

METERSIZER

Operating Instructions

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Addendum

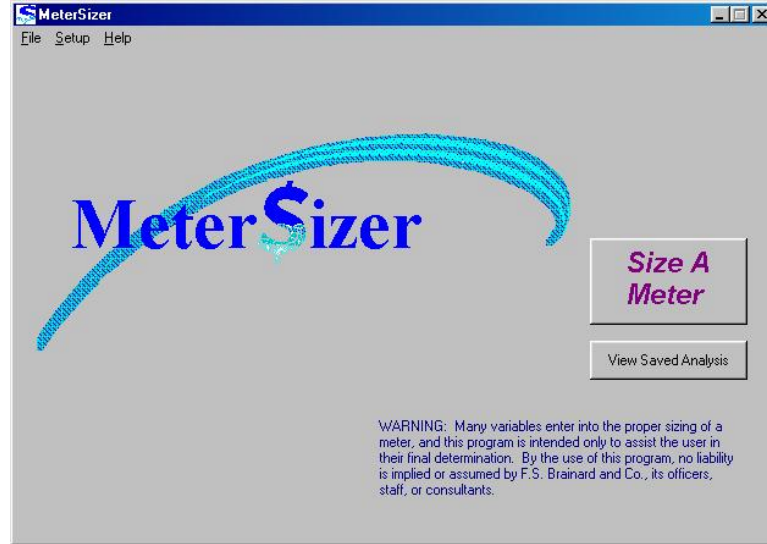
for MeterSizer Software Version 1.4

Data Files: The default location for MeterSizer and Meter-Master data files is now the Windows Common Documents folder. If the Meter-Master Model 100 Program is installed, the MeterSizer program will use that program's data file directory as its default data directory. This directory is located as follows:

XP: C:\Documents and Settings\All Users\Documents\
F.S._Brainard_&_Co\MM100\Data Files

Vista; Win7: C:\Users\Public\Documents\F.S._Brainard_&_Co\
MM100\Data Files

1. About The MeterSizer Program



MeterSizer™ is designed to determine the best meter type and size for a particular installation. Using a set of financial and meter accuracy assumptions that may be modified by the user, the program automatically estimates the projected percentage of accounted-for water and the annual revenue increase or decrease associated with each meter type and size option. It also calculates the percentage of flow in each meter option's normal flow range, the number of months it would take for a meter changeout to pay for itself, and the headloss at maximum recorded flow for each meter option. The software accomplishes this by distributing high resolution demand data collected at a meter site into software defined flow ranges for each meter type and size option.

Most all water meters purchased and installed by water utilities and their customers must meet industry standard performance ratings. The MeterSizer software uses as its defaults those standards developed by the American Water Works Association (AWWA). However, many utilities use unique specifications when purchasing meters. Furthermore, AWWA does not define meter performance standards below and above given flow rates

for each type and size meter. This software enables a user to both accommodate his/her unique meter performance requirements and make reasonable assumptions for meter accuracy below and above specified minimum and maximum flow rates, respectively. The program comes with software default values that may be used for all meter performance parameters. Those values for parameters not defined by AWWA have been developed in consultation with industry professionals.

The MeterSizer software consists principally of three setup screens and four screens for stepping through the sizing process. Before beginning, the user must confirm or change the software defaults and enter utility specific information, such as the water cost for each rate class, wastewater rates, minimum/fixed charges, and meter purchase costs. Meter types are divided into five categories: positive displacement, multi-jet, turbine class I, turbine class II, and compound.

Once the setup parameters have been entered, the user steps through the meter sizing process. On the first screen, the user imports a Meter-Master data file or a comma separated value (CSV) file if the data was created using other technology. The data may also be entered manually. On the second screen, a seasonal adjustment may be performed by entering the billing records for the previous year. The last two screens show the analysis results.

MeterSizer operates as a stand-alone program or as a companion program to the Meter-Master Model 100 Program which interfaces with the Meter-Master Model 100EL flow recorder.

2. Installing The MeterSizer Software

MeterSizer is a 32 bit program for Windows and will run only on Windows 95+ or Windows NT.

TO INSTALL METERSIZER

1. Insert the CD-ROM into your CD-ROM drive.
2. Run the Setup program. Follow the onscreen prompts.
3. Once the program is installed, you may size a meter using software defaults; however, you must enter financial parameters applicable to your circumstances in order for the program to do a financial analysis. The program will automatically prompt you through the setup (see next section).

3. MeterSizer Setup

While it is possible to use the MeterSizer software as is with just the software defaults, it is essential that you review the defaults and software assumptions before making any sizing decisions based on this program. Certain defaults, such as the rates of flow applicable to compound meter changeover ranges, do not have AWWA standard values; accordingly, the software uses “reasonable” default values based on consultation with industry professionals. The program requires that you input certain financial information before it can do a financial analysis.

MeterSizer has been designed around AWWA standards; however, users may customize meter performance parameters should they wish to. Many utilities have their own standards of meter performance which represent local conditions and/or experience. When performing an analysis, you may create your own meter performance categories and repeatedly change the meter accuracy assumptions in order to evaluate the financial implications of various “what if” scenarios.

While users may change values or erase categories which they have created themselves, the MeterSizer default values cannot be edited or erased.

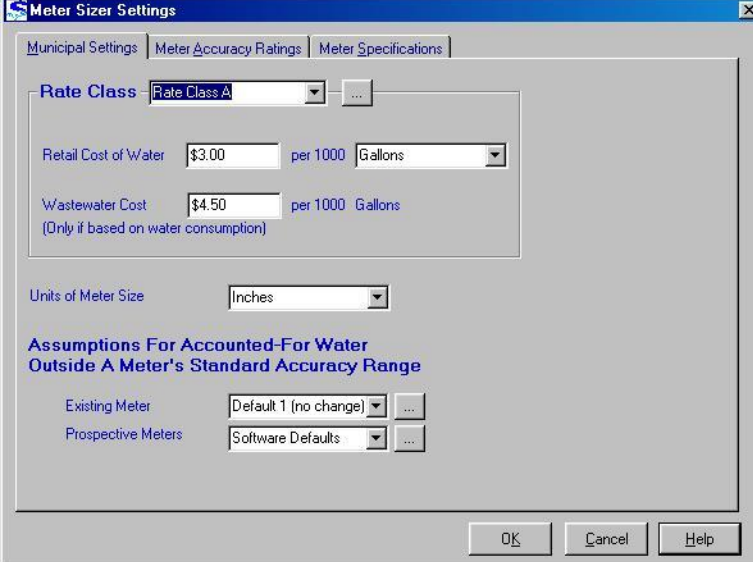
MINIMUM SETUP REQUIRED FOR FINANCIAL ANALYSIS

1. **Municipal Settings Screen:** Retail cost of water for at least one rate class and, if based on water usage, associated wastewater rates.
2. **Meter Specifications Screen:** (a) fixed charges, if applicable, for all meter types and sizes to be included in the analysis; (b) costs to change out meters (labor and meter purchase costs); and (c) average monthly maintenance costs for all meter types and sizes to be included in the analysis.

STARTING THE SOFTWARE

The software is accessed through the MeterSizer icon. If you have not yet entered setup parameters for your utility, you will be prompted to do so when you press the “Size A Meter” button.

MUNICIPAL SETTINGS SCREEN



The screenshot shows the "Meter Sizer Settings" dialog box with the "Municipal Settings" tab selected. The dialog has three tabs: "Municipal Settings", "Meter Accuracy Ratings", and "Meter Specifications". The "Municipal Settings" tab contains the following fields and controls:

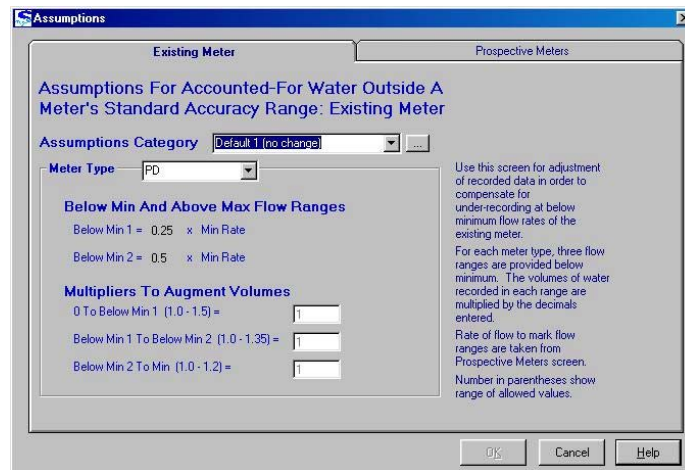
- Rate Class:** A dropdown menu set to "Rate Class A" with a "..." button to its right.
- Retail Cost of Water:** A text box containing "\$3.00", followed by "per 1000" and a dropdown menu set to "Gallons".
- Wastewater Cost:** A text box containing "\$4.50", followed by "per 1000" and "Gallons". Below this is the text "(Only if based on water consumption)".
- Units of Meter Size:** A dropdown menu set to "Inches".
- Assumptions For Accounted-For Water Outside A Meter's Standard Accuracy Range:**
 - Existing Meter:** A dropdown menu set to "Default 1 (no change)" with a "..." button to its right.
 - Prospective Meters:** A dropdown menu set to "Software Defaults" with a "..." button to its right.

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

The Municipal Settings screen allows input of information unique to each utility. This information includes the retail cost of water for each rate class, the related wastewater rate/cost (if applicable), the units of meter size (English or Metric), and the assumptions for accounted-for water outside a meter's standard accuracy range. Wastewater rates should be entered only if wastewater charges are based on metered water consumption. Normally, the user will use the software defaults for assumptions for accounted-for water below and above AWWA accuracy ranges; however, a user may edit these, if desired.

1. **Rate Class:** First time users must add at least one rate class with a retail cost of water before the program will perform a financial analysis.
 - **Adding A New Rate Class:** Click on ellipse button ("...") and enter name of the customer rate class. Enter retail cost of water per billing increment (e.g., thousands of gallons or hundreds of cubic feet) and select the billing increment from the pull-down list. If wastewater charges are based on metered water consumption, enter the Wastewater cost per billing increment; if not, leave as 0.
 - **Editing Values Of An Existing Rate Class:** Using the pull-down menu, select the Rate Class you wish to edit. Edit the values as necessary.
2. **Units of Meter Size:** Using the pull-down menu, identify whether your meters are sized using English (inches) or Metric (millimeter) units.
3. **Assumptions For Accounted-For Water Outside A Meter's Standard Accuracy Range:** Meters do not stop registering flow for rates above and below AWWA specified accuracy ranges. Reasonable assumptions need to be made. Threshold flow rates below each meter's minimum flow rate and above each meter's maximum flow rate are calculated using the values entered in these two screens. These flow rates are used to establish additional flow ranges in which meter accuracy assumptions can be made. It is recommended that you use the software default values unless you have a good basis for using alternate values.
 - **Existing Meter:** This dialog box enables adjustment of recorded data to compensate for under-recording below the minimum flow rate of the existing meter. "Default 1" provides no adjustment; "Default 2" provides a modest adjustment. Click on the ellipse button ("...") to view the values used in the default settings or to create a new category with your own values.

For each of the five meter types, three flow ranges are provided below minimum: zero to Below Min 1, Below Min 1 to Below Min 2, and Below Min 2 to the meter's minimum flow rate. The flow volumes recorded in each range are multiplied by the decimals entered. In a meter sizing analysis, the only values used are those for the existing meter type; values for other meter types are not considered for the existing meter.



To enter your own values:

1. To enter this screen, click on the ellipse button ("...") to the right of the Existing Meter pull-down menu on the Municipal Settings Screen.
 2. Create a new assumptions category or select a category you have already created (you cannot change the software default values). To create a new category, click on the ellipse button ("...") to the right of the Assumptions Category pull-down menu, enter a category name in the dialog box, and click "Add". The dialog box will close displaying the new category with the values for the prior category, which may be edited as desired.
 3. To edit the values: for each meter type, enter the multiplier to augment the volumes calculated from the recorded data file. Entering 1.0 will keep the values the same; entering 1.1 will multiply the volume within the specified flow range by 1.1, thereby increasing the volume by one-tenth, or 10%.
 4. For example, suppose the existing meter is a PD 2" and the Meter Specifications Screen indicates that this meter has a minimum flow rate of 2 gpm. Suppose also that Below Min 1 = 0.5 gpm (i.e., the multiplier displayed is 0.25, and $0.25 \times$ the min flow rate of 2 gpm = 0.5 gpm). If you enter "1.25" as the multiplier to augment volumes for the "0 To Below Min 1" range, then a flow rate of .4 gpm for 60 seconds will yield a volume of 0.5 gallons instead of 0.4 gallons.
- **Prospective Meters:** This dialog box enables viewing and editing of values used to handicap flow rates outside a meter's standard accuracy range. They affect all of the prospective meter types included in an analysis. One default is provided which is based on consultations with industry professionals.

For each meter type, three flow ranges are provided below minimum: zero to Below Min 1, Below Min 1 to Below Min 2, and Below Min 2 to the meter's minimum flow rate. Also, two flow ranges are provided above maximum: Max To Above Max 1 and Greater Than Above Max 1. The volumes of water recorded in each flow range below minimum and above maximum are diminished for each meter type and size based on the multipliers determined by the values entered on this screen.

To enter your own values:

1. To enter this screen, click on the ellipse button ("...") to the right of the Prospective Meters pull-down menu on the Municipal Settings Screen.
2. Create a new assumptions category or select a category you have already created (you cannot change the software default values). To create a new category, click on the ellipse button ("...") to the right of the Assumptions Category pull-down menu, enter a category name in the dialog box, and click "Add". The dialog box will close displaying the new category with the values for the prior category, which may be edited as desired.
3. To set the five flow ranges: for each of the five meter types, enter the values used to determine the Below Min 1, Below Min 2, and Above Max 1 flow rates. These three rates are calculated by applying a percentage to each prospective meter's minimum flow rate or maximum flow rate expressed as a decimal between 0 and 1.0.

For example, suppose the prospective meter is a PD 2" and the Meter Specifications Screen indicates that this meter has a minimum flow rate of 2 gpm and a maximum flow rate of 160 gpm. If, under the PD meter type, you enter a Below Min 1 value

of .5, a Below Min 2 value of .75, and an Above Max 1 value of 1.5, then the first flow range below the minimum flow of the meter will be 0 to 1 gpm (.5 x 2 gpm), the second flow range will be 1 to 1.5 gpm (.75 x 2 gpm), and the third flow range will be 1.5 to 2 gpm. The two flow ranges above the maximum flow of the meter will be 160 gpm to 240 gpm and greater than 240 gpm (1.5 x 160 gpm).

4. To set the data multipliers: for each meter type, enter the values used to calculate the multiplier used to diminish the volumes in each calculated flow range below the minimum and above the maximum flow rates. The values entered here are not the final multipliers themselves; instead, the accuracy ratings are determined by multiplying the values entered on this screen by the percentage values given in the Meter Accuracy Ratings Screen.

For example, suppose the prospective meter is a PD 2" with the flow ranges given above (0 to 1 gpm, 1 to 1.5 gpm, 1.5 to 2 gpm, 160 to 240 gpm, and above 240 gpm). Suppose also that we are using PD accuracy ratings (from the Meter Accuracy Ratings Screen) of 95% for Min To Low Normal flow rates and 98.5% for Low Normal To Max flow rates. If you enter ".4" for the "Below Min 1 To Below Min 2" range, ".8" for the "Below Min 2 To Min" range, and ".9" for the "Max To Above Max 1" range, then the program will calculate accounted-for water as follows: If a rate is below 1 gpm, the volume recorded is multiplied by 0 (always multiplied by 0 for zero to Below Min 1). If a rate is between 1 and 1.5 gpm, the volume recorded is multiplied by .4 x 95%, or 38%. If a rate is between 1.5 and 2 gpm, the volume recorded is multiplied by .8 x 95%, or 76%. If a rate is between 160 and 240 gpm, the volume recorded is multiplied by .9 x 98.5% or 88.65%. And if the rate is above 240 gpm, then the volume recorded is multiplied by 0 (always multiplied by 0 for Greater Than Above Max 1).

METER ACCURACY RATINGS SCREEN

The screenshot shows the 'Meter Sizer Settings' dialog box with the 'Meter Accuracy Ratings' tab selected. The 'Accuracy Ratings Category' is set to 'Industry Standard'. The settings are organized into two columns: 'PD' and 'Compound'. Each meter type has an 'Include in Analysis' checkbox and two input fields for accuracy percentages.

Meter Type	Include in Analysis	Min To Low Normal (%)	Low Normal to Max (%)
PD	<input checked="" type="checkbox"/>	95	98.5
MultiJet	<input checked="" type="checkbox"/>	95	98.5
Turbine Class 1	<input checked="" type="checkbox"/>	98	
Turbine Class 2	<input checked="" type="checkbox"/>	98.5	
Compound	<input checked="" type="checkbox"/>	95	97
Compound (Bypass)		95	97
Compound (Changeover Area)		90	
Compound (Main: Changeover To Max)		97	

Additional text in the dialog: 'Meter Accuracy Ratings are used to determine the minimum anticipated accounted-for water for different flow rates. For each meter included in an analysis, the volume recorded in each range of flow rates is multiplied by the percentage shown here in order to calculate the minimum volume each meter should record in each range. The program's assumptions for accounted-for water outside a meter's accuracy range are entered through the Municipal Settings Screen.'

The Meter Accuracy Ratings Screen defines the types of meters which are to be included in the sizing analysis and the accuracy percentages which are to be used. Default accuracy percentages are based on the minimum AWWA standards. The user may add his/her own categories with other accuracy percentages in order to base the analysis on local conditions, specifications, or perspectives.

AWWA is continuously reviewing and updating its standards. Accordingly, no representation is made concerning the accuracy of program parameters intended to represent AWWA standards at a specific point in time. The software attempts to reflect the consensus of industry professionals at the time of each version's release.

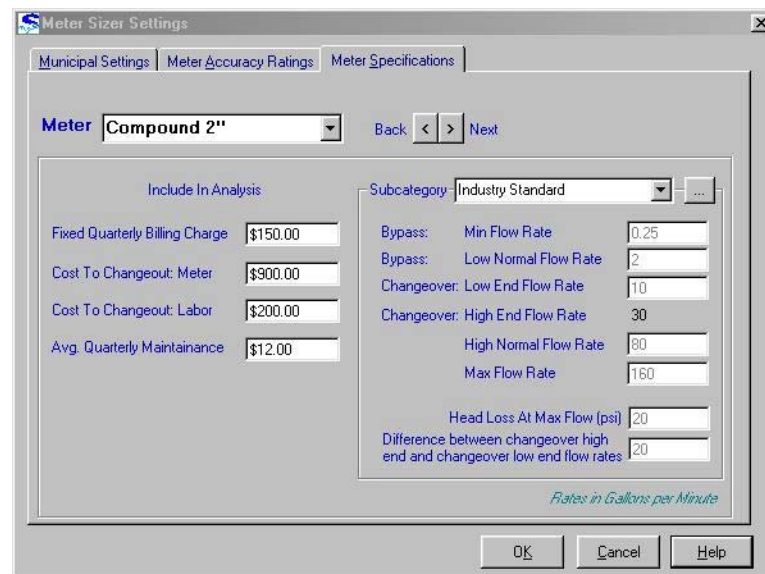
The check box to the top right of each meter type allows the user to select the types of meter he/she would consider for installation at the target meter site.

To choose types of meters to include in analysis:

- Click in the "Include in Analysis" box to the top right of each meter type in order to toggle between including and not including each of the available meter types in an analysis.

To enter your own Accuracy Ratings:

1. Add A New Accuracy Ratings Category: Click on the ellipse ("...") button, enter a new category name, and then click "Add".
2. Edit The Values: Edit the text boxes so that they reflect your desired accuracy ratings for each meter type.
3. Click OK: "Cancel" reverses only those changes made to the current onscreen values.

METER SPECIFICATIONS SCREEN


The screenshot shows the 'Meter Sizer Settings' dialog box with the 'Meter Specifications' tab selected. The 'Meter' dropdown is set to 'Compound 2\".

Include In Analysis		Subcategory: Industry Standard	
Fixed Quarterly Billing Charge	\$150.00	Bypass: Min Flow Rate	0.25
Cost To Changeout: Meter	\$900.00	Bypass: Low Normal Flow Rate	2
Cost To Changeout: Labor	\$200.00	Changeover: Low End Flow Rate	10
Avg. Quarterly Maintenance	\$12.00	Changeover: High End Flow Rate	30
		High Normal Flow Rate	80
		Max Flow Rate	160
		Head Loss At Max Flow (psi)	20
		Difference between changeover high end and changeover low end flow rates	20

Rates in Gallons per Minute

Buttons: OK, Cancel, Help

The Meter Specifications Screen defines meter cost and performance information used in calculating both the accounted-for water benefits of a potential meter changeout and the financial and headloss implications. With the one exception of the compound meter Changeover Low End Flow Rate, the

default flow rates and head losses reflect industry standards (AWWA) for each meter type and size.

The left side of the screen contains financial information applicable to each meter type and size option; the right side of the screen displays the meter flow ranges to which the Meter Accuracy Ratings apply. Also shown on the right side of the screen is head loss information for each meter option. A financial analysis is performed for only those meter type and size options for which financial information is entered.

FINANCIAL INFORMATION:

1. **Fixed Quarterly Billing Charge:** This number should equal the sum of any fixed, minimum, or other charges included in a customer's water bill other than the charge for actual water usage. If a utility's rate structure defines these values on a monthly or bimonthly basis, these numbers must be converted to quarterly equivalents.
2. **Cost To Changeout: Meter:** Enter the unit cost for each meter type and size. This number should equal the most recent price paid by the utility for each type and size meter.
3. **Cost To Changeout: Labor:** Enter the labor cost associated with changing out any existing meter to each type and size option. Ideally, this number should equal the sum of all costs associated with performing a meter changeout with the exception of the new meter cost.
4. **Average Quarterly Maintenance:** Based on your own experience or available statistical information, enter the average per-quarter cost of maintaining the accuracy of each meter type and size option. For example, the cost of maintaining a compound meter is typically significantly higher than the cost of maintaining a turbine meter. Meter Sizing analyses should reflect these differences. Ideally, this number should include actual, average test and repair costs for each meter type and size option. Any available data must be converted to quarterly equivalents.

Meter Flow Ranges And Head Loss

1. **Flow Ranges:** With one exception, the default values are intended to represent AWWA standards at the time of the program release. As with the Meter Accuracy Ratings, these standards are continuously being reviewed and updated by AWWA; accordingly, no representation is made concerning the accuracy of program parameters intended to represent AWWA standards at a specific point in time.

The one program default that is not based on AWWA standards is the Changeover Low End Flow Rate for compound meters. In this case, AWWA specifies only the differences between the changeover low end and high end flow rates, not the actual changeover flow rates themselves. Accordingly, before you run the program with compound meters identified as an option on the Meter Accuracy Ratings Screen, you should verify that the default flow rates are consistent with local conditions, experience, and/or specifications. The default values are based on the advice and experience of industry professionals.

2. **Head Loss At Max Flow:** Head loss at Max flow reflects the water pressure drop through the meter at the meter's maximum flow rate. The default values are based on AWWA standards.

To edit flow ranges and head loss:

1. Add A New Subcategory Or Select A Category You Have Already Added: To add a new category, click the ellipse ("...") button, enter a new category name, and then click "Add".
2. Edit Values: Edit the text boxes so that they reflect the flow ranges and head loss desired.
3. Click OK: "Cancel" reverses only those changes made to the current onscreen values.

4. Sizing A Meter

INTRODUCTION

Once you have entered all information required by the setup screens, you are ready to import your data file and perform the analysis. The analysis is a seven step procedure.

The initial step, an optional Site Review, involves an analysis of all factors that influence sizing decisions, including a determination of the timing and duration of the proposed data collection. Step two, recording the data, and the remaining steps involve the analysis of the data using the financial and meter information contained in the setup screens.

COLLECTING CONSUMPTION DATA

1. Site Review

A questionnaire sheet should be created for reviewing sites prior to recording data. Whenever possible, this site review should be performed and considered an integral component of the analysis. The review may be performed either on site with the property management, via telephone or fax with the property management, or from utility records if adequate information is available.

Some of the issues which should be addressed by a site review questionnaire are:

- Is the planned recording period representative of typical usage by the customer. A recording should not be made during an unusually low usage period, such as a vacation, shut-down, etc.
- The software includes a seasonal adjustment capability. However, seasonal usage patterns may be so dramatically different that a software adjustment is not sufficient. The

seasonal adjustment is made by adjusting all rate data up using the same multiplier; however, seasonal variations usually affect certain flow ranges much more than others.

- Some service lines double as fire service lines. In such cases, fire flow requirements must be considered.
- Some users may have only periodic high usage requirements. The recording should be timed to capture such uses.

2. Consumption Profile

A consumption profile should be recorded for a minimum of 24 hours using either a Meter-Master Model 100EL flow recorder or other hardware capable of generating a data file in a comma separated value (CSV) format. Frequently, one week of demand data is recorded for meter sizing purposes. Alternatively, data may be entered manually. If a Meter-Master Model 100EL is used, the imported data file will automatically be in the correct format as long as it was generated or converted using the Model 100 Program version 3.0 or later. If an alternative device is being used to create rate data, the device's output must be converted into per minute rate data, e.g., gpm or cfm, in a comma separated value (CSV) file format prior to import into the MeterSizer software. In the case of manual data collection, data should be carefully noted and entered into the appropriate fields as instructed below.

Data should be collected in a high resolution format, e.g., rates in 5, 10, 30, or 60 second increments such as provided by the Meter-Master Model 100EL. Because multi-family and commercial/industrial flow rates can change dramatically in small time increments, it is important to store consumption data in small time increments, such as 10 seconds.

USING THE METERSIZER SOFTWARE

3. Customer Information Screen (Step 1 in MeterSizer program)

Size A Meter

STEP ONE: Enter Customer Information
Enter the information requested. Click 'Import Data File' to load data from a Meter-Master or other data file. Click 'Manual Entry' to clear any existing data and type data into the appropriate fields.

Customer ID: 96700024
 Name: Actimed Pharmaceutical Products
 Accuracy Ratings Category: Industry Standard
 Rate Class: Rate Class A
 Existing Meter Type: Turbine Class 2 2"
 Units of Measure: Gallons
 Start Time: 06/08/1995 13:45:36 Interval (secs): 10

Date/Time	Rate
06/08/1995 13:45:36	0.4838709677415
06/08/1995 13:45:46	0.1209677419354
06/08/1995 13:45:56	0.1209677419354
06/08/1995 13:46:06	0.1209677419354
06/08/1995 13:46:16	2.5403225806451
06/08/1995 13:46:26	2.903225806451E
06/08/1995 13:46:36	2.4193548387096
06/08/1995 13:46:46	1.451612903225E
06/08/1995 13:46:56	0.9677419354836

Rates in Gallons per Minute

Buttons: Import Data File, Manual Entry, Back, Next, Print Screen, Help

The customer information and consumption profile are entered/imported at this point. Data may be imported either as a Meter-Master data file (*.mdb) or as a comma separated value (*.csv) file, or the data may be typed directly into the cells. When importing a Meter-Master data file, you will not have to change the directory as long as the file is in the Model 100 Program default directory (programf\mmv30). CSV files must have a ".csv" extension, and "*.csv" must be selected as the file type in the import file dialog box. If the data file is a Meter-Master file, the customer information will be captured directly; otherwise, it must be entered manually.

To import a Meter-Master (*.mdb) file:

1. Click "Import", select the desired file, and click OK. The default directory is the default directory of the Model 100 Program (programf\mmv30) as long as it exists; otherwise, it is the MeterSizer directory.
2. Select the existing meter type from the pull-down menu. This is the meter type and size from which the consumption data was recorded.

3. Confirm the rate class and change, if necessary, on the Municipal Settings Screen.
4. When done, click OK to proceed to Step Two.

To import a CSV file:

1. Ensure that the file is in an acceptable file format. Three options are provided: (a) one column of rate data, (b) two columns separated by a comma with each row having a date/time (mm/dd/yyyy hh:mm:ss), a comma, and a rate, and (c) one column of rate data except for the first row which has the data start time (mm/dd/yyyy hh:mm:ss), a comma, and the logging interval in seconds between each data value. Do not put quotes around any of the values.
2. Click "Import", move to the desired directory, select the file, and click OK. If your file is in the first format above ("a"), you will be prompted to enter a start time and logging interval.
3. Enter the customer information.
4. Select the existing meter type from the pull-down menu. This is the meter type and size from which the consumption data was recorded.
5. Confirm the rate class and change, if necessary, on the Municipal Settings Screen.
6. When done, click OK to proceed to Step Two.

To enter data manually:

1. Click Manual Entry.
2. Enter Data Start Time and interval in seconds.
3. Enter values in the rate column only: the program will fill in the date/time. Values entered in the rate column should be the average rate of flow for each time increment.
4. Enter the customer information.
5. Select the existing meter type from the pull-down menu. This is the meter type and size from which the consumption data was recorded.
6. Confirm the rate class and change, if necessary, on the Municipal Settings Screen.
7. When done, click OK to proceed to Step Two.

4. Seasonal Adjustment Screen (Step 2 in MeterSizer program)

STEP TWO: Make Seasonal Adjustments

Flow data should be adjusted according to monthly or quarterly variations in usage. 'Volume' is the amount of water billed for in each billing cycle. 'Days' is the number of days in each billing cycle. To use a previously saved value, click 'Load Data', or you may type in new values. To save the current values, click 'Save Data.'

A seasonal adjustment applies a multiplier to all rates in the data file such that the average daily volume given by the data equals the highest average daily volume of any billing period. A seasonal adjustment is performed only when the multiplier is greater than 1. A warning will appear if the multiplier is greater than 2.

Radio buttons for billing cycle: None, Monthly, Bi-Monthly, Quarterly

Month	Volume	Days
January	37000	31
February	38000	28
March	40000	31
April	38000	30
May	39000	31
June	39000	30
July	42000	31
August	45000	31
September	42000	30
October	40000	31
November	36000	30
December	32000	31

Volume in Gallons

Buttons: Load Data, Save Data, Back, Next, Exit Screen, Help

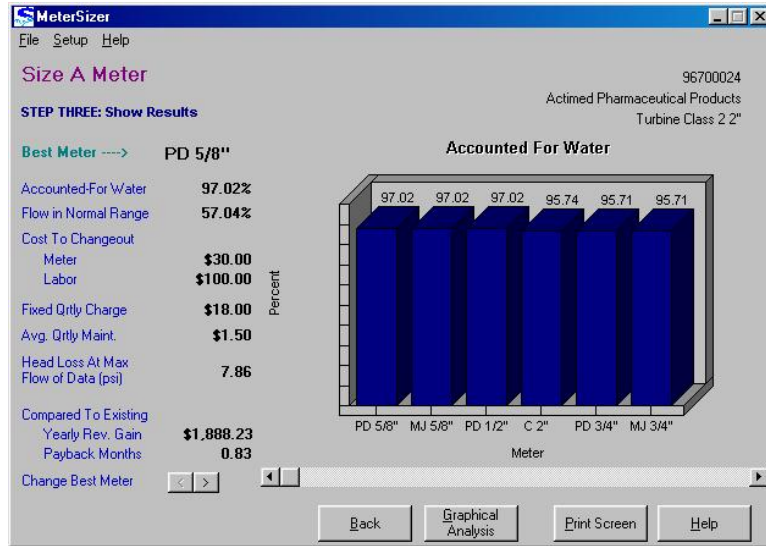
The Seasonal Adjustment Screen allows the user to apply a multiplier to the rate values to adjust data upward to reflect the seasonal peak use period. This adjustment is optional.

The customer's most recent annual billing history is used to adjust the rate values. For example, if the average daily use during the peak billing period is 20% greater than the average daily usage during the recording period, all rate values will be increased 20%.

To adjust data to reflect the peak use period:

1. Select the billing period: (a) Monthly, (b) Bi-Monthly, or (c) Quarterly.
2. Enter the Volume of water and number of Days in each period. Take care to always enter this data accurately. You may also import a billing record you have previously saved by pressing "Load Data" and selecting the desired file.
3. If desired, save the billing record. Press "Save Data", name the file, and press OK.
4. When done, press OK to proceed to Step Three.

5. Show Results Screen (Step 3 in MeterSizer program)



The show results screen ranks the meters from best to worst based on the projected percentage of accounted-for water and displays the changeout cost, annual revenue impact, payback period, and other information related to the best meter type and size option.

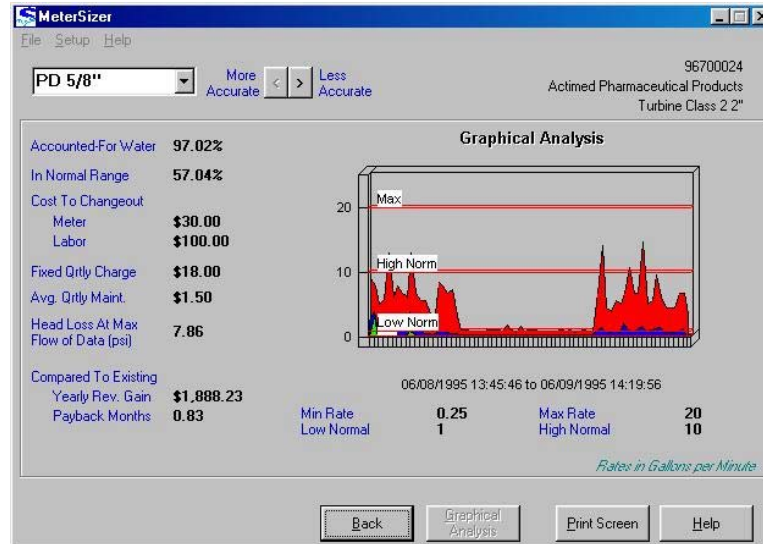
If the program determines that the best meter option will result in an increase in headloss, a dialog box will appear showing the projected increase at the maximum recorded flow rate. The equation used to calculate this head loss is:

$$\text{HeadlossAtMaxFlowRateOfMeter} \times \left(\frac{\text{MaxFlowRateInDataFile}}{\text{MaxFlowRateOfMeter}} \right)^2$$

A scroll bar allows you to see the projected performance of all meters considered in the analysis. You may also view the projected performance of all meter options by clicking the navigation buttons (" $<$ ", " $>$ ") at the lower left of the screen.

Click "Graphical Analysis" for a more in-depth view of how each meter type and size option fits with the consumption profile.

6. Graphical Analysis Screen



Provides a graphical display of the customer consumption profile in relation to the flow rate parameters of each meter type and size option. You may scroll backwards and forwards through the entire range of meter options in order to make a visual analysis and comparison of the financial implications and flow capacities of each meter option.

Some issues to consider:

- The percentage of flow within each meter's "normal" range.
- The maximum flow capacity of a meter.
- Fire flow requirements.
- Fixed/minimum charges vs. accuracy objectives.
- Equity considerations.

Concerning the percentage of flow within a meter's normal flow range, a higher percentage is always preferable both from an accuracy and a meter reliability (maintenance) perspective.

7. Calibration Of Results

The MeterSizer program models meter performance based on recorded data and various assumptions that may be edited by the user. However, no model is perfect. If you are unsure about any of the assumptions, run the analysis using best and worst case scenarios in order to determine the range of possible outcomes. For example, if you are unsure of relative meter maintenance costs or wish to vary assumptions for accounted-for water below min and above max flow rates, run the analysis using different values. It is recommended that you try different scenarios for each sizing analysis in order to better understand the potential deviation of results obtained through this model.

In many cases, people are surprised at the potential for downsizing and will often opt for a meter smaller than the existing meter, yet larger than the optimum calculated by the model. MeterSizer allows the user to evaluate all potential scenarios and their results in the graphical analysis section. In cases where a more conservative decision is either preferred or required due to specific considerations such as fire flows, the program provides a good indication of the cost (lost revenue potential) associated with that decision.

5. Service And Support

TECHNICAL SUPPORT

F. S. Brainard & Co. offers support and advice both in the use of the software and with related issues.

Should you experience a problems with your MeterSizer program, you may email F. S. Brainard & Company's Customer Service Department at service@meter-master.com. You may also fax or phone us between 8 A.M. and 5 P.M. (Eastern U.S. Time). Fax and phone numbers are shown on the front page of these instructions.

LIMITED WARRANTY AND DISCLAIMER

F. S. Brainard & Company warrants that the media on which the MeterSizer Software is distributed will be free from defects. Your sole remedy in the event of a breach of this warranty will be that F. S. Brainard & Company will replace any defective media returned to F. S. Brainard & Company.

F. S. Brainard & Company does not warrant that the Software will meet your requirements or that operation of the Software will be uninterrupted or that the Software will be error-free.

This warranty is exclusive and in lieu of all other warranties, whether express or implied, including the implied warranties of merchantability, fitness for a particular purpose, and noninfringement.

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