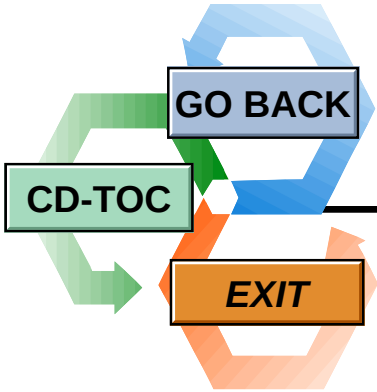


Abbott

ALCYON®

CLICK ON ITEM BELOW

Host Interface Specifications

List No. 4E91-04

Abbott Laboratories
Abbott Park, IL 60064
30-1836/R4—June 1999

List Number Change

The current list number of the **ALCYON Host Interface Specifications** is 4E91-04.

The 4E91-03 (April 1999) version of this manual was distributed as a limited release. Due to certain field issues, it has been updated and re-issued with a new revision and list number, 4E91-04. Currently, customers may be using either the 4E91-02 version or the 4E91-03 version of the **ALCYON Host Interface Specifications**. Both of these versions are now obsolete and should be replaced in their entirety with this new manual.

Verify use of the current and correct version of the manual by ensuring the correct document control number and revision date on the Revision Status page appear as follows:

- Document Control Number: 30-1836—R4
- Revision Date: 6/99

Revision Status

Document Control Number(s)	Revision Date	Section(s) Revised	Pages Revised and Added	Software Version
30-0840—R1	4/98	Original Issue	Original Issue	Version 1.0
30-1439—R2	10/98	All Sections	All Pages	Version 1.5
30-1713—R3	4/99	All Sections	All Pages	Version 1.6 (limited release)
30-1836—R4	6/99	All Sections	All Pages	Version 1.5

Pictorial Disclaimer

The sample printouts, screens, and figures contained in this manual are for information and illustration purposes only. Abbott Laboratories makes no representations or warranties about the accuracy and reliability of the information on the printouts, screens, and figures in this manual; their information is not to be used for clinical or maintenance evaluation.

Trademark Statements

ALCYON® is a registered trademark of Abbott Laboratories.

Teflon® is a registered trademark of E. I. Dupont de Nemours and Co.

Hazards

Warnings are inserted throughout this manual to alert Operators to potential hazards. The standard warning convention, including hazard signal words and icons are described as follows:

Signal Word	Definition
WARNING	Denotes a hazard which could result in moderate to serious personal injury.
CAUTION	Denotes potential hazards that could result in minor injury. Also used for conditions or activities that could interfere with proper functioning or performance of the Analyzer.
NOTE	Denotes Operator or service information.

Safety hazard icons are used in this manual and on Analyzer labels to identify potentially hazardous conditions or situations. In this manual and on some Analyzer labels, text describing the hazard accompanies the safety icon. On other labels, the Operator is referred to the **ALCYON Operations Manual** for specific information; therefore, users of the ALCYON Analyzer must be familiar with the following messages:

Icon and Related Text	Description
 **CAUTION: or WARNING:**	Identifies an activity or area that may present a physical, mechanical or chemical hazard.

Icon and Related Text	Description
 **WARNING: Moving Parts**	Possible injury may result from allowing part of your body to enter the range of movement of the following parts during Analyzer operation: • Sample and reagent transfer arms • Sample and reagent probes • Automatic cuvette load / unload module (located on the right side of the Analyzer) • Reaction carousel • Reagent and Sample Carousel Keep all protective covers in place when the Analyzer is running. If the Analyzer is used in a manner not specified by the manufacturer, protection provided by the Analyzer may be impaired.
 **CAUTION: Class 1 Laser Product**	Denotes lasers or laser systems that do not, under normal operating conditions, pose a hazard. The ALCYON Analyzer utilizes an embedded Class 2 laser with a maximum power output of 2mW. Laser light produced by the sample bar code reader can cause eye damage. **Do not stare into the light source.** Momentary exposure to a CDRH Class 2 laser is not known to be harmful.
 **CAUTION: Class 1 LED Product**	The ALCYON Analyzer utilizes an embedded Class 2 LED with a maximum power output of 2 mW. LED light produced by the sample bar code reader can cause eye damage. **Do not stare into the light source**.  **CAUTION:** Use of controls, or adjustments, or performance of procedures other than those specified may result in exposure to hazardous radiation.

Table of Contents

NOTES

Overview

The ALCYON Analyzer is a chemistry analyzer for *in vitro* diagnostic use. The unit performs quantitative Kinetic and End-Point determinations of specific analytes, and processes up to 300 tests per hour. The ALCYON 300i Analyzer with ISE module also measures concentration of the electrolytes sodium, potassium, and chloride, in samples using indirect potentiometry.

Analyzer Description

The ALCYON Analyzer

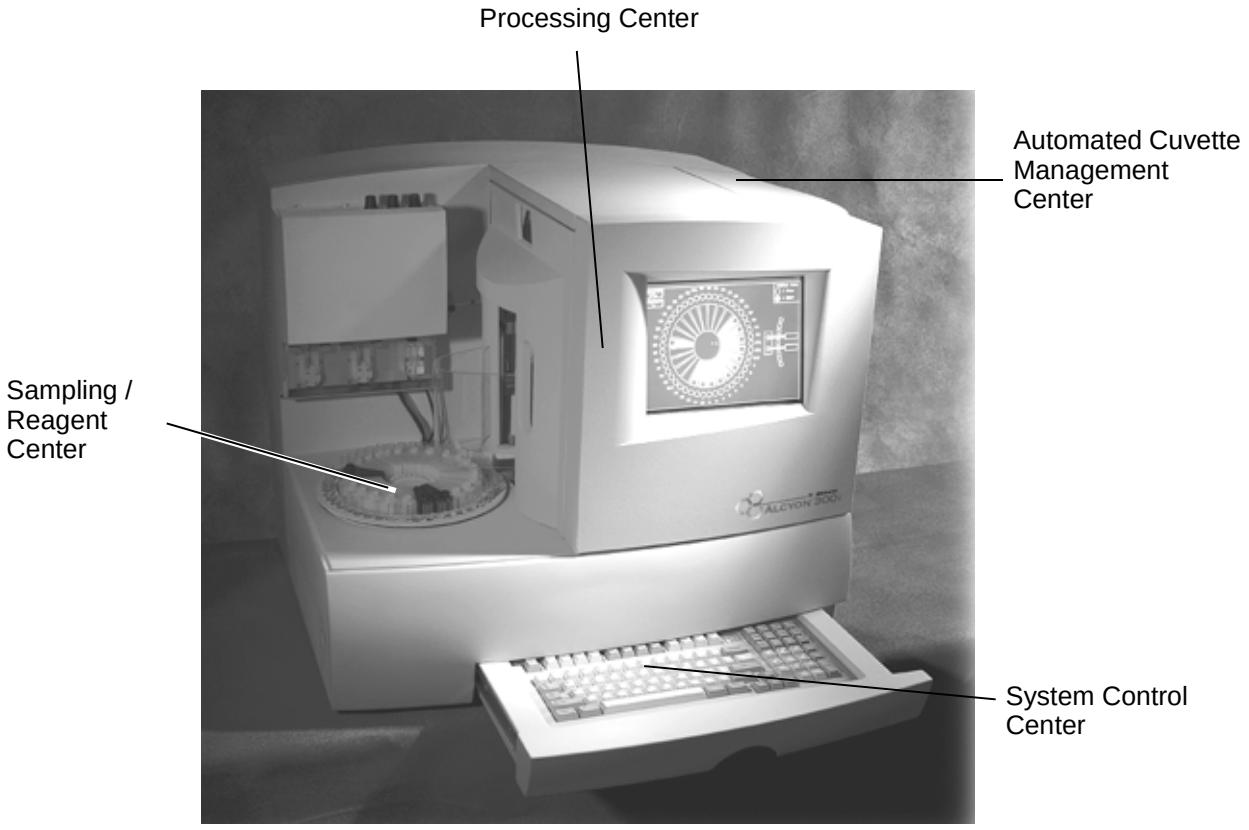


Figure 1: ALCYON Analyzer

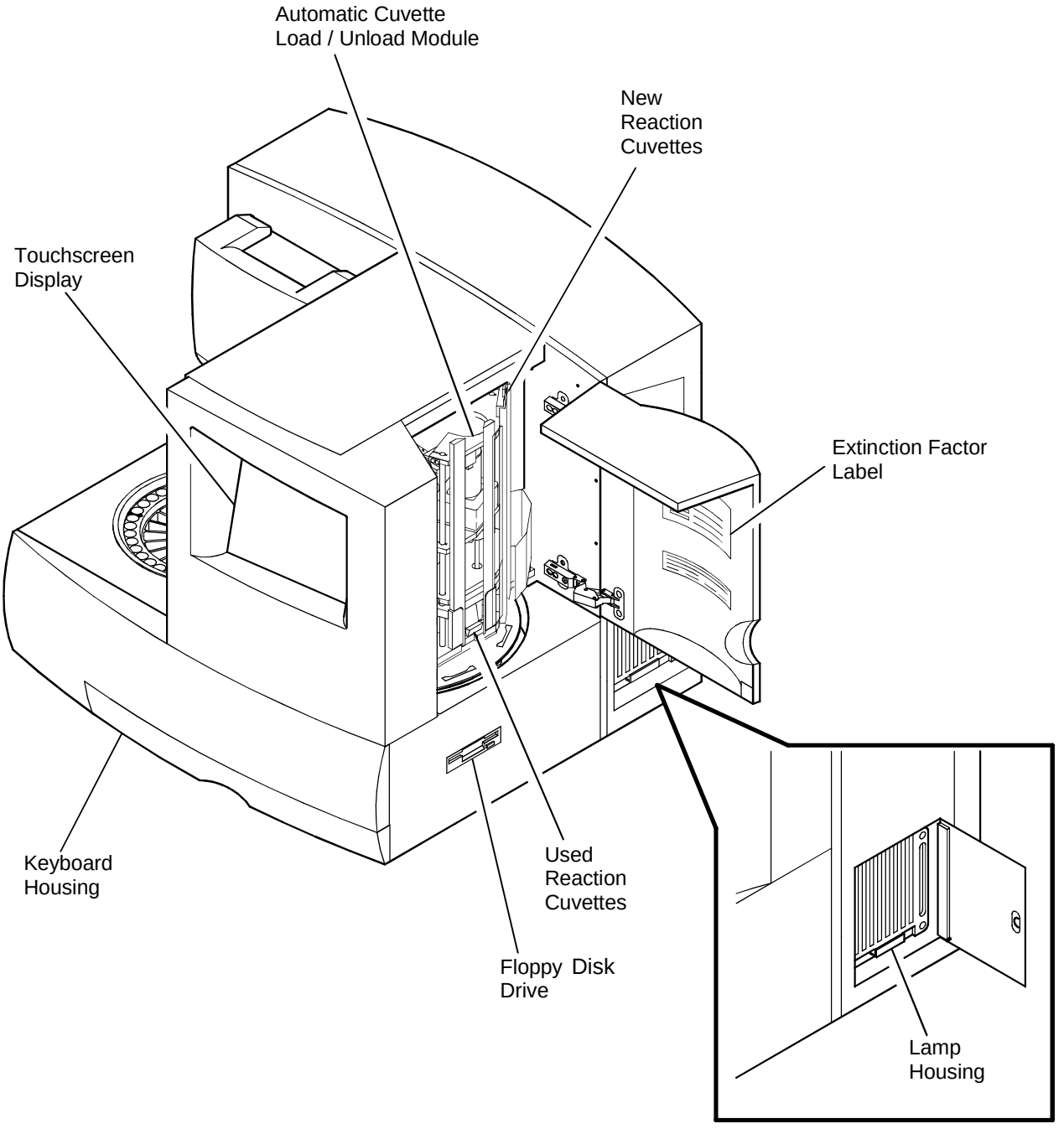


Figure 2: ALCYON Analyzer

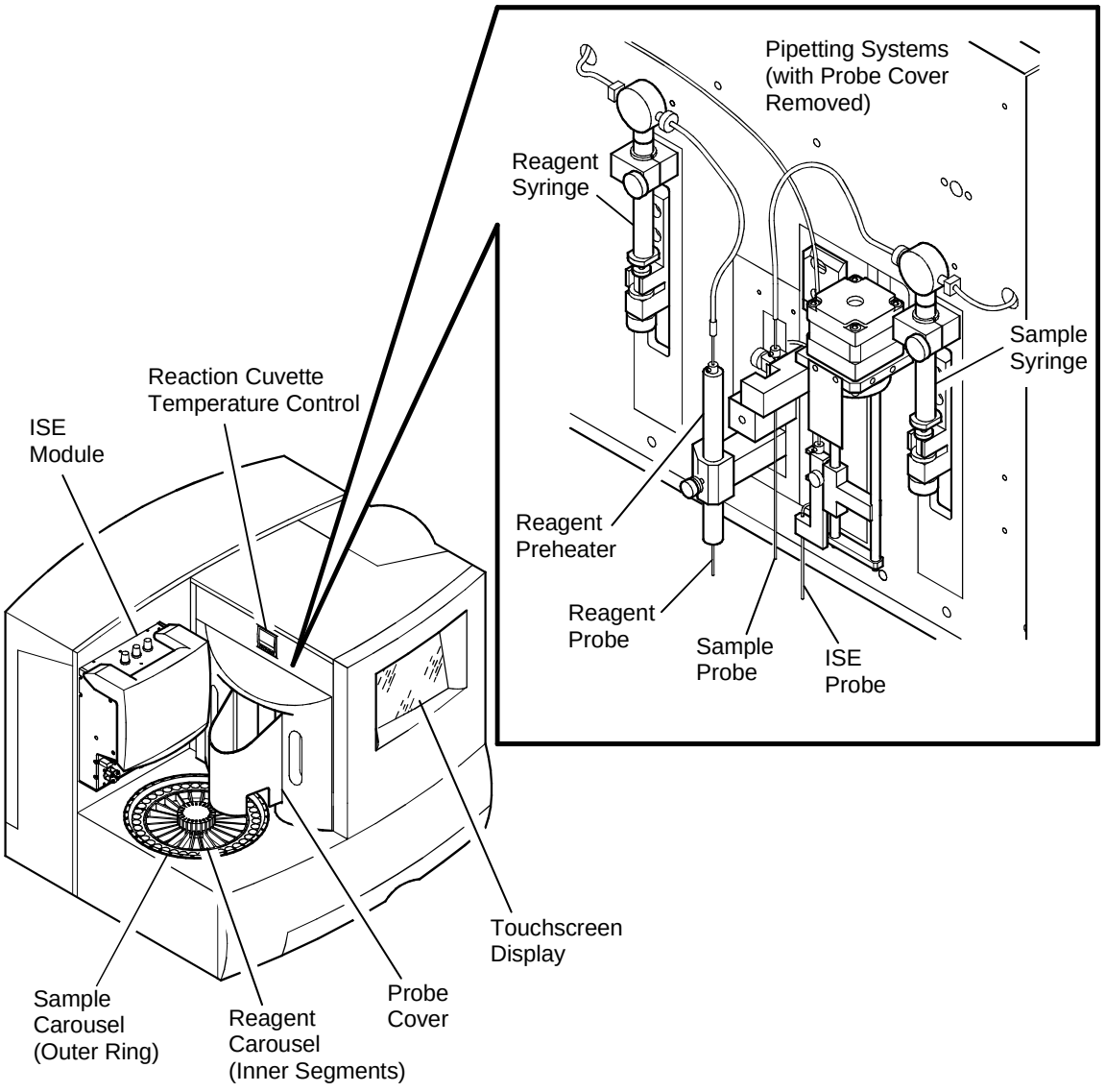


Figure 3: Carousels and Pipetting Systems

Sampling and Reagent Center

Sample Carousel

The non-removable Sample Carousel has 39 universal positions used for patient samples, controls, or calibrators.

Samples can be added to the Sample Carousel any time the Analyzer is in continuous mode.

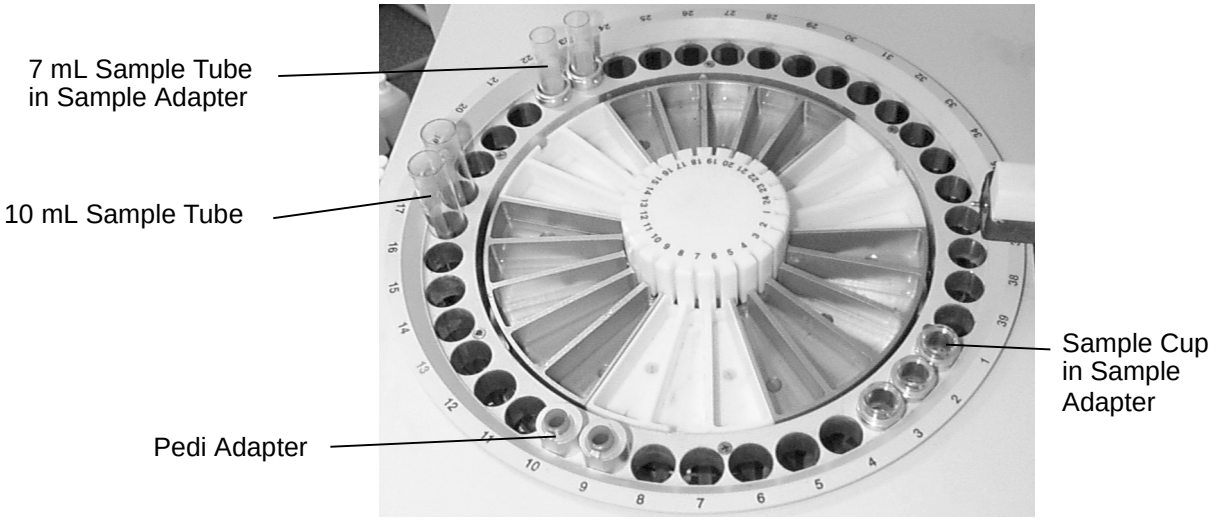


Figure 4: Sample Carousel with Probe Cover Removed

The ALCYON Analyzer Sample Carousel can hold:

- 5 mL tubes (Sample adapter must be used.)
- 7 mL tubes (Sample adapter must be used.)
- 10 mL tubes
- 2 mL sample cups (single lining only) (Sample adapter must be used.)
- 0.7 mL pediatric cups (Pedi adapter must be used with pediatric tube.)

NOTE: Abbott Laboratories does not support the use of double walled 0.5 mL sample cups.

Pedi Adapters

Pedi adapters are used to support pediatric cups when placed on the Sample Carousel.

When using pediatric cups, the open notched side of the cup should be placed across the raised notch on the adapter. The flat side of the adapter must be placed toward the outside of the carousel, facing the numbers.

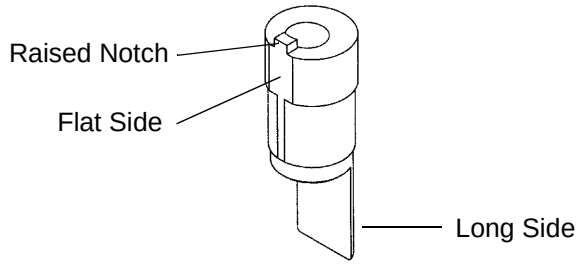


Figure 5: Pedi Adapter

Sample Adapters

Sample adapters are used to support 2 mL sample cups, and 5 mL and 7 mL primary tubes when placed on the Sample Carousel. The flat side of the adapters must be placed toward the outside of the carousel, facing the numbers.

CAUTION: Flat sides of the adapters **must** be properly oriented. Failure to comply results in a probe crash.

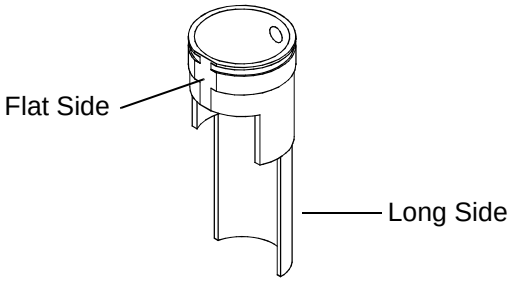


Figure 6: Sample Adapter

.

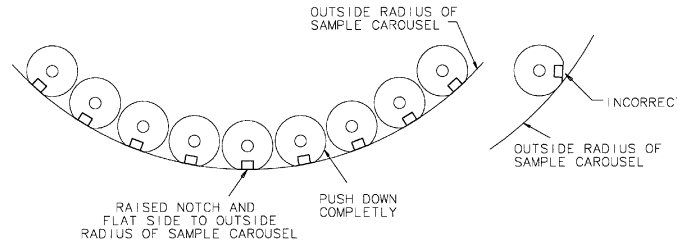


Figure 7: Pedi and Sample Adapter Orientation

The Analyzer has an optical detector which automatically senses whether a tube or a cup has been placed in the Sample Carousel.

Sample Adapter Tool

The sample adapter tool is used to remove the sample adapters from the carousel. Insert the tool into the hole in the adapter, and lift up to remove.

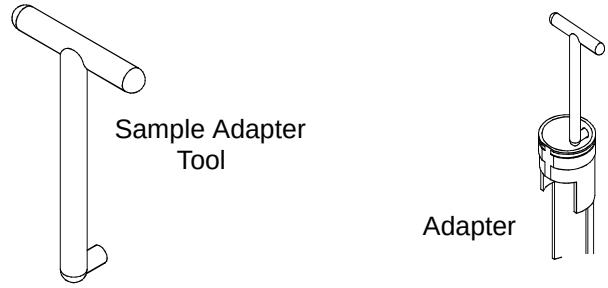


Figure 8: Sample Adapter Tool with Adapter

CAUTION: When removing adapters from the carousel, do not move the carousel. If the carousel is moved, the Analyzer **must** be reinitialized to prevent a probe crash.

Reagent Carousel

The Reagent Carousel provides 24 positions which contain:

- 15 cooled positions (approximately 10 to 12°C below ambient temperature by Peltier effect)
- 9 ambient temperature positions

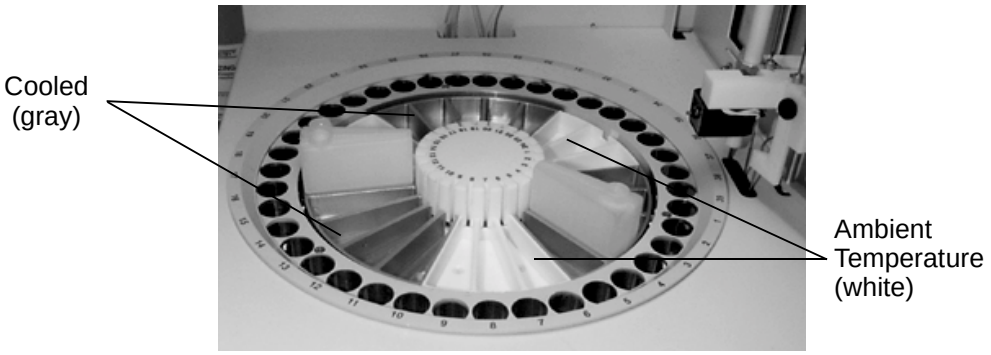
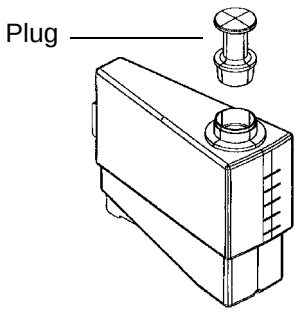


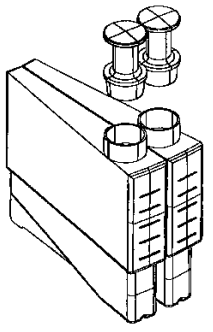
Figure 9: Reagent Carousel Positions

The ALCYON Analyzer can be configured for five different Reagent Carousels. Two sizes of reagent containers can be placed on the Reagent Carousel.

- 26 mL, large reagent containers



- 12 mL, small reagent containers for dual reagent assays. This allows a method requiring two reagents to be run while using only one position on the Reagent Carousel.



CAUTION: Reagent containers have volume indicators along the back. Fill the container slowly to prevent foaming and/or overfilling.

CAUTION: When removing reagent containers from the Reagent Carousel, do not move the carousel. If the carousel is moved, the Analyzer **must** be reinitialized to prevent a probe crash.

Reagent Funnels

Reagent funnels may be used to help pour reagents into reagent containers.

CAUTION: Do not reuse reagent containers or reagent funnels. Doing so may produce erroneous results.

Pipetting Systems

The ALCYON Analyzer provides two separate pipetting systems:

- The sample system consists of a 50 µL syringe for accurate volume measurement and a stainless steel Teflon®-coated sample probe that dispenses between 2 and 30 µL sample in 0.1 µL increments, with a precision ≤ 1.2% (when tested at 3 µL). An additional 12 µL distilled or deionized water is dispensed following aspiration of each sample. With this probe, mixing of sample and reagent is performed in the reaction cuvette during the sample dispensing cycle.
- The reagent system consists of a 500 µL syringe for accurate volume measurement and a stainless steel Teflon®-coated reagent probe that dispenses between 10 and 388 µL reagent in 1 µL increments, with a precision ≤ 1.3% (when tested at 220 µL). A built-in preheater ensures reagents are dispensed at the approximate incubation temperature. The preheater may be set at 30.0°C or 37.0°C. (This setting should match the reaction cuvette temperature control.) Refer to **Instrument Set-Up** in *Section 2, Installation Procedures and Special Requirements* of the **ALCYON Operations Manual** for information on setting the preheater temperature.

Both the sample and reagent probes are washed inside and outside with wash water between each dispensing. Both probes use an automatic capacitance level detector for determining the liquid level when sampling.

ISE Module

The ALCYON Analyzer equipped with ISE module is used for the determination of Na^+, K^+, and Cl^-. Measurements are performed using indirect potentiometry. Serum can be tested without manual predilution of the sample.

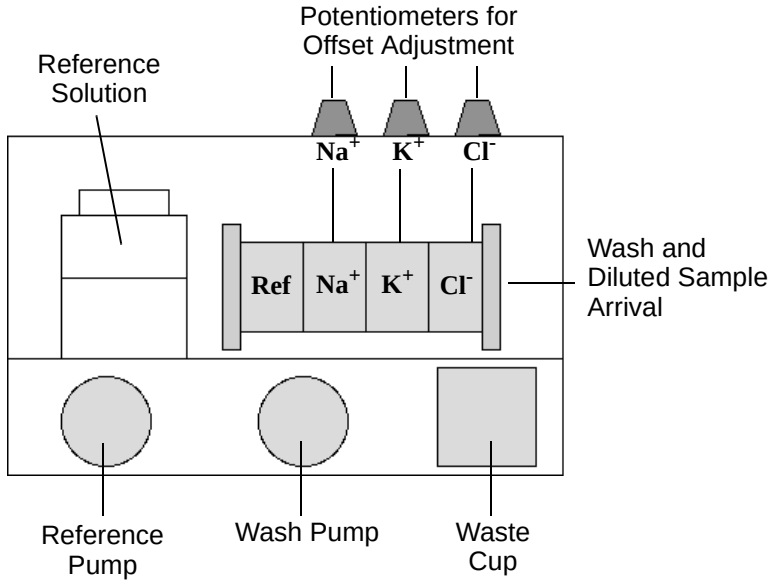


Figure 10: ISE Module

The ISE module is positioned on the back wall of the Analyzer and is isolated to eliminate any electrical interference. The module cover also eliminates outside electrical interference, since electrical interference can cause errors in a result.

The sample is prediluted 1:11 with ISE sample diluent, which is positioned in one of the ambient temperature positions on the Reagent Carousel. This predilution is made in a reaction cuvette. The ISE probe aspirates the diluted sample from the reaction cuvette. A peristaltic pump transfers the fluid to the ISE electrodes.

The volume of fluid used for these dilutions:

- Sample diluent—300 µL
- Sample—30 µL

Prior to measuring a sample, the ISE module takes a reference measurement from ISE stabilizing solution, which is aspirated from the wash well. This ensures a stable baseline for measurement.

When not measuring samples, the ISE module continues to aspirate a small amount of ISE stabilizing solution, to ensure the electrodes are kept moist, and in optimum condition. This process continues as long as the Analyzer is powered on.

ISE Components

Sodium Electrode

The sodium electrode membrane is sodium-sensitive glass containing aluminum, sodium, and lithium oxides. The internal filling solution is sodium chloride. The internal reference is a silver-silver chloride (Ag/AgCl) electrode.

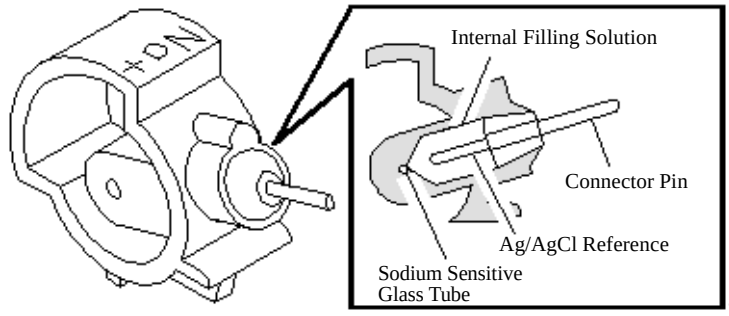


Figure 11: Sodium Electrode

Potassium Electrode

The potassium electrode uses a valinomycin membrane with a potassium chloride internal filling solution. The internal reference is a silver-silver chloride (Ag/AgCl) electrode.

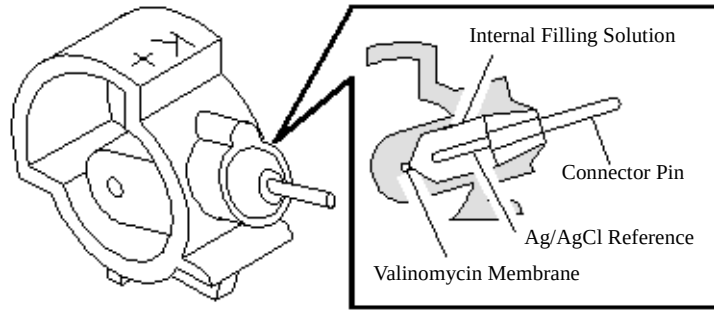


Figure 12: Potassium Electrode

Chloride Electrode

The chloride electrode uses a chloride-sensitive membrane with a potassium chloride internal filling solution. The internal reference is a silver-silver chloride (Ag/AgCl) electrode.

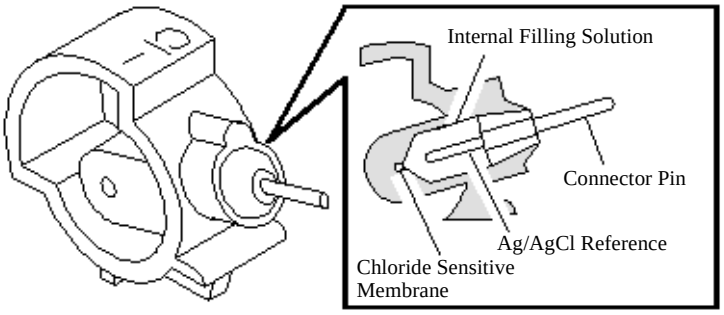


Figure 13: Chloride Electrode

Reference Electrode

The reference electrode is a calomel variety which employs an open type liquid junction. There is a thin capillary connection between the sample and the chamber filled with potassium chloride (KCl) reference solution.

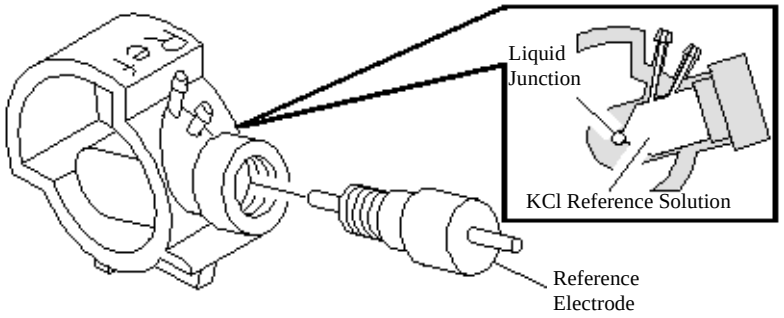


Figure 14: Reference Electrode

Sample Bar Code Reader

The ALCYON Analyzer is equipped with an integrated sample bar code reader. This bar code reader enables the Analyzer to make positive identification of sample tubes, when there is a bidirectional connection between the ALCYON Analyzer and the laboratory Host computer.

WARNING: Class 1 Laser Product. Refer to *Section 8, Hazards* of the **ALCYON Operations Manual** for information on the laser.

WARNING: Class 1 LED Product. Refer to *Section 8, Hazards* of the **ALCYON Operations Manual**.

Water Supply

The ALCYON Analyzer uses distilled or deionized water or saline for manual dilutions, and uses distilled or deionized water (Type II or better recommended) for all wash procedures. A gauge placed in the water container alerts the Operator when the water level is low. Average water use by the ALCYON Analyzer during normal continuous operation is three to four liters per hour.

CAUTION: Thoroughly rinse the water container with distilled or deionized water prior to initial use. Failure to rinse the container may result in damage to the Analyzer.

Water Gauge

There are two water gauge designs. Both types are shown below.

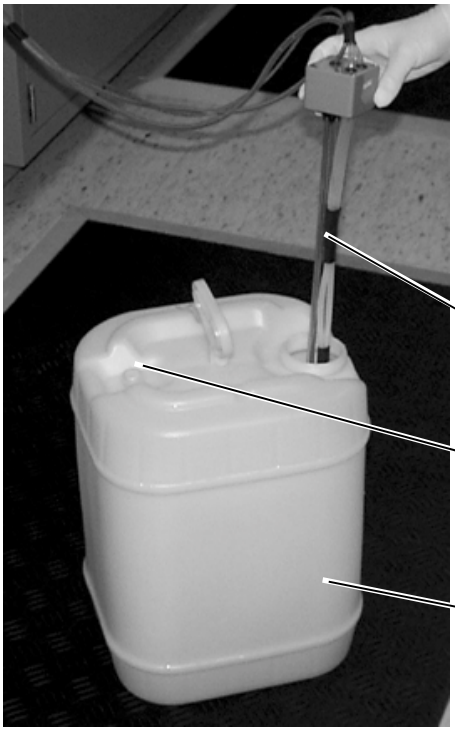


Figure 15: Type A Water Supply

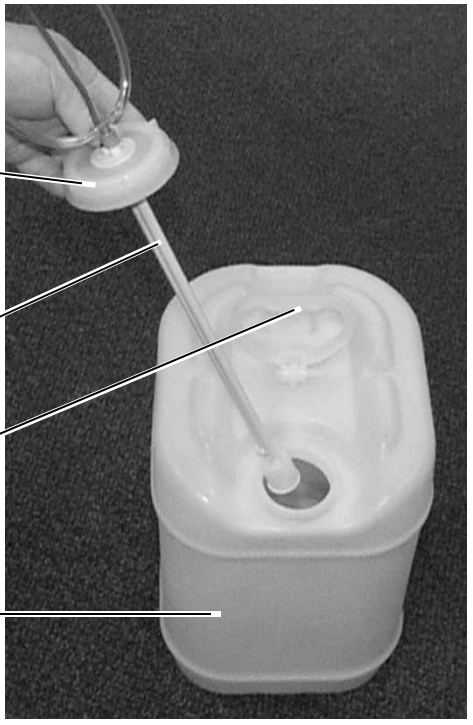


Figure 16: Type B Water Supply

NOTE: The type B water gauge is supplied with two caps; a large one for use with the supplied water container (refer to **Figure 16**) and a small one for use with a disposable water container (not shown).

NOTE: The vent cap on the water container must be loosened to prevent a vacuum from forming in the water container.

Waste Container

The ALCYON Analyzer is supplied with a waste container identical to the water container. A cap with tubing connectors may be provided with the waste container.

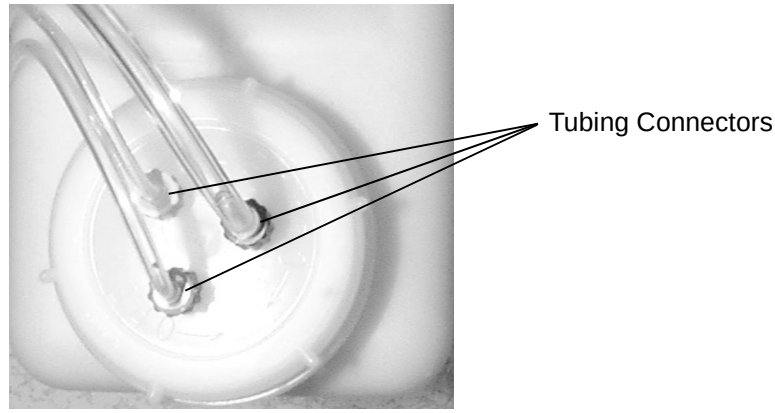


Figure 17: Waste Container Cap with Tubing Connectors

Reagents / Solutions

Reagents

The ALCYON Analyzer is an open system, manufactured with general purpose features for use with secondary reagents.

ISE Analysis Solutions

The ALCYON Analyzer with ISE module utilizes the following solutions when performing Na^+, K^+, and Cl^- tests:

- **ISE stabilizing solution**—an aqueous solution containing specific amounts of sodium, potassium, and chloride ions aspirated between each sample to keep the electrodes moist and to ensure a proper baseline for measurement.
- **ISE sample diluent**—ionic buffer used to dilute the sample when running ISE tests.
- **ISE reference solution**—a potassium chloride solution used in the reference electrode.

  NOTE: The reference solution contains potassium chloride that limits the life of the electrode membranes if allowed to contact the electrodes.

ISE Maintenance Solutions

- **ISE deproteinizer solution**—bleach solution used for daily maintenance.
- **ISE Na^+ conditioning solution**—used for daily maintenance.
- **ISE cleaning solution**—weak detergent used weekly for cleaning.

Cuvette Management Center

Reaction Cuvettes

Reaction cuvettes are provided as disposable segments used on the reaction carousel. A segment has 12 reaction cuvettes. The reaction carousel has nine positions and can hold up to eight cuvette segments (96 reaction cuvettes) at once (one position is always unloading). Reaction cuvettes have a path length of 0.5 cm.

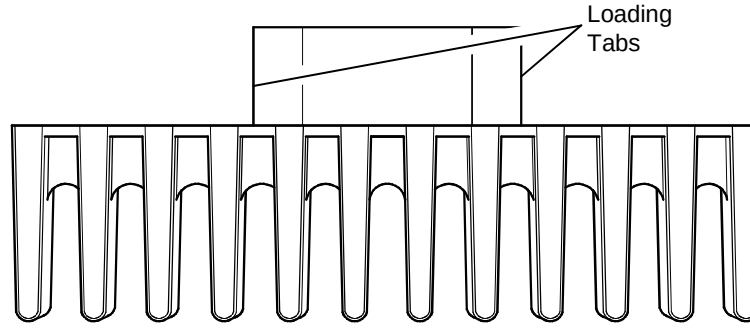


Figure 18: Reaction Cuvette Segment

NOTE: Care should be used when handling reaction cuvette segments. Touch only the loading tabs.

NOTE: Reaction cuvettes should be stored at room temperature. Do not store heavy objects on top of the reaction cuvettes.

Automatic Cuvette Load / Unload Module

The automatic cuvette load / unload module loads and unloads reaction cuvette segments when required. Two optical sensors detect when new reaction cuvettes must be added, and when used reaction cuvettes must be removed. New reaction cuvettes are added on the right side of the module. The cuvette guide helps the Operator load reaction cuvettes correctly. Used reaction cuvettes are automatically pushed up on the left side of the module, to be removed and discarded by the Operator. An audible alarm alerts the Operator when this task should be performed. Reaction cuvette segments can be loaded or unloaded any time, while the Analyzer is operating or idle. The automatic cuvette load / unload module holds up to 11 new segments (132 reaction cuvettes).

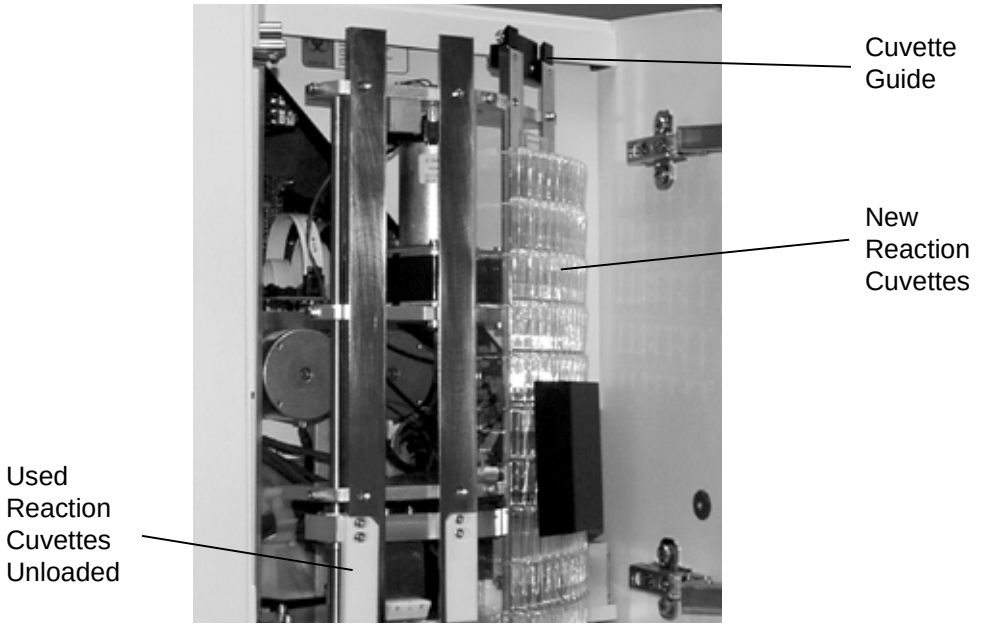


Figure 19: Automatic Cuvette Load / Unload Module

Processing Center

Reaction Cuvette Temperature Control

Reaction cuvette temperature is controlled by a programmable air bath using the control located on the central wall of the ALCYON Analyzer. A 30.0°C or 37.0°C incubation temperature is used to perform chemistry analysis. This setting should match the preheater temperature. Use the arrow keys <↑> <↓> to set the temperature control to the desired temperature. Refer to **Instrument Set-Up** in *Section 2, Installation Procedures and Special Requirements* of the **ALCYON Operations Manual**.

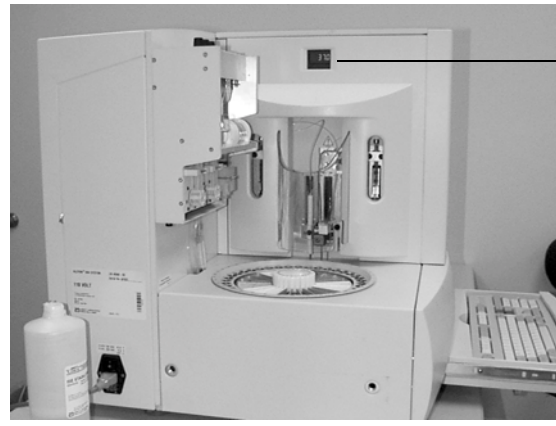


Figure 20: Reaction Cuvette Temperature Control

Optical System

The ALCYON Analyzer optical system is comprised of a static photometer with six individual filter positions. The tungsten-halogen lamp is located behind an access door on the right side, toward the rear of the Analyzer. Light is transferred to the photometer using a separate optical fiber for each wavelength. Each of the six positions contains its own specific filter, detector, and A/D (analog / digital) converter optimized for its specific wavelength. The six wavelengths measured are:

- 340 nm
- 380 nm
- 405 nm
- 500 nm
- 550 nm
- 600 nm

During every cycle, each active cuvette passes in front of the photometer, and the absorbance for all six wavelengths is measured and recorded.

Photometric reproducibility	± 0.0001 at 1.0 A ± 0.0003 at 2.0 A
Wavelength filter band width (HWHM)	≤ 12 nm
Wavelength accuracy	± 3 nm

System Control Center

Computer

The ALCYON Analyzer is controlled by an incorporated computer capable of saving up to 1.2 million patient files. A floppy disk drive is also included to allow for future software upgrades and data download.

An RS-232 port provides the capability to connect the ALCYON Analyzer to a Host computer.

Keyboard and Touchscreen

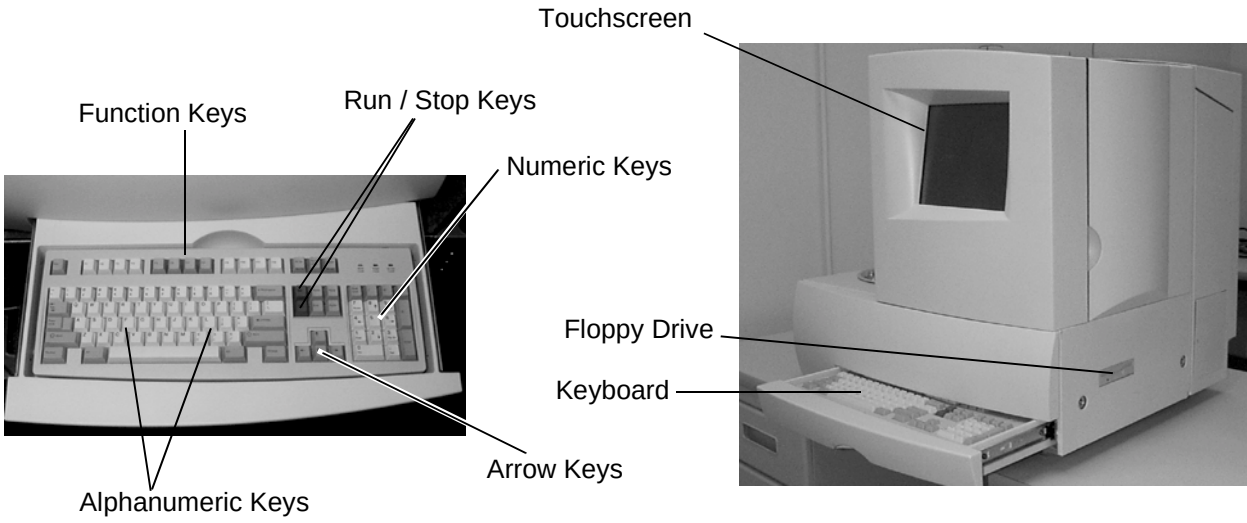


Figure 21: Keyboard and Touchscreen

The keyboard and touchscreen are used to access all functions of the Analyzer.

- The arrow keys are used to navigate through the menu options.
- The **Enter** key is used to accept data.
- The **F2** key is used to view the Analyzer status.
- The **F10** key is used to validate / save data.
- The **ESC** key is used to return to the previous menu without saving or validating data.

Printer

A dot matrix printer is shipped with the ALCYON Analyzer.

Modem Diagnostics

The ALCYON Analyzer has optional modem capabilities.

NOTE: Modem diagnostics may not be available in all areas.

Power Input

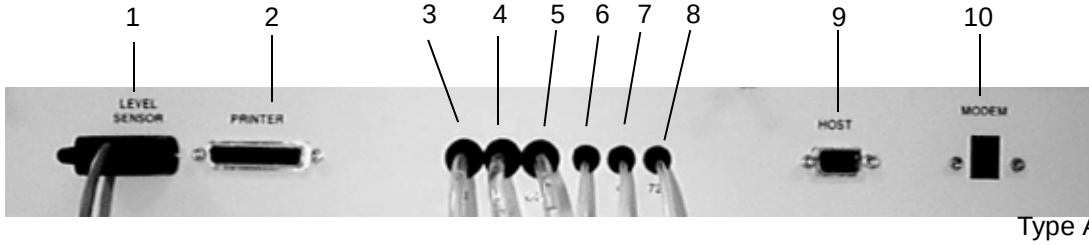
The Main Power Switch is located on the left side of the Analyzer, in the lower rear-left corner.

The AC power connector is located below the Main Power Switch.

Figure 22: Power Input

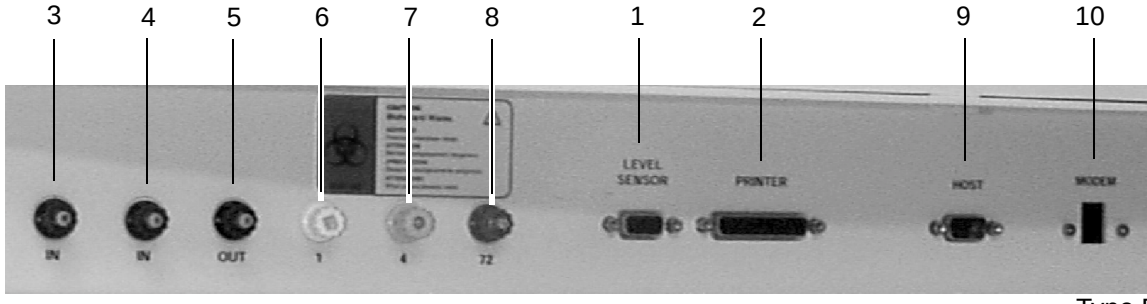
Ports

The following illustrations and table identify the ports located on the rear of the ALCYON Analyzer.



Type A

or



Type B

Figure 23: ALCYON Analyzer Ports, Rear Panel

No.	Port Name	Description
1	LEVEL SENSOR	For the sensor that monitors liquid level in the water container (9-pin female)
2	PRINTER	For external printer (25-pin female)
3	IN	Sample water supply input (1/4” tubing)
4	IN	Reagent water supply input (1/4” tubing)
5	OUT	Sample and reagent waste output (1/4” tubing)
6	1	* ISE stabilizing solution supply input (1/8” tubing)
7	4	* ISE liquid waste output (1/8” tubing)
8	72	* ISE liquid waste output (5/32” tubing)
9	HOST	For communications to a laboratory computer (9-pin male)
10	MODEM	Telephone line connection (RG11 female)

* = Units with ISE module only

Analyzer Serial Number

The serial number is located on the left side of the Analyzer on the lower rear-left corner.

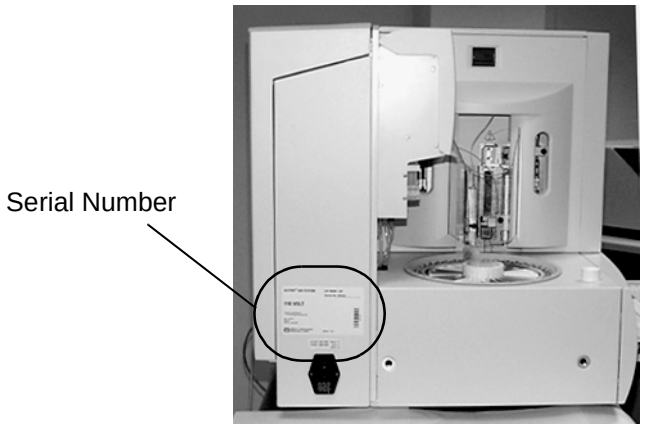


Figure 24: Analyzer Serial Number

Power Conditioner

The ALCYON Analyzer is shipped with a power conditioner, designed to provide a clean source of power.

NOTE: Only the ALCYON Analyzer and a printer should be plugged into the power conditioner. The power conditioner should be plugged into a properly wired outlet.

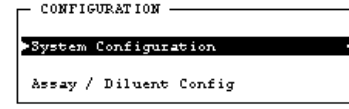
NOTE: The power conditioner is **not** an uninterruptable power supply (UPS).

LIS Interface Configuration

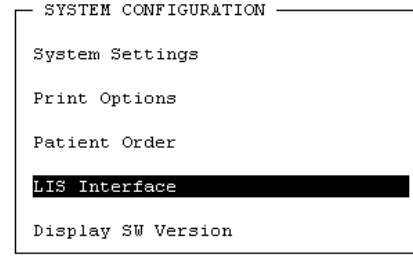
Use this option to define parameters for interfacing with the Host computer.

1. Begin at the MAIN MENU, as shown below:

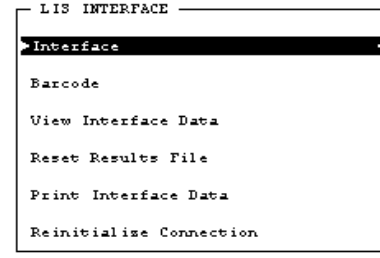
2. Select **Configuration**. The screen displays an additional menu as shown:



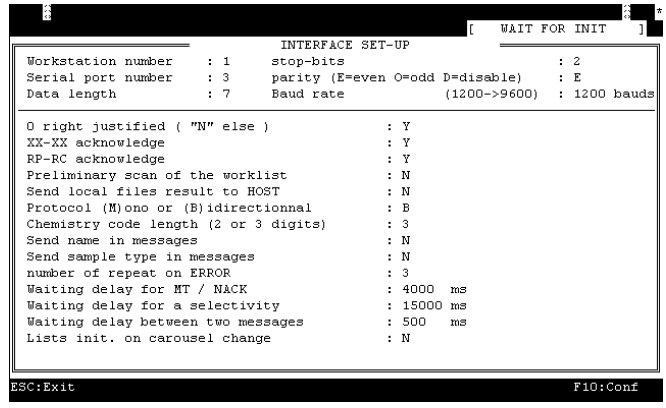
3. Select **System Configuration**. The screen displays an additional menu as shown:



4. Select **LIS Interface**. The screen displays an additional menu as shown:



5. Select **Interface**. The screen displays:



6. Select each item necessary to match specifications of your Host computer. Type the entry, then press **<Enter>**. Choices include:

   - **Workstation Number**—a one- or two-digit identifier used to designate each Analyzer connected to a Host computer. Workstation numbers 1 to 99 are supported by the Analyzer. The default setting is **1**.
   - **Serial Port Number**—a number equivalent to the communications (COM) port identifier used to describe each of the COM ports. The serial port number on the Analyzer must be set to **3**, the default setting.
   - **Data Length**—designates the number of bits transmitted to represent each character sent or received by the Analyzer through Host communication interface. Data lengths of 7 or 8 bits are supported by the Analyzer through the Host computer interface. This setting must match the data length setting on the Host computer. The default setting is **7** bits.
   - **Stop-Bits**—signal the end of a character sent or received by the Analyzer. The number of stop-bits supported by the Analyzer is either 1 or 2. This setting must match the stop-bits setting on the Host computer. The default setting is **2** stop-bits.
   - **Parity**—an optional method used by the Analyzer to perform error checking on the data received from the Host computer interface. The parity settings that are supported by the Analyzer are “even”, “odd”, and “disabled”. The default setting is **even**.
   - **Baud Rate**—the number of times per second the data signal changes on the Host computer interface. Baud rates of 1200 bps, 2400 bps, 4800 bps, and 9600 bps are supported by the Analyzer. The default setting is **1200** bps.

- **0 Right Justified**—if **Y** (yes), chemistry numbers and sample IDs are padded with leading zeros to the left (*e.g.*, 3 = 003, 45 = 045, etc.). If **N** (no), the numbers are padded with space bar characters. The default setting is **Y**.
- **XX-XX Acknowledge**—if **Y**, the Analyzer transmits a counter and sample position to the Host. If **N**, the Analyzer sends 0000-00. The default setting is **Y**.
- **RP-RC Acknowledge**—used if the length of a result message is longer than 255 characters.
  - If **Y**, two messages with the same patient number are sent to the Host computer. The first message is identified by an RP header (R = results, P = partial), and the second message by an RC header (R = results, C = complete).
  - If **N** is selected, two messages with the same patient number are sent to the Host computer without any discrimination.
- **Preliminary Scan of the Worklist**—if **Y**, bar codes will be read when not interfaced to the Host. If **N**, bar codes will not be read.

  NOTE: This option is used for unidirectional communication when a Worklist is set up and bar coded tubes are used.

  CAUTION: The Analyzer scans bar codes and runs the tests associated with the **Patient Identification Number**. When using this option, the bar code labels must match patient identification. If a patient identification number is not entered, the **Patient Identification Number** defaults to the number entered for **Sample Identification**.
- **Send Local Files Result to HOST**—if **Y**, the Analyzer transmits complete results to the Host. If **N**, the completed results are not transmitted.
- **Protocol (M)ono or (B)idirectional**—select from:
  - **(M)ono** when the Analyzer only sends results without waiting for an acknowledgment message.
  - **(B)idirectional** when messages are received from the Host computer and handshaking is performed with an acknowledgment character.
- **Chemistry Code Length**—chemistry codes can be 2 or 3 digits long, and must be the same as the Host configuration.

- **Send Name In Messages**—if **Y**, the name is transmitted to the Host.
- **Send Sample Type In Messages**—if **Y**, sample type (serum or urine) is transmitted to the Host. This parameter must be the same as the Host configuration.
- **Number of Repeat on ERROR**—controls the number of times that the Analyzer will resend the same message when an error occurs.
- **Waiting Delay for MT / NACK**—the time delay for the receipt of Message Toggle (MT). The default is **4** seconds (4000 milliseconds).
- **Waiting Delay for a Selectivity**—the time delay between frames.
- **Waiting Delay Between Two Messages**—the time delay between transmission and reception of two messages.
- **Lists Init. on Carousel Change**—if **Y**, the Analyzer retransmits the Reagent Carousel configuration to the Host if the current Reagent Carousel configuration has changed.

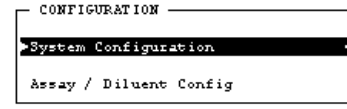
7. Confirm entries by pressing **<F10>**.
8. Press **<ESC>** to return to the previous screen.

Bar Code Configuration

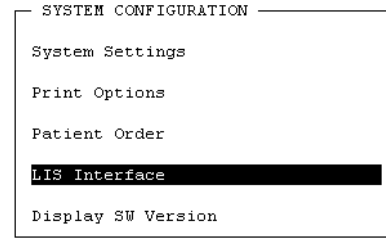
Use this option to specify the type of bar codes to be used with the Analyzer.

1. Begin at the MAIN MENU, as shown below:

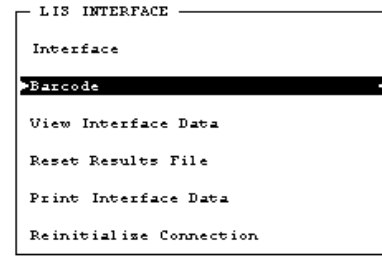
2. Select **Configuration**. The screen displays an additional menu as shown:



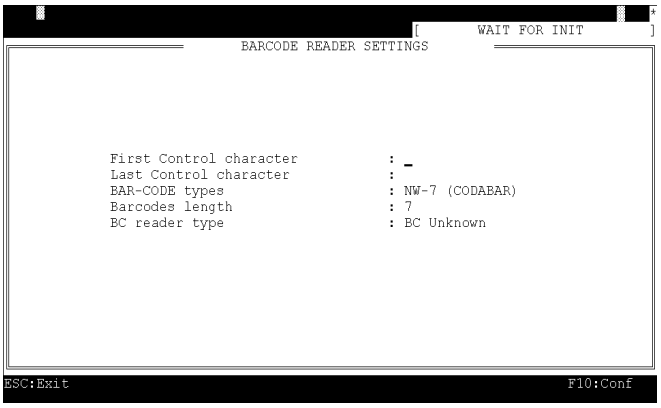
3. Select **System Configuration**. The screen displays an additional menu as shown:



4. Select **LIS Interface.** The screen displays an additional menu as shown:



5. Select **Bar code**. The screen displays:



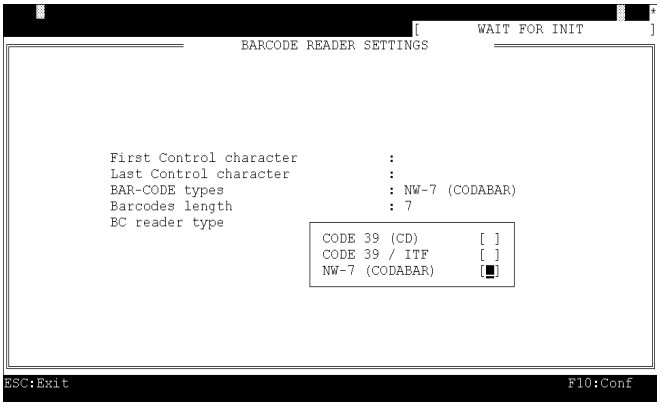
Control characters are not a part of the bar code number. To determine which characters are control characters on your labels, contact your label provider.

6. Select the bar code type of the patient samples as shown. Press **<Enter>**. The screen displays the following three options:

   - Code 39 (CD)—(Code 39 with Check Digit)
   - Code 39 / ITF—(Code 39 or Interleaved 2 of 5 without Check Digit)

     NOTE: Code 39 and Interleaved 2 of 5 symbologies cannot be used simultaneously.

   - NW-7 (CODABAR)—(CODABAR / NW-7 / Monarch)



7. In the Bar Code Length field, type the character length required by the symbology. Press **<Enter>**.

NOTE: Only the number of characters entered in the Bar Code Length field are read. The Bar Code Length field **must** match the number of digits in the Sample field, regardless if the sample ID originates from the bar code or is manually entered on the Analyzer. If additional numbers are encoded on the bar code label, they will be truncated from the left.

NOTE: When transmitting results, the ALCYON Analyzer pads the identification number with either leading zeros or space bar characters (depending on the setting of the 0 right justified parameter), up to 15 characters. If the 0 right justified parameter is configured to **Y** (yes), chemistry numbers and sample IDs are padded with leading zeros to the left (*e.g.*, 3 = 003, 45 = 045, etc.). If **N** (no), the numbers are padded with space bar characters. The default setting is **Y**.

8. Confirm entries by pressing **<F10>**.

9. The following chart describes the ALCYON Analyzer bar code reader settings:

Code 39 w/ Check Digit (CD)		
First Control Character	: *	**REQUIRED**
Last Control Character	: *	**REQUIRED**
Bar Code Types	: CODE 39 (CD)	
Bar Codes Length	: No. of Bar Code Data Characters	**ONLY**
	*(Must **NOT** include the no. of control characters or the check digit. Ex: *123013A* Length = 6.* *Leading zeros are not allowed.* *Maximum no. of data characters is 6)*	
BC Reader Type	: xxxxxx	

Code 39 w/o Check Digit		
First Control Character	: *	**REQUIRED**
Last Control Character	: *	**REQUIRED**
Bar Code Types	: CODE 39 / ITF	
Bar Codes Length	: No. of Bar Code Data Characters	**ONLY**
	*(Must **NOT** include the no. of control characters or the check digit. Ex: *1230113* Length = 7.* *Leading zeros are not allowed.* *Maximum no. of data characters is 7)*	
BC Reader Type	: xxxxxx	

NOTE: For Code 39 symbology, the check digit (CD) is the character to the far right before "*". This character must **not** be entered on the Host computer.

Interleaved 2 of 5		
First Control Character	:	**Must be blank**
Last Control Character	:	**Must be blank**
Bar Code Types	: CODE 39 / ITF	
Bar Codes Length	: No. of Bar Code Data Characters without leading zeros	**ONLY**
	(Ex 1: 123456789 Length = 9. *Ex 2: 0123456789 Length = 10.* *No letters are allowed.* *Maximum no. of data characters is 15)*	
BC Reader Type	: xxxxxx	

CODABAR		
First Control Character	: a	**REQUIRED**
Last Control Character	: a (First and Last control characters can be any character, but **must be equal**)	**REQUIRED**
Bar Code Types	: NW-7 (CODABAR)	
Bar Codes Length	: No. of Bar Code Data Characters	**ONLY**
	*(Must **NOT** include the no. of control characters* *Ex: a123013456a Length = 9.* *Leading zeros are not allowed.* *Maximum no. of data characters is 10)*	
BC Reader Type	: xxxxxx	

Quick Reference Table

Symbology	1st Cntl Char	2nd Cntl Char	BC Option	Length (L)	Check Digit	Leading Zero
Code 39 CD	*	*	Code 39 (CD)	2 ≤ L ≤ 6	Yes	No
Code 39	*	*	Code 39 / ITF	2 ≤ L ≤ 7	No	No
I 2 of 5	Blank	Blank	Code 39 / ITF	3 ≤ L ≤ 10 (Including any leading zero)	No	Yes (Must not be included in Length)
CODABAR	a	a	CODABAR	3 ≤ L ≤ 10 (Cntl Chars are excluded)	No	No

NOTE: For Code 39 symbology, the check digit (CD) is the character to the far right before "*". This character must **not** be entered on the Host computer.

Bar Code Labels for the ALCYON Analyzer

Types

- Code 39 (CD) (Code 39 with Check Digit)
- Code 39 / ITF (Code 39 or Interleaved 2 of 5 without Check Digit)
- NW-7 (CODABAR) (CODABAR / NW-7 / Monarch)

Bar Code Requirements

Determine the type of bar code reader contained in your Analyzer, by removing the front bezel and reading the CAUTION label. Remove the front bezel as shown below:

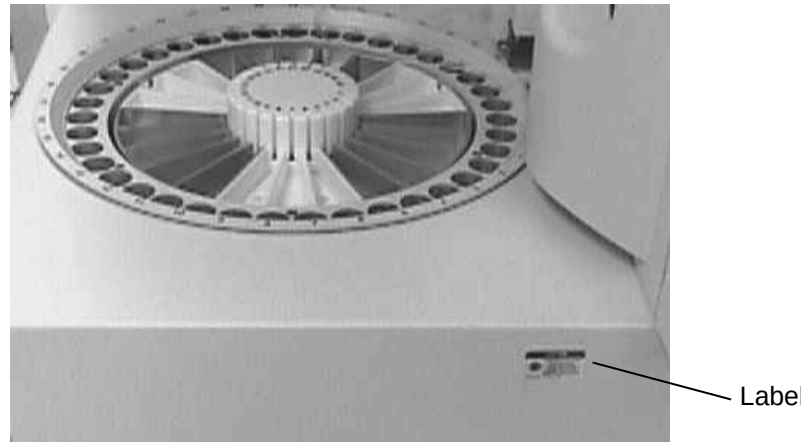


Figure 25: Bar Code Reader Caution Label Location

The label will caution against either Laser Radiation or LED Radiation.

Laser Label LED Label

Figure 26: Bar Code Reader Caution Labels

Refer to the bar code requirements below for each type of bar code reader:

- A minimum of 4 mm white space must be above and below the bars on the bar code label. (Laser and LED)
- The bar section of the bar code must be less than or equal to 30 mm. (Laser and LED)

- The bottom bar of the bar code label must be placed 15 mm above the bottom of the sample tube. (Laser and LED)
- There must be a sharp delineation between black and white bars on the bar code. (Poor printer quality could cause bar codes to be misread.) (Laser and LED)
- Density ≥ 9 mils (Laser)
- Density 5 - 10 mils (LED)
- Ratio: 3-to-1 (Laser and LED)
- Ratio: 2-to-1 (LED only)

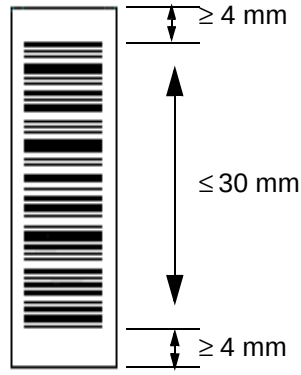


Figure 27: Bar Code Label

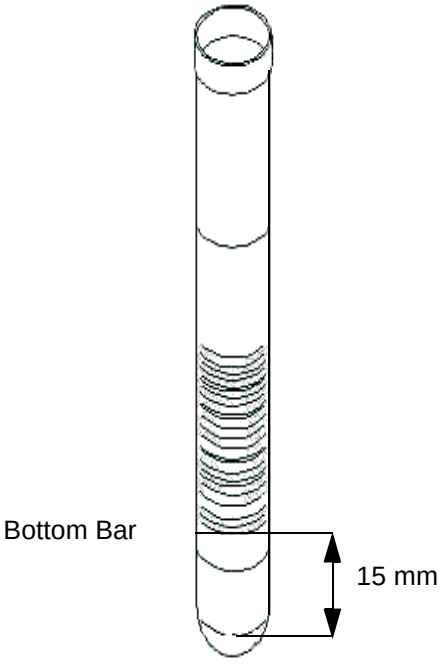


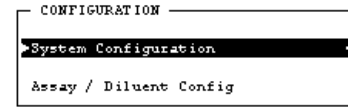
Figure 28: Placement of Bar Code Label on the Tube

View Interface Data

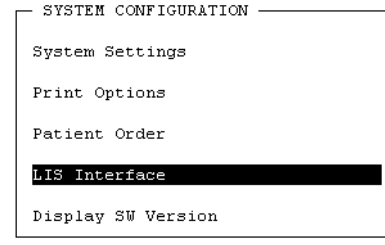
Use this option to view the messages exchanged between the ALCYON Analyzer and the Host computer.

1. Begin at the MAIN MENU, as shown below:

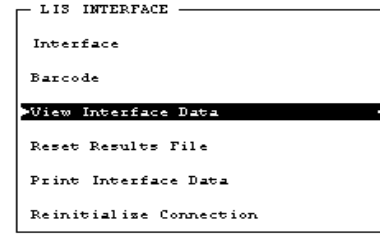
2. Select **Configuration**. The screen displays an additional menu as shown:



3. Select **System Configuration**. The screen displays an additional menu as shown:



4. Select **LIS Interface.** The screen displays an additional menu as shown:



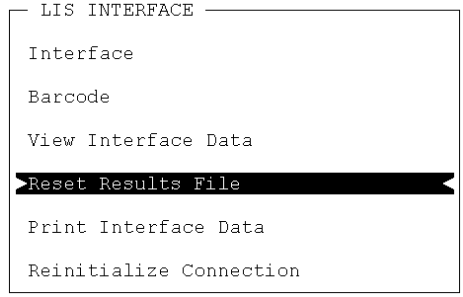
5. Select **View Interface Data**. The screen displays the data, as shown in the example below:

```
 8:  H:0
 9:  H:2I [
10:  A:2
11:  H:3S @
12:  A:3
13:  *:Chemistry Configuration
14:  A:(2) 1C 0101016013006007001094095096 (13) (10)^(3)
15:  H:1
16:  *:Request
17:  A:(2) 2Q 01-02000000000001234 (13) (10)^(3)
18:  H:2
19:  H:4Y 000000000001234 John Smith                          S096 (13) (10) z
20:  A:4
21:  *:Results
22:  A:(2) 3RC000000000001234 S00001-02 30/03/99 09:54001 (13) (10) 096      1.0      (13
)(10)h(3)
23:  H:3
24:  H:5Z 00000
25:  A:5
```

6. Press any key, except **<ESC>**, to view additional data.
7. Press **<ESC>** to return to the previous screen.

Reset Results File

The following option is not currently available:

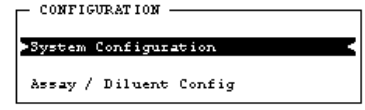


Print Interface Data

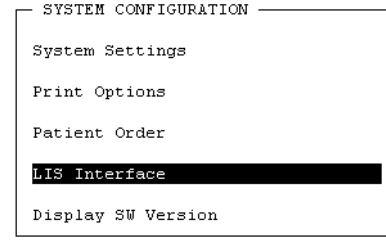
Use this option to print the messages (data stream) exchanged between the ALCYON Analyzer and the Host computer.

1. Begin at the MAIN MENU, as shown below:

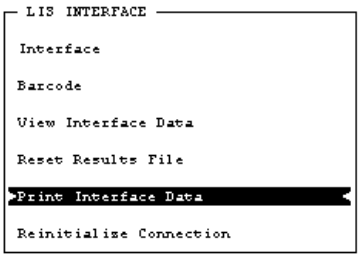
2. Select **Configuration**. The screen displays an additional menu as shown:



3. Select **System Configuration**. The screen displays an additional menu as shown:



4. Select **LIS Interface**. The screen displays an additional menu as shown:



5. Select **Print Interface Data**. The Analyzer prints the messages (data stream) on the printer and the message "Printing Interface Data. <ESC>" appears on the bottom of the screen.

6. Press **<ESC>** to return to the previous screen.

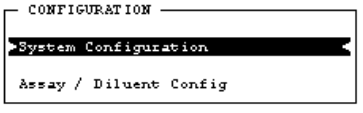
Reinitialize Connection

Use this option to reconnect the ALCYON Analyzer and Host computer.

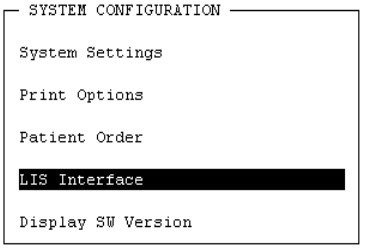
NOTE: The Host computer must establish the initial connection to the Analyzer.

1. Begin at the MAIN MENU, as shown below:

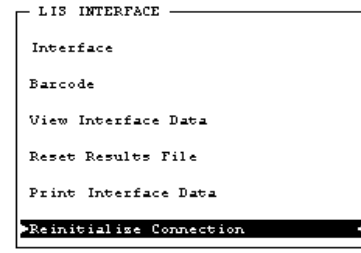
2. Select **Configuration**. The screen displays an additional menu as shown:



3. Select **System Configuration**. The screen displays an additional menu as shown:



4. Select **LIS Interface**. The screen displays an additional menu as shown:



5. Select **Reinitialize Connection**. The Analyzer reconnects to the Host computer. The message "Instrument On Line <ESC>" appears at the bottom of the screen. The message in the upper-right corner is "Instrument Master".

6. Press **<ESC>** to return to the previous screen.

Running Tests Downloaded from a Host Computer

General Information About Interfacing

The ALCYON Analyzer interface is compatible with many Host computer systems. Interface can be accomplished by using either the LIS mode or LIS download modes.

Bidirectional Mode

There are two interface modes described below:

NOTE: Sample IDs (SID) and tests must be entered on the laboratory computer (Host).

NOTE: The ALCYON Analyzer pads the identification number with either leading zeros or space bar characters (depending on the setting of the 0 right justified parameter), up to 15 characters. If the 0 right justified parameter is configured **Y** (yes), chemistry numbers and sample IDs are padded with leading zeros to the left (*e.g.*, 3 = 003, 45 = 045, etc.). If **N** (no), the numbers are padded with space bar characters. The default setting is **Y**.

- **LIS Mode**—in this mode, bar coded tubes or non-bar coded tubes / cups may be used. The sample ID is either manually entered on the Analyzer (for non-bar coded tubes or cups) or read from the bar code label on the tube. Using the sample ID, the Analyzer then queries the Host computer for the tests to be run. The Host computer downloads the tests; the Analyzer runs the tests, and results are uploaded to the Host computer.
- **LIS Download**—in this mode, a Worklist is created on the Host computer, then downloaded to the Analyzer. The downloaded Worklist must be printed. Tubes or cups are loaded in the appropriate position, then run. When the tests are completed, results are uploaded to the Host computer.

  CAUTION: Review the printed downloaded list. If the CHEM.LIST field is blank for any patient, DO NOT PROCEED. Refer to the **CAUTION** statements found under **LIS Download and LIS List / Run** later in this manual.

Unidirectional Mode

When using unidirectional mode, manually enter sample IDs and tests on both the ALCYON Analyzer and Host computer. The Analyzer runs the tests, then uploads results upon completion.

Establishing Communication

NOTE: The Host computer must establish the initial connection to the Analyzer.

NOTE: During communication, any informational messages or error messages are displayed in the upper-right portion of the screen. Examples of these interface messages are explained later in this section.

1. Power on the Analyzer and wait for the MAIN MENU to display on the screen.

   `[WAIT FOR INIT]` appears in the upper-right corner.

2. Initialize the connection from the Host computer (use information provided by the Host computer vendor).

   The following messages are displayed quickly, in sequence, in the upper-right corner of the ALCYON Analyzer screen as communication is being established:

   `[CONNECTED]`

   `[INSTRUMENT MASTER]`

   `[CONFIG TRANSMITTED]`

3. Proceed to one of the following modes of operation once the connection is successful:

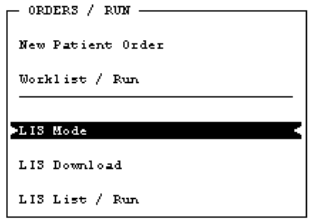
   - LIS mode
   - LIS download

LIS Mode

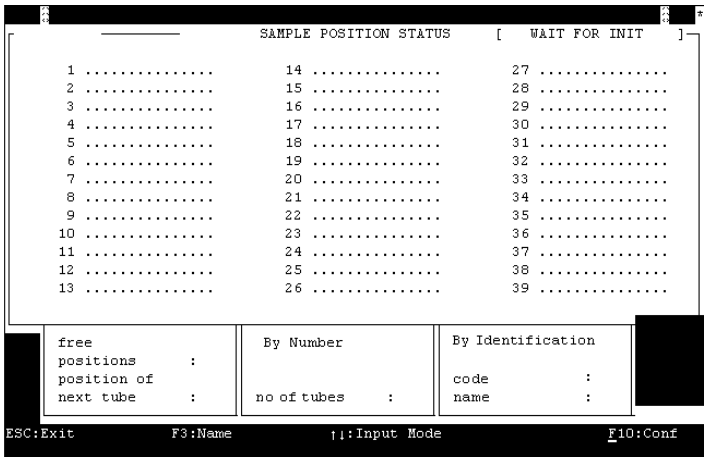
Use the following instructions to download tests from a Host computer utilizing the LIS mode.

1. Begin at the MAIN MENU, as shown below:

2. Select **Orders / Run**. The screen displays an additional menu as shown:



3. Select **LIS Mode**. The screen displays:



NOTE: STATS, controls, and calibrators cannot be requested from this screen. Only routine samples can be requested from this screen.

NOTE: The length of the identification number on the bar code must match the Bar Code Length field on the **Bar Code Reader Settings** screen.

NOTE: Correct bar code label placement is necessary. Place the label on the tube so that the bottom bar of the bar code is approximately 15 mm above the bottom of the tube.

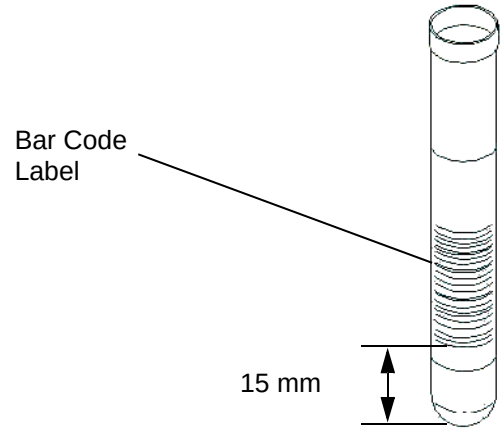


Figure 29: Correct Placement of Bar Code Label

NOTE: When **<F10>** is pressed to confirm test processing, the Analyzer scans the bar codes, then sends a message to the Host computer requesting tests to be run on that sample. The Analyzer waits for a response from the Host computer. This response must come within the time period specified on the **Interface Set-Up** screen. If the Host computer has test requests for the sample, it downloads them to the ALCYON Analyzer. All data exchanges between the Host computer and the Analyzer occur almost immediately. As a result, when **<F10>** is pressed, test processing begins immediately.

4. Use the arrow keys <↑> or <↓> to toggle between the following options:

   - Select **By Number** for sample tubes identified by bar code.

     a. Place tubes in the Sample Carousel, starting with the position of the next tube displayed on the screen (lower-left quadrant). Place the bar code labels facing the blue number position on the Sample Carousel.

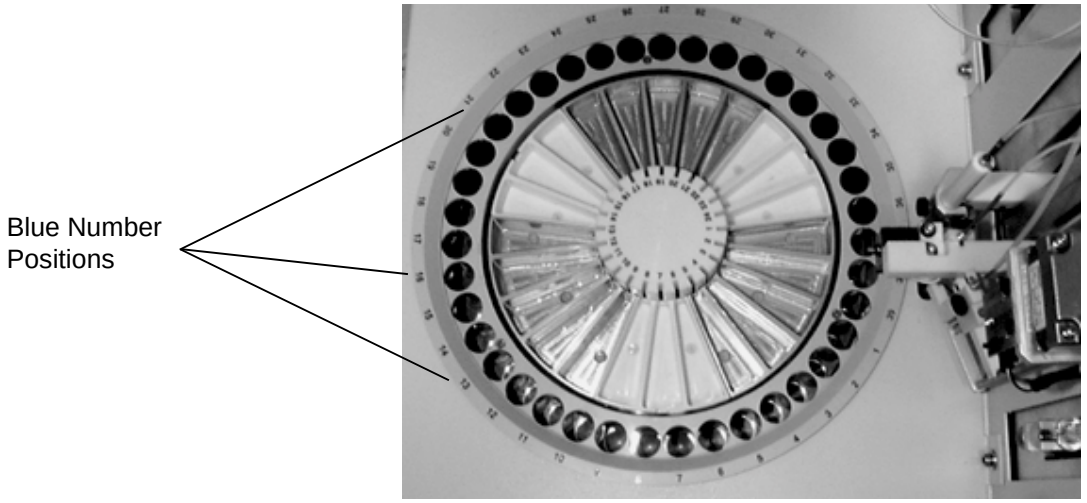


Figure 30: Tube Placement on Sample Carousel

     b. Enter the number of tubes placed on the carousel.

     c. Press **<F10>** to confirm.

Processing begins immediately!

WARNING: Moving Parts. Refer to *Section 8, Hazards* of the **ALCYON Operations Manual**.

     d. Press **<ESC>** to return to the previous screen.

   - Select **By Identification** for sample tubes without bar codes, or sample cups.

     a. Place tube(s) or cup(s) in position of the next tube displayed on the screen (lower left).

     b. Enter the identification number in the Code field.

     c. Press **<F10>** to confirm.

Processing begins immediately!

WARNING: Moving Parts. Refer to *Section 8, Hazards* of the **ALCYON Operations Manual**.

d. Repeat this procedure for all additional samples.

e. Press **<ESC>** to return to the previous screen.

Messages Displayed on the Screen

The following messages may display during an ID mode run.

Black messages displayed on a white background indicate free positions	
`.....`	• Indicates a free position (tube with or without a bar code label can be placed here).
`Read error`	• The bar code reader was unable to read the bar code label. (This message is also printed on the report.)
`Not started`	• Sample does not have chemistries selected, according to the Host computer. • Sample required chemistries which were not available on the current Reagent Carousel. • (A communication failure occurred between the ALCYON Analyzer and the Host computer during processing.) This message appears at the first sample position affected, and any subsequent carousel positions.
`Finished tube`	• Chemistries are completed for this tube.
White messages blinking on a black background indicate positions used for ID mode are running	
`1234567*`	• Tube read by the bar code reader but not yet run.
`1234567`	• Number entered manually for one position (the sample ID was not read by the bar code reader).
`.....`	• Positions programmed to be processed which have not yet been read by the bar code reader.
White messages not blinking on a black background indicate tubes being processed	
`Manual entry`	• Position taken by sample entered manually in “tests entry” menu.
`Calibration`	• Position taken by calibrator.
`1234567`	• Chemistries have been run for this tube.
`Control Name (user defined)`	• Locations identified by CTL.
`Busy`	• Identifies STAT positions during processing.

Italicized text in the table above (*i.e., 1234567*) is an example, the screen displays actual data.

LIS Download and LIS List / Run

CAUTION: The conditions listed below must be met before using the LIS download and LIS list / run options for establishing a bidirectional interface. Contact your LIS Host vendor to ensure these conditions are met.

The Host computer software must be able to:

1. Receive current Reagent Carousel information (“C” message) from the ALCYON Analyzer. Refer to **<C > Message** in this manual for more information.
2. Sort the downloaded list so that only test requests with reagents and/or diluents configured on the current Reagent Carousel are downloaded.

Configure the Lists Init. on Carousel Change parameter on the ALCYON Analyzer to **Y** (yes). Refer to **LIS Interface Configuration** in *Section 2, Installation Procedures and Special Requirements* of the **ALCYON Operations Manual**.

The Host must:

1. Download at least one test configured on the current Reagent Carousel for each sample.

   CAUTION: Do **not** download a sample without a test ordered.

2. Sort by current Reagent Carousel configuration, and transmit a new downloaded list every time the Reagent Carousel is modified.

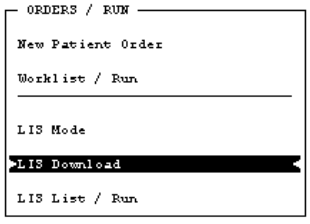
The printed downloaded list must be used as the reference to place each sample in the designated position on the Sample Carousel.

NOTE: The downloaded list can only be removed from the Analyzer memory by cycling the power. Otherwise, each downloaded list is designated by the next sequential number.

Use the following instructions to download a list from the Host computer to the ALCYON Analyzer.

1. Begin at the MAIN MENU, as shown below:

2. Select **Orders / Run**. The screen displays an additional menu as shown:



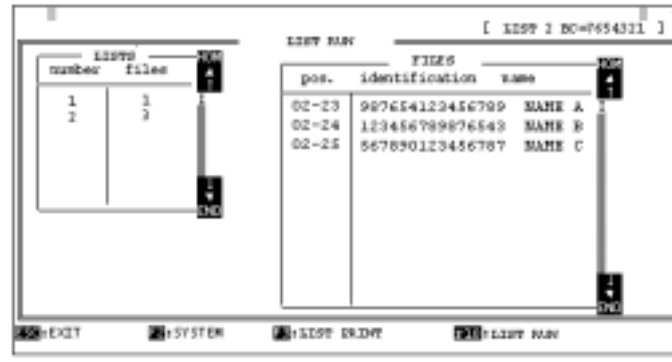
3. Select **LIS Download**.
4. Press **<F3>** to view previously downloaded list(s). (If none were previously downloaded, no list displays.)
5. Press **<ESC>**.
6. Use a one-digit or two-digit number, not previously used, to identify a list. Enter the number of the list and press **<Enter>**.
7. Type the exact number of files (samples) to be downloaded in this list and press **<Enter>** or **<F10>**.

   CAUTION: The number of files downloaded must correspond to the number of files requested, or the Worklist does not download. No error will be seen, though the communication status in the upper-right corner of the screen appears to indicate the tests were downloaded. These tests are not stored by the ALCYON Analyzer.

8. Press **<ESC>** to return to the **Orders / Run Menu** screen.
9. Select **LIS List / Run**.

10. Select the list to be run and press **<Enter>**. An additional list displays on the right side of the screen.

CAUTION: The displayed list is a list of samples downloaded from the Host computer. **Do not load the Sample Carousel using the list displayed on the screen.** Use the downloaded list printed in the following step.



11. Press **<F3>** to print the list, as shown in the example below. The samples must be loaded on the Sample Carousel using the Sample Carousel position number indicated on the printed downloaded list.

CAUTION: Review the printed downloaded list. If the CHEM.LIST field is blank for any patient, DO NOT PROCEED. Refer to the **CAUTION** statement found at the beginning of this section.

downloaded list no 2

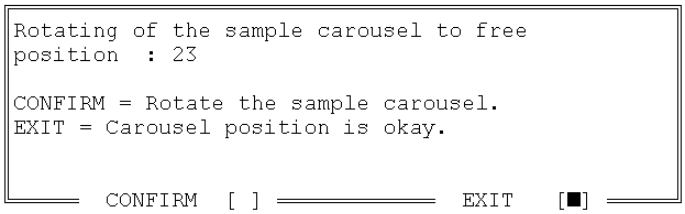
POSITION	IDENTIFICATION	NAME	CHEM.LIST
02-23	987654123456789	NAME A	BILI T
02-24	123456789876543	NAME B	AC URI AMY
02-25	567890123456787	NAME C	AMY

Sample Carousel Position Number

Run Number

12. Place the samples in the indicated positions on the printed list, then press **<F10>** to confirm.

13. The screen displays:



If the carousel needs rotation to access the indicated position(s) on the printed list, select **CONFIRM** and press **<Enter>**.

If the carousel does not need rotation, select **EXIT** and press **<Enter>**.

14. Verify the samples were placed in the appropriate positions according to the printed list.

15. Press **<Enter>** to confirm.

NOTE: The list prints automatically when **<F10>** is selected.

NOTE: If a read error occurs, the sample is not processed.

Processing begins immediately!

WARNING: Moving Parts. Refer to *Section 8, Hazards* of the **ALCYON Operations Manual**.

16. Press **<ESC>** to return to the previous menu.

Interface Messages

The following interface messages are displayed in the upper-right corner of the screen.

Message	Explanation
[REQUEST BC = 123456789123456]	Displayed when the Analyzer issues a request to the Host computer by sending a sample ID read from a bar code label or manual entry.
[CODE = 1234567891234 Y/N] **NOTE:** When 14 or 15 characters are used, Y/N is not displayed.	Response of the Host computer to a request from the ALCYON Analyzer with the sample ID number followed by: • **Y**—if tests are to be run for this sample or • **N**—if no tests are ordered at the Host computer for this ID
[LOAD LIST # 01]	Displayed when the Host computer downloads a list.
[RESULTS 123456789123456]	Displayed during transmission of results to the Host computer.
[UC OVERFLOW]	Displayed when the Host computer cannot accept a result. The ALCYON Analyzer automatically tries to send results again in five minutes.
[UC READY]	Displayed when the Host computer is able to receive results again.
[WAIT FOR re-INIT]	Displayed when the ALCYON Analyzer is waiting for a reinitialization from the Host computer, following a break in communication.

Host Interface Scope

These specifications apply to on-line communication between the ALCYON Analyzer and the external data processing unit (Host).

The responsibility of the Analyzer for the RS-232C interface ends with the communication connector. The broken line in the figure below shows the boundary of the operating domain.

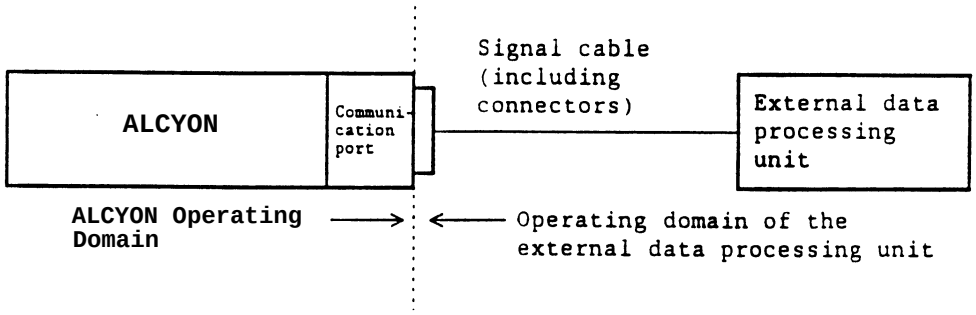


Figure 31: Domain Boundary

Overview

The ALCYON Analyzer is equipped with an on-line communication function which enables the Analyzer to send the sample results to the Host and to receive order requests.

The Analyzer utilizes two types of on-line communication:

- Analyzer as master
- Host as master

The Analyzer is connected directly to the Host with a standard null modem cable. The Analyzer operates in two basic communication modes, *i.e.*, bidirectional and unidirectional.

Hardware Specifications

Interface Specifications

Transmission method	Asynchronous, full-duplex, RS-232C
Baud rate	9600, 4800, 2400, or 1200 bps (selectable). The baud rate is specified on the **Interface Set-Up** screen.
Bit composition	[Data] or [Character length] 7 or 8 bits. The character length is specified on the **Interface Set-Up** screen.
	[Parity] 1 bit. Disable, E, O (selectable). The parity bit is specified on the **Interface Set-Up** screen.
	[Stop-bit] 1 or 2 bits. The stop-bit is specified on the **Interface Set-Up** screen.
Connector	9-pin D-sub connector, female on the cable side
Signal level (RS-232C)	+5 V ~ +15V: “0” - 3 V ~ -15 V: “1”
Maximum cable length	10 m (RS-232)
Hardware handshake	Handshake is performed by the DSR / DTR control signals

Bit Composition

An example of bit composition for a data length of 7 bits is shown below:

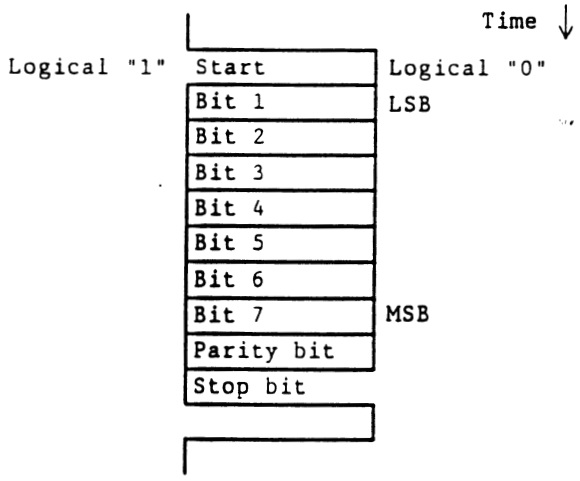
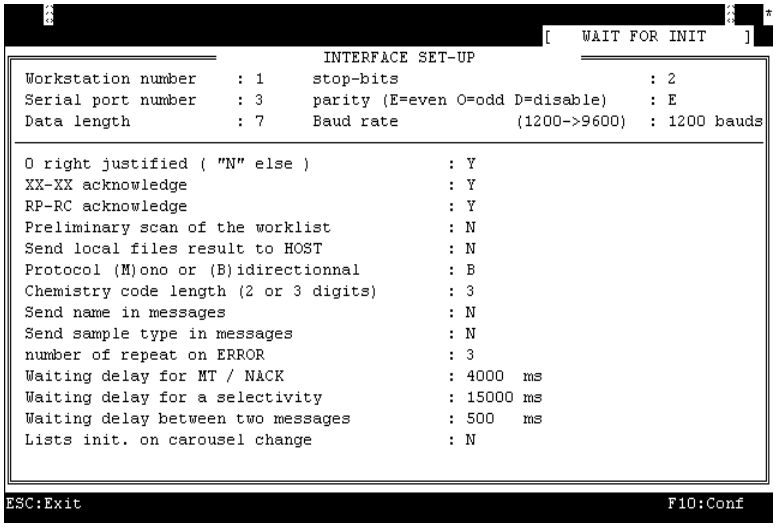


Figure 32: Bit Composition for 7 bit Data Length

Factory Settings

The **Interface Set-Up** screen below shows the factory settings for the ALCYON Analyzer.



Software Specifications

Transmission Protocol (Messages)

All communication between the ALCYON Analyzer and the Host is accomplished by messages which are exchanged between them. All messages exchanged between the Analyzer and the Host consist of three (3) parts:

- Message prologue
- Message text
- Message epilogue

Example:

<Message Prologue><Message Text><Message Epilogue>

All messages exchanged between the ALCYON Analyzer and the Host are less than two hundred fifty-six (256) characters in length.

Special Characters

Several special characters are used to define messages. These characters are listed in the table below:

Representation Format	Print Symbols	Hexadecimal Format	Decimal Format	Control Format	Description
<STX>	☺	x '02 '	2	^B	Start of Text
<ETX>	♥	x '03 '	3	^C	End of Text
<NAK>	§	x '15 '	21	^U	Non Acknowledgment
<CR>	<<	x '0D '	13	^M	Carriage Return
<LF>	>>	x '0A '	10	^J	Line Feed

NOTE: The caret, ^, means control, *e.g.*, ^B means control B and can be achieved by holding down **<Control>** and then pressing **<B>** at the same time.

NOTE: (<<) and (>>) are not the actual symbols for carriage return, *i.e.*, <CR>, and line feed, *i.e.*, <LF>. The actual symbols cannot be used since they cause a real carriage return and line feed when any attempt is made to print them.

Message Prologue

Each message begins with a message prologue. The message prologue is always two (2) characters long. The first character is always <STX>, *i.e.*, x'02', which is the start of text (transmission) character. The second character is always the message toggle. The message toggle is a character between zero, *i.e.*, x'30', and capital Z, *i.e.*, x'5A', in the ASCII character set. The message toggle will be described in detail later.

<Message Prologue> = <STX><MT>.

Message Epilogue

Every message ends with a message epilogue. The message epilogue is always two (2) characters long. The first character is always the <LRC> which is the longitudinal redundancy check. The <LRC> is described in detail below. The second character is always <ETX>, *i.e.*, x'03', which is the end of text (transmission) character.

<Message Epilogue> = <LRC><ETX>

Message Toggle <MT>

The message toggle is the first character following the <STX> in every message. The ALCYON Analyzer and the Host maintain their own message toggles. Each message sent has a unique message toggle. The first message begins with a message toggle of the ASCII character 0 (zero), *i.e.*, x'30'. Each subsequent message uses the next ASCII character in sequence up to and including the ASCII character Z, *i.e.*, x'5A'. Once the message toggle reaches 'Z', the next message toggle would then begin again with the ASCII character 0 (zero). There are forty-three (43) possible message toggle ASCII characters as shown in the following table:

'30' to '5A' hexadecimal : 48 to 90 decimal	
Hexadecimal	3 4 5 5 0123456789ABCDEF0123456789ABCDEF0123456789A
Decimal	4 5 6 7 8 9 8901234567890123456789012345678901234567890
ASCII Character	0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ

Longitudinal Redundancy Check <LRC>

The longitudinal redundandancy check byte (character) is obtained by performing an EXCLUSIVE OR on every byte (character) in the message except for the STX, ETX and the LRC itself. This byte is used as a quick check on the validity of the information received. It should be noted that, if the calculated value for the <LRC> is the same as <ETX>, then the <LRC> is set to x'7F', otherwise the message reception would be terminated prematurely.

Message Acknowledgment

The recipient of the message acknowledges that the message was received without transmission errors by sending the received message toggle back to the sender. Otherwise a <NAK>, *i.e.*, x'15', is sent back to the sender. Sending the message toggle back to the sender does not imply that the content of the message itself was correct, only that there were no detectable errors in transmission.

The sender of the message treats the receipt of any character other than the expected message toggle as a <NAK>. If the message sender receives a <NAK>, then the sender resends the message. When resending a message, the message toggle is not changed, that is, the same message toggle is used each time the message is retransmitted.

Message Types

The **I** (initialization) message must be sent by the Host to the ALCYON Analyzer to establish the communications link. The **I** message must be immediately followed with an **S** message which makes the Analyzer the initiator of messages.

The Analyzer always responds to the receipt of an **S** message by sending a **C** (configuration) message to the Host.

When a **W** (worklist) message is received from the Analyzer, the Host must reply with one or more **Y** (yes) messages, *i.e.*, one for each sample to be run. The **Y** message tells the Analyzer to run the specified sample identifier. After the last **Y** message has been sent, the Host must send an **S** message which indicates to the Analyzer that the Worklist transmission has been completed.

When a **Q** (query) message is received from the ALCYON Analyzer, the Host must reply with either a **Y** message or a **N** (no) message. The **Y** message tells the Analyzer to run the specified analyses for the specific sample identifier. The **N** message tells the Analyzer to **not** run any analyses for the specific identifier.

When either **R**, **RC**, or **RP** (result) messages are received from the ALCYON Analyzer, the Host must reply with a **Z** message indicating what, if any, errors occurred in the transmission of any completed **R**, **RC**, or **RP** message(s).

Messages Transmitted by the ALCYON Analyzer

<C >	Informs the Host of the current chemistry configuration.
<W >	Requests data from the Host for the specimens associated with the enclosed Worklist number.
<Q >	Requests data from the Host for the enclosed sample ID number.
<RP>	Informs the Host that a partial result is enclosed and that more result messages are forthcoming.
<RC>	Informs the Host that the result enclosed is the last of a sequence of result messages.
<R >	Informs the Host that the result enclosed is the one and only result message.

NOTE: Control results will not upload to the Host.

Messages Transmitted by the Host

<I >	Informs the ALCYON Analyzer that the Host has been initialized and is ready for a communication dialog.
<S >	Informs the ALCYON Analyzer that the Analyzer is now the originator of messages.
<Y >	Informs the ALCYON Analyzer that the data associated with the request messages are available and enclosed within the message text.
<N >	Informs the ALCYON Analyzer that the data associated with the request messages are NOT available.
<Z >	Sent by the Host in response to any result message (R, RC, RP) from the ALCYON Analyzer.

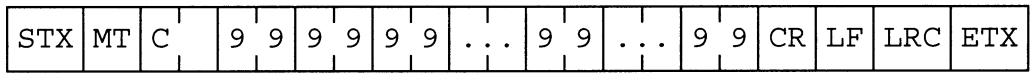
Communication Protocols from the ALCYON Analyzer to the Host

<C > Message

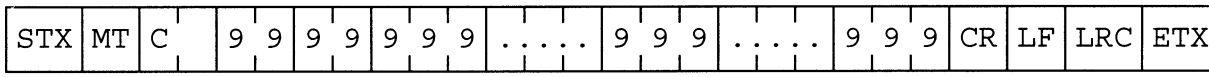
- Description:

	Code	No. of Bytes				Item Description
1	<STX>	1				
2	<MT>	1				
3	<C >	2				
4	99	2				4. ALCYON Analyzer number
5	99	2				5. Reagent Carousel number
6	99 or 999	2	or	3		6. Chemistry number
	. . .				Up to 27 times	
6	99 or 999	2	or	3		
7	99 or 999	2	or	3		7. Ratio number
	. . .				Up to 10 times	
7	99 or 999	2	or	3		
8	<CR>	1				
9	<LF>	1				
10	<LRC>	1				
11	<ETX>	1				
Length (bytes)		123	Maximum			

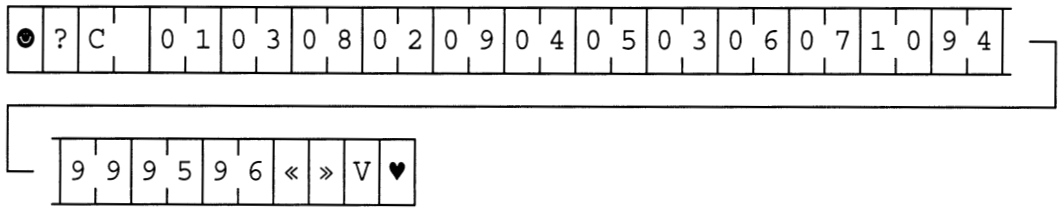
- Format:



or



- Example:

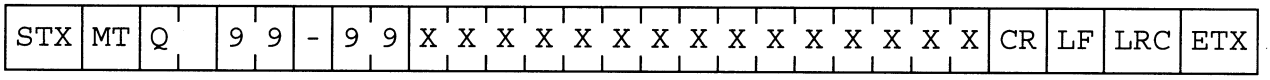


<Q > Message

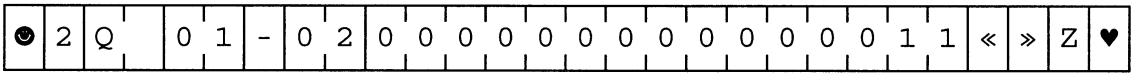
- Description:

	Code	No. of Bytes	Item Description
1	<STX>	1	
2	<MT>	1	
3	<Q >	2	
4a	99	2	4a. Counter
4b	–	1	4b. Delimiter
4c	99	2	4c. Sample position
5	xxxxxxxxxxxxxxx	15	5. Sample ID
6	<CR>	1	
7	<LF>	1	
8	<LRC>	1	
9	<ETX>	1	
Length		28	

- Format:



- Example:

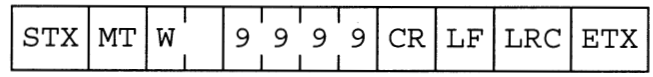


<W > Message

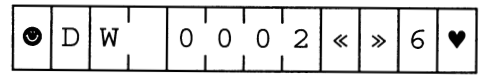
- Description:

	Code	No. of Bytes	Item Description
1	<STX>	1	
2	<MT>	1	
3	<W >	2	
4	9999	4	4. Worklist number (1,...,999)
5	<CR>	1	
6	<LR>	1	
7	<LRC>	1	
8	<ETX>	1	
Length		12	

- Format:



- Example:



<R >, <RP>, and <RC> Messages

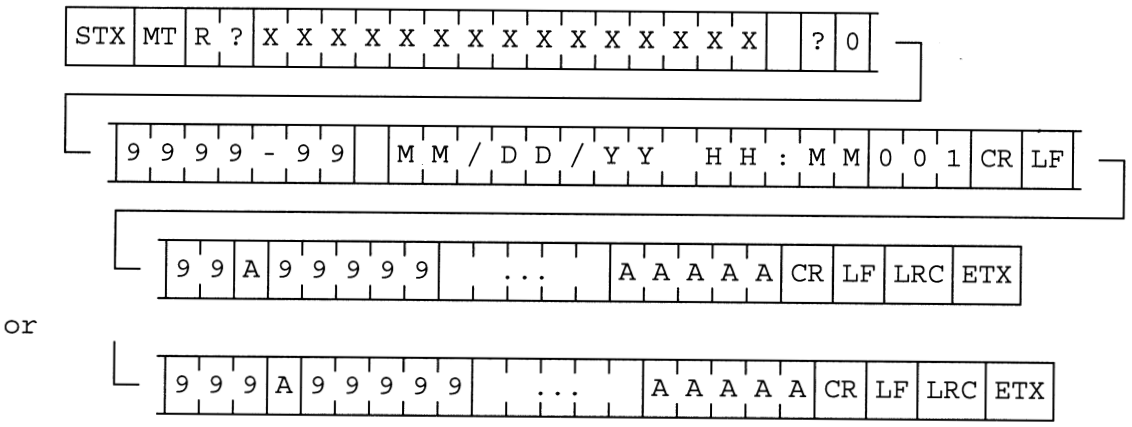
- Description:

	Code	No. of Bytes	Item Description
1	<STX>	1	
2	<MT>	1	
3	<R > or <RP> or <RC>	2	
4	xxxxxxxxxxxxxxx	15	4. Sample ID
5	< >	1	5. Space
6	<S> or <U> or <>	1 or 0	6. (S)erum, (U)rine or nothing
7	<0>	1	7. 0
8	0000 - 00 or 0099 - 99 or 9999 - 99	7	8. Counter and sample position (00xx-xx) or Worklist number and position in the list (xxxx-xx)
9	< >	1	9. Space
10	mm/dd/yy hh : mm	14	10. Aspiration date / Aspiration time
11	<001>	3	11. 001
12	<CR>	1	12. <CR>

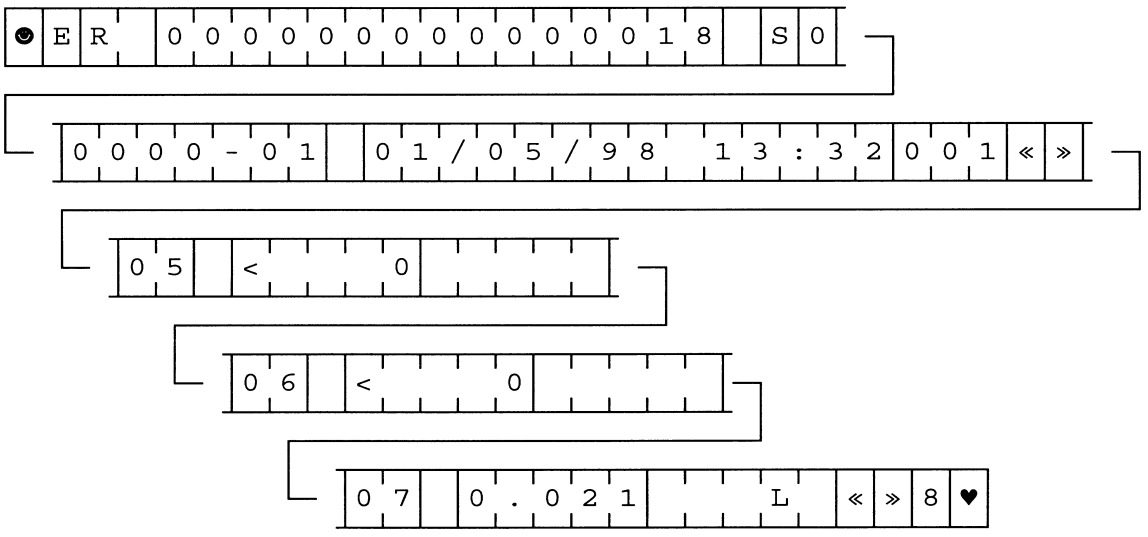
(Continued on next page)

13	<LF>	1		13. <LF>
14	99 or 999	2 or 3		14. 2 or 3 digit chemistry or ratio #
15	<a>	1		15. Error code: L, G, or space L : < chemistry range G : > chemistry range
16a	< 0			16a. Result
	or 999.9			
	or 99.99		Repeated	
	or 9.999		For Each	
	or *****	5	Chemistry	
16b	aaaaa		or Ratio	16b. Positional error
				1. * or space
	12345			2. T or space: (temp.)
				3. R or space: (reagent baseline exceeded)
		5		4. L or space: (exceeds mean sq., RBL endpt. or assay pt. limit)
				5. D or space: exceeds abs. limit.
17	<CR>	1		
18	<LF>	1		
19	<LRC>	1		
20	<ETX>	1		
Length		Maximum 571		

- Format:



- Example:



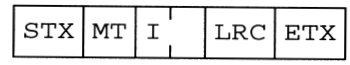
Transmission Protocols from the Host to the ALCYON Analyzer

Host <I > Message

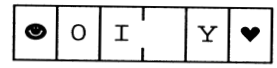
- Description:

	Code	No. of Bytes
1	<STX>	1
2	<MT>	1
3	<I >	2
4	<LRC>	1
5	<ETX>	1
Length		6

- Format:



- Example:

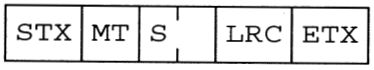


Host <S > Message

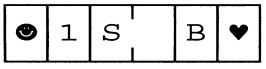
- Description:

	Code	No. of Bytes
1	<STX>	1
2	<MT>	1
3	<S >	2
4	<LRC>	1
5	<ETX>	1
Length		6

- Format:



- Example:

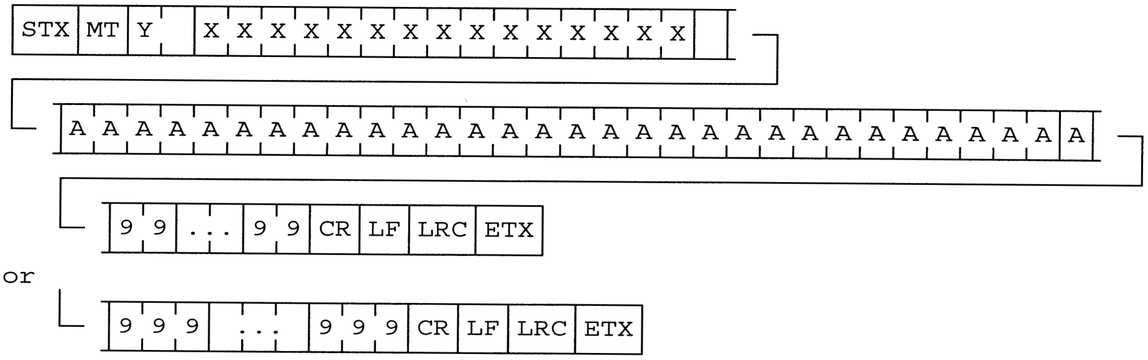


Host <Y > Message

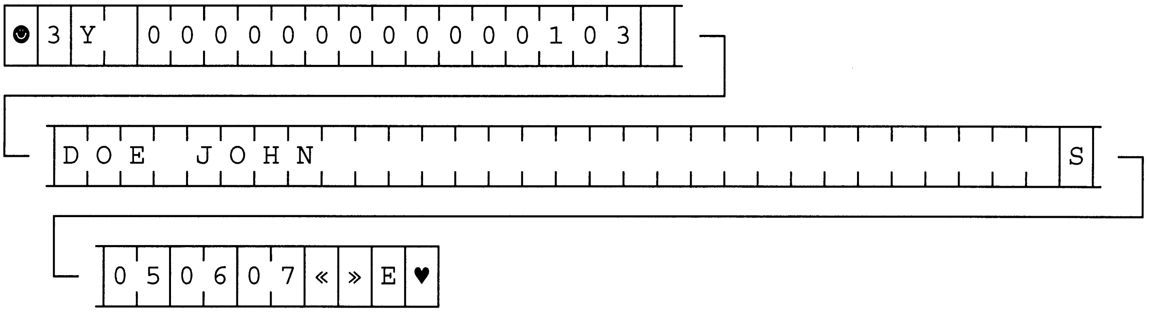
- Description:

	Code	No. of Bytes			Item Description
1	<STX>	1			
2	<MT>	1			
3	<Y >	2			
4	xxxxxxxxxxxxxxx	15			4. Sample ID
5	< >	1			5. Space
6	aaaaaaaaaaaaaaaaaaaaaaaaaaaaa	30			6. Patient name (optional)
7	a	1			7. (S)erum / (U)rine or blank (optional)
8	99 or 999	2	or 3	Up to 27 times	8. 2 or 3 digit chemistry # or ratio (repeated up to 27 times)
	. . .				
8	99 or 999	2	or 3		
9	<CR>	1			
10	<LF>	1			
11	<LRC>	1			
12	<ETX>	1			
Length		136 Maximum			

- Format:



- Example:

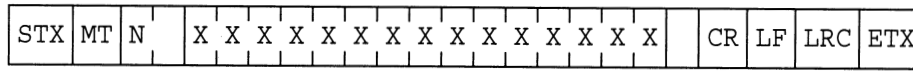


Host <N > Message

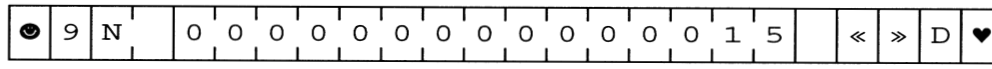
- Description:

	Code	No. of Bytes	Item Description
1	<STX>	1	
2	<MT>	1	
3	<N >	2	
4	xxxxxxxxxxxxxxx	15	4. Sample ID
5	< >	1	5. Space
6	<CR>	1	
7	<LF>	1	
8	<LRC>	1	
9	<ETX>	1	
Length		24	

- Format:



- Example:

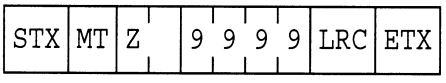


Host <Z > Message

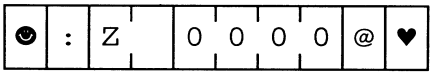
- Description:

	Code	No. of Bytes	Item Description
1	<STX>	1	
2	<MT>	1	
3	<Z >	2	
4	9999	4	4. A four digit positional error code field:
	1234		1- 0 or 2: Invalid Sample ID 2- 0 or 3: Duplicate Sample ID 3- 0 or 6: Host file full. Delay 5 minutes 4- 0 or 9: Incorrect dilution factor
5	<LRC>	1	
6	<ETX>	1	
Length		10	

- Format:



- Example:



Glossary

Analyte	A substance undergoing analysis.
Assay	Analysis to determine the presence, absence, or quantity of one or more analytes.
Assay Parameter	A term that defines specific characteristics or verifies the performance of an assay.
Calibration Run	A procedure that standardizes an instrument prior to assaying patient samples for a particular analyte.
Calibrator	Analyte sample provided for use in standardizing an instrument.
Controls	Predetermined quantified sample provided for monitoring the performance of a calibrated instrument.
Dilution	Procedure used to reduce the amount of analyte in a sample to accurately measure its concentration.
Field	A subdivision of a record containing one specific piece of information, such as an address.
Processing Center	Consists of reaction cuvette temperature control, optical system, and reaction carousel.
Qualitative	A type of test which provides a non-numerical result, in the format of “reactive” (positive) or “non-reactive” (negative).
Quantitative	A type of test which provides a numerical result in the format of a concentration unit.
Random-Access	The capability to process tests in a random manner, independent of the assays requested and dependent on the sample status.
Receiver	A device which responds to a sender and accepts information.
Sample Cup	Small, disposable plastic cup that holds sample, calibrators, or controls.
Sampling Center	Area of the Analyzer where the user loads samples, controls, calibrators, and reagents.
Sender	A device that initiates the transmission process.

Test	A procedure for examining a specific objective, substance, or set of values to determine a specific result, condition, or value.