both of the following are true:

• Temporary ID Weighing has been enabled in setup

• The ID of the vehicle and its associated tare weight do not need to be recalled after the outbound transaction is complete

Do not attempt to use the Temporary ID Weighing mode if either of the following are true:

• Vehicle ID and tare weight need to be recalled on a recurring basis

• The TEMPORARY ID softkey does not display on any available weighing operations softkey screens

Index Weighing

Use the Index Weighing mode when both of the following are true:

- Index Weighing has been enabled in setup
- The ID of the vehicle and associated database value IDs have been pre-entered in the Index table in setup mode

Do not attempt to use the Index Weighing mode if any of the following are true:

- Vehicle ID is unknown
- Tare weight of the vehicle has changed
- The INDEX softkey does not display on any available weighing operations softkey screens

Transient Vehicle Weighing

Use the Transient Vehicle Weighing mode when both of the following are true:

- Transient Vehicle Weighing has been enabled in setup
- The vehicle is not part of normal operation and does not need to be included in transaction totals

Do not attempt to use the Transient Vehicle Weighing mode if either of the following are true:

- Vehicle ID and tare weight need to be recalled on a recurring basis
- The TRANSIENT VEHICLE WEIGHING softkey does not display on any available weighing operations softkey screens

Vehicle ID Weighing

```
┌─────────────┐
│ Vehicle ID  │
│  Weighing   │
└─────────────┘
       │
┌─────────────┐
│Vehicle enters the│
│     scale   │
└─────────────┘
       │
┌─────────────┐
│  Press the  │
│ VEHICLE ID  │
│   softkey   │
│   [ID]      │
└─────────────┘
       │
┌─────────────┐
│Enter the vehicle│         ◇ Vehicle ID         ┌──────────────┐
│ID and press the│◇ NOT Found  │────────────│ Press the    │
│  ENTER key  │                              │ ESCAPE softkey│
└─────────────┘                              │   ESC        │
       │                                     │to try to enter a│
    ◇ Vehicle ID                             │ different ID │
    ◇ Found                                  └──────────────┘
       │                                     ┌──────────────┐     Search for an ID when
┌─────────────┐                              │ Press the    │     it is likely to be in the
│  Terminal   │                              │ DATABASE     │     database. A search is
│ changes to Net│                            │QUERY softkey │     helpful when the
│mode and uses│                              │   [?]        │     complete ID is not
│the stored tare│                            │to search for │     known or when an
│  value to   │                              │  the ID      │     entry error is made.
│determine net│                              └──────────────┘
│   weight    │                              ┌──────────────┐
└─────────────┘                              │Press the Insert│
       │                                     │New Vehicle ID│
┌─────────────┐                              │   softkey    │
│Enter database│                             │   [ ]        │
│ information │                              │to create a new│
│ (optional)  │                              │     ID       │
└─────────────┘                              └──────────────┘
       │                                            │
┌─────────────┐                              ┌──────────────┐
│Enter variable│                             │Terminal switches to│
│ information │                              │ Temporary ID │
│ (optional)  │                              │operation mode│
└─────────────┘                              │(see Temporary ID│
       │                                     │ flowchart)   │
┌─────────────┐                              └──────────────┘
│Validate all data│
│ displayed.  │
└─────────────┘
       │
┌─────────────┐     ┌──────────────┐
│Data is stored│    │ The terminal │
│and printed  │─────│clears the screen│
└─────────────┘     │and returns to the│
                    │default weighing│
                    │   screen     │
                    └──────────────┘
```

Temporary ID Weighing

```
┌─────────────────┐
│  Temporary ID   │
│    Weighing     │
└─────────────────┘
         │
┌─────────────────┐
│ Vehicle enters the │
│      scale      │
└─────────────────┘
         │
┌─────────────────┐
│   Press the     │
│  TEMPORARY ID   │
│    softkey      │
│   [Temp ID]     │
└─────────────────┘
         │
┌─────────────────┐
│ Use the Auto    │        ◇ Vehicle ID
│ Temp Vehicle ID │          NOT Found
│ Number that     │
│ Displays OR     │
│ Enter a vehicle │
│ ID. Press the   │
│ ENTER ⏎  key    │
└─────────────────┘
```

Press the ESCAPE softkey **ESC** to try to enter a different ID

Press the DATABASE QUERY softkey to search for the ID — Search for an ID when the transaction should be outbound. A search is helpful when the complete ID is not known or when an entry error is made.

Press the INSERT softkey to insert a new temporary ID and description in the Temporary ID table — Insert a new temporary ID when the transaction should be inbound.

◇ Auto Temp Vehicle No. Used OR Vehicle ID Found

Terminal processes the transaction as an outbound transaction, so it changes to Net mode and uses the stored tare value to determine net weight

Enter database information (optional)

Enter variable information (optional)

Validate all data displayed

Data is printed and removed from the Temporary ID table

The terminal clears the screen and returns to the default weighing screen

Terminal processes the transaction as an inbound transaction, so it changes to Gross mode and determines tare weight

Enter database information (optional)

Validate all data displayed

Data is stored in the Temporary ID table and printed

The terminal clears the screen and returns to the default weighing screen

Index Weighing

```
┌─┬─────────────┬─┐
│ │    Index    │ │
│ │  Weighing   │ │
└─┴─────────────┴─┘
```

```
┌──────────────┐
│Vehicle enters the│
│    scale     │
└──────────────┘
```

```
┌──────────────┐
│Press the INDEX│
│   softkey    │
│   [INDEX]    │
└──────────────┘
```

```
┌──────────────┐           ╱╲
│Enter the Index ID│        ╱    ╲
│and press the │────────  Index ID
│  ENTER key   │        ╲ NOT Found╱
│      ←       │          ╲    ╱
└──────────────┘           ╲╱
```

```
        ╱╲
      ╱    ╲
     Index ID
     ╲ Found ╱
      ╲    ╱
       ╲╱
```

```
┌──────────────┐
│Terminal changes│
│to Net mode and│
│uses the stored│
│ tare value to │
│determine net │
│   weight     │
└──────────────┘
```

```
┌──────────────────┐
│Vehicle ID and other│
│database information is│
│  automatically   │
│displayed—change if│
│    necessary     │
└──────────────────┘
```

```
┌──────────────┐
│Enter variable │
│ information   │
│  (optional)  │
└──────────────┘
```

```
┌──────────────┐
│ Data is stored│
│ and printed  │
└──────────────┘
```

```
┌──────────────┐
│ The terminal  │
│clears the screen│
│and returns to the│
│default weighing│
│   screen      │
└──────────────┘
```

```
┌──────────────┐
│ Press the     │
│ESCAPE softkey │
│    ESC        │
│to try to enter a│
│ different ID  │
└──────────────┘
```

```
┌──────────────┐
│  Press the    │
│  DATABASE     │
│QUERY softkey  │
│ [icon]        │
│to search for  │
│   the ID      │
└──────────────┘
```

Search for an ID when it is likely to be in the database. A search is helpful when the complete ID is not known or when an entry error is made.

Transient Vehicle Weighing

```
Transient
Vehicle
Weighing
```

```
Vehicle enters the
scale
```

```
Press the
TRANSIENT
VEHICLE softkey
```

```
Enter the vehicle
Description and
press the ENTER
key
```

```
Terminal displays
the gross weight
of the vehicle
```

```
Enter database
information
(optional)
```

```
Enter variable
information
(optional)
```

```
Validate all data
displayed
```

```
Data is stored
and printed
(no totals are
stored)
```

```
The terminal
clears the screen
and returns to the
default weighing
screen
```

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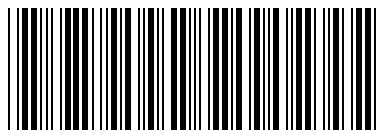
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