iChart Software

Installation & Operation Instructions

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NexSens iChart Software
1.0 Introduction

1.1 Overview

iChart is an easy-to-learn, easy-to-use Windows based software program designed to work with popular environmental monitoring sensors and systems. iChart automates much of the tedious programming, data collection and manual data processing common with other environmental data collection systems.

Direct connection to local sensors and wireless communication to remote sensors, combined with a multi-vendor instrument library, provide real-time environmental data on your desktop. iChart’s secure database and powerful data query offer comprehensive reports with easily generated plots, data tables and statistics. iChart makes it easy to create reports in PDF format and automatically email or transfer them to the web.

iChart connects directly to monitoring devices via your desktop computer serial port, or it can be used with various wireless communication devices. For a complete list of wireless devices and application notes on how to connect to your environmental monitoring instruments in real-time, see our website at http://www.NexSens.com.

Many customers use iChart as a data collection and data pre-processing program. Data is collected and securely stored in a local database. Reports are quickly and easily generated by selecting the monitoring parameter, time frame and output that is desired. Report outputs include plots, data tables and statistics. Data can be exported in ASCII format for importing into other database and spreadsheet software programs.

1.2 About this manual

This manual is designed to provide you with quick instructions for getting started and more detailed reference information. As with any new product, it is a good idea to read the documentation thoroughly before operating the software.

Also included with this manual is a detailed appendix with operating procedures for NexSens communication devices and some popular environmental monitoring sensors and systems.
1.3 Technical Support and Software Update

This manual should provide you with the information needed to use iChart. If you experience difficulty, we suggest you follow the procedure below:

1. Review the subject in the manual.
2. Check the version number for iChart by clicking the Help menu and selecting About. Compare this version to the update version on the NexSens web page: http://www.nexsens.com/support/download.htm
3. If your version is older, download the update for iChart to a temporary directory on your desktop computer. Close all programs, including iChart. Run the update by double clicking the icon. Your iChart will be updated. Run iChart and check the version number in the Help, About menu.

If you are still having difficulty, email your technical support question to: info@NexSens.com

1.4 System Requirements

iChart requires the following minimum system configuration:

- Pentium class PC
- 64 MB RAM
- 100 MB hard drive
- 2MB video card
- CD-ROM drive for software installation
- Windows 95, 98, ME, NT4 (SP3 or higher), 2000 (SP1 or higher), XP

For better performance and reliability, twice the minimum system configuration and WinNT4 (or Win2000) are recommended. If you are communicating with a NexSens 2100 Field modem or NexSens 3100 Cellular modem, we recommend that you use an external modem with a Rockwell (Conexant) chipset.
1.5 Software Installation

*i*Chart is distributed on CD-ROM. The setup program starts automatically when the CD is inserted. If not, you can manually start the setup process by following the steps below. We suggest that you accept the default options presented by the *i*Chart setup program.

Double click “My Computer”.
Double click the CD-ROM drive to open *i*Chart CD.
Double click “Setup.exe” or “Setup” icon to start the installation program.

During the installation, you will be asked to register *i*Chart software. You can either print the registration form and mail or fax it to NexSens or connect to the Internet and register online. By registering within 30 days of purchasing *i*Chart, you are eligible for 2 years of free software updates.

After installation is complete, you can run *i*Chart from the start menu “Program|NexSens| *i*Chart”. For your convenience a shortcut to *i*Chart is also placed on your desktop.

1.6 Important Notice

Managing your environmental data and information is a formidable task. *i*Chart simplifies this effort and organizes your important data. Be sure to backup your database and other important files on a regular basis. To help you with this, *i*Chart has automatic backup and remind-me-to backup features.

See Backup and Restore for details.

1.7 Uninstalling *i*Chart

To uninstall *i*Chart, click Settings in the Start Menu. Select Control Panel and then Add / Remove Programs. Follow the instructions to remove *i*Chart and all associated files.
2.0 Setting up the Network and Communicating

2.1 Getting Started

iChart monitoring networks can consist of multiple instruments from multiple vendors at numerous sites. Each individual instrument is accessible from one PC through various NexSens communication devices. Whether you have one instrument directly connected to your computer, or many instruments at remote sites, the first step to create an instrument network is to start a new iChart database.

The first time you run iChart, a blank window appears. Create a new database as follows.

Step 1
Select the menu option “File:New” or click on the “New” icon on the tool bar (first icon on the left).
Step 2
Enter a file name for the database configuration. iChart will add the extension .icr to the file name that you entered. The database configuration file holds information related to devices and parameters associated with each instrument in your network.

![iChart DBase Configuration File](image)

Step 3
Pick a device from the “Select Device” dialog. The left pane shows a list of manufacturers. Click on the plus sign ‘+’ in front of a manufacturer to display a list of devices from that manufacturer. Click once on the device name on the left pane or the device image on the right pane to select the device. Only one device may be selected at a time, adding multiple instruments to your network will be described following this section. Click the OK button to accept your selection.

![Select Device](image)
Step 4

After you click the “OK” button from the “select device” dialog, the “device property” dialog will appear (screenshot on next page).

In the “Device” section of the “General” tab, a default name is given to the instrument that you have selected. The instrument can be given a unique name or number in the “Device:Description” field. For multiple instrument networks it is important to give each instrument a unique, recognizable name or number. The name will appear on all future graphs and reports.

Next you will need to select the method of communication with the device. Click on the “Connection” field in the “Communication” section of the “General” tab to select your method of communication (direct, phone modem, cellular modem, or 4100 radio). When you select the desired communication method the baud rate will automatically be chosen according to the protocol of the selected device. However, you need to verify that the default serial port (COM 1) is correct. If you are using a serial port other than COM 1, you need to select the appropriate port from the “COM Port Setting…” menu.

When using a modem to communicate with an instrument, if you do not know which COM port you are using, check your modem settings in the Windows control panel. You can access this by clicking on the ‘Start’ menu, then ‘Settings’ and ‘Control Panel’. There should be an icon with a name similar to “Phone and Modem Options”. From there you should be able to determine which COM port your modem is setup to use. For cellular modem-specific settings, including power on/off settings and dialing protocols see Appendix C.

For direct connections or 4100 radio connections, connect the device to the serial port on the back of your PC now. The serial port is usually set to COM1, but on occasion it may be different (sometimes COM2 is used).

The “iSIC” section of the “Device Property” dialog refers to the iSIC option on NexSens-iSIC communication devices. If you are using any NexSens communication device with an iSIC board, the “iSIC” option must be checked. For information on correctly setting the address and port number of devices when utilizing a NexSens iSIC board, please reference the communication device manual.
Once you have properly chosen the settings for your instrument, click the “Detect” button in the “Parameters” section of the “Device Property” dialog.

Step 5
Depending on whether the selected device is properly connected to your PC COM port, iChart will either fail to or successfully detect the device operating parameters.

Step 5-a
If successful, iChart will display a list of parameters along with their units of measure in parentheses (as shown on the following page). You can change the unit, i.e. from feet to meter, by pressing the “Change…” button. Click “OK” to start data interrogation/collection at the predefined schedule. To customize the data interrogation schedule, please see Step 7 of this section. To customize specific device operating parameters, such as logging interval, see the section on “Device Dependent Settings”.

[Image of iChart Software dialog box with icons and settings]
Step 5-b.  
If iChart was not able to communicate with the selected device, a warning message will appear and the “Parameters” list will be empty. Be sure the device is properly connected and powered. If an error other than the message shown below appears, please refer to the Device Dependant Information Appendices for more specific instructions. After going over the device sections, please return to step 5-a to continue.
Step 6
After pressing “OK” on the “Device Property” dialog, the main data interrogation/collection screen appears. The iChart history buffer is limited to 1400 readings. Thus, the charts only display the most recent 1400 readings. The most recent reading is displayed in a green box on the right hand side of the chart window.
To customize the setup of the real-time chart window, go to the “Setup:Chart View:Edit” menu. This menu will allow you to add or remove parameters from the display, change the order that the parameters are displayed and change the duration of the real-time data display.

Any changes that are made in the “Chart View Property” menu will only change the display in the real-time chart window. Changes made here will not alter the setup of your real-time instruments.

To remove a parameter from your real-time display, simply click on the parameter in the “Active Parameters” window and then click on the red “X” above the box.

Once a parameter has been removed, it can be returned to the list of active parameters by clicking on the icon to the left of the red “X”. A list of possible parameters to add will be displayed.

To change the order of the parameters just click on a parameter and then click on the up or down arrow to reposition it. The order of the parameters in the list will be the order that their graphs are displayed in the real-time chart window.

“Display Duration” sets the time period of real-time data displayed. In the example above, the most recent 168 hours of data will be shown in the real-time chart window.

“Sample Interval” is only used when non-data logging instruments are connected. For example, if a Hydrolab sonde is in your network the 5-second setting in the window above would update the real-time data reading every 5 seconds. The data would not be logged at a 5 second interval, the real-time display would be adjusted every 5 seconds.
To adjust the range of the graphs, go to the “Setup:Chart View:Graph Property” menu.

To modify a parameter’s graph you need to click on the instrument’s folder to display its parameters. Then click the parameter for which you want to modify the graph. To manually set the upper and lower limits of the graph you must un-check the “autoscale” feature. Next you can manually enter values for the upper and lower limit. This menu also gives you the ability to change graph colors and the width of the line on the graph (“Trace Width”).

Step 7
The real-time charts will not contain any data until the first data interrogation takes place. Depending on the instrument being used, iChart will either download all of the new data saved on the instrument, or simply record the present reading. For device specific setup and logging schedules, see the appendices on “Device Dependent Settings”. To set the iChart interrogation schedule go to the “Setup:Device:Edit” menu.
Once in the “Device Property” dialog, choose the “Schedule” tab.

In the “Schedule” menu you can choose the frequency with which iChart will collect data from the instrument. In the case of a YSI 6-Series sonde, data is actually recorded in the sonde, and then retrieved by iChart. In the example shown above, the instrument is being interrogated every hour of every day. The instrument itself may be logging as frequently as every 5 or 10 minutes, but the data is brought into iChart every hour.

The “Offset (sec)” feature specifies an offset time to the specified interrogation schedule. An example will clarify how this is used. A Vaisala weather station samples every 15 minutes and takes 59 seconds to finish a sample. Interrogation is set to occur every 60 minutes. If the offset is 0, interrogation will take place exactly at the beginning of each hour (while the weather station is in the middle of taking a new reading). Thus, the last reading that is being taken is missed. If the offset is set to 60 seconds, then interrogation is taken at 60 seconds after the beginning of each hour and will include the latest reading.
It is also possible to manually interrogate your devices, either between scheduled interrogations or in place of an interrogation schedule. To turn off all scheduled interrogations, simply un-check all of the days of the week in the “Schedule Interrogation” menu. To perform a manual interrogation of an instrument go to the “Action:Interrogate Now” menu and select the instrument that you would like to interrogate.

2.2 Adding Additional Monitoring Instruments

For systems with multiple devices, we suggest that you add all of your devices to the same database. The primary reason is that all of your data from various sensors and instruments will be kept in one location. Hence, cross parameter reporting and trending, i.e. comparing dissolved oxygen between multiple sites, can be accomplished with ease. The “Reporting” section of this document describes the procedure for generating reports and trends.

Adding new devices

Once a database has been created, and at least one device has been successfully added, you can add more devices one at a time to complete a network of devices. Each device must have its own connection type and port, independent from other devices in the same configuration as in the case of an RS-232 interface, or they can share the same connection type and port, as in the case of an RS-485 interface. The only requirement is that each device address must be unique.

To add a new device to an existing database:

Make sure the real-time chart window is opened and selected.
Go to the “Setup:Device:Add...” menu. From this point forward, the procedure is exactly the same as steps 3 to 6 in “Getting Started” of the first section in this chapter.

2.3 Basemap View

In addition to Chart View as explained in Step 6 of section 1, you can choose to represent your network of devices with a photograph or drawing of your sampling sites. From this point forward we will refer to the graphical representation as a “basemap”. The basemap is a tool that allows you to click on a specific instrument within your network and see a custom report that was generated from that instrument’s data.

You need to complete a few tasks before attempting to set up the basemap feature. First, you need to have already established a database with one or more instruments as described in section 2.1 (Getting Started). Next you need to create a bitmap image (file extension .bmp) that is either a photograph or drawing of your sampling network. The image you choose must have an aspect ratio of 800X600 and must be saved as a bitmap file. You can use any graphical program to create the image as long as the final version of the file has the correct aspect and format. Finally, you need to create a report for each instrument or site that will be represented on the basemap view. For instructions on creating reports, see section 3.1.
To begin creating a basemap, select “View:Basemap”. A white screen will appear. Next select “Basemap:Edit Mode”. Edit mode allows you to make changes to the basemap. Now you can import an image by going to the “Basemap:Basemap image…” option. Find the folder where your image is stored and select the bitmap file. Your basemap will now appear in the iChart window. Next you need to draw data sources on your map. The data sources can be drawn by selecting “Basemap:Place data source…”. Selecting the “Place data source…” option will turn your mouse pointer into a pen tool. Operate the pen tool by clicking once to initiate an object, moving the mouse to size the object, and then clicking again to finalize the object. The tool only draws rectangles and squares. Once the object is drawn you can re-size it by clicking once to select the object and then click and drag to change the size as if you were modifying an object in a drawing program. You should size the objects to approximately cover the site or instrument for which you will link to. To move an object you can place the cursor over the object, click and hold, and move the object with the mouse. You should create one data source for every report that you plan to link to.

Once you have completed placing and sizing data sources, you can start linking them to reports. To link a data source to a report, double click on a data source. You will then need to specify the instrument in your network that the report will be generated from. Click on the arrow to the right of the “Data source link” field to display a list of your instruments. Select the correct instrument name from the list. Next you will need to specify the pre-defined report that needs to be accessed. Click on the “… (browse) button to the right of the “report link” field to search for a report that you have already defined. The reports for your study are located in the “NexSens: iChart:Users” folder. In the “Users” folder you should look for a folder that is named “xxx.report”. The “xxx” would be your database name. Go into the report folder, select the name of your pre-defined report and click “Open”. Verify that the instrument name and report link are correct, and then click “OK”.

When you are finished placing and linking data sources on your map, go to the “Basemap:Edit mode” option and de-select “Edit mode”. If the option is checked you are in “Edit mode”, if the option is not checked you are in Run Mode. If you place your cursor over a data source in run mode, your cursor will turn into a hand. When you click on a data source in run mode an updated report will appear the data parameters that you defined when you created the report. To modify the report go to the “Setup:Report format” menu and make any necessary changes. If you want to keep the changes make sure to save the new version of the report. To go back to the basemap view, simply close the report.

To turn the basemap view on or off go to the “View:Basemap” option. If the option is checked, you are in basemap view. If the option is not checked, you are not running the basemap view. Simply click on the option to toggle it on or off. If you are in Basemap view, and then turn off the basemap, your real-time chart view will be minimized in the bottom left-hand corner of the screen. Click on the “maximize” button to restore it.
3.0 Working With Data

iChart interrogates data from devices in its configuration and stores them in an encrypted database. Even though data cannot be modified once stored, they can be exported to other popular programs such as Microsoft Excel or Access for more flexible data handling and manipulation. iChart provides ways to view data in the database, via reporting. The data reporting module is a combination of database query and a scheduler.

3.1 Query the Database and Generate Reports

To create a new report, select the “File:Report:New...” menu. If the real-time chart window is active, iChart will display a report property page to allow you to select the type of report to generate and which parameters to report based on the current database. If the real-time chart window is inactive, iChart will display a file selection to allow you to choose a database configuration file (.icr) before showing the report property page.
After selecting “New”, the “Report” dialog will open. This screen will let you customize your reports by choosing which data to report and how to report it (Note: this window can be re-opened anytime after the report has been generated by selecting “Setup:Report Format”).

3.2 Report Types

iChart offers 2 reporting types: standard and condensed. A standard report simply displays data from the database as is, with no data processing. A condensed report breaks down time into several windows, i.e. hourly or daily, and then calculates statistics with data for each time window. An example will illustrate the differences between the two report types.

Example: An OTT Thalimedes samples and stores water level every 10 minutes. A daily standard report will display 144 readings. A monthly standard report will display 4320 readings (144 * 30). A daily average condensed report will show only 24 readings (1 per hour, taking an average of 6 data points). A monthly average condensed report will show 30 readings (1 per day, taking an average of 144 data points). A max daily condensed report will show 24 readings, but instead of an average reading every hour, it shows the max reading of each hour.

As the example shows, the advantage of a condensed report is that it greatly reduces the number of data to be viewed. Hence, with a few clicks of the mouse, you can quickly spot anomalies or assess the overall condition of your study. This is a very powerful and unique feature that iChart offers. We recommend that you experiment by changing different reporting criteria, and then observe the differences in the output.

Other Report Format Options

Parameter: the parameter window displays a list of devices represented by the yellow folders. To see the list of parameters associated with each device, click on the ‘+’ sign in front of the device name. Place a check mark in the checkbox in front of parameter name to select that parameter to report.
Time limit: specifies the time duration when you want the data to be reported.

All shows all data in the database regardless of when the readings were taken.
Day, month, or year reports data taken on a specific day, month, or year. Click on the dropdown list to show the calendar so you can pick a specific day, month, or year.
From…To… specify an arbitrary reporting time interval.

Include graph/data/statistical summary: A report contains 3 sections: graph, data, and statistical calculations based on the reported data. Each one can be turned on or off in the output. Furthermore, each of the 6 statistical calculations can also be turned on or off. This is accessed by clicking on the “…” button beside “Statistical Summary”.

Report Format Advanced Settings
Other settings such as the number of decimal places for each parameter, condensed report scope, and data filtering are grouped in the “Advanced” tab of the report dialog. Each of these settings is associated with the currently selected parameter (the one that is being highlighted). Thus, before changing the setting, click once on the desired parameter to highlight it.

Parameter: similar to the parameter window in the property page, the parameter window displays a list of devices represented by yellow folders. To see the list of parameters associated with each device, click on the ’+’ sign in front of the device name. Click once on a parameter name to select it for modification.
**Precision:** select the number of decimal places in the output. Values from 0 to 6 are allowed. Select default to let iChart decide the number of decimal places based on sensor resolution.

**Condensed report settings:** for condensed reports, iChart divides time into small windows and performs statistical calculations on each window. By default, for daily reports the time window is an hour; for monthly reports, the time window is a day; for annual reports the time window is a month; and for arbitrary time reports the time window is 1 hour if the total time is a day or less, a day if total time is a month or less, a month if the total time is a year or less, or a year if total time is more than a year. Use the dropdown box to force the time to hourly, daily, monthly, or annually, regardless of the reporting interval. Another setting for condensed reports is outputs. You can select one or more statistical output that you want in your report by placing a check mark on the checkbox in front of each calculation.

**Value limit:** data filtering is specified in value limit settings. Sensors and instruments are not perfect, and sometimes sensors can generate erratic readings. You can filter these readings out by specifying any one of the 3 filters that iChart provides.

- **X <= filter:** reports all data less than or equal to the specified value. This filters out all the high faulty readings.
- **X >= filter:** reports all data greater than or equal to the specified value. This filters out all the low faulty readings.
- **X >= AND X <= filter:** reports only values within the specified range. This filters out all the low and high faulty readings.

If you select any of the filters, filtered data will be represented by dashes “-----” on the report.

**3.3 Sending Reports**

Besides sending report output to the display, iChart can also send it to the printer, email it to a number of recipients, ftp it to a web site, save it in a folder on your computer, or save it in an .html file that can be posted directly to the web. This feature and the report scheduler described in the next section, form a powerful report automation tool that allows you to see a complete picture of your study at your desk or around the globe via the internet. Note: You must have the report open in iChart to do automatic output through a schedule.
Destination: you have 5 choices of where to send the report to.

Display only.

Printer. Prints out data on your printer.

E-mail: multiple e-mail addresses are separated by semicolons ‘;’.
FTP: ftp to a web site. You must have an ftp account established on your website and access to the location that you want to ftp the reports. If you ftp to a location other than root, specify them using a forward slash ‘/’. For example ftp.nexsens.com/ichart puts the report in an iChart folder at the NexSens web site. In addition to ftp the report, you have the choice of letting iChart also ftp an HTML file (default name is “index.html”) to the same location to allow easy access to the reports. The index.html file is generated based on a template file “_indexhtml.tmpl” located at the “NexSens\ iChart\ System” folder in your hard drive where iChart is installed. Before modifying the HTML template, please make a backup in case you want to go back.
Folder: Save data to a folder on your computer. Type the folder location or browse to the folder where you want to locate the data. Each file will be given a different name based on the date and type of report. If you host your own website you can post reports directly to the web allowing easy access to the reports. Select the “Generate HTML index page” check box and specify a file name if you want iChart to create an indexed HTML page (default name is “index.html”). The index.html file is generated based on a template file “_indexhtml.tmpl” located at the “NexSens\ iChart \System” folder in your hard drive where iChart is installed. Before modifying the HTML template, please make a backup in case you want to go back. If you want to use a fixed file name so that the same file is overwritten each time then select “Use fixed file name” and specify a file name. This can be linked to directly from a web page.

Format: comma separated value (csv) format is generally used when you import the report to another program such as Microsoft Excel or Access. It is also the format of choice if you want to post process the report yourself, i.e. present it on a web page. Window meta file (WMF) is a graphical format used when you intend to include charting in the report and want to incorporate it in other documents such as Word. Adobe PDF is a universal format for electronic document handling. It can be viewed with Acrobat reader that can be freely downloaded from the Adobe web site at http://www.adobe.com. Various plug-ins are also available for the popular web browsers Internet Explorer and Netscape Navigator. With these plug-ins, you can view the PDF report directly from your browser. You can customize the PDF output paper size, margin, and font scaling by clicking the “Property…” button.
The iChart Database (IDB) format can be used when you want to view the entire iChart database. If you want to use a fixed file name so that the same file is overwritten each time then select “Use fixed file name” and specify a file name.
Report schedule

Report schedule allows reports to be generated automatically based on a predefined schedule. This schedule is similar to the interrogation schedule described in the Step 7 of Section 2.1. You can specify on what days at what times you would like your report to be generated.
3.4 Exporting Data

Similar to its Send Data feature, iChart can also export your data to a file. The file-format will be .csv (comma separated value), and the file can be used in popular spreadsheet programs such as Microsoft Excel.

To export data, first go to the “File:Export Data” menu.

The following dialog will open up,

In the “File name” field, type in a name for the file that will contain your exported data. Make sure you know which folder you are saving your file in. This can be determined by clicking on the down arrow on the right of the “Save In” field near the top of the dialog box. After you have finished typing in the name, and set the location to where the file will be stored click on “Save”. You can view this file any time later by going to the specified folder and opening the .csv file with any popular spreadsheet program.
4.0 Database Maintenance

4.1 Backing Up Data

Whenever you are dealing with computers, there will always be the possibility of a power outage, system failure, or other catastrophe that could lead to the loss of important data. In order to help prevent this, iChart can backup your data using its own data backup function.

To begin backing up data, go to the “File:Backup” menu as shown below (make sure you are in Chart View mode while backing up data. It will not work if you are in Report mode),

After this is done, the Data Backup dialog box will appear as shown below,

This menu lists all the options you will need to begin backing up any information you have generated with iChart.

‘To’: This field contains the destination folder for your backed up data. You can change this location by clicking on the three dots in the box next to the field.
‘Backup Schedule’: The situation may exist where you will need to backup your data at regular intervals. iChart makes it easy to do this through the Backup Schedule field. Choose to backup your data at a certain time everyday or automatically backup only on a certain day of the week. The time field allows you to set the day and time when backup will occur.

‘How Much Data to Backup’: ‘Current Month’ will backup all data recorded during the current month. ‘Current Year’ will backup all data recorded during the entire year. Finally, ‘All’ will backup all information you have in your iChart data file. (Note: if you are backing up an entire year’s worth of data, the output file may not fit on a floppy disk. Ideally, backing up to your hard drive or a suitable network drive would be the best option).

4.2 Restoring Data

If you have previously backed up data, it can be restored using iChart’s restore function. Go to “File:Restore” as shown below,

A dialog box will appear that will ask for the location of the backup file. Click on the box with the three dots immediately right of the ‘From’ field to select which iChart backup file you want to restore. (Note: Backup files will have the extension .icr).

If everything is successful, the following dialog box will appear,

4.3 Copying the Database to Another Computer

The easiest way to copy an iChart database to another computer is to use the backup and restore functions. Since iChart may use multiple files and folders to hold your data, copying one file may not always transfer all the data. Use the Backup function to backup your data to a floppy disk or network drive. Another method would be to backup your database to your hard drive, and burn it onto a CD-ROM.

Once you have successfully backed up your files to an alternate location, use iChart’s Restore function to import the database into iChart on the target computer. After Restore is complete, you will be able to directly open a new copy of the database on your second computer.
5.0 Reference Guide

5.1 File Menu Commands

- **New Database**  Create a new iChart database (.icr file).
- **Open Database**  Opens an existing iChart database.
- **Close**  Close the currently open iChart database.
- **Save**  Save the currently open iChart database.
- **Report**  Opens an existing report or creates a new report based on the data in your iChart database.
- **Export**  Exports iChart data to a .csv file for use in popular spreadsheet programs.
- **Backup**  Automatic or manual backup of the data contained in the opened iChart database.
- **Restore**  Restore iChart data from backup files.
- **Print**  Prints chart data from the current iChart database.
- **Print Preview**  Shows a preview of what the printout will look like.
- **Print Setup**  Selects a printer and printer connection.
- **Send To**  Immediately sends current report to mail recipient, FTP, or Folder.
- **Exit**  Exit iChart and return to Windows.

(* - only available in Report Mode)

**New Database (File Menu)**
Use this command to create a new iChart database. This database will contain all the data for the entire network of devices. Upon creation of a new database, iChart will ask for the first device to be added. A list of devices and manufacturers will open in a new window. Select your first device from this list and continue.

**Shortcuts**

**Toolbar:**

**Keys:** CTRL+N

**Open Database (File Menu)**
Use this command to open an existing iChart database. Only one database can be open at a time so make sure you save your current database before opening another one.

**Shortcuts**
Close (File Menu)
Use this command to close the active iChart database. iChart will ask that you save your changes before closing the database. If you close your database without saving, you will lose any changes you have made. Before closing an untitled database, iChart will bring up the Save As dialog so you can give the file a name.

Save (File Menu)
Use this command to save the current iChart database using its current name and directory. When you save a database for the first time, iChart will bring up the Save As window where you can choose what filename to use and which directory to save in. If you want to change the name of the file before you save it, choose “Save As” from the File Menu.

Export (File Menu)
This command is accessible only through Report Mode. Use it to save your iChart data to a comma separated value (.csv) file. This file is formatted for use in most popular spreadsheet programs, such as Microsoft Excel.
Backup (File Menu)

Use this command to backup your current iChart database. When this command is selected, the Backup/Restore Data dialog box (as shown above) is opened by iChart. By setting the options here, you can customize the method in which your backups will take place. It is recommended that you do not backup your data to a floppy disk due to the possible large size of your database. Backing up to your hard disk or a network drive will ensure that all your data is saved.

Restore (File Menu)

Use this command to restore any data that you have previously backup using iChart’s Backup command. Choose your backup file and location from the “From” field and then click “Restore Now”. Using this command will ensure that any data you have backed up will be restored correctly.
Print (File Menu)
Use this command to print your Report Data. A print dialog box will appear that will let you choose your printer, number of copies, and set printer specific settings.

Shortcuts
Toolbar: 
Keys: CTRL+P

Print Preview (File Menu)
Use this command to display your Report Data as it would appear printed. When this command is chosen, the normal Report Mode screen is replaced by a screen showing a page which will look exactly like your printed data. There are buttons that will show the next page, zoom in, and zoom out.

Print Setup (File Menu)
Use this command to select a printer and printer connection. This command will open the Printer Dialog Box which will let you set many printer specific options.

Send To (File Menu)
Use this command to immediately send a report to a mail recipient, FTP, or folder. To send to a mail recipient you must first enter an email address in the report format. With the report open go to Setup -> Report Format… then click the Output tab. Select Email as the destination and then enter an email address. You may now use the Send To mail recipient option. After entering an email address in Report Format the email address can be changed directly in the auto report email that is displayed when Send To command is selected. To send FTP or to a folder enter the information as prompted. See 3.3 Sending Reports above for further information.

Exit (File Menu)
Use this command to exit iChart. This will close the open iChart database, and close any reports that may be open. If the database has not been saved, iChart will prompt to do so. If the database has never been saved, iChart will open the Save As dialog box. From here you can enter a filename and directory to save the database in.

5.2 View Menu Commands
• Toolbar Toggles the toolbar on and off.
• Status Bar Toggles the status bar on and off.
• Navigation Panel Toggles the navigation panel on and off.
• Output Window Opens and closes the output window.
• Basemap Toggles Basemap view.
• Statistical Summary* Shows or hides statistical summary section.
• Graph* Shows or hides report graph section.
• Data* Shows or hides report data section.
 (* - only available in Report Mode)
**Toolbar (View Menu)**

Use this command to toggle the toolbar (as shown above) on or off. The toolbar contains the New Database, Open Database, Save, Print, Help, and Toggle Live Chart commands.
**Status Bar (View Menu)**

Use this command to toggle the status bar (as shown above) on or off. The status bar contains information about certain aspects of iChart. The left corner of the status bar will give information as to what function iChart is currently performing. Many error messages will appear on this part of the status bar. The right side of the status bar shows the current date and time.

**Navigation Panel (View Menu)**

Currently only available in iChartOE.

**Output Window (View Menu)**

Use this function to watch all commands sent between iChart and your monitoring devices. When Output Window is selected, a new window is created underneath the charts and data reports. By watching this window, you can see the data and commands that iChart is sending to your equipment. In the event of an error in situations such as interrogating or adding devices, the Output Window is an extremely valuable tool for troubleshooting.

**Basemap (View Menu)**

Use this command to represent your database with a photograph or drawing of your sampling site and devices. When Basemap is activated, all your devices will be shown on top of a picture or diagram and can be selected individually by clicking on them. This function makes it extremely easy to generate reports and data for a single device instead of having to sort through your entire network to find it. Instructions for setting up a Basemap are located in section 2.3 of this manual.

**Statistical Summary (View Menu)**

<table>
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<tr>
<th></th>
<th>Ver. 1</th>
<th>Ver. 2</th>
<th>Ver. 3</th>
<th>Mean Ver.</th>
<th>Std</th>
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<tr>
<td>Min</td>
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<td>-5.3</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>06:05:02</td>
<td>06:05:02</td>
<td>06:05:02</td>
<td>09:30</td>
</tr>
<tr>
<td>Std</td>
<td>8.0</td>
<td>11.2</td>
<td>16.7</td>
<td>11.5</td>
<td></td>
</tr>
</tbody>
</table>

Use this command (found in Report Mode only) to generate special statistics from your data. When the Statistical Summary option is checked, iChart will generate averages, maximum values, minimum values, and standard deviation for each selected parameter in your database.
**Graph (View Menu)**

Use this command in Report mode to toggle the data graphs on and off. If iChart is setup to do so, it will report your data using graphs in Report Mode. If the Data command is un-checked in the pull-down menu, the data graphs will be hidden from view.

**Data (View Menu)**

Use this command in Report Mode to toggle the data listing. If the option is checked when generating a report, iChart will show all the data over the specified range on the report in Report Mode. If the Graph command is un-checked, iChart will hide the reported data.

### 5.3 Setup Menu Commands

- **Device**
  - **Edit**
    - Edit the properties of a device in your database.
  - **Add**
    - Adds a new device to your database.
  - **Delete**
    - Removes a device from your database.

- **Chart View**
  - **New**
    - Creates a new set of graphs for your data.
  - **Edit**
    - Opens “Chart View Property” dialog box that allows you to choose which parameters to show on your chart.
  - **Delete**
    - Removes the currently selected Chart View
  - **Graph Property**
    - Opens the “Graph Property” dialog box from which you can change the display settings of your graphs.

- **Alarm**
  - **Setup**
    - Sets up the alarm settings for a sensor.
  - **Clear**
    - Clears any active alarms.

- **Report Format**
  - Opens the “Report Format” dialog box.

- **Page Layout**
  - Opens the “Report Page Layout” dialog box.

- **Font**
  - Changes the data font

- **Graph Property**
  - Opens the “Graph Property” dialog box.

- **System**
  - **Change Password**
    - Changes the supervisor password.
  - **General Settings**
    - Sets up program parameters.

(* - only available in Report Mode)
(** - only available in iChartOE software)
Device:Edit (Setup Menu)

Use this command to bring up the “Device Property Dialog”. As explained in chapter 2 of this manual, the “Device Property Dialog” allows you to setup the options for a particular device in your network. Interrogation schedules are set here as well as the power schedule for NexSens 3100 cell modems and NexSens 4100 Spread Spectrum Radio. This dialog will also hold settings specific to the devices or sensors in the network.

Device:Add (Setup Menu)

Use this command to add a new device to your database. When an iChart database is first created, only one device is added. In order to add more devices, you must go to Device:Add to do so. When adding new devices using this menu, follow the same instructions outlined in chapter 2 of this manual.

Device:Delete (Setup Menu)

Use this command to delete a monitoring device from your database.

Chart:New (Setup Menu)

Use this command to create a set of graphs in a new window. This function can be useful if you want to show only one device per window.
(Available only in iChartOE)

Chart:Edit (Setup Menu)
Use this command to bring up the “Chart View Property” dialog box. From here you can choose which parameters to display on your chart as well as choose the order in which they will be displayed. The exact description of this dialog box can be found in Chapter 2, Step 6.

**Chart:Delete (Setup Menu)**

Use this command to remove the currently selected Chart View. Be cautious not to close all chart view windows without saving. Be sure to save all changes to your database before you remove the currently selected chart.

**Chart:Graph Property**

![Graph Property dialog box](image)

Use this command to set the display options for your data graphs. If you want to change how a device’s chart looks, select it from the list of parameters in the list on the left of the dialog. You can modify the display by changing the options on the right side of the dialog box.

If you want to change the scale of your graph manually, uncheck “Autoscale”. The ‘Lower Limit’ and ‘Upper Limit’ fields will set the scale on the y-axis. This axis is the data obtained from the monitoring devices.

The ‘Back Color’, ‘Trace Color’, and ‘Grid Color’ boxes will change the colors of your chart in the Chart View Window. By default they are set to white, red, and gray respectively.

Changing the ‘Trace Width’ field will change the thickness of the line displayed on your chart. If you want a think line, increase the value of the trace width. For a thin line, decrease the value.
Use this command to set iChart to alert you if data falls within a certain limit. An alarm can be set on every data parameter found in the list on the left of the dialog box. If you want to set alarms on multiple parameters, one alarm must be set on each of them.

There are two types of alarm, High alarms and Low alarms. The “High Alarm” section will set iChart to alert you if the data from the specific parameter goes too high. To enable this function, first check the “Enable” box. “Set Point” – Type your upper limit for data in this field. If data goes higher than this number, iChart will activate the alarm. “Reset Point” – iChart will deactivate the alarm if the data falls back under this number.

The “Low Alarm” section works opposite of the “High Alarm” one. In this alarm type, iChart will alert you if data falls below a certain point. Set this low point in the “Set Point” field.

“Alarm Action” – Use this option to set how iChart will alert you if an alarm goes off. There are a number of alarm types to choose from:

- **Sound PC Speaker** – iChart will cause your PC speaker to make a beeping noise.

- **Flash Message** – iChart will flash a dialog box containing whatever message you choose to show.

- **Play Wave File** – iChart will play a pre-recorded wave file. After selecting this option, a field will appear where you will have to type in the location of a wave file for iChart to play.
**Dial Pager** – iChart will dial-out using your modem to a pager. After selecting this option, a field will appear where you will have to type in the pager number for iChart to dial.

**Dial Phone** – iChart will alert the user by dialing the specified phone number.

**Send e-mail Message** – iChart will e-mail the user when the alarm conditions are met.

**Alarm:Clear (Setup Menu)**
Use this command to clear any alarms you have created. This function can be useful if you have many alarms and want to reset them all quickly.

**System:General Settings (Setup Menu)**

**General**
*Reload on start* - Use this command to automatically load a database when iChart is opened. The database open or the last database opened when this option is selected is the one that will open automatically. To change this option to a different database you must close all databases, unselect the option, open the database you want opened automatically and then reselect the option.

**Email**
*MAPI* – This is the default Protocol setting for email.
*SMTP* – Use this option when email is sent through a dial-up connection. To use this option you must have a dialup connection already setup on your computer. Enter name and email address of the sender of the email. Contact your System Administrator to get the Server information. You must select the “Auto Connect to the Internet” check box. Email address of receiver is placed in Report Format Output.
5.4 Action Menu Commands

- **Interrogate Now**   Interrogate one or every device in the network.
- **Import**   Import ASCII data to a device.
- **Refresh Report**   Refresh report with new data if any is available.
- **Supervisor Mode**   Switch to supervisor mode.

(* - only available in Report Mode)

**Interrogate Now (Action Menu)**

Use this command to interrogate either one device in your network or all of them at once. When iChart interrogates a device, it makes a connection through whatever method you have setup (field radio, modem, cell modem, etc…) and obtains data from the device. If the device has recorded any new data since its last interrogation, iChart will download it and show it on the graph.
Choose “ALL” from the pull-down menu to interrogate every device in your network. iChart will systematically interrogate each device one-by-one, and report any new data in the charts. This option can be very useful in situations where many devices must be interrogated quickly.

**Import (Action Menu)**

Use this command to import data to the database for the selected device in your network. Upon selecting this command, iChart will bring up a dialog box asking for a comma-separated value (.csv) file. Certain devices are equipped with the ability to have data uploaded to them in the form of .csv files. iChart makes it easy to send this data to your device should it become necessary. (Note: this feature is still under construction and will be available for future use.)

**Refresh Report (Action Menu)**

Use this command in Report Mode to update your report with any new data acquired during previous interrogations. Reports generated by iChart are automatically updated if a pre-defined schedule is setup in the report format. If a pre-defined schedule has been setup but data as been uploaded during an interrogation since the automatic update the user can manually update the report using this command. The command will update all data parameters for every device.

**Supervisor Mode (Action Menu)**

Use this command to prevent un-authorized changes from being made to your iChart database configuration. Upon selecting this command, iChart will open a dialog box asking for a password (shown above). Without entering the password first, it will be impossible for anyone to make changes to the database. (Note: the default password is blank)

### 5.5 Tool Menu Commands

- **Model 4100 Radio**
  
  Setup Model 4100 Spread Spectrum Radio

- **ISIC**
  
  Setup the iSIC board controlling your devices.

- **DN710 Smart Rain Gauge**
  
  Setup DN710 Smart Rain Gauge.

- **DN510 Smart DO Sensor**
  
  Setup DN510 Smart DO Sensor.

- **DN110 Smart Temperature Sensor**
  
  Setup DN110 Smart Temperature Sensor.

- **YSI Sonde**
  
  Open terminal window on a YSI Sonde.

- **Program Cellular Modem**
  
  Setup cellular modem for interface with iChart.

**Model 4100 Radio (Tools Menu)**
Use this command to program specific settings for your NexSens 4100 Spread Spectrum radio. From this dialog box, you can set the COM port, iSIC address, baud rate, and time. It is important that the internal clock in the 4100 radio is synchronized with your PC clock so that data is recorded at the correct time. This can be done easily by clicking on the “Sync to PC Clock” button. This will adjust the clock in the radio to the time shown on your PC clock.

A power schedule must be set if your radio has been setup in the field. By adjusting the on-times in the “Switch Power Schedule” section, the 4100 will power-on only during the intervals you set. It is important to set a power schedule so the battery powering the radio will last longer. When a power schedule is set, instead of staying on all day, the radio will only turn itself on when it needs to take a measurement or interact with iChart.

**ISIC (Tools Menu)**

Use this command to set diagnostic settings on your iSIC board. The iSIC board is what enables your monitoring devices to interact with iChart and it must be setup correctly for this to happen. While iChart usually detects all iSIC settings when adding new devices, on occasion it may be necessary to set these manually. Through the “ISIC Setup” dialog box all options can be set manually. In addition, it is
important to synchronize the iSIC clock with your PC clock. Clicking on the “Sync to PC Clock” button will do this quickly and easily.

**DN710 Smart Rain Gauge (Tools Menu)**  
Use this command to setup your DN710 Smart Rain Gauge.

**DN510 Smart DO Sensor (Tools Menu)**  
Use this command to setup your DN510 Smart DO Sensor.

**DN110 Smart Temperature Sensor (Tools Menu)**  
Use this command to setup your DN110 Smart Temperature Sensor.
YSI Sonde (Tools Menu)

Use this command to access the YSI Sonde Terminal. Using the terminal you can change many settings internally on the sonde. For example, you can delete data stored in the sonde or begin a new data logging session. For a complete listing of terminal commands, check your YSI sonde manual.

Program Cellular Modem (Tools Menu)

Use this command to program and activate a NexSens 3100 cellular modem for use. Use this dialog box to enter the phone number of the cellular modem, as well as its System Identification (SID). Both numbers are obtained from your cellular service provider and must be programmed into the modem before it can be operated.
Appendix - Device Dependant Information

Appendix A: Setting up a YSI 6-Series Sonde

Follow the instructions provided with your YSI multi-probe to set up an unattended study. iChart will NOT detect your Sonde as a network instrument without an unattended study in use.

The third tab in the “Device Property” dialog (access via “Setup|Edit Device…” ) is device dependent settings. The tab is there only if the device has specific settings. Some devices, such as the YSI model 6500, do not have any settings, in which case the tab is not present. Other devices, such as the OTT Thalimedes level logger, has a dozen or so settings. All device dependent settings are described in their perspective manuals so we will not go over them in detail here. Instead, for your reference in the next couple of pages, we will show you screen shots of these settings and comment where appropriate.

Click the “Connect” button to access the sonde’s internal menu. All sonde settings can be accessed via its internal menu.

If you want your sonde to run in discrete mode, check the “Run Discrete Mode” to quickly setup this option.

Note: Upon detection of your YSI 6-Series Multi-Probe when setting up the device, iChart may bring up a dialog box similar to the following:

This caution box appears because the time set in the internal clock on the multi-probe is different from the time of your PC clock - the time in the lower-right hand corner of your Windows screen. Neither
clock needs to be reset for iChart to collect data, but if you want synchronized times, reset your PC

clock by double-clicking on the time in the lower right hand corner of your Windows screen.

In the case above, the multi-probe clock was 209 seconds slower. You may get a different number. If

you do not care about the time difference, then just click OK and continue.

Appendix B: Connecting to a Sontek Argonaut MD Sensor

Before iChart will be able to detect an Argonaut Sensor, the device must be connected correctly to the
terminal strip of your NexSens communications device (field modem, cell modem, etc…). The table
below lists the wire colors of the Argonaut interface cable and their corresponding NexSens terminal
strip location.

<table>
<thead>
<tr>
<th>Interface Cable Wire</th>
<th>Function</th>
<th>Terminal Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>+12VDC</td>
<td>+12v</td>
</tr>
<tr>
<td>Black (thicker wire)</td>
<td>Ground</td>
<td>GND</td>
</tr>
<tr>
<td>White</td>
<td>Data Out</td>
<td>P1.Rx</td>
</tr>
<tr>
<td>Black (thinner wire)</td>
<td>Data In</td>
<td>P1.Tx</td>
</tr>
</tbody>
</table>

Note: If you are using Port 0 on the terminal strip, connect the white wire and thin black wire to P0.Rx
and P0.Tx respectively.

Appendix C: Connecting to an ISCO 6712 Sampler

The color codes for the interrogator wire of the ISCO 6712 Sample and their corresponding locations on
the NexSens terminal strip are as follows:

<table>
<thead>
<tr>
<th>Interrogator Wire Color</th>
<th>Function</th>
<th>Terminal Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>+12VDC</td>
<td>+12v</td>
</tr>
<tr>
<td>Black</td>
<td>Ground</td>
<td>GND</td>
</tr>
<tr>
<td>Orange</td>
<td>Transmit</td>
<td>P1.Tx</td>
</tr>
<tr>
<td>Yellow</td>
<td>Receive</td>
<td>P1.Rx</td>
</tr>
</tbody>
</table>

Appendix D: Connecting to a Raymarine L760 Depth Finder

Before the depth finder will interface correctly with iChart, the NMEA-Out codes must be configured on
the device. The following procedure should be followed to correctly setup NMEA-Out on your device:

- For this example we will configure the L760 to measure depth, latitude and longitude.
- First, turn on your Raymarine L760 Depth Finder.
- Press the Menu button on the L760 (found in lower right-hand corner of device).
- Notice that across the bottom of the L760 there are four black circular buttons with a green line at
the top of each. These are the ‘Soft Keys’ as shown in the picture below:

![Soft keys](image)

- After pressing the menu button, four options will appear at the bottom of the LCD.
- The option you need is the ‘System Set-Up’ box (shown below).
• To access this area, press the soft key underneath the ‘System Set-Up’ box.
• Using the directional-pad on the L760, scroll down the setup list until ‘NMEA-Out Set Up’ is highlighted.
• Once it is highlighted, a box will appear in the lower-left of the LCD screen that says “NMEA-Out Set Up”.
• Press the corresponding soft key to select the box.
• A new screen will appear with a list of three-letter NMEA codes.
• In order to measure depth, latitude, and longitude, only two NMEA codes need to be turned on.
• The only codes that need to be turned on are ‘DBT’ for depth, and ‘GLL’ for longitude and latitude.
• To change the status of a code, first move the cursor over the code you wish to change. ‘ON’ and ‘OFF’ boxes will then appear at the bottom of the LCD. Press the corresponding soft key to turn the code on or off.
• Turn off all other NMEA codes except these two.
  o Note: The L760 outputs data to your computer using the NMEA Out codes. iChart takes this data and puts it in an easy to read and understand format.
• After you have turned off all codes except DBT and GLL press the ‘ENTER’ button on the L760.
• To exit the setup menu, keep pressing ‘CLEAR’ until you return to the original screen.
• The device is now ready for interface with iChart. Start iChart software and select “New Database” from the File Menu.
Note: Before setting up the device in iChart, make sure the GPS antenna is placed in area where it will be able to pick up the satellite signal. If the GPS cannot find the satellite, iChart will not detect the latitude and longitude variables.
• Refer to Chapter 2 of the iChart manual for instructions from here.

Appendix E – Connecting to a Vaisala MAWS

Before attempting to interface your MAWS with iChart, make sure the weather station is completely setup. Connect all sensors and make sure power is being supplied (battery, AC, or solar). Next, run iChart software and begin a new database.

Add the MAWS following the steps outlined in the Getting Started section found in chapter 2 of this manual. Once the MAWS has been detected, click on the “MAWS” tab as shown in the screenshot below:
Use the options here to calibrate and configure your weather station. Set the “Log Interval” field to the desired time between readings. After you have entered the time, check the “Force reprogram” box. Next, change the “Wind Direction” field to zero and physically aim the wind vane on the weather station towards north. Finally, enter the appropriate values in the remaining calibration fields.

Checking the “Set MAWS clock to PC clock” will synchronize the internal clock on the weather station to your time set in Windows. Checking the “Erase data flash” box will empty any previously stored data values from the weather station’s memory.

Once your have set all your calibration and configuration options, click the “OK” button at the bottom of the dialog box. The MAWS should now be configured to interface with iChart software.