6712 Sampler

This pocket guide is not intended to replace the instruction manual. Read the instruction manual thoroughly before operating the sampler.

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6712 Sampler

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6712 Sampler

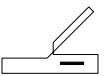
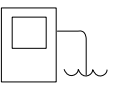
Section 1 Programming

Before programming the 6712, you should become familiar with its keys and how to use the programming screens. A description of the keys appears in Table 1-1.

Table 1-1 Keypad and Connector Icons

Icon	Function
On-Off 	Turns sampler on or off.
Stop 	Stops the pump, distributor, or a running program. In programming screens, returns to a previous screen.
Enter 	Accepts a menu choice or number entry and goes to next screen.
Help 	In programming screens, displays a brief help message.

Table 1-1 Keypad and Connector Icons	
Icon	**Function**
Down-Right 	Selects the menu option right or below the current choice.
Up-Left 	Selects the menu option left or above the current choice.
Numbers 	Types a number.
Decimal Point 	Types a decimal point.
Pump Reverse 	Press when at main menu to run pump.
Pump Forward 	Press when at main menu to run pump.
Power 	12 volt power source

Table 1-1 Keypad and Connector Icons	
Icon	**Function**
Rain Gauge 	674 Rain Gauge SDI-12 Sondes Programmable Pins (Pins C, H, and I)
Interrogator 	581 RTD IBM PC or compatible computer running FLOWLINK or SAMPLINK.
Flow Meter 	4200 Series Flow Meters 4100 Series Flow Logger 1640 Liquid Level Actuator 2100 Series Flow Modules Non-Isco flow meters

1.1 Getting Started

Turn the sampler on by pressing the On/Off key. It is labeled with this icon: ⏻. The start up screen appears first.

```
6712 SAMPLER
STANDARD PROGRAMMING
For HELP at any
SCREEN PRESS ? KEY.
```

It remains on the display for about 8 seconds or until you press a key. The main menu screen appears next.

```
RUN
PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

1.2 Using Menus and Entering Numbers

A menu is a list of options. The main menu has four options:

- Run
- View Report
- Program
- Other Functions

1.2.1 Selecting Menu Options

In menu screens, one menu option always blinks.

- Press ↵ (Enter) when the blinking option is the one you want; it will accept your choice and go to the next screen.

  The Enter key always accepts the blinking option.

- Select a different option by pressing an arrow key until the option you want blinks. Then press Enter.

1.2.2 Entering Numbers

Press the number keys to type the number. Then, press Enter. As soon as you press Enter, the sampler saves your number and moves to the next screen. In some screens, you can use the . (Decimal Point) key in a number.

Some screens display the range of acceptable numbers between parentheses. If you enter a number that is too low or high, the controller

beeps and erases the entry. Type a new number and continue.

Example 1-1 Programming

One Sample every 15 Minutes, One Sample in Each Bottle Using Normal Programming Style, no module attached.

1.

```
6712 SAMPLER
STANDARD PROGRAMMING
For HELP at any
SCREEN PRESS ? KEY.
```

This screen disappears on its own after 8 seconds.

2.

```
RUN
PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

The option PROGRAM will be blinking. Press Enter.

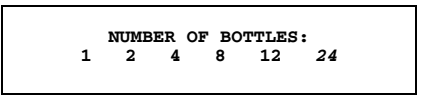
3.

```
SITE DESCRIPTION:
"FACTORY "
CHANGE?
YES NO
```

The option NO will be blinking. Press Enter.

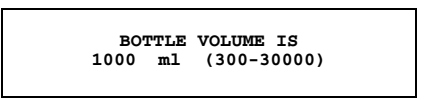
Example 1-1 Programming (Continued)

4.



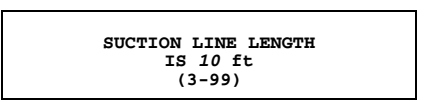
Select 24. Press Enter.

5.



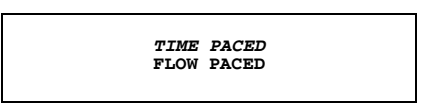
Type the volume for the bottles in your kit. For this example, 1000 is correct, so simply press Enter.

6.



Type the length of the suction line, then press Enter.

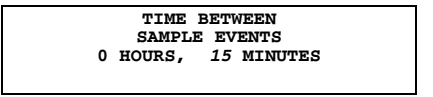
7.



Select TIME PACED by pressing an arrow until the option TIME PACED blinks. Then, press Enter.

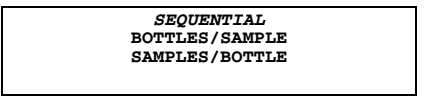
Example 1-1 Programming (Continued)

8.



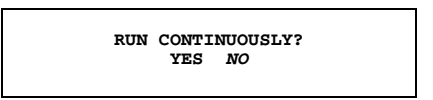
Type 0 for hours and press ↵ (Enter). Type 15 for minutes and press Enter.

9.



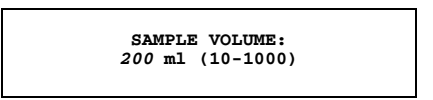
Select SEQUENTIAL by pressing an arrow until the option SEQUENTIAL blinks. Then, press Enter.

10.



Select NO. Press Enter after making your choice.

11.



Type the volume of the sample you want deposited in each bottle. Then, press Enter.

Example 1-1 Programming (Continued)

12.

```
NO DELAY TO START
 DELAYED START
 CLOCK TIME
```

Select DELAYED START by pressing an arrow until the option blinks. Then, press Enter.

13.

```
FIRST SAMPLE
   AFTER A
5  MINUTE DELAY
   (1-999)
```

Type the delay period you want between the time you run the program and the time the sampler takes the first sample. Then, press Enter.

14.

```
PROGRAMMING COMPLETE
RUN THIS PROGRAM
     NOW?
  YES   NO
```

Select NO. Press Enter after making your choice.

15.

```
   RUN
 PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

Run the program by selecting RUN and pressing Enter.

1.2.3 Clock and Calendar Entry Screens

When setting the clock and calendar, use a 24 hour clock for times and the day-month-year format for dates.

- To move without changing the setting, press the arrow keys.
- Change the setting by typing a new number. Press Enter to accept the new setting.

For example, to enter 2:00 p.m. (2:00 p.m. is 14:00 on a 24-hour clock), type 14. Press Enter. Type 0 (zero) for the minutes, and press ↵ (Enter). To enter a date, such as January 22, 2001, type: 22 ↵ 01 ↵ 01 ↵ .

Example 1-2 Setting the Clock and Calendar

1.

```
RUN
PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

Select OTHER FUNCTIONS.

2.

```
MAINTENANCE
MANUAL FUNCTIONS
MODULE
```

Select MAINTENANCE.

3.

```
SET CLOCK
PUMP TUBE ALARM
INTERNAL BATTERY
DIAGNOSTICS
```

Select SET CLOCK.

4.

```
ENTER TIME AND DATE:
 HH:MM    DD-MON-YY
 14:00    22-JAN-01
```

Enter the time and date.

5.

```
SET CLOCK
PUMP TUBE A.LARM
INTERNAL BATTERY
DIAGNOSTICS
```

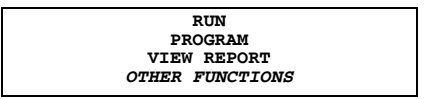
Press Stop to return to the main menu.

1.3 Quick View Screens

Quick view screens are a special type of menu screen. They show the current program settings and let you move quickly through the program. You must change the programming style to QUICK VIEW/CHANGE to see the quick view screens.

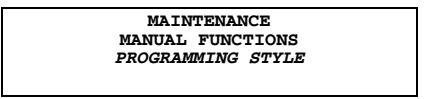
Example 1-3 Changing the Programming Style

1.



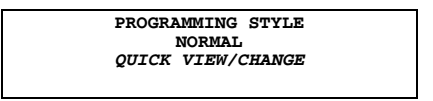
Select OTHER FUNCTIONS.

2.



Select PROGRAMMING STYLE.

3.



Select QUICK VIEW/CHANGE.

1.3.1 Paging Through the Quick View Screens

The arrows in the corners of each quick view screen are menu options that let you move from one quick view screen to another.

- Select the reverse arrow to go to the previous screen.
- Select the forward arrow to go to the next screen.
- Press Stop to return to the main menu.

1.3.2 Changing Settings in a Quick View Screen

Although the quick view screens offer you a quick way to see the program settings, they also provide you with a way to change settings. Using quick view screens to change settings is sometimes a faster way to change a program because you can go quickly to the setting or settings that needs updating.

To change the program settings in a quick view screen, press an arrow until the setting blinks. Press Enter. The 6712 then displays the screen used to change the setting.

When you change a setting, the sampler stores the new settings and returns to the updated quick view screen.

1.4 Help Notes

To see a help note:

1. Press the Help key.
2. When the note requires several screens, the word “more” appears in the lower right corner. Press Enter for the next note.
3. Move back and forth between screens by pressing the arrow keys.
4. Press Stop at any time to return to the programming screen.

Screens that are self explanatory or that require extensive explanation have notes that contain only references to the manual.

1.5 Warning Messages

Warning messages appear when the sampler determines something is out of the ordinary. For example, screen *b* appears when you type a number in screen *a* that is larger than the standard bottle volume.

a

```
BOTTLE VOLUME IS
3500 ml   (300-30000)
```

b

```
WARNING!
STANDARD BOTTLE
VOLUME EXCEEDED!
```

The 6712 *does* accept nonstandard volumes. For a list of recommended volumes, press the Help key at screen *b* or refer to the manual.

The 6712 uses the bottle and sample volume settings to determine the maximum number of samples that can be deposited without overfilling the bottles. Entering a volume that exceeds the standard volume may cause the sampler to overfill the bottle.

1.6 Changing to and from Extended and Standard Screens

At the main menu, type “6712.2” to show the Extended Programming screens.

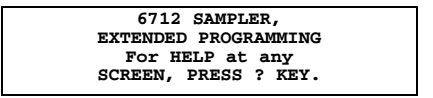
At the main menu type 6712.1 to show the Standard Programming screens.

1.7 Storage For Extended Programs

The sampler stores five sampling programs: one standard and four extended. Program storage eliminates the need to reprogram the sampler with frequently used settings.

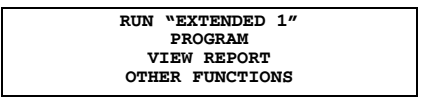
Example 1-4 Selecting a Stored Extended Program

1.



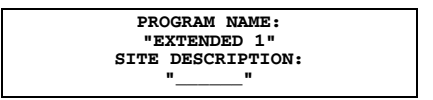
If “STANDARD PROGRAMMING” appears on the second line of the start up message, type **6712.2** at the main menu.

2.



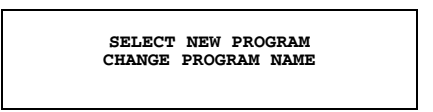
Select PROGRAM from the main menu.

3.



Select PROGRAM NAME: “EXTENDED 1" from the quick view menu.

4.



Select SELECT NEW PROGRAM to change the program.

Example 1-4 Selecting a Stored Extended Program (Continued)

5.

```
"EXTENDED 1"
"EXTENDED 2"
"EXTENDED 3"
"EXTENDED 4"
```

Select the name of the extended program you want to use.

•
•
•

6.

```
PROGRAMMING COMPLETE
RUN THIS PROGRAM
NOW?
YES  NO
```

Select NO.

```
RUN "EXTENDED 2"
PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

1.8 Programming the Modules

The module programming screens contain a branch of setup screens that let you specify the units of measure and the data storage interval.

Some module setup screens are available to you even when no module or rain gauge is attached to the sampler. When you attach a 700 Series Module to the sampler, the sampler adds an additional set of screens needed to program the

module. Menu charts for the modules appear in the manuals shipped with each module. For more information about programming modules, refer to the manual provided with the module.

1.9 Programming SDI-12 Sondes

The sampler's extended programming screens can be modified for optional SDI-12 Sondes. To use or record the SDI-12 parameters, you must first configure the sampler.

Once configured, the sampler adds the selected SDI-12 Sonde parameters to the Sampler Enable screens. The sampler will also automatically record the selected sonde parameter data at the programmed data storage interval.

1.9.1 Stored Programs

You can store any sampling program, even those that include settings for modules. The module's screens appear only when the module is attached to the sampler. When using a module, make sure that it is attached before turning the sampler on.

Stored programs also save the sampler enable conditions using rain gauge data or SDI-12 parameters. These program settings remain as long as you do not change the type of module, or change the rain gauge or SDI-12 Hardware setup. If you make any of these changes, the sampler updates the stored programs to the current sampler configuration.

If you select a new program, the sampler will ask “PROGRAM CHANGE -- STORED DATA WILL BE LOST! ARE YOU SURE? YES NO.”

- Select YES to select the program. The sampler will erase *all* stored data relating to rain and module partitions.
- Select NO when you do not want to lose the data. The sampler will not load in the new program.

1.10 Programming Examples

Example 1-5 Standard Program

Flow Paced Sampling, Two Bottles per Sample, Normal Programming Style.

Program type: Standard.

Site description: SITE 29.

Bottle kit: 24, 1000 milliliter bottles.

Suction-line length: 7 feet.

Pacing: Flow pacing, two pulses.

Distribution: 2 bottles per sample.

Sample volume: 250 milliliters.

Start time: Clock time, 6:00 a.m. on Monday, Wednesday, Friday.

Module: No module installed.

1.

```
6712 SAMPLER
STANDARD PROGRAMMING
For HELP at any
SCREEN PRESS ? KEY.
```

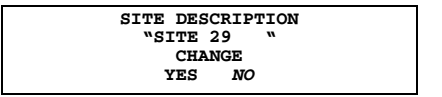
2.

```
RUN
PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

Select PROGRAM.

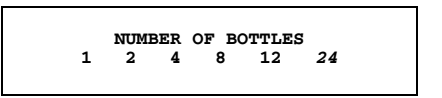
Example 1-5 Standard Program (Continued)

3.



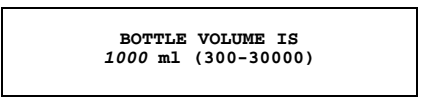
Select NO.

4.



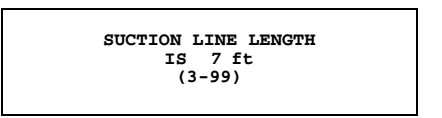
Select 24.

5.



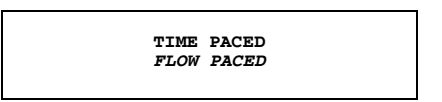
Enter 1000.

6.



Enter 7.

7.



Select FLOW PACED.

Example 1-5 Standard Program (Continued)

8.

```
FLOW BETWEEN
SAMPLE EVENTS:
2 PULSES (1-9999)
```

Enter the number of pulses between sample events.

9.

```
SEQUENTIAL
BOTTLES/SAMPLE
SAMPLES/BOTTLE
```

Select BOTTLES/SAMPLE.

10.

```
2 BOTTLES PER
SAMPLE EVENT (1-24)
```

Enter 2.

11.

```
RUN CONTINUOUSLY?
YES  NO
```

Select NO.

12.

```
SAMPLE VOLUME:
250  ml  (10-1000)
```

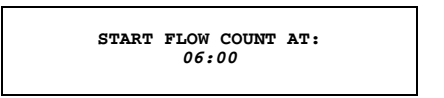
Enter 250.

Example 1-5 Standard Program (Continued)

13.

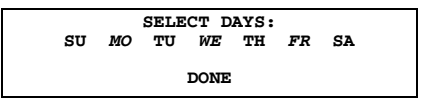
Select CLOCK TIME.

14.



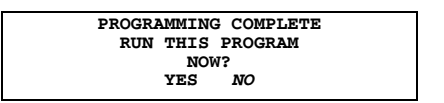
Enter 0, then enter 6. This is the time at which the sampler will start the pacing countdown.

15.



Use arrow keys and Enter to elect MO, WE, and FR. When the correct days are blinking, select done and press Enter.

16.



Select NO.

Section 2 Operation

2.1 Installation and Operation Checklist

1. Prepare the sampler.
   a. Adjust the distributor arm to fit the bottle kit. Then install the distributor arm and discharge tube. For portable composite sampling, use the composite tube guide instead of the arm. For refrigerated single bottle sampling, remove the distributor arm.
   b. Install the bottle kit.
   c. Install the power source. If using a power pack, use only the newer model High Capacity Power Packs. See details in the 6712 manual.
   d. Check the pump tube. Replace it if necessary and reset the Pump Tube Warning. Use only 6712 pump tubing, identified by the blue alignment collars.
   e. Attach the suction line to the pump tube.
   f. Attach a strainer to the suction line if necessary.
2. Install the sampler at the monitoring site.

a. Ice the tub, if desired.

b. Install the strainer or end of the suction line in the flow stream and route the suction line to the sampler.

c. Install a module, if desired. Refer to the module manual for instructions for installing the module.

d. Place the sampler in position.

e. Connect any necessary external instruments to the sampler.

3. Program the sampler.

   Programming guidelines are in Section 1 of the pocket guide and in more detail in the 6712 manual. Guidelines for programming the module are in each module manual.

4. Run the sampling program.

5. Service the sampler.

   a. Recover the sampler.

   b. Collect the sample bottles.

   c. Replace the battery if required.

   d. Collect the sampling data.

   e. Replace the sample bottles.

   f. Run the sampling program.

2.2 Installing Distributor Arm

All 6712 Samplers use the same adjustable distributor arm. The two-piece arm is marked with positions A, B, C, and D. Table 2-1 shows the arm positions and the discharge tube

lengths for each bottle kit. Adjust the distributor arm. Thread the discharge tube through the arm so the tube protrudes 1/16 to 1/8 inch. Slide the arm onto the distributor shaft and secure it with the black plastic nut.

When using the refrigerator make sure the correct distributor shaft extension is installed. The extension must be installed on the controller before the controller is mounted on the refrigerator.

Table 2-1 Distributor Arm Positions and Discharge Tube Lengths

Configuration	Bottle	Distributor Arm Position	Discharge Tube Length
Compact 24 Bottle Kit	500 ml Plastic	B	14 1/4" (36.2 cm)
Compact 12 Bottle Kit	375 ml Glass 375 ml Plastic	B	14 1/4" (36.2 cm)
Compact 1 Bottle	9.4 L Glass 9.4 L Plastic	Tube Guide	10" (25.4 cm)

Table 2-1 Distributor Arm Positions and Discharge Tube Lengths

Configuration	Bottle	Distributor Arm Position	Discharge Tube Length
Standard 24 Bottle Kit	350 ml Glass 1,000 ml Plastic	D	17 1/4" (43.8 cm)
Standard 12 Bottle kit	950 ml Glass 1,000 ml Plastic	C	16 1/2" (41.9 cm)
Standard 8 Bottle Kit	1.8 L Glass 2.0 L Plastic	B	15 3/4" (40.0 cm)
Standard 4 Bottle Kit	3.7 L Glass 3.7 L Plastic	A	15" (38.1 cm)
Standard 1 Bottle	9.4 L Glass 9.4 L Plastic	Tube Guide	12" (30.5 cm)
5 gal Bottle Base	18.9 L Glass	Tube Guide	12" (30.5 cm)

Table 2-1 Distributor Arm Positions and Discharge Tube Lengths

Configuration	Bottle	Distributor Arm Position	Discharge Tube Length
Refrigerator 24 Bottle Kit	350 ml Glass 1,000 ml Plastic	D	20" (50.8 cm)
Refrigerator 12 Bottle kit	2.5 L Plastic	D	20" (50.8 cm)
Refrigerator 8 Bottle Kit	1.8 L Glass 2.0 L Plastic	B	20" (5.8 cm)
Refrigerator 2 Bottle Kit	9.4 L Glass 7.5 L Plastic	A	16" (40.6 cm)
Refrigerator 1 Bottle Kit	9.4 L Glass 9.4 L Glass 15.0 L Plastic 18.5 L Glass 20.0 L Plastic	Lid With Hole	17 1/4" (43.8 cm) 17 1/4" (43.8 cm) 16 1/2" (41.9 cm) 15 3/4" (40 cm) 15 3/4" (40 cm)

2.3 Installing Bottle Kits

When installing bottles or a new kit, keep these guidelines in mind:

- Do not mix glass and plastic bottles together.
- Install all bottles to insure that they remain in place.
- Align the bottles correctly. If the bottles are misaligned, the sampler may miss the bottle mouth, or deposit samples in the “wrong” bottle.
- Each time you change bottle sizes, you must adjust the distributor arm and install a discharge tube of the correct length.
- Each time you install a bottle kit, check the program settings for the number of bottles and bottle volume. Also rotate the distributor arm to each bottle position to ensure the arm is properly positioned over each bottle. When rotating the distributor arm use the controller software. **Do not manually rotate the distributor arm.**
- When using the refrigerator you may need to readjust the stops and ramps, and use a different distributor shaft extension.

2.4 Positioning a Sampler

- Place the sampler on a flat horizontal surface. The refrigerator has leveling feet that can be adjusted to keep the refrigerator level.
- Be sure the vertical distance between the liquid and the pump is as small as possible.
- Route the line so that it runs continuously downhill from the sampler to the liquid source. This helps drain the line during presample and postsample purges.
- Avoid loops of coiled suction line.
- For representative samples, place the intake in the main current of the flow stream, not in an eddy, or at the edge of flow.

Table 2-2 Safe Depths of Submersion for Suction Line

Strainer	3/8" Vinyl	3/8" Teflon
3/8" Stainless Steel	22 Feet	15 Feet
1/4" Stainless Steel	22 Feet	----------
CPVC	4 feet	----------

☑ Note

The suction lines float when filled with air from the purge cycles and when installed at depths exceeding the maximum depths listed here. Secure the lines when installing them at depths greater than the maximums. Teflon suction line is compatible only with the 1 inch diameter, stainless steel strainer.

2.5 Connecting An External Instrument

2.5.1 Flow Meter Connector

Connect the sampler to Isco flow meters, Isco flow loggers or 1640 Liquid Level Actuators by attaching their connect cables to the flow meter connector. Remember these guidelines:

- Both the sampler and the instrument must be running a program.
- If using a flow meter or flow logger for flow pacing, the sampler and the instrument must both run programs with flow pacing settings.
- If using a flow meter or flow logger for trigger pacing, the sampler must run a program with flow pacing settings, and the instrument must run a program with trigger pacing settings.
- When the sampler runs an event paced program, it disregards pacing pulses from a flow meter or flow logger. However, the sampler continues to monitor for enable signals.

2.5.2 Rain Gauge Connector

Connect the rain gauge or SDI-12 Sonde connect cables to the nine-pin Rain Gauge Connector. (Samplers with a four-pin Rain Gauge Connector can only accept a rain gauge.) When both devices are necessary, Y cables are available.

Rain gauge readings are recorded automatically when using standard programming. However, when you use extended programming, rain gauge readings are not available until enabled in the hardware setup.

SDI-12 Sonde readings are only available with extended programming and must also be enabled in the hardware setup. Always update the hardware setup when you add or remove a SDI-12 Sonde or a rain gauge.

2.6 Running Programs

To run a standard or extended program, select RUN from the main menu. You may also select YES at the RUN THIS PROGRAM NOW? screen at the end of the programming screens.

2.7 Interrupting a Running Program

You can stop a sampling program by pressing the Stop key. You can run the program again, but the sampler may show you an additional screen. If no programming changes are made, you have the option of selecting a new starting

bottle. There are some things to consider before you run the program again:

- When you press Stop, the sampler records a “USER STOPPED” program event as the last event in memory. If the sampling data recorded by the sampler is important, be sure to collect it before you run the program again. When you select RUN, the sampler erases all stored sampling data so that it can record new data.
- When you enter a bottle number, be sure the bottle does not already contain liquid.
- The start bottle number screen has a “time out.” If no entry is made within 60 seconds the screen disappears. The program automatically continues using the bottle number that appeared.

2.8 Run Time Screens

While running a sampling program, the sampler displays a variety of messages that report the program’s status. If the sampler has not yet reached the programmed start time, it displays the scheduled start time as well as the current time.

Once the program reaches the start time, you can determine the time of the next sample, the next bottle to receive a sample, sample distribution, and other information. Other messages appear while the sampler runs through a sampling cycle as it takes a sample.

When the sampler needs to report multiple messages, it alternates them.

2.8.1 Module and SDI-12 Sonde Readings

Samplers with an attached module will display the module's readings. Readings usually appear on the third and fourth lines of the display. The SDI-12 data screen alternates with the sampler and module screen.

An * (asterisk) appears next to the reading if the module or SDI-12 was unable to take a reading. If an * appears, the reading displayed is the last available reading.

2.9 Error Messages

If an error is detected that prevents the sampler from taking a sample or continuing the program, an error message is displayed for the following errors:

- Pump Jammed
- Distributor Jammed
- Probable Overflow
- Power Failed
- User Stopped
- No Distributor Arm
- No Liquid Detected
- No More Liquid
- Pump Latch Open
- Sampler Shut Off

- Bottle Full
- Sample In Progress

The sampler may encounter more than one error during a program. It records each error and the time it occurred in the Sampling Results and Combined Results report. It alerts you to the errors by displaying the message, “ERRORS HAVE OCCURRED DURING PROGRAM.”

2.9.1 Fatal Error

A Fatal error will only show up if you are using a multiple bottle configuration and the distributor system fails. A fatal error can indicate any of the following conditions:

- The distributor arm is not attached to the sampler.
- The distributor arm stop inside the center section or refrigerator is missing or broken.
- The distributor drive mechanism inside the controller is malfunctioning.

2.10 Recovering the Sampler

- When recovering the sampler, keep it level to prevent spilling the collected samples.
- If the battery’s charge is questionable, replace it with a fully charged battery.

2.11 Viewing the Data

- For the Sampling Report, the sampler displays each program event, one at a time.
- For the Module and Rainfall Data reports, it displays daily summaries, instead of the full reports available with the RTD, FLOWLINK, or SAMPLINK.
- SDI-12 and rain gauge data can be viewed in Combined reports.

As soon as you select one of the report options from the View menu, the sampler begins displaying the report data. The sampler advances automatically through the report items, displaying each item briefly. While the sampler advances automatically through the displays:

- Stop the automatic displays by pressing Stop once. Then, use the arrow keys to move manually through the report.
- Return to the main menu by pressing Stop twice.

At the end of the report, the sampler leaves the last item displayed until you press:

- the arrow keys to move forward or backward manually through the report.
- Stop to return to the main menu.
- Enter to start the automatic displays again.

2.12 Configuring Reports

The Configure Report option allows you to specify which of the Sampling Reports will be included in any output request.

- SAMPLINK REPORT provides the sampling reports, but disables the output of the detailed partition data.
- FLOWLINK REPORT provides the sampling reports and the detailed partition data.
- CUSTOM REPORT allows you to specify which reports and data are available as an output. Use this to optimize the data collection time, printout length, and data storage space.
- ALL REPORTS provides every available report and detailed partition data from the module, rain, and SDI-12 readings.

2.13 Grab Samples

Grab samples let you take a single sample on demand.

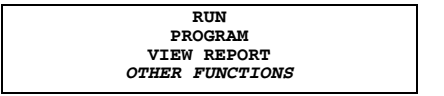
- When the sampler delivers a grab sample, it runs through a complete sampling cycle, using the current settings for volume and for line rinses or retries. If it is a two-part program, the sampler uses the volume setting for part A.
- To take a grab sample while the sampler is running a program, you must interrupt the program. (Press the Stop key.) Restart the program by running it again.

To take a grab sample:

1. Disconnect the pump tube from the bulkhead fitting.
2. Place the end of the tube over a collection container.
3. Follow the steps in Example 2-1.
4. Reconnect the pump tube to the bulkhead fitting.

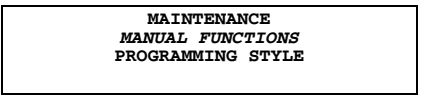
Example 2-1 Taking a Manual Sample

1.



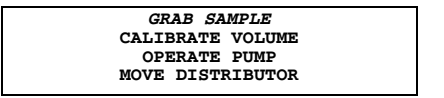
Select OTHER FUNCTIONS.

2.



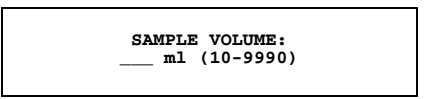
Select MANUAL FUNCTIONS.

3.



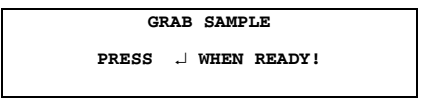
Select GRAB SAMPLE.

4.

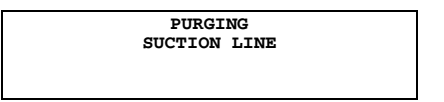


Enter the desired volume.

5.



6.



Example 2-1 Taking a Manual Sample

7.

```
PUMPING 200 ml
```

8.

```
PURGING
SUCTION LINE
```

9.

```
GRAB SAMPLE
CALIBRATE VOLUME
OPERATE PUMP
MOVE DISTRIBUTOR
```

Press Stop to return to the main menu.

2.14 Calibrating

The sampler delivers accurate sample volumes without calibration. If you find that sample volumes vary significantly from the programmed values, first check the suction line for proper installation. Be sure it slopes continuously downhill to the liquid source and drains completely after each sampling cycle. Then, compare the actual length of the suction line to the suction line length settings in the program to see that the setting matches the line length. Also check the pump tube for excessive wear, replacing it if necessary.

You may want to calibrate when:

- A new pump tube is installed. Run the pump for five minutes before calibrating.
- The sample source is above the sampler.
- Sampling from a pressurized line.

2.14.1 Calibration Tips

- For the best results, calibrate the sampler after it's installed on site.
- Use a graduated cylinder for volume measurement.
- The sampler clears the previous calibration setting when you reinitialize the sampler.
- You cannot calibrate while the sampler is running a program.
- When the sampler delivers the sample, it runs through a complete sampling cycle, using the current settings for volume line rinses and retries. If it is a two part program, the sampler uses the volume setting for part A.

To calibrate:

1. Disconnect the pump tube from the bulkhead fitting.
2. Place the end of the tube over a collection container.
3. Follow the steps in Example 2-2.
4. Reconnect the pump tube to the bulkhead fitting.

Example 2-2 Calibrating a Sample

1.

```
RUN
PROGRAM
VIEW REPORT
OTHER FUNCTIONS
```

Select OTHER FUNCTIONS.

2.

```
MAINTENANCE
MANUAL FUNCTIONS
PROGRAMMING STYLE
```

Select MANUAL FUNCTIONS.

3.

```
GRAB SAMPLE
CALIBRATE VOLUME
OPERATE PUMP
MOVE DISTRIBUTOR
```

Select CALIBRATE VOLUME.

4.

```
SAMPLE VOLUME:
___ ml (100-9990)
```

Enter the desired volume.

5.

```
CALIBRATE VOLUME

PRESS ↵ WHEN READY!
```

6.

```
PURGING
SUCTION LINE
```

Example 2-2 Calibrating a Sample (Continued)

7.

```
PUMPING 200 ml
```

8.

```
PURGING
SUCTION LINE
```

9.

```
VOLUME DELIVERED:
____ml
```

Measure the volume delivered and enter the amount here.

10.

```
200 ml!
ARE YOU SURE?
YES      NO
```

This screen appears when the amount you entered in step 9 was more than twice, or less than half, the programmed volume. Select YES if the volume delivered matches the volume displayed on this screen. Select NO to enter the volume delivered.

Section 3 Reference

3.1 Replacing the Pump Tube

Replace the pump tube only with Teledyne Isco's 6712 pump tubing. **Other types of pump tubes will not work.** The 6712 pump tube is easily recognized by the blue alignment collars. Also note that the discharge tube is not the same as tubing as the pump tube. Double-check these to ensure the correct tubing is used.

Inspect the pump tube periodically. Replace the tube when it cracks or seems worn. Inspect the tube frequently when the sample liquid contains a high percentage of suspended or abrasive solids.

3.1.1 Pump Tube Warning

The sampler tracks the pump counts in both the forward and reverse cycles with a resettable counter. When the count reaches 1,000,000 (or the count you enter), the sampler displays the message "Warning! Replace Pump Tube." The message appears each time you turn on the sampler or run a program until you reset the counter.

After replacing the pump tube, reset the count to zero so that the sampler can begin tallying the counts for the new tube. Example 8 shows how to reset the pump counts. Replacing the tube does not reset the counter.

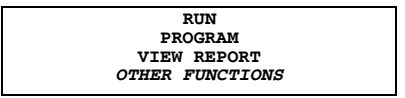
Experience may suggest a significantly different pump tube life. The alarm count is user definable. Example 8 shows how to set the alarm count.

3.1.2 Checklist For Replacing Pump Tube

1. Disconnect power from the sampler.
2. Loosen the liquid detector's cover. Unlatch the pump band.
3. Pull the tube away from the bulkhead fitting. Pull it from the pump and detector.
4. Clean the pump rollers and the inside of the pump band.
5. Thread the new tubing through the pump so that the tube follows its natural curve around the pump rollers.
6. Align the tube by placing the blue collars in the grooves inside the liquid detector.
7. Tighten the liquid detector's cover. Latch the pump band.
8. Reset the pump tube counter. See step 5 in Example 3-1.
9. Take a "dry" manual sample to test the tube installation.

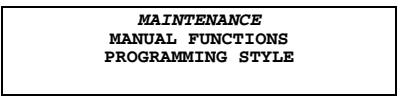
Example 3-1 Resetting the Pump Tube Warning

1.



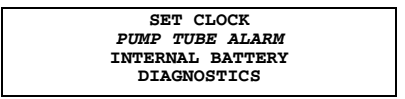
Select OTHER FUNCTIONS.

2.



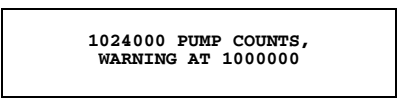
Select MAINTENANCE.

3.



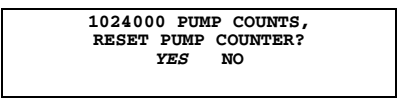
Select PUMP TUBE ALARM.

4.



The sampler displays this screen briefly to give you the current pump count information.

5.



Example 3-1 Resetting the Pump Tube Warning (Continued)

To reset the counter to zero, select YES. Always reset the counter after replacing a pump tube. Select NO when merely checking the current count.

6.

```
WARNING AT 1000000
   PUMP COUNTS
(1 - 99) 00000
```

If necessary change the pump count alarm setting by typing the first two digits of the new setting.

7.

```
SET CLOCK
PUMP TUBE ALARM
INTERNAL BATTERY
DIAGNOSTICS
```

You will be returned to this menu. Press Stop to return to the main menu.

3.2 Rinses and Retries

Rinses and retries are in extended programming only. The number of rinses can be set from 0 to 3. The number of retries can also be set from 0 to 3.

3.3 Pacing

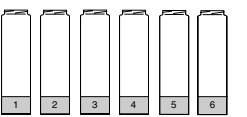
Sample pacing is the rate at which the sampler takes samples. Depending on the type of pacing you select, the rate is controlled by the sampler's internal clock or by inputs received from connected instruments. Standard programming provides time pacing and flow pacing. Extended programming provides some additional pacing types: random interval pacing, nonuniform time pacing and event pacing.

3.4 Distribution

3.4.1 Sequential

In sequential distribution, the sampler deposits one sample in each bottle. A sequential sample represents a “snapshot” of the flow stream at a point in time.

Figure 3-1 Sequential Distribution



Standard Programming

1.

```
DISTRIBUTION:
 SEQUENTIAL
```

2.

```
 SEQUENTIAL
BOTTLES/SAMPLE
SAMPLES/BOTTLE
```

3.

```
RUN CONTINUOUSLY?
    YES  NO
```

Extended Programming

1.

```
DISTRIBUTION:
 SEQUENTIAL
```

2.

```
1 BOTTLES PER
SAMPLE EVENT (1-24)
```

3.

```
SWITCH BOTTLES ON:
NUMBER OF SAMPLES
TIME
```

4.

```
SWITCH BOTTLES EVERY
1 SAMPLES (1-50)
```

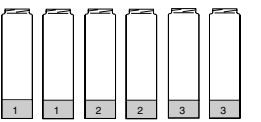
5.

```
RUN CONTINUOUSLY?
YES  NO
```

3.4.2 Bottles Per Sample

In bottles per sample distribution, the sampler deposits a sample in each of a set of bottles. A bottle set includes at least two bottles and may include all bottles. Use this method when the volume to be collected is larger than the amount one bottle can hold or when you need identical samples.

Figure 3-2 Bottles per Sample Distribution



Standard Programming

1. **DISTRIBUTION:**
   2 BOTTLES/SAMPLE

2. **SEQUENTIAL**
   BOTTLES/SAMPLE
   SAMPLES/BOTTLE

3. ***2*** **BOTTLES PER**
   SAMPLE EVENT (1-24)

4. **RUN CONTINUOUSLY?**
   YES *NO*

Extended Programming

1.
```
DISTRIBUTION:
2 BOTTLES/SAMPLE
```

2.
```
2 BOTTLES PER
SAMPLE EVENT (1-24)
```

3.
```
SWITCH SETS ON:
NUMBER OF SAMPLES
TIME
```

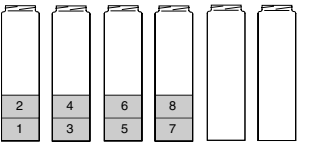
4.
```
SWITCH SETS EVERY
1  SAMPLES (1-50)
```

5.
```
RUN CONTINUOUSLY?
YES  NO
```

3.4.3 Samples Per Bottle

In samples per bottle distribution, the sampler deposits samples from several sample events in a single bottle before moving to the next bottle. Use this method to collect a series of small composite samples.

Figure 3-3 Samples per Bottle Distribution



Standard Programming

1.
```
DISTRIBUTION:
2 SAMPLES/BOTTLE
```

2.
```
SEQUENTIAL
BOTTLES/SAMPLE
SAMPLES/BOTTLE
```

3.
```
2 SAMPLES PER
BOTTLE (1-50)
```

4.
```
RUN CONTINUOUSLY?
YES  NO
```

Extended Programming

1.
```
DISTRIBUTION:
2 SAMPLES/BOTTLE
```

2.
```
1 BOTTLES PER
SAMPLE EVENT (1-24)
```

3.
```
SWITCH BOTTLES ON:
NUMBER OF SAMPLES
TIME
```

4.
```
SWITCH BOTTLES EVERY
___ SAMPLES (1-50)
```

5.
```
RUN CONTINUOUSLY?
YES NO
```

3.4.4 Composite

For single bottle configurations, samples per bottle distribution is known as composite sampling. A composite sample represents an average of the flow stream's characteristics during the sampling period.

3.4.5 Multiple Bottle Compositing

Multiple bottle compositing is a combination of bottles per sample and samples per bottle. Multiple bottle compositing is available only in extended programming. Refer to your user manual for a more complete description of this method.

The flow charts on the following three pages show some of the screens you would step through for the sequential, bottles per sample, and samples per bottle distribution methods. The screens shown are Quick View screens.

3.5 Sampler Enable

Isco flow meters, flow loggers, and PAL 1110s (no longer sold) can enable (start) or disable (stop) a program according to certain monitored conditions.

- At a specific time and date.
- When the pH reading passes a set point.
- When the reading is inside or outside a certain range.
- When the rainfall rate exceeds a set point.

A sampler running either a standard or extended program can rely on an external input for enable or disable controls.

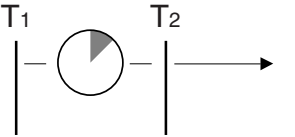
Input from a rain gauge, an input pin, or a SDI-12 module may be used when programming enable conditions. Any combination of up to two conditions can be programmed. In addition to programming enable conditions, extended programming lets you control the sampler's response to its enable state. You can:

- Stay enabled after the first enable.
- Set up a repeatable enable.
- Delay the start of sampling after the enable.
- Reset the sampling interval countdown when the sampler is enabled.
- Control the sampling-interval countdown while disabled.

3.6 Start Times

It is important to understand the difference between the time at which you run a program and the program's start time. Running a program simply means selecting RUN from the sampler's start up menu. The start time is the time at which the sampler begins the program's first sample interval countdown. The start time is controlled by your selections from the start time screens.

Figure 3-4 Delayed Start Time

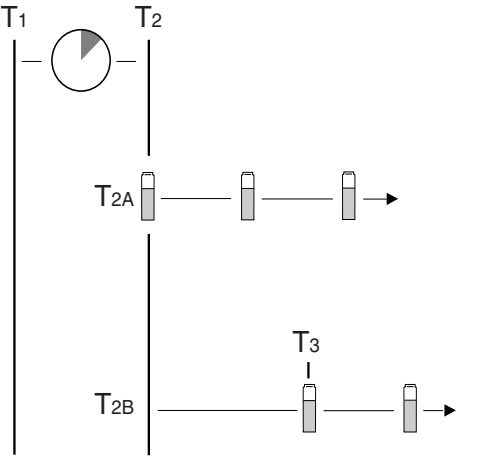


T_1	Select “Run” from the Start-up Menu.
T_1–T_2	Delay to Start Time
T_2	Program’s Start Time. Sampling progress begins at this point.

Each program contains start time settings that tell the sampler when to begin the program. When programming the sampler, you can select one of three start time options:

- Select NO DELAY TO START when you want the sampler to start as soon as you select RUN.
- Select DELAYED START when you want the sampler to delay from 1 to 999 minutes before starting the program.
- Select CLOCK TIME when you want the sampler to begin the program at a specific time on at least one day of the week.

Figure 3-5 Enable Settings



Time	Description
T_1	Select RUN from the Start-up Menu.
T_1–T_2	During the delay, the sampler ignores disable signals from a flow meter, flow logger, a 700 Series Module, rain gauge or I/O pin.
T_2	Programmed Start Time

Time	Description
T_{2A}	The sampler is enabled at the Programmed Start Time. A Sample event at the start time always occurs for all time-paced programs except “random.” For flow-paced programs, it occurs when the program requires a sample at the start time.
T_{2B}	The sampler is *not* enabled at the start time. It remains disabled until T_3.
T_3	The sampler becomes enabled. A sample event at the enable time always occurs for event-paced programs. For other programs, it occurs at the enable time only when the program requires a sample at enable.

3.7 Operating the Pump

The pump can be operated manually. The sampler will display the number of pump counts during the pump's operation. This feature will estimate the pump counts needed to purge a suction line.

Example 3-2 Operating the Pump

1.

```
GRAB SAMPLE
CALIBRATE VOLUME
OPERATE PUMP
MOVE DISTRIBUTOR
```

2.

```
SELECT DIRECTION
PUMP FORWARD
PUMP REVERSE
```

3.

```
PURGING. . .
PRESS THE RED 'STOP'
KEY WHEN DONE
```

4.

```
PURGED _____COUNTS
```

3.8 Moving the Distributor Arm

The sampler lets you reposition the distributor arm. Use this feature when installing a bottle kit. Use the steps shown in the example.

⚠ CAUTION

DO NOT rotate the distributor arm manually; this will severely damage the distributor drive.

Example 3-3 Moving the Distributor Arm

1.

```
GRAB SAMPLE
CALIBRATE VOLUME
OPERATE PUMP
MOVE DISTRIBUTOR
```

2.

```
GO TO BOTTLE ____
     (1-24)
```

3.

```
NOW AT BOTTLE ____
```