



PDA TRAINING

USAID-Funded Economic Governance II Project



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TABLE OF CONTENTS

1.	INTRODUCTION.....	4
2.	TRAINING REQUIREMENTS.....	4
3.	PDA OPERATION	5
4.	MEMORY CARD CHANGING	9
5.	BATTERY CHANGING AND RECHARGING	10
6.	STARTING THE SURVEY PROGRAM	12
7.	USING THE APPLICATION	13
8.	SEARCHING THE DATABASE	14
9.	DATA ENTRY	16
10.	FIELDS REQUIRED FOR SURVEY	19
11.	DROP DOWN BOX CHOICES	23
12.	APPENDICES.....	27
	<i>APPENDIX A – TECHNICAL SPECIFICATIONS.....</i>	27
	<i>APPENDIX B – BILLING DISTRICT NUMBERS.....</i>	28

1. INTRODUCTION

A Metering Survey is to be carried out in Iraq to inspect and record the condition of the existing meters. The survey will start in Baghdad and then be done for the rest of Iraq. The information will be collected on handheld collection devices called Personal Digital Assistants (PDAs). The information will be stored in a database. This database will be loaded with information from the existing billing files to simplify and speed up the collection process.

2. TRAINING REQUIREMENTS

Training in metering and survey techniques is to be carried out by the Ministry of Electricity.

This document is to be used to train the surveyors in how to use the PDA and the survey application.

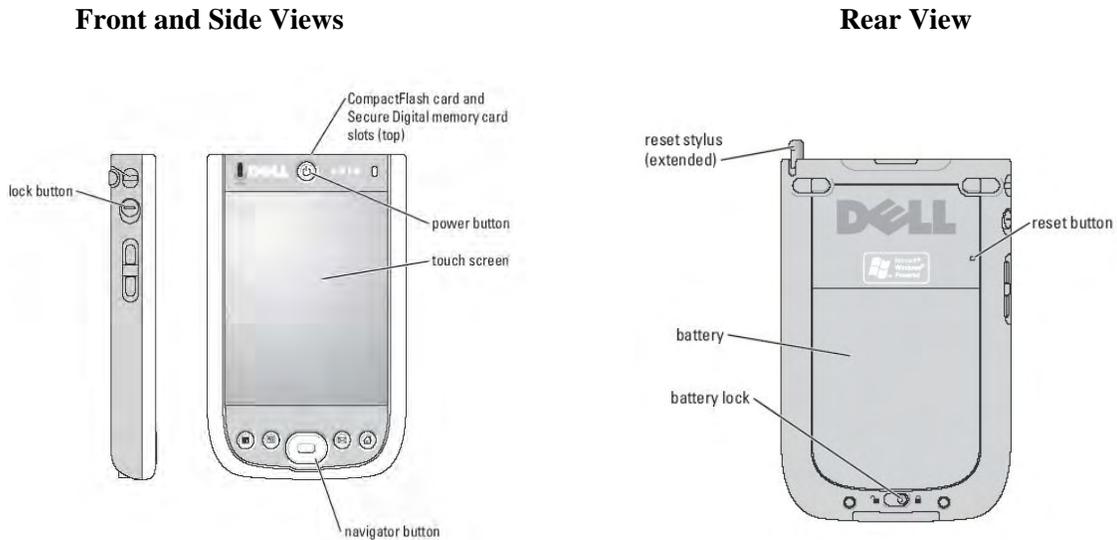
The subjects to be covered are:

- PDA Operation
- Memory card changing
- Battery changing and recharging
- Starting the Survey Program
- Using the Survey Application
- Searching the Survey Database
- Data entry
- Survey Information
- Drop down box choices

3. PDA OPERATION

The PDA chosen for the survey is the Dell X50 as per the technical specification detailed in Appendix A. Each surveyor will be provided with a PDA.

The device has hardware buttons that control actions and scroll functions, a touch screen for menu selection and entering information using a stylus to replace a normal PC mouse.



Power Button

The Power button is used to turn the device on and off. It will turn itself off after a period of inactivity. The Power button can also be used to dim the screen display and save the battery.

Press the power button to turn the device on or off.

Press and hold the power button to dim the display.

Press and hold the power button again to return the display to full brightness.

- When the device is connected to external power and the main battery is fully charged, the power button light is solid green.
- When the main battery charge is low, the power button light flashes amber. The battery should be charged as soon as possible.
- When the battery is being charged, the power button light is solid amber.

Reset Stylus

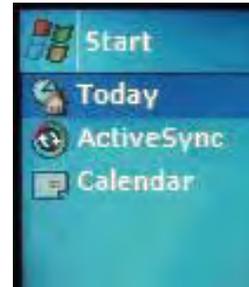
Use the reset stylus to enter data on the touch screen. To remove the stylus, pull it straight up and out of the holder. To avoid losing the stylus, store it in the holder when it is not in use. Make sure that the stylus fits properly when it is replaced in the slot.

Report

Touch Screen

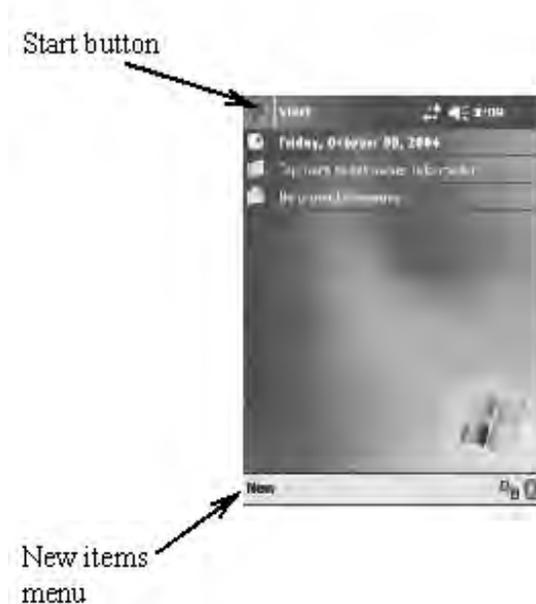
On the device, the stylus replaces the mouse normally used on a PC and operates in the following manner:

- Tap - Touch the screen once with the stylus on any item to open that item and select options.
- Drag - Hold the stylus on the screen and drag across the screen to select text and images.
- Tap and hold - Tap and hold the stylus on an item to see a list of actions available for that item. On the pop-up menu that appears, tap the action to be performed or the item to be entered.



Today Screen

When the device is turned on for the first time each day (or after 4 hours of inactivity), the Today screen appears. The Today screen can also be viewed by tapping the Start button and then tapping Today. The Today screen displays today's date and information about the device owner.



Report

Status Icons

Status Icons appear at the top of the screen. If there is not enough room to display all the icons, the notification icon, , displays. Tap the notification icon to view all other icons.

-  Backup battery is low.
-  Main battery is charging.
-  Main battery is low.
-  Main battery is very low.
-  Main battery is full.

Navigation Bar and Command Bar

The navigation bar is located at the top of the screen. It displays the active program and current time and allows switching to other programs and close screens.

Use the command bar at the bottom of the screen to perform tasks in programs. The command bar includes menu names, icons, and the input panel icon.

Lock Button

The lock button allows the device to be locked so that it does not respond to accidental key presses. The lock should be in the “ON” position when the device is not going to be used for a long period of time. The pictures below show the lock in the “On” and “Off” position.

Lock - On Position



Lock - Off Position

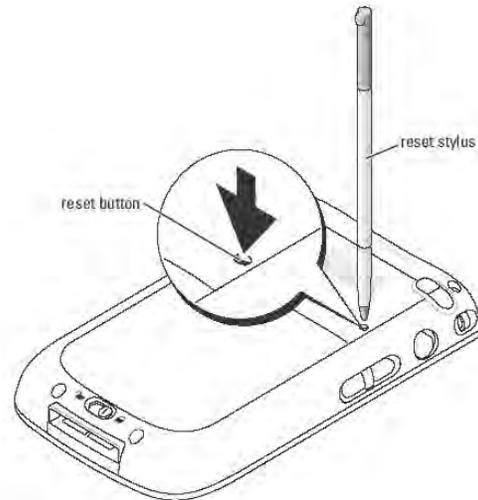


Reset Button

When you do a reset, the device deletes any data that has not been saved. Any data that has been stored in memory is retained. It is important to press the save button after any data has been entered or changes made to reduce the risk of data loss. A reset should only be done if the device does not respond when the display is tapped or a button is pressed.

To perform a reset, use the reset stylus to press the reset button.

The reset action will restart the PDA and the surveyor will need to re-open the survey application and logon to the system again.



Programs

The Survey Program is started by selecting the required program from the Start menu. Press Start to see the programs available and then tap the survey application.

Pop-Up Menus

With pop-up menus, you can select an action for an item.

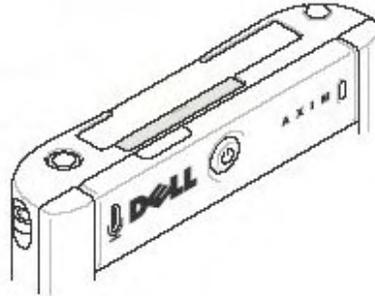
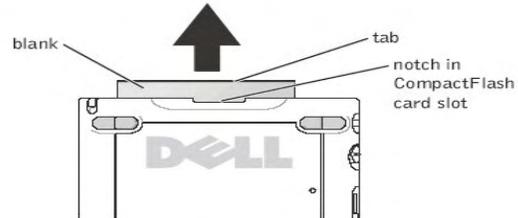
To access a pop-up menu, tap and hold the stylus on an item name. When the menu appears, lift the stylus and tap the action to be performed. To close the menu without performing an action, tap anywhere outside the menu.

Backing up Data

The survey data is stored on the Memory card and cannot be lost once any changes are saved unless the memory card is damaged. The data collected will be transferred to the main database every week so that any possible data loss from a damaged memory card will be reduced.

4. MEMORY CARD CHANGING

CompactFlash Card and Secure Digital Memory Card Slots



To install a CompactFlash card:

Align the tab on the back of the CompactFlash card with the notch in the CompactFlash card slot, and slide the card into the slot.

NOTE: Do not force the card. If there is any resistance, remove the card, check that it is the right way round and reinsert it.

When you receive the PDA it will contain a 512 Mb flash memory card that stores all the existing billing file information for the District being surveyed. Any new data collected or changes made to existing data will also be stored on the memory card. Once a week, the memory card will be removed from the PDA and replaced with a new card containing all the billing file information and the new information from the previous week. The data on the memory card removed from the PDA will then be loaded into the main database and the card will be updated again to match the current database.

5. BATTERY CHANGING AND RECHARGING

Removing the Battery

To remove the battery:

- 1 Slide the battery latch to the left to unlock the battery cover.
- 2 Lift the battery cover.
- 3 Pull the tab to lift the battery out of the slot.

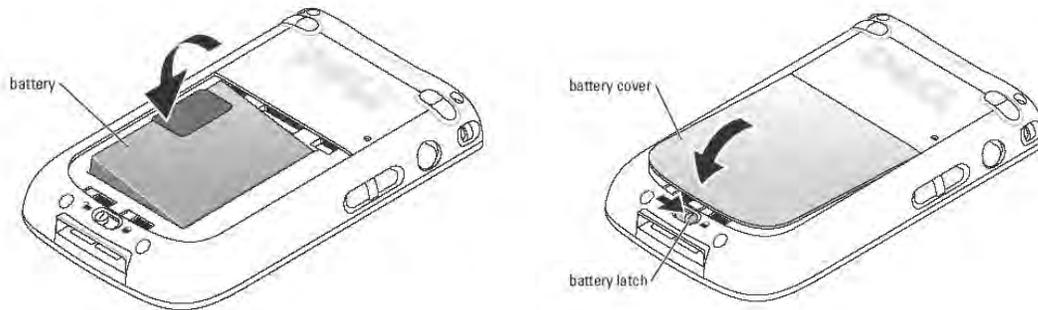


Installing the Battery

To install the battery:

- 1 Ensure that the device is turned off.
- 2 Align the battery contacts with the contacts in the battery slot, insert the battery, and lower the battery into the slot until it clicks.
- 3 Close the battery cover.
- 4 Lock the battery cover by sliding the battery latch to the right.

NOTE: The device will turn on when the battery is inserted and the battery cover latch is locked.



Recharging the Battery

You will be provided with a battery charger to use to recharge the battery every day.

- Connect the battery charger to an electrical outlet and the PDA device. Leave to charge overnight.

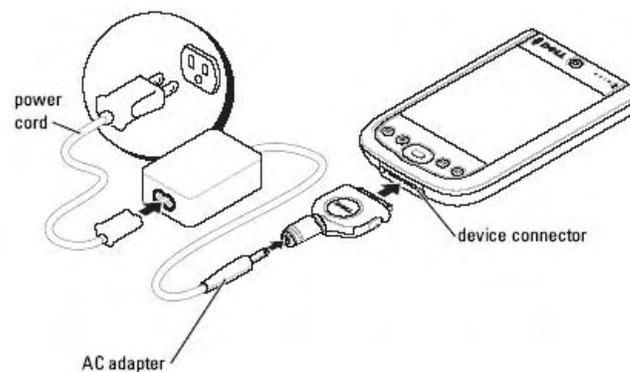
The standard battery pack (1100mAh) completely charges within 5 hours.

If the main battery is critically low, the device enters "sleep" mode and then turns off.

To recover from a critically low battery:

- 1 Plug in the AC adapter or replace the main battery with a charged battery.
- 2 Press the power button to turn on the device.

If the main battery is removed, the internal backup battery can last for up to 30 minutes in "sleep" mode. The main battery should not be removed if the backup battery power is low.



6. STARTING THE SURVEY PROGRAM

Login Screen

To start the Survey Program:

Switch on the PDA by pressing the “On” switch

Tap the Start icon with the stylus which opens a selection menu of programs available

Tap the Survey Program which shows a Login screen.

The Login Screen requests a User Name and Password

The User Names of all surveyors are stored in the PDA and are available in a drop down box.

Select your name from the list

You will be provided with a password to use the survey application. Enter your password in the Password box using the screen keyboard and stylus and then press the Login button

The Screen keyboard is activated by tapping the keyboard icon at the bottom right of the screen. After entering the User Name and Password, the screen keyboard can be hidden by tapping the keyboard icon again.



7. USING THE APPLICATION

Welcome screen

The application will then Open with the Welcome screen and confirm that you are logged into the Survey application as – “Your User Name”

From this screen you can start collecting Survey data using the “Accounts” button. Press the Accounts button to show a pop up menu with choice of Quick Search or Advanced Search.

You will use the Quick Search most of the time and will enter the full Account Number of the house, shop or industrial site taken from the Meter Reader’s meter reading sheet.

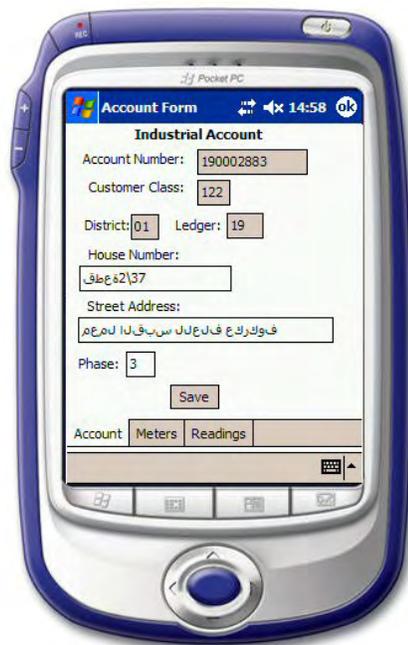


8. SEARCHING THE DATABASE

Quick Search Screen

You will be accompanying a meter reader who will have a meter reading sheet for each Customer. The meter reading sheet contains an Account Number which is the key to locating the Customer record for each site. You will select either Residential or Industrial depending on the type of Customer that you are surveying and enter the Account Number from the meter reader's sheet in the box provided. You must select Customer type in addition to entering the Account number because some Account numbers are used in both the Residential and Industrial files.

When you have selected the Customer Type and entered the Account Number, tap the "Go To Account" button. This will show you an "Account Form" like the one below to allow you to add or edit the Customer information as described in Section 10.



Advanced Search Screen



If the “Quick Search” does not present a Customer record then the surveyor can try a more detailed search. All the Customer Records for each District are stored on the PDA so this Advanced Search should not be required often.

The Advanced Search can prove useful however in reducing the number of digits of the account number that you need to input. By entering the first five or six digits of the Account Number and tapping search, the PDA will offer a drop down list of all accounts starting with these numbers. The list can only contain up to fifty

accounts and will display a message informing you if there are more than fifty available. The number of digits entered must be enough to limit the choices to less than fifty. From the list you will tap the Account number you want and then tap Select. An Account form like the one on the right above will then show.



9. DATA ENTRY

Account Form

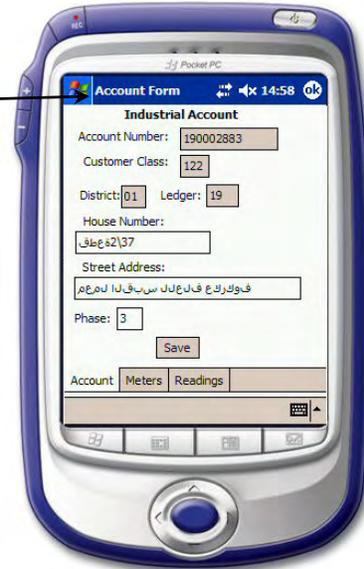
On selecting an Account from one of the two Search screens, the Account Form is displayed which details the data from the billing file as shown in this example

You will check the details on the screen and correct any errors in the Customer Class or Street Address.

Once you have made any changes on this form the “Save” button must be tapped to store the new data.

You can then start to survey the Metering and Meter Reading information.

The list of fields available and descriptions of each survey item is given in detail in Section 11.



Meter Form

After saving the Customer details on the Account form, you will then review the Metering details by tapping the Meters button.



For Residential sites, this will display the Meters List with the serial number of the one meter at site. Select the meter and tap “Edit” button. The Meter Form will then display the known details of the meter at site such as Meter serial number, date of installation if recorded in the billing file and the Meter multiplying factor.

For Industrial sites, the Meter Form will display a list of Meters at the site and each Meter can be chosen in turn. The Meter Form will then display the details of the chosen Meter.



You will review the details for each Meter and amend any errors.

Report

You can then input the new metering data such as Meter manufacturer, date manufactured and Meter type using the drop down boxes. These boxes are described in detail in Section 12 and contain all the details of meters currently being used in Iraq. If any meters are discovered that are not in the drop down lists, you will choose “Other” and use the “Comment” box on the Meter Reading form to provide details of the new meter.

Having completed the data input and any changes to existing information, tapping the “Save” button will update the database. This must be done for each meter before choosing another meter for checking.

Empty Meter Reading List

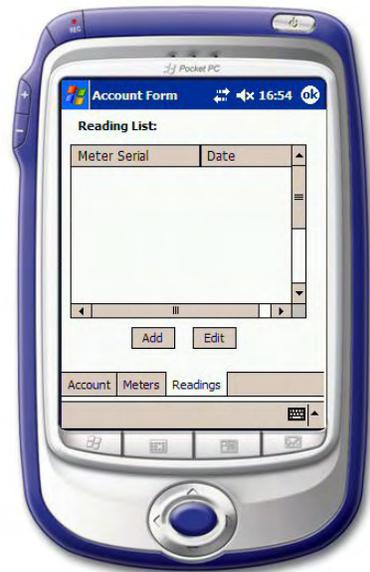
Having updated and saved the Meter information, you will then proceed to collect the meter reading and record the condition of the meter.

Tap the “Readings” button from the Account Form and you will be presented with a Meter Reading List.

This list will contain the Meter Serial numbers at the site and the last meter reading date if there are any existing readings in the database.

If there are no existing readings in the database, this list will be empty as shown here and you will tap the “Add” button and be presented with a blank “Meter Reading” form as shown in “Meter Reading Form – Select Meter” below.

If a previous reading exists, you will be shown a list of Meter Serial numbers and the date of the last meter reading. You will select a meter serial number and tap the “Add” button which will present the “Meter Reading” form as shown in “Meter Reading Form – Choose a Meter” below.



Meter Reading Form – Select Meter

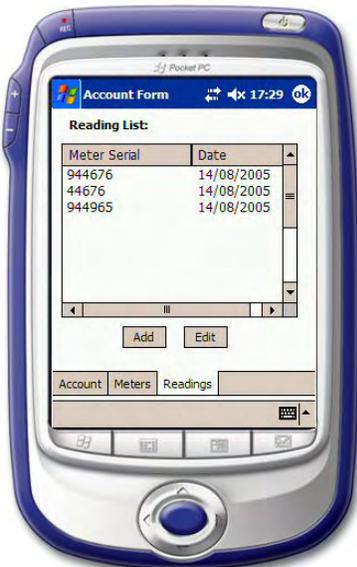


When offered an empty Meter Reading list, the Add button displays a blank meter reading form as on the left and the meters can be selected from a drop down list of serial numbers for the site. You will select a meter from the Meter Serial number box as shown on the right, enter the reading in the Reading box and choose the meter condition from the drop down options box for Condition1. Condition 1 must be completed. Conditions 2 and 3 are



available if there is more than one option applicable to the meter. Enter any additional comments in the Comment box using the screen keyboard and then save the changes. Carry out these actions for each meter at the site by choosing each meter in turn from the drop down box of serial numbers. The changes must be saved for each meter before going on to the next one. Conditions and Comments are described in detail in Section 12.

Meter Reading Form – Choose a Meter



When previous Meter Readings exist in the application, the Reading List will display the Meter Serial Number for each meter at site and the date of the last meter reading. You may select each meter in turn, tap the edit button to display the Reading form and review the previous reading. To add a new reading, tap the add button, select the meter and enter all the necessary information as above. Remember to save the changes before selecting the next meter in the list.





Report

10. FIELDS REQUIRED FOR SURVEY

The survey PDA will be loaded with the existing billing file customer and metering information. This will reduce the amount of data that has to be input manually. The table below shows the items of data that will be reviewed at site against the existing billing file information or input into the PDA where the data does not already exist. You will only need to enter the fields highlighted in yellow. The fields highlighted in blue can be edited if they are found to be wrong.

Data Element Name	Customer Details	
Service Account Number	Loaded from billing	
District	Created from billing file (1st & 2nd digits taken from account number)	
Ledger	Created from billing file (Residential -3rd, 4th & 5th digits taken from account number), (Industrial – 3rd & 4th digits from account number)	
Customer House Number	Loaded from billing	
Customer Street Address	Loaded from billing (Update if incorrect)	
Customer Class	Loaded from billing (Update if incorrect)	
	Meter Details	
Meter Manufacturer	Choose from drop down options. Table 1	
Meter Manufactured (Year)	Enter year of manufacture from meter faceplate	
Meter Type	Choose from drop down options. Table 2	
Meter Installation Date - if known	Loaded from billing (Leave blank if empty)	
	From Billing File	Update if incorrect
1 or 3 phases	Loaded from billing	1 or 3
Meter Serial Number	Loaded from billing	Site meter serial number
Multiplying Factor	Loaded from billing	Site multiplying factor
CT Ratio	Enter CT Ratio. Table 3	
VT Ratio	Enter VT Ratio. Table 4	
Meter Reading	Enter actual meter reading	
Meter Reading Date	Date is taken from PDA	
Meter condition	Choose from drop down options. Table 5	
Comment	40 Characters available	

The **Meter Details** will be completed for each meter at every location. Residential customers will have only one meter but Industrial Customers may have up to 5 meters.



Report

Each PDA will be loaded with all the account information for the District being surveyed as in the table above so that any surveyor will be able to accompany any meter reader and have access to every customer during the daily survey process. The use of existing billing system data and drop down menus will reduce the time taken to complete the survey.

The 5 Drop Down Menu tables referred to above are detailed in Section 12 and show the various fields offered to the surveyor.

In addition to the items above, the most recent meter readings and reading dates will be loaded into the PDA when these are available in the billing file. Readings are not available for the majority of sites but, on completion of the survey of each District, readings will be available for all sites visited. The only missing readings will be from sites that are not accessible for security reasons.

The PDA Data requirements for Customer, Meters and Meter Readings are:

- Customer Details

- Service Account Number

Residential

The service account number is 11 digits which consist of:-

1&2 are the District number which is the Governate where the customer premise is located i.e. Baghdad.

3, 4 & 5 are the Ledger number which groups the customers within a specific geographic location within the Directorate.

6-10 are the sequence/location route number

11 is a check digit.

Example

Account Number	District	Ledger	Sequence/location	Check digit
00001032003	00	001	03200	3
00068018339	00	068	01833	9
00658630237	00	658	63023	7

Industrial

The service account number is 11 digits which consist of:-

1&2 are the District number which is the Governate where the customer premise is located i.e. Baghdad.

3&4 are the Ledger number which groups the customers within a specific geographic location within the Directorate.

5&6 are the Group table code.

7-10 are the sequence/location route number

11 is a check digit.

Example

Account Number	District	Ledger	Group Table	Sequence/location	Check digit
00110050142	00	11	00	5014	2
00520006933	00	52	00	0693	3
00984417206	00	98	44	1720	6

Report

– District

District is not a separate field in the billing files. The field in the PDA has been created from the first two digits of the 11 digit Account number as shown above. All Baghdad is District 00 and, to separate Resafa from Karkh, Resafa is numbered 00 and Karkh is numbered 01.

– Ledger

Ledger is not a separate field in the billing files. The field in the PDA has been created from digits 3, 4 & 5 from the Residential Account numbers and digits 3 & 4 from the Industrial Account numbers as shown above.

– Customer House Number and Customer Street Address

The House number and Street Address are self explanatory. Any inaccuracies in the Street Address identified at site will be corrected in the PDA and the billing files will be updated with the new information.

– Customer Class

Customer Class designates the type of premise – domestic, shop, small business etc. in the Residential category and type of Industry in the Industrial category. You will change the Customer Class in the PDA if it is shown incorrectly

• Meter Details

Not all the following metering details are in the current billing files. The new items of information are needed to make a new database of meter system details for future meter management and to allow the reporting of meter type and age details.

Residential and Industrial

– Meter Manufacturer and Meter Manufactured Date

This is the name of the Meter Manufacturer and the date that the Meter was made. Both appear on the Meter faceplate.

– Meter Type

This is the Meter Manufacturers' Meter Type as printed on the Meter faceplate.

– Meter Installation Date

This is the date that the Meter was installed at its present location. Many sites do not have a Meter Installation date and this field will be blank. It will not be changed during the survey. When new meters are installed to replace faulty or damaged meters, then the new installation date will be entered into the database.

– Number of phases

Simply the number of phases of the supply at the premises i.e. 1 or 3

– Meter Serial Number

This is the Manufacturers meter serial number taken from the meter faceplate

Report

– Multiplying Factor

The Multiplying Factor is used to multiply the meter advance between readings to calculate the actual power used at the customer's premise. It is already in the PDA from the billing file and you will confirm that the value is correct from the meter and change in the PDA if necessary

– Meter Reading and Meter Reading Date

The last meter reading and the date it was taken are in the PDA if they were in the billing file. The new meter reading will be "added" to the PDA and the PDA will enter the date automatically.

Each Industrial site can have multiple meters up to a maximum of 5 although the incidence of 4 or 5 meters is very low.

All the metering details listed above will be entered for each meter in turn as described in Section 10 – Data Entry.

Industrial only

In addition, it is intended to collect details of the Current Transformer/s (CT) and Voltage Transformer/s (VT) at each industrial site. These details are not in the billing files but are needed to confirm that the billing constants (meter multiplier) used in bill calculation are correct.

There are tables of CT and VT in the PDA but the data will not be collected during the initial survey since this would delay the collection process and require additional training.

11. DROP DOWN BOX CHOICES

Drop down boxes are available for several of the new Metering details to be collected.

Meter manufacturer

The table below contains the option choices for Meter Manufacturer and Meter Type based on the meters in current use in Iraq. You will click the box and choose the correct Meter Manufacturer and Type from the options available. If the Meter at site is not available in the option boxes, you will choose the Manufacturer and Type as “Other” and then enter the details in the Comments box.

Manufacturer – Table 1	Meter Type – Table 2
AEG	AEG - DHICZC 19 WI
Diyala	Diyala - ML 230 XF3
Ferranti	Ferranti - FNEA 34 Q
Ganz	Ganz - HNG 4
Grizik	Grizik - ET 414 K
Hindi	Hindi - EH-341
Holly	Holly - DT 862
Landis & Gyr	Landis & Gyr - ML 3
Sewedy	Sewedy
Siemens	Siemens - 7 CA 5461
Other – specify in comments	Other – specify in comments
	* Maximum Demand meters.

* Maximum Demand meters.

Some of the meters in use in Industrial locations are used for two purposes - normal energy measurement and Maximum Demand (MD). The meter is considered to be two different meters in the billing information. In these instances the meter serial number in the billing file and in the PDA should be the same as the faceplate serial number for the energy meter (Meter Number 1). The serial number used in the billing file for the MD is the same serial number as Meter Number 1 but has the first digit/s removed.

For an explanation of the options for checking the MD Meter Serial Number see the following details and table of examples.

If the serial number of Meter Number 1 is 123456, then the serial number used for the MD meter would be 23456 – leave off the first digit (1). If the serial number of Meter Number 1 is 103456, the serial number used for the MD would be 03456 but the serial number should not start with a zero and cannot be 03456. In this case, the zero would also be ignored and the MD meter serial number would be 3456. If the serial number of Meter Number 1 is 100456, ignoring the first digit (1) would give a serial number for the MD meter of 00456. In this case, the two leading zeros would also be ignored and the MD meter serial number would be 456. This would apply to any number of consecutive zeros following the first digit in Meter Number 1 serial number.



Report

The table gives examples of the Meter Number 1 serial number and the equivalent serial number to be used for the MD Meter:

Meter Number 1 Serial Number	Digit/s removed	MD Meter Serial Number
123456	1	23456
37888	3	7888
206684	20	6684
400521	400	521
700027	7000	27

You will need to recognize that the serial number listed in the PDA for the MD part of the meter is a part of the actual meter serial number on the meter face plate and choose the meter type from the list above as MD.

The MD meter serial number recorded in the PDA should only be corrected if the part of Meter Number 1 serial number has been recorded incorrectly. For example – if Meter Number 1 serial number is 123**456** then the MD meter serial number should be 23**456**. If it has been recorded as 23**546**, then the PDA record should be amended to the correct serial number of 23**456**.

Report

CT & VT Ratios

The CT & VT Ratios are the technical data of the Current Transformer and Voltage Transformer used to drive the Metering and to calculate the Customer bills. This data is available at site but it will require a higher level of Training and experience to locate the correct transformers and collect the data. For this reason, the CT Ratio and VT Ratio will be collected at a later date by Metering personnel who will use the PDAs to record the details.

The list of potential CT and VT ratios covers all possible combinations and will be more than are required for the options in current use in Iraq. The extra values will be left in the database to cover any new ratios that are available and may be used in the future. The data collector will click the box and choose the correct CT Ratio from these choices.

CT Ratio – Table 3	VT Ratio – Table 4
100/5	6600/110
200/5	11000/110
300/5	33000/110
400/5	132000/110
500/5	400000/110
600/5	
800/5	
1000/5	
1200/5	
1600/5	

Meter Condition

This table contains the option choices for Meter Condition. The database will allow up to 3 different conditions for each meter since several may exist at the same location. Meter Condition 1 is a required field and you must choose one of the options. Use “Good Condition” if there are no problems with the meter being surveyed.

Meter Condition – Table 5	Example
No Meter – No Supply	Building has no electricity supply or meter
No Meter – Supply in use	Customer is using electricity but it is not metered
Broken Meter Case	The meter case has been damaged
Broken Meter Glass	The meter glass is cracked or broken
Missing Main Cover Seals	Access is possible to the internal works of the meter
Missing Terminal Cover Seals	Access is possible to meter terminals
Single phase meter with 3 phase supply in use	All 3 phases are in use but only 1 phase is metered
Interference with Meter Case	Holes drilled in case to interfere with disk
Interference with wiring	Meter shorted out or wiring reversed
Other (Specify in Comments)	Any condition not detailed above
Good Condition	There are no problems with the meter or the wiring

To collect information under the first two items (No Meter – No Supply & No Meter – Supply in use), it will be necessary to visit every site regardless of whether the meter reader normally calls or not. This will ensure that any properties with no electricity or using unmetered electricity are identified for action.

12. APPENDICES

Appendix A – Technical Specifications

Technical Specification

Axim X50

Processor:	320 MHz Intel XScale PXA270 with WMMX
Operating System:	Windows Mobile 2003 Second Edition
Display:	3.5 inch 240 x 320 QVGA screen
Memory:	64 MB SDRAM; 128 MB flash ROM; 2*512 RAM CF CARD
Size & Weight:	4.68" x 2.87" x 0.63", 167 grams (5.9 ounces)
Expansion:	CompactFlash Type 2 and SDIO slots
Docking:	36-pin connector, standard USB cradle
Communication:	Integrated Bluetooth 1.2
Audio:	Internal monaural speaker; microphone; 3.5mm headphone/headset jack
Battery:	Standard 3.7 volt, 1100 milliamp-hour Lithium-Ion battery
Input:	6 remappable application buttons; 5-way directional pad; touch screen
Software:	Windows Media Player 10, 802.1x security client, Outlook 2002
Other:	Consumer IR, lock switch

Appendices

Appendix B – Billing District Numbers

Map #	Directorate	Billing District #	Map #	Directorate	Billing District #
1	Baghdad (بغداد)	00/01	10	Babil (بابل)	53
2	Salah ad Din (الدين صلاح)	32	11	Karbala (كربلاء)	55
3	Diyala (ديالى)	33	12	An Najaf (النجف)	54
4	Wasit (واسط)	34	13	Al Anbar (الأنبار)	52
5	Maysan (ميسان)	60	14	Ninawa (نينوى)	10
6	Al Basrah (البصرة)	59	15	Dahuk (دهوك)	63
7	Dhi Qar (ذي قار)	58	16	Arbil (أربيل)	65
8	Al Muthanna (المتنى)	57	17	At Ta'mim (التأميم)	64
9	Al Qadisyah (القادسية)	56	18	As Sulaymaniyah (السليمانية)	62

