METTLER TOLEDO

IND780drive
Terminal
and
Drive-780
Application Software
Technical Manual

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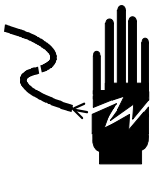

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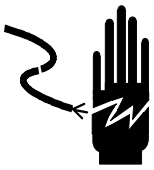

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Contents

Chapter 1.0

Introduction

Overview

The **IND780drive** industrial terminal is a single- or multi-range, high-performance weighing terminal for use with analog and/or METTLER TOLEDO® POWERCELL®/MTX® scale bases. The IND780drive may be used with one or two platforms connected, allowing both platforms access to the same database. The **Drive-780 Application Software**, enabled by the installation of a hardware key, augments the basic functionality of the IND780 with a variety of vehicle-specific capabilities.

The terminal has permanent and temporary memory locations for storing vehicle IDs and weights. These can be recalled to complete a transaction and print a ticket. User-definable database tables enable application and variable data to be stored permanently or temporarily and recalled on demand.

In general, the IND780drive terminal functions, and is configured in the same way as, the IND780 with basic functionality. This document details only those aspects of function and configuration specific to the Drive-780 application. Detailed information about common features of the terminal may be found in the IND780 User's Guide, Installation Manual and Technical Manual.

The IND780drive's features include:

- Temporary ID, Vehicle ID, Index and Transient Vehicle weighing procedures, using data stored in tables and available as reports printed in a user-defined format
- User-definable application tables
- Extensive transaction data stored in a printable table
- Traffic control using either lights triggered by weight, or gates triggered by input from embedded loops, together with optional vehicle positioning detection
- Filling on scale – the ability to control the addition of material to a vehicle while on scale, until a target net weight is reached
- Input from one or two scales

This chapter provides an overview of IND780drive functionality.

Model Identification

Figure 1-1 explains the model numbers used to define and identify the hardware and software configuration of an IND780.

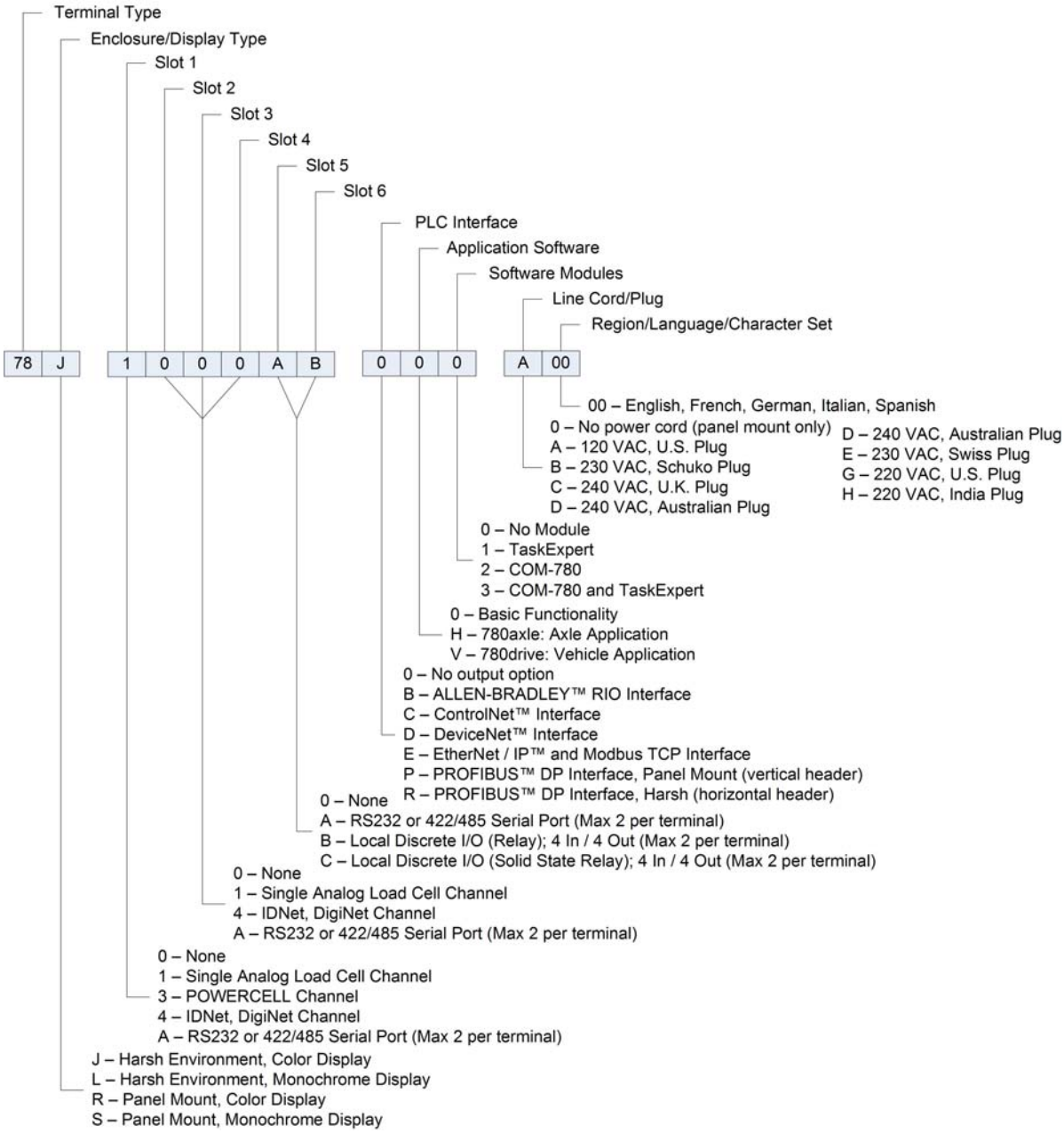

Figure 1-1: Model Configuration Numbers

Basic Capabilities

Each of the following functions is outlined in Chapter 2 and described in detail in Chapters 4, 5 and 6. The IND780Drive may be configured to enable any combination of one or more of these functions.

Temporary ID Weighing

Temporary ID weighing is also known as In-Out Weighing, where a truck is weighed upon entering and exiting a facility. This two-pass transaction uses the Temporary Vehicle ID table to coordinate the Inbound and Outbound processes. In this application, vehicles are not permanently stored in the Vehicle ID table. Supplemental Vehicle information can be stored in the Temporary ID table during the Inbound process. When the vehicle exits the facility, it is weighed again following the Outbound process, and the temporary entry is removed. Because the entry is temporary, vehicle totals are not accumulated – only totals in the A6-A9 tables are accumulated.

Vehicle ID Weighing

In Vehicle ID weighing, the operator uses a permanently stored Vehicle ID table to identify the tare value of the vehicle, and then follows the steps defined by the Outbound process (below) to complete the transaction. Vehicle ID weighing enables the accumulation of totals based on vehicle ID. If enabled, totals are also accumulated for the records in the A6-A9 tables.

Index Weighing

Index Weighing condenses the Vehicle ID Weighing mode and the Outbound process by using a special Index table. This table acts as an index reference for a relationship between records of multiple tables, A6 to A9. If enabled, totals are accumulated during an Index Weighing for records in the respective Vehicle ID and A6-A9 tables.

Transient Vehicle Weighing

Transient Vehicle weighing provides a procedure that allows vehicles that are not normally part of a facility's operation to be weighed and have a ticket printed. The process is similar to that for Vehicle ID weighing, but does not use the Vehicle ID table. The operator can be required to enter vehicle data. These transactions are not included in totals.

Outbound and Inbound Processes

The two processes which may be involved in a transaction are Outbound and Inbound.

Outbound Process

The Outbound process completes a vehicle transaction. In the case of a permanently stored tare value (using the Vehicle ID Table), the tare value is retrieved from memory. In the case of a temporarily stored tare, (using the Temporary ID Table), the inbound weight is used. In both cases, the gross, tare and net weight values are now known. Depending on vehicle weighing mode, other transaction information may be collected – A6-A9 table data, Variable 1 and/or Variable 2 entries. The completed transaction information is stored and can be printed, with formatting determined by the configuration of one of the Output Templates (refer to Configuration Options in Chapter 3).

Inbound Process

The Inbound process creates a temporary vehicle ID and an associated stored weight value. Other transaction information may be collected and saved as table A6-A9 data, and as Variable 1 and/or Variable 2. Inbound transaction information is stored and can be printed, with formatting determined as for the Outbound process. The stored weight may be for either a full or an empty vehicle.

Net Sign Correction for Shipping and Receiving

Net Sign Correction allows the IND780drive to be used for both shipping (inbound empty) and receiving (inbound loaded) operations. With net sign correction enabled, the terminal will, if necessary, swap the inbound and outbound weight fields on the printed ticket, 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.

Traffic Control

Traffic Control is effected:

- By lights, actuated by weight
- By gates, actuated by loops

The presence of the vehicle is detected and a weighment taken once a no-motion state is achieved. A weight threshold value ensures that lights are actuated appropriately by a vehicle.

Vehicle Positioning

An optional input can be used to prevent a transaction from being completed if either an entrance or exit is blocked, indicating that the vehicle is not fully on the scale.

Timer Control

Timer Controls are used to determine when the scale re-sets to zero. A timer can also determine the delay before gates or lights return to the configured default configuration if its weight reading does not fall below its threshold setting after a transaction.

Filling on Scale

In this mode of operation, a vehicle can be filled with material using the IND780's Basic Functionality Target Control capabilities. A target value is set or recalled before filling. Once the target is achieved, a standard Temporary or Transient Vehicle transaction is carried out.

Chapter 2.0

Operational Overview

Introduction

This chapter provides an overview of operations that are specific to the IND780drive. Details on basic IND780 functionality may be found in the IND780 User's Guide and Technical Manual.

- In Drive-780 operation, only two scales can be assigned to the IND780. However, one of these can be the sum of multiple platforms. To perform a vehicle transaction on a specific scale, change focus to that scale by pressing the SELECT SCALE button .

Home Screen

Figure 2-1 shows an IND780drive Home screen, with two platforms in use. In this example, a tare (PT) has been taken for the vehicle on Scale 1 (assigned the name "Inbound" in setup).

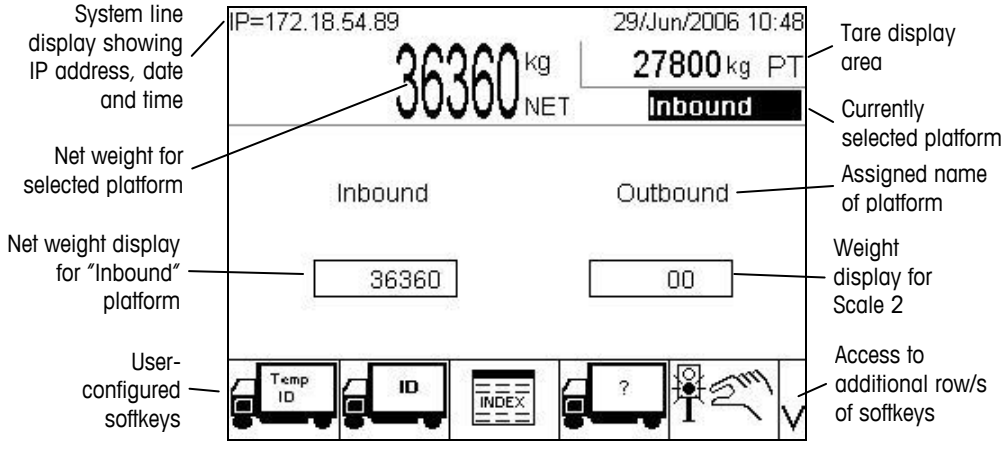

Figure 2-1: Elements of the Home Screen

- The softkeys visible in the screen shown in Figure 2-1 are determined in setup. The selection of available softkeys will vary between terminals.

Security

The IND780drive supports the use of usernames and passwords for four levels of setup security. Refer to the IND780 Technical Manual Appendix B, Default Settings, to determine security levels assigned to specific parameters in setup.

- **Administrator**—An Administrator account has unlimited access to all areas of the operating and setup system. There can be multiple Administrator accounts. There is a Primary Administrator account, which can be changed but never deleted. The terminal is pre-configured at the factory with the Primary Administrator account with 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 are available to all users until a password for the Primary Administrator account is set up.

  When the Metrology switch is turned "on", all users with Administrator rights are reduced to the Maintenance level. This is done to protect metrologically significant parameters that cannot be changed when the terminal is "approved."

Once a password is set up, be sure to remember it. 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.

- **Maintenance**—Access is generally the same as the Administrator level with the exception of access to metrologically significant areas of the setup.
- **Supervisor**—Access is generally limited to editing tables and setting time and date.
- **Operator**—One default operator account is provided. Sites with validation requirements might create many operator accounts, each with a username and password entry requirement. The Operator-class of security is the most restrictive, allowing the user to use and view, but not change records within tables.

If a password has been programmed for the default Administrator username in Setup, and all other users have a password assigned, a login screen is presented whenever the Setup softkey is pressed. A valid username and password must be entered. Depending on the access level of the user logged in, setup screens may be visible only, or visible and available for modification.

If a login fails, the display exits the login page and returns to the home screen.

Softkeys and Icons

Table 2-1 lists all icons specific to the IND780drive, i.e., those that are not available with the basic functionality version of IND780. **Bold** function titles indicate icons that can be assigned as a Home screen softkey.

Table 2-1: Drive-780 Icons and Softkeys

Icon	Function	Explanation
	**Vehicle ID**	Permits entry of vehicle ID to recall information from the Vehicle ID table
	**Temporary ID**	Enters Temporary ID Weighing mode, permitting entry of information for vehicles not permanently stored in the Vehicle ID table
	**Transient Vehicle**	Enters Transient Weighing mode, permitting non-permanent entry of ID information for a vehicle that is not part of normal operation
	**Index Weighing**	Enters Index Weighing mode, permitting recall of information from the Index table
	Closed Gate	Indicates gate is closed
	Opened Gate	Indicates gate is open
	Go Light	Indicates light is showing Go/green
	Stop Light	Indicates light is showing Stop/red
	**Manual Lights**	Starts manual traffic control of lights or gates: Icon appears in position 3. UP/DOWN arrow keys switch control between Entrance and Exit.
	Switch Lights	When Manual Lights selected, appears as a softkey in position 3. Toggles state of lights on/off, or gates up/down
	Edit Variables	During transaction data entry, return to Var1/Var2 entry screen
	Edit Tables	During transaction data entry, return to A6-A9 record identifier entry screen
	A6 Table	A6 ID entry/selection
	A7 Table	A7 ID entry/selection
	A8 Table	A8 ID entry/selection
	A9 Table	A9 ID entry/selection

Outbound and Inbound Processes

Outbound Process

Completing the Outbound Process involves these steps:

- Entering Database information
- Entering Variable information
- Validating, printing and saving the transaction

Entering Database Information

Database files must be enabled in setup 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.

In each type of weighing process, once the Vehicle ID or description has been entered, if tables are enabled (in setup, at Application > Drive-780 > Inbound/Outbound/Transient – refer to Chapter 3, **Configuration**) a screen like the one in Figure 2-2 displays. Only those tables enabled in setup appear. In this case, all tables are enabled, and their entry fields labeled using the names set in the tables' respective configuration screens (in setup at Application > Drive-780 > Database > A6 Table…A9 Table – refer to Chapter 3, **Configuration**). If the transaction is based on an Index Table entry, these fields may already be populated when the screen appears.

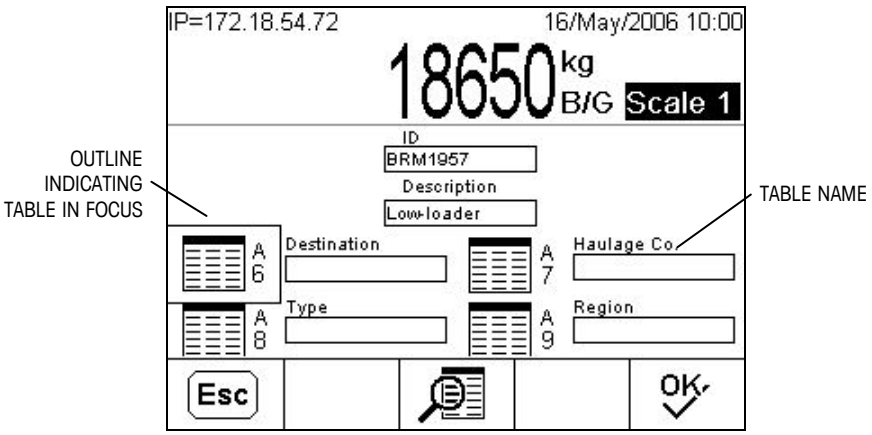

Figure 2-2: Database Table ID Entry Screen

Use the UP/DOWN arrows to cycle focus through each of the tables in turn.

With a table in focus, data can be entered in one of two ways:

- Either press ENTER to move focus to the ID entry field, type the ID of the desired database information into the box, then press ENTER again. If the ID is

found, the box will display the referenced information. If the ID is not found, an "ID not found" prompt will display and focus will return to the table icon.

- Or press the TABLE SEARCH softkey to view the table, use the arrow keys to select an entry to associate with the transaction, and press the OK softkey to return focus to this screen. Table records cannot be modified here.

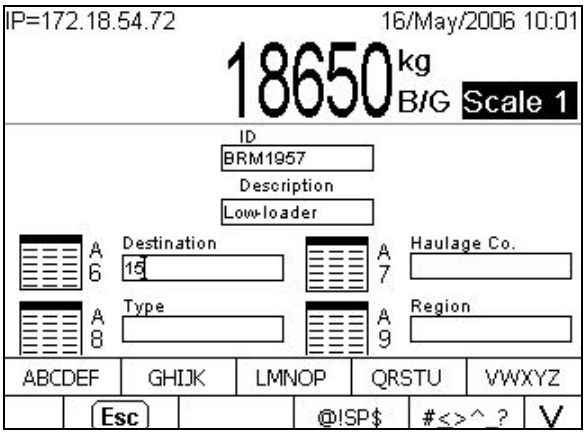

Figure 2-3: Entering Database ID

The value associated with the database ID will appear in the data field. If the field is selected again by putting the table in focus and pressing ENTER, the ID will appear, rather than the string associated with it.

In Vehicle ID and Index Weighing, database information may already be associated with the ID entered on the first page, and will appear in this screen. New IDs may be entered or searched, to replace the existing ones. However, Index Table references will not be changed, and the original data will appear the next time this Index ID is used.

Once all the database information is identified, the screen will look like Figure 2-4:

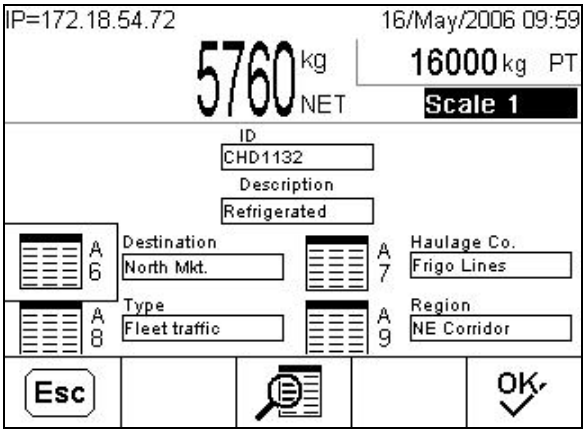

Figure 2-4: Database Information Fields Fully Populated

Entering Variable Information

Press the OK softkey OK to confirm the entries. If either or both of the variables are enabled in the Inbound/Outbound/Transient setup screen, the variable entry screen appears (Figure 2-5) with the appropriate entry field/s available. If Variables are not enabled, the validation screen (Figure 2-6) appears.

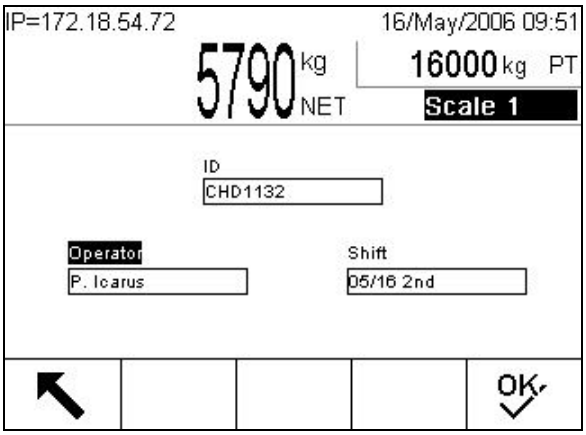

Figure 2-5: Var1 and Var2 Entry Screen

In this case Var1 and Var2 have been named "Operator" and "Shift", respectively.

The entry of values in variable fields is optional. Once the information in the screen is complete, press the OK softkey OK to view the validation screen.

Validating the Transaction

Once all the information has been entered, a validation screen like the one shown in Figure 2-6 is displayed. Here, all the data entered for the transaction table can be reviewed and, if necessary, modified. Only those elements (tables, variables) enabled in setup will appear in this screen.

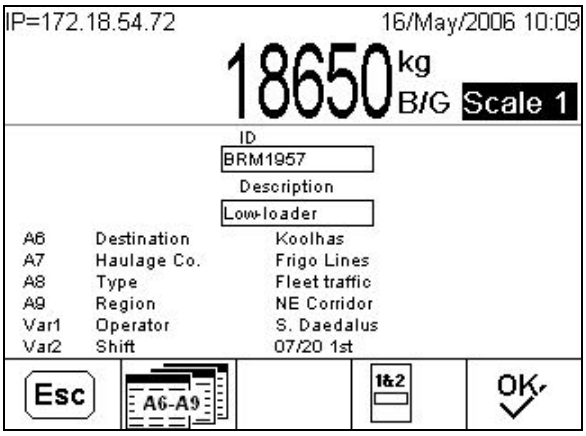

Figure 2-6: Transaction Data Validation Screen

The following actions are possible in this screen:

Esc	ESCAPE	After OK at "Clear Scale?" prompt, abandon transaction and return to initial entry screen
A6-A9	RETURN TO TABLE ENTRY	Return to database ID entry screen (Figure 2-3)
1&2	RETURN TO VARIABLE ENTRY	Return to Var1 and Var2 entry screen (Figure 2-5)
OK	OK	Save the transaction to the Transaction Table and print the transaction record, then return to the initial entry screen. If the scale is in motion, the transaction cannot be completed, and an error message will display

Inbound Process

The Inbound Process typically is performed when a vehicle ID doesn't have a tare value recorded. It involves these steps:

- **Entering an ID** – For 2-pass Temporary ID Weighing, the ID must be created so a tare value can be associated with it and saved for recall during the Outbound Process. ID entry is also necessary for 2-pass Vehicle ID weighing, when a new Vehicle ID is created with the transaction.
- **Entering Database information** – As listed under the Outbound Process.
- **Entering Variable data** – As listed under the Outbound Process.
- **Validating, printing and saving the transaction** – As listed under the Outbound Process, except that ID, description and inbound weight information related to the transaction are also stored in the Temporary Table.

Basic Operation

Each of the following types of basic operation is accessed using a softkey. The location of the softkey in the home screen is determined during setup. If an operational mode is not applicable for a particular installation, the softkey does not need to appear.

Temporary ID

Detailed Temporary ID weighing procedures may be found in Chapter 4.

Temporary ID functionality is used when vehicle tare weights are not stored for repeated use. The inbound weight is assigned a temporary ID and memory location. Storing the inbound weight, together with any additional data, is known as the Inbound Process. When the vehicle exits the facility, the original weight is recalled from memory and used to compute the net weight of the material being shipped or received. Again, additional data may be gathered during this Outbound

Process. Once the outbound ticket is printed, the temporary memory location used to store the inbound weight is cleared from memory.

In the simplest sequence of operation, the Temporary ID is automatically assigned by the IND780drive. After the inbound weight is stored, a ticket is automatically printed, in a format based on a specifically defined inbound template. Using the inbound ticket can simplify recalling the stored weight and processing the vehicle during the Outbound Process.

Shipping and Receiving

The IND780drive can work with receiving operations where the inbound weight is larger than the outbound weight (coming in full), or with shipping applications where the inbound value is less than the outbound weight (coming in empty). The IND780drive can be configured to automatically print the larger value in the gross weight position on the ticket, so that the net weight is printed as a positive value, whether material is being shipped or received. This capability is known as Net Sign Correction.

Tare Expiration

Tare Expiration can be used to clear vehicle records from the Temporary ID Table automatically. Tare Expiration is determined by the number of days. Records are cleared at midnight on the expiration date. If Automatic Deletion is disabled, a warning will appear if an expired tare is selected.

Vehicle ID

Detailed Vehicle ID weighing procedures may be found in chapter 5.

The IND780drive can use permanently stored tare values. When the full vehicle is on the weighing platform, this stored information is recalled from memory. During this Outbound Process, additional data can also be gathered. The Vehicle ID mode of operation is useful in applications where many of the trucks are part of a fleet that is often associated with the installation. Common examples of such installations include refuse or aggregate operations. When the Vehicle ID table is used, record totalization may be enabled. With this capability turned on, total weights for each vehicle ID will be maintained.

In order to make the overall installation of the IND780drive more effective, the Drive-780 Application will allow the initial database weight values to be entered as zero. During the first transaction involving a particular vehicle ID, the truck is weighed twice – once empty and once full. The empty weight is then stored as the permanent tare value.

Shipping and Receiving

The Vehicle ID mode may also be used in conjunction with a shipping or receiving operation. The only limitation is that a permanently stored tare must be used.

Runtime Additions

While it is expected that these tare weights all exist in the database, some operations will add new vehicles to their database. The IND780drive can be configured to allow the operator to add these vehicles to the database without entering Setup.

Tare Expiration

Practically speaking, tare weights will vary over time. Legislation currently under consideration in many locations would require permanently stored tare values to be updated at regular intervals. The IND780drive's Tare Expiration capability can be enabled to help manage this updating procedure. Tare Expiration may be set by days or date. This selection in made per record.

Transient Vehicles

Detailed Transient Vehicle weighing procedures may be found in Chapter 6.

Some operations allow weighing of vehicles that are not part of the normal operation of the scale. These vehicles typically are ones that just want a gross weight ticket to be printed. While the owner of the scale may wish to accommodate these types of transactions, they usually do not want these weights to affect totals they are tracking.

Advanced Capabilities

Operator-Defined Variables

The IND780drive supports the entry or one or two operator-defined variables. Each of the variables may be up to sixteen characters long, entered during either the Inbound or the Outbound Process. The variable information may appear on the inbound or outbound ticket, or on both.

User-Defined Tables

The IND780drive supports up to four user-defined tables (A6, A7, A8 and A9). Each table's name may be defined during configuration. An ID, description and two data fields may be defined for each record. In addition, totals and the number of transactions associated with each record may be tracked. The information associated with these tables may be entered during the Inbound and/or Outbound Process.

Contract and Commodity Tables

Two of the database tables can be configured to perform special functions:

- By default, the **A6 Table** type is configured as **Commodity**. If a record in the table is associated with a transaction, totals for the transaction will be recorded and reported using the custom units defined for the commodity. These units are produced by multiplying or dividing the primary units in use by a factor defined in the Commodity Table record. Refer to Chapter 3, **A6 Table – Commodity or Standard** for further details on the function of this table.
- By default, the **A7 Table** type is configured as **Contract**. If a record in the table is associated with a transaction, then the net recorded net weight will be deducted from the contract total, and the amount remaining on the contract will be saved. Refer to Chapter 3, **A7 Table – Contract or Standard** for further details on the function of this table.

Index Weighing

Detailed Index Weighing procedures may be found in Chapter 5.

Some operations use the Vehicle ID table with the User Defined Tables in set combinations. In order to help increase the efficiency of these installations, an Index Table may be established that predefines specific combinations of Vehicle ID with records from one or more of the user-defined tables. When Index Weighing is used, selection os a specific Index ID will automatically populate data fields for an Outbound Process.

Net Sign Correction for Shipping and Receiving

Net Sign Correction is configured in setup at Scale *n* > Tare > Types. It may be either disabled (the default) or enabled. When enabled, it allows the IND780 to be used for both shipping (inbound empty) and receiving (inbound loaded) operations.

If net sign correction is disabled in setup, any stored weight value in the tare register is assumed to be a tare regardless of the gross weight present on the scale at the time of the final transaction. In this case, net values can be negative.

With net sign correction 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.

Net sign correction affects the display, stored data, weight recall, and printed data, and will operate with pushbutton tare (T), preset tare (PT), or tare memories (M).

An example of weight values with and without net sign correction is shown in Table 2-2. In this example, the value in the tare register is 38,520 kg, and the current weight on the scale is 24,500 kg.

Table 2-2: Effect of Net Sign Correction on Weight Values

	Net Sign Correction	
Printed and Displayed	**Disabled**	**Enabled**
Gross	24,500 kg	38,520 kg
Tare	38,520 kg	24,500 kg
Net	–14,020 kg	14,020 kg

When net sign correction is enabled, the tare weight field in the recall display will be labeled with the letter "M" to indicate "Memory" instead of "T" or "PT". Performing a transaction switches the label to "PT." Figure 2-7 shows an example of tickets produced by a receiving operation, with Net Sign Correction enabled.

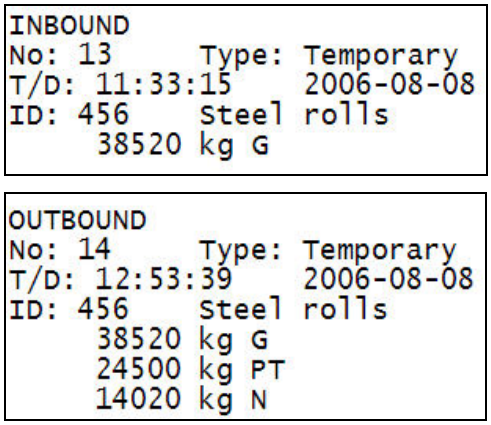

Figure 2-7: Net Sign Correction in Temporary Vehicle Transaction

Traffic Control

Detailed traffic control procedures may be found in Chapter 7.

To help make vehicle transactions more efficient, Traffic Control permits the IND780drive to be integrated with scale controls including lights and gates. The controls may be operated automatically, triggered by weight readings or embedded loops. They may also be operated manually, directly from the IND780's operator interface.

Filling with Drive-780

Detailed target control procedures may be found in Chapter 7.

The basic functionality of the IND780 includes the ability to use the Target Table to control the operation of discrete outputs for material transfer. This capability can also be used in conjunction with the Drive-780 Application to support simple filling

of a vehicle. The process is initiated by entering target values and using the Start of Target Control softkeys. Simple one or two-speed control of the transfer of material is then enabled.

Report Generation

In addition to the standard Alibi, Tare and Target Table reports, Vehicle ID, Temporary ID, Index ID, A6-A9 and Transaction Table reports can be generated using the REPORTS softkey . Records from each of the tables used by the Drive-780 can also be defined and printed from the Application > Drive-780 > Database branches of the setup menu tree.

The Repeat Print softkey may be assigned to one of the softkey locations. It permits additional tickets to be printed after a transaction is completed. Each repeated ticket is headed DUPLICATE. Additional tickets for a transaction may be printed at any time until another transaction is performed, or until terminal's power is cycled off and on.

Detailed information on configuring and generating reports may be found in Chapter 3.0, Calibration, of the IND780 Technical Manual.

Formatting Reports

The format of reports produced using the REPORTS softkey is set at Communication > Reports (Figure 2-8). In this screen, the width of the report, the inclusion of a title line, space at the top and bottom of each page, and the insertion of separators between records may be specified.

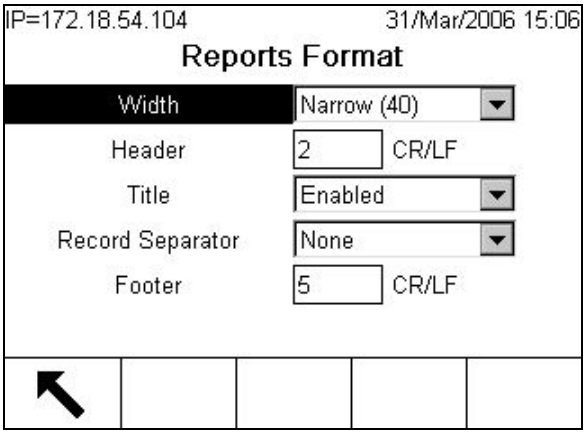

Figure 2-8: Reports Format Screen

Available options are specified below, with default settings indicated in bold:

Width	**Narrow (40)**, Wide (132)
Header	**2** Carriage Returns/Line Feeds
Title	**Enabled**, Disabled

Record Separator	None, *, -, =, CR/LF,
Footer	5 Carriage Returns/Line Feeds

Creating Custom Tickets

Custom reports can be generated by associating a connection (in Setup at Communication > Connections) with a port, a template, and a trigger.

Connections may be made via an available COM port, or an Ethernet connection, assigned to Demand Output. Refer to the **Communication** section of Chapter 3 of this manual for details on setting up connections.

A template can be configured to format information to be included on the ticket. If the ticket requires more information than one template can contain, additional templates can be called and included using their shared data name. Note that some templates are pre-configured for particular purposes:

Template 1	Default output of Gross, Tare and Net weights
Template 2	Inbound transaction
Template 3	Outbound transaction
Template 4	Transient Vehicle transaction

The content of templates 1 through 6 is detailed in the **Communication** section of Chapter 3 of this manual. Templates 7, 8, 9 and 10 are not pre-configured, and may be set up to produce custom reports. The IND780 Terminal Shared Data Reference gives details on data that can be included in templates. The InSite™ Template Editor software provides a simple, graphical way to set up templates.

User-configured Triggers are available and may be assigned either as a softkey or as an application key. This permits the custom report to be generated easily from the home screen. Note that, in the Drive-780 application, three of the custom triggers are already assigned to Inbound, Outbound and Transient Vehicle Transactions.

Chapter 3.0

Configuration

Installing the Hardware Key

The hardware key which enables Drive-780 functionality must be installed in a socket on IND780 Main PCB. Access to the Main PCB varies depending on whether the enclosure is the Panel Mount or Harsh model.

- When the IND780 terminal is restarted after the hardware key is installed or removed, all configuration settings and files except metrologically significant scale data are restored to their factory defaults. Any information stored in user-configured tables such as targets and tare weights will be lost. This information can be saved by performing a Backup to USB operation **before** installing the hardware key. Refer to the Chapter 4 of the IND780 Technical Manual, Service and Maintenance, for the procedure to follow. Calibration data will not be affected.

To install the hardware key:

1. Remove power from the terminal.
2. Access the Main PCB:
    A. For a Panel Mount unit, remove the four screws that fasten the back cover to the enclosure.
    B. For a Harsh unit, remove the front panel using a flat blade screwdriver, as described in Chapter 6 of the IND780 Technical Manual, Installation.

3. Identify the hardware key socket, adjacent to the Main PCB backup battery. The socket is indicated in Figure 3-1.

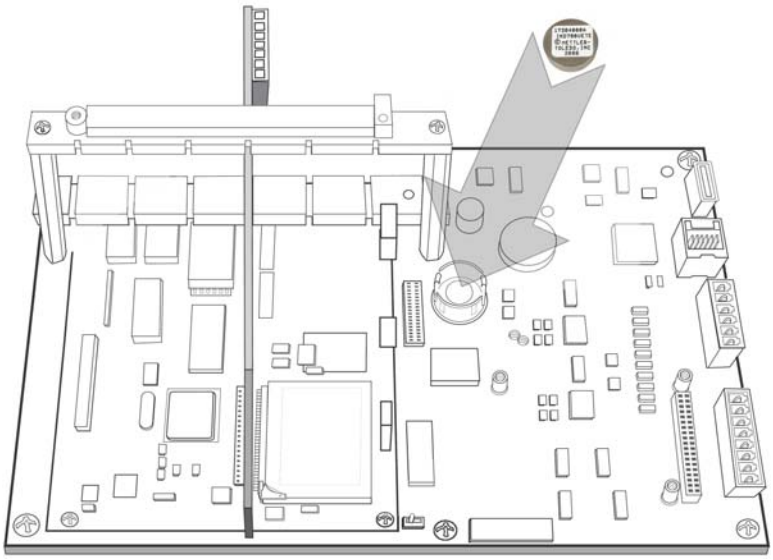

Figure 3-1: Hardware Key Socket

4. Position the hardware key in the socket, label-side up. Press it down into the socket until the two retaining clips snap into position, as seen in Figure 3-2.

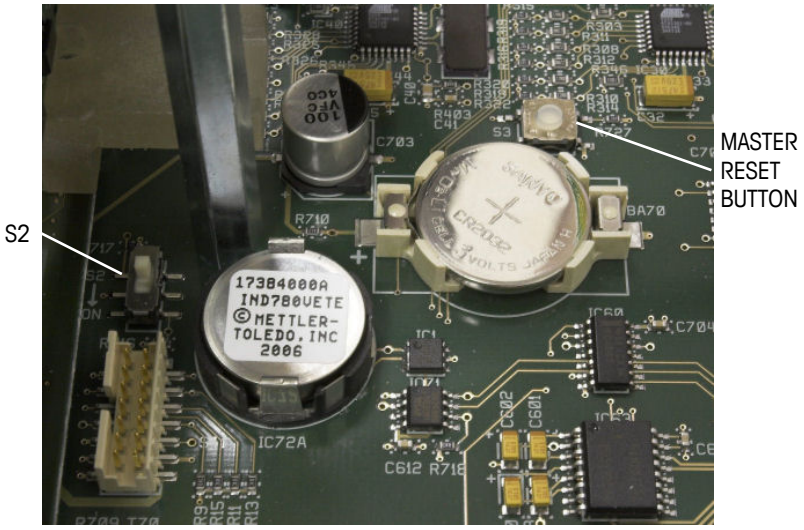

Figure 3-2: Hardware Key Installed

5. Note that when the terminal is restarted, a Master Reset must be performed by holding down the Master Reset button (indicated in Figure 3-2) when power is applied, until the terminal beeps.

The Master Reset operation will not reset metrologically significant scale configuration data unless S2 (shown in its OFF position in Figure 3-2) is in its ON position when the reset is performed.

Setup Mode

Entering and Exiting Setup Mode

To access the setup menu tree, press the DOWN or UP key, if necessary to display the appropriate row of softkeys, then press the SETUP softkey .

If security is enabled (passwords have been assigned to the default Administrator and Operator), and no log-in is in effect, attempts to access setup will be met with a Login screen (Figure 3-3) that requires the entry of a valid user name and password. Depending on the access level of the login, setup screens may be visible only, or visible and modifiable.

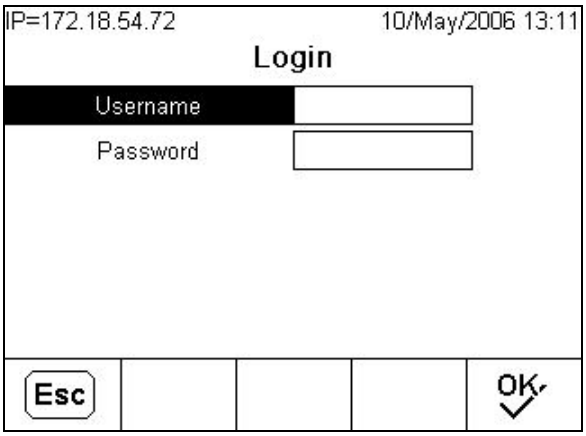

Figure 3-3: Log-In Screen

To leave setup and return to the home screen, either press the first (left-most) softkey while the menu tree is showing, or use the UP key to move focus to the Home branch and then press ENTER.

Drive-780 Setup Menu Tree

The setup menu of the Drive-780 version of the IND780 includes all the elements and functionality of the default configuration (detailed in Chapter 3 of the IND780 Technical Manual, Configuration), together with some additional or modified screens. Figure 3-4 shows the tree with new or modified leaf nodes (in the Application, Terminal and Communication branches of the tree) expanded and shaded. Unchanged branches are shown unexpanded. The functions and parameters of each of the affected screens are detailed in the Configuration Options section, immediately below.

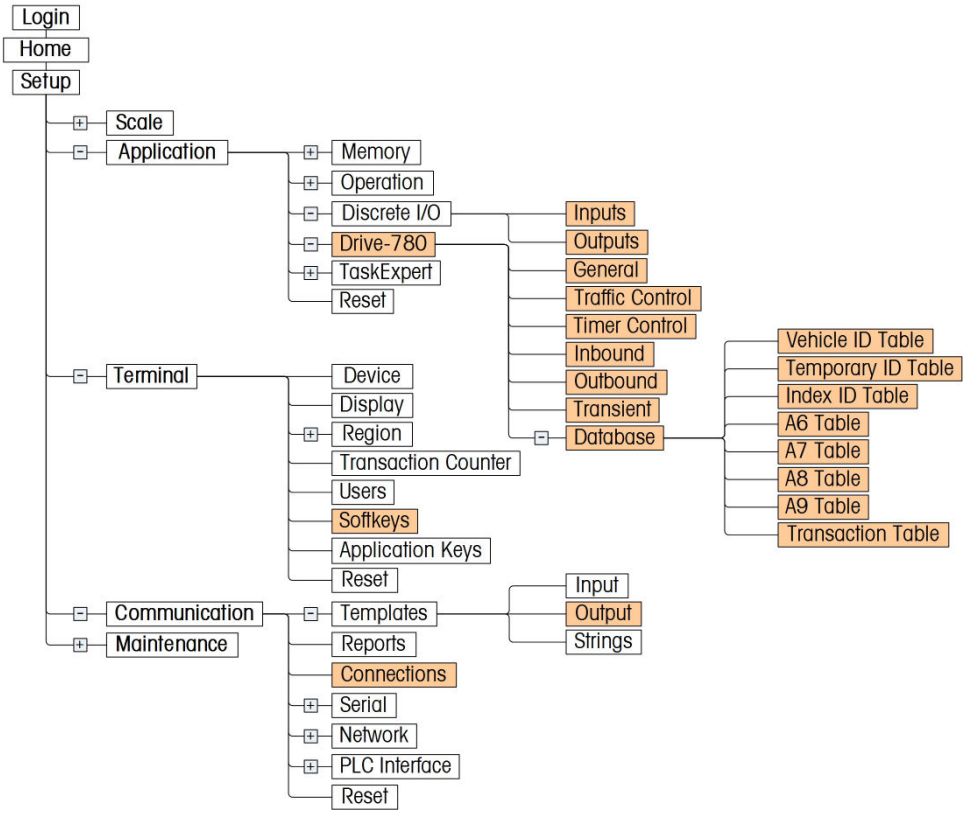

Figure 3-4: IND780 Menu Tree: Branches Specific to Drive-780

Tare Type Setup

The Scale n > Tare > Types branch of the menu tree is not shown expanded in Figure 3-4. However, for 780-Drive operation Tare Type settings must be correctly configured, with Pushbutton Tare and Keyboard Tare both set to Enabled. This is the default setting.

If Net Sign Correction is desired, it must be enabled for every active scale. This is done in the same setup screen.

Configuration Options

In the following sections, default values are indicated with an asterisk (*).

Application > Discrete I/O

Inputs

Selecting Application > Discrete I/O > Inputs opens the screen shown in Figure 3-5. By default, four inputs are defined, intended to handle inputs from entrance and exit loops (see Traffic Control, below) from two scales.

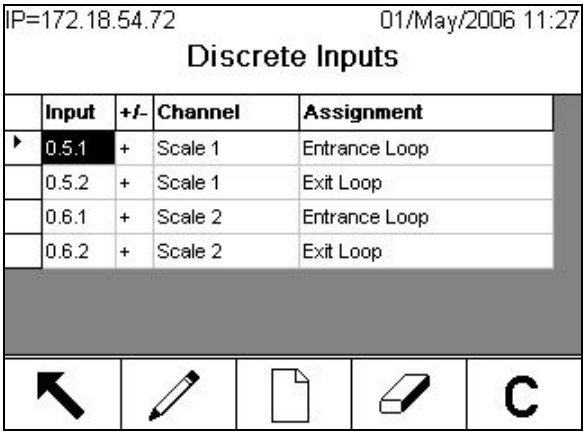

Figure 3-5: Discrete Inputs

At the bottom of the Discrete Inputs screen, softkeys permit the operator to EXIT the screen, EDIT an existing Input, create a NEW input, DELETE an input, or CLEAR all inputs C.

Pressing NEW opens the Discrete Input New screen (Figure 3-6).

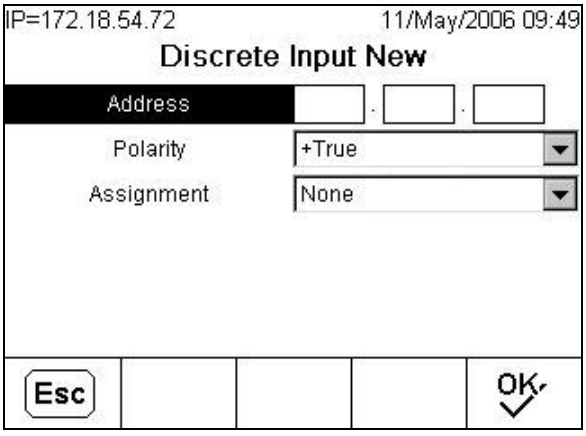

Figure 3-6: Discrete Input New

Here, an **Address** may be entered for the Input, and its function defined. The **Channel** selection list only appears for scale-specific assignments – Clear Tare, Print, Tare, all Target- and Units-related assignments, Zero, and the Loop assignments.

Settings available in this screen are as follows:

Polarity	+True*, -True
Assignment	None*, Blank Display, Calibration Test, Clear Tare, Disable Keypad, Disable Run Flat, Disable Setup, Enter Key, Print, SmartTrac, Tare, Target–Abort, Target–Pause, Target–Resume, Target-Start, Task 1, Task 2, Task 3, Task 4, Task 5, Trigger 1, Trigger 2, Trigger 3, Trigger 4, Trigger 5, Units–Primary, Units–Secondary, Units–Switch, Zero, Entrance Loop, Exit Loop
Channel [Displays depending on Assignment selected]	Selected, Scale 1*, [all other installed scales]

Once the new Discrete Input is defined, pressing the OK softkey saves the Input and returns the view to the Discrete Inputs screen.

The EDIT screen (Figure 3-7) offers similar options, except that the **Address** for the Input is fixed. To re-assign an address, the Input must be deleted and re-created. Note that in this screen, an Assignment (Entrance Loop) has been defined that causes the Channel selection box to display.

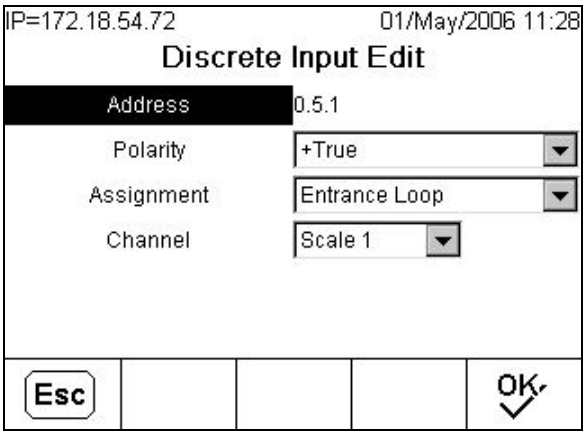

Figure 3-7: Discrete Input Edit

Pressing the DELETE softkey in the Discrete Inputs screen removes the entry currently in focus (highlighted) without further warning.

Finally, pressing the CLEAR softkey C causes the screen shown in Figure 3-8 to display. Press the OK softkey OK to confirm the action, and clear all Discrete Inputs, or press the ESCAPE softkey Esc to cancel the operation. In either case, focus returns to the Discrete Inputs screen.

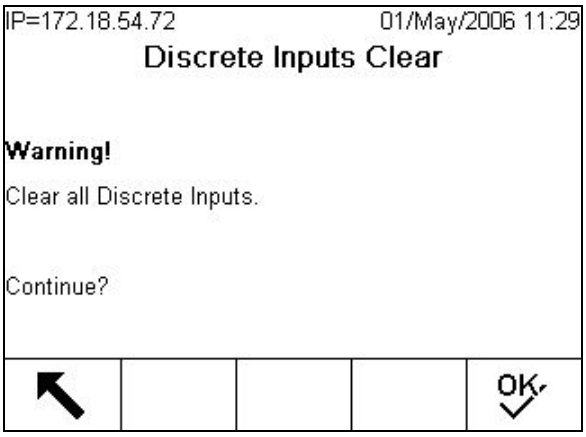

Figure 3-8: Discrete Input Clear Warning

Outputs

By default, the Discrete Outputs screen (Application > Discrete I/O > Outputs) has eight pre-defined entries to control entrance and exit lights for two scales. Entries may be edited, created, deleted and cleared, as for Discrete Inputs.

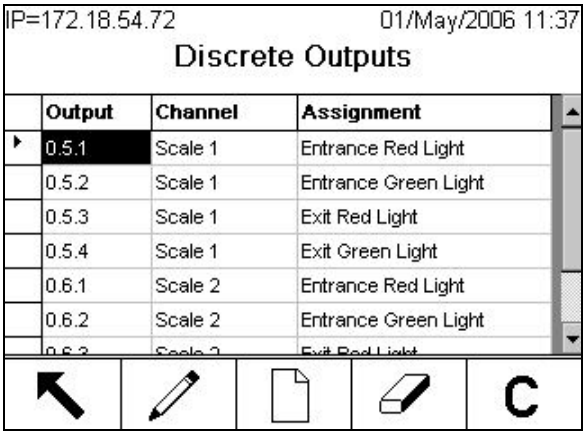

Figure 3-9: Discrete Outputs

Output-specific settings are as follows:

Assignment	None*, Center of Zero, Fast Feed, Feed, Motion, Net, Over Capacity, Over Zone, Tolerance–OK, Under Zero, Under Zone, Entrance Green Light, Entrance Red Light, Exit Green Light, Exit Red Light
Channel	Selected*, Scale 1, Scale 2

Note that the Light assignments remain, whether Traffic Control (see below) is set to **Lights/Weight** or **Gates/Loops**. In the latter case, the assignments control Gates.

Since each output is associated with a scale, the **Channel** selection list is present in the NEW and EDIT screens, regardless of **Assignment**.

Application > Drive-780

General

Vehicle Weighing General, the first Drive-780 screen (Figure 3-10), can be accessed at Application > Drive-780 > General.

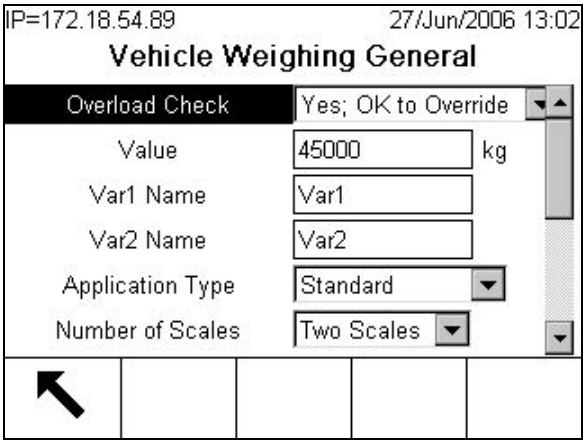

Figure 3-10: Vehicle Weighing General

An additional screen (Figure 3-11) is accessible by scrolling down using the DOWN arrow key. If Number of Scales is set to One Scale, only the Scale A field appears.

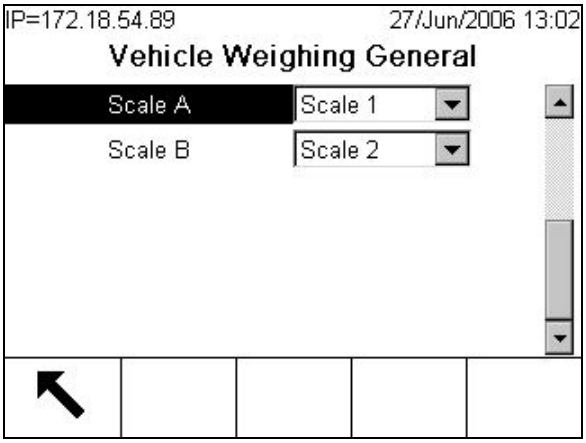

Figure 3-11: Vehicle Weighing General, Two Scales

Settings available in these screens are:

Overload Check	Disabled*, Yes; OK to Override, Yes; No Override
Value Displays if Overload Check is set to Yes	0-999,999, 45000* In primary units, decimal places to match Scale 1 **Increment** setting
Var1 Name	Var1*
Var2 Name	Var2*

Application Type	Standard* [Currently the only option; for future implement, this option may also include Axle – Automatic, Axle – Manual, None, Multi-Platform]
Number of Scales	One Scale*, Two Scales
Scale A	Scale 1*, Scale 2, Scale 3, Scale 4, Sum Scale
Scale B If Number of Scales is set to Two	Scale 1, Scale 2*, Scale 3, Scale 4, Sum Scale

The **Overload Check**, if enabled, may be set so that it can or cannot be over-ridden by the operator. The value at which an overload is detected is set in the **Value** field.

Var1 Name and **Var2 Name** set the variable names that appear on screen during the variable entry phase of a transaction, if variables are enabled in the appropriate transaction configuration screen (Inbound, Outbound or Transient). Typical names for variables might be Quality Rating, Humidity, or Operator. These names can be up to 16 characters long.

Application Type currently has only one value, Standard. In future, options will include the ability to perform sequential weighments for each axle, and other applications.

The **Number of Scales** setting defines whether one or two scales are in use. Any scale connected to the IND780 can be configured as Scale A or Scale B. By default, Scale 1 is set as Scale A, and Scale 2 as Scale B. Sum Scale is used in cases where multiple scales are used for a single transaction. Only the summed value is available in the Transaction and Alibi records. In some applications, an extension is added to an existing platform. If the original platform uses analog load cells and the extension uses MTX cells, the two may be combined using the Sum Scale. Sum Scale configuration is made in the Scale sub-block of setup.

Traffic Control

The **Traffic Control** screen (Figure 3-12 to Figure 3-14) varies in its appearance, depending on which **Control Type** is selected. By default, **Control Type** is set to **None**, as shown in Figure 3-12. In this case, only the **Threshold** and **Zero Tolerance** settings are available in addition to **Control Type**.

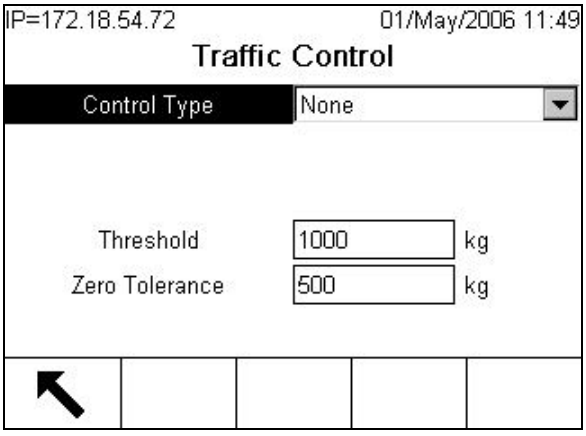

Figure 3-12: Traffic Control, Type None

If traffic control is to be used with the installation, the type of control and Idle State of the devices must be determined. In addition, the installation may be set up so that the IND780rive supports the manual control of lights or gates. Select Lights/Weight if traffic control will be determined by the weight on the platform. If an external control input such as a loop or photoeye is to be used, select Gates/Loops.

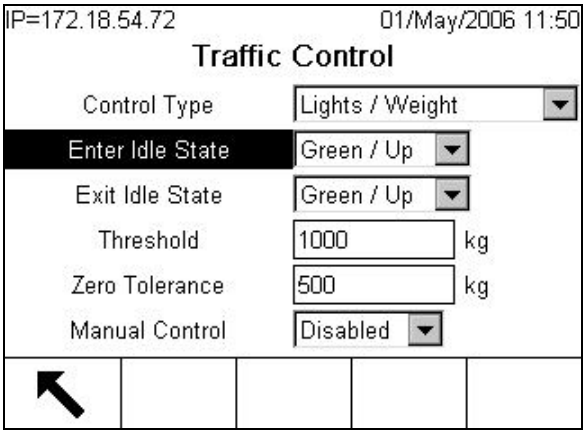

Figure 3-13: Traffic Control, Type Lights/Weight and Gates/Loops

If **Traffic Control** is set to **Positioning**, only the **Threshold** and **Zero Tolerance** options are available. In this mode of control, the operator is alerted if the vehicle is not properly positioned on the platform.

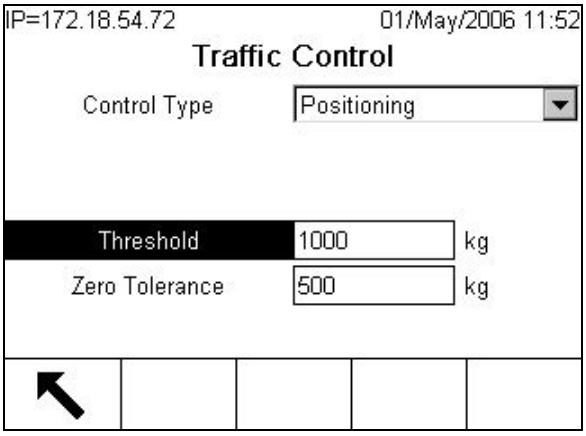

Figure 3-14: Traffic Control, Type Positioning

Settings available in these screens are:

Control Type	None*, Lights/Weight, Gates/Loops, Positioning
Enter Idle State Displays when **Control Type** is set to Lights/Weight or Gates/Loops	Green/Up*, Red/Down
Exit Idle State Displays when **Control Type** is set to Lights/Weight or Gates/Loops	Green/Up*, Red/Down
Threshold	0-999,999, 1000* In primary units, decimal places to match Scale 1 **Increment** setting

Zero Tolerance	0-999,999, 500* In primary units, decimal places to match Scale 1 **Increment** setting
Manual Control Displays when **Control Type** is set to Lights/Weight or Gates/Loops	Disabled*, Enabled

Control Type determines the way in which vehicles are handled as they arrive at and leave the scale/s. When **None** is selected, no traffic control is in effect.

- The **Lights/Weight** setting uses scale output to control red and green lights at the scale's entry or exit or both.
- The **Gates/Loops** setting uses embedded loops to detect the presence or absence of a vehicle and to control entry and exit gates accordingly.
- **Positioning** uses input from loops or photoelectric sensors to detect whether the vehicle is properly positioned on the scale. On-screen prompts indicate when the vehicle is not ready for weighing, and Drive-780 operation is stopped until the interlock is cleared.

Enter Idle State and **Exit Idle State** set the conditions occupied by the controls when a transaction is not underway, and no manual control is being exercised.

The **Threshold** value must be greater than the **Zero Tolerance** value. Threshold determines the point at which a value from the scale/s is interpreted as signaling the presence of a vehicle. Light and gate controls are not actuated until this weight is surpassed. After the vehicle leaves the platform, the scale weight will fall below the threshold value. At this point, a timer will start. When the exit timer expires, the lights/gates will return to their idle state.

Zero Tolerance is used in combination with the **Zero Timer**. Typically, this is set to the same value as the semi-automatic zero range. When the Zero Tolerance value is exceeded, a message will be displayed, "Scale is not zeroed." If light or gate traffic control is enabled, the lights will turn red or the gates will lower, closing the scale. In order to minimize the number of 'false positives', the Zero Timer is employed to delay the control signal. A value of zero disables Zero Tolerance checking.

Timer Control

The **Timer Settings** screen has three different configurations, depending on the **Control Type** selected in the **Traffic Control** screen (see above).

When **Control Type** is set to None or Positioning, the **Timer Settings** screen appears as in Figure 3-15.

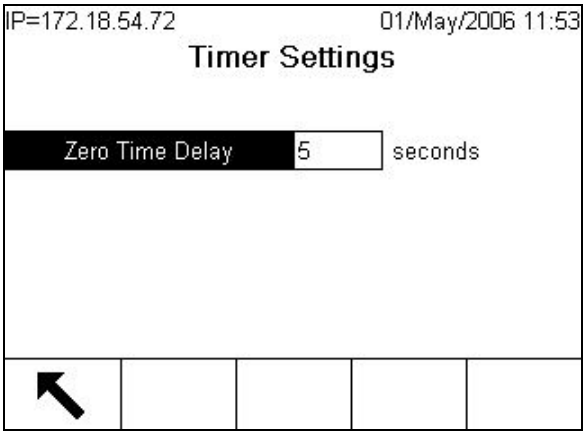

Figure 3-15: Timer Settings, Traffic Control Type None or Positioning

When **Control Type** is set to Lights/Weights, **Timer Settings** displays with a **Zero Time Delay** field, as seen in Figure 3-16.

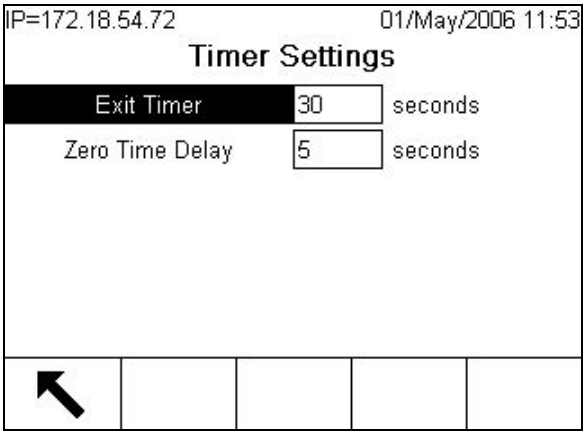

Figure 3-16: Timer Settings, Lights/Weight Traffic Control

When **Control Type** is set to Gates/Loops, the **Timer Settings** screen shows the **Excursion Timer** field seen in Figure 3-17.

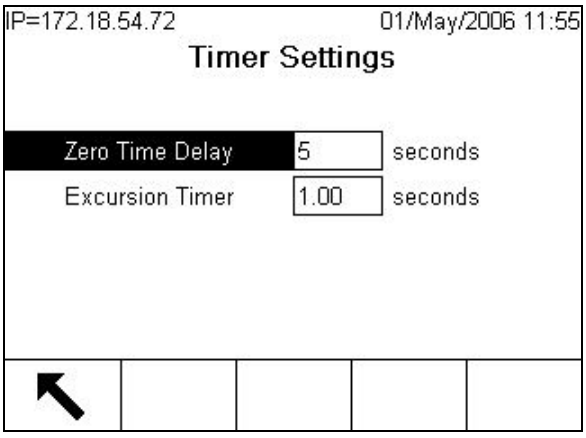

Figure 3-17: Timer Settings, Gates/Loops Traffic Control

Settings available in these screens are:

Exit Timer Displays if Traffic Control set to Lights/Weight	0-99, 30* Two digits, no decimal places
Zero Time Delay	0-99, 5* Two digits, no decimal places
Excursion Timer Displays if Traffic Control set to Gates/Loops	0.01-10, 1.00* Two decimal places

The **Exit Timer** can be used when Traffic Control is set to Lights/Weight. Its default value is 30 seconds. The timer only affects the controls if the weight has not fallen below the threshold at the end of the set period. This could be the case if the vehicle has not moved, or because another vehicle has followed it closely as it left the scale. In this case, both lights are set to red. If necessary, the vehicle can be released using the manual controls.

The **Zero Time Delay** is used in conjunction with the **Zero Tolerance** setting. In order to avoid setting the lights to red or closing the gates unnecessarily, it sets a delay in sending the control signal when zero tolerance is exceeded. If the scale is out of tolerance after the delay, then the controls are actuated.

The **Excursion Timer** can be used when traffic control is set to Gates/Loops. Its default value is 1 second. It sets the delay between the loops' detection of the vehicle and the actuation of the gates.

Inbound

The **Vehicle Weighing Inbound** screen (Figure 3-18) determines which information is to be gathered during the Inbound Process. This information can then be included as part of the inbound ticket template.

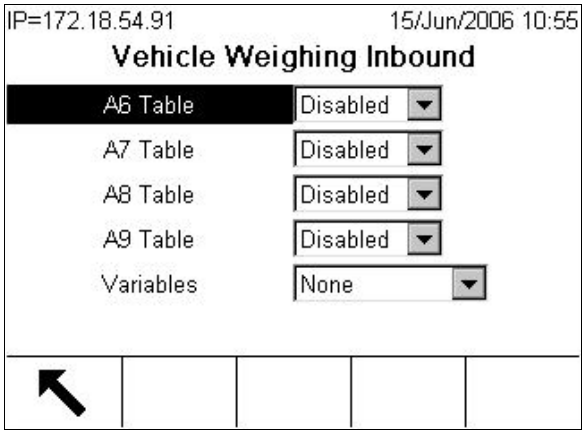

Figure 3-18: Vehicle Weighing Inbound

Settings available in this screen are:

A6 Table – A9 Table	Enabled, Disabled*
Variables	Var1 & Var2, Var1, None*

By default, all the **Tables** are disabled. Each can be enabled using the associated drop-down selection box.

By default, neither user-entered **Variables** (named in the **Vehicle Weighing General** screen, above) is used. Alternatively, both variables or only Var1 can be selected.

- Only Tables and Variables enabled here will appear on screen during an Inbound transaction.

Outbound

The **Vehicle Weighing Outbound** screen (Figure 3-19) functions in the same way as the Inbound screen, above, but for the Outbound Process.

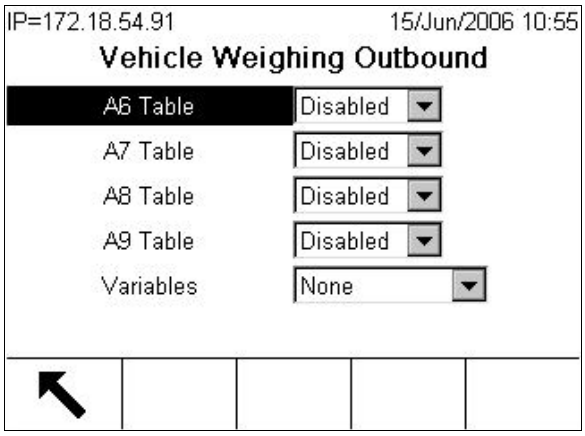

Figure 3-19: Vehicle Weighing Outbound

- Only Tables and Variables enabled here will appear on screen during an Outbound transaction.

Transient

The **Vehicle Weighing Transient** screen (Figure 3-20) functions in the same way as the Inbound and Outbound screens, but for Transient Vehicle weighing.

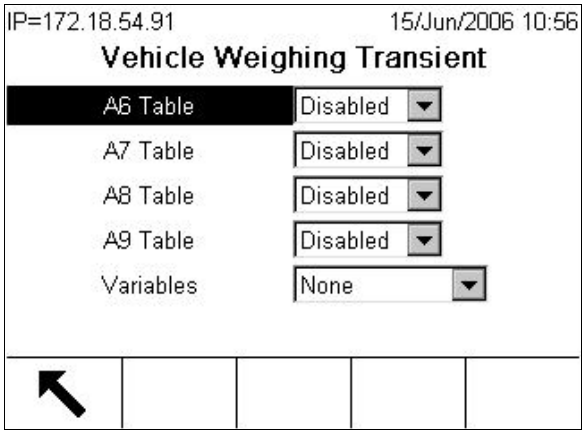

Figure 3-20: Vehicle Weighing Transient

By enabling the user-defined tables, values can be selected and printed. However, transient weight values do not affect table totals.

- Only Tables and Variables enabled here will appear on screen during an Transient vehicle transaction.

Application > Drive-780 > Database

The **Database** branches of the Drive-780 setup tree allow access to the tables that store vehicle IDs and other information used in transactions. Some of the tables can be configured to store information specific to particular types of transaction.

- In all table views, it is possible to scroll through the records using the UP, DOWN, LEFT and RIGHT keys. If an optional external keyboard is in use, the PAGE UP and PAGE DOWN keys may be used to move up and down through the table one page (6 records) at a time.

Vehicle ID Table

Vehicle ID Table configuration

When Application > Drive-780 > Database > Vehicle ID is selected from the setup tree, the screen shown in Figure 3-21 appears.

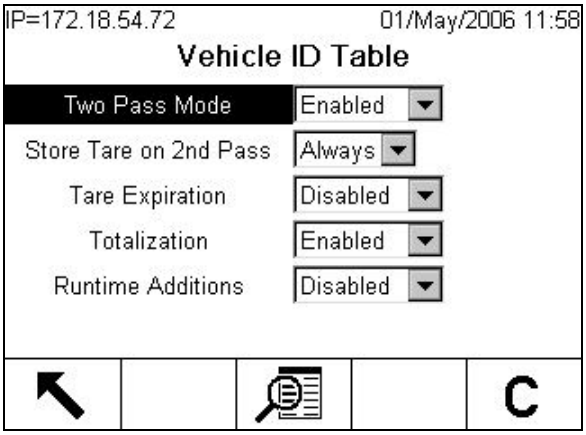

Figure 3-21: Vehicle ID Table Configuration

Settings and functions available in this screen are:

Two Pass Mode	Disabled, Enabled*
Store Tare on 2nd Pass	Never, Prompt, Always* Displays if **Two Pass Mode** is Enabled
Tare Expiration	Disabled*, Days, Date
Totalization	Disabled, Enabled*
Runtime Additions	Disabled*, Enabled
TABLE SEARCH	Opens **Vehicle ID Table/Search** screen (Figure 3-22)
C CLEAR	Opens **Vehicle ID Table Clear** warning screen (Figure 3-26)

The **Two Pass Mode** enables the ability of the IND780drive to use the lower value taken from an Inbound and Outbound Process as the stored tare value. Enabling this capability allows the Vehicle ID Table to be loaded with all data except the tare value. The tare weight is generated during the second transaction.

Store Tare on 2nd Pass is shown only if Two Pass Mode is enabled. When this is set to **Always**, the lower of the Inbound and Outbound weight values is automatically stored as a tare value for the vehicle after each transaction. When set to **Prompt**, the operator is asked whether to store the tare for each transaction.

When **Tare Expiration** is set to **Date**, and the expiration date has passed, a Tare Expiration error message will display. Once the message is acknowledged, the Tare Expiration date must be reset before the inbound part of the Two Pass transaction can be performed.

When Tare Expiration is set to **Days** and a transaction is initiated after the expiration period has ended, an error message appears but the user is given the option to continue with the transaction and store the inbound weight. In this case, the expiration period will reset automatically.

If enabled, **Totalization** stores a total of all weights recorded for each Vehicle ID. This value appears in the Total column of the Vehicle ID table.

Runtime Additions adds flexibility to the functionality of the IND780drive. If enabled new Vehicle ID records may be added to the Vehicle ID Table during normal operation. **Two Pass Mode** must also be enabled if this capability is desired. When **Runtime Additions** is enabled, a NEW softkey appears on the ID entry screen. If no ID or an invalid ID is entered and ENTER pressed, the softkey is accessible. When pressed, it opens the Vehicle ID New screen (Figure 3-24). If **Runtime Additions** is disabled and no ID or an invalid ID is entered, the operator can press ESC to clear the scale, or search for a valid ID using the VIEW TABLE softkey to open the search screen shown in Figure 3-22.

Vehicle ID Table search

The **Vehicle ID Table/Search** screen is accessed from the **Vehicle ID Table** configuration screen, above.

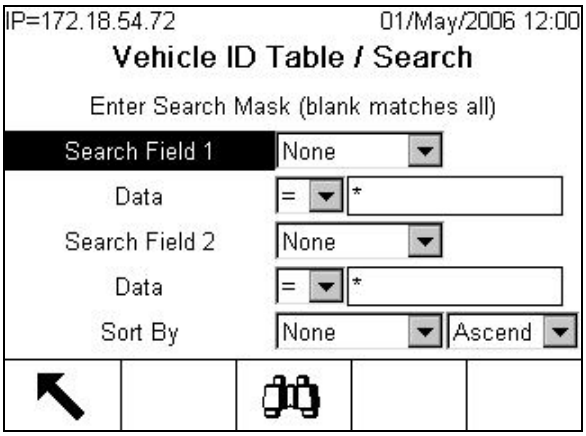

Figure 3-22: Vehicle ID Table/Search

This screen may be used to limit the Vehicle ID Table search to only those records of interest. Using the default settings displays the complete contents of the table.

Settings and functions available in this screen are:

Search Field 1	None*, ID, Description, Tare Weight, Units, Date, Time, Expiration (days), Expiration (date), Count, Total Weight, Saved Weight, A6 ID, A7 ID, A8 ID, A9 ID, Var1, Var2
Data	**Data** specifies operation to be performed on entered data (below): < (less than), <= (less than or equal to), =* (equals), <> (is not), >= (greater than or equal to), > (greater than) **Data field**: Alphanumeric entry field
Search Field 2	Same as **Search Field 1**
Data	Same as first **Data** row
Sort By	Same as **Search Field 1** Ascend*, Descend
VIEW TABLE	Performs search, and opens Vehicle ID table (Figure 3-23) showing entries as filtered by the Search screen

For example, the selections shown below would result in a view of the Vehicle ID table showing only entries using kilograms and with a tare weight of at least 7,500 kg, sorted in ascending (alphanumeric) order of ID.

- **Search Field 1** Units
- **Data** = kg
- **Search Field 2** Tare Weight
- **Data** >= 7500
- **Sort By** ID Ascend

Vehicle ID Table view and modification

Once VIEW TABLE has been pressed, the **Vehicle ID** table (Figure 3-23) appears.

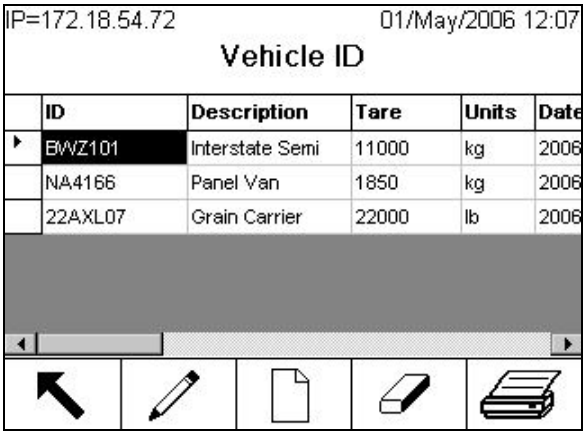

Figure 3-23: Vehicle ID Table

To see more columns, use the RIGHT arrow to scroll the view. Using the RIGHT arrow at the end of a row wraps focus to the start of the next row. The PAGE UP and PAGE DOWN keys of an optional external keyboard scroll up and down through the table one page (6 rows) at a time.

Columns in this table are as follows:

ID	Alphanumeric string associated with a specific vehicle, typically a license number or other unique identifier, that appears in the "ID" field during the generation of a transaction, and in the transaction record
Description	Alphanumeric string that appears in the "Description" field during the generation of a transaction, and in the transaction record
Tare	Tare value for the vehicle, used during a one pass transaction
Units	Units of the Tare and Total values
Date	Date on which the Tare value was entered
Time	Time at which the Tare value was entered
Expiration	Days before Tare expires – used if Tare Expiration is set to Days in the **Vehicle ID** configuration screen (Figure 3-21)
Expiration	Date on which Tare expires – used if Tare Expiration is set to Date in the **Vehicle ID** configuration screen (Figure 3-21)
Count	The number of transactions performed using this Vehicle ID
Total	Total weight value associated with all transactions performed using this Vehicle ID
Saved	A vehicle weight value that is stored during the first part of a 2-pass transaction. This may be the vehicle's gross weight, or a temporary tare in a 2-pass transaction if no tare is already stored, or if the ID record has expired. The value is stored until the second pass, at which point the tare is saved with the Vehicle ID or, if so configured, the operator is prompted to save or discard the tare.
A6-A9 ID	Includes the database ID reference specified during the transaction
Var1, Var2	Includes with the transaction record entries made in the Variable fields during a transaction

Options for entries in this table include EDIT, CREATE and DELETE. Selected table records may be printed using the PRINT softkey.

Figure 3-24 shows the Vehicle ID New screen.

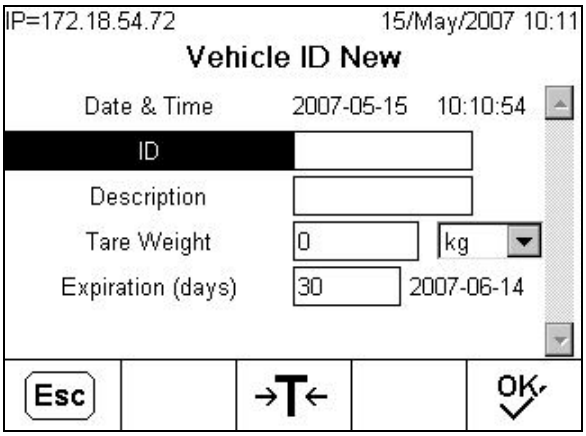

Figure 3-24: Vehicle ID New

Figure 3-25 shows the **Vehicle ID Edit** screen, including a view scrolled down to show the additional field available when **Totalization** is **Enabled** in the **Vehicle ID Table** configuration screen (Figure 3-21).

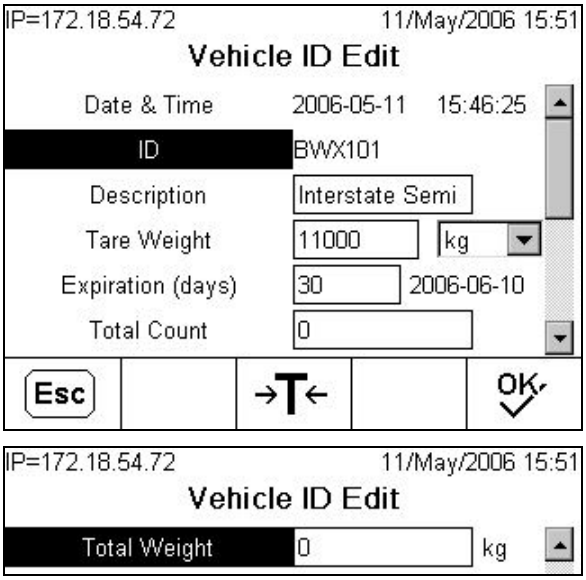

Figure 3-25: Vehicle ID Edit

Settings and information available in the New and Edit screens shown above are:

Date and Time	Cannot be modified by operator – date and time are set automatically when the record is created
ID [Only in New screen]	A 16-character alphanumeric string associated with a specific vehicle, typically a license number or other unique identifier, that appears in the "ID" field during the generation of a transaction, and in the transaction record.
Description	A 40-character alphanumeric string that appears in the "Description" field during the generation of a transaction, and in the transaction record
Tare	Tare value for the vehicle – may be entered directly, or captured using the TARE softkey →T← and the current reading from the scale in focus as the Tare Weight value
Units	Units used for the Tare Weight value
Expiration (days) **Expiration (date)**	Depending on Tare Expiration setting in the **Vehicle ID** configuration screen (Figure 3-21), either Days or Date field is enabled for entry
Total Count [Only in Edit screen]	In the Edit screen it is possible to enter or modify the number of transactions that have used this record
Total Weight	Accumulated weight from transactions associated with this vehicle
Esc ESCAPE	Return to Vehicle ID table without saving changes.
→T← TARE	Capture the scale's current reading as the tare value for this Vehicle ID.
OK OK	Save record and return to Vehicle ID table

Clearing the Vehicle ID Table

Pressing the CLEAR softkey C in the Vehicle ID Table configurations screen (Figure 3-21) opens the warning screen shown in Figure 3-26.

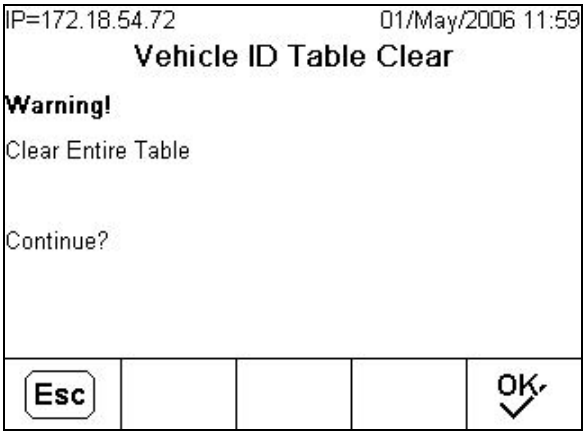

Figure 3-26: Vehicle ID Table Clear Warning

Pressing the OK softkey OK confirms the clear operation, and returns focus to the **Vehicle ID Table** configuration screen. Pressing ESCAPE Esc aborts the operation.

Temporary ID Table

Temporary ID Table configuration

The first screen that displays when **Temporary ID Table** is selected (Figure 3-27) allows Tare Expiration to be Enabled or Disabled. If it is enabled, the **Expiration (days)** and **Auto Delete Expired** fields shown below appear.

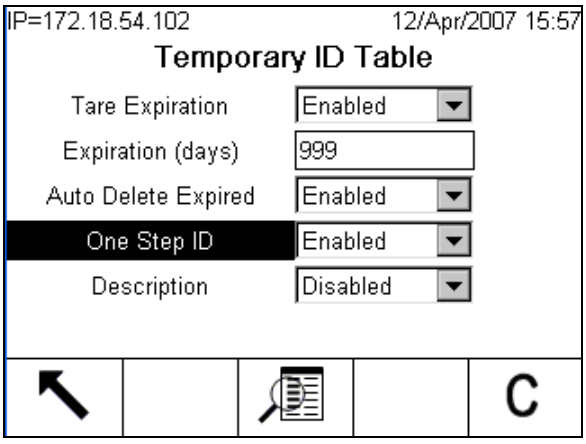

Figure 3-27: Temporary ID Table Configuration, Tare Expiration Enabled

Pressing the VIEW TABLE softkey in this screen opens the **Temporary ID Table/Search** screen shown in Figure 3-28, below.

Pressing the CLEAR softkey C opens a warning screen similar to the one shown in Figure 3-26.

The following settings are available in this screen:

Tare Expiration	Disabled*, Enabled
Expiration (days) [If Tare Expiration Enabled]	0-999*
Auto Delete Expired [If Tare Expiration Enabled]	Disabled, Enabled*, If Enabled, the terminal compares Temporary ID record dates with the current date, and automatically deletes records once the number of days specified in the Expiration (days) field has passed.
One Step ID	Disabled, Enabled* • If enabled, Temporary ID Inbound transactions are automatically assigned a numerical ID, which is incremented by one for each transaction; the transaction moves straight to the confirmation screen, and the ID cannot be edited. For Outbound transactions, the assigned ID must be entered directly **before** the Temporary ID softkey is pressed. • If disabled, the user can create a new ID number or recall an existing one by pressing the Temporary ID softkey. If the ID field is left blank, an automatically-generated ID may be used when the NEW softkey is pressed.
Description	Disable*, Enabled • If Disabled, the Description field is not shown when performing a Temporary ID transaction.

Temporary ID Table search

The **Temporary ID Table/Search** screen allows the operator to filter table records and view only those matching particular criteria. Using the default settings displays the complete contents of the table.

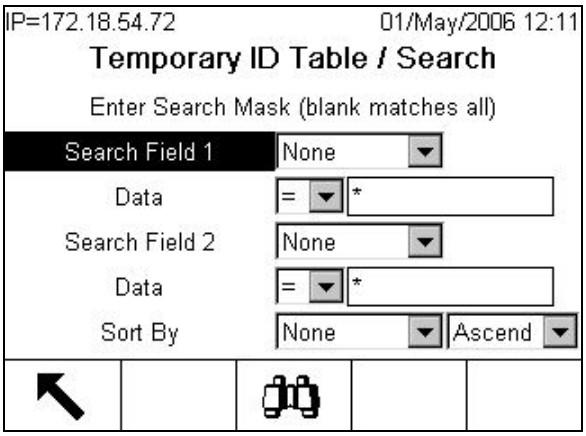

Figure 3-28: Temporary ID Table/Search

Settings and functions available in this screen are:

Search Field 1	None*, ID, Description, Saved Weight, Units, Date, Time, Expiration, A6 ID, A7 ID, A8 ID, A9 ID, Var1, Var2
Data	**Data** specifies operation to be performed on entered data (below): < (less than), <= (less than or equal to), =* (equals), <> (is not), >= (greater than or equal to), > (greater than) **Data field**: Alphanumeric entry field
Search Field 2	Same as **Search Field 1**
Data	As for first **Data** row
Sort By	Same as **Search Field 1** Ascend*, Descend
VIEW TABLE	Performs search, and opens Temporary ID table (Figure 3-29) showing entries as filtered by the Search screen

Temporary ID Table view and modification

Figure 3-29 shows an example of the **Temporary ID Table** that displays when the VIEW TABLE softkey is pressed.

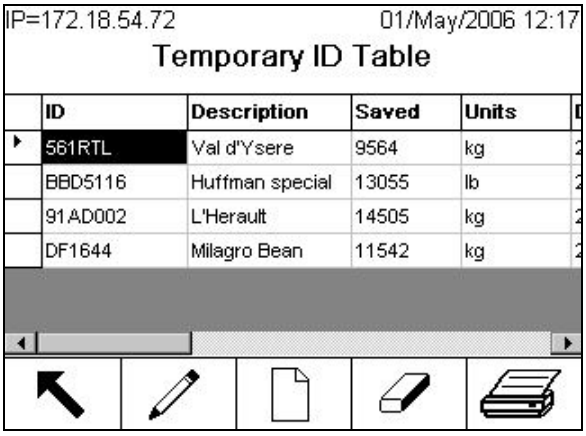

Figure 3-29: Temporary ID Table

Entries can be edited, created or deleted using the softkeys.

ID	Alphanumeric string associated with a specific vehicle, typically a license number or other other unique identifier, that appears in the ID field during the generation of a transaction, and in the transaction record.
Description	Alphanumeric string that appears in the Description field during the generation of a transaction, and in the transaction record.
Saved	Weight value saved for the temporary entry – re-set to zero after the outbound transaction is completed.
Units	Units of the Saved value.
Date	Date on which the record was entered.
Time	Time at which the record was entered.
Expiration	Date on which the Tare expires – used if Tare Expiration is enabled.
A6-A9 ID	Includes the database ID reference specified during the transaction.
Var1, Var2	Includes with the transaction record entries made in the Variables fields during a transaction.

Figure 3-30 shows the **Temporary ID New** screen. The **Temporary ID Edit** screen is identical, except that the ID field is not editable.

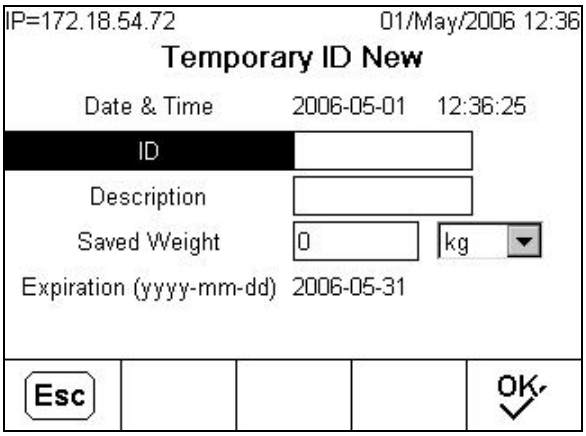

Figure 3-30: Temporary ID New

Settings available in this screen are as follows:

Date & Time	Cannot be modified by operator – date and time are set automatically when the record is created
ID	Alphanumeric string associated with a specific vehicle, typically a license number or other unique identifier, that appears in the "ID" field during the generation of a transaction, and in the transaction record. Cannot be changed in the Edit screen
Description	Alphanumeric string that appears in the "Description" field during the generation of a transaction, and in the transaction record
Saved Weight	The tare weight saved for the temporary entry – re-set to zero after the outbound transaction is completed
[Saved Weight units]	lb, kg*, g, t, ton

Expiration [If Tare Expiration enabled]	Displays the date on which the Temporary ID will expire – set by the number of days from the date of creation configured in **Expiration (days)** field on the Temporary ID Table configuration page (Figure 3-27). Only appears if **Tare Expiration** has been enabled.

Index ID Table

The Index ID Table stores relational information that associates a record from one or more user-defined tables with a Vehicle ID. In Index ID Weighing, entering a user-configured ID populates the Table data fields automatically.

Index ID Table search

The **Index ID Table/Search** screen allows the operator to filter table records and view only those matching particular criteria. Using the default settings displays the complete contents of the table.

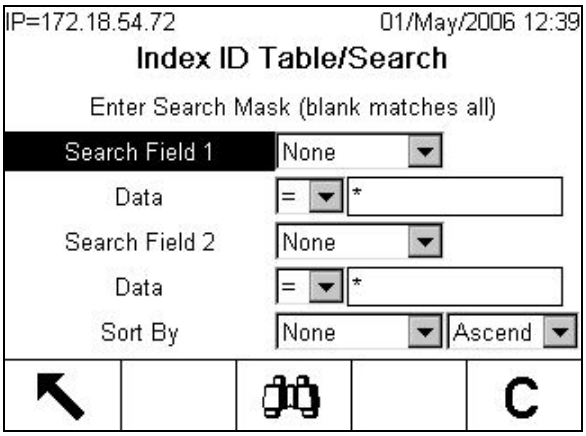

Figure 3-31: Index ID Table/Search

Options specific to this screen are:

Search Field 1	None*, ID, Description, Vehicle ID, A6 ID, A7 ID, A8 ID, A9 ID	
Data	**Data** specifies operation to be performed on entered data (below): < (less than), <= (less than or equal to), =* (equals), <> (is not), >= (greater than or equal to), > (greater than) **Data field**: Alphanumeric entry field	
Search Field 2	Same as **Search Field 1**	
Data	As for first **Data** row	
Sort By	Same as **Search Field 1**	Ascend*, Descend
VIEW TABLE	Performs search, and opens Index ID table (Figure 3-32) showing entries as filtered by the Search screen	

Index ID Table view and modification

Pressing the VIEW TABLE softkey opens a screen like the one shown in Figure 3-32.

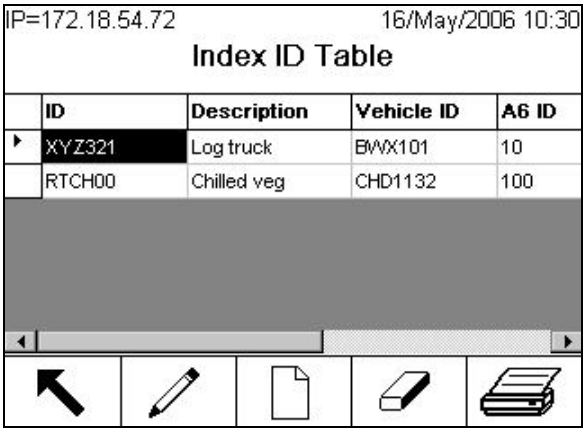

Figure 3-32: Index ID Table

Columns in this table include the following:

ID	The Index ID, with which the row of table data is associated
Description	Alphanumeric string that appears in the "Description" field during the generation of a transaction, and in the transaction record
Vehicle ID	Alphanumeric string associated with a specific vehicle, typically a license number or other unique identifier, that appears in the "ID" field during the generation of a transaction, and in the transaction record
A6-A9 ID	The ID associated with data in one of the A6-A9 tables – not the data itself, but a reference. Each ID must match an ID entry in the relevant table

Entries can be edited, created, deleted or printed using the softkeys. Figure 3-33 shows the **Index ID New** screen – use the DOWN arrow key to scroll down and view the A9 ID entry field. The **Index ID Edit** screen is identical, except that the ID field is not editable.

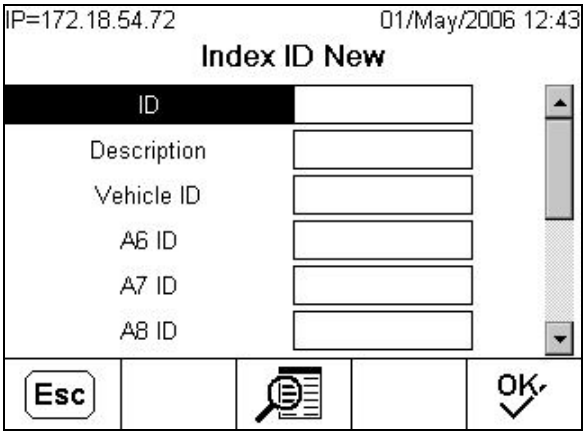

Figure 3-33: Index ID Table New

If the record's ID is not known, use the UP/DOWN arrow keys to select a table row (A6 ID – A9 ID), then press the TABLE SEARCH softkey, to open the search screen associated with that table. Selecting a row and pressing the OK softkey will return focus to the **Index ID New** screen, with the table ID reference placed in the entry field.

The PRINT softkey produces a hard copy of the table via a connected printer.

A6 Table – Commodity

A6 Table configuration

By default, the A6 Table is configured for special use as a Commodity table, as seen in Figure 3-34. It can also be used as a Standard table.

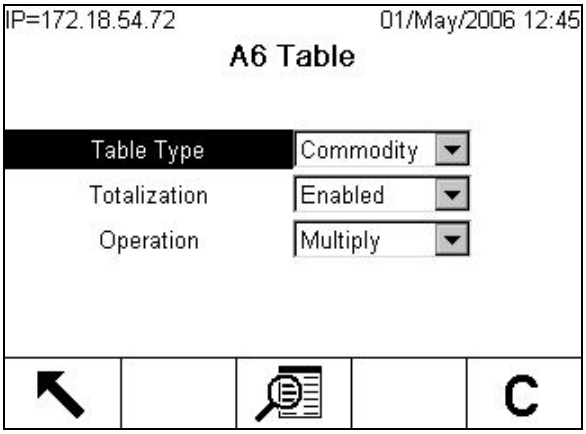

Figure 3-34: A6 Table Configuration, Commodity

The settings and functions available on this screen are as follows:

Table Type	Commodity*, Standard
Totalization	Disabled, Enabled*
Operation	Divide, Multiply*
VIEW TABLE	Opens the **A6 Table/Search** screen (Figure 3-35)
C CLEAR	Opens the **A6 Table Clear** warning screen

Totalization determines whether the table generates a total weight value. In the case of the Commodity table, the total is stored in converted units.

Operation specifies how the **Factor** set in each Commodity record is applied to the primary units in use, in order to produce the converted **Unit** named in the record. Thus, for example, if a custom **Unit** named Bu (for bushel) is defined, and each bushel weighs 28.38 kg, then the **Factor** would be set to 23.38 and **Operation** to **Divide**.

An alternative use would be to define a price-per-weight. If the price is $1.50 per weight unit, then setting **Factor** to 1.5 and **Operation** to **Multiply** would give the price of the recorded weight of commodity.

Commodity Table search

Pressing the VIEW TABLE softkey opens the screen shown in Figure 3-35.

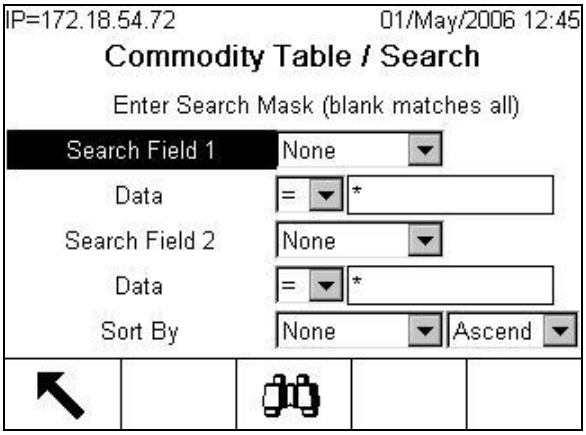

Figure 3-35: Commodity (A6) Table Search

This screen may be used to limit the Commodity Table search to a subset of all records. The default settings cause the complete contents of the table to display.

Settings and functions available in this screen are:

Search Field 1	None*, ID, Description, Factor, Units, Resolution, Count, Total Weight
Data	**Data** specifies operation to be performed on entered data (below): < (less than), <= (less than or equal to), =* (equals), <> (is not), >= (greater than or equal to), > (greater than) **Data field**: Alphanumeric entry field
Search Field 2	Same as **Search Field 1**
Data	Same as for first **Data** row
Sort By	Same as **Search Field 1**
	Ascend*, Descend
VIEW TABLE	Performs search, and opens the A6 Table (**Figure 3-36**) showing entries as filtered by the Search screen

Commodity Table

When the VIEW TABLE softkey is pressed, the **Commodity Table** displays, with seven columns of data describing each commodity. Table records can edited, a new record added, or records deleted. In addition, all records resulting from a search can be printed.

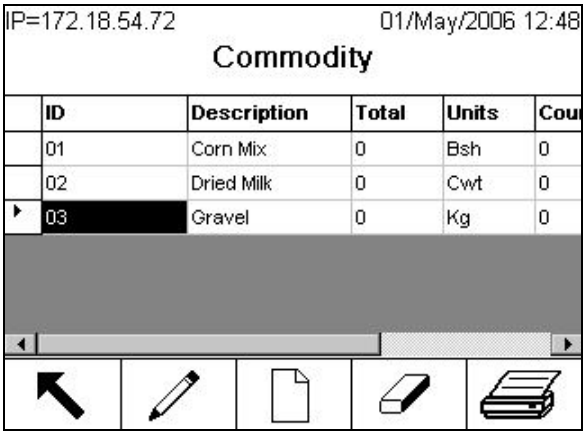

Figure 3-36: Commodity (A6) Table

The contents of the Commodity table are as follows:

ID	A 16-character alphanumeric, user-defined label used to identify the record for ease of reference
Description	A 40-character descriptive alphanumeric entry. The description appears adjacent to the A6 Table label during validation of a transaction and is saved with the transaction record
Factor	A 5-digit multiplier or divisor applied (as defined in the A6 Table configuration page) to the net weight in primary units in order to produce the custom units named in the **Units** column
Units	A 3-character alphanumeric entry, permitting a custom unit to be named. Do **not** use a name (such as LB or lb) that can be confused with a standard unit of measure.
Resolution	Specifies the resolution, in decimal places, of the custom Units
Count	A 6-digit value showing the number of transactions associated with this Commodity since the last CLEAR TOTALS C* operation, master Reset or Application Reset
Total	If **Totalization** is enabled, this 12-character column displays the accumulated total of weight, in custom units, of transactions using this record. This corresponds to the **Total Commodity Weight** value found in the **Commodity Table Edit** screen

When the NEW softkey is pressed in the Commodity table view (Figure 3-36), the **Commodity Table New** screen (Figure 3-37) appears.

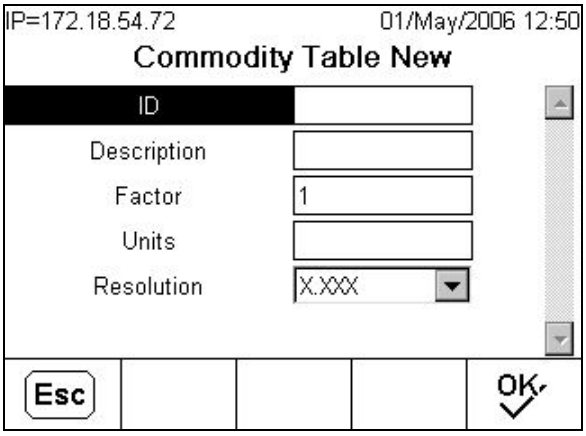

Figure 3-37: Commodity Table New

By default, the **ID**, **Description** and **Units** fields are blank, while the **Factor** is set to 1. **Resolution** is a drop-down selection box offering the following options:

Resolution X, X.X, X.XX, X.XXX*

The **Commodity Table Edit** screen (Figure 3-38) is accessed by pressing the EDIT softkey . It is populated with the current values for the record, including fields for the **Total Count** and **Total Commodity Weight** (visible when the screen is scrolled down). **ID** is not editable.

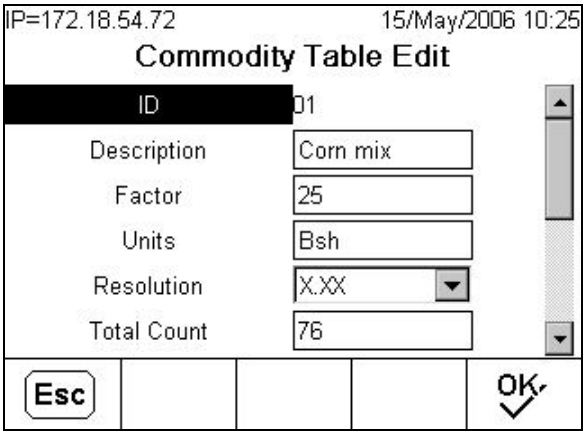

Figure 3-38: Commodity Table Edit

A6 Table – Standard

When A6 is configured as a Standard Table, the configuration screen appears as in Figure 3-39.

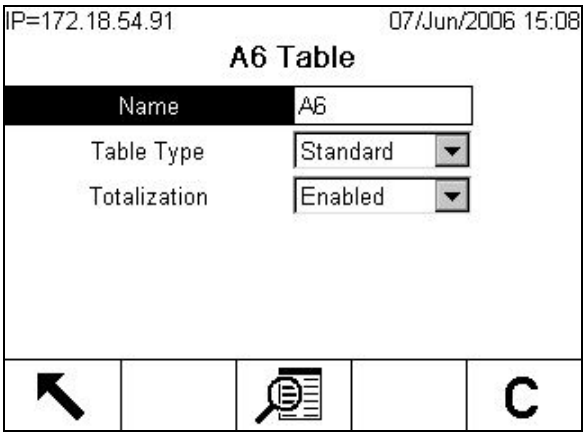

Figure 3-39: A6 Table Configuration, Standard

The settings available on this screen are as follows:

Name	Alphanumeric entry field
Table Type	Commodity*, Standard
Totalization	Disabled, Enabled*
VIEW TABLE	Opens the **A6 Table/Search** screen (Figure 3-35)
C CLEAR	Opens the **A6 Table Clear** warning screen

Totalization determines whether the table generates a total weight value.

A6 (Standard) Table view and modification

- **Table Type** cannot be changed from **Commodity** to **Standard** or vice versa without performing a Table Clear operation.

When the **Table Type** is configured as **Standard**, the table appears as in Figure 3-40. The count and weight columns are not visible in this view. To see them, use the arrow keys to scroll the screen sideways.

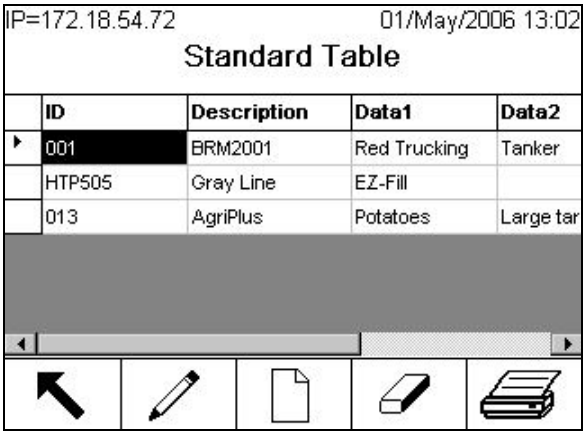

Figure 3-40: A6 (Standard) Table

The contents of this table are as follows:

ID	A 16-character alphanumeric, user-defined identifier used to name the record for ease of reference
Description	A 40-character descriptive alphanumeric entry that appears adjacent to the A6 Table label during validation of a transaction, and saved with the transaction record
Data 1, Data 2	16-character, alphanumeric, user-defined entries used to add further information about the item
Total Count	6-digit count of the number of transactions associated with this record since the last CLEAR TOTALS C* operation, master Reset or Application Reset
Total Weight	12-digit value showing the total weight of all transactions associated with this record since the last CLEAR TOTALS C* operation, master Reset or Application Reset

The **Standard Table New** screen allows the operator enter a value for the **ID**, **Description** and **Data** fields. In the **Standard Table Edit** screen (Figure 3-41), **ID** is not editable, but **Total Count** and **Total Weight** fields are included and editable.

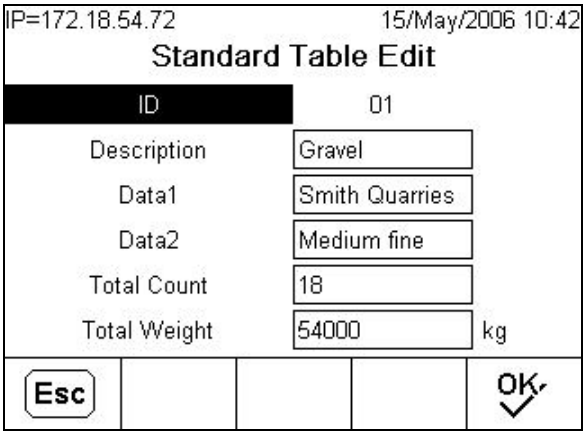

Figure 3-41: Standard Table Edit

A6 (Standard) Table search

If the **Table Type** is set to **Standard**, the table search options are as follows:

Search Fields 1 & 2 None*, ID, Description, Data 1, Data 2, Count, Total Weight

A7 Table – Contract

By default, the A7 Table is configured for special use as a Contract table, as seen in Figure 3-42. By including values for total quantity and quantity remaining, the Contract table allows the IND780 to track the status of a contract.

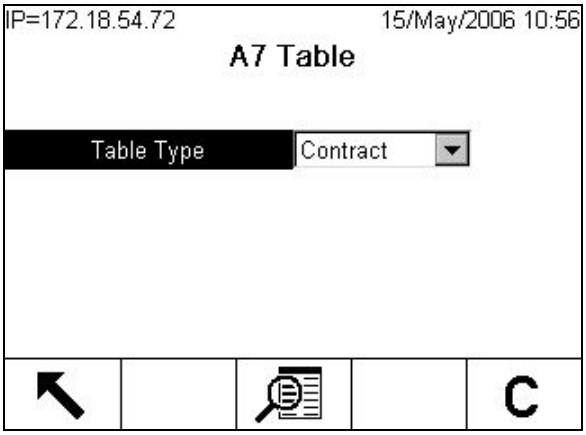

Figure 3-42: A7 Table Configuration

Contract Table search

Pressing the VIEW TABLE softkey opens the **Contract Table/Search** screen shown in Figure 3-43.

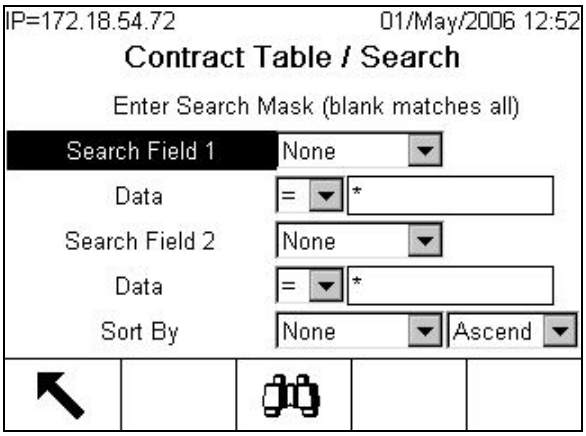

Figure 3-43: Contract (A7) Table Search

This screen may be used to limit the Contract Table search to a subset of all records. Using the default settings displays the complete contents of the table.

Settings and functions available in this screen are:

Search Field 1	None*, ID, Description, Contract Target, Remaining
Data	**Data** specifies operation to be performed on entered data (below): < (less than), <= (less than or equal to), =* (equals), <> (is not), >= (greater than or equal to), > (greater than) **Data field**: Alphanumeric entry field
Search Field 2	Same as **Search Field 1**
Data	As for first **Data** row
Sort By	Same as **Search Field 1** Ascend*, Descend
VIEW TABLE	Performs search, and opens the **Contract Table** (Figure 3-44) showing entries as filtered by the **Search** screen

Contract Table view and modification

When the VIEW TABLE softkey is pressed, the **Contract Table** (Figure 3-44) appears, displaying four columns of data that identify each contract and describe its status.

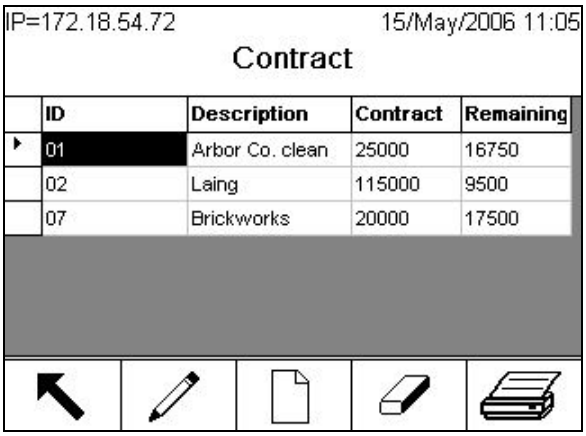

Figure 3-44: Contract (A7) Table

The contents of this table are as follows:

ID	An alphanumeric, user-defined identifier used to identify the record for ease of reference
Description	A descriptive alphanumeric entry that appears adjacent to the A7 Table label during validation of a transaction, and saved with the transaction record
Contract	The total weight of the contract associated with this record
Remaining	The weight remaining in the contract, calculated by subtracting the weight of all transactions performed using this record from the total (**Contract**) weight it defines

When the NEW softkey is pressed in the Contract table view, the **Contract Table New** screen (Figure 3-45) appears.

Figure 3-45: Contract Table New

The **Contract Table Edit** screen (Figure 3-46) is accessed by pressing the EDIT softkey . It is populated with the current values for the record. **Contract Target** and **Remaining** weights may be edited. **ID** is not editable.

Figure 3-46: Contract Table Edit

A7 Table –Standard

The A7 Table can also be used as a Standard table, in which case its Search, View, Edit, New and Clear functions are the same as for the A6 Table when its **Type** is configured as **Standard**. Switching between configurations requires performing a Table Clear operation, thus losing all existing entries and totals.

A8 and A9 Tables – Standard

The only configuration option for the A8 and A9 Tables is **Totalization**, which may be enabled or disabled. Search, View, Edit, New, Clear and Print functions are the same as for the A6 Table when its **Type** is configured as **Standard**.

Transaction Table

A transaction is defined as a complete inbound and outbound process. Since the Vehicle ID and Transient Weighing applications are typically completed using only the Outbound Process, each transaction is recorded upon completion of that process.

For each transaction, the Transaction Table records values associated with all enabled items (tables and variables).

Transaction Table search

Accessing Transaction Table opens the **Transaction Table/Search** screen seen in Figure 3-47.

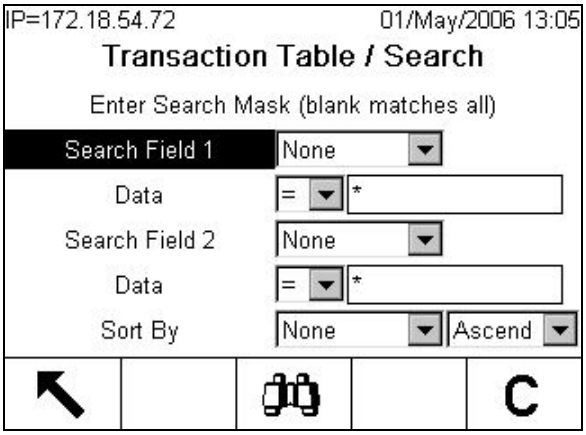

Figure 3-47: Transaction Table/Search

This screen may be used to constrain a search so that only a subset of the Transaction Table displays when the VIEW TABLE softkey is pressed.

Settings and functions available in this screen are:

Search Field 1	None*, Transaction, Description, ID, Date, Time, Scale, Mode, Gross, Tare, Net, Units, Type, A6 ID, A7 ID, A8 ID, A9 ID, Var1, Var2
Data	**Data** specifies operation to be performed on entered data (below): < (less than), <= (less than or equal to), =* (equals), <> (is not), >= (greater than or equal to), > (greater than) **Data field**: Alphanumeric entry field
Search Field 2	Same as **Search Field 1**
Data	As for first **Data** row
Sort By	Same as **Search Field 1**
	Ascend*, Descend
VIEW TABLE	Performs search, and opens the Transaction Table (Figure 3-48) showing entries as filtered by the Search screen

Search Fields 1 and 2 allow the table to be searched by the usual values, and also by their association with records in the A6, A7, A8 and A9 Tables, and with user-entered variables Var1 and Var2.

Transaction Table view and print

The Transaction Table stores the record of all transactions. Figure 3-48 shows an example of a Transaction Table record.

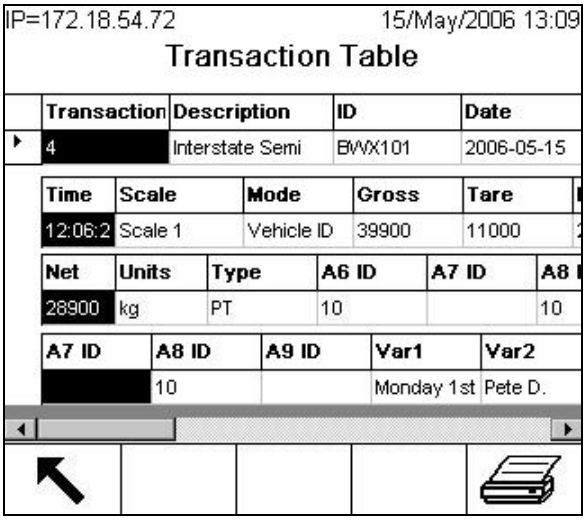

Figure 3-48: Transaction Table

Note that the screen image in Figure 3-48 has been edited in order to show all available columns in one view.

In practice, the LEFT/RIGHT arrow keys must be used to see additional columns of data. Using the RIGHT arrow key in the last row of a record wraps the view to the first column of the next record, if one exists. Similarly, using the LEFT arrow key in the first column of a record wraps the view to the last column of the previous record, if there is one.

The following data are included in each record:

Transaction	Sequential number identifying the transaction
Description	Alphanumeric string from the Description field displayed during the transaction
ID	Vehicle identifier from the ID field displayed during the transaction
Date	Date on which the transaction was performed
Time	Time at which the transaction was performed
Scale	Scale used for the transaction. Where two scales are in use, typically one each is assigned to the Inbound and Outbound processes
Mode	The type of weighing operation used for the transaction – Vehicle ID, Temporary ID, or Transient Vehicle. Index ID weighing is recorded as Vehicle ID in the Transaction Tabe
Gross	The weight measured at the scale
Tare	The tare value recalled or generated for the transaction
Net	The gross weight less the tare weight
Units	The units used for the transaction

Type	The type of tare taken – T (Pushbutton Tare), PT (Preset Tare) or M (Manually entered tare)
A6-A9 ID	IDs from the database table entry screen during the transaction (references to table records, not the values themselves)
Var1, Var2	Values entered in the Var1 and Va2 entry screen during the transaction

Transaction Table records cannot be created, edited or deleted from this view.

Pressing the PRINT softkey  prints the selected records.

Terminal

Softkeys

The **Softkeys** setup screen (Figure 3-49) allows a variety of functions to be assigned to the three rows of available softkeys on the home screen. For ease of operation, only those softkeys required for the specific installation should be assigned.

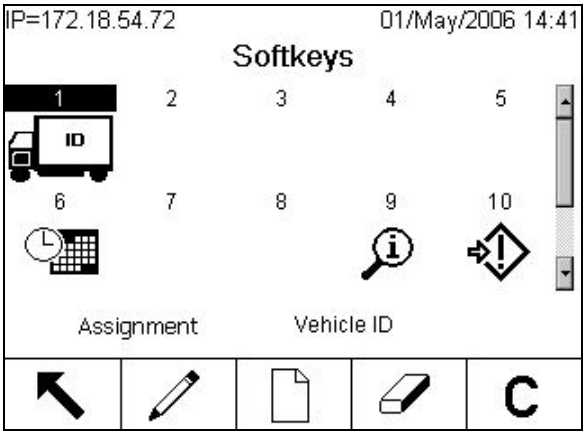

Figure 3-49: Softkeys Setup

A complete list of available softkeys and their functions is available in the IND780 Technical Manual, Appendix E, **Softkey Mapping and Application Key Configuration**. The following softkeys are specific to the Drive-780 Application:

- Temporary ID
- Vehicle ID
- Transient Vehicle
- Index
- Manual Lights

Functions in the Softkeys screen are described in Table 3-1.

Table 3-1: Softkey Setup Functions

Icon/Key	Function	Explanation
UP, DOWN, LEFT, RIGHT	Arrow keys	Change focus between softkey positions, as indicated by highlighted number (see Figure 3-49)
	EXIT	Returns to setup menu tree
	EDIT	Edits assignment for selected position. If current selection is **None**, may be used to add a new softkey without changing positions of other softkeys; if position is currently assigned, changing to **None** removes the softkey without changing positions of other softkeys
	NEW	Inserts a new softkey in the selected position, and moves all subsequent softkeys one position to the right. If either the Information Recall or the Setup softkey is in the last (15th) position, the softkey assignments move over one position, and the softkey formerly assigned in the 14th position is removed
	DELETE	Deletes the selected softkey, and moves all subsequent softkeys one position to the left. Has no effect on sole instance of Information Recall or Setup softkey
C	CLEAR	Opens the Softkeys Clear warning screen (Figure 3-52) where selecting OK permits softkeys to be reset to their default configuration

- One instance of each of the Information Recall and Setup softkeys must always present. To move one these softkeys, first use EDIT or NEW to assign it to a new position, then delete it from its original location.

The following Figures show the **Softkey New** and **Edit** screens, and the **Softkeys Clear** warning screen. The only difference between these screens, apart from the functions described in Table 3-1, is that the **Edit Softkey** screen shows the current assignment when it is accessed.

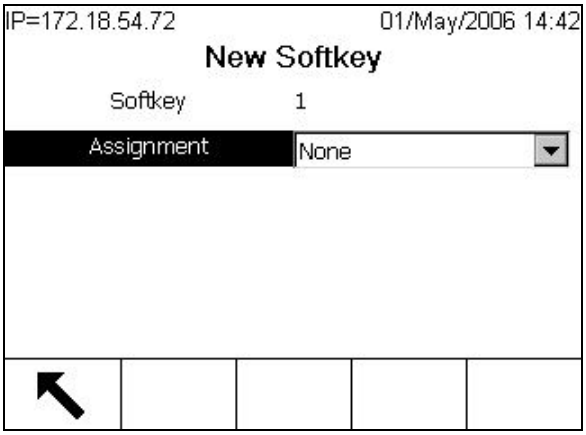

Figure 3-50: Softkey New

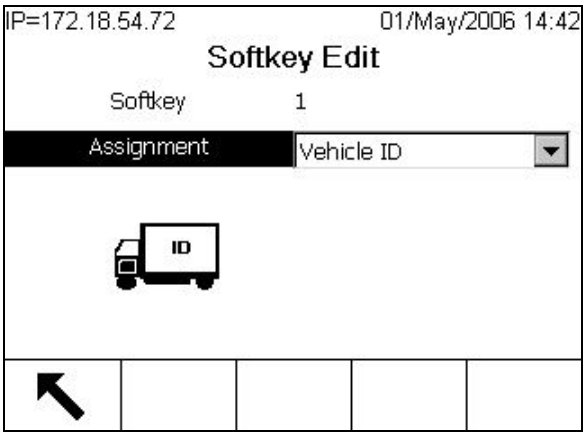

Figure 3-51: Softkey Edit

When the CLEAR softkey C is pressed on the **Softkeys** screen, the warning shown in Figure 3-52 appears.

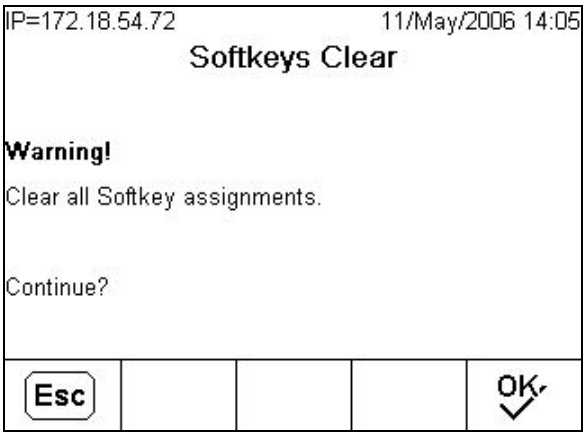

Figure 3-52: Softkeys Clear Warning

Pressing the OK softkey OK confirms the clear operation, and returns focus to the Softkeys screen, with the two non-removable softkeys present in whichever positions they were assigned when the Clear command was issued.

Pressing ESCAPE Esc aborts the operation, and returns to the Softkeys screen with existing assignments retained.

Communication

Output Templates

Output Template 1 is configured as for the basic functionality version of the IND780. Output Templates 2, 3, 4, 5 and 6 are set up for Drive-780 functions. These templates are described in the following sections.

Output Template 2

Output Template 2 (Figure 3-53) is set up to produce a record for Inbound transactions.

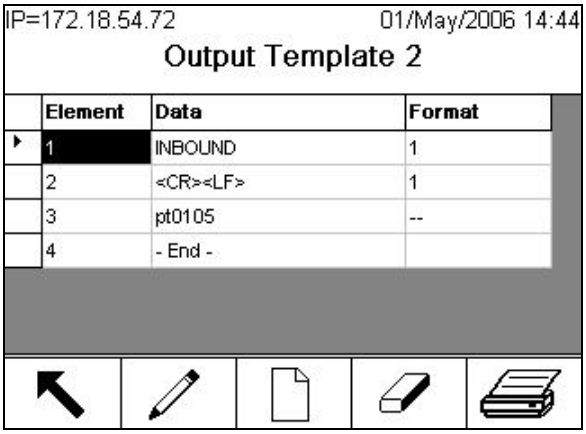

Figure 3-53: Output Template 2

The only data contained in this template is a header line (INBOUND), a carriage return and line feed, and a Shared Data name that calls the contents of Template 5.

For Strings and SDNames, the **Format** column indicates how the element will be aligned. For Characters, CR/LF and Strings, it also indicates the number of times the element will be repeated and, for Strings, their length. For non-default alignment, a number representing the length of the string appears in square brackets. In the example below, the string is defined as being four characters in length, and repeating twice:

2[04]	Left aligned
2[04]	Center aligned
2[04]	Right aligned

A Print Template defines a serial data stream that the IND780 sends to a printer.

The template can be customized by editing, adding or deleting rows, and it can be printed. Printing from this screen will print the format of the template, without the information defined by the Shared Data variable.

Figure 3-54 shows an example of the screen the opens when the EDIT softkey is pressed. Its fields are populated with the currently assigned values. The Output Template 2 New screen is identical in layout, but its fields are blank.

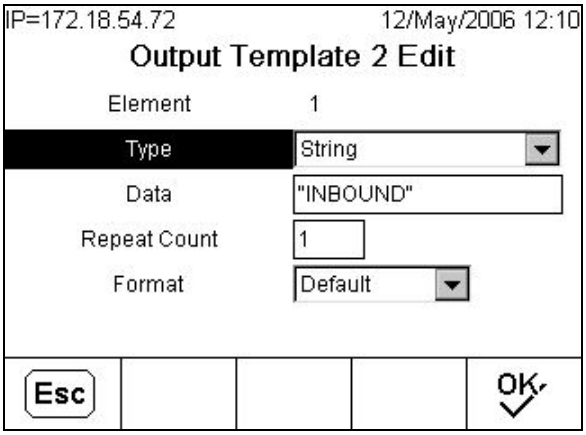

Figure 3-54: Output Template 2 Edit

The following information and settings are available in this screen:

- Further details about template editing are provided in the IND780 Technical Manual, Chapter 3.0, Configuration. The InSite Template Editor software provides a graphical means of editing templates, which may then be uploaded to the terminal.

Element	Row number – cannot be modified in either the New or the Edit screens
Type	String*****, Character, CR/LF, SDName, Special Character, String
Data [When **Type** = Character, SDName or String]	Editable alphanumeric data entry field
Data [When **Type** = CR/LF]	**CRLF,** non-editable
Data [When **Type** = Special Character]	01H-SOH*, 02H-STX, 03H-ETX, 04H-EOT, 05H-ENQ, 06H-ACK, 07H-BEL, 08H-BS, 09H-HT, 0AH-LF, 0BH-VT, 0CH-FF, 0DH-CR, 0EH-SO, 0FH-SI, 10H-DLE, 11H-DC1, 12H-DC2, 13H-DC3, 14H-DC4, 15H-NAK, 16H-SYN, 17H-ETB, 18H-CAN, 19H-EM, 1AH-SUB, 1BH-ESC, 1CH-FS, 1DH-GS, 1EH-RS, 1FH-US [These standard ASCII control characters are listed and defined in Appendix G of the **IND780 Technical Manual**, **ASCII Standard and Control Characters**]
Repeat Count [Displays if **Type** = Character, CR/LF, String]	Specifies the number of times the data repeats. E.g., can be used to print a separator line of asterisks.
Format [If **Type** = SDName, String]	Default*****, Center, Left, Right Defines the alignment of the SDName or String
Length [Displays if **Format** <> Default and Type = SDName or String]	Defines the length of the output data

Output Template 3

Output Template 3 is similar to Template 2, except that it is set up to produce a record for Outbound transactions, and it calls Print Template 6.

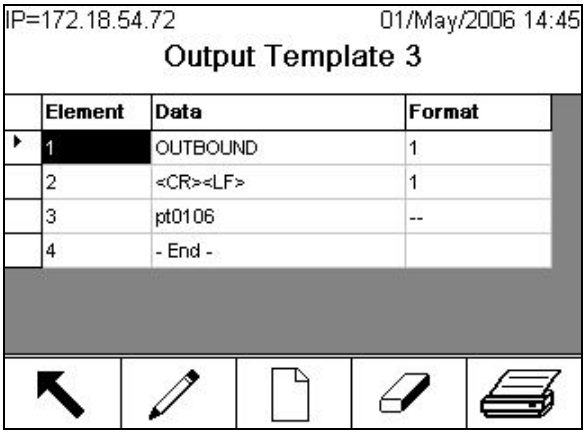

Figure 3-55: Output Template 3

Output Template 4

Output Template 4 is similar to Output Template 3, but it is used to produce a record for Transient Vehicle transactions – its header string is TRANSIENT.

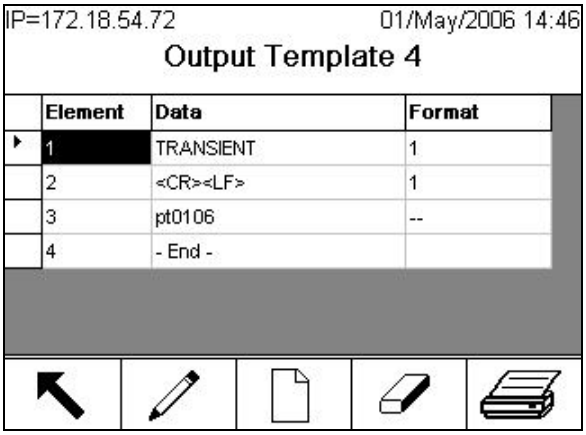

Figure 3-56: Output Template 4

Output Template 5

Output Template 5 defines a larger array of data than can be viewed in one screen. Use the UP and DOWN arrow keys to scroll through the template.

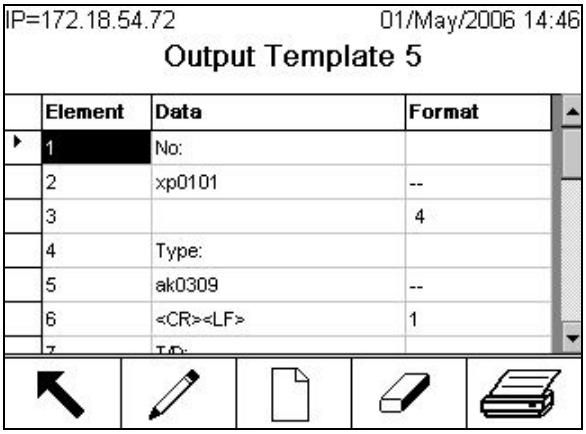

Figure 3-57: Output Template 5

Table 3-2 details the elements present in Output Template 5.

Table 3-2: Output Template 5 (pt0105) Definition

Data	Explanation [Format]
No:	[Text]
xp0101	Transaction number
	[4 spaces]
Type	[Text]
ak0309	Transaction type (Temporary, Vehicle ID, Transient, Index)
<CR><LF>	[New line]
T/D:	[Text]
ak0305	Time
	[4 spaces]
ak0306	Date
<CR><LF>	[New line]
ID:	
tx0102	Vehicle ID
	[4 spaces]
tx0114	Vehicle Description
<CR><LF>	[New line]
ak0301	Gross weight
	[space]
ak0304	Units
G	[Text]
<CR><LF>	[New line]

Figure 3-58 is an example of an INBOUND ticket generated using template 5:

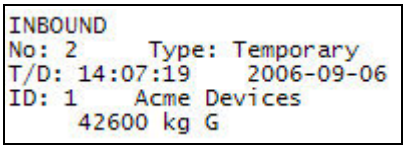

Figure 3-58: Ticket Generated Using Output Template 5

Output Template 6

Use the UP and DOWN arrow keys to scroll through Output Template 6.

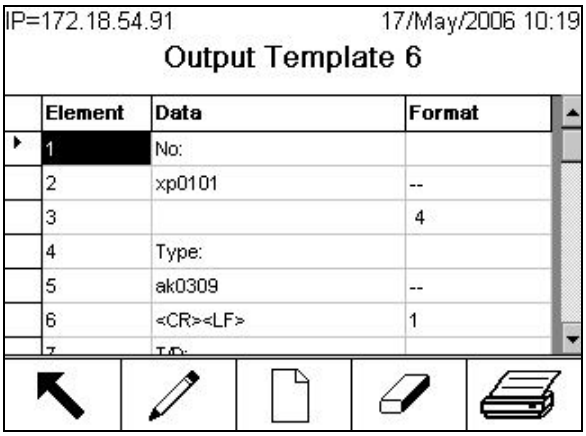

Figure 3-59: Output Template 6

Table 3-3 details the elements present in Output Template 6.

Table 3-3: Output Template 6 (pt0106) Definition

Data	Explanation [Format]
No:	[Text]
xp0101	Transaction number
	[4 spaces]
Type	[Text]
ak0309	Transaction type
<CR><LF>	[New line]
T/D:	[Text]
ak0305	Time
	[4 spaces]
ak0306	Date
<CR><LF>	[New line]
ID:	
tx0102	Vehicle ID
	[4 spaces]
tx0114	Vehicle description
<CR><LF>	[New line]

Data	Explanation [Format]
ak0301	Gross weight
	[space]
ak0304	Units
G	[Text]
<CR><LF>	[New line]
ak0302	Tare weight
	[space]
ak0304	Units
	[space]
ak0308	Tare type
<CR><LF>	[New line]
ak0303	Net weight
	[space]
ak0304	Units
N	[Text]
<CR><LF>	[New line]

Figure 3-60 is an example of an OUTBOUND ticket generated using template 6:

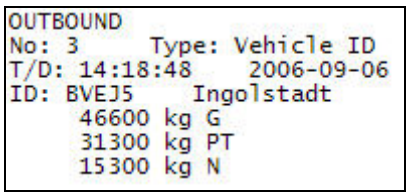

Figure 3-60: Ticket Generated Using Output Template 6

Shared Data Variables

Table 3-4 lists Shared Data variables that may be used in custom output templates for use with the Drive-780 application.

Table 3-4: Shared Data Variables for Use in Custom Templates

Data Field	SDName	Max. Length	Values
Gross Weight	ak0301	13	
Tare Weight	ak0302	13	
Net Weight	ak0303	13	
Unit	ak0304	3	
Time	ak0305	8	hh:mm:ss
Date	ak0306	10	yyyy-mm-dd
ScaleID	ak0307	21	
Tare Type	ak0308	2	(T or PT)
Transaction Number	xp0101	7	

Data Field	SDName	Max. Length	Values
Transaction Type	ak0309	9	Temporary, Vehicle ID, Transient, Index
Vehicle ID	tx0102	16	
Vehicle Description	tx0114	40	
A6 Table Name	dd0741	40	
A6 ID	dd0702	16	
A6 ID Descr	dd0703	40	
A7 Table Name	dd0841	40	
A7 ID	dd0802	16	
A7 ID Descr	dd0803	40	
A8 Table Name	dd0941	40	
A8 ID	dd0902	16	
A8 ID Descr	dd0903	40	
A9 Table Name	dd1041	40	
A9 ID	dd1002	16	
A9 ID Descr	dd1003	40	
Var1 Name	az0101	16	
Var1 Value	tx0115	16	
Var 2 Name	az0102	16	
Var 2 Value	tx0116	16	
Gross Weight 1	ak0310	13	Gross, Tare, Net in the Primary Unit
Tare Weight 1	ak0311	13	
Net Weight 1	ak0312	13	
Unit 1	ak0313	3	
Gross Weight 2	ak0314	13	Gross, Tare, Net in the Secondary Unit
Tare Weight 2	ak0315	13	
Net Weight 2	ak0316	13	
Unit 2	ak0317	3	
Inbound Weight	ak0318	13	Weight Date and time for the inbound part of the transaction
Inbound Date	ak0319	10	
Inbound Time	ak0320	8	
A6- Result	ak0401	13	Result of a commodity unit transaction
A6- Unit	ak0402	3	Commodity unit in the A6 table
Gross Weight	ak0301	13	
Tare Weight	ak0302	13	

Connections

The **Connections** screen is used to assign available ports to functions, to triggers that cause the output to occur, and to templates that format the output.

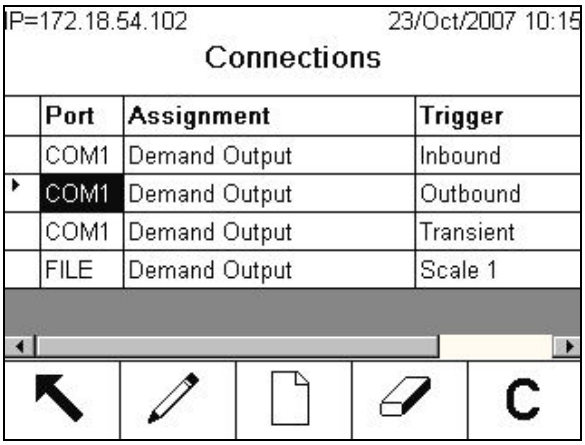

Figure 3-61: Connections

The default Connections setup configures a series of different options for the COM1 port. All use the COM1 port for demand output. COM1 is set to output data for Inbound, Outbound and Transient transactions, using the appropriate Output Templates, described above.

The terminal will automatically create a FILE port, demand output setting for each configured scale. This connection is always required for the Drive-780 to operate correctly.

Softkeys can be used to edit, add or delete connections, and to clear the entire table.

Figure 3-62 shows a typical **Connection New** screen. The fields available vary (see Table 3-5) depending on the Port selected and the Assignment set for it.

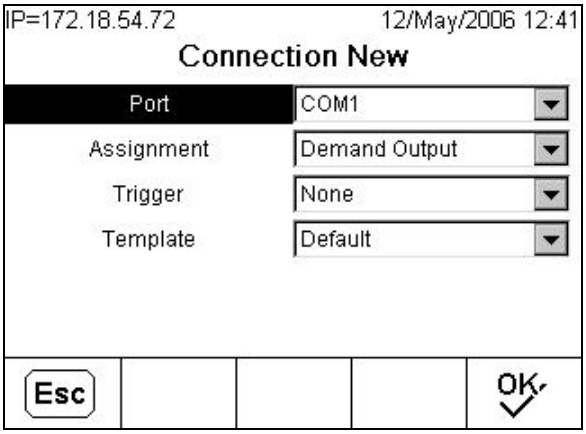

Figure 3-62: Connection New

Settings available in this screen are shown in Table 3-5.

Table 3-5: Connection Options by Port and Assignment

Port	Assignment	Trigger	Template	# of Nodes	Node Address	Checksum
FILE	Demand Output	None*, Scale 1 – Scale 4, Sum Scale				
COM1 COM2 COM3 COM4	None*					
	ASCII Input					
	Continuous Output	None*, Scale 1 – Scale 4, Sum Scale				Disabled*, Enabled
	Continuous – Multi 1					
	Continuous – Multi 2					
	Continuous – Template	None*, Scale 1 – Scale 4, Sum Scale	Template 1* – Template 10			
	Continuous – Extended				1* - 9	Disabled*, Enabled
	CTPZ Input					
	Demand Output	None*, Scale 1 – Scale 4, Sum Scale, Trigger 1 – Trigger 20	Default* Template 1 – Template 10			
	Keyboard Input					
	Remote I/O			1*		
	Reports					
	SICS	None*, Scale 1 – Scale 4, Sum Scale				
	Totals Report					
Enet1 Enet2 Enet3	Demand Output	None*, Scale 1 – Scale 4, Sum Scale, Trigger 1 – Trigger 20	Default* Template 1 – Template 10			
Enet4	Continuous Output	None*, Scale 1 – Scale 4, Sum Scale				
	Continuous - Template		Template 1* -- Template 10			
	Continuous - Extended				1* - 9	
	Continuous - Multi 1 Continuous - Multi 2					
EPrint	Demand Output	None*, Scale 1 – Scale 4, Sum Scale, Trigger 1 – Trigger 20	Template 1* -- Template 10			
	Continuous Output	None*, Scale 1 – Scale 4, Sum Scale				
	Continuous Template		Template 1* -- Template 10			
	Continuous - Extended				1* - 9	
	Continuous - Multi 1 Continuous - Multi 2					

If a demand output with a scale trigger connection is configured to print a standard template to a physical port, performing a vehicle transaction will automatically issue a print of the standard template also. If this operation is not desired, then it is recommended to use the custom print triggers and custom trigger softkeys instead,

to initiate a standard template printout independently. Using custom triggers to print a template will not affect the alibi records, table totals and transaction counters.

Continuous - extended output connections can be used with COM1 through COM4, Enet4 and Eprint ports. They extend the standard 17-byte continuous output format to 24 bytes. (An optional checksum is provided with COM1/2/3/4.) The additional bytes provide a node address and, optionally, custom application bits. This format supports control of traffic lights in the ADI320 and ADI420 remote scoreboards.

Data for continuous -extended connections takes the following form:

<SOH><ADR><SB-1><SB-2><SB-3><SB-4><WWWWWWWWW><TTTTTTTT><CR><CKS>

The Drive-780 application uses bit 0 and bit 1 of Status Byte 4 (**<SB-4>**) to indicate the status of the exit traffic lights for each respective scale – refer to Table 3-6. For example, when the exit traffic light is red, the IND780 transmits a 22Hex (34 Dec) for status byte 4 and when the light is green, it transmits a 21Hex (33 Dec). The continuous - extended output format is required if Drive-780 is used to control the traffic lights in the ADI320 and ADI420 scoreboards.

Table 3-6: Status Byte 4 Definition for Drive-780 Traffic Lights

Bit	Description
0	Green light on = 1, off = 0
1	Red light on = 1, off = 0
2	0
3	0
4	0
5	Always = 1
6	0

Chapter 4.0

Temporary ID Weighing

Basic Operation

Temporary ID Weighing

- To use this function, the IND780 must be configured so that the TEMPORARY ID softkey  is visible on the home screen. Refer to the **Terminal** section of Chapter 3 for softkey configuration information.

Temporary ID weighing is a 2-pass mode that uses the Temporary ID Table to record tare weights for Inbound transactions, and to recall those weights when the Outbound transaction is performed. The tare weight may be manually entered, or captured from the selected scale. (Refer to the **Temporary ID Table** section of Chapter 3 for detailed information about the this table).

Once the Outbound phase is complete, the vehicle ID is removed from the Temporary ID table.

Performing Basic Temporary ID Transactions

One Step ID Enabled

In this example, trucks are arriving at the facility full and leaving empty. Tare values for the trucks are not known ahead of time, and it is not necessary to record additional (user-defined table) data with the transaction.

The objective is the fastest possible processing of incoming trucks; therefore, One Step ID is enabled (in the Temporary ID Table configuration screen).

Inbound Process

1. Once the vehicle is on the scale, press the TEMPORARY ID softkey  .
2. A "Working" message displays briefly, and then a confirmation screen like the one shown in Figure 4-1 appears, with a number in the ID field.

- Note that the ID number is assigned automatically by the IND780drive, and cannot be edited.

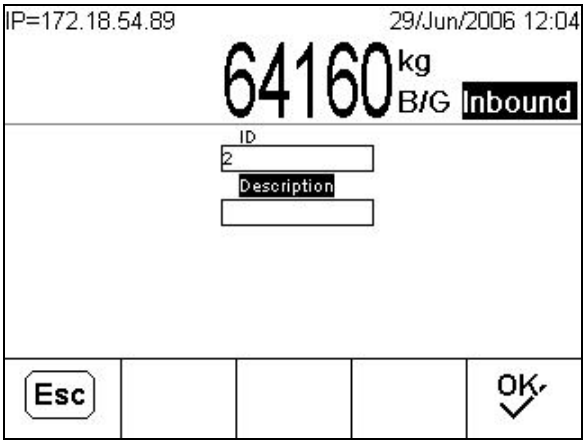

Figure 4-1: Temporary ID Transaction, One Step ID Assigned

3. Press ENTER to select the DESCRIPTION field (if enabled in Setup) and, if required, type a description. Press ENTER again.
4. Press the OK softkey OK to complete the transaction. "Saving Transaction" and "Printing…" messages will appear in turn, and then the home screen will reappear.

Outbound Process

When using one-step ID, the outbound process is as follows:

1. Enter the Temporary ID directly, using the IND780's keypad or optional external keyboard,
2. Press the Temporary ID softkey. The inbound weight is retrieved from memory. The Description field may be selected and edited at this stage.
3. Press OK OK to complete the transaction and print the outbound ticket.

- If the vehicle's inbound weight has been stored, but the ID is not known, enter a value that is clearly not in the database and then press the Temp ID softkey Temp ID. After the terminal determines that no such record exists, use the Table Search softkey to locate the desired record.

One Step ID Disabled

In this case, both the ID and a description (if enabled) can be entered by the user during the Inbound process. When the Temporary ID softkey Temp ID is pressed during the Outbound process, the ID field appears and the user-assigned ID entered. Alternatively, the ID may be entered directly, and the Temporary ID softkey then pressed to recall the record.

1. With the vehicle on the scale, enter an unused temporary ID (e.g. truck's license plate number).
2. The terminal will search for that ID, then return an "ID not found" message. Press the NEW softkey. If no ID was entered, pressing the NEW softkey will automatically generate an ID.
3. The description field (Desc:) will appear (if enabled in Setup). Enter a description, and press Enter.
4. Finally press OK to save the inbound weight and print the inbound ticket.

- If the vehicle's inbound weight has been stored, but the ID is not known, press the Temp ID softkey and then enter a value that is clearly not in the database. After the terminal determines that no such record exists, use the Table Search softkey to locate the desired record.

With User-Defined Tables and Variables

User-defined tables are used to store the net weight of transactions in separate locations. These tables allow tracking of weights based on up to 4 characteristics, each characteristic being represented by a table (Figure 4-2).

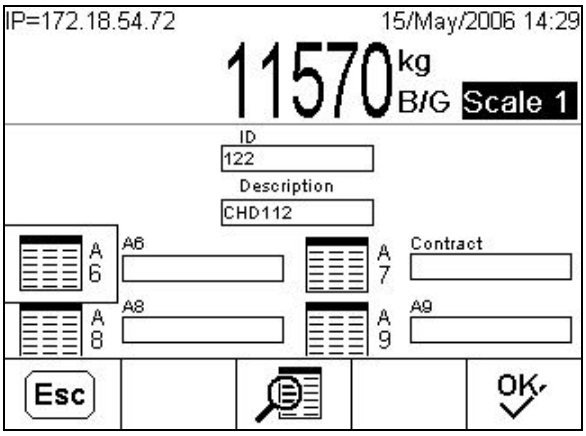

Figure 4-2: User-Defined Tables – Table Data Screen

Note that the Temporary ID table does not accumulate totals. However, total weight and number of transactions are stored for each of the A6-A9 tables. In addition to information stored in these tables, two fields of variable information (Var1 and Var2) can be associated with each transaction. No totals or counts are tracked for these variables but they can be printed as part of the Inbound or Outbound templates. In the screen shown, Var1 and Var2 have been assigned (in setup at Application > Drive-780 > General) labels "Operator" and "Shift."

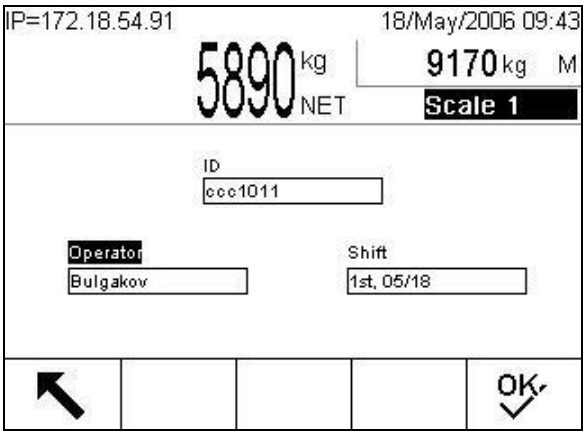

Figure 4-3: Variable Entry Fields

User-defined table records and variables are associated with the Inbound and/or Outbound transaction in setup at Application > Drive-780 > Inbound *or* Outbound. For table and variable data to be entered during the Inbound Process, an entry screen appears after the Temporary ID number is assigned and a description entered. For these to be accessed during the Outbound Process, an entry screen appears after the Temporary ID record is retrieved from memory.

After data has been entered, all information associated with the transaction is presented in a confirmation screen (Figure 4-4). If the table values need to be edited, press the Tables softkey, A6-A9. To edit variable entries, press the Variables softkey 1&2. After the information is verified, press the OK softkey OK to complete the process and print the transaction.

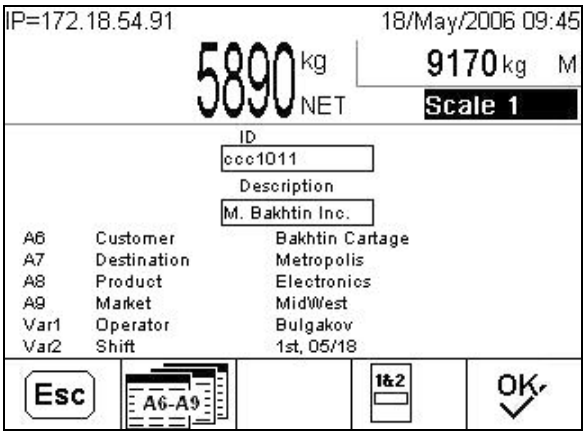

Figure 4-4: Data Confirmation Screen

Deleting Records with Expired Tares

If Auto Deletion of expired tare records is disabled, a supervisor may wish to generate a report of all trucks in the Temporary ID database that have departed and should be cleared from the database.

1. In setup, access Application > Drive-780 > Database > Temporary ID Table.
2. Press the View Table softkey.

3. In Search Field 1, select Expiration (date) as the search filter. The Data operator field may be used to select a range of dates, or a particular date, by using a comparative operator such as <=, or simply =. In the Data entry field, type the date
4. Press the Table Search softkey  . A table view will appear, including only those records matching the criteria set in step 3.
5. The list of records can now be printed as a report, and records can be deleted using the DELETE softkey  .

Chapter 5.0

Vehicle ID Weighing

Basic Operation

Vehicle ID Weighing

- To use this function, the IND780 must be configured so that the VEHICLE ID softkey  is visible on the home screen. By default, this softkey appears in the first position on the first softkey row. Refer to the **Terminal** section of Chapter 3 for softkey configuration information.

Vehicle ID weighing uses the Vehicle ID Table, where vehicle IDs, descriptions, permanently stored tares, and references to user-defined tables, are entered prior to operation. If totalization is enabled for the table, totals of vehicle weights are also maintained in the Vehicle ID Table. Refer to the **Drive-780 Database** section of Chapter 3 for detailed information about this table. Total weight and number of transactions are also stored in each of the A6-A9 tables, if they are enabled.

Performing a Vehicle ID Transaction

To start a Vehicle ID mode transaction, a vehicle identifier must be entered in the ID field (Figure 5-1). This can be done in either of two ways:

- Press ENTER to change focus to the ID field, enter the ID, then press the VEHICLE ID softkey  .
- Press the VEHICLE ID softkey, enter the ID, then press ENTER.

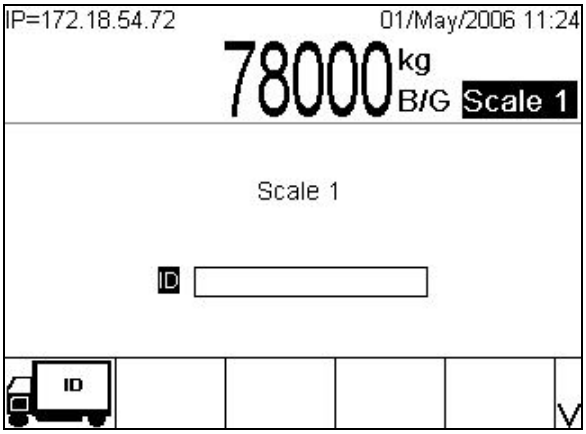

Figure 5-1: Vehicle ID Mode, Initial Screen

With the field selected, an ID may be entered using an external keyboard or the alpha keys that appear (Figure 5-2). ID entry is not case-sensitive.

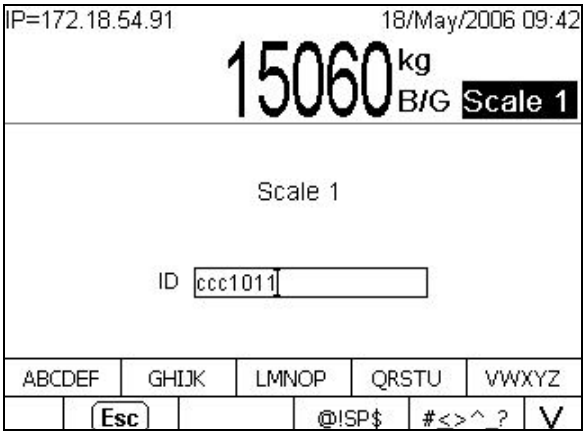

Figure 5-2: Vehicle ID Entry, Alpha Keys Showing

If the ID is not found in the Table, an "ID not found" prompt (Figure 5-3) displays.

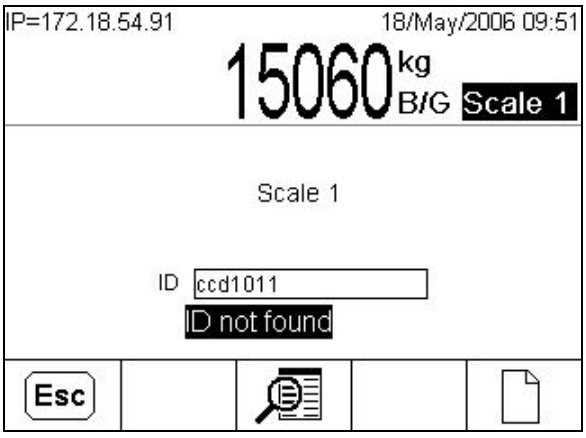

Figure 5-3: ID Not Found Prompt

Here, the operator has three options:

Esc ESCAPE	When pressed, displays a "Clear Scale?" prompt with ESCAPE and OK softkeys showing: • If **Traffic Control** is disabled, ESCAPE and OK function in the same way, returning the view to the initial screen (Figure 5-1), where the transaction can be re-started. • If **Traffic Control** is enabled, pressing OK releases the vehicle currently on the scale and abandons the transaction. The view returns to the initial screen (Figure 5-1). Pressing ESCAPE returns to the initial screen without releasing the vehicle from the scale; the transaction can be re-started.
TABLE SEARCH	Opens the **Vehicle ID Table/Search** screen, permitting the operator to search for a valid ID. Table entries cannot be modified here.
NEW	Opens the **Vehicle ID New** screen (Figure 5-4), permitting the operator to create and save a new Vehicle ID record in the table. This softkey is only available if **Runtime Additions** is enabled in the Vehicle ID Table setup screen.

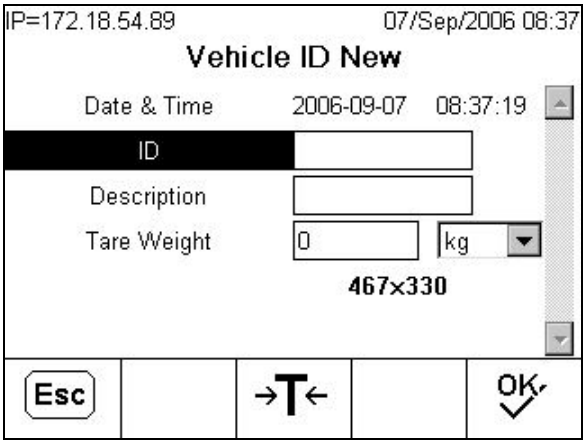

Figure 5-4: New Vehicle ID Screen

For further information on creating Vehicle ID Table entries, refer to the **Vehicle ID Table** section of Chapter 3.

If a Vehicle ID is entered while the scale is below the threshold weight, and the VEHICLE ID softkey is pressed, an error message like the one shown in Figure 5-5 appears.

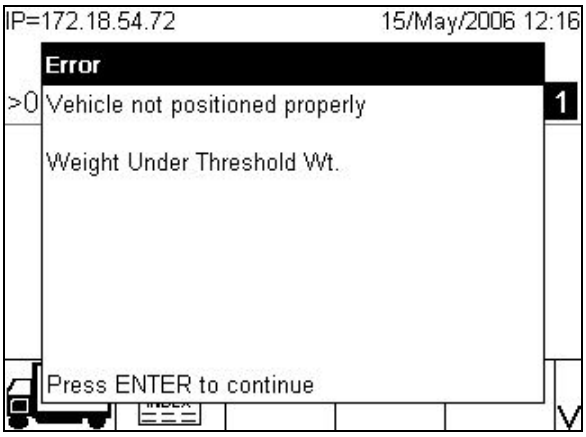

Figure 5-5: Vehicle ID Mode, Under Threshold Weight

Once a vehicle is on the scale and its ID entered, touching the VEHICLE ID softkey causes the IND780 to search its Vehicle ID Table and, if the ID is valid, to display all table data, including Tare weight, associated with that ID (Figure 5-6). The table name is configured in setup – refer to the **Drive-780 Database** section of Chapter 3 for details on setting up tables.

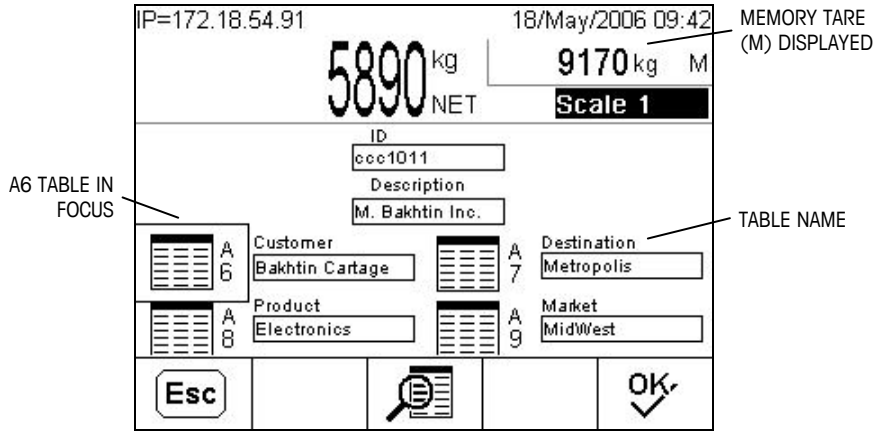

Figure 5-6: Vehicle ID Found, Data Displayed

In this screen, the UP and DOWN arrow keys can be used to select each of the Tables A6 – A9 in turn. (In Figure 5-6, a rectangular outline indicates that Table A6 is selected.) With a table selected, the TABLE SEARCH softkey can be used to filter and view (but not modify) records in that table, and to associate them with this transaction.

Pressing the OK softkey OK displays a screen (Figure 5-7) in which alphanumeric Var1 and Var2 entries of up to 16 characters can be made for the transaction. Note that the variables are labeled with names configured in setup at Application > Drive-780 > General. Use the UP and DOWN arrow keys to toggle between the two entry fields.

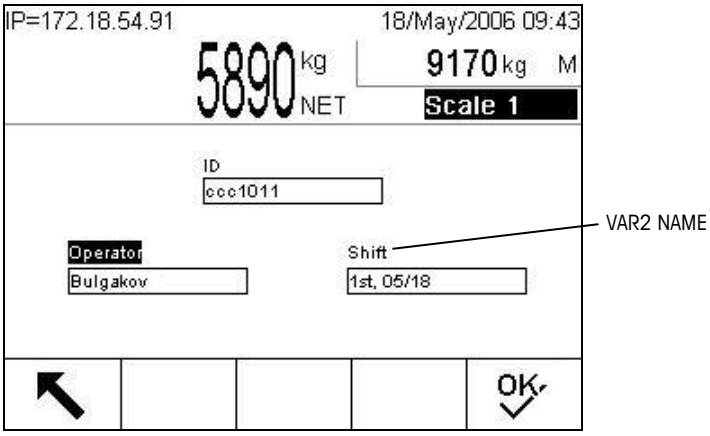

Figure 5-7: Variable Entry Screen

Finally, pressing OK again displays a validation screen like that shown in Figure 5-8. The transaction is ready to be completed by pressing the OK softkey OK again. All the data retrieved from the Vehicle ID and A6-A9 tables, as well as the variable information entered on the previous screen, is now displayed, ready to be associated with the transaction.

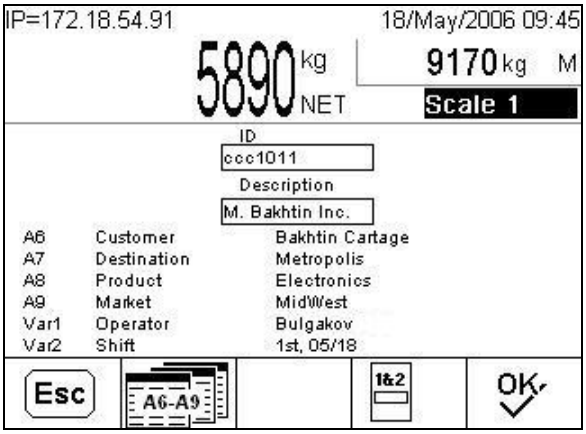

Figure 5-8: Vehicle ID Validation Screen

From this screen, the A6-A9 and Var1/Var2 values can still be edited. Press the RETURN TO A TABLE softkey A6-A9 to return to the data display screen (Figure 5-6), where the A6-A9 table IDs can be changed, and the RETURN TO VARIABLE 1&2 softkey to open return to the variable entry screen (Figure 5-7). Pressing OK in either of those screens returns to this point.

To record the transaction, press OK. If the scale is not in motion, a prompt reading "Saving Transaction…" will appear briefly, and the screen will revert to the initial Vehicle ID screen shown in Figure 5-1. If the scale is in motion, an error message will display – "Print Failed, Scale in Motion". Pressing ENTER closes the message and displays a prompt "Clear Scale?" Select either ESCAPE Esc to return to the

validation screen, or OK to return to the ID entry screen and start the transaction again.

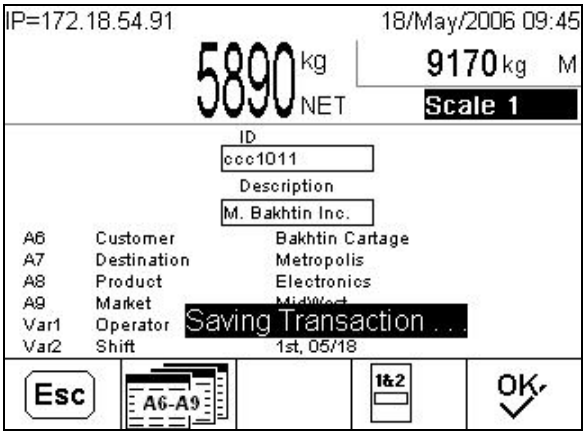

Figure 5-9: Saving Transaction

A Transaction Table record like the one shown in Figure 5-10 is generated. This illustration has been altered to show all available columns. In practice, it is necessary to use the LEFT and RIGHT arrow keys to scroll the screen horizontally to view additional columns of data. Scrolling RIGHT at the end of a row wraps the view to the beginning of the next row, if there is one. If an optional external keyboard is used, the PAGE UP and PAGE DOWN can be used to scroll through the table one page (6 records) at a time.

The A6-A9 table columns contain the ID reference numbers, and not the actual data provided on-screen for the transaction. Using the PRINT softkey to generate a hard-copy of the records produces a print-out that includes the A6-A9 ID numbers.

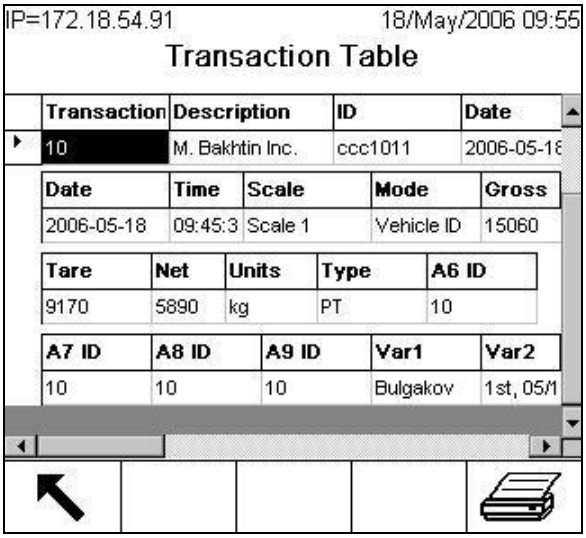

Figure 5-10: Transaction Table Record

Sample Ticket

Figure 5-11 shows an example of a ticket produced by the Vehicle ID weighing process.

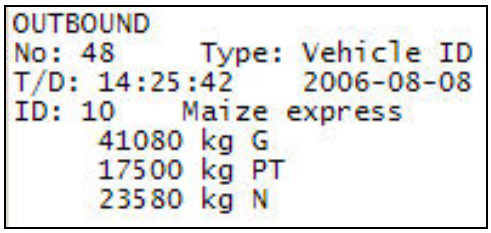

Figure 5-11: Vehicle ID Weighing Transaction Ticket

Two-Pass Vehicle ID Weighing

If the vehicle's record in the Vehicle ID Table has a Tare Value set to zero, and **Store Tare on 2nd Pass** is set to **Prompt** in the Vehicle ID Table configuration screen, the first transaction using this ID is assumed to be as an Inbound transaction. In this case, during the Outbound side of the transaction, the IND780 will prompt the operator "Save this tare weight in the Vehicle ID Table?" If the operator answers YES, the tare weight is stored permanently in the Vehicle ID Table. If the user answers NO, the tare weight in the table resets to zero and subsequent transactions will be Inbound and Outbound in turn. To keep all further transactions using this ID in Inbound/Outbound (2-pass) mode, the operator must always answer NO.

If **Store Tare on 2nd Pass** is set to **Never**, the tare is not stored during the Outbound process, and a new tare must be entered or captured every time the vehicle ID is used for a transaction.

If **Store Tare on 2nd Pass** is set to **Always**, the prompt does not appear and the inbound value is automatically set as the Tare. For receiving, Net Sign Correction can be used (refer to **Net Sign Correction for Shipping and Receiving** in Chapter 1) to ensure that the resulting net weight is always a positive value.

Index Weighing

- The IND780 must be configured so that the INDEX softkey 

is visible on the home screen. Refer to the **Terminal** section of Chapter 3 for softkey configuration information.

Index Weighing uses the Index Table during the Outbound process. This table enables a relational ID to be used to locate values for enabled table information, including Vehicle ID and A6-A9 tables (if configured in Setup). The Index and A6-A9 tables are described in detail in the **Drive-780 Database** section of Chapter 3.

Performing an Index Transaction

With the vehicle on the scale, press the INDEX softkey to change focus to the ID entry field (Figure 5-12).

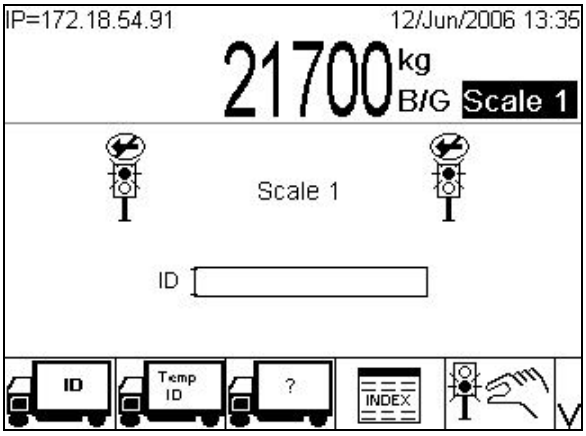

Figure 5-12: Index ID Entry, Initial Screen

A record may be selected in one of two ways:

- If the Index ID is **known**, enter it and press ENTER. A "SEARCHING…" prompt displays briefly (Figure 5-13) before the validation screen (Figure 5-16) appears.

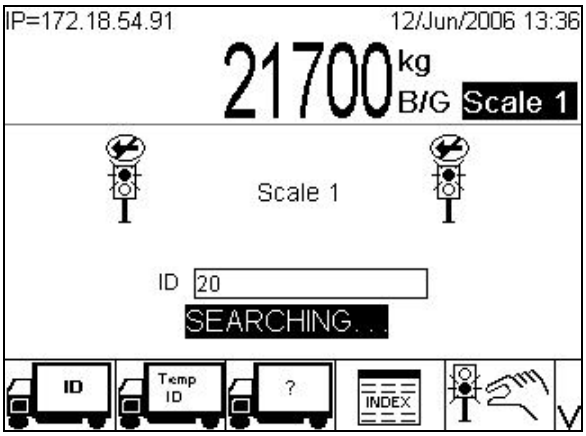

Figure 5-13: Searching for Index ID

- If the ID is **not known**, simply press ENTER to display the TABLE SEARCH softkey. Press TABLE SEARCH to open the **Index ID Table/Search** screen. Select the desired filtering options (refer to the **Drive-780 Database** section of Chapter 3 for details on table searching). Press the TABLE VIEW softkey and, when the table displays, use the DOWN and UP arrow keys to select the desired record.

Once the record is in focus, press OK to select it. A prompt ("Loading, please wait…") appears briefly, then a screen like the one shown in Figure 5-14 appears.

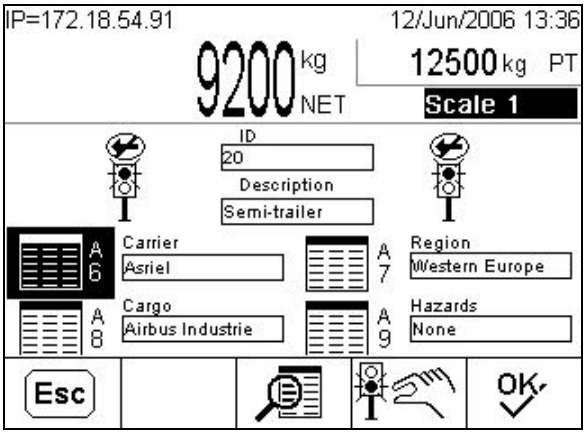

Figure 5-14: Index Transaction – Table Data Screen

If an invalid ID is entered, the "ID not found" prompt displays, and ESCAPE and TABLE SEARCH softkeys appear. Either search the table, as described above, or press the ESCAPE softkey [Esc] and press OK when the "Clear Scale?" prompt appears, to abandon the transaction and start again.

- At each step of the transaction, an ESCAPE [Esc] softkey allows the operator to abandon the transaction after responding to the "Clear Scale?" prompt. Pressing the OK softkey continues to the next step.

In the table data screen, if different table references are required for the transaction, the A6-A9 Tables may be selected in turn using the UP and DOWN arrow keys. When a table is selected, pressing the TABLE SEARCH softkey opens the search screen associated with that table, permitting a new table entry to be found and associated with the transaction. Index Table entries cannot be modified here.

Press the OK softkey to display the Variable entry screen (Figure 5-15), where additional information may be associated with the record.

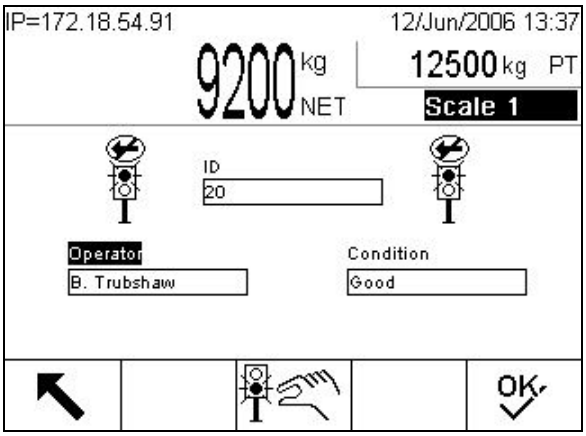

Figure 5-15: Variable Entry Screen

Press the OK softkey OK again to display a validation screen like the one in Figure 5-16.

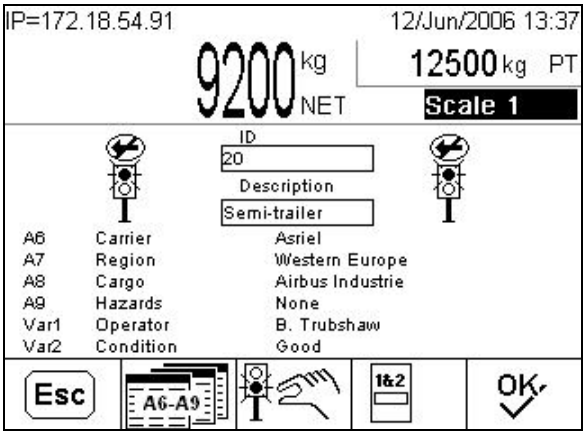

Figure 5-16: Index Transaction Validation Screen

From here, it is possible to return to the A6-A9 table screen (A6-A9) and to the variables entry screen (1&2) in order to modify the data associated with the index transaction.

If all the information is correct, press the OK softkey OK to perform and record the transaction. The "Saving transaction…" and "Printing…" prompts will appear in turn (Figure 5-17), and then the initial ID entry screen (Figure 5-12) will display.

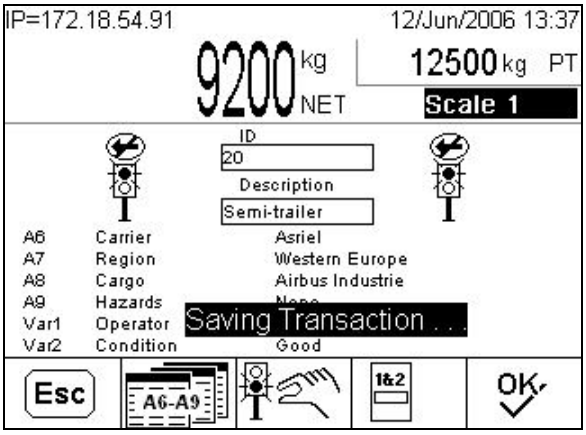

Figure 5-17: Saving Transaction

Chapter 6.0

Transient Vehicle Weighing

Basic Operation

Transient Vehicle Weighing

Transient Vehicle Weighing is a one-pass (Outbound-only) process used for vehicles that should not be included in totals.

Performing Transient Vehicle Weighing

With the vehicle on the scale, press the TRANSIENT VEHICLE softkey  .

A prompt to enter a vehicle description (**Desc:**) displays (Figure 6-1). Use an external keyboard or the alpha keys to enter a description for the transient vehicle. Press ENTER to complete the entry.

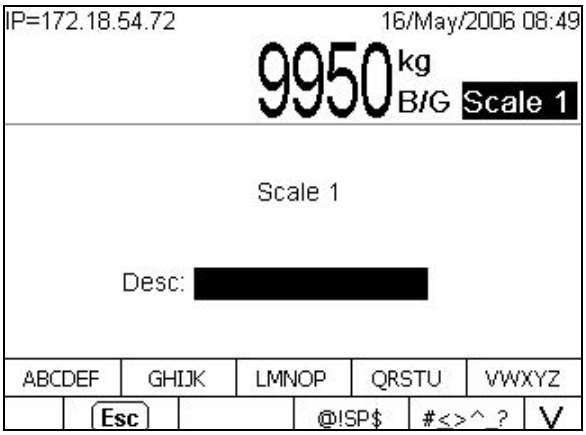

Figure 6-1: Transient Vehicle Weighing – Description Entry Field

A screen appears like the one shown in Figure 6-2. Only those Tables enabled in setup (at Application > Drive-780 > Transient) are available.

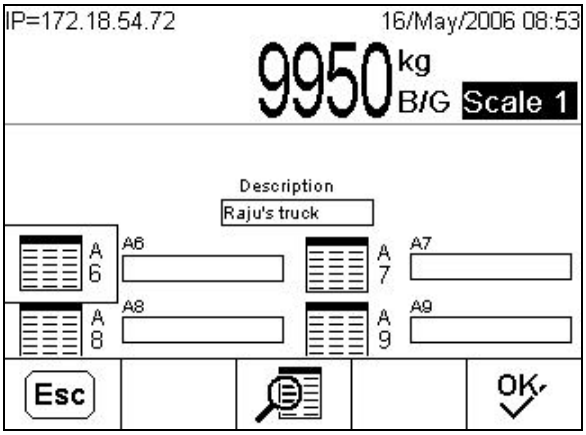

Figure 6-2: Transient Vehicle Data Entry Screen

Once Table data has been selected, pressing OK either opens the Variable entry screen (if enabled), or the transaction validation screen. When the Transient vehicle transaction is completed, weight totals will not be recorded but the transaction will appear in the Transaction Table.

Chapter 7.0

Advanced Applications

Operation with Traffic Control

Lights/Weight

If Lights/Weight is the selected Traffic Control Type, the presence of a vehicle on the scale triggers the control sequence. The vehicle's weight must pass the threshold set in the Traffic Control configuration screen in order to trigger the sequence. The transaction processes are the same as those described in the **Vehicle ID**, **Temporary ID**, **Index** and **Transient Vehicle** sections above. The sequence of illustrations below shows how a typical weighing transaction – in this case based on an Index record – interacts with the Lights/Weight traffic control.

Traffic Control, Multiple Scales

Figure 7-1 shows Lights/Weight traffic control enabled with two scales in use. Scale 1 has a vehicle on it ready for the start of a transaction, and its lights are red; Scale 2 is idle, and both its lights are green.

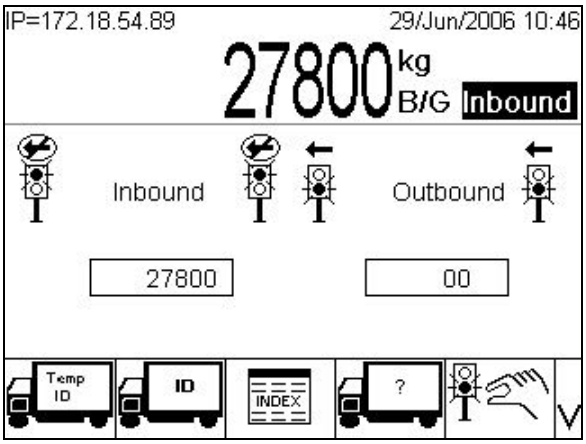

Figure 7-1: Traffic Control by Lights, Two Scales in Use

Typical Automatic Lights/Weight Sequence

In Figure 7-2, the scale is idle. Because the **Enter Idle State** and **Exit Idle State** are both set to their default (**Green/Up**) in the **Traffic Control** configuration screen, the entry and exit lights both show green.

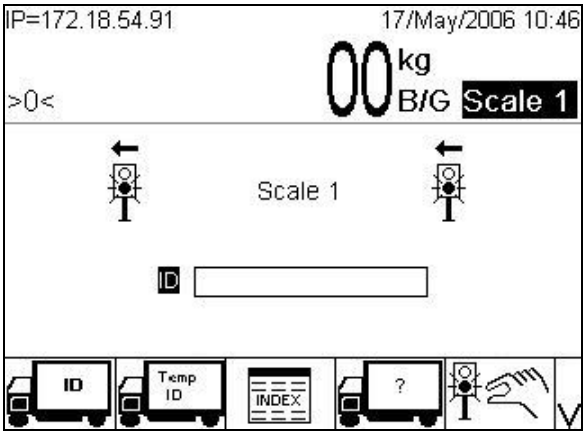

Figure 7-2: Scale in Idle State

Figure 7-3 shows the error message that appears if an ID entry is attempted while the scale is below its threshold weight. A transaction cannot be initiated without a vehicle present on the scale.

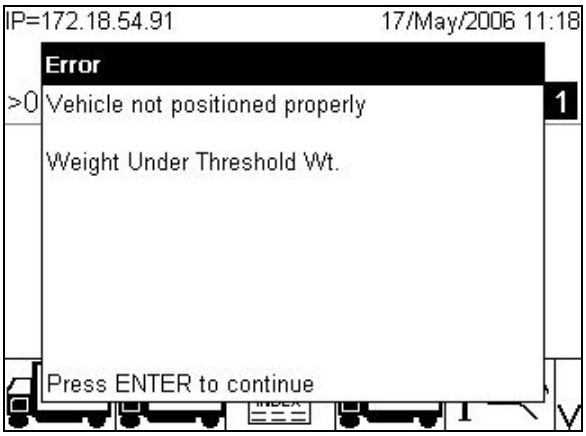

Figure 7-3: ID Entry Attempted Without Vehicle on Scale

In Figure 7-4, a vehicle has moved onto the scale. Its gross weight exceeds the control trigger threshold, and both lights now show red.

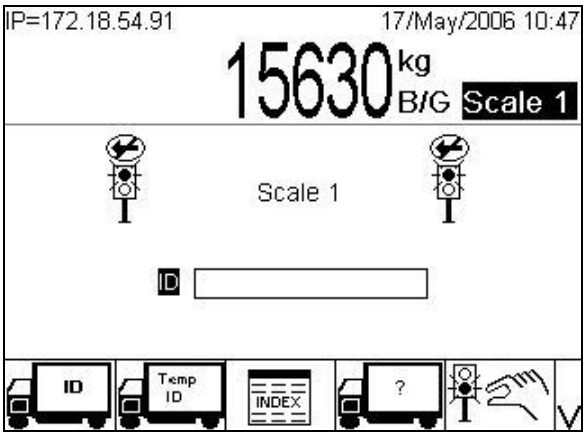

Figure 7-4: Vehicle On Scale, Lights Triggered

In Figure 7-5, an ID entry is being made.

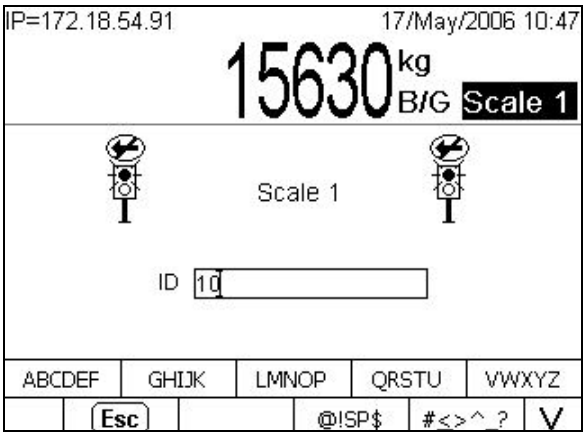

Figure 7-5: Making the Index Entry

Figure 7-6 shows the table data screen with all its fields populated – either automatically, as in an Index transaction, or manually. Because the transaction has not been completed, both lights remain red.

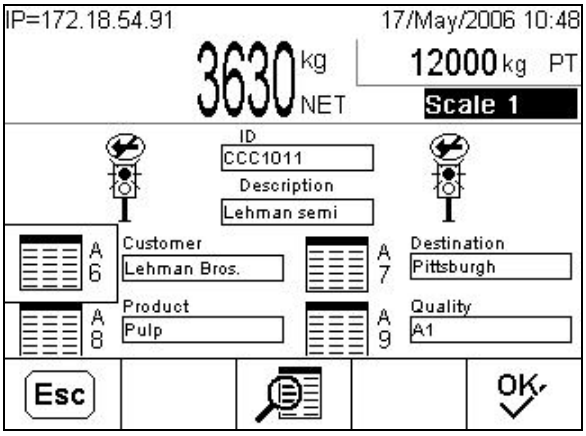

Figure 7-6: Table Data Entry Complete

If, in Figure 7-6, the ESCAPE softkey Esc is pressed, a "Clear Scale?" prompt appears at bottom left, as seen in Figure 7-7. Pressing the OK softkey now will abandon the transaction and set the exit light to show green (as in Figure 7-10), releasing the vehicle from the scale.

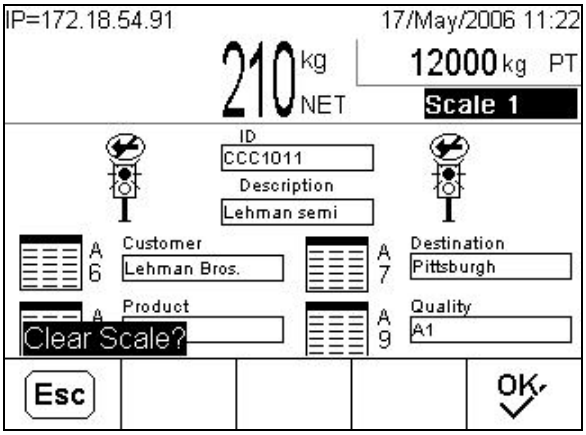

Figure 7-7: Clear Scale Prompt

If, in Figure 7-6, the OK softkey OK is pressed, the variable data entry screen appears, if variable fields have been enabled in setup (Figure 7-8).

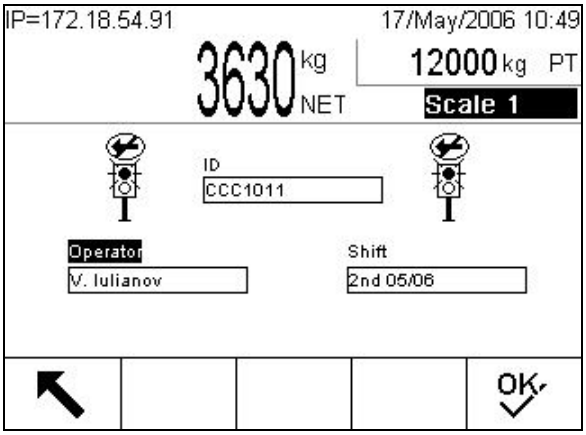

Figure 7-8: Variable Entry Complete

Figure 7-9 shows the validation screen. Here, a complete list of data and variables associated with the transaction is displayed. From here, the transaction can be completed, or entries modified using the A6-A9 and 1&2 softkeys.

- Note that, if the scale is in motion, the transaction cannot be completed, and an error message displays.

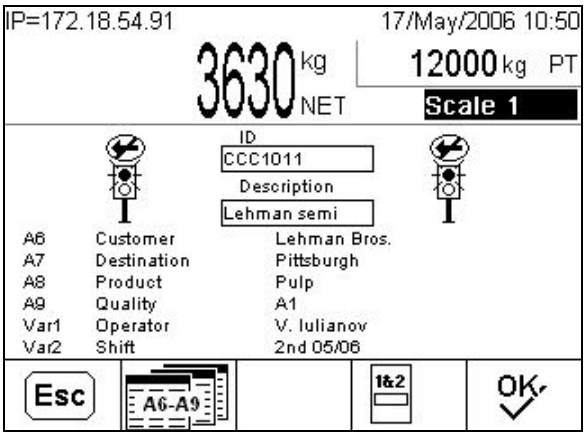

Figure 7-9: Transaction Validation Screen

In Figure 7-10, the validation screen OK softkey OK has been pressed, and the transaction has been recorded and printed. The vehicle is now released, and the exit light shows green. The entry light remains red.

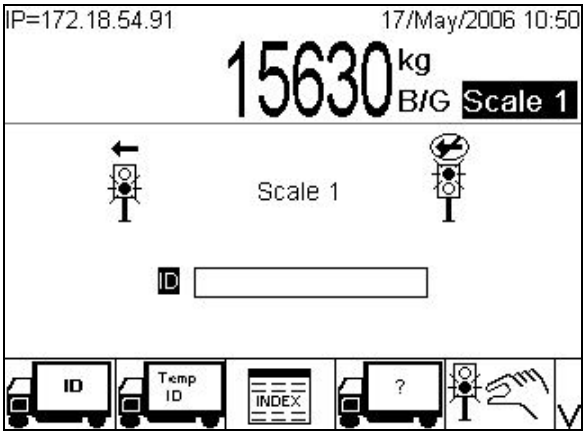

Figure 7-10: Transaction Recorded and Printed, Vehicle Released

In Figure 7-11, the vehicle has left the scale. As the weight has fallen beneath the trigger threshold, both lights have returned to their idle state, and show green.

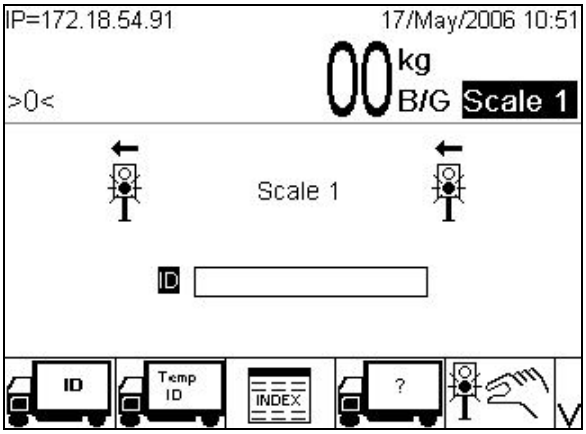

Figure 7-11: Vehicle Off Scale, Idle State Resumed

Gates/Loops

If Control Type is set to Gates/Loops, the control sequence is triggered by I/O connected to embedded loops or photo-eyes. These detect the presence of a vehicle, and change the state of gates to control the movement of vehicles through the scale/s.

The relationship between input from the loops and the state of the gates is determined by how the Discrete I/O connections are set up – refer to the **Discrete I/O** section in Chapter 3. By default, four Discrete Inputs are set up to read Entrance and Exit loops for Scales 1 and 2; each input is defined so that positive polarity is interpreted as True.

If **Enter Idle State** and **Exit Idle State** are both set to their default (**Green/Up**) in the **Traffic Control** configuration screen, the entry and exit gates are both open, as seen in Figure 7-12.

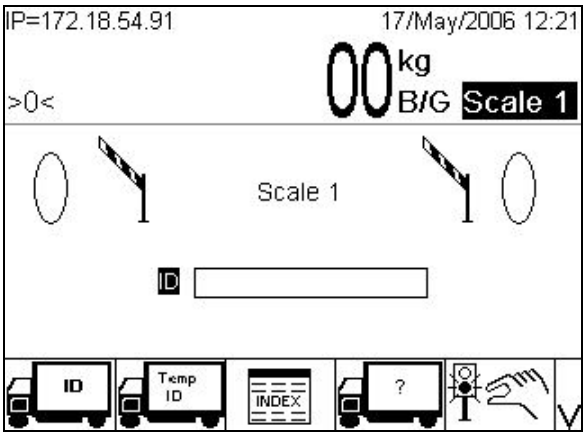

Figure 7-12: Gates Open

When one loop is activated, the opposite (exit) gate is closed. Once the first loop is cleared, the entrance gate is also closed. A threshold weight value is used to deactivate the loops from changing the I/O once the scale weight is above threshold. In this case, the loops signals are ignored. This capability is used to prevent the loops from activating the I/O during a transaction.

If another vehicle approaches the scale and activates the loop, the loop signal is ignored and the gate remains closed. Once the transaction is completed and the truck leaves the scale, the entrance gate will open.

Figure 7-13 shows the screen with the gates closed, after a vehicle has entered the scale and triggered the loops.

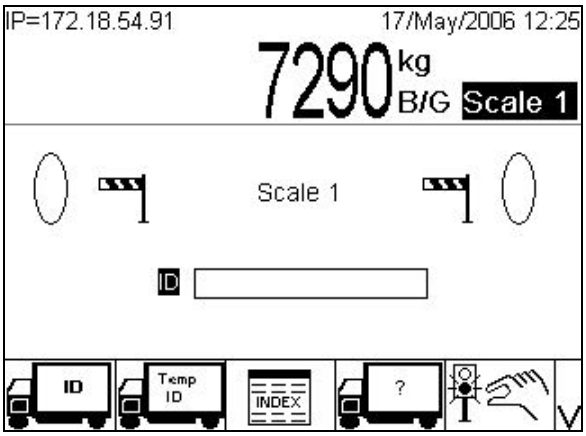

Figure 7-13: Gates Closed

Manual Control of Lights or Gates

To control the lights or gates manually, manual control must be enabled in the Traffic Control configuration screen, and the MANUAL LIGHTS softkey available on the home screen. Note the following points:

- Manual control is **not** integrated with the transaction sequence.
- The state of the lights or gates when using manual control is **not** related to weight readings from the scale or Discrete I/O input from the loops.
- It is critical that the gate safety circuit be wired so that the gate **cannot** be manually closed while the loop is covered
- When Manual control is initiated by pressing the softkey, it affects traffic control for the currently selected scale

In the following example, lights are shown.

Example of manual control of lights

Pressing the MANUAL LIGHTS softkey opens a screen like that shown in Figure 7-14. The entry and exit lights are in the same state as they were before the MANUAL LIGHTS softkey was pressed – in this case, both red (since a vehicle is on the scale).

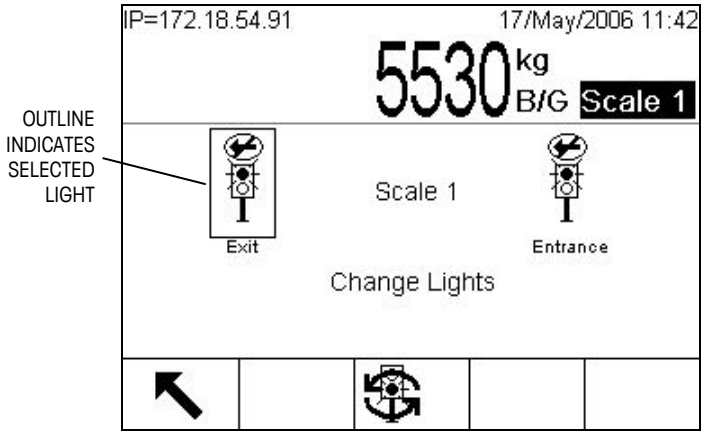

Figure 7-14: Manual Control of Lights, Initial Screen

In manual control, the following functions are available:

EXIT	Returns view to the automatic light control screen; lights return to automatically-determined state
UP/DOWN ARROW KEYS	Toggle between Exit or Entrance light, selection indicated by outline around light
SWITCH LIGHTS	Changes the state of the selected light – red to green or green to red

Positioning

If Traffic Control Type is set to Positioning, inputs from loops or photoelectric sensors are used to detect whether the vehicle is properly positioned on the scale. When the vehicle is on the scale and the threshold weight is exceeded, the vehicle transaction can be started. However if any of the loops are triggered by the out-of-position vehicle, it will not be possible to complete the transaction. An on-screen prompt (Figure 7-15) indicates when the vehicle is not positioned properly for the weighing, and the Drive-780 operation is stopped until the interlock is cleared.

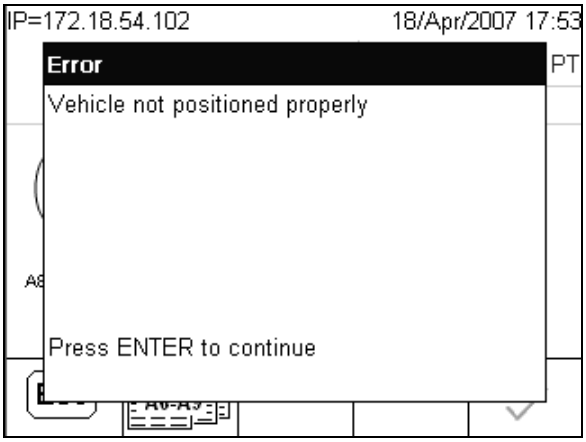

Figure 7-15: Vehicle Out of Position

If in Figure 7-15, the ENTER key is pressed, a "Try again?" prompt appears at the bottom left, as seen in Figure 7-16. The input loops must first be cleared at this point before pressing the OK softkey to complete the transaction. Both loops must be inactive for the transaction to complete. Pressing the ESC softkey in Figure 7-16, will allow a means to abort the transaction.

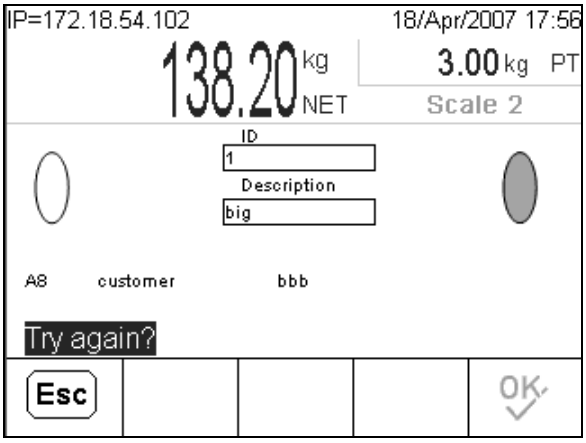

Figure 7-16: Try Again Prompt

Timer Control

Timer control settings are described in detail in the **Timer Control** section of Chapter 3, **Configuration**. Depending on the **Traffic Control** Type setting, it is possible to configure an Exit Timer, a Zero Time Delay, and an Excursion Timer.

The **Exit Timer** can be used when Traffic Control is set to Lights/Weight. Its default value is 30 seconds, and it only affects the controls if, after a transaction is completed, the scale's weight reading does not fall below the threshold set in the Traffic Control configuration screen – either because the vehicle has not left, or because another vehicle followed the first closely as it left the scale. In this case, at the end of the set period the exit timer resets both lights to red. If necessary, the vehicle can be released using the manual controls.

The **Zero Time Delay** is used with all forms of Traffic Control. Its default value is 5 seconds, and it sets the period when the weight reading from the scale is between the zero tolerance and threshold values, after which a "Scale Not Zeroed" error is displayed. And if lights or gate traffic control is enabled, the lights will turn red or the gates lower, closing the scale. At this point, the traffic control devices can be manually set to allow the scale to be cleared, or the transaction can be started again from the beginning.

The **Excursion Timer** can be used when traffic control is set to Gates/Loops. Its default value is 1.00 second. It sets the delay between the loops' detection of the vehicle and the actuation of the gates.

Integration of Target Control

Filling On Scale Overview

Filling on scale allows the vehicle to be used like a container. Target values, set by creating records in the Target Table, are used to control the filling mechanism. The following must be configured in Setup in order to perform Filling On Scale:

- The respective scale's **Target Source** must be set to Displayed Weight and **Latching** is set to Enabled.
- The Target Table **Mode** must be set to Material Transfer, its **Tolerance Type** to Target Deviation, and its **Output Type** to Concurrent.
- A Target Table record must be defined with an **ID**; a **Target** value and units; **Tolerance** values; and **Spill**, and **Fine Feed** values.
- Discrete I/O **Outputs** must be assigned for **Fast Feed** and **Feed**, respectively, with **Channel** set to the scale assigned for the filling operation.
- Discrete I/O **Inputs** can be assigned for **Target Start**, with **Channel** set to the scale assigned for the filling operation.
- The IND780 terminal must be configured to display the **Target Table** and **Target Start** softkeys, in addition to any of the **Vehicle ID**, **Temporary ID**, **Transient Vehicle** and **Index** softkeys that may be required.

Target Definition

To set a target:

1. Access setup and navigate to Application > Memory > Target Table.
2. In the Target Table configuration window (Figure 7-17), select Material Transfer mode, Target Deviation tolerance type, and Concurrent output type.

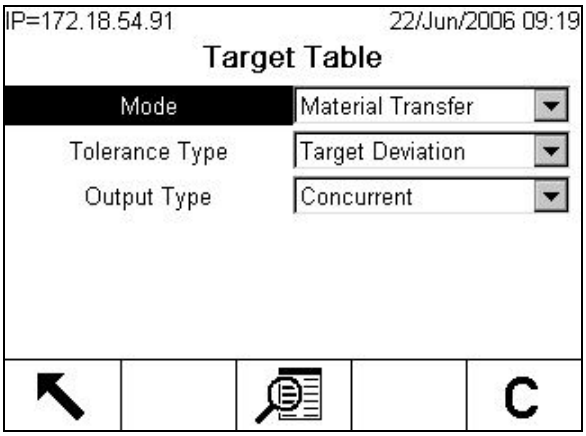

Figure 7-17: Target Table Configuration Screen

3. Press the View Table softkey . The Target Table Search screen (Figure 7-18) appears.

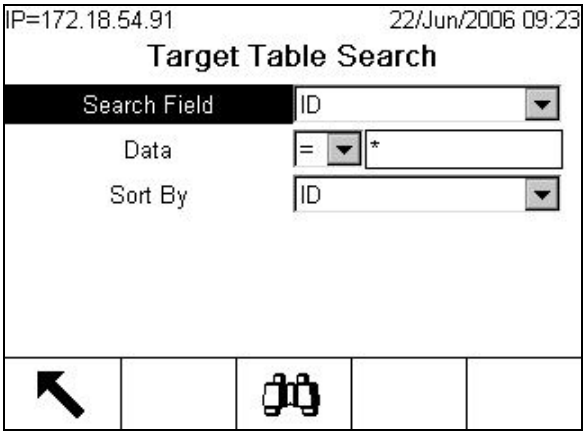

Figure 7-18: Target Table Search

4. Press the Table View softkey to open the Target Table. In the screen shown in Figure 7-19, no targets have been defined yet.

Figure 7-19: Target Table Search View

5. To create a new target record, press the NEW softkey. The Target New screen (Figure 7-20) opens.

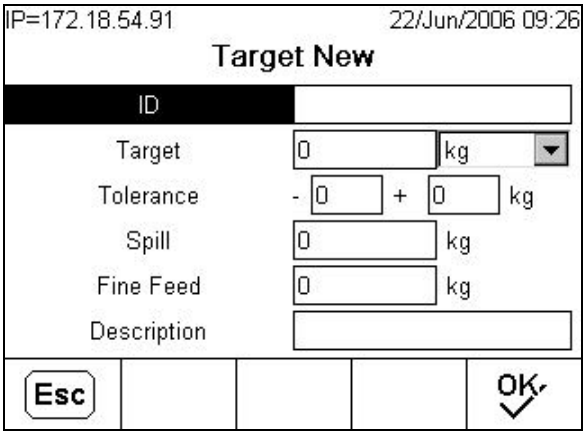

Figure 7-20: Target New Screen

6. The settings available in this screen are as follows:

ID	Alphanumeric label, identifying the target record.
Target	The weight value to be reached during the fill operation. Weight units are set using the pull-down list, which offers the following choices: • lb • g • ton • dwt • kg (default) • t • ozt • oz
Tolerance –/+	Acceptable deviation from the target value.
Spill	The quantity of material that is already on its way into the container to be filled, when the flow of material is cut off.
Fine Feed	The weight below the target after which the fast feed output is turned off, slowing the rate of feed to ensure accuracy.
Description	An alphanumeric string describing the target. Note that this description appears on-screen only during SmartTrac

	operation, which is not available when the Drive-780 application is in use.
Esc	Return to the Target Table View screen without creating a record
OK	Create the target record and return to the Target Table View screen.

7. Once the target has been defined, press the OK softkey OK to return to the Target Table View. Confirm that the settings appear as expected, then press the EXIT softkey ↖ three times to return to the setup menu tree. Exit the tree.

The target is now ready to be recalled and used during a fill operation.

Typical Sequence

A typical fill-on-scale sequence is as follows:

1. An empty vehicle enters the scale.
2. Press the TARGET TABLE softkey ◈, configure the Target Table search (if desired), then press the TABLE VIEW softkey 🚚.
3. Scroll to select the desired Target, and press the OK softkey OK.
4. Initiate the Vehicle ID transaction; the Vehicle Tare record is recalled.
5. Activate the Target Start input. The **Fast Feed** and **Feed** outputs will come on, and material will be added to the vehicle.
6. Once the net weight reaches the **Fine Feed** threshold, the rate of filling will decrease. When the net weight reaches the **Target** weight less the **Spill** value, the Fine Feed output will go off.
7. At this point, proceed to complete the vehicle transaction operation by entering the necessary data for the A6-A9 tables and variables, and then accept the transaction.

The Target softkeys are not accessible while a transaction is in progress, so if no external inputs are used for Target Start, the fill part of the operation must be performed before initiating the vehicle transaction.

If a Temporary ID transaction is to be performed instead, the inbound transaction is executed first to store the temporary tare. This is followed by selecting the desired Target record from the Target Table. The outbound transaction can then start by recalling the same Temporary ID without having the vehicle leave the scale. The Target Start input must be triggered first to start the filling cycle before completing the outbound transaction.

Appendix A

Default Settings

Table A-1 lists default values for all IND780 settings that are specific to the Drive-780. Default settings for IND780 basic functionality are listed in Appendix B of the IND780 Technical Manual, **Default Settings**.

Table A-1: IND780 Drive-780 Default Settings

Setup Feature	Default Value	Security Access
Application – Discrete I/O – Inputs		
Discrete Inputs	4 loop inputs defined: One for each Entrance and Exit Loop for Scales 1 and 2	
Application – Discrete I/O – Outputs		
Discrete Outputs	8 light control outputs defined: Red and green for Entrance and Exit for Scales 1 and 2	
Application – Drive-780 – Vehicle Weighing General		
Overload Check	Disabled	
Overload Value	45000	
Var1 Name	Var1	
Var2 Name	Var2	
Application Type	Standard	
Number of Scales	One Scale	
Scale A	Scale 1	
Scale B [If Number of Scales = 2]	Scale 2	
Application – Drive-780 – Traffic Control		
Control Type	None	
Enter Idle State [If Control Type = Lights/Weight or Gates/Loops]	Green/Up	
Exit Idle State [If Control Type = Lights/Weight or Gates/Loops]	Green/Up	
Threshold	1000	

Setup Feature	Default Value	Security Access
Zero Tolerance	500	
Manual Control [If Control Type = Lights/Weight or Gates/Loops]	Disabled	
Application – Drive-780 – Timer Settings		
Exit Timer [If Control Type = Lights/Weight]	30	
Zero Time Delay	5	
Excursion Timer [If Control Type = Gates/Loops]	1.00	
Application – Drive-780 – Vehicle Weighing Inbound		
A6 Table	Disabled	
A7 Table	Disabled	
A8 Table	Disabled	
A9 Table	Disabled	
Variables	None	
Application – Drive-780 – Vehicle Weighing Outbound		
A6 Table	Disabled	
A7 Table	Disabled	
A8 Table	Disabled	
A9 Table	Disabled	
Variables	None	
Application – Drive-780 – Vehicle Weighing Transient		
A6 Table	Disabled	
A7 Table	Disabled	
A8 Table	Disabled	
A9 Table	Disabled	
Variables	None	
Application – Drive-780 – Database – Vehicle ID Table		
Two Pass Mode	Enabled	
Store Tare on 2nd Pass	Always	
Tare Expiration	Disabled	

Setup Feature	Default Value	Security Access
Totalization	Enabled	
Runtime Additions	Disabled	
Application – Drive-780 – Database – Temporary ID Table		
Tare Expiration	Disabled	
Expiration (Days) [If Tare Expiration = Enabled]	30	
Auto Delete Expired [If Tare Expiration = Enabled]	Disabled	
One Step ID	Disabled	
Application – Drive-780 – Database – A6 Table		
Name [If Table Type = Standard]	A6	
Table Type	Commodity	
Totalization	Enabled	
Operation [if Table Type = Commodity]	Multiply	
Application – Drive-780 – Database – A7 Table		
Name [If Table Type = Standard]	A7	
Table Type	Contract	
Totalization [If Table Type - Standard]	Enabled	
Application – Drive-780 – Database – A8 Table		
Name	A8	
Totalization	Enabled	
Application – Drive-780 – Database – A9 Table		
Name	A9	
Totalization	Enabled	
Communication – Connections		
Connections	Demand Outputs on COM1, triggered by Inbound, Outbound and Transient transactions, plus one Demand Output on FILE for each configured scale (one or two).	

Appendix B

Glossary

Cross-referenced items are given in **bold** in the Glossary.

Alibi memory	Stores basic transaction information that is not user-definable.
Alpha keys	The **Softkeys** and **Application Keys** function as alpha keys on some setup and operational screens for entering alphabetic characters.
Application keys	"A" keys (A1–A4) located beneath the softkeys that can be assigned specific functions for different operations depending on configuration.
Drive-780	The vehicle weighing application which, when enabled, makes the terminal an **IND780drive**.
Focus	Items on a screen that display in reverse video or highlighted text indicate where the current focus is located.
Hardware key	Removable key that unlocks access to application software such as **Drive-780** and **Task Expert**.
Highlighted text	Items on a screen that display in reverse video to indicate where the current focus is located.
IND780drive	IND780 weighing terminal with the **Drive-780** application software enabled by use of a hardware key.
Index weighing	In index weighing mode, an index file enables a relational ID to be used to select the values for the enabled table information, including vehicle ID.
Keyboard tare	When keyboard tare is enabled, the known value for the empty weight of a vehicle (tare) can be entered manually. Use the numeric keypad to enter the known tare weight. The terminal will then display the net weight of the contents of the vehicle.
Manually-Entered tare weights	Manually-entered tare weights can be used for **Temporary ID weighing** transactions if enabled in the scale tare setup. Manually-entered tare weights are entered *before* the Temporary ID softkey is pressed.

Navigation keys	Keys located below the **Numeric keypad** that include arrow keys for navigating in operation and setup screens, and an ENTER key for accepting data entries.
Net sign correction	Net sign correction enables the **IND780drive** to be used for both shipping (inbound empty) and receiving (inbound loaded) operations, and in **Two-pass weighing**. 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.
Numeric keypad	Keys located above the **Navigation keys** that permit the direct entry of numerical values – for example, a manual tare weight. These keys also include a clear button and a decimal point.
One-pass weighing	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. See also **Two-pass weighing**.
Pushbutton tare	When pushbutton tare is enabled, the user can press the TARE scale function key when an empty vehicle is on the scale to determine tare. The terminal displays a zero weight and net mode. When the vehicle is loaded and driven back onto the scale, the terminal 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.
Pushbutton zero	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.
Scale function keys	Keys located to the right of the display screen that perform specific actions: • Select scale • Tare • Zero • Print
Targets	Targets are on/off outputs that indicate whether the weight displayed on the scale is greater than or less than a preprogrammed weight value. Targets are typically used in material filling applications in order to fill a vehicle to a preset weight.
TaskExpert™	Application software permitting users to program customized functions for use in the IND780.

Two-pass weighing	A mode where the vehicle empty weight (tare) is recorded on the inbound pass, stored in the Vehicle ID table, and used to calculate net weight on the outbound pass. See also **Net Sign Correction**.
Softkeys	Keys located at the bottom of the display screen that can change position and/or function depending on operation setup and configuration.
Tare	Tare is the empty weight of a vehicle. Tare is normally used to determine the net weight of the contents of a vehicle. See also **Net Sign Correction**.
Tare interlocks	A set of restrictions on how tare can be used that 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 auto tare.
Temporary ID weighing	The weighing mode that 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 this mode.
Traffic Control	Feature of **Drive-780** software that integrates traffic control with the transaction process. The IND780drive can control lights or gates, based on input from the scale or from embedded loops. See also **Vehicle Positioning**.
Transaction table	A table that stores all the vehicle weighing transactions that have been performed on the terminal. The table consists of records with data such as the transaction number, vehicle ID, date, time, description, gross, net, tare, weight units, scale channel and other user-entered data associated with each transaction.
Transient vehicle weighing	The weighing mode used when vehicle information should not be stored in memory or included in table totals.
Vehicle ID weighing	The weighing mode that involves the use of the Vehicle ID Table, where vehicle IDs, descriptions, and permanent stored tares are entered prior to operation. This information is recalled during Vehicle ID weighing transactions. Totals for vehicle weights are also maintained in the Vehicle ID Table, if totalization is enabled in setup.
Vehicle Positioning	Feature of **Drive-780** software that uses input from photoelectric sensors, permitting a vehicle's position relative to the scale to be integrated into the transaction process. See also **Traffic Control**.

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