

# **ChargeMate Scrap Management System For Charge Bucket Loading Crane Operator Manual**

**For Version 03.004 CL2137.2**

*By: Encompass Automation & Engineering Technologies, LLC*

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## 1. Introduction

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This manual describes the operation of the EAET ChargeMate Scrap Management System. ChargeMate is intended for charge bucket loading. The ChargeMate System provides the following features:

1. Prompts crane operator through the loading of scrap, by grade, (recipe based) using weight.
2. Records the actual weights loaded by grade.
3. Base station server records actual weights, and can update customer database for inventory relief, and reporting.
4. Crane to Scale and Base Station communication over EAET industrially proven Radio Modems.

The ChargeMate system consists of the following components:

1. **Crane Controller** – This is a Windows NT based industrial touch screen PC that provides the crane operator interface to the system.
2. **Weighing System** – Optionally provided SA0I component that allows The ChargeMate the system to measure the weight of each scrap loaded. This is an over magnet load-cell scale for weighing by the drop.
3. **Radio Modems** – Provide communications between the Crane Controller and the Weighing System, and optional Base Station Server.
4. **Base Station Server (Optional)**– Resides in the yard office and accumulates bucket reports from the Crane Controller, uploads recipes to the crane controller, and provides an interface to the customer's level 2 systems.



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## 2. System Operation

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This section describes how the crane operator runs the system, along with example screens to demonstrate exactly how the operator interfaces with the system. Each crane is equipped with a crane controller, which consists of a touch screen based industrial PC that communicates with the weighing system, and Base Station Server over Radio Modems. The touch screen both instructs the operator what to do, and allows the operator to control the system.

### 2.1 Variations in the Operation of the system

This program is designed to operate in several different ways, depending on the needs of the operation. One particular setting will change the personality of the system noticeably.

1. Recipe control: Enabled or Disabled. If recipes are enabled, the operator will be required to follow the recipe as supplied. He may alter the sequence of the loading, but will eventually be required to load all of the requested materials. If recipes are disabled, the operator is free to load the material in the order and quantity he chooses. The program will only require him to indicate when he is changing the material to load so that proper inventory control is maintained.
2. Automated scrap selection: If the automated scrap selection mode is turned on, the scale unit will automatically select the materials to be loaded and automatically switch to the next scrap in the recipe when the desired scrap weight is reached. It will also automatically close out the bucket when it has reached the target weight. This mode greatly simplifies the operator interaction with the scrap loading system.

Whatever method is chosen for operation, the operator will find that the program is simple to operate and intuitive in its procedure. There are a number of checks and balances to minimize the number of mistakes that can be made during its operation. Certain buttons will be grayed out when they must not be used (Prevent entering letters in a number field) or it wouldn't do any good to press it anyway (A Scroll-UP button will be grayed out if the highlight is on the number 1 item). The operator is prevented from inputting text or numbers that are longer than the field is designed to hold. A universal keyboard for numbers and text is used whenever a detailed entry is required of the operator. See section 3.1 for a physical description.



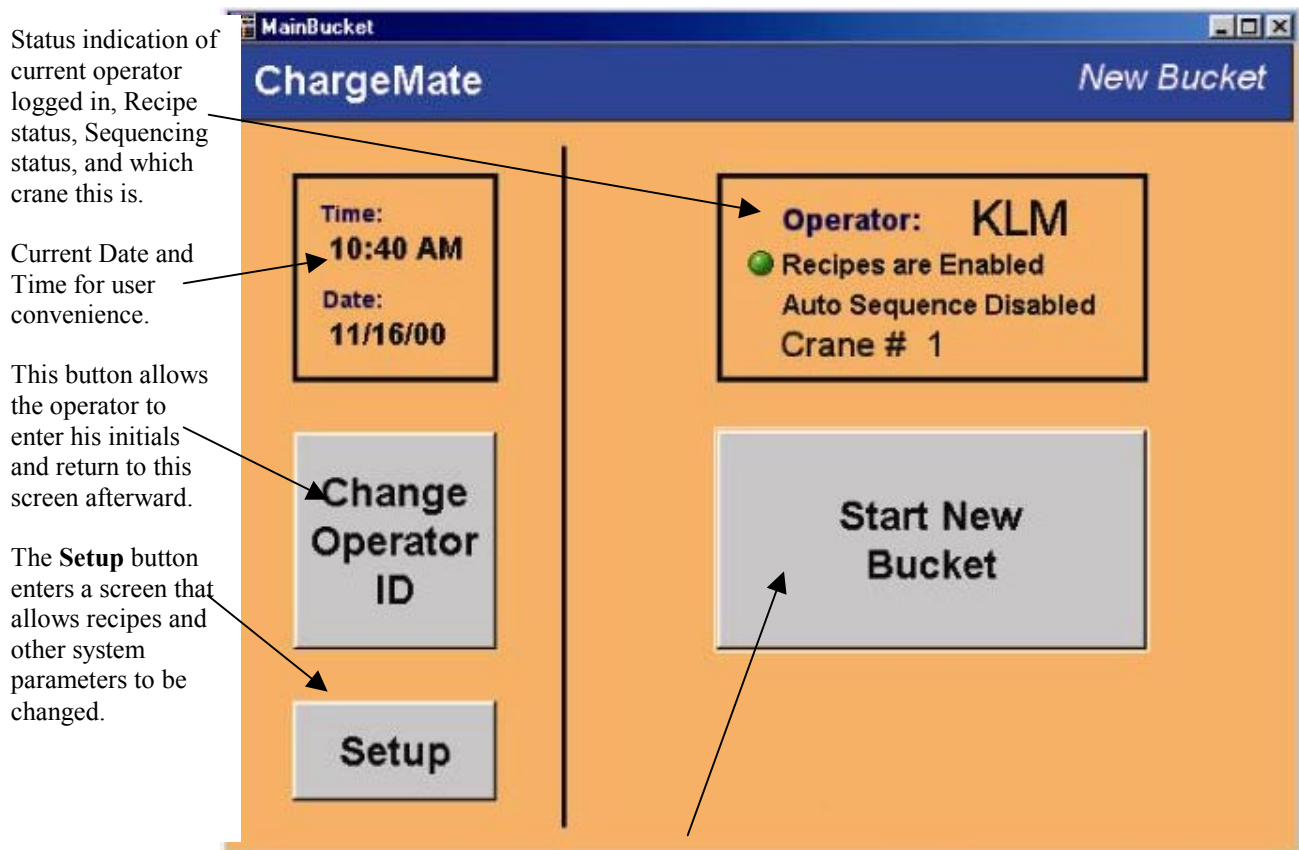
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## 2.2 Start New Bucket - MainBucket

Since every program has to start somewhere, this one starts with the screen shown below. This is the **MainBucket** screen and allows the following:

1. Change the current operator initials. The **CHANGE OPERATOR** button opens a keypad and permits the operator to enter three characters, which generally consists of his initials. Each operator should start his shift with this button.



The Start New Bucket Button will start a loading sequence. See the next section for details on entering a Bucket ID.

2. Start a new load sequence. To start, press the **Start New Bucket** button and be prepared to enter a bucket ID (See 2.3 Enter Bucket ID).
3. Go into **SETUP** mode. Entering setup and then pressing the **Shut Down** button will permit safe shut down or turn OFF of the computer. Setup is also used to enter/modify recipes and do scale diagnostics, etc. This area is not for general use by the operator, however in a pinch, he can use it to add or modify a recipe. Setup is password protected.

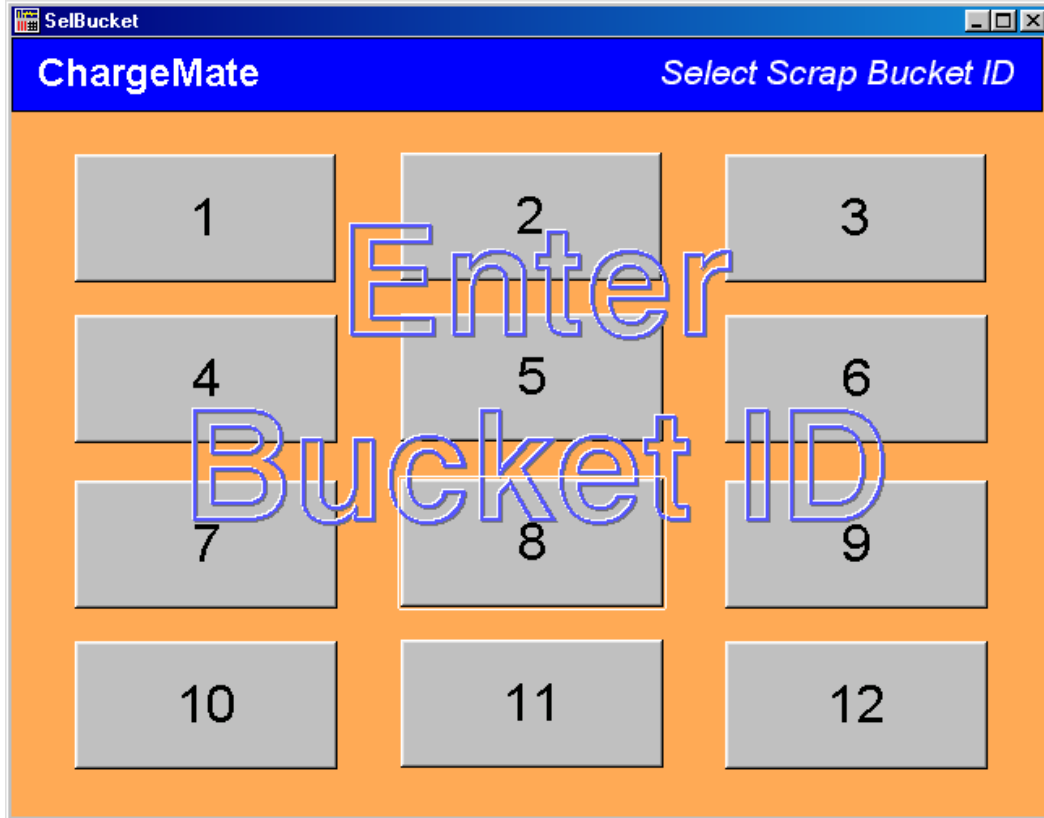


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### 2.3 Select Scrap Bucket ID

The operator must enter a Bucket ID before continuing (paperwork). The operator will be asked to press a button, which identifies the bucket being loaded. After a bucket is selected, the **Yard Select** Screen will appear.

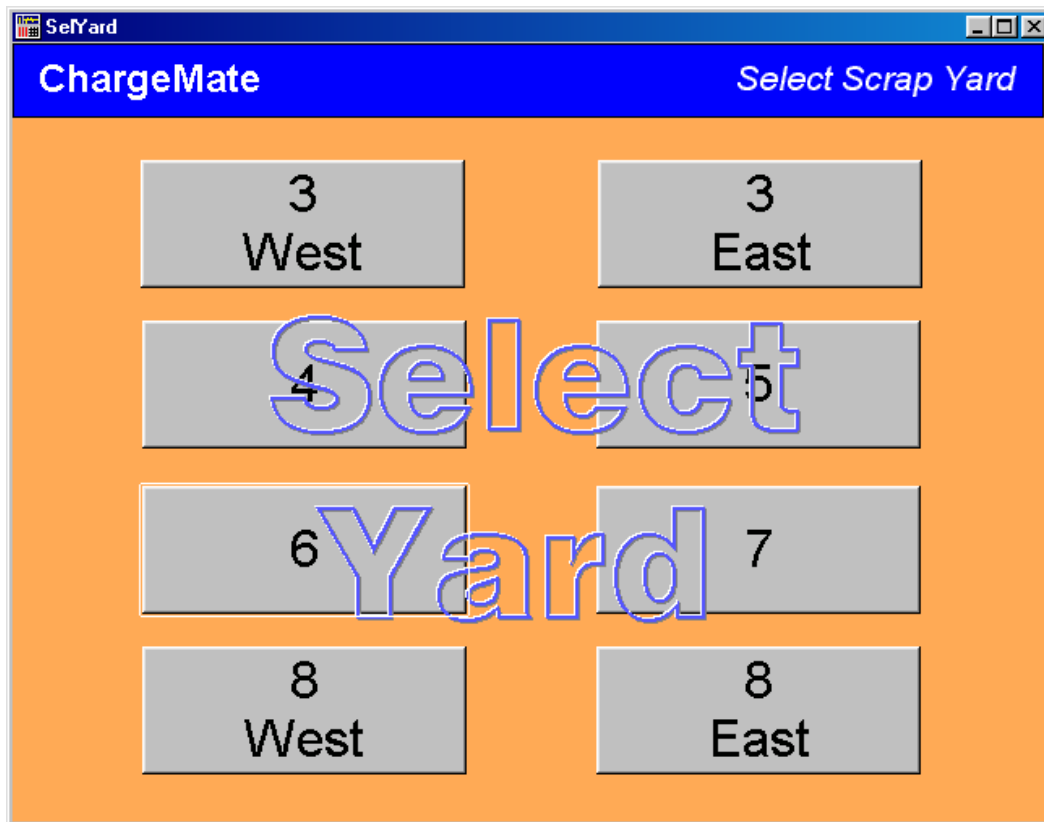


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## 2.4 Select Scrap Yard

The operator must now select the yard that he is operating from. The operator will be asked to press a button, which identifies the yard from which the scrap will be loaded into the bucket. After a yard has been selected, the **RecpSel** Screen, for **Recipe Selection** will come up, as described in the next section.



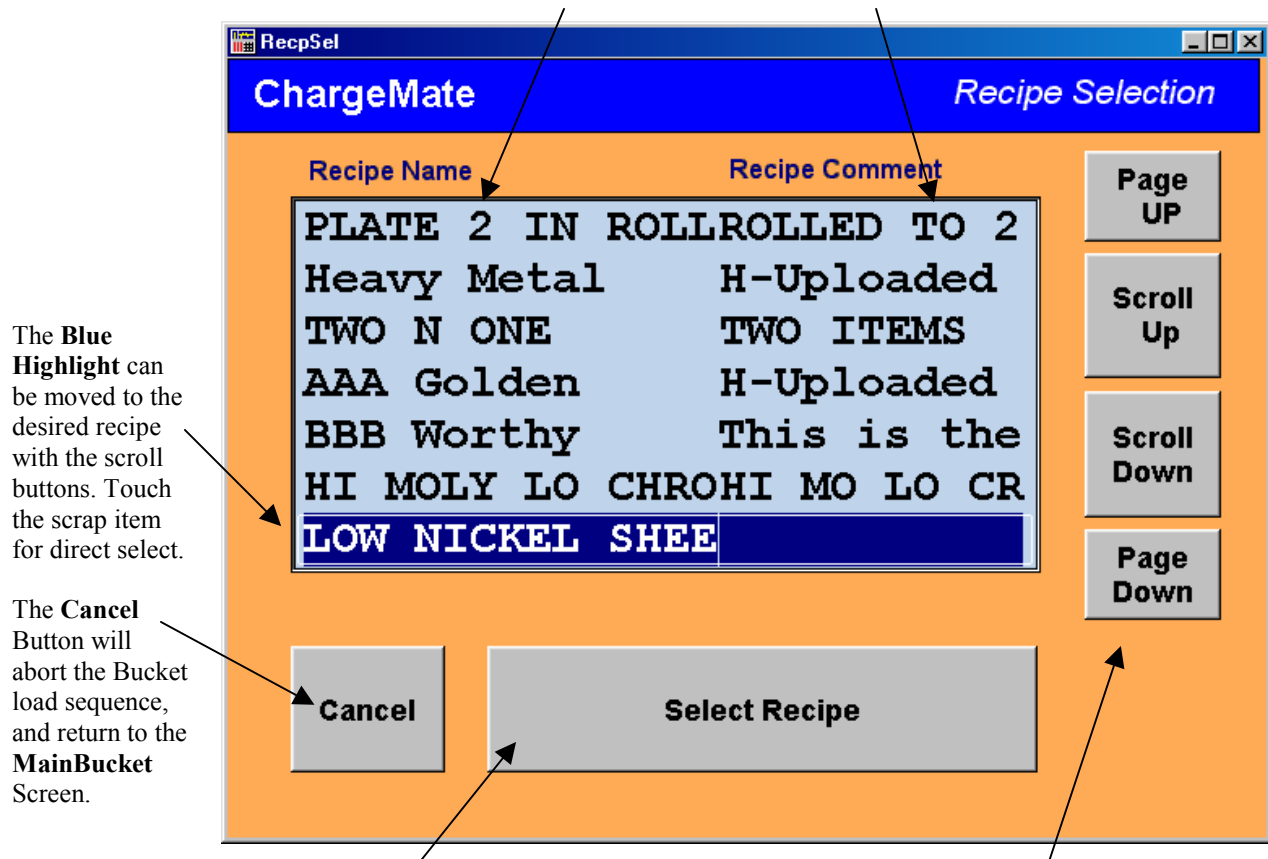
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## 2.5 Recipe Selection (Recipes Enabled)

If recipes are enabled, the Recipe Select Screen (**RecpSel**) will display after a yard is entered. If recipes are not enabled, then the **Scrap\_Pik** Screen will come up instead (This will be discussed later). The Recipe Select screen allows the operator to select one of the pre-configured recipes. Recipes can be configured manually (See Setup) or uploaded automatically from the Base Station Server. Once a recipe is selected, the program moves on to the **StepSel** screen, which will prompt the operator through a list of scraps and target weight to load.

The list of **Recipe Names**, and **Recipe Descriptions** are shown in this window.



The **Select Recipe** button will accept the highlighted recipe as the one to use, and then switch to the **StepSel** screen.

The **Scroll** buttons move the Blue Highlight up and down through the recipe list. If there are more recipes than will fit in the window, the list will scroll through the window as needed. **Page** moves 5 lines.

To select a recipe:

1. Use the **Scroll Up/Scroll Down** buttons to move the Blue Highlight to the desired recipe name. **Page Up/Page Down** allows fast access to large lists by jumping 5 lines at a time. Or, just touch the desired recipe for direct select.



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2. Press the **Select Blend** Button, which will select the recipe and then switch to the **StepSel** screen to select a blend step.
3. The **Cancel** button throws you all the way back to the **MainBucket** screen to start from the beginning.

Note: A grayed button indicates that it is temporarily deactivated. A button will be grayed if it either should not be pressed or it wouldn't do any good to press it anyway

## 2.6 Select Scrap Step to Load (Recipes Enabled)

With recipes enabled, the operator must select which step (or scrap), in the recipe, he is going to load next. The **Select Recipe Step to Load** screen (StepSel) allows this selection, and will come up after either a new recipe has been selected, or the **End Scrap** button is pressed on the **Scrap Load** Screen.

To select a scrap on this screen:

1. Use the **scroll buttons** to highlight the scrap (or recipe step) to be loaded. A particular step can be loaded more than once, and the system will total the weights. If this screen is entered after selecting a new recipe, the first item will be highlighted. If the screen is entered after having loaded a scrap, the next scrap item, in the list, will already be highlighted. That is, if item two has just finished being loaded, item three will already be highlighted. In either case, the most likely scrap will be highlighted, ready for the operator to press the **Select Highlighted Scrap** button.
2. Press the **Select Highlighted Scrap** button, and the system will change to the **Select Scrap Pile** screen.

If loading process is completed (all materials loaded to specifications), then press the **Close & Log Recipes** button, which will record the bucket scraps and weights, and return to the **MainBucket** startup screen. The report for this production run will be downloaded to the base station while the next run is in progress. This button will blink, if the production-run requirements are satisfied, to cue the operator to press the button.

The **Back to Blend Select** button will permit the operator to change recipes without aborting the bucket load sequence, providing that he has not yet loaded any material for the run (If material has been loaded, the button will be grayed out). This may be useful if the wrong recipe was selected and it was only obvious when materials list appeared.

The **Modify Scrap** button will open the **Scrap\_Pik screen** and permit the operator to make a substitution of scrap materials. (See 2.8 Scrap Select From Scrap List – Scrap\_Pik (Recipe Disabled)). Only approved materials can be selected.



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The **Recipe Step** number shows the portion of the recipe visible in the scroll window.

Recipe steps will scroll through the window as the scroll buttons are pressed. In this example, the first 2 scraps are scrolled off the window.

The **Blue Highlight** indicates which step will be loaded when the **Select Scrap** button is pressed.

The **Close & Log Recipe** button will log a report of what was loaded into this bucket, and return to the **MainBucket Screen**.

The **Recipe name and Recipe Description** is shown above the scroll

The **Spec Weight** is the recipe-requested amount of this scrap to be loaded. **Picked Weight** is the amount of pounds loaded, so far, in this bucket charge.

Step	Description	Spec Weight	Picked Weight
3	Heavy #1	23000	0
4	Light # 6	24000	0
5	Pigs	25000	0
6	Bundles	21000	0
7	Low Ni	19000	0

Bucket: 8 Yard: 3W Totals: 225000 0

If a specified scrap is not available, the **Modify Scrap** button allows selecting another scrap for this bucket only.

You may go back and change your recipe selection with this button. It is unavailable after loading has started.

The **Select Scrap** Button will use the highlighted step/scrap as the one to load, and switch to the **Scrap Load** Screen.

The **Scroll Buttons** move the Blue Highlight through the steps, and scrolls the available steps through the window.

## 2.7 Select Scrap Pile (Recipes Enabled)

With recipes enabled, the operator will be requested to select the Scrap Pile where the scrap is stored. The operator must select the appropriate pile number, 'Railcar' or 'No Pile' before continuing.

## 2.8 Scrap Load Screen - ScrapLoad (Recipes Enabled)

After indicating the scrap pile to load from, the **ScrapLoad** Screen will appear. This is the screen that the operator uses to load the target picks and weight of this scrap. This screen has visual helpers for the operator:

1. The Recipe step box will change from GREEN to GRAY, after the first pick/drop, to indicate that the scrap loading has already started. The **Target Weight**, **Net Weight**, and **Weight Remaining** fields' turn from WHITE to YELLOW when only one pick or drop remains.



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- The number fields then turn to RED after the last pick has been loaded and remains RED until a new material is selected.

The screenshot shows the 'ScrapLoad' window with the following components and annotations:

- ChargeMate Scrap Load Screen**: The main title bar.
- Sheet**: The name of the scrap being loaded.
- Target Weight**: 13000 (Remaining weight needed weight for this scrap).
- Weight Remaining**: 3388 (Target (desired) weight for this scrap).
- Bucket Totals**: A table showing 'Needed 39000', 'Actual 22428', and 'Remaining 16572'.
- Scrap Step**: 2 (Net Weight of the selected scrap).
- Net Weight**: 9612 (Recipe Step for this scrap).
- End Scrap Load**: A button to end the session and return to the Recipe Step Selection screen.
- Serial Status Lights**: A vertical row of lights for Scale Data, Com Port Open, Server Run Req, Server Run, Scale Enabled, Com Read, Rx Sync, and Rx Seq. The Error Count is 0.00.
- Current Bucket Information**: A table with fields: Bucket ID: 12 (3847), Recipe: AAA Golden, Loadout Yard: 8E, Current Pile: Rail, Operator: KLM, and Current Pick Wgt: 10322 (3204). There is an 'Auto Step' button next to the weight.

Annotations describe the functions of these elements, such as the 'End Scrap Load' button ending the session and the serial status lights indicating scale communication.

- The **End Scrap Load** button will blink to indicate that the operator should press this button to select another material to load.
- The **Bucket Totals** weight field will also turn YELLOW when only one scrap drop is needed to finish the bucket charge or loading sequence.
- Bucket Totals** will then turn RED when the recipe bucket weight has been exceeded

Operator involvement: The operator will be required to keep track of the remaining weights needed. When the required weight reaches zero, he will need to press the **End Scrap** button to log the data and return to the **StepSel** Screen to select another material to load.

The serial status lights should all be GREEN/WHITE for normal operation. The Com Read light will blink once each received weight from the scale. Any type of serial failure will cause a light to turn RED. The lights are defined as follows:



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1. **Com Port Open** indicates that the computer can attach to the specified port, the port is probably good, and the port is not in use by any other program. Note: After Sep 2001, this indicates that the DDE connection to the **OmniWgt** scale program is valid. GREEN means DDE channel is open and active. RED means there is a problem with the DDE interface.
2. **Server Run Req** and **Server Run** indicate that the program is requesting data from the scale. Not used on all systems.
3. **Scale Enabled** indicates that the scale is activated. Not used on all systems.
4. **Com Read** changes between GREEN and WHITE each second indicating that scale data is being received regularly. This will turn RED if the scale stops sending data
5. **Rx sync** means that the data from the scale is usable and that the data has the proper format and length.
6. **Rx Seq** means that each drop is sequential and no drops were missed.

## 2.9 Auto Sequence Mode (Recipes Enabled)

If the Auto Sequence Mode is enabled, the computer will automatically go to the **Scrap\_Pik** screen and select the next scrap out of the scrap list and then return to the **ScrapLoad** screen when the remaining weight for the scrap is less than the **Wgt. Margin** value. If the bucket weight drops below twice the **Wgt. Margin** value, the bucket will automatically be closed for the operator.

## 2.10 Select Scrap to Load – Scrap\_Pik (Recipes Disabled)

The **Scrap\_Pik** screen allows selecting a scrap out of the full scrap list (in contrast to the limited list of scraps available for a specific recipe). Because no specific recipe has been selected, the selected scrap has no predetermined requirements. The display only shows the scrap material totals already loaded. The operator determines the amounts loaded. The Scrap select screen is used in the following areas:

1. To select scraps to load when Recipes are disabled. The **Scrap\_Pik** screen will automatically come up after the Bucket ID and Yard are entered. It will also display after a scrap load is completed (Pressing **End Scrap** button on the **ScrapLoad** screen.).
2. To select an Alternative Scrap (Recipes Enabled Mode) in a recipe when the recipe specified scrap is not available. The **Modify Scrap** button on the **StepSel** screen brings the operator to this screen.

To use the **Scrap\_Pik** screen, use the scroll buttons to move the highlight to the desired scrap, and press the **Select Highlighted Scrap** Button, which cause the highlighted scrap to be used.



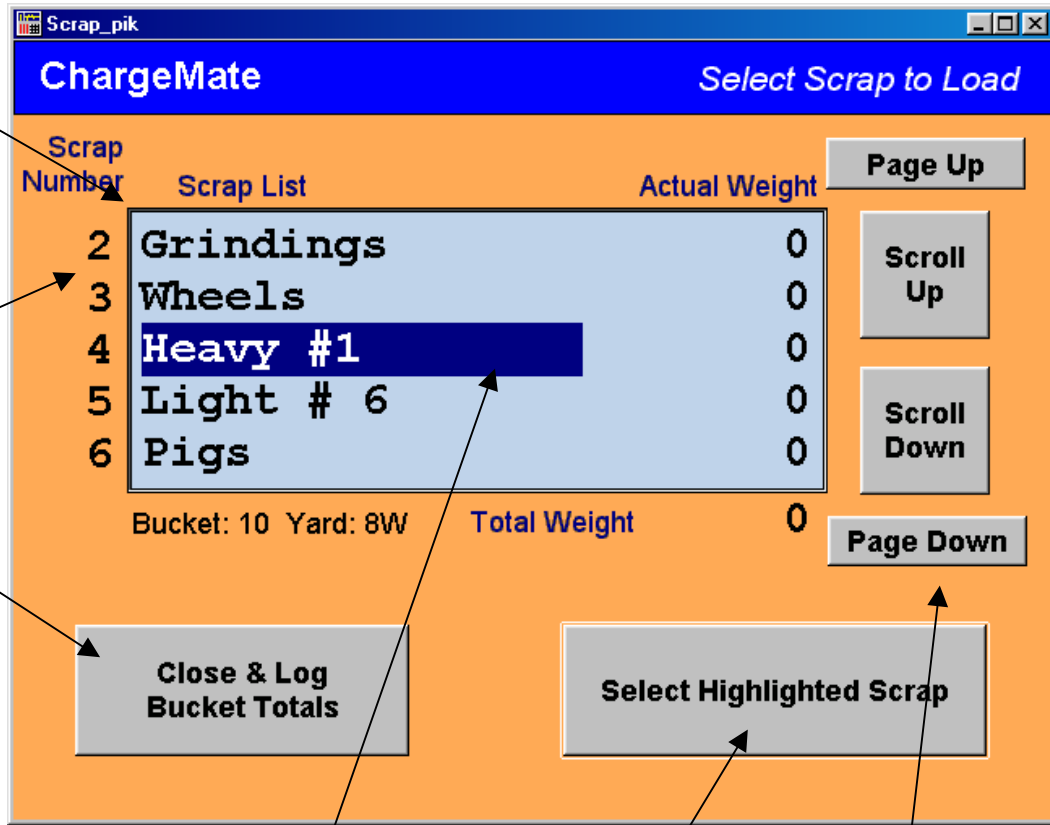
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**Scrolling window** lists all available scraps. List scrolls through window as scroll buttons are pressed. Touch the scrap name for direct select.

The **Scrap number** helps show, which part of the total list, is in the scroll window.

**Close & Log Bucket Totals** Button Ends the bucket load sequence and returns to the **MainBucket** Screen.



The **Blue Highlight** over a scrap moves with the scroll buttons, and shows which scrap will be selected.

The **Select Highlighted Scrap** Button causes the highlighted scrap to be selected, and the system will switch to the **Pile Select** screen.

Scroll buttons move the highlighted field.

## 2.11 Select Scrap Pile (Recipes Disabled)

With recipes disabled, the operator will be requested to select the Scrap Pile where the scrap is stored. The operator must select the appropriate pile number, 'Railcar' or 'No Pile' before continuing.



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## 2.12 Scrap Load Screen - ScrapLoad (Recipes Disabled)

The **Scrap Load** screen will come up with a slightly different appearance from the recipes enabled screen. This is the screen that the operator uses to load the target weights of this scrap. The recipe step box will change from GREEN to GRAY, after the first pick/drop, to indicate that scrap loading has already started. The operator is permitted to load any quantity of weight he so chooses. Information he has available to him is:

1. The net weight for the material being loaded,
2. The total bucket weight for the materials already loaded, and
3. Scrap Name, Scrap step, Bucket ID, Yard, and Pile.

The operator ends a scrap load by pressing the **End Scrap** button. This will return him to **Scrap\_Pik** screen to choose another material.

Name of scrap being loaded

Net (actual) weight loaded for this scrap

Scrap step for this scrap

Field shows the total weight for the bucket (All scraps so far).

Pressing the **End Scrap** button will end this session and return to the **Recipe Step Selection** screen

Serial status information used for scale. Com Read should blink regularly.

Current bucket information: Bucket ID, selected recipe, loading area, source scrap Pile, current operator, and the gross weight on scale.

<b>Bucket ID:</b>	10	3847
<b>Recipe:</b>	Recipes = OFF	
<b>Loadout Yard:</b>	8W	Auto
<b>Current Pile:</b>	8	Step
<b>Operator:</b>	KLM	
<b>Current Pick Wgt:</b>	10322	3204



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## 3. Setup

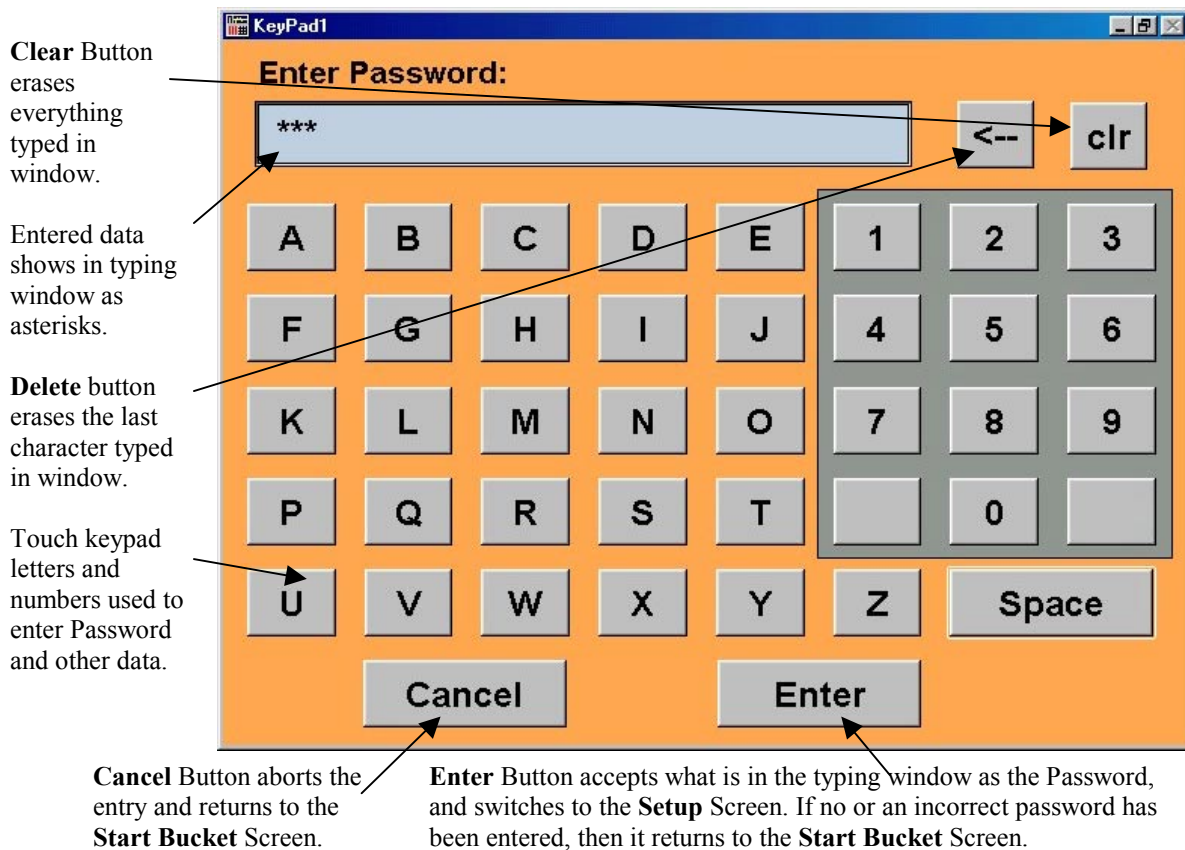
This section describes how an administrator can change recipes and other system parameters.

### 3.1 Entering Setup

Enter **Setup** from the **MainBucket** Screen. If password protection is enabled, the following keypad will prompt you for a password before entering setup proper.

This screen allows the following:

1. Enter **Setup** screen when a correct password is entered.
2. Return to previous screen when an incorrect password is entered or the **Cancel** button is pressed.



Note: the keypad screen is a general-purpose data entry screen that is used throughout the program whenever special operator input is required.



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### 3.2 System Services & Setup - Setup

The **Systems Services & Setup** screen allows an administrator to change system parameters and recipe information. This screen allows the following:

1. Change or set the systems **Time** and **Date** (see Section 3.7 Changing the Time and Date)
2. Activate **Fix #COM** repair function (see Section 3.8 Fix #COM)
3. Return to main bucket screen for normal operation.
4. Enable/disable recipe mode. Green light = Enabled; Black = Disabled. Push once to enable/disable.

The screenshot shows the 'Setup' window for 'ChargeMate System Services & Setup'. The window title is 'Setup' and the main title is 'ChargeMate System Services & Setup'. Below the title bar, it says 'Engcompass Automation LLC, ChargeMate Ver. 03.004.NJ, Copyright Dec, 2001.' The current system date and time are '12/3/01 17:21'. The screen contains several buttons and controls:

- Set Time**: Time/Date buttons change the computer date or time.
- Set Date**: Time/Date buttons change the computer date or time.
- Fix #COM**: Repairs #Com Database Error.
- Back To Main**: Back To Main button exits the setup screen and returns to the MainBucket screen.
- Shutdown**: Shutdown Button ends the ChargeMate program and resets the computer.
- Jumbo Text**: Turns ON/OFF jumbo text on screens.
- Disable Recipes**: Enable/Disable Recipes by toggling this button. (Green light is on)
- Wgt Margin 300**: Wgt Margin Scrap loaded Wgt. tolerance.
- Scrap Edit**: Pressing the Scrap Edit button will switch to the Scrap List Editor screen.
- Scale Diag**: Pressing the Scale Diag button will switch to the Scale Server Control Panel.
- Disable Auto Sequence**: Enable/Disable Auto Sequence Recipes by toggling this button. (Green light is on)
- Enable Recipe Close**: Enable/Disable Recipes by toggling this button. (Black light is on)
- Recipe Edit**: Recipe Edit button will switch to the Scrap Recipe Editor screen.
- Change Password**: Change Password button will bring up the keypad screen.
- Select Next Crane # 1**: Button toggles the crane ID. This is set once at installation, and forms the crane ID that is in the bucket report.



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5. Enable/disable Auto Sequencing mode. Green light = Enabled; Black = Disabled. Push once to enable/disable. Note: not. available on all systems.

The operator can manually override the auto sequence operation by pressing the **END Scrap Load** button on the **ScrapLoad** Screen. The system will return to auto mode after he selects a new scrap. To load more than the specified weight of a scrap, the operator must reselect the scrap to be loaded manually. The operator cannot override the end of bucket weight, to make it heavier, once a recipe is started.

6. Enable/disable Recipe Close mode. Green light = Enabled; Black = Disabled. Push once to enable/disable. The auto mode will close out a charged bucket after the recipe scraps have been loaded. Note: Not. available on all systems.
7. **Wgt Margin:** Auto Sequence mode will automatically close out a scrap and select the next scrap providing the remaining weight of the scrap to load is below the **Wgt Margin** weight. Auto Sequence will also close out the scrap and the bucket if the remaining bucket weight is less than twice the **Wgt Margin** weight.
8. **Shutdown** the **ChargeMate** program and turn off the computer (See 3.5 Shut Down – Power Down The Computer).
9. Enter the **Scrap List Editor** screen (See 3.3 Edit the Scrap List).
10. Enter the **Scrap Recipe Editor** screen (See 3.4 Edit the Scrap Recipe).
11. Turn ON/OFF the **Jumbo Text** that is seen on the Bucket Select, Yard Select and Pile Select screens. Push once to enable/disable.
12. Enter the **Scale Diagnostic** screen (See 3.6 Using the Scale Diagnostic Screen).
13. Change the **Setup** entry password.
14. Change crane identification. Just push the **Crane #** button momentarily until the desired crane number appears. Range 1 to 9.

Note: There is no way to **UNDO** any change made on this screen and there are few requests to verify a change. Be aware of the values before you change one and be careful not to touch the screen unnecessarily.



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### 3.3 Scrap List Editor

The scrap list editor screen allows an administrator to change or delete an existing scrap type, or to create a new scrap type. The scrap list shows all available scraps, and is used to select scraps when editing a recipe, or to select which scrap is being loaded if recipes are not enabled. This list can also be uploaded from the optional base station.

The screenshot shows the 'ScrapEdit' window with the following components and annotations:

- Scrolling window lists all available scraps.** List scrolls through window as scroll buttons are pressed.
- The Blue Highlight** over a scrap moves with the scroll buttons, and shows which scrap will be selected.
- The Scrap number** helps show, which part of the total list, is in the scroll window.
- Add a Scrap** button will ask for the name of a new scrap to be entered. (Added to end of list).
- Delete Scrap** button will erase the highlighted scrap type.
- The Exit** Button closes the session and returns to the previous screen.
- The Edit Scrap Name** button allows the highlighted scrap name to be changed via the alphanumeric keypad.
- Edit Scrap ID** Allows user to set a short name or location code for the scrap.

Scrap Number	Scrap Name	Scrap ID
2	Grindings	Grin
3	Wheels	Whel
4	Heavy #1	Hevy
5	Light # 6	Ligh
6	Pigs	Pigs

At End Of List

To add a scrap:

1. Press the **Add a Scrap** button, enter a scrap name such as 'Home Scrap 1' then press **Enter**
2. Then press the **Edit Scrap ID** button and enter a brief (4 digit max) name or location code for the scrap, followed by **Enter**.



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To edit a scrap name or ID, select the scrap to be changed and press **Edit Scrap**. Then make changes as if it were a new scrap.

To delete a scrap:

1. Select the scrap to be deleted and Press the **Delete a Scrap** button.
2. Then respond to the 'Are You Sure?' Dialog box as shown here.



### 3.4 Scrap Recipe Editor

This screen allows an administrator to add, change or delete any recipes. Recipes can be edited on the crane display as described here, or uploaded from the optional base station.

The **Recipe Step** helps show, which part of the total list, is in the scroll window.

**Scrolling window** lists all available scraps. List scrolls through window as scroll buttons are pressed.

The current selected recipe name and description is displayed here. Choose the recipe by using the **Next** and **Previous Recipe** buttons.

The **Blue Highlight** over a scrap moves with the scroll buttons, and shows which scrap is being changed.

The **Exit** Button closes the **Scrap Recipe Editor** screen and returns to the previous screen.

The **Next** or **Previous Recipe** buttons select the recipe to be changed.

These buttons will copy, create a new, or erase the recipe selected. A new or copied recipe is added to the end of the list.

This is the entered target weight for this recipe step.

These buttons will allow the **name** or **description** of the selected recipe to be changed.

These buttons will allow a scrap to be **added** or **deleted** from the recipe.

This button will allow the name of the highlighted scrap to be changed.

Button will allow the target weight of the highlighted scrap to be changed.



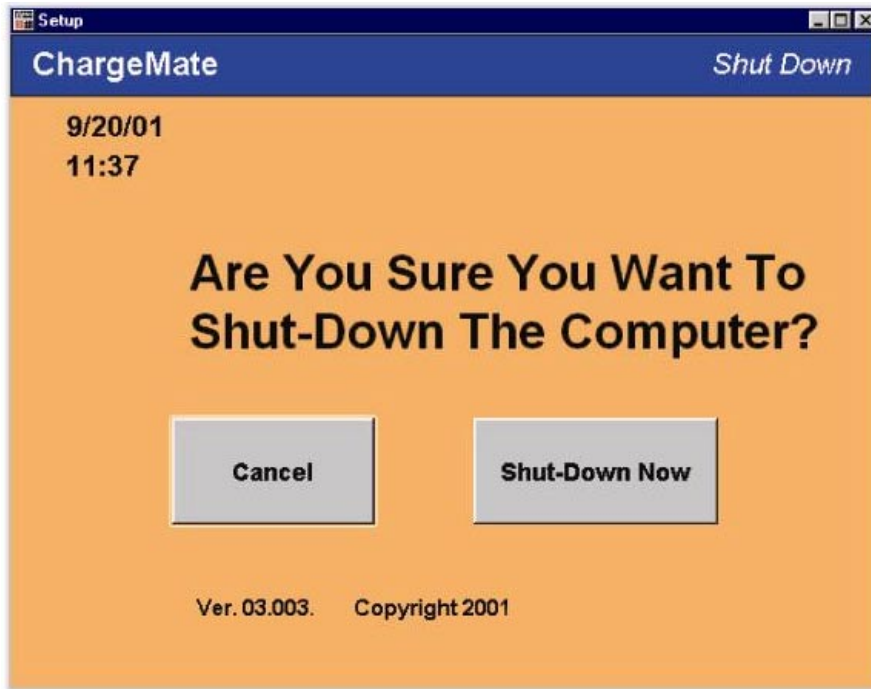
1. To change the materials in the recipe.
  - i. Select the recipe to change.
  - ii. Select either **Add/Copy Recipe** or **Add a Recipe** button. Copy creates a copy of the selected recipe. **Add** creates a blank recipe. The new recipe is named **NewRecipe** and it is at the end of the list.
  - iii. Press **Change Recipe Name** button and enter a new name for the recipe.
  - iv. Press **Change Recipe Descr** button and give the recipe a new description.
  
2. To change the materials in the recipe.
  - i. Select the recipe to change.
  - ii. Select the material item to change. On a new recipe, the material list will be blank, and the operator will need to press the **Insert Step** button. This will create a material called **New Scrap** with a value of zero pounds. You can insert a step anywhere in the recipe, be sure to position the highlight over the appropriate place before pressing the button. Note: The highlighted scrap will be pushed down one line. Also, a recipe can have a maximum of ten steps.
  - iii. Press **Change Scrap Name** and select an approved material from the list and press the **Select Highlighted Scrap** button.
  - iv. Press the **Change Weight** button and enter the desired weight for this material.
  
3. To delete a recipe, select the recipe of interest using the **Next** and **Prev** Buttons. Then press the **Delete Recipe** button. You will be prompted to confirm your decision to delete the recipe with a dialog box asking “Are You Sure?” Press the appropriate button to continue. Note: You must respond to the dialog box in order to continue.
  
4. To delete a scrap item from a recipe, first select the recipe, then select the scrap item, and finally press the **Delete Step** button. You will be prompted to confirm your decision to delete the scrap item with a dialog box asking “Are You Sure?” Press the appropriate button to continue. Note: You must respond to the dialog box in order to continue.
  
5. **Exit** will return to the **Setup** screen.



### 3.5 Shut Down – Power Down The Computer

This screen allows the computer to be turned off without damage to the program or the database.

1. To shut the computer down press the **Shut-Down Now** button. The computer will close the program, the database, and then will close Windows NT until it states it is safe to turn the power off.



2. To continue running the program and return to **Setup**, merely press the **Cancel** button.
3. There is a hidden button under the words “Shut Down”. This button will exit the program and return to the system window without resetting the computer.

### 3.6 Scale Diagnostic Screen

This diagnostic screen is primarily for use by an experienced EAET technician. It will help him during installation and testing of the system.

Some notes on the things it does:

The last pick/drop weight is just to see that it is detecting drops.

The Citect general diagnostic buttons allow one to wander through the program screens without actually playing by the rules of the program. Of course, one can get into trouble this way so it is best to leave this to the professionals. Besides canceling an alarm or two, you can't really hurt the program or destroy any data by doing this. But, you can get the program into a mode where the program ONLY looks like it is operating normally, but it is not really doing anything of



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value. Simply press the Citect back arrow until you return to this screen or press the various **Close** and **Exit** buttons until you arrive at the **MainBucket** screen and start again.

The screenshot shows the 'Scale Server Control Panel' interface. At the top, it displays 'Utility' and 'EXITING...'. The main display area shows '3204 LBS Net' and 'Bucket 1 currently Selected'. There are four 'Bucket' buttons (1, 2, 3, 4) and a 'Close & Exit' button. On the right, there is a 'Base - Scale' status section with several green indicator lights and labels: 'Server Run Req', 'Server Run', 'Com Port Open', 'Com Write', 'Com Read', 'Rx Sync', and 'Read Enable'. Below this are buttons for 'Server Start', 'Swap Com Port', and 'Server Stop'. A 'Test Flag' of 105 is shown. At the bottom, there is a serial data display showing a timestamp '12:01:23 PM' and a long alphanumeric string. A legend at the bottom explains the data: 'Error count of serial reads or missed reads' (0.00), 'Internal software run time codes' (105), 'Base station Serial status data. Com Read should blink.' (105), 'Scale Serial status data. Com Read should blink.' (105), and 'Read enable turns on reading serial scale data.' (Read Enable button).

Weight represents the last pick weight from the scale.

Citect general diagnostic buttons.

These are bucket select buttons and are not used on all systems.

Poll Wait Time and Backoff Delay sets internal timing for the serial scale reads.

Close and Exit returns to the Setup screen.

Serial Scale diagnostic data.

Base station data transfer status information

Error Count: 0.00  
Test Flag: 105

Base - Scale  
 ● Server Run Req  
 ● Server Run  
 ● Com Port Open  
 ● Com Write  
 ● Com Read  
 ● Rx Sync  
 Read Enable  
 Server Start  
 Swap Com Port  
 Server Stop

12:01:23 PM 00020322G00068N00003204A  
 12:01:23 PM 30.30.30.31.30.33.32.32.47.30.37.30.36.38.4e.30.30.30.30.33.32.30.34.41.  
 12:01:23 PM 30.30.30.31.30.33.32.32.47.30.30.30.36.38.4e.30.30.30.30.33.32.30.34.41.

Enable/Disable Scale Serial Processing. Utility Scl\_Panel

Error count of serial reads or missed reads    Internal software run time codes    Base station Serial status data. **Com Read** should blink.    Scale Serial status data. **Com Read** should blink.    Read enable turns on reading serial scale data.

Bucket Select buttons allow the operator to select the scale to use for loading. This feature is not used on this system.

**Poll wait Time** and **Back off Delay** are timing elements that help synchronize the incoming data from the scale so that weights are recorded accurately and timely. The values shown are about optimal and are in milliseconds.

1. The serial scale diagnostic data is.
  - i. The time the scale string arrived. It is not part of the scale data.
  - ii. The actual ASCII string as received from the scale using the Poll Wait and Back Off timing.



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- iii. The next two lines are the string data represented in Hex instead of ASCII. This data has been filtered in the code a little bit from one to the other. In general, they should both be the same.
  - iv. At startup, it will be obvious that the data is not in sync because the lines will change in length from read to read. Once synchronized, they will look as they do in the picture.
2. The little round lights attempts to show the status of the serial ports and if data is actually being received from the scale and base station.
    - i. The **Read Enable** must be on to see scale data. The program ignores scale data if it is not actually loading scrap. The enable overrides the OFF condition.
    - ii. The **Com Read** lights indicate the reception of data from either the base or the scale. The activity from the scale should be about once a second. The base station transmits in about 30 second intervals unless actually downloading recipes or uploading reports.
    - iii. The **Rx sync** light for the scale indicates that the data is the right length and the right format for proper use.
    - iv. The **Rx sync** light for the base will blink about once a second to indicate that the program is monitoring the channel for a base station query. The light activity will increase during an upload and download sequence.
  3. The banner just to the left of the Time and Date provides a text description of the activity between the base station and the crane computer.

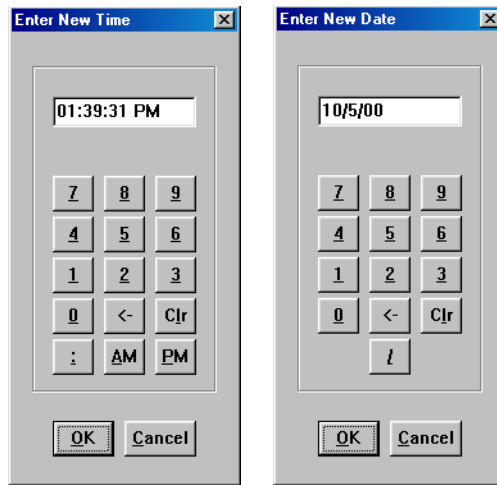
### 3.7 Changing the Time and Date

The Time and Date fields can be changed to keep the system in sync with the rest of the world. One of the following two pop-up windows will appear. Merely enter the correct value and press OK. Otherwise, press the Cancel button.



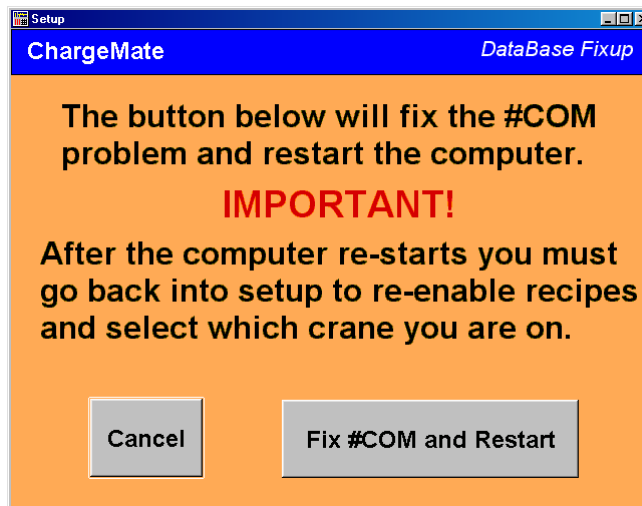
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### 3.8 Fix #COM – DataBase Fixup

This button will re-create the setup database on disk should it become corrupted due to a power failure or other uncontrolled shutdown of the system. Should this happen data on the screens will be replaced with a “#COM” indicating the data is un-available. Basically the Setup database becomes corrupted, and this button deletes the database. The operator must reboot the system after performing this operation. When the program cannot find the database, it builds a new empty database. Most of the



crane ChargeMate setup data is lost in this operation and the operator must reselect the operating parameters he was using before continuing. This screen is an attempt to warn the operator that he should not perform this operation unless absolutely necessary.



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