Cat. No. 877-92

Operating Instructions

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Form 40085 Rev 1905

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Indicates a premier feature of DataTrac Software

Indicates a reminder

Indicates a warning

SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to http://www.skcinc.com/warranty.

Introduction
DataTrac Software for Leland Legacy

Features
- Program a sampling operation from a PC
- Calibrate pump flow
- Display the operating state including flow rate, temperature, atmospheric pressure, run time, and battery status of the connected pump
- Create and save a sampling program without a pump connected to the PC
- Program up to 26 sampling sequences, each at different flow rates, if desired
- Download pump run time data and history to your PC
- Document sampling history using the sample setup feature
- Print a history file containing pump run time data
- Print a worker exposure profile containing run time data and pump history
- Document date of pump calibration

DataTrac System Requirements
- Hard drive with a minimum of 20 MB free disc space
- Available USB port for use with SKC USB DataTrac adapter cable
- Mouse
- Microsoft® Windows® 7 or higher

DataTrac Components
- DataTrac Software and instructions via free download on website
- DataTrac adapter cable

DataTrac Setup

Installing DataTrac Software

Installation of New Software

1. Close all applications.

2. Go to www.skcinc.com/catalog/datatrac/DataTracLeland_license.html. See Download DataTracLeland for the Leland Legacy for instructions on downloading and installing DataTrac on your PC.

If installation is unsuccessful, an error box will display indicating that installation was not successful and that the user should perform the installation procedure again.

A shortcut to Legacy.exe will be installed automatically on the PC desktop.

If changes to settings are desired after installation, perform Steps 1 through 4 below. The IS Program Maintenance window will display. Select Modify to change settings.

Installation of Software Update *(previous version exists on PC)*

1. Close all applications.

2. Go to www.skcinc.com/catalog/datatrac/DataTracLeland_license.html. See Download DataTracLeland for the Leland Legacy for instructions on downloading and installing DataTrac on your PC.

3. The IS Welcome window will display. Click Next.

4. The IS Program Maintenance window will display. Three options will appear:
   - **Modify -** used to change settings after installation
   - **Repair -** used to update previously installed software
   - **Remove -** used to remove the previously installed version of the software from the hard drive ***(SKC recommended)***.
     a. Click Remove.
     b. Click Next.
     c. The IS Remove the Program window will display.
     d. Click Remove.
     e. The IS Removing the Program window will display.
     f. The IS Wizard Completed window will display, indicating successful removal of the existing software.
     g. Click Finish to exit the IS Wizard.

5. Follow instructions for Installation of New Software.

Complete DataTrac Software features are only available when an active sample pump is connected to the PC (see Connecting the Pump to a PC). The SKC DataTrac Pump Manager window may be accessed without a pump connected to the PC; however, only limited features will be available (see Connecting the Pump to a PC, Connection Error Box, Figure 2B on page 5).

Connecting the Pump to a PC *(Figure 1)*

USB port on PC: Use the supplied adapter cable to connect the pump to the PC.

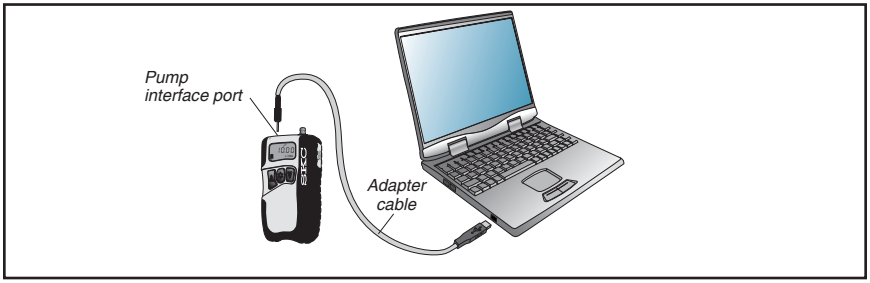


Figure 1. Hardware Setup

First Time Connection

1. Connect the pump to a PC using the DataTrac adapter cable.
   a. If a **Found New Hardware Wizard** window displays during connection, follow this procedure:
      i. Ensure the wizard wants to install software for "USB Serial Port."
         1. If the wizard wants to install any other software, cancel the wizard, and connect the adapter cable to a different USB port.
      ii. Select Install the software automatically (Recommended).
      iii. Click Next.
      iv. The installing USB Serial Port window will display. Installation may take several minutes. **Do not press any keys during installation.**
      v. The Completing the Found New Hardware Wizard window will display, indicating a successful installation.
      vi. Click Finish to close the wizard.
2. Activate the pump LCD by pressing any button on the pump keypad.
3. Launch DataTrac Software on the PC by double-clicking the Leland Legacy shortcut icon on the PC desktop.

4. The Leland Legacy Connection window will display *(Figure 2).*
   a. Click Connect to Pump
5. If connection is successful, the Leland Legacy Connection window will display a shaking hands icon *(Figure 2A).* Proceed to Step 6. If connection is unsuccessful, an error window will display *(see box and Figure 2B on page 5).*

Figure 2. Connection Window

Figure 2A. Successful Pump-PC Communication

Successive Connections

1. Connect the pump to a PC using the DataTrac adapter cable.
2. Activate the pump LCD by pressing any button on the pump keypad.
3. Launch DataTrac Software on the PC by double-clicking the Leland Legacy shortcut icon on the PC desktop.
4. The Leland Legacy connection window will display *(Figure 2)*.
   a. Click Connect to Pump.
5. The Leland Legacy Connection window will display a shaking hands icon indicating a successful connection *(Figure 2A)*. Proceed to Step 6.

Connection Error Box

If an error box displays during connection *(Figure 2B)*, follow this procedure:

a. Ensure pump LCD is activated. *See Step 2 on page 4.*
b. Check cable connections and click Retry. If the error box displays again, go to Step c.
c. Ensure the COM ports for the adapter cable are numbered between 1 and 9. See changing the COM Port box below.

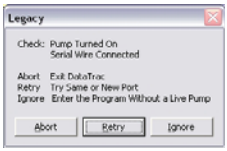


Figure 2B. Connection Error Box

Another option in the error box is Ignore. Clicking Ignore opens the SKC DataTrac Pump Manager window but only allows limited access to software features.

Changing the COM Port

To **change the COM** port:

1. Ensure DataTrac adapter cable is connected to a USB port.
2. Click Start menu.
3. Right click on My Computer.
4. Select Manage.
5. Select Device Manager.
6. Expand the **Ports (COM & LPT)** menu.
7. Double-click to select USB Serial Port (COM10 or similar).
8. Select Port Settings.
9. Click on Advanced.
10. Select a COM port between 5 and 9 from the COM Port Number dropdown menu.
11. Click OK to close.
12. Follow instructions for Connecting the Pump to a PC *(see page 4).*

COM Port Window

6. If the date and time settings on the PC and pump differ by a day or more than 5 minutes, respectively, a Time Discrepancy Alert window will display *(Figure 3).*
    a. Reconcile the date and/or time.
    b. Click OK.
7. DataTrac Software will load and display the SKC DataTrac Pump Manager window *(Figure 4).*

Figure 3. Time Discrepancy Alert Window

Recommended for first time users: *Connect a Leland Legacy pump to your PC and explore the features of DataTrac through the Real Time Monitor (see page 8).*

SKC DataTrac Pump Manager

The SKC DataTrac Pump Manager window *(Figure 4)* is the first window that opens in DataTrac. All windows are accessible from this main window.

Figure 4. SKC DataTrac Pump Manager Window

SKC DataTrac Pump Manager Menus

File Menu

Exit.....exits the program and returns to Windows

View Menu

Pump Scheduler .....opens the SKC Pump Scheduler window
STEL/Timed Run .....opens the STEL/Timed Run window
Sample Sheet.....opens the Sample Sheet Setup window
Report .....loads a report file previously saved to a PC
Pump History .....opens the SKC Pump History window
Archive History .....loads a history file previously saved to a PC
Calibration Info .....opens the Calibration Info window
Real Time Monitor ....opens the SKC Real Time Monitor window

Tools Menu

Set Date/Time.....opens the Set Date/Time for Pump window
Temperature and Pressure
Calibration.....opens Temperature and Barometric Calibration

Help Menu

About .....displays the PC and pump software version numbers, pump serial number, date of last full calibration, language, and information about downloading the latest version of DataTrac

On-line Manual .....displays latest DataTrac Software Operating Instructions (Form 40085) in PDF format. To download, go to www.skcinc.com/DataTracLeland.

SKC Real Time Monitor

The SKC Real Time Monitor window *(Figure 5)* directly controls the pump, allows calibration of flow rate, displays a real time readout of pump operations, and displays the connected pump's serial number.

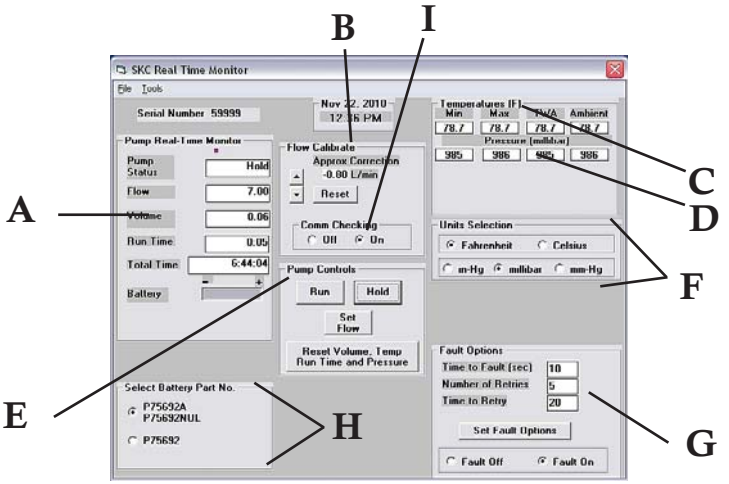


Figure 5. Real Time Monitor Window

A. *Real Time Monitor Display (page 9)*
B. *Flow Calibrate Buttons (page 10)*
C. *Temperature Display (page 12)*
D. *Pressure Display (page 13)*
E. *Pump Controls Buttons (page 13)*
F. *Units Selection Buttons (page 14)*
G. *Fault Options (page 14)*
H. *Battery Selection Buttons (page 10)*
I. *Comm Checking Buttons (page 11)*

Real Time Monitor Menus

File Menu

Exit..... returns to the previous screen

Tools Menu

Clear Schedule ..... clears the programmed pump schedule from the pump

Clear STEL/
Timed Run..... clears programmed timed run from the pump

Clear History..... clears the pump history

Pump Real Time Monitor Display

The Real Time Monitor display *(Figure 6)* shows the operating status of the connected pump.

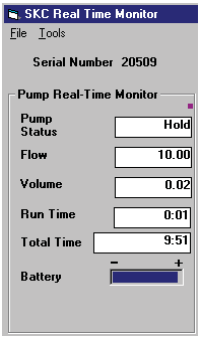


Figure 6. Pump Real Time Monitor Display

Pump Status

Cell Readout	Operating State of the Pump
Run	pump in run mode
Hold	pump in hold mode
Fault (Run)	pump in flow fault status while running
Fault (Hold)	pump in flow fault status and hold mode
Prog (Hold)	pump in hold mode while running a program
Prog (Run)	pump in flow mode while running a program
Prog (Sleep)	pump in sleep mode while running a program
Reset	run time data has been zeroed
Sleep	pump in sleep mode
User Setup	pump user interface accessed and user adjusting pump
Pre-Cal Flow	single-point calibration mode; first calibration average, date, and time
Post-Cal Flow	single-point calibration mode; final calibration average, date, and time
Timed Run	pump running a preset sampling time (ST)
Low Bat	battery depleted
Flow Adjust	pump flow rate or flow correction being adjusted by user

Flow Cell.....current pump flow rate in L/min
Volume Cell.....total volume of air pumped since reset
Run time Cell.....total run time of pump since reset
Total Time Cell...total run time of pump since factory calibration
Battery Cell.....graphically displays battery life. The battery life is indicated by a colored bar with low (-) charge indicated on the left side and full (+) charge indicated on the right side. A long colored bar (closer to the + end) represents a battery near a full charge. A short colored bar (closer to the - end) represents a battery near depletion.

Data in the Pump Real Time Monitor display cells is updated every 5 seconds.

Battery Selection Buttons

The Battery Selection Buttons *(Figure 7)* allow the user to select the battery that is installed in the sample pump. Check the label on the battery pack, and then click the button next to the appropriate battery Part No. Selecting the proper battery ensures that the pump indicates accurate battery status.

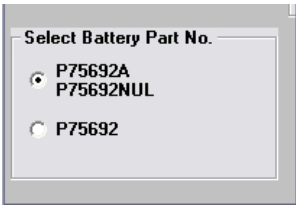


Figure 7. Battery Selection Buttons

Flow Calibrate Buttons

The Flow Calibrate buttons *(Figure 8)* are used to apply a correction to the pump flow rate during calibration to a primary standard

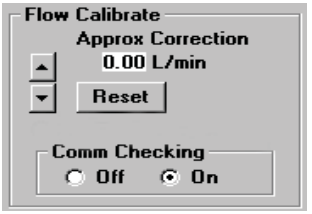


Figure 8. Flow Calibrate

Controls	Function
▲	increases correction of pump flow rate
▼	decreases correction of pump flow rate
Reset	zeroes the value in the Approx Correction cell
Comm Checking	turns the communication checking function on or off. This feature allows the user to unplug a pump and plug in another pump without causing a communication error.

Adjusting the Approximate Flow Correction

The Leland Legacy pump should be calibrated before each sample run.

1. Click the Reset button to reset the correction value to 0.00 L/min.

   Changing the pump flow setting will also reset the correction value to 0.00 L/min.

2. Turn on the pump and connect the inlet port of the pump to a primary standard calibrator. Read the flow displayed on the calibrator.

3. Click on the ▲ or ▼ buttons in the Flow Calibrate window until the calibrator displays the desired flow rate.

   When adjusting the correction, the flow rate displayed on the calibrator changes, the flow rate displayed on the pump does not change. The range of flow correction is ± 2.5 L/min.

4. Repeat calibration after sampling to verify flow.

Example: The desired flow rate is 10 L/min.

Set the pump to 10 L/min. If the calibrator displays 9.7 L/min, click the ▲ button in Flow Calibrate until the calibrator displays 10 L/min. If the calibrator displays 10.5 L/min, click the ▼ button in Flow Calibrate until the calibrator displays 10 L/min. Repeat calibration after sampling to verify flow.

Comm Checking Buttons

The Comm Checking buttons *(Figure 9)* turn the communication checking function on or off. Comm Checking monitors the interface cable connection between the PC and the pump. The default value is On. If the interface cable becomes detached, an error message displays *(Figure 10)*. Reconnect the pump and click on Retry. If the Off button is selected in Comm Checking, the pump's real time information will not be updated.

If programming more than one pump, turn Comm Checking off by clicking the Off button. Turning Comm Checking off when programming multiple pumps will eliminate the error message that displays each time the pump is disconnected.

Figure 9.
Comm Checking Button

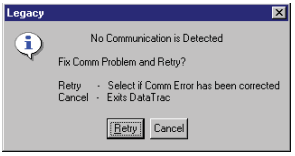


Figure 10.
Error Message

When Comm Checking is turned off, the pump will enter Sleep mode five minutes after the last interaction between the computer and the pump.

Temperature Display

The Temperature Display *(Figure 11)* shows the temperature of the air entering the connected pump.

Cell	Readout
Min	minimum air temperature during the program run
Max	maximum air temperature during the program run
TWA	time-weighted average (TWA) of all air temperatures
Ambient	current air temperature

Note: The Temperature Display is not ambient air temperature. It reflects the temperature of the air within the pump.

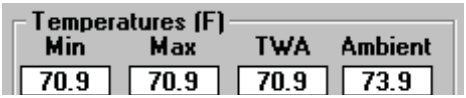


Figure 11. Temperature Display

The Min, Max, and TWA are calculated from the temperatures measured during the total run time of the pump. Unless reset, the temperature data will remain in memory and will be included in future Min, Max, and TWA calculations. Reset by clicking on the Reset Volume, Temp, Run Time, and Pressure button in the Pump Controls section of the Real Time Monitor (Figure 11A).

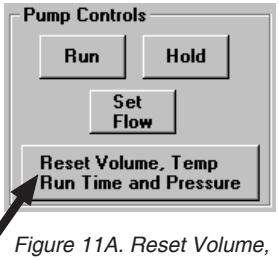


Figure 11A. Reset Volume, Temp, Run Time, and Pressure Button

Pressure Display

The Pressure Display *(Figure 12)* shows the atmospheric pressure of the air entering the connected pump.

Cell	Readout
Min	minimum atmospheric pressure during the program run
Max	maximum atmospheric pressure during the program run
TWA	time-weighted average of all atmospheric pressure
Ambient	current atmospheric pressure

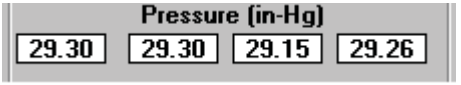


Figure 12. Pressure Display

The Min, Max, and TWA are calculated from the atmospheric pressure measured during the total run time of the pump. Unless reset, the pressure data will remain in memory and will be included in future Min, Max, and TWA calculations. Reset by clicking on the Reset Volume, Temp, Run Time, and Pressure button in the Pump Controls section of the Real Time Monitor (Figure 11A).

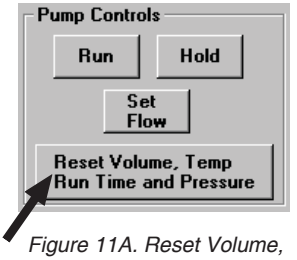


Figure 11A. Reset Volume, Temp, Run Time, and Pressure Button

Pump Controls Buttons

The Pump Controls buttons *(Figure 13)* directly control the connected pump.

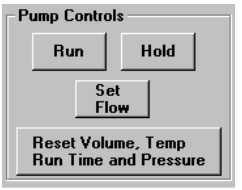


Figure 13. Pump Controls Buttons

Control	Function
Run	places the pump in RUN
Hold	places the pump in HOLD
Set Flow	opens the Monitor Set Flow window *(similar to Figure 25)*
Reset Volume, Temp, Run Time, and Pressure	clears the accumulated data: volume, temperature (Min, Max, and TWA), time, and pressure (Min, Max, and TWA)

Units Selection Buttons

The Units Selection buttons *(Figure 14)* allow the user to select the temperature and pressure units of the connected pump.

Control	Function
Fahrenheit	selects the Fahrenheit temperature scale
Celsius	selects the Celsius temperature scale
in-Hg	selects the atmospheric pressure display in units of inches of mercury
millibar	selects the atmospheric pressure display in units of millibar
mm-Hg	selects the atmospheric pressure display in units of millimeters of mercury

Fault Options

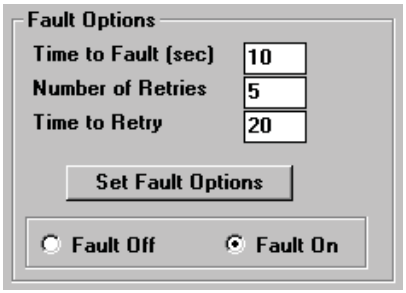


Figure 15. Fault Options

Figure 14. Units Selection Buttons

The Fault Options *(Figure 15)* allows the user to select the time the pump spends in flow fault mode and the number of times the pump attempts to restart.

Cell/Control	Readout/Function
Time to Fault (sec)	click on the box and enter a number from 5 to 30. This value is the number of seconds the pump spends in Flow mode before going into Flow Fault Hold mode.
Number of Retries	click on the box and enter a number from 0 to 25. This value is the number of times the pump attempts to restart once it goes into Flow Fault Hold mode.
Time to Retry (sec)	click on box and enter a number from 5 to 600. This value is the number of seconds between when the pump goes into Hold after a flow fault and when it restarts.
Set Fault Options	saves the chosen options
Fault On/Fault Off	enables/disables Fault mode. When set to "Fault Off," no flow fault will occur.

STEL/Timed Run

The STEL/Timed Run window *(Figure 16)* allows the user to set a pump run for a predetermined length of time, e.g., 15 minutes. Once the STEL/Timed Run is set, the user presses the ▲▼ keys on the pump simultaneously to start the run. After the timed run is completed, the pump will stop automatically.

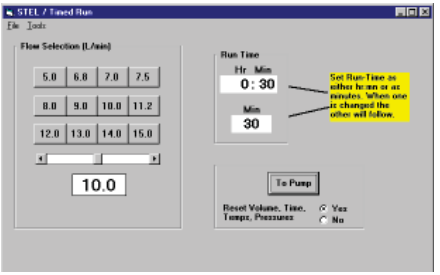


Figure 16. STEL/Timed Run Window

STEL/Timed Run Menus

File Menu

Exit.....exits the STEL/Timed Run window

Tools Menu

Clear STEL
in Pump .....cancels the programmed sampling time
Change Default
Flow Buttons .....displays a text box reminder on how to change the default flow rates displayed on the Flow Selection buttons in the STEL/Timed Run window

STEL/Timed Run Buttons

Control	Function
Flow Selection (L/min)	permits selection of pump flow rate
Run Time	permits pump run time to be set in hours and minutes
To Pump	sends settings to pump
Reset Volume, Run Time, Temps, Pressures	resets Min, Max, and TWA values in Real Time Monitor

To program a sampling time, use the flow selection buttons and scroll bar to select a flow rate. Enter the duration of the sample run by clicking on the Run Time box and entering the run time. The sampling time can be set up to 99,999 minutes.

Once the flow rate and sampling time have been set, click the To Pump button to program the connected pump.

SKC Pump Scheduler

The SKC Pump Scheduler window *(Figure 17)* is the DataTrac programming window. Programs can be created, sent to a pump, saved to a PC, loaded from a disc or a pump, and printed.

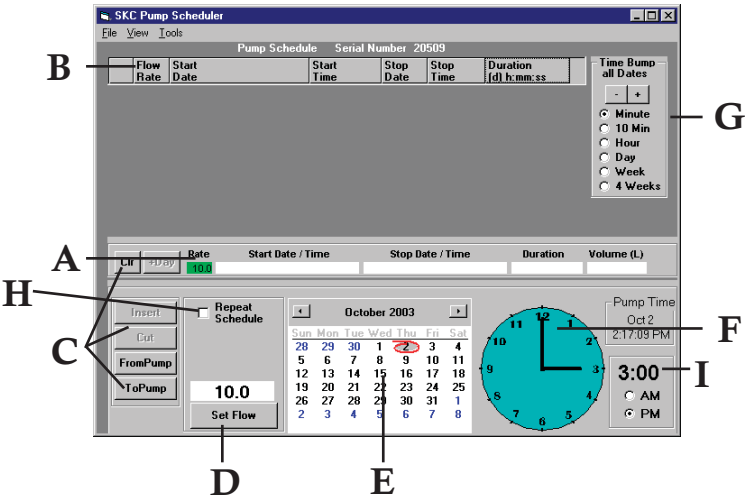


Figure 17. Pump Scheduler Window

A. *Program Edit Bar (page 17)*
B. *Pump Schedule (page 18)*
C. *Programming Buttons (pages 18-20)*
D. *Set Flow Button (page 20)*
E. *Calendar (page 21)*
F. *Clock (page 21)*
G. *Time Bump all Dates Buttons (page 22)*
H. *Repeat Schedule (page 26)*
I. *Digital Time Display (page 22)*

Pump Scheduler Menus

File Menu

Open.....opens a pump program previously stored on disc
Save .....saves a pump program to a PC
Print.....prints the pump program schedule displayed on the screen
Exit.....exits the Pump Scheduler window

View Menu

Cycle Scheduler .....opens Cycle Scheduler window
Preview Repeat Schedule .....opens Repeat Scheduler window
Scheduler Presets .....opens Scheduler Options window
Clock Resolution .....sets the clock resolution

Tools Menu

Clear Schedule .....clears the programmed pump schedule
Clear History.....clears the pump history
Compare Pump Clock/PC Clock.....opens the time display window and allows the pump and PC times to be synchronized *(see Figure 3)*
Comm Checking.....Enables/disables communication checking, indicated by ✓ on menu

Program Edit Bar

Figure 18. Program Edit Bar

The Program Edit Bar *(Figure 18)* is where the user sets up a pump program. A program is set up by entering the Flow Rate, Start Date/Time, Stop Date/Time, and Duration in the cells of the Program Edit Bar.

A pump program contains these sampling parameters:

Parameter	Value
Rate	flow rate in L/min
Start Date	start date of the program
Start Time	start time of the program
Stop Date	stop date of the program
Stop Time	stop time of the program
Duration	total run time of the program in days: hours: minutes: seconds ([d] h:mm:ss)

To program the above parameters into the cells of the Program Edit Bar, click on the Programming buttons *(see pages 18-20)* that select the value of the parameters, then click on the appropriate cell.

Pump Schedule

The Pump Schedule *(Figure 19)* contains pump programs (or pump schedules) set by the Program Edit Bar. The pump is programmed for a sampling operation by sending this list of programs to the pump's memory. The Pump Schedule is built by using the Programming buttons described in the next section. The maximum number of programs that can be contained in the Pump Schedule is 26.

Pump Schedule

	Flow Rate	Start Date	Start Time	Stop Date	Stop Time	Duration (d) h:mm:ss
1	9.0	Mon Nov 17 2003	8:00:00 AM	Nov 17	4:00:00	8:00:00
2	9.0	Tue Nov 18 2003	8:00:00 AM	Nov 18	4:00:00	8:00:00
3	9.0	Wed Nov 19 2003	8:00:00 AM	Nov 19	4:00:00	8:00:00
4	9.0	Thu Nov 20 2003	8:00:00 AM	Nov 20	4:00:00	8:00:00

Figure 19. Pump Schedule Containing Programs

Before entering a program into the Pump Schedule, go to the Scheduler Options window (Figure 35) to reset data and pump history.

Programming Buttons

The Programming buttons *(Figure 20)* select the program parameters, insert programs into the Pump Schedule, write programs to the pump, and read programs from the pump.

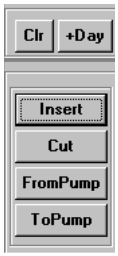


Figure 20. Programming Buttons

Button	Function
Clr	erases the program in the Program Edit Bar
+Day	adds one day to the program in the Program Edit Bar, which is useful for programming same start and stop times on consecutive days, or use Repeat Scheduler *(see page 26)*
Insert	places the program displayed in the Program Edit Bar into the Pump Schedule
Cut	clears the selected (highlighted) program in the Pump Schedule and places it into the Program Edit Bar where it can be edited
FromPump	reads the program stored in the pump and displays it in the Pump Schedule
ToPump	writes the program displayed in the Pump Schedule to the pump

Insert Button

To insert the completed program from the Program Edit Bar into the Pump Schedule *(Figure 19),* click on the Insert button *(Figure 20).* The Pump Schedule can hold 26 programs. However, if a large number of programs are to be stored, consider using the Cycle Scheduler *(see page 25)* or the Repeat Scheduler *(see page 26).*

Cut Button

To clear the selected (highlighted) program from the Pump Schedule and place it into the Program Edit Bar, click on the Cut button *(Figure 20).* A program can also be cut by double-clicking the program number or the line number to the left of the rate column of the Pump Schedule *(Figure 19).*

Clear the history either in the Scheduler Presets menu or in the Tools menu and set Scheduler Presets in the View menu before sending a program to the pump by clicking the ToPump button.

ToPump Button

To write the Pump Schedule to the pump, click the ToPump button *(Figure 20).* A dialog box will appear *(Figure 21).*

Click OK in the dialog box to send the program to the pump. A "Program Loaded" dialog box *(Figure 22)* will appear on screen to verify the operation.

An overwrite dialog box will appear if a program has already been sent to the pump. Click Yes if you wish to overwrite the program in the pump.

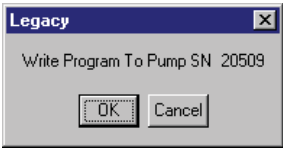


Figure 21. Confirmation Dialog Box

Writing a program to the pump will cause the PROG icon to appear on the pump LCD *(Figure 23),* which will remain active until all programs have run. The pump cannot be controlled manually until all programmed schedules have run.

Figure 22. Program Loaded Dialog Box

Edit a Program

To edit a program displayed in the Pump Schedule, double-click on it. This will remove it from the Pump Schedule and place it in the Program Edit Bar. Any program already in the Program Edit Bar will be erased. Click insert once the program is edited to move it back to the Pump Schedule.

Figure 23. Leland Legacy with Program

FromPump Button
To display a Pump Schedule from a previously programmed pump, click on the FromPump button *(Figure 20).*

Time Bump Buttons
To increase or decrease all program start and stop times in the Pump Schedule, click on the Time Bump buttons *(Figure 32).*

Save a Program (File Menu)
To save information from the Pump Schedule to a PC as a program file, select the Save command from the File menu.

The default extension ".pgm" is used to indicate Pump Schedule files.

Open Program (File Menu)
To open a previously stored program, select Open from the File menu.

Print Program (File Menu)
To print the Pump Schedule information displayed on the screen, select Print from the File menu.

Set Flow Button
The Set Flow button *(Figure 24)* opens the Scheduler Set Flow window *(Figure 25)* to allow the user to set the pump flow rate.

Figure 24. Set Flow Button

Scheduler Set Flow Window
The Scheduler Set Flow window *(Figure 25)* allows the user to select the pump flow rate using the numbered flow buttons and the scroll bar.

Select Flow Rate
To set the flow rate, click on the desired flow rate button. The new flow rate appears in the display cell.

Scroll Bar
To increase or decrease the displayed rate, use the scroll bar.

Enter Flow Rate
To enter the displayed flow rate into the Rate cell of the Program Edit Bar, click on OK.

Previous Button
To reset the displayed flow rate to the previously set pump flow rate, click on the Previous button in the Scheduler Set Flow window.

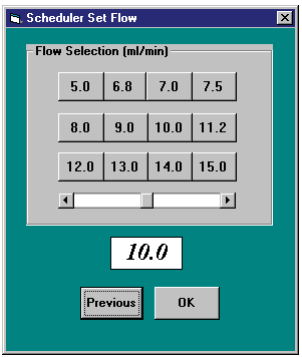


Figure 25. Scheduler Set Flow Window

Calendar

The Calendar *(Figure 26)* shows the time interval over which the pump can be programmed. Use the Calendar to select the start and stop dates for the scheduled sample run.

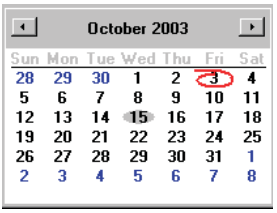


Figure 26. Calendar

Selecting a Date

To select a date, click on it then click on the Start Date/Time or Stop Date/Time cell in the Program Edit Bar to enter the date into that cell. Use the right and left arrows to select a different month.

Clock

The Clock *(Figure 27)* consists of a clock face, a digital display corresponding to the time on the clock face, AM and PM buttons, and the current date and time. The clock face perimeter is divided into 10, 15, and 30-minute and 1-hour intervals depending on the selected clock resolution *(Figure 28).*

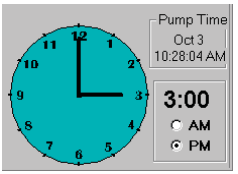


Figure 27. Clock

Clock Resolution

To change the Clock Resolution or time intervals to 10, 15, or 30 minutes or 1 hour, select the Clock Resolution command from the View menu *(Figure 28).* Clock Resolution can also be selected by clicking on the clock face perimeter between the digits.

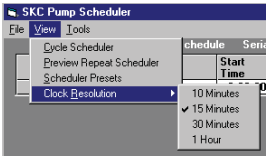


Figure 28. Clock Resolution

Selecting Time Using the Clock Face

To select the start or stop times, select the Clock Resolution *(Figure 28),* click on the clock face perimeter, the AM or PM button, and then click on the Start Date/Time or Stop Date/Time cell of the Program Edit Bar.

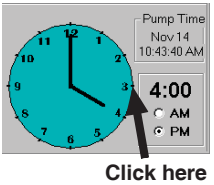


Figure 29. Select 4:15

Example: To set the time to 4:15 PM, *select "15 minutes" from the Clock Resolution menu (Figure 28), click on the clock perimeter at 4:15 (Figure 29), and click on the PM button.*

Selecting a Time Using the Digital Time Display

The Digital Time display *(Figure 30)* can also be used to select the time, especially outside the clock resolution settings. Double-click on the time display to highlight it *(Figure 31)*, then key in the desired time (including the colon). One or more numbers can be individually selected by clicking and dragging across the digit to be changed. Click on the appropriate time cell in the Program Edit Bar to enter the time into that cell.

Figure 30. Digital Time Display

Figure 31. Select Time Display

Time Bump all Dates Buttons

The Time Bump all Dates buttons *(Figure 32)* add or subtract the selected time interval to all program Start Time and Stop Time in the Pump Schedule.

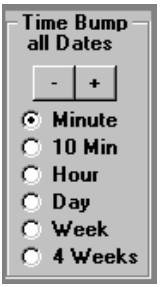


Figure 32. Time Bump all Dates Buttons

Time Interval

Click on the desired time interval.

Minus (-) Button

To subtract the selected time interval from all programming steps, click on the (-) button.

Plus (+) Button

To add the selected time interval to all programming steps, click on the (+) button.

Date/Time Display

To access the Date/Time Display window *(Figure 33)*, go to the Tools menu and select Compare Pump Clock/PC Clock. This feature allows the time and date of the PC and the connected pump to be synchronized.

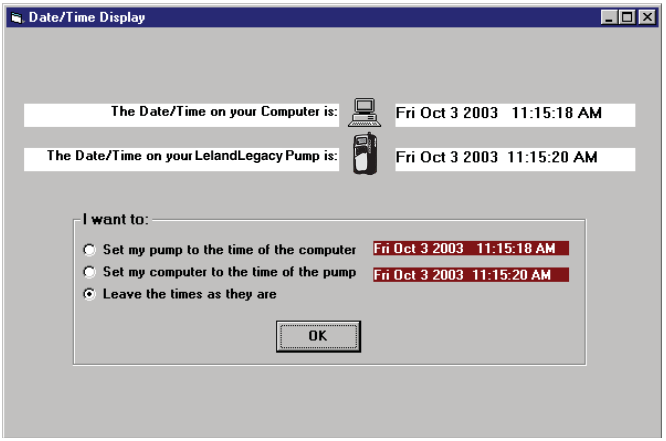


Figure 33. Date/Time Display Window

Resetting the pump time will issue a Clear History Message (Figure 34). The pump history must be cleared before the pump time can be reset.

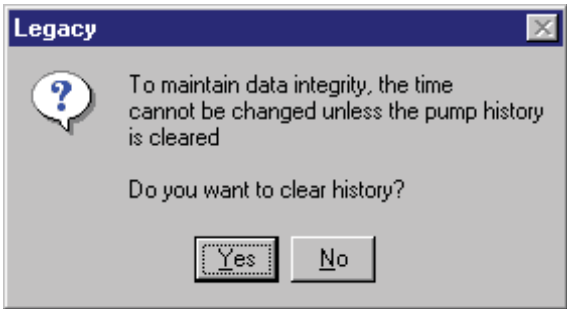


Figure 34. Clear History Message

Scheduler Options

To access the Scheduler Options window *(Figure 35)* in the SKC Pump Scheduler, go to the View menu and select Scheduler Presets. The Scheduler Options window includes User Lock Out, Clear History, and Reset Volume, Time, Temperatures, and Pressures. The Scheduler Options take effect when the Pump Schedule is sent to the pump's memory from the SKC Pump Scheduler window *(see page 16)*.

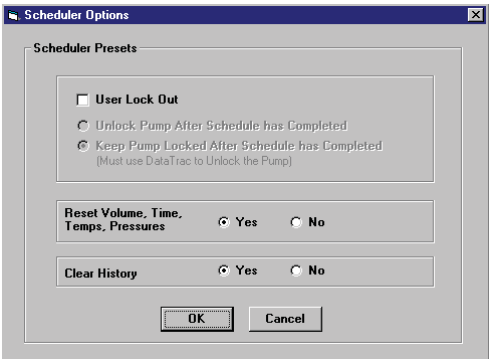


Figure 35. Scheduler Options

Button	Function
User Lock Out	click on the box to activate (a check mark will appear) or click again to remove check mark and deactivate; User Lock Out will prevent anyone from altering the pump operating parameters once a schedule has been sent to the pump. However, the operator will still be able to scroll through the data display. Select "Unlock Pump After Schedule has Completed" for automatic deactivation or choose "Keep Pump Locked..." for continued security (unlock in DataTrac).
Reset Volume, Time, Temps, Pressures	click on Yes to activate or No to deactivate; Yes will reset the accumulated volume pumped, time duration, minimum and maximum temperatures, and pressure data to zero (0).
Clear History	click on Yes to activate or No to deactivate

To set the values and return to the previous window, click the OK button.

All activated options will take effect when the ToPump button (Figure 20) is clicked. The ToPump button sends the information in the Pump Schedule (Figure 19) to the connected pump.

Cycle Scheduler

To access the Cycle Scheduler window *(Figure 36)* in the Pump Scheduler, go to the View menu and select Cycle Scheduler. The Cycle Scheduler window allows the user to program intermittent (repeated start/stop) sampling cycles that will run over several days in a minimal number of steps. *See pages 27-30 for an example schedule.*

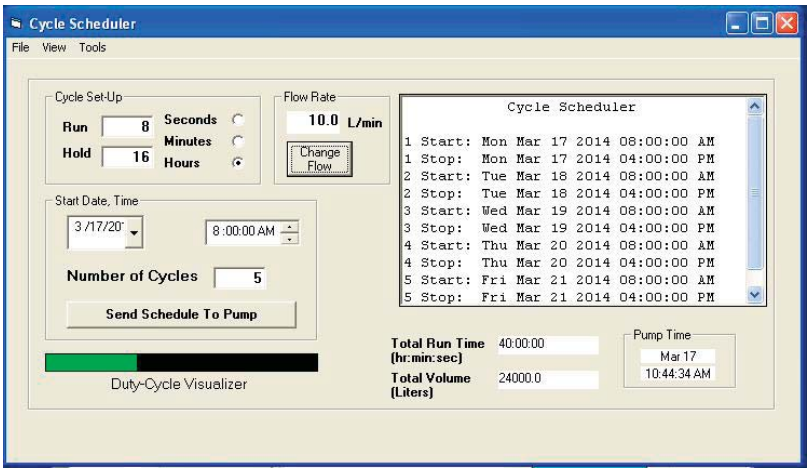


Figure 36. Cycle Scheduler

Cell/Button	Readout/Function
Cycle Setup Run Cell	enter time that each cycle is to run
Cycle Setup Hold Cell	enter time between each cycle
Seconds, Minutes, Hours Buttons	select time increment for Run and Hold
Flow Rate Cell	enter pump flow rate in L/min
Start Date, Time Cell	enter starting date and time of first cycle
Number of Cycles Cell	enter total number of cycles to run
Cycle-Scheduler Times	DataTrac automatically compiles the cycle schedule based on the user input and summarizes it in this cell. Total Run Time and Total Volume are also calculated and displayed
Duty-Cycle Visualizer	bar graph indicates how much of the time the pump will be running
Send Schedule to Pump Button	sends the cycle program to the attached pump

Repeat Scheduler

To activate the Repeat Scheduler *(Figure 37),* go to the Repeat Schedule cell in the Pump Scheduler window and click in the box until a check mark appears. Click on the desired time frame (daily or weekly) and enter the desired number of cycles in the Execute Count cell. Enter the desired flow rate in the Set Flow cell or click the Set Flow button. Click the ToPump button. Go to the View menu and select Preview Repeat Scheduler. A summary including total run time and volume will appear. The Repeat Scheduler allows the user to repeat a pump schedule over many weeks. The schedule can vary from day to day. *See pages 27-30 for an example schedule.*

There must be a Pump Schedule in place to take advantage of this feature.

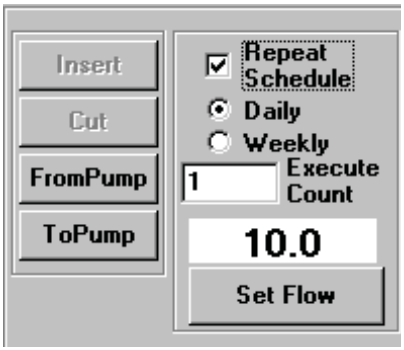


Figure 37. Repeat Scheduler

Cell/Button	Readout/Function
Repeat Schedule Cell	.....click to activate the Repeat Scheduler (check mark)
Daily/Weekly Buttons	.....click desired repeat interval
Execute Count Cell	.....enter number of intervals schedule is to repeat
Set Flow Cell and Button	....enter or select pump flow rate in L/min

Example Scheduler Program

This example program demonstrates step-by-step how to use the SKC Pump Scheduler window *(see page 16)* to set a program.

A sampling operation requires the Leland Legacy to sample at a constant flow of 10 L/min from 8:00 AM to 4:00 PM daily for one work week. Enter the parameters as follows.

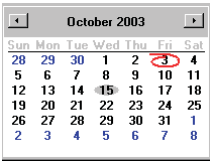
To Reset Volume, Time, Temperature, and Pump History

To set the flow rate:

Click on the Set Flow button. The Scheduler Set Flow window opens. Click on the 10.0 button then click on OK. "10.0" now appears in the Rate cell of the Program Edit Bar.

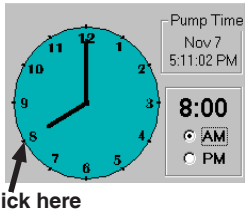
To set the start/stop date:

Click on any Monday in the Calendar (do not select a date already past). The date is now highlighted. Click on the Start Date/Time cell in the Program Edit Bar. The date now appears in the cell. Click on the Stop Date/Time cell to enter the same date into the Stop Date cell.



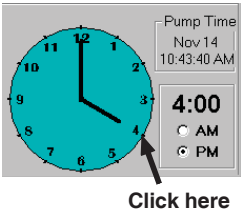
To set the start time:

Click on the Clock at 8. The clock hands will now point to 8:00 and it also appears in the digital display next to the Clock. Click on the AM button, then click on the Start Date Time cell of the Program Edit Bar; 8:00 AM now appears in the cell.



To set the stop time:

Click on the Clock at 4. The clock hands will now point at 4:00 and it also appears in the digital display next to the Clock. Click on the PM button, then click on the Stop Time cell of the Program Edit Bar; 4:00 PM now appears in the cell. The Duration cell now displays 8 hours, which is the length of the programmed operation.



Example Scheduler Program

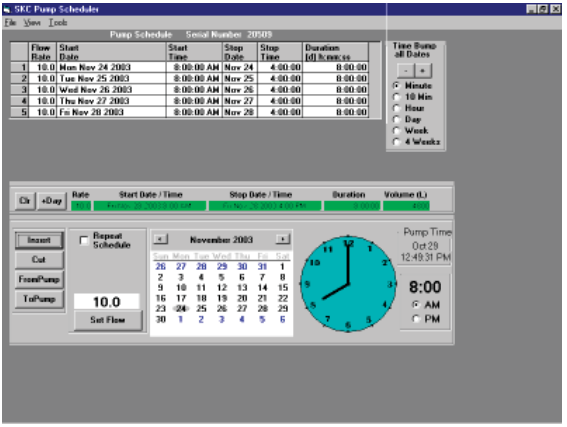
To insert the program into the Pump Scheduler:

Click on the Insert button. The program appears in the Pump Schedule. Note that the program is still displayed in the Program Edit Bar. The Pump Scheduler now has a program that tells the pump to run at a constant flow of 10 L/min from 8:00 AM to 4:00 PM on Monday. The same operating parameters must be entered for each day of the week.

To add extra days to the program schedule:

Click on the +Day button. This will add one day to the Start Date and Stop Date in the Program Edit Bar. Click on Insert to place the program into the Pump Scheduler.

Repeat the procedure to add an additional day to the Pump Scheduler until each day of the week has been entered.



Repeat Scheduler

If the user wishes to repeat the example schedule for the next 10 weeks, the Repeat Scheduler could be used to save entry time *(refer to Figure 37).*

1. In the Pump Scheduler, set up a regular program *(see pages 16-24).*

2. At the bottom of the window, click on the Repeat Schedule box (a check mark should appear).

3. Click on the Weekly button.

4. Click in the Execute Count box and enter the number 10.

5. Click on the ToPump button to send the program to the pump.

Cycle Scheduler

To set up the same scenario in the Cycle Scheduler, follow this procedure *(refer to Figure 36):*

1. In the SKC Pump Scheduler, go to the View menu. Select Cycle Scheduler.

2. Go to the Start Date, Time section and select the start date of Mar 17. Click in the Time box. Use the ▲▼ keys to select 8:00 AM or highlight the digit to be changed, and type in the desired number.

3. Move to the Number of Cycles box, highlight the current entry, and type in 5.

4. Go to the Cycle Setup section. Click in the Run box and highlight the current entry. Type in 8. Click in the Hold box, highlight the current entry, and type in 16 (time between runs). Choose hours as the unit of time.

5. Go to the Flow Rate section and click on the Change Flow button. Select a flow rate of 10 L/min and click OK.

6. Verify that the schedule is correct by reviewing the Cycle-Scheduler Times window. The horizontal Duty-Cycle Visualizer bar graph at the bottom of the window can be used as a visual cue as to how much of the time the pump will be running.

7. Once the schedule is verified, click on the Send Schedule to Pump button.

Example Scheduler Program

To set the desired Scheduler Options:
Select Scheduler Presets from the View menu and click on the desired Scheduler Options *(see page 24)*.

To write the program to the Pump:
Click on the ToPump button. DataTrac will now write all steps contained in the Pump Schedule to the pump.

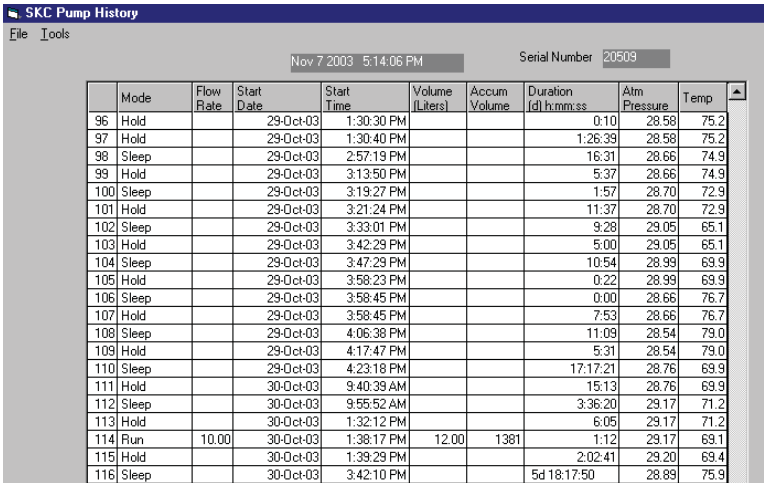
To save a pump program to a PC:
Select the Save command from the File menu. The program displayed in the Pump Schedule will be saved as a program file (.pgm). Programs can be saved for future use or editing.

To print the pump program:
Select the Print command from the File menu; this prints the contents of the Pump Schedule.

To erase the contents of the Pump Schedule:
Select Clear Schedule from the Tools menu; this will erase the contents of the Pump Schedule displayed on screen and in the connected pump's memory.

SKC Pump History

The SKC Pump History window *(Figure 38)* displays a record of all operations the pump has performed. Approximately 300 histories can be stored in the pump's memory. This window can also be saved to a PC or printed.



	Mode	Flow Rate	Start Date	Start Time	Volume (Liters)	Accum Volume	Duration (d) h:mm:ss	Atm Pressure	Temp
96	Hold		29-Oct-03	1:30:30 PM			0:10	28.58	75.2
97	Hold		29-Oct-03	1:30:40 PM			1:26:39	28.58	75.2
98	Sleep		29-Oct-03	2:57:19 PM			16:31	28.66	74.9
99	Hold		29-Oct-03	3:13:50 PM			5:37	28.66	74.9
100	Sleep		29-Oct-03	3:19:27 PM			1:57	28.70	72.9
101	Hold		29-Oct-03	3:21:24 PM			11:37	28.70	72.9
102	Sleep		29-Oct-03	3:33:01 PM			9:28	29.05	65.1
103	Hold		29-Oct-03	3:42:29 PM			5:00	29.05	65.1
104	Sleep		29-Oct-03	3:47:29 PM			10:54	28.99	69.9
105	Hold		29-Oct-03	3:58:23 PM			0:22	28.99	69.9
106	Sleep		29-Oct-03	3:58:45 PM			0:00	28.66	76.7
107	Hold		29-Oct-03	3:58:45 PM			7:53	28.66	76.7
108	Sleep		29-Oct-03	4:06:38 PM			11:09	28.54	79.0
109	Hold		29-Oct-03	4:17:47 PM			5:31	28.54	79.0
110	Sleep		29-Oct-03	4:23:18 PM			17:17:21	28.76	69.9
111	Hold		30-Oct-03	9:40:39 AM			15:13	28.76	69.9
112	Sleep		30-Oct-03	9:55:52 AM			3:36:20	29.17	71.2
113	Hold		30-Oct-03	1:32:12 PM			6:05	29.17	71.2
114	Run	10.00	30-Oct-03	1:38:17 PM	12.00	1381	1:12	29.17	69.1
115	Hold		30-Oct-03	1:39:29 PM			2:02:41	29.20	69.4
116	Sleep		30-Oct-03	3:42:10 PM			5d 18:17:50	28.89	75.9

Figure 38. SKC Pump History Window

SKC Pump History Menus

File Menu

Print History .....prints the current history

Save History.....saves a history file to a PC. Can be viewed using Archive History *(see page 34)*

Save as Comma-separated Text.....saves history file as a text file (.txt)

Exit .....exits the SKC Pump History window and returns to the previous screen

Tools Menu

Clear History.....clears the pump history displayed on screen and in pump memory

Options .....provides history display and sample interval options

Reload History.....reloads existing history

SKC Pump History

Clear Pump History
To clear the pump history, select Clear History from the Tools menu.

Change Options*
To change display and sample interval pump history options, select Options from the Tools menu.

** Changes to these parameters will also be reflected on the pump LCD.*

Reload History
To reload existing pump history, select Reload History from the Tools menu.

Print Pump History
To print the pump history file displayed on screen, select Print from the File menu *(see page 31).*

Save Pump History
To save a pump history to a PC, select Save from the File menu. The pump history is saved to a PC as a history file (.hst).

Save Pump History as Comma-separated Text
To save a history file as a text file (.txt), select Save as Comma-separated Text from the File menu.

Pump History Display
Data displayed in the Pump History window *(Figure 38)* shows the record or history of all operations performed by the pump. A history will remain on screen and in pump memory until it is cleared. If more than 300 history operations have occurred since history was cleared, they will roll over in memory so that the 300 most recent operations will be displayed. A history includes the following data:

Pump Status Mode

Readout	*Operating State of the Pump*
Run	pump in run mode
Hold	pump in hold mode
Fault (Run)	pump in flow fault status while running
Fault (Hold)	pump in flow fault status and hold mode
Prog (Hold)	pump in hold mode while running a program
Prog (Run)	pump in flow mode while running a program
Prog (Sleep)	pump in sleep mode while running a program
Reset	run time data has been zeroed
Sleep	pump in sleep mode

User Setup .....pump user interface accessed and user adjusting pump
Pre-Cal Flow .....single-point calibration mode; first calibration average, date, and time
Post-Cal Flow.....single-point calibration mode; final calibration average, date, and time
Timed Run.....pump running a preset sampling time (ST)
Low Bat.....battery depleted
FullCal.....full (multiple-point) calibration mode
Flow Adjust.....pump flow rate or flow correction being adjusted by user
Flow.....flow rate in L/min
Start Date.....start date of the program
Start Time .....start time of the program
Volume (Liters)....flow rate multiplied by the duration
Accum. Volume...sum of all previous volumes (Liters) on the history page
Duration .....total running time of the program

Archive History

The Archive History window loads and displays a pump history file that was saved to a PC. This window is empty until a history file is opened.

Archive History Menus

File Menu

Open.....opens a saved history file
Print.....prints the displayed history file
Exit.....returns to the previous window

Open a History

To open a history file, select Open from the File menu. Browse to and select the desired ".hst" file.

Print a History File

To print a history file, select Print from the File menu.

Reports

DataTrac allows reports or worker exposure profiles to be printed or saved as text and imported into word processing software or a text editor. These files combine the setup data (information denoting sampling media, methods, location, etc.) from the Sample Sheet Setup window *(Figure 39)* and a pump history *(Figure 38).*

File menu

Open.....opens a saved report file
Save as Text .....saves report as text (.txt) that any word processor or text editor can read
Print.....prints the displayed worker exposure profile
Exit.....exits the worker exposure profile

Sample Sheet Setup

The Sample Sheet Setup window *(Figure 39)* saves setup data pertaining to the sample run. All data displayed on the screen can be printed or saved as a setup file (.stp), or user-selected data can be saved as a template file (.tpl).

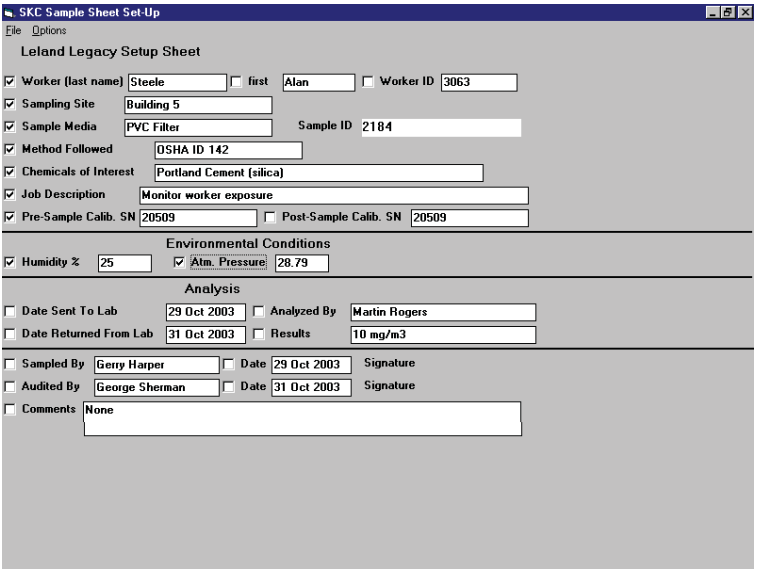


Figure 39. Sample Sheet Setup Window

Sample Setup Menus

File menu

New .....clears all data cells in the Sample Sheet Setup window
Load Setup .....loads a setup file
Save Setup .....saves a setup file

Load Template.....loads a template file
Save Template.....saves a template file
Print.....prints the current sample sheet data displayed on screen
Exit.....exits the Sample Sheet Setup window and returns to the previous window

Option Menu

Merge Pump .....writes the pump history from the connected pump memory to the displayed sample sheet setup and creates a worker exposure profile
Merge File.....writes the pump history from a previously stored history file to the displayed sample sheet setup, and creates a worker exposure profile
Clear Sample Sheet.....clears all entered data from cells

Setup Files

The Sample Sheet Setup window *(Figure 39)* contains a list of information (in data cells) that will be printed in a report. The displayed sample sheet setup can be saved to a PC as a setup file (.stp). A setup file consists of all the information contained in all data cells.

Enter Data into Sample Sheet

To enter the information into the data cells, click on the cell then type the data using a keyboard. The Tab key can be used to move from one cell to the next.

Save Setup

To save all entered data, select the Save Setup command from the File menu. The Save Setup command saves all data as a setup file (.stp).

Template Files

The displayed sample sheet setup can also be saved to a PC as a template file (.tpl). A template file reduces the need to repeatedly type data that rarely changes. A template file contains only the information included in the data cells that have an active check box (the small square button before the data cell as shown in *Figure 40*). To activate a check box, click on it until a check mark appears.

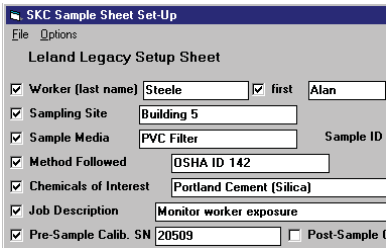


Figure 40. Close-up of the Sample Sheet Setup Window Showing Active Check Boxes

Save Template

To save only the information contained in data cells with active check boxes, select Save Template from the File menu. The Save Template command saves the checked data as a template file (.tpl).

Print

To print the displayed sample setup or template, select Print from the File menu.

Worker Exposure Profile

A worker exposure profile contains a sample sheet setup file and a pump history. A worker exposure profile can be created using the connected pump's history or a history file (.hst) saved to a PC.

Worker Exposure Profile created with Pump History

To create a worker exposure profile containing the sample sheet displayed on screen and the history of the connected pump, select Merge Pump from the Options menu of the sample sheet. The worker exposure profile will be saved to a PC as an ".rpt" file and will also appear on screen.

Worker Exposure Profile created with History File

To create a worker exposure profile containing the sample sheet displayed on screen and a history file saved to a PC, select Merge File from the Options menu. The worker exposure profile will be saved to a PC as an ".rpt" file and will appear on screen.

Print Worker Exposure Profile

To print the worker exposure profile displayed on screen, select Print from the File menu.

CalChek Full Calibration Data Display and Verification

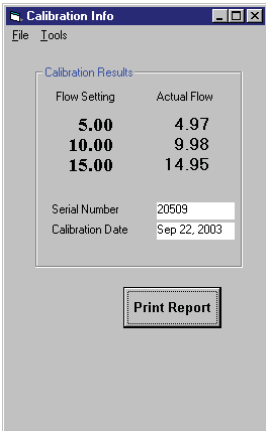


Figure 41.
Calibration Info Window

Viewing CalChek Full Calibration Data

Caution: *Full calibration completely clears DataTrac, run time parameters, and the Pump Schedule.*

Full calibration data can be viewed and printed by going to the DataTrac Pump Manager window and clicking on the View menu. Choose Calibration Info *(Figure 41).* This window will display calibration results, pump serial number, and date of the last full calibration.

Calibration Info Window

The Calibration Info window displays the results of a full calibration after using CalChek, allows data to be printed, and provides a means of validating printed data.

File Menu

Print.....prints the current calibration data
Exit.....exits the Calibration Info window and returns to the Pump Manager window

Tools Menu

Confirm Validation
Code .....allows the user to enter calibration data from a printed report to determine if printed information has been tampered with

Validating CalChek Full Calibration Data

To confirm printed calibration data, open the DataTrac Pump Manager window and click on the View menu. Choose Calibration Info *(Figure 41).* Click the Print Report button. Go to the Tools menu and choose Confirm Validation Code *(Figure 42).* Enter the calibration date shown on the printed report, enter each actual flow, and then enter the validation code. Click on the Check Validation Code button. The box to the right of the button will display red and "invalid" if the data has been entered incorrectly or tampered with. A green bar with the word "valid" will display if data entered is valid.

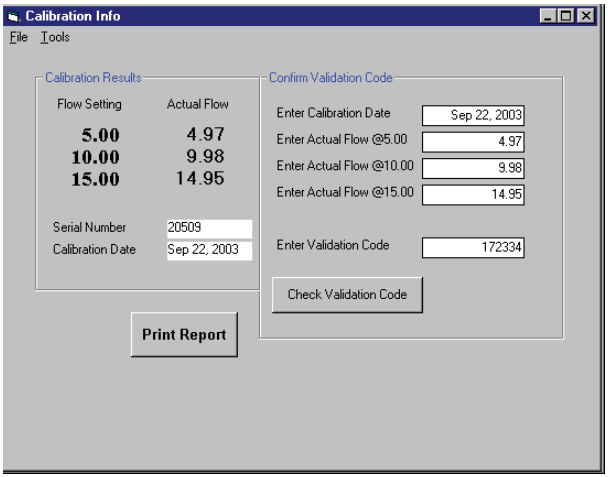


Figure 42.
Calibration Info Window with Confirm Validation Code

Clearing the history will not clear full calibration data. This data can only be cleared by performing another full calibration.

When entering data to confirm the validation number, enter the date in the following format: mmm dd, yyyy (e.g., Aug 18, 2010).

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