

GSE 450 SERIES
PROGRAMMABLE WEIGH
INDICATORS

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Part Number 39-10-37661

GSE Scale Systems

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This user's guide is intended to be a reference tool for explaining the basic functions. Questions concerning the programming, setup, or servicing of this product should be addressed to your GSE distributor.

If you have any questions or need assistance after first reading this guide, please contact a GSE customer service representative at the following number.

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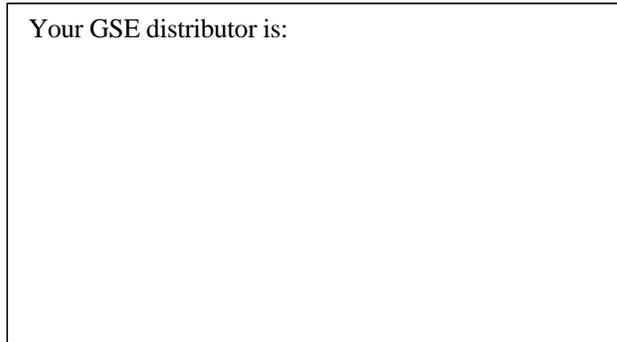
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Chapter 1 Introduction

GSE Inc. develops technically advanced, precision weighing instruments for high quality weighing systems. These instruments enable innovative weighing solutions for a variety of weighing applications.

Among these instruments are GSE's 450 Series Programmable Weigh Indicators (PWIs), which can be set up to meet the specific requirements of your application.

1.1 About This Guide

This *User's Guide* contains the information you need to operate GSE 450 Series PWIs on a day-to-day basis. It provides brief descriptions of the Model 450 and Model 455 indicators and basic installation, set up, operating, and troubleshooting information.

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1.2 Related Publications

The *450 Series Programmable Weigh Indicators (PWI) Technical Reference Manual*, herein referred to as the *450 Series Technical Reference Manual*, provides detailed technical information on all available options, installation, operation, and system setup capabilities (for example, check-weighing) for the 450 Series indicators. The manual is available from your GSE distributor.

1.3 450 Series Indicators

The Model 450 indicator, shown in Figure 1-1, and Model 455 indicator, shown in Figure 1-2, are designed for most weighing and counting applications. The Model 455 is distinguished from the Model 450 by its numeric keypad and its capability to weigh trucks and store average piece weights. (Contact your local GSE distributor for more information).

Both models are equipped with several standard selectable weighing programs. These programs are designed around two setpoint outputs and include filling and emptying operations.

The Model 450 or Model 455 indicator can be integrated with a load cell scale platform to create a *weighing system*. Built to provide years of accurate weighing and counting in the most demanding industrial environments, the 450 Series indicators are able to display outputs from platforms made by GSE and other manufacturers.

Programmable software enables the user to customize the transmission of output from the 450 Series indicators to computers or printers via an RS-232 interface. Contact your local GSE distributor for information on this capability.

1.4 Common Applications

GSE 450 Series indicators can be used in the following operations:

- Standard weighing
- Tank weighing
- Holding tank control
- Process industry weighing
- Check-weighing
- Filling to a target (dispensing)
- Floor and hopper scales
- Conveyor weigh systems control
- Batching (mixing)
- Counting
- Truck weighing (Model 455 only)
- Average piece weight storage (Model 455 only)
- Other applications

You can select the standard programs features of the 450 Series indicators to customize your own weighing system. For more information, contact your local GSE distributor.

1.5 Features

The 450 Series Programmable Weigh Indicators have the following features:

- Highly Visible Display. Brilliant .75-inch high six-digit vacuum fluorescent display is clearly readable even at a distance.
- Durability: Stainless Steel Washdown Enclosure and sealed elastomer keypad provide superior protection against chemicals and hostile environments.
- High Capacity: Capable of powering as many as eight 350-ohm load cells for such demanding applications as floor, tank, and hopper scales.
- Versatile Communications: Programmable RS-232
- Swivel stand enables table or wall mounting.
- Time and Date Clock (battery-backed optional)
- Front panel calibration and linearization capability
- Full scale response time from 0.06 to 8 seconds
- Two Open Drain (FET) setpoint outputs
- Selectable weighing units: pounds (lb), kilograms (kg), ounces (oz), grams (g), etc.
- AC power operation (90 - 250 VAC)
 - (version 200450-02003) (model 450)
 - (version 200450-03003) (model 450)
 - (version 200455-02003) (model 455)
 - (version 200455-03003) (model 455)
- AC/DC power (10 - 28 VDC and AC)
 - with external transformer
 - (version 200450-00001) (model 450)
 - (version 200450-00002) (model 450)
- Weighing increments: 1, 2, 5, 10, 20, 50, 100, 200 and 500
- Remote key activation
- Remote Display capability
- Expandable memory for increased setup storage

1.6 Display

The display for the 450 Series indicators has two sections: a large numeric area on the left, and a smaller two-line-by-10-character dot matrix are on the right side. See Figure 1-3.

The six large digits display numeric data.

The dot matrix area has several functions. The first two characters of the upper line show the weighing units of the displayed data, and the last three characters indicate a CENTER ZERO (-->O<--) condition, when applicable. The lower line specifies the type of data, such as Gross, Net, Tare, etc. The dot matrix area also displays messages during operation and setup.

1.7 Keyboard

The Model 450 Indicator has a simple five-key keyboard. The keyboard for the Model 455 indicator has seven functions keys and a numeric keypad. Specific key functions for each keyboard are described in the following two sections.

1.7.1 Model 450 Keyboard

The simplified keyboard, shown in Figure 1-4, enables operator interface with the Model 450. Key functions are described below. Some of these keys have additional functions when the Model 450 is in the Setup Mode.

[ZERO] Press to reset the current weight reading to zero. This key also doubles as a **[CLR]** key. Press this key to correct a number entry mistake prior to entering it in memory.

[UNITS] Press to select the available displayed units, such as lb, kg, oz, g, etc.

[SELECT] Press to select the programmed operating mode such as NET Weight, TARE Weight, GROSS Weight, Time-Date, etc.

[PRINT] Press to send data to a printer, computer or other device.

[TARE] Press to establish a Tare Weight. This key also doubles as an **[ENTER]** key. Press this key after making an entry.

[UNITS] and **[PRINT]** These keys are also used when making character entries to create Custom Transmits, etc.

1.7.2 Model 455 Keyboard

The Model 455 keyboard, shown in Figure 1-5, has seven function keys and includes a numeric keypad for the direct entry of numbers. Several of the function keys have multiple functions. The function depends on which mode of operation the indicator is in.

Model 455 key functions are described below. Some of these keys have additional functions when the Model 455 is in the Setup Mode.

[ZERO] Press to reset the current weight reading to zero.

- [UNITS]** Press to select the available displayed units, such as lb, kg, oz, g, etc. This key doubles as the UP arrow key when scrolling through the ASCII character set.
- [SELECT]** Press to select the programmed operating mode such as NET Weight, TARE Weight, GROSS Weight, Time-Date, and so on
- [ID]** Press to enter, store, and use the **ID** parameters. IDs are used for the Truck IN/OUT mode and also standard ID operation. This key doubles as the LEFT arrow key during data entry, enabling you to back up to the previous character.
- [TARGET]** Press this key to key in a new target value. The target value is directly associated with setpoints and hardware outputs (relays). This key doubles as the DOWN arrow key when scrolling through the ASCII character set.
- [TARE]** Press to establish a Tare Weight. This key doubles as the RIGHT arrow key during data entry, enabling you to move to the next character position.
- [PRINT/ENTER]** Press to enter and store ID information. Press to send data to a printer, computer, or other device. This key is also used when making character entries to create Custom Transmits, etc.

When the Model 455 is in the Weigh mode, it can accept characters from a structured ASCII file as you enter data for custom setups. The custom setup transmission is received through the unit's bi-directional communications port (J6).

1.8 Available Options

Hardware and software options available from GSE provide additional functionality for standard 450 Series indicators, helping you take advantage of their total capabilities. These options can be installed in the field. It is **not** necessary to return the indicator to GSE for installation of these options.

The following options are available for the 450 Series indicators:

Compatible Peripheral Options:

Barcode Contact Wand or Scanner

Label Printer (Thermal)

Document Printer (Dot Matrix)

Cable Options:

Scanner / Keyboard Cable

Thermal (Label or Bar Code) Printer (Eltron)

RS-232 Cable Option

Memory Expansion Option:

Increases internal memory from 512 bytes to 2.48kB using E2 memory.

Relay Module Option:

External box permitting the indicator to drive 2 relay outputs

Time & Date Option:

Adds capability of battery backed time of day and date.

1.9 Operating Modes (Brief Explanation)

Four operating modes are available in the 450 Series indicators: Weighing mode, Calibration mode, Accumulation mode and Setup mode.

The Setup mode gives you access to the 17 groups of Parameter registers physically resident within each indicator. By entering data in the Parameter registers, you can customize your weighing operation to *remember* the different programming information for your particular weighing application.

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NOTE:

In order to connect the load cells and peripherals, the indicator must be opened. However, this may void the warranty. Your GSE distributor is available to make the proper internal connections. The *450 Series Technical Reference Manual* details all internal connections.

IMPORTANT!

The 450 Series indicators do not include an on/off switch and, therefore, must be installed near a power outlet socket that is easily accessible and in keeping with UL/CSA approval requirements.

NOTE:

Parameters P181 through P184 apply to the 450 Series counting operations.

Chapter 2 Installation Instructions

Before you begin the installation of your 450 Series indicator, please review the guidelines and step-by-step installation procedures provided in this chapter. More detailed installation procedures are provided in the *450 Series Technical Reference Manual*.

2.1 Table-Top Use

Each of the standard 450 Series indicators comes with a swivel bracket that permits you to tilt the face of the instrument to any desired angle. The bottom of the bracket has non-slip rubber pads. These pads prevent the indicator from scratching and sliding across a table surface when you press the keys.

2.2 Permanent Mounting

Four mounting holes on the swivel bracket enable the indicator to be secured to a fixed surface. The holes are 0.28-in diameter (0.7 mm) to accommodate 1/4-in (M6 metric) fasteners. For the mounting hole pattern and overall dimensions, see Figure 2-1 for the Model 450 and Figure 2-2 for the Model 455.

2.3 Panel Mount Use

The Model 450 indicator is available in a panel mount version. The length-by-width panel cutout dimensions are 9.25 x 6.25 in. Once it is installed, the panel unit has full washdown capability.

The panel mount version functions just like the table top version. Differences are in the enclosure packaging and the positioning of the main board and display. See Figures 2-3 and 2-4.

(Model 450 Panel Mount, GSE PN: 200450-10001).
(Panel Mount EMI Shield GSE Part Number: 44-25-30082).

2.4 Environmental Suitability

Each of the standard 450 Series indicators comes in a sealed stainless steel enclosure that can be used in a washdown environment. If the indicator is used in such a setting, be sure the AC power socket outlet is properly protected!

The keypad is made of silicon rubber. Specifications are available from GSE for the reactions of this material to various solvents.

The display window is made from a polycarbonate material. The gasket for the display is a white closed-cell polyethylene foam. The gasket is resistant to water, detergent, and alcohol, but it may be adversely affected by aliphatic and aromatic hydrocarbons.

The rear panel gasket is made from a PORON® cellular urethane. It is unaffected by mild inorganic acids and bases. Oils, greases and other linear hydrocarbons may cause it to swell modestly. Strong polar solvents can cause the gasket to swell considerably, possibly reducing its effectiveness.

Chapter 3

Calibration Mode

3.1 Calibration Mode

The 450 Series indicators can be calibrated several ways. The methods described below assume that the necessary parameters (full scale value or graduation size, for example) are selected before the actual calibration is performed. These parameters normally are set up by a GSE distributor. Information on parameter setup for calibration of the 450 Series indicators can be found in the *450 Series Technical Reference Manual*.

3.2 Quick Calibration

To enter the **Quick Cal** mode from the Weigh and Counting modes:

(with a 450)

Press **[ZERO]** + **[SELECT]** simultaneously.
Then press **[ZERO]** **[PRINT]** **[UNITS]** **[ENTER]**.

(with a 455)

[100] **[SELECT]** **[54321]** **[ID]** **[ENTER]**

"Quick Cal!" is displayed briefly, then the following selections appear, starting with "New Zero?".

- a) "New Zero?"
- b) "Last Zero?"
- c) "Temp Zero?"
- d) "Only Zero?"
- e) "Cal Reset"

Press the **[SELECT]** key to toggle through the available selections. and **[ENTER]** when the desired selection is displayed.

a) New Zero?:
New calibration (establishing the first or a new calibration)

The indicator will display (perhaps not in precise units) the dead load that is present on the scale. The indicator assumes a "NO LOAD" condition. At this point the indicator asks you to remove any extraneous load. Do so, and press **[ENTER]**.

Once you press **[ENTER]**, a new zero is established. This is reflected on the main display along with the following prompt: "Adj'g Zero" and another prompt: **Keyin CalWt**

The indicator is waiting for the actual calibration value to be entered as it prompts "KeyIn CalWt ". At this point you can place the calibration weight on the platform, key in the weight value, and then press **[ENTER]**.

Entering Numeric Values:

Where appropriate, you can enter numeric values using the **[▲]** (**[PRINT]**) and **[▶]** (**[UNITS]**) keys.

By convention, pressing the [▲] or [PRINT] key initiates numeric entry. The first character displayed is a decimal point (.). Press the [▲] key continually to scroll through characters 0 through 9 and "-" and ".". Once the desired character is displayed, press [▶] or [UNITS] to move to the next digit location. In other words, once the entry mode has begun, the [▲] key will increment the entry and the [▶] key will move right one character.

To decrement the character, press the [▲] and [▶] arrow keys ([PRINT] + [UNITS]) simultaneously. There is no key to move left one character. If you make an error, press [ZERO] to clear the entry.

b) "Last Zero?":

Re-Cal (with cal weight already applied)

Re-Cal enables you to recalibrate the indicator without removing the applied weight when, during a calibration check, the calibration is found to be out of tolerance. This is especially beneficial when 450 Series indicators are used in large-capacity applications, such as tank weighing.

For this operation you press the [ENTER] key when "Last Zero?" is displayed during the calibration procedure.

A scenario for using this feature is as follows:

- a) You must check a scale for compliance with local weights and measures regulations.
- b) You press the [ZERO] key to zero out the 450 Series indicator.
- c) You try to verify indicator accuracy by applying the necessary load.
- d) The weight displayed indicates that the indicator is out of tolerance.
- e) With the calibration weight still applied, you access the Calibration mode using the Quick Cal method, described previously, or the conventional method.
- f) At the "Last Zero?" prompt, you press the [ENTER] key.
- g) The indicator displays "Units = xx" briefly. This indicates the proper units for keying in the calibration weight. The indicator will use the zero established the last time the [ZERO] key was pressed in the Weigh mode as the new calibration zero.
- h) The prompt "Keyin CalWt" is displayed.
- i) You key in the currently applied weight, such as **50000** [ENTER]. The indicator adjusts the calibration parameters, bringing the system into calibration.
- j) The prompt "Cal OK?" is displayed. Here, you can remove the weight or reapply it later, if necessary, to assure your inspector that the calibration has been adjusted properly.
- k) Once your inspector is satisfied with the calibration, you press the [ENTER] key to save the calibration.
- l) The prompts "Save Mods?" and "Enter = Save" are displayed. You press [ENTER] to save the new calibration factors.
- m) At the "Enter = Exit" prompt, you press the [ENTER] key and the indicator returns to the Weigh mode.

**c) "Temp Zero?":
Re-Cal (without establishing new zero)**

In some applications, you should perform a calibration without removing the currently applied load. This is particularly useful in tank weighing applications where it is time-consuming and costly to drain a tank before it is weighed.

When the [ENTER] key is pressed at the "Temp Zero?" prompt, the indicator *temporarily* zeroes the displayed weight and more weight can be added, assuring indicator calibration. The zero determined during the previous calibration is not affected.

For example, for a tank containing an unknown amount of material:

- a) Zero out the displayed value.
- b) Apply the calibration weight to the tank.
- c) Key in the value of the calibration weight, for example, **1000 [ENTER]**.
The numeric display should show the entered value.
- d) Remove the calibration weight from the tank.
The display should return to zero.

If the display reads as specified, at the "Cal OK?" prompt press [ENTER]

Otherwise, repeat the calibration process, by pressing [CLR] and repeat the previous steps.

- e) Save the newly determined calibration weight: At the "Enter = Save" prompt, press [ENTER].
- f) At the "ENTER = EXIT" prompt, press [ENTER], and the indicator will return to the Weigh mode.

d) "Only Zero?" Calibration re-zeroing

To re-establish the indicator's calibration zero without affecting the established gain, you can press the [ENTER] key at the "Only Zero" prompt during the calibration process. After you do this, the message "Adj'g Zero!" will flash for one second and the "Cal OK?" prompt will be displayed.

Calibration re-zeroing can be useful in tank weighing applications where the re-zero parameter (**P118**) is set very low in order to prevent inadvertent re-zeroing. A build-up of sludge can be zeroed out in this manner. Refer to the *450 Series Technical Reference Manual* for more information.

For example, with the connected scale platform cleared of any extra weight:

- a) At the "Only Zero?" prompt press [ENTER]
The prompts "Adj'g Zero!" and "CAL OK?" are displayed.
- b) Press [ENTER] to accept the newly established zero or [CLR] to re-do the calibration.
The calibration zero of the indicator is now set to establish the gross zero of the platform as the current input signal from the scale platform.

NOTE:

If the keyed in weight exceeds Full Scale by +4% or falls below 0.1% of Full Scale, an error message will be displayed. If you forget to add the calibration weight before you press [ENTER], the indicator will prompt you to do so. In this case, place the calibration weight on the scale, and press [ENTER].

If an overload exists or the instrument gain set previously is too high, the indicator will display an overload message. In this case, press **[CLR]** and the indicator will reduce the current instrument gain and return you to the start of the calibration procedure.

e) **“Cal Reset”**
(Not in 450 firmware dated before 072095)

A Cal Reset option is included in the calibration routine. At the **New Zero?** prompt in the Cal mode, press **[SELECT]** repeatedly until Cal Reset is displayed. The Cal Reset adjusts the zero and gain factors of the amplifier on the A/D. The parameters being adjusted are listed below.

P61101	Cal Factor
P61104	CZero
P61106	CGain

When reset, these parameters are adjusted to normal values.

Normally a Cal Reset is performed if the amplifier is locked in at extremely high gain factors and will not allow a new calibration to be performed. If an over-load or under load condition exists while in the Cal mode, press **[CLR]** to perform a Cal Reset. This has the same effect as pressing the **[ENTER]** key at the Cal Reset prompt. After a Cal Reset is performed, the unit goes back to the New Zero? prompt. The **[SELECT]** key will toggle to the desired calibration routine.

After performing a Cal Reset, a re-calibration should be performed before exiting the calibration or setup modes. The reset will not be saved unless a re-calibration is performed and changes are saved.

3.3 **Save Calibration**

The indicator will perform the calibration, display the value of the calibration weight, and display the prompt, **CAL OK?** At this point, you can check the accuracy of the calibration by weight without leaving the Calibration mode.

- A. If the calibration was accurate, press **[ENTER]**.
The indicator will prompt you to save the new calibration plus any other changes you made. Press **[ENTER]** to save, and **[ENTER]** to exit.

- B. If the calibration is not accurate, press **[CLR]**.
The indicator will return to the **NO LOAD?** prompt.

NOTE:
If the calibration weight is less than 5% of capacity or if there is a large change in the calibration, the indicator will prompt, **ReCal Req'd.** Press **[ENTER]** and you will be returned to the beginning of the calibration selections, or press **[CLR]** to obtain the **CAL OK?** prompt as described above and override the re-calibration requirement. GSE recommends that you perform a re-calibration in order to avoid any serious inaccuracy.

A variation of the calibration process is the linearization procedure. Linearization is useful in improving the absolute accuracy of large-capacity systems, which often exhibit poor linearity. This feature is documented in the *450 Series Technical Reference Manual*.

Chapter 4

Counting Mode

4.1 Parts Counting

The Counting mode enables the 450 Series indicators to *count* the number of parts on the weigh platform. In order to do this, a sampling operation must first be performed to establish the average weight of each of the pieces to be counted. However, if the average piece weight value is already known, you can key it in directly, and thus avoid the sampling operation.

4.1.1 Counting mode (Key Operation)

To activate the counting operation, the indicator must be in the *Quantity mode*. To access the Quantity mode, you must place parameter 30 in the selectable modes of instrument operation. Simply press the [SELECT] key to step through all enabled modes of instrument operation, including the Quantity mode. (Refer to Chapter 12 of the *450 Series Technical Reference Manual*.) The Model 455 indicator enters the Quantity mode when you press [30] [SELECT].

Once you are in the Quantity mode, if you press the [ENTER] key (Model 450) or [UNITS] key (Model 455) alone (without first making a numeric entry), the indicator will perform an auto-tare, establishing a net zero as a starting point. The current net weight and the prompt "Add XX" will be displayed. ("XX" is the default value set at parameter P182.)

If you add the specified number of parts—the default sample size set at P182—press the [ENTER] key to confirm the sample. If the number of parts you add is different from the default sample size set at P182, first key in the *actual* number, then press the [ENTER] key. The subsequent results depend on the selections made for the auto-enhance and minimum accuracy selections. Refer to sections 4.1.4 and 4.1.5 for more information.

If you make a numeric entry before you press the [ENTER] key (model 450) or [UNITS] key (model 455), the indicator will *not* perform an auto-tare. The entry is assumed to be the number of parts already on the scale platform. If you make the entry when the current mode is GROSS or GrTot, the stored tare weight is assumed to be from a previous weighing and is cleared out. Otherwise, any previous tare is assumed to be for the container in use, so the tare is retained and the current net weight is used to calculate the piece weight based on the entered sample size. This allows for the situation where the tare weight of the container, if any, remains consistent with what has been established. Here, you can add the parts and then key in the number of parts.

NOTE:

The first method is recommended to avoid the possibility that inappropriate tare weights may affect the piece weight calculation.

NOTE:

When the Quantity mode is accessed and the residing piece weight value is "0.00", the prompt "Must Sampl" will be displayed. Press [ENTER] key (model 450) or [UNITS] key (model 455) to proceed with the sampling to determine a piece weight (refer to section 4.1.2) or key in a piece weight value at P34.

4.1.2 Sampling to Determine a Piece Weight

Sampling can be performed in a number of ways, but the recommended method is to access the Quantity mode, place an empty box or empty container on the scale platform, and press the [ENTER] key (model 450) or the [UNITS] key (model 455).

The indicator will perform an auto-tare, resulting in a zero net weight. You will be prompted to **Add xx**, where the "xx" is the sample quantity of parts. (This is the sample size set by parameter P182—the manufacturer default setting is 10 pieces.) Add the requested number of parts to the scale platform, and press the [ENTER] key.

If the total weight of the sample is sufficient, the indicator will calculate the piece weight and display the sample quantity. Otherwise, it might prompt you to *add* more parts. The additional parts are requested if minimum accuracy's are not met. The exact prompts will depend on whether the auto-enhance and/or minimum accuracy assurance features (Parameter 181 and Parameter 183, respectively) have been enabled. The minimum amount of weight required for the sample routine is considered in order to meet the selected accuracy requirements for the specified scale capacity

If the weight of the sample is undetected or barely detected, the message **Code 32 ADD MORE!** will be displayed briefly. This will most likely occur when you press the [ENTER] key without adding any parts. If, however, you have placed parts on the scale, either the parts are too light to count on that capacity platform or a much larger quantity of parts must be hand-counted in order to perform the sample.

4.1.3 Negative Sampling to Determine a Piece Weight

To perform a negative sample routine, access the Quantity mode, place a *full* or *partially full* container of parts on the scale, and press the [ENTER] key (model 450) or the [UNITS] key (model 455).

The indicator will perform an auto-tare, resulting in a zero net weight. You will be prompted to **Add: xx** where the "xx" is the sample quantity of parts (sample size set by parameter P182). Disregard the "**Add:xx**" prompt. Instead, assume **Take:xx** and *remove* the requested number of parts.

The weight difference of the requested number of parts will be calculated by the indicator. Press the [ENTER] key. If the total weight of the sample is sufficient, the indicator will calculate the piece weight and display the sample quantity. Otherwise, it might prompt you to *take* additional parts. The exact prompts will depend on whether the auto-enhance and/or minimum accuracy assurance features (Parameter 181 and Parameter 183, respectively) have been enabled.

The minimum amount of weight required for the sample routine is considered to meet the selected accuracy requirements for the specified scale capacity. Continue to enhance, as desired. Key in the tare weight of the empty container, and put the parts removed for sample back into the container. The quantity displayed will be the *total* quantity in the container.

If the weight of the removed sample is undetected or barely detected, the message **Code 32 ADD MORE!** is displayed briefly. (Here, *ADD* actually means *TAKE* if a negative sampling is to be performed. The indicator does not know whether the operator intends to perform a positive or a negative sampling if no weight is added or removed. This prompt indicates that more weight must be **removed** from the overall sample weight.) This message will most likely occur when you press the [ENTER] key without first removing any parts. If you have, in fact, removed the parts from the scale, either the parts are too light to count on that capacity platform or a much larger quantity of parts must be hand-removed in order to perform the sample.

4.1.4 Using the Auto-Enhance Feature (Parameter 181)

If the auto-enhance feature (Parameter 181) is enabled, then following a sample operation the indicator will calculate the number of parts that can be added to the scale within $\pm 1/3$ of a part.

If the total number of parts that can be counted without error is more than the number sampled, the indicator will briefly display the maximum number of parts that can be used to perform an auto-enhance. If you add parts while the total displayed quantity remains *less than or equal to* the displayed maximum enhance amount, then as soon as motion ceases the indicator will automatically re-calculate the piece weight based on the new larger quantity. Then it will display the new maximum enhanceable quantity and the process will repeat.

However, the indicator has a minimum threshold of the piece weight for which enhancements can occur. This minimum enhanceable piece weight is 0.0084% of capacity. If the piece weight is less than this amount, enhancements are not possible and the message **Can't Enhnc** is displayed.

Whenever you key in a piece weight, the indicator clears its calculated accuracy and last sample registers. This occurs because the accuracy and the sampled quantity of the entered piece weight are unknown. Therefore, auto-enhancements are not possible with entered piece weights.

4.1.5 Using the Minimum Accuracy Assurance Feature (Parameter 183)

The minimum accuracy feature ensures that parts counting operations will result in a pre-specified minimum accuracy. To accomplish this, the sampled parts must meet or exceed a minimum weight, or must have additional enhancements after the initial sampling (if the enhance feature is enabled) before a large number of parts can be counted.

If the enhance feature is disabled and the weight of the sampled parts is insufficient to guarantee the required accuracy (as set by P183), you will be prompted to **Add xx** parts. Here, "xx" represents the number of parts you must hand-count and add to the scale so accuracy can be achieved.

If, however, the enhance feature is enabled, the results of the sampling operation can vary. These variations are detailed in the following sections.

4.1.6 Achieved Accuracy is Less Than Required

When the achieved accuracy is insufficient to allow an enhancement to occur with at least 5 additional pieces, you will be prompted to **Add xx** parts. (Here, "xx" is the number of additional parts required to allow either enhancements to be achieved, or the number required to achieve the required accuracy, whichever is less.) Add the specified number of parts and then press **[ENTER]**, or add even more parts, key in the TOTAL number of parts on the scale, and press **[ENTER]**.

The current quantity will be shown on the numeric display and **Enh# xx** will be shown on the dot matrix. (Here, "xx" is the total maximum number of parts that can be on the scale for enhancement to occur.) You can add parts up to the number shown. As soon as motion ceases, if the quantity displayed is more than the original sampled amount and less than the displayed maximum enhance amount, then the piece weight will be re-calculated and the achieved accuracy will be re-evaluated. If the required accuracy still has not been achieved, another enhancement will be required and this step will be repeated with a larger maximum enhance amount.

If more parts than specified are added, the display will read **Code 53 Accy >Req'd**. This indicates that the required accuracy has not been achieved and counting may not continue.

4.1.7 Parts Counting Methods

There are several approaches toward counting parts with the 450 Series indicators. Three methods are described below.

Method 1: Counting a specific number of parts

Access the Quantity mode. Place an empty container on the platform (optional), and press **[ENTER]** key (Model 450) or **[UNITS]** key (Model 455).

The indicator tares to a zero net weight. The display shows the current net weight and prompts, **Add 10**. (The actual number can be programmed in setup parameter P182).

Place the specified number of parts on the scale, and press **[ENTER]**. (Or add any number of parts, key in the number added, and then press **[ENTER]**.) The indicator will calculate the piece weight of the sample parts. (If the number of parts you have added is insufficient to achieve the required accuracy as set by P183, you will be prompted to add more parts.) Add the specified number of parts, and press **[ENTER]**).

Place the additional parts to be counted on the scale.

Method 2: Counting out a specific number of parts with piece weight enhancement.

Access the Quantity mode. Place an empty container on the platform (optional), and press **[ENTER]** key (Model 450) or **[UNITS]** key (Model 455).

The indicator tares to a zero net weight. The display shows the current net weight and prompts, **"Add 10."** (The actual number can be programmed in setup parameter P182).

Place the specified number of parts on the scale, and press **[ENTER]**.

The indicator will calculate the piece weight of the sample parts and display the maximum number of parts that can be added for a piece weight enhancement to occur. Then the minimum achieved accuracy will be displayed.

If a greater accuracy is desired, add more parts but not more than the maximum enhanceable quantity.

As soon as motion ceases, the indicator will recalculate the piece weight and display the new maximum number of pieces that can be added while still accurately enhancing the piece weight.

Repeat the procedure as many times as desired. Add the additional parts to be counted.

Method 3: Counting the total number of parts on hand with a known container weight

Access the quantity mode. Place the full container of parts on the weigh platform, and press the **[ENTER]** key (Model 450) or the **[UNITS]** key (Model 455).

The indicator tares to a zero net weight. The display shows the current net weight and prompts, **Add 10** (add means take in this instance). (The actual number can be programmed in setup parameter P182).

Remove the specified number of parts from the box, and press **[ENTER]**.

The indicator will calculate the piece weight of the sample parts removed.

Add the sample pieces back in and key in (or bar-code scan) the tare weight of the container.

The displayed quantity then becomes the total number of parts in the container.

4.2 Front Panel Key Operation (Counting Related)

All of the indicator front panel keys operate normally in the Weighing modes.

[ZERO]

This key zeroes the indicator and establishes the current signal from the weighing platform as a gross weight of zero. When the [ZERO] is executed from the quantity (Qty) mode, the indicator remains in the quantity mode and any existing tare weight is cleared. If the [ZERO] is executed from any of the other counting modes, the current mode changes to the GROSS mode.

[UNITS]

The only counting modes for which the [UNITS] key is defined are the piece weight modes, APW and APW*K. During these two modes the [UNITS] key toggles through the units that were selected in setup modes P151 through P154. In the other counting modes the [UNITS] key on a model 450 is ignored. In the quantity mode the [UNITS] key on a model 455 is the SAMPLE key.

[SELECT]

The [SELECT] key advances the indicator to the next mode as programmed during the setup mode in P300 through P309. Alternatively, keying in a mode number and pressing [SELECT] changes the current mode to the mode of the number just keyed in.

[ID] (Model 455 only)

The [ID] key on the Model 455 performs as it does in most other weigh modes, depending on the selection for setup parameter P720. If P720 is set for "APW", pressing the [ID] key allows access to storing, retrieving, keying in, printing and clearing specific or all pieceweights in a database. Once in the database mode the [SELECT] key toggles through all these selections. Press the [ID] key to step back out of the Pieceweight Database Mode. Refer to section 4.5 for more information.

[TARGET] (Model 455 only)

The [TARGET] key allows access to the setpoint target registers (associated with P5100 program selection). Refer to Chapter 14, Standard Programs Operations (setpoint related) in the *450 Series Technical Reference Manual*.

[TARE]

The [TARE] key can be used to perform auto-tare or keyboard tare operations. When a new tare is stored and the current mode is the Quantity mode, the current mode remains the Quantity mode. If the current mode is any other counting mode, the mode changes to the net mode. This operation is the same as most other weigh modes.

[PRINT] (Model 450 only)

This key is pressed to transmit data out of the Model 450 serial port.

[PRINT/ENTER] (Model 455 only)

This key has two functions: to initiate the transmission of data out of the Model 455 serial port, and to initialize the accumulate total to some value.

While accessing the quantity accumulation register, if an entry has been keyed in, the Model 455 prompts "MOD Ac?" and "ENTER = MOD!" Press the [ENTER] key to store the entered number as the new quantity total., or any other key to prevent changing the current quantity total value.

If the [PRINT/ENTER] key is pressed without an entry, the custom transmit setups, if any, are transmitted.

If the Quantity mode is accessed, the [ENTER] key is used to calculate a piece weight based on a sample of parts to be counted.

[CLR]

Pressing the [CLR] key causes prompts "CLEAR ACs?" and "ENTER = CLR!" to be displayed. Press [ENTER] to clear all the accumulate totals (gross, net, and qty) to zero. Press any other key to abort the clearing of the totals.

4.3 Parts Counting Parameter Setup

P181 AEnh

Auto-Enhance: Set this parameter to "off" to prevent the auto-enhance feature from operating. The "on" selection allows the Indicator to auto-enhance the piece weight whenever the necessary criteria are met.

P182 SmpSz

Default Sample Size: This parameter specifies the sample amount you are prompted to add after you access the Quantity mode and press the [ENTER] key. Enter any whole number between 1 and 9999. The factory default is 10.

P183 %Accy

Required Piece Weight Accuracy for Sample Acceptance: The value you enter here specifies the minimum piece weight accuracy that must be achieved in order for a sample to be accepted. If an applied sample weight is insufficient to achieve the accuracy specified, you will be prompted to add a specific number of parts in order to achieve that accuracy. The choices available are no minimum accuracy required (displayed as "none") or 90.0% to 99.96%, in 0.04% increments. Key in the desired percentage, and press [ENTER]. Entries are rounded down to the next lower available accuracy increment. Enter [0] for no accuracy requirement. This results in a minimum sample weight of slightly greater than the zero-track aperture, P112. Press [ENTER] to cycle through the available choices starting at the previously selected choice.

P184 AcDsp

Accuracy Displayed: When you set this parameter to "on," the accuracy of the current piece weight is shown on the display, above the "Qty" indication, whenever the weight is not in motion. For example, after it performs a sample operation the indicator might show " 10. 98.3% Qty". If this parameter is selected as "off" then the top line of the alpha numeric display will only be used to indicate motion.

4.4 Counting Mode Listing

The [SELECT] key advances the indicator to the next mode as programmed in the setup mode parameters P300 - P309. Alternatively, you can key in a mode number and press [SELECT] to change the current mode to that of the mode number you just keyed in. The following eight modes are 450 Series counting related. Refer to Table 4-1.

30 Quantity

The current net weight is divided by the current piece weight, resulting in the current quantity. This value may not be entered.

31 Quantity Total

This mode displays the current total accumulated quantity. The value displayed is the result of previous additions of the displayed quantity to the previous total quantity.

It operates the same as mode 3, the gross total mode. The largest value that can be displayed is 999,999. If a larger value is achieved, the display will read "Code04 #> Dsply". However the stored total is still active and accumulates may continue to occur. These larger values may be printed without any problem. If the value exceeds 3,000,000 internal rounding will be performed. Theoretically this value is 16,777,216.

34 Piece Weight

This register holds the value of the average piece weight established after a sample routine.

35 Piece Weight x 1000

This register holds the value of the average piece weight times 1,000. This value is calculated after the piece weight value is established.

37 Last Sampled Amount

This register holds the quantity of the last sample size used during a sampling routine. An example might be 10 pieces. The factory uses 10 as a default sample size.

4.5 Piece Weight Database Mode (model 455)

Pieceweight storage/recall is an application for which the 450 Series indicators are well suited. This application takes into account the two most frequent situations: storing and recalling pieceweights.

In Pieceweight storing (**Store**), the pieceweight value residing in the pieceweight register is placed in a database associated with an ID number.

In Pieceweight recall (**Get**), the pieceweight value is recalled from a database associated with an ID number and placed in the pieceweight register.

The APW database capability makes use of the **[ID]** key to permit entry of pieceweight identification (ID) numbers. The IDs associated with a pieceweight are stored within the system via the “**store**” or “**keyin**” pieceweight (APW) mode. The pieceweight values are recalled from the database via the “**Get**” pieceweight (APW) mode.

This feature includes the ability to store, recall, keyin, print all, clear any or all stored pieceweights.

The APW Database Mode feature works in a relatively preset manner. Customized ticket printouts specific to the customer needs can be created but are not tied directly to this mode. The database format is fixed.

4.5.1 Method of Operation

Figure 4-1 shows the modes of operation which are selectable when the **[ID]** key is pressed. The first menu item listed in Figure 4-1 will appear. Pressing the **[SELECT]** key will advance through the menu items. If the last menu item is displayed, pressing **[SELECT]** will *wrap* to the beginning of the menu. Once in the menu, press **[ID]** again to exit to the previous weight display.

4.5.2 Alpha-Numeric “APW” IDs

The 455 numeric keypad allows for easy numeric APW ID entries. Alpha character entry is possible using the cursor keys. The [A-Z] key must be pressed to initiate an alpha entry. The [◀] and [▶] arrow keys allow for moving back and forth between the next or previous character entries. The [▲] and [▼] arrow keys allow for scrolling up and down through the ASCII character set.

Accumulation Mode	Mode Number
Gross Total	03
Net Total	06
<i>Accumulation Counter</i>	09
QtTOT	31

Chapter 5

Truck Weighing (Model 455 Only)

Truck Weighing is an application for which the Model 455 is very well suited. This application takes into account the two most frequent situations: **dumping** and **pick up**.

In truck *dumping*, the initial weight of the truck coming in (Truck In) is heavier than when the truck is leaving (Truck Out). In Truck *pick up*, the initial weight of the truck coming in (Truck In) is lighter than when the truck is leaving (Truck Out).

The Truck In/Out capability lets you use the [ID] key to enter truck identification (ID) numbers. The IDs are stored within the system with the incoming weight of the truck. When the truck is on the way out, the In-Weight is compared to the Out-Weight. The indicator considers the lower of the two weights to be the Tare Weight, the larger to be the Gross Weight, and the difference to be the Net Weight.

Tare Weights can be permanently stored in the system to determine truck weights with a single weighment. One or more of the Custom Transmits may be sent, providing either a ticket documenting the amount of weight picked up and/or dropped off, or sending the data to a computer or remote display. This feature makes the instrument an ideal weight unit for dump site weighing, gravel pit weighing, and many other truck weighing applications.

This feature includes the ability to establish and store the tare weight of a vehicle, clear any or all stored weights or transmit the currently stored truck weights.

The Truck In/Out feature works in a relatively preset manner. It can be customized to some extent with its setup, and custom transmits.

Weigh In: Key in ID# and press [ENTER] or press [ENTER] alone and you will be prompted to key in ID#. If ID# does not exist, a *temporary* row will be created with this ID# and weight. Custom transmit #1 will be sent out the comm port. Return to previous weight display.

Auto Tare: Key in ID# and press [ENTER] or press [ENTER] alone and you will be prompted to key in ID#. If ID# does not exist, a new *permanent* row will be created in the database. If ID# does exist, the existing ID# information will be overwritten with the new data. Return to previous weight display.

KeyIn Tare: Key in ID# and press [ENTER] or press [ENTER] alone and you will be prompted to key in ID#. If ID# does not exist, a new *permanent* row will be created in the database. If ID# does exist, the existing ID# information will be overwritten with the new data. Return to previous weight display.

Print Tares: Press [ENTER] to print stored tare weights in row/column format with header. Return to previous weight display.

Clear One: Key in ID# and press [ENTER] or press [ENTER] alone and you will be prompted to key in ID#. If ID# is found, *Sure? ???* will prompt you to confirm your intention to delete that ID# from the database followed by “Enter = Yes”. Press [ENTER] to clear or press any other key to abort by pressing [ENTER]. Press any other key to abort. Briefly display *Done!* after deleting and return to previous weight display. If ID# is not found, briefly display *IDnot Found* and return to previous weight display.

Clear All: Press [ENTER] to delete all ID#'s from the database. *Sure? ???* will prompt you to confirm your intention to delete all data followed by “Enter = Yes”. Press [ENTER] to clear or press any other key to abort. Briefly display *Done!* after deleting and return to previous weight display.

Table 5-2. Method of Operation

Description	Parameter ID
30	Quantity
31	Quantity Total
34	Piece Weight
35	Piece Weight x 1,000
37	Last Sampled Amount

Table 4-1. Counting Modes

MENU ITEM OPERATION

Store APW: Key in the ID# and press [ENTER], or press [ENTER] only and you are prompted to key in the ID#. If the ID# does not exist, a row is created with this ID# and pieceweight. Unit returns to the previous display mode.

Get APW: Key in the ID# and press [ENTER], or press [ENTER] only and you are prompted to key in the ID#. If the ID# does not exist, *IDnot Found* is displayed briefly followed by *Must Sampl*. Follow the sample routine procedure stated earlier, or exit by pressing [ID] to restart entry of a new ID#. If found, the pieceweight register is updated with the associated value. Unit returns to the previous display mode.

KeyIn APW: Key in the ID# and press [ENTER], or press [ENTER] only and you are prompted to key in the ID#. If the ID# does not exist, a new *permanent* row is created in the database. If the ID# exists, the existing ID# information is overwritten with the new data. Unit returns to the previous display mode.

- Print APWs:** Press [ENTER] to print the stored piece weights in row/column format with header. Unit returns to the previous display mode.
- Clear One:** Key in the ID# and press [ENTER], or press [ENTER] alone and you will be prompted to key in the ID#. If the ID# is found, the prompts *Sure? ???* and “**Enter = Yes**” require you to confirm your intention to delete that ID# from the database. Press [ENTER] to clear or any other key to abort. The prompt *Done!* displays briefly after the deletion and the display again shows the previous weight. If the ID# is not found, *IDnot Found* displays briefly, and the unit returns to the previous display mode.
- Clear All:** Press [ENTER] to delete all ID#s from the database. The prompts, *Sure? ???* and “**Enter = Yes**” require you to confirm your intention to delete all data. Press [ENTER] to clear or any other key to abort. *Done!* displays briefly after the deletion and the unit returns to the previous display mode.

Figure 4-1. Counting Modes

Description	Parameter ID
12	TrGrs (Truck Gross Wt.)
13	TrNet (Truck Net Wt.)
14	TrTar (Truck Tare Wt.)
21	Tr ID (Truck ID #)
50	TrTim (Truck Time)

WARNING!

Make sure the Model 450 or Model 455 indicator is completely disconnected from the power source before working on it.

Any operation that involves opening the indicator enclosure should be performed only by qualified service personnel and only after the power is disconnected! Hazardous voltage is accessible within the enclosure.

Chapter 6

Standard Programs Operations

The 450 Series indicators have several commonly used scale routines programmed into their firmware. These standard programs are selectable from the setup mode. Each of them makes use of the 450 Series setpoint outputs. (Two setpoints are standard in the 450 Series indicators). Contact your local GSE distributor for more information on Setpoints/Logic Outputs and program setup. The six Standard Programs featured in the 450 Series are:

Check Weighing	(Ckwhg)
Two-Speed Filling	(Fill)
Two Ingredient Batch	(Batch)
Two-Speed Emptying	(Empty)
Both Fill and Empty	(Both)
Independent	(Indep)

These Standard Programs are defined in the next six sections. Only one of the Standard Programs can be initiated at one time.

6.1 Check Weigh Operation

The standard 450 Series check-weigh operation is designed to check the weight of an item against a given standard or target weight.

The 10 character auxiliary display can be programmed for displaying the status of the item placed on the scale (for example, percentage of target reached—98%, 100%, etc.—and weight deviation and visual accept and reject prompts: Good, Over or Under).

The 450 Series indicators can be set up to allow the operator to change the target value easily from the front panel keypad, if desired. In this case pressing the **[SELECT]** key scrolls through the specified modes of operation including the “Target 1” entry mode. The new values are entered using the **ARROW** keys. The pre-programmed acceptable percentage above and below the new target are assigned automatically.

6.2 Filling Operation

The standard 450 Series Two-Speed Filling operation is designed with three ways to initiate a filling operation. The three methods are by the **[TARE]** key, by a remote key or automatically.

The **[TARE] key method** will perform a motion inhibited tare operation before activating the two setpoints. This will yield a net zero displayed value.

The **remote key method** does not perform a tare operation. The setpoints are based on the sum of the previously displayed value plus the specified target value.

The **auto-start method** will automatically activate both setpoints when the net weight falls between +/- 5 graduations of zero and motion ceases. This is useful for automatic drum filling systems. An initial drum tare is established by pressing the **[TARE]** key, the net weight falls between +/- 5 graduations of zero and the setpoints are activated. After the drum is filled, the setpoints cut-off. The drum is removed, displaying a negative value. A new drum is placed on the scale putting the net displayed value between +/- 5 graduations of net zero, hence activating the setpoints. This can be repeated with each successive drum.

The auxiliary display can be programmed to display the status of the filling operation. (for example, percentage of target reached (97%, 100%, etc.), weight deviation and visual status prompts: Fast, Slow and Done). This indication is displayed immediately and therefore ignores any motion. The Setpoint Outputs respond immediately ignoring motion.

The 450 Series indicators can be set up to allow the operator to change the target value easily from the front keypad if desired. In this case pressing the **[SELECT]** key will scroll through the specified modes of operation including the “Target 1” entry mode. The new values are entered using the ARROW keys. The pre-programmed acceptable percentage above and below the new target will be automatically assigned.

6.3 Batching Operation

The standard 450 Two Ingredient Batching operation provides three ways to initiate a batching operation. The three methods are the **[TARE]** key, by a remote key or automatically.

The **[TARE] key method** will perform a motion inhibited tare operation before activating setpoint #1. This will yield a net zero displayed value.

The **remote key method** does not perform a tare operation. Setpoint #1 is based on the sum of the previously displayed value plus the specified target value.

The **auto-start method** will automatically activate setpoint #1 when the net weight falls between +/- 5 graduations of zero and motion ceases.

The **[TARE] key method** for the second ingredient will perform a motion inhibited tare operation before activating setpoint #2. This will yield a net zero displayed value.

The **remote key method** for the second ingredient does not perform a tare operation. Setpoint #2 is activated and then de-activate when the display reflects the sum of the previously displayed value plus the specified target value.

The **auto-start method** will automatically activate setpoint #2 when motion ceases from the first ingredient fill.

The auxiliary display may be programmed to display the status of the filling operation. (for example, percentage of target reached, (97.5%, 102%, etc.) weight deviation and visual status prompts: Fill1, Fill2 and Done). This indication is displayed immediately and therefore ignores any motion. The Setpoint Outputs respond in the same manner ignoring motion.

The 450 Series indicators can be set up to allow the operator to change the target values of either **Target 1** or **Target 2** easily from the front keypad if desired. In this case pressing the **[SELECT]** key will scroll through the specified modes of operation including the “Target 1” and “Target 2” entry mode. The new values are entered using the ARROW keys. The pre-programmed acceptable percentage above and below the new targets will be automatically assigned.

6.4 Emptying Operation

Standard 450 Series Two-Speed Emptying operation provides two ways to initiate an emptying operation. The **[TARE]** key and a remote key.

The **[TARE] key method** will perform a motion inhibited tare operation before activating setpoints 1 and 2. This will yield a net zero displayed value.

The **remote key method** does not perform a tare operation. Setpoints 1 and 2 are based on the negative sum of the previously displayed value plus the specified target value. For example, the target = 10 lbs., the display reads -37 lbs. the setpoints will de-activate at -47 lbs. This example indicates that 10 pounds of material has been dispensed from the tank.

The auxiliary display may be programmed for displaying the status of the emptying operation. (for example, percentage of target reached (99%, 101%, etc.), weight deviation and visual status prompts: Fast, Slow and Done). This indication is displayed immediately and therefore ignores any motion. The Setpoint Outputs respond in the same manner ignoring motion.

The 450 Series Two-Speed, single material emptying operation can be set up to allow the operator to change the target value easily from the front keypad. This value is initially fixed when entered during the setup mode. If this value must be changed during operation which is normally the case, place the **Targ1** parameter in the set of selectable modes. Pressing the **[SELECT]** key will scroll through the specified modes of operation including the Targ1 entry mode. The numeric values during operation are entered using the ARROW keys. The acceptable pre-act values will move around the new target as before.

Note that during the emptying operation after a tare operation, the display will reflect a negative value.

6.5 Filling and Emptying Operation (Both)

Standard 450 Series Filling and Emptying operation provides three ways to initiate a filling operation and two ways to initiate an emptying operation. The following describes the three methods for initiating the **fill mode**.

The **[TARE] key method** will perform a motion inhibited tare operation before activating setpoint #1. This will yield a net zero displayed value.

The **remote key method** does not perform a tare operation. Setpoint #1 is based on the sum of the previously displayed value plus the specified target value.

The **auto-start method** (Fill mode only) will automatically activate setpoint #1 when the net weight falls within +/- 5 graduations of zero and motion ceases.

The following describes the methods for initiating the emptying mode.

The **[TARE] key method** will perform a motion inhibited tare operation before activating setpoint 2. This will yield a net zero displayed value.

The **remote key method** does not perform a tare operation. Setpoint 2 is activated and then de-activated when the display reflects the negative sum of the previously displayed value plus the specified target value. For example, the target = 10 lbs., the display reads -37 lbs. the setpoints will de-activate at -47 lbs.). This example indicates that 10 pounds of material has been dispensed from the tank.

The auxiliary display may be programmed for displaying the status of both the filling and emptying operation. (for example, percentage of target reached, weight deviation and visual status prompts: Fill, Empty and Done). This indication is displayed immediately and therefore ignores any motion. The Setpoint Outputs respond immediately ignoring motion.

The 450 Series Filling and Emptying operation can be set up to allow the operator to change the target values for either the filling or emptying modes easily from the front keypad. These values are initially fixed when entered during the setup mode. If these values must be changed during operation which is normally the case, place the **Targ1** and **Targ2** parameters in the set of selectable modes. Pressing the **[SELECT]** key will scroll through the specified modes of operation including the Targ1 and Targ2 entry modes. The

numeric values during operation are entered using the ARROW keys. The acceptable pre-act values will move around the new targets as before.

Note that during the emptying operation after a tare operation, the display will reflect a negative value.

6.6 Independent Operation (Indep)

The Independent Setpoints lend themselves to many **standard setpoint** applications. There are 2 setpoints available associated with the 2 open drain type outputs located on the main board (SP1 and SP2). The independent setpoint setup allows for setup of two independently configured setpoints. Target and Reset values can be entered for each setpoint and a different parameter for each setpoint to be based on is selectable.

These setpoints can be configured as *latching, non-latching, automatic reset, reset on [TARE], reset remotely or reset at a specified value*. Contact your GSE distributor or refer to the *450 series Technical Reference Manual* for setup information.

6.7 Target Key Operations (M455 Only)

The target mode of operation is modeled after the M455 setpoint configurations with some enhancements.

The [TARGET] key can be enabled or disabled. An access code can also be established for priority usage of the [TARGET] key.

Contact your GSE distributor or refer to the *450 series Technical Reference Manual* for setup information.

Operation:

Press the [TARGET] key. The prompt **Keyin Code:** will appear. Keyin the Target key access code and press [ENTER] (note that each character of the code is represented as a dash "-"). If the wrong code is entered the message "**WRONG CODE!**" is displayed briefly.

6.7.1 Filling/Emptying/Batching/Both Operations

Pressing the [TARGET] key will provide a one-key method of allowing access to the target entry process when P5100 is set for *Fill, Batch, Empty* or *Both*.

When P5100 is set for *Fill, Batch, Empty* or *Both*, if P5000 is set for *enabled* and P5001 is set for *none!*, then the [TARGET] key will function as follows.

Target Value Entry (*Fill*) and (*Empty*) modes

- 1 Pressing [TARGET] will access the Targ1 register. Proceed to key in a target value and press [ENTER]. The unit will prompt, =**NEW TARG?** to confirm your intention to accept that weight as the new target. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME TARG!**. The previous target will remain as before. Proceed to enter the preact values (*P.A.1 and P.A.2 values*).
- 2 Keying in a number followed by a [TARGET] keypress will enter the keyed in value as the new target value. The unit will then show the new target value in the main display and Prompt =**NEW TARG?**. Press [ENTER] to verify this value as the new entered value. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME TARG!**. The previous target will remain as before. Proceed to enter the preact values (*P.A.1 and P.A.2 values*).

Preact Value Entry (*Fill*) and (*Empty*) modes

P.A.1 (Preact 1) value must be keyed in as an absolute value smaller than the target value.

After the target value has been entered, the P.A.1 register entry mode is accessed. The display will show “**NEW? P.A.1**” if no preact has been entered or “**X.XX P.A.1**” if a previous value has been entered. Key in a value lower than the target value and press [ENTER]. The unit will indicate the entered P.A.1 value in the main display and prompt, **NEW ? P.A.1**. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME PA!**. The previous target will remain as before.

Press [ENTER] to proceed to the P.A.2 (preact2) value entry mode.

The display will show “**NEW? P.A.2**” if no preact has been entered or “**X.XX P.A.2**” if a previous value has been entered. Key in a value smaller than P.A.1 value and press [ENTER] (P.A.2 must be smaller than P.A.1 or setpoint errors will occur). The unit will indicate the entered P.A.2 value in the main display and prompt, **NEW ? P.A.2**. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME PA!**. The previous target will remain as before.

Press [ENTER] to advance out of the Target Entry mode and back to the weigh mode.

Target 1 Value and Preact 1 Entry

(Batch) and (Both) modes

- 1 Pressing [TARGET] will access the Targ1 register. Proceed to key in a target value and press [ENTER]. The unit will prompt, =**NEW TARG?** to confirm your intention to accept that weight as the new target. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME TARG!**. The previous target will remain as before. Proceed to enter the preact value (*P.A.1*).
- 2 Keying in a number followed by a [TARGET] keypress will enter the keyed in value as the new target value. The unit will then show the new target value in the main display and Prompt =**NEW TARG?**. Press [ENTER] to verify this value as the new entered value. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME TARG!**. The previous target will remain as before. Proceed to enter the preact value (*P.A.1*).
P.A.1 (Preact 1) value must be keyed in as an absolute value smaller than the target value.

After the target value has been entered, the P.A.1 register entry mode is accessed. The display will show “**NEW? P.A.1**” if no preact has been entered or “**X.XX P.A.1**” if a previous value has been entered. Key in a value lower than the target value and press [ENTER]. The unit will indicate the entered P.A.1 value in the main display and prompt, **NEW ? P.A.1**. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME PA!**. The previous target will remain as before.

Press [ENTER] to proceed to Target2.

Target 2 Value and Preact 2 Entry

(Batch) and (Both) modes

- 1 Proceed to key in a target value and press [ENTER]. The unit will prompt, =**NEW TARG?** to confirm your intention to accept that weight as the new target. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display **SAME TARG!**. The previous target will remain as before. Proceed to enter the preact value (*P.A.2*).

Press [ENTER] to proceed to the P.A.2 (preact2) value entry mode.

The display will show “NEW? P.A.2” if no preact has been entered or “X.XX P.A.2” if a previous value has been entered. Key in a value smaller than P.A.1 value and press [ENTER] (P.A.2 must be smaller than P.A.1 or setpoint errors will occur). The unit will indicate the entered P.A.2 value in the main display and prompt, NEW ? P.A.2. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display SAME PA!. The previous target will remain as before.

Press [ENTER] to advance out of the Target Entry mode and back to the weigh mode.

6.7.2 Check Weighing Operations

When P5100 is set for *CkWgh* or *CkAbs*, if P5000 is set for *enabled* and P5001 is set for *none!*, then the [TARGET] key will function as follows.

Target Value Entry (*CkAbs*)

- 1 Pressing [TARGET] with an applied weight (exceeding 5 graduations from zero) will display the weight value in the main display and prompt, =NEW TARG? to confirm your intention to accept that weight as the new target. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display SAME TARG!. The previous target will remain as before. Proceed to enter *HI* and *LOW* limits.
- 2 Pressing [TARGET] without an applied weight (5 graduations or less from zero) will allow access to the **Targ1** register. This will allow for a value to be keyed in at this point. Proceed to key in a target value and press [ENTER]. The unit will then show the new target value in the main display and Prompt=NEW TARG?. Press [ENTER] to verify this value as the new entered value. Proceed to enter *HI* and *LOW* limits.
- 3 Keying in a number followed by a [TARGET] keypress will enter the keyed in value as the new target value regardless of any weight on the scale. The unit will then show the new target value in the main display and Prompt=NEW TARG?. Press [ENTER] to verify this value as the new entered value. Proceed to enter *HI* and *LOW* limits.

Lower and Upper Limit Entry (*CkAbs*)

Lower limit value must be keyed in as an absolute value lower than the target value.

After the target value has been entered, the lower limit register entry mode is accessed. The display will show “**LOWER**” indicating access to this register. Key in a value lower than the target value and press [ENTER]. The unit will indicate the entered lower absolute value in the main display and prompt, NEW ? LOWER. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display SAME LOWER. The previous target will remain as before.

Press [ENTER] to proceed to the UPPER absolute value entry mode.

The display will show “**UPPER**” indicating access to this register. Key in a value higher than the target value and press [ENTER]. The unit will indicate the entered upper absolute value in the main display and prompt, NEW ? UPPER. Press [ENTER] to confirm or any other key to abort. If any other key besides the [ENTER] key is pressed, the unit will briefly display SAME UPPER. The previous target will remain as before.

Target Value Entry (Ckwgh)

- 1 Pressing [**TARGET**] with an applied weight (exceeding 5 graduations from zero) will display the weight value in the main display and briefly prompt, **Targ1**. The new target weight will immediately be accepted. The unit will present the *weight* of the item placed on the platform in the main display, **100% Good** in the auxiliary display. Proceed to enter the percent *HI* and *LOW* limits, as necessary, explained in the next section titled *Lower and Upper Limit Entry*.
- 2 Pressing [**TARGET**] without an applied weight will briefly prompt **AddOr Keyin**. This indicates that a target weight item should be added to the platform or a target value should be keyed in. Refer to steps 1 or 3.
- 3 Keying in a number followed by a [**TARGET**] keypress will enter the keyed in value as the new target value regardless of any weight on the scale and briefly prompt, **Targ1**. The new target weight will immediately be accepted. The unit will return to the weigh mode. Proceed to enter the percent *HI* and *LOW* limits, as necessary, explained in the next section titled *Lower and Upper Limit Entry*.

Lower and Upper Limit Entry (Ckwgh)

The value entered here is a percentage value. This percentage value is an amount lower than the target value.

After the target value has been entered, the lower limit register entry mode can be accessed by pressing [**81**] [**SELECT**]. The display will show “**0.00% LOWER**” indicating access to this register. Key in a percentage value for the lower limit and press [**ENTER**]. The unit will indicate the entered lower percentage value in the main display and prompt, **%NEW? LOWER**. Press [**ENTER**] to confirm or any other key to abort. If any other key besides the [**ENTER**] key is pressed, the unit will briefly display **SAME LOWER**. The previous limit will remain as before.

Press [**ENTER**] to proceed to the UPPER limit percentage value entry mode.

The display will show “**0.00% UPPER**” indicating access to this register. Key in a percentage value for the upper limit target value and press [**ENTER**]. The unit will indicate the entered upper limit percentage value in the main display and prompt, **%NEW? UPPER**. Press [**ENTER**] to confirm or any other key to abort. If any other key besides the [**ENTER**] key is pressed, the unit will briefly display **SAME UPPER**. The previous limit will remain as before.

Press [**SELECT**] to return to the weigh mode.

The UPPER and LOWER tolerances can be accessed *individually* with the following key strokes. Follow the same procedure stated above for entering values into these registers and also exiting these registers.

LOWER: [**81**] [**SELECT**]
UPPER: [**82**] [**SELECT**]

These values can also be entered at the following parameters.

LOWER: P5102
UPPER: P5103

6.7.3 Independent Setpoint Operations

When P5100 is set for *Indep*, if P5000 is set for *enabled* and P5001 is set for *none!*, then the [**TARGET**] key will function as follows.

Activation Value 1 and 2 Entry (*Indep*)

- 1 Pressing [**TARGET**] will allow access to the *AVall* register (setpoint#1 activation value). Keyin an *activation value* and press [**ENTER**]. To confirm your intention to accept this value as the activation value, press [**ENTER**]. This will then proceed to the *AVal2* register. Keyin an *activation value* and press [**ENTER**]. To confirm your intention to accept this value as the activation value, press [**ENTER**]. This will then proceed back to the initial display mode.

Activation Value 1 and 2 Entry, Reset Value 1 and 2 Entry (*Indep*)

P5125 Rset1 and/or P5135 Rset2 must be set for *Value*.

- 2 Pressing [**TARGET**] will allow access to the *AVall* register (setpoint#1 activation value). Keyin an *activation value* and press [**ENTER**]. To confirm your intention to accept this value as the activation value, press [**ENTER**]. This will then proceed to the *RVal1* register (setpoint#1 reset value). Keyin the *reset value* and press [**ENTER**]. To confirm your intention to accept this value as the reset value, press [**ENTER**]. This will then proceed to the *AVal2* register (setpoint#2 activation value). Keyin an *activation value* and press [**ENTER**]. To confirm your intention to accept this value as the activation value, press [**ENTER**]. This will then proceed to the *RVal2* register (setpoint#2 reset value). Keyin the *reset value* and press [**ENTER**]. To confirm your intention to accept this value as the reset value, press [**ENTER**]. This will then proceed back to the initial display mode.

Direct Access to Activation Value 1 or 2 Entry (*Indep*)

- 3 Pressing [**X**][**TARGET**] ($X = 1$ or 2) will allow direct access to the *AVall* or *AVal2* register (setpoint#1 or #2 activation value). Keyin an *activation value* and press [**ENTER**]. To confirm your intention to accept this value as the activation value, press [**ENTER**]. This will then proceed back to the initial display mode.

Direct Access to Activation Value 1 or 2 Entry, Reset Value 1 or 2 Entry (*Indep*)

P5125 Rset1 and/or P5135 Rset2 must be set for *Value*.

- 4 Pressing [**X**][**TARGET**] ($X = 1$ or 2) will allow direct access to the *AVall* or *AVal2* register (setpoint#1 or #2 activation value). Keyin an *activation value* and press [**ENTER**]. To confirm your intention to accept this value as the activation value, press [**ENTER**]. This will then proceed to the *RVal1* or *RVal2* register (setpoint#1 or #2 reset value). Keyin the *reset value* and press [**ENTER**]. To confirm your intention to accept this value as the reset value, press [**ENTER**]. This will then proceed back to the initial display mode.

Chapter 7

Accumulation Operations

The indicator contains two memory registers into which weighing data may be accumulated. The way in which Accumulations operate depends on selections made during the Setup Mode. Refer to the *450 Series Technical Reference Manual* or contact your GSE distributor.

7.1 Performing Accumulations

(model 450)

First, enter the desired Accumulation Mode either by pressing the **[SELECT]** key until one of the Accumulation Modes appears on the display. Once in an Accumulation Mode, press the **[ENTER]** key to add the displayed value to the accumulated total. Accumulate operations are motion delayed. If motion is occurring when an accumulation is requested, the Mot'n Delay prompt is displayed until motion ceases. During this time, press **[CLR]** to abort the accumulation. There are three Accumulation Modes with corresponding Mode Numbers as shown in Table 7-1. The order of appearance of these modes can be assigned when setting up parameters **P300 - P309**. Refer to the *450 Series Technical Reference Manual* or contact your GSE distributor.

When an Accumulation is made, both the Gross and Net totals are affected.

(not available in firmware releases before 072095 - next 2 paragraphs)

Performing an accumulation is possible from the active gross or net display mode. Press the **[UNITS]** + **[SELECT]** keys simultaneously to accumulate from either of these two modes. When the NTEP parameter (P440) is enabled, keyboard accumulating is only possible in the gross or net display mode. With the NTEP parameter disabled, accumulating is also possible from the gross total and net total display modes in the same way.

The **[UNITS]** + **[SELECT]** keys pressed simultaneously on a 450 from within the quantity mode will also perform a quantity accumulation.

After an accumulation occurs, these values are frozen at their new accumulate total values until the Gross Weight again falls below the value set by parameter P164. Parameter P164 has several selections of percentages of full scale value. The weight must fall below this percentage of full scale before another accumulation is allowed. At that time, these values again resume their active state.

(Model 455)

First, enter the desired Accumulation Mode either by pressing the **[SELECT]** key until one of the Accumulation Modes appears on the display, by serially transmitting an accumulation *total* mode number shown in Table 7-1 and followed by %s or by directly keying in one of the mode numbers shown in table 7-1 followed by the **[SELECT]** key. Once in the desired accumulation mode, press the **[.]** **[ENTER]** keys or serially send to the indicator a **.%e** to add the displayed total. Accumulate operations are motion delayed. If motion is occurring when an accumulation is requested, the Mot'n Delay prompt is displayed until motion ceases. During this time, press **[CLR]** to abort the accumulation.

There are three (3) Accumulation Modes with corresponding Mode Numbers as shown in Table 7-1. The order of appearance of these modes can be assigned when setting up parameters **P300 - P309**. Refer to the section on Operation Modes.

When an Accumulation is made, both the Gross and Net totals are affected. The Quantity total is unaffected. The Total Quantity register must be accessed directly to perform an accumulation of the quantity.

After an accumulation occurs, these values are frozen at their new accumulate total values until the Gross Weight again falls below the value set by parameter P164. Then the same procedure to perform another accumulation applies. Refer to section on Preventing Double Accumulations.

7.2 Initializing Accumulate Totals

The Accumulation Registers may be reset to a new number. This would permit you to enter a total from the previous day or shift to continue the accumulation, or to reset the number to 0. Simply access the accumulation mode, enter the desired number (use **[PRINT]** and **[UNITS]** keys for character selection, use the numeric keypad on the Model 455) and press **[ENTER]**. You will then be prompted by a display of **MOD AC?** for 1 second followed by **ENTER =MOD**. Press **[ENTER]** to complete the change or any other key to abort the modification of the accumulation total.

The **[CLR]** key may be used to reset both the net and gross totals to zero. The prompt **CLEAR ACS?** will appear briefly followed by **ENTER =CLR!** Press **[ENTER]** to complete the clearing or press any other key to abort the clear operation.

7.3 Preventing Double Accumulations

A setup parameter (P164) can help to prevent accidental double accumulations. This parameter lets you choose a percent of capacity that the gross weight must fall below before a second accumulation can take place.

If an accumulate is attempted without first removing the last accumulated weight, the message **CLEAR WGHT!** is displayed briefly and the operation is aborted.

Chapter 8

Printing Operations

Pressing the **[PRINT]** key will transmit the information in the custom transmit. The custom transmit refers to a table that can be customized to your application. The 450 series indicators are configured with a factory default transmission, shown below. If this is not the desired transmission format, refer to the *450 Series Technical Reference Manual* or contact your GSE distributor.

ID #1:
9876.54 lbs Gross Wt.
9864.20 lbs Net Wt.
12.34 lbs Tare Wt.

Although all transmissions are usually begun by pressing the **[PRINT]** key, exceptions in the setup will allow for remote key printing and continuous printing. The continuous print will transmit the custom programmed information each time the display updated. This feature is particularly useful with a remote display or an interface with a computer that is monitoring a process. Refer to the *450 Series Technical Reference Manual* or contact your GSE distributor.

If the receiving device (printer, display or computer) goes off line, is powered down or for any other reason cannot receive the data being sent, the message "Tx On Hold" will appear for a few seconds. Press **[CLR]** to abort the transmission. If this situation happens while using the continuous print feature, the transmission is suspended, but can be resumed by pressing the **[PRINT]** key.

Chapter 9

Time and Date

Standard 450 Series indicators include a Time-Date feature, which is non-battery backed. This means that when the feature is used, the time and date must be entered every time the instrument is powered up. The 450 Series indicators can be set up to prompt you to enter the time and date at power up. If entering the time and date at each power up is considered undesirable, a battery-backed Time-Date option is available at additional cost. The Time-Date feature permits printouts with time and day of the week and the date in many possible formats. Consult with your dealer for installing battery-backed time-date.

NOTE: In the following discussion, HH is a 2 digit representation for hours, MM is minutes, SS is seconds, MO is month, DA is day and YR is year. When the 450 Series indicators are powered up, the time and date clock is set to Jan 1, 1970, 00:00:00 am (the UNIX computer standard). If the clock is not reset at powerup, either by the operator or by having the time-date option installed, the current time and date will be the elapsed time since power-up.

9.1 Accessing the Time and Data Parameters

A new Time and Date value can be keyed in by accessing the time-date setup parameters. (Refer to the *450 Series Technical Reference Manual* or contact your GSE distributor.) The 450 Series indicators can also be set up so that the time and date are displayed upon powerup. Time and date are displayed in the large numeric display in the format "HH.MM.SS" and "MO.DA.YR" (or DA.MO.YR if set for the international style). If not battery-backed, the upper line of the character display reads "enter". The lower line of the character display reads "Time" or "Date" as appropriate. If the battery-backed time-date option is installed, time and date are each displayed for about 3 seconds and no changes are allowed. If desired, you can press **[ENTER]** to end the Time-Date display before the 3 seconds is over.

9.2 Viewing the Time and Date

While in the Weigh Mode, the time and date can be displayed simultaneously in the dot matrix and main displays. This is accomplished by setting parameter 11 in one of the selectable modes in the 300 parameters. (Refer to *450 Series Technical Reference Manual* or contact your GSE distributor.) Pressing **[SELECT]** key will toggle through all the parameters present in the P300 table, for example, gross, net, tare, time/date, etc. The date is then displayed on the large numeric display in the format "MO.DA.YR" (or DA.MO.YR for international style) and the time is displayed on the dot matrix display in the format "HH:MM:SS". The time may be displayed in a 24 or 12 hour format with an "am" or "pm" displayed as appropriate, depending on the setup of time-date.

9.3 Entering the Time

A new time may be entered at power-up by keying in "HH.MM.SS" in a 24 hour format! Numeric values must be entered with the **[PRINT]** and **[UNITS]** keys (use numeric keys on the 455). Hours and minutes entries must be separated by a decimal point. Seconds entry is optional, and if omitted, they are set to zero. To specify seconds, it also must be separated from minutes by a decimal point. Leading zeroes need not be entered. For example, if you enter "8.9.45" and press **[ENTER]**, the time will be set to 08:09:45; if you enter "15.02" and press **[ENTER]** the time is set to 15:02:00. If time is entered improperly, the prompt "try h.m.s" is displayed.

9.4 Entering the Date

A new date may be entered at power-up by keying in "MO.DA.YR" (or "DA.MO.YR" if international format was selected) followed by the **[ENTER]** key. Month, day and year entries must be separated by decimal points. Leading zeroes need not be entered. For example, if you enter "1.8.96" and press **[ENTER]** the date is set to 01/08/96. If the date is entered improperly, the prompt "try m.d.y" (or "try d.m.y" for international format) is displayed.

Chapter 10

Troubleshooting

This chapter provides information on error messages, trouble-shooting and servicing the 450 Series indicators. Some information included in this chapter refers to parameters that are not discussed in this guide. They are provided as a "quick look-up" for factory trained service technicians.

10.1 Error Messages (Overview)

The following is a summary of all of the error messages within the Indicator. They are listed below in numerical order. The leading two digits will appear on the numerical portion of the display, and the message will appear on the two lines of dot matrix display. Following each message is a summation of possible causes and probable remedy.

10.2 Operational Mode Error Messages

- 02 UnderLoad!** Input signal less than negative full scale. If this is due to excessive loading, reduce the load. Otherwise, check the load cell connections. If a 4 wire load cell cable is being used, check that the sense jumpers are in place. Verify that the capacity selection **P110** is correct. Use the information parameters, especially **P61100**, to check the setup and input signal.
- 03 Over-Load!** Input signal is greater than positive full scale. Use same check as for underload.
- 04 # > Dsply** Number to be displayed will not fit within 6 digits. This will not normally occur for the Gross, Net or Tare Weights but may result while displaying the accumulated totals if the amount exceeds 999,999. Either clear the totals or settle for only being able to transmit the totals.
- 05 Zero > Max.!** An attempt was made to zero out more than allowed per **P118** selection. Use the **[TARE]** key for subtracting off container weights or if large dead-load is always to be present, apply this dead-load during the No Load? prompt during calibration to permanently eliminate the offset.
- 06 Tare > F.S.!** Tare entry was greater than full scale. Most likely the entered tare value was incorrect.
- 07 Tare < 0 !** Negative tare attempted, but not allowed per **P162**. For auto-tares, the GROSS Weight must be greater than zero unless **P162** is changed to allow negative tares.

10.3 Setup Mode Error Messages

- 10 Entry > Max!** An entry was made which had more characters than allowed.
- 11 WRONGCODE!** The incorrect access code was entered, thus preventing changes. In order to access the Setup Mode, either the proper code must be entered or the **[ENTER]** key must be pressed alone (to view selections without making changes).
- 12 No Mods!** The Setup Mode is being accessed, but changes are prevented.

- 13 OutOfRange** An entry made for a selection was beyond the range of valid choices.
- 14 Must Keyin** The choice for the current parameter must be keyed in.
- 15 Size>998 !** The size of one of the Custom Transmit setup has exceeded the limit.
- 16 CHECK JUMPR** A programming operation was attempted when the program jumper is installed. Installation of this jumper will prohibit any programming changes.
- 17 A/D BAD!** The processor has detected a problem with the A/D chip (U9).
- Loose chip:** Simply re-seat the chip in U9 by gently pushing down on it.
- Wet/damp:** The unit was water damaged or is simply in a damp environment and condensation has built up on the A/D and is shorting the component. A heat gun or common blow dryer used *carefully* will sufficiently dry the area.

10.4 Hardware Problem Error Messages

- 21 EEROMerror** Error reading data from the EEPROM. Possible U6 problem.
- 22 EEROMerror** Error writing data to the EEPROM. Possible U6 problem.
- 23 CheckU6** Supplementary error message for above errors.
- 24 EEROMFull!** The setup being attempted requires more EEPROM than is currently installed.
- 25 DefltSetup** Upon power-up the Indicator has not found the proper codes. Therefore all parameters have been reset to factory default values.
- 26 Bad Setup** The stored data has a checksum error. Check all parameters or re-load setup.
- 27 RE-BOOT!** The Indicator cannot use the EEPROM for data storage, so it is attempting to power-up again to cure the problem.
- 28 NoRAMAVAIL** The current setup requires more RAM than is currently installed. Either contact your dealer or the factory.

10.5 Calibration Error Messages

- 30 F.S.>MAX!** The entered calibration weight, together with the currently applied signal, indicates that the full scale signal will be greater than the allowed maximum of the Indicator. Verify that correct entries have been made for the capacity, **P110**, and for the calibration weight. If all appears correct, refer to the use of the information parameter **P61100**, and determine the output (in mv / volt) of the connected load cell.
- 31 F.S.<.1mVv** The entered calibration weight, together with the currently applied signal, indicates that the full scale signal will be less than the allowed minimum of the Indicator. Verify the proper entries for the capacity, **P110**, and for the calibration weight. If all appears correct, refer to the use of the information parameters, **P61100**, and determine the output (in mv / volt) of the connected load cell.

- 32 ADD MORE!** The applied weight during calibration was less than 0.1% of capacity. More weight than this is required. Refer to **P61100** if this is incorrect.
- 33 ReCALReq'd** The just completed calibration is insufficient to guarantee accurate results due to either the cal weight being less than 5% of capacity or this was the first calibration of this platform to this Indicator and therefore the coarse gain was adjusted by the Indicator.
- 34 RES> 25K!** The current combination of capacity **P110** and increment **P111** result in a resolution greater than 25,000 graduations. This is simply a warning in case this was not intended.
- 35 RES>100K!** The current combination of capacity **P110** and increment **P111** result in a resolution greater than 100,000 graduations. This is not allowed and as soon as any key is pressed the instrument will jump back into the setup mode to parameter **P110** to verify the settings.
- 36 RES< 100!** The current combination of capacity **P110** and increment **P111** result in a resolution less than 100 graduations. This is simply a warning in case this was not intended.
- 37 RES< 1 !!** The current combination of capacity **P110** and increment **P111** result in a resolution less than 1 graduation (for example, the increment is greater than capacity). This is not allowed and as soon as any key is pressed the instrument will jump back into the Setup Mode to parameter **P110** to verify the settings.

10.6 General Error Messages

- 99 Can't Set!** An attempt to enter a value for a parameter which is not field changeable, such as the serial numbers or the audit trail counter results in this message.
- - **Cksumerror** Upon each power-up, the Indicator tests the integrity of its EPROM. If the result is not correct this message is displayed and the Indicator is not usable. Verify that the EPROM (U4) is installed properly (no bent over pins).

10.7 Miscellaneous Messages

- - **EntryError** This error message is the most commonly used. The primary causes are entering a value preceding a key (such as **[ZERO]**) which is not allowed, entering alpha data for a numeric selection, or entering a fractional value for an entry which only accepts whole numbers. This may occur while in the Setup Mode or one of the operational modes.

10.8 Communications Error Messages

- par'y error** This indicates that the parity of a received character did not match the parity specified in the Setup Mode, parameter P202. This could also result if the baud rate (P200) or the number of data bits (P201) are incorrect.
- ovrun error** This indicates an over-run error where an additional character was received while the receive buffer of the 450 Series indicator was full, and thus the extra received character will be lost.

frm'g error	This indicates that the stop bit of a received character did not occur when it was expected. This could be the result of an incorrect baud rate (P200), incorrect number of data bits (P201), or incorrect parity setting (P202).
port error	This indicates that the 450 Series indicator did not check its receive data register in time, thus missing a character. If this error should occur, please notify your GSE distributor or the factory. To prevent the problem, try reducing the baud rate (P200).
tx on hold	This will occur if a data transmission is held up for two seconds or more due to a de-asserted handshake. Refer to the description of parameter P209 for more information.
tx abort	This occurs if the [CLR] key is pressed when the tx on hold error message is shown or if P209 is set for abort and the transmit buffer becomes full.
tx con'd	This will appear briefly when the handshake is re-asserted after the tx on hold message occurs.

10.9 Setpoint Error Messages

Setpoint errors will occur if there is a conflict with the way the parameters are selected in the setup mode. The setpoint setup is located at parameters 5100 through 5115. The **XX** in the error message below will be replaced with a number associating it with the last two numbers of the parameter with the invalid setting.

SPtXX Error

example #1

Parameter P5111 is the setting for initiating the method by which the setpoint will be activated. The method could be automatic, remote key or the Tare key. The error **11** indicates that the method to initiate setpoint 2 is identical to setpoint 1. *This is not valid.* Both setpoints cannot be initiated via the same method.

SPt11 Error

example #2

Parameter P5109 is the setting for the preact2 value. This value cannot be greater than the preact1 value. The error **9** indicates that there is a conflict between the two preact values.

SPt9 Error

10.10 Service

There are no user-serviceable items in GSE 450 series indicators! Service must be performed by qualified service technicians only! Attempts to service this instrument by unqualified personnel may void the warranty!

10.11 Troubleshooting

DATA TRANSMISSION: If a data transmission of any weight-related numeric data such as Gross, Net or Tare, is sent as dashes, an overload or underload (negative overload) condition was in effect.

Remove the cause of the overload (or underload) and repeat the transmission. Check also the setup of parameters **P204** and **P209**.

DISPLAYED WEIGHT: If an overload or underload occurs due to an electrical overstress (EOS) normally due to lightning or ESD discharge, then press the **[CLR]** key. The message "wait 1" will appear for about 1 second. The A/D converter will then be reset and the system should again be functional. If not, power down for a few seconds. If the Indicator still does not work properly after power-up, check the load cell or platform wiring. If okay, permanent damage may have been occurred, most likely at U9, the instrument amplifier.