SciLog® LabTec™

Installation, Operating & Maintenance Instructions

ENGINEERING YOUR SUCCESS.

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Parker has a continuous policy of product development and although the Company reserves the right to change specification, it attempts to keep customers informed of any alterations. This publication is for general information only and customers are requested to contact our Process Filtration Sales Department for detailed information and advice on a product's suitability for specific applications. All products are sold subject to the company's Standard conditions of sale.

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Precautions

READ this manual BEFORE operating or servicing this equipment.

FOLLOW these instructions carefully.

SAVE this manual for future reference.

DO NOT allow untrained personnel to operate, clean, inspect, service or tamper with this equipment.

ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

Contact Parker for parts, information and service.

	WARNING DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND / OR PROPERTY DAMAGE.
	CAUTION OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.
	WARNING ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TEST AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.
	WARNING FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD, CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.
	IF THE POWER CORD IS LOST OR DAMAGED, CONTACT CUSTOMER SERVICE TO OBTAIN A NEW ONE. DO NOT REPLACE IT ON YOUR OWN.

Précautions

LISEZ ce manual AVANT de faire fonctionner ou d'entretenir cet équipment.

SUIVEZ attentivement ces instructions.

CONSERVEZ ce manuel pour future référence.

NE LAISSEZ PAS du personnel non qualifié utiliser, nettoyer, inspecter, entretenir, réparer ou manipuler cet équipement.

DÉBRANCHEZ TOUJOURS cet équipement de la source de courant avant de nettoyer ou d'exécuter l'entretien.

APPELEZ PARKER pour pièces détachées, renseignements et entretien.

	⚠ ATTENTION DÉBRANCHEZ TOUT COURANT DE CETTE UNITÉ AVANT DE FAIRE L'INSTALLATION, D'EFFECTUER L'ENTRETIEN, LE NETTOYAGE OU AVANT DE RETIRER LE FUSIBLE. NE PAS OBSERVER CES PRÉCAUTIONS RISQUERAIT DE CAUSER DES BLESSURES CORPORELLES OU / ET D'ENDOMMAGER L'ÉQUIPEMENT.
	⚠ PRUDENCE SOYEZ PRUDENT LORSQUE VOUS MANIPULEZ DES APPAREILS SENSIBLES À L'ÉLECTROSTATIQUE.
	⚠ ATTENTION AUTORISEZ SEULEMENT LE PERSONNEL QUALIFIÉ À ENTRETENIR CET ÉQUIPEMENT. SOYEZ PRUDENT LORSQUE DES VÉRIFICATIONS, TESTS ET AJUSTEMENTS DOIVENT ÊTRE EFFECTUÉS SOUS TENSION. NE PAS OBSERVER CES PRÉCAUTIONS RISQUERAIT DE CAUSER DES BLESSURES CORPORELEES.
	⚠ ATTENTION POUR ASSURER UNE PROTECTION CONTINUE CONTRE UNE DÉCHARGE ÉLECTRIQUE, BRANCHEZ UNIQUEMENT SUR UNE PRISE CORRECTEMENT RELIÉE Á LA TERRE. NE RETIREZ PAS LA FICHE DE TERRE.
	SI LE CORDON D'ALIMENTATION EST PERDU OU ENDOMMAGE, CONTACTEZ LE SERVICE CLIENTELE POUR EN OBTENIR UN NOUVEAU. NE LE REMPLACEZ PAS PAR VOUS-MEME.

Introduction

Please read the following instructions carefully!

Inspections: Remove the system and accessories carefully from the shipping container. Check the contents against the purchase order to verify that all parts are included and undamaged.

Please do the inspection now, even if the system is not used immediately. Many carriers must receive damage claims within seven days of delivery. Please retain all packing material so unit may be shipped safely, if necessary.

Customer Service: Parker customer service: If assistance is required, please contact us at:

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Process Filtration - Europe
Durham Road
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DH3 2SF, England
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2340 Eastman Avenue
Oxnard, California 93030, USA
toll free: 877 784 2234
phone: +1 805 604 3400
fax: +1 805 604 3401
email: dhpsales.na@parker.com
www.parker.com/dhsingleuse

Parker customer service personnel will be able to serve you more efficiently if you have the following information:

- Serial number and model name of the equipment
- Installation procedure being used
- Concise list of symptoms
- List of operating procedures and conditions in use when problem arose

Warranty

Country specific information can be found at: www.parker.com/termsandconditions

Standards

EN 61326-1:2006, Class B
EN 6100-3-2:2006
EN 6100-3-3:1995 +A1:2001 +A2:2006
EN 61010-1 Issued: 2001/03/01
Conforms to UL STD 61010-1:2012 Ed.3+R:29Apr2016
Certified to: CAN/CSA-C22.2 No 61010-1-12:2012 Ed.3+U1:U2

Installation & Start Up

Installation of the LabTec™ System must be carried out only by trained personnel in accordance with the relevant regulations and this operations manual.

Make sure that the technical specifications and input ratings of the LabTec™ are observed.
See “LabTec™ Specifications”.

The protection provided by this equipment may be impaired if the LabTec™ is used in a manner inconsistent with this manual or for purposes not specified by the manufacturer.

Maintenance & Cleaning

The LabTec™ is practically maintenance free. The SciPres® sensors used with the system come pre-calibrated from the factory and require no maintenance. The ™ peristaltic pump head should periodically have tubing debris cleaned from it, but requires no lubrication.

Parker recommends a factory cleaning, testing and recalibration be done to your LabTec™ at least once a year, to maintain the accuracy of the unit and reduce your downtime.
Contact Customer Service for an RGA or contact your Territory Manager. We can design a preventative maintenance program specifically for your company.

To remove dust, dirt and stains, the outer surfaces of the LabTec™ may be wiped using a soft, non-fluffing cloth moistened with water. If required, you may also use a mild detergent or 2-propanol.

The SciPres® sensors may be sanitized with 0.1 Molar NaOH, or 2-propanol. They may be autoclaved up to twice, and may be gamma-irradiated.

Hardware

Specifications

Dimensions		W: 5.75¨ (14.6 cm); Height 8.5¨ (21.2 cm); D: 11¨ (27.9 cm)
Weight		14 lb (6.4 Kg)
Enclosure		Aluminium / Steel; Corrosion Resistant, Recessed Handle.
Pump Head / Motor Options		1. Tandem™ 1082 peristaltic pump head with 600-RPM motor Thick-walled (0.090¨) pump tubing: #15, 24 and #35. Flow Range: 59 to 2258 mL / min. Recommended for most applications. 2. Tandem™ 1081 peristaltic pump head with 160-RPM motor Thin-walled (0.060¨) pump tubing: #13, 14, 16, 25, 17, and #18. Flow Range: 0.5 to 554 mL / min. Recommended for small aliquots at reasonable speeds. 3. Tandem™ 1081 peristaltic pump head with 8-RPM motor Thin walled (0.060¨) pump tubing: #13, 14, 16, 25, 17 and #18.Flow Range: 0.03 to 24.3 mL / min. Recommended for very small aliquots where speed is not an issue. 4. Piston and Magnetic Gear Heads Also available as your application requires.
Pressure Sensors		Accommodates one SciPres® pressure sensor using the P1 Port. P2 and P3 Ports may be used as alternates. Pressure is used for monitoring and alarms. The user selects P1, P2 or P3 as the pressure source.
Pressure Displayed		With a resolution of 0.1 psi (0.007 bar); choice of psi, bar, kpa.
Pressure Range: 0-60 psi (0 - 4.14 bar)		The default pressure range of the sensors is 0-60 psi (0 - 4.14 bar), and is calibrated at the factory. Most peristaltic pumps generate pressures up to 40 psi (0 - 2.76 bar). This can be re-calibrated using an external pressure reference source.
Electrical	Power	100-240 V , 47-63 Hz, 150 VA, listed Class 2 switching power supply. Double fused: 1A-T, 250V (CE: IR35A 250V).
	Battery	CR1220, used to support the internal clock only, not user serviceable.
	Motor	Choice of four motors: 8, 160, 600 and 3400 RPM at 24V, 3.8 Amperes, Variable Pump Speed optically encoded servo-controlled motors. Not all heads can accommodate all motors.
	Encoder	100 lines per / rev. for 600-RPM motor. 120 lines per / rev. for all other motors.
Software	Weight Ratio Mode	Auto-weighing and dilution of samples with pressure monitoring.
	Volume Dispense Mode	Programmable batch dispensing by volume with pressure monitoring
	Weight Dispense Mode	Programmable batch dispensing by weight with pressure monitoring
	Setup Mode	Selection of user preferences and interface options
	Manual Mode	Manual pump control with pressure monitoring, no alarms.

Hardware

Specifications

Footswitch Interface	Provides for foot / hand operated remote start / stop control of the dispensing system.
I/O Ports:	'Printer' Female DB9 connector for data collection with Printer or PC 'S1' Male DB9 connector for RS-232 connection to an electronic scale. 'S2' Male DB9 connector, Not utilized on LabTec™. Do not remove the cover. 'S3' Male DB9 connector, Not utilized on LabTec™. Do not remove the cover. 'External I/O' Female DB37 connector used for remote On/Off control of LabTec™ via footswitch, or for Analog interface with SciCon or other 4-20 ma source, A1, A2, A3. 'V', Female DB15 connector, not utilized on LabTec™. 'Temperature' 2 pin Conxall connector for SciTemp® Temperature Sensor. 'P1, P2, P3' RJ11 connectors used for SciPres® Pressure Sensors. (Do not connect these to a telephone system) 'USB' USB-A connector, used for RS-232 data collection with a PC. 'Ethernet' RJ-45 connector, not functional.
Display	Two line LCD, 20 Characters each, back-lit.
Data Entry	Membrane keyboard with auditory feedback.
Environmental:	Temperature Range: 4 to 40° C
	Altitude: Up to 2000 Meters
	Indoor, dry environments only, clean up is wipe down only. (IP 20)
	Relative humidity: 0 – 95%
	Voltage fluctuations: +/_ 10%
	Pollution Degree: 2
SciDoc Documentation Software for PC	SciDoc is an Excel spreadsheet with custom macros and Winwedge PC interface software for data compilation. Sent to you ready to use. Real-time verification and documentation of process parameters.

Display, print out and Excel abbreviations

MT = Military Time	SC = Sample Count
DV = Dispensed Volume	CV = Cumulative Volume (Volume Dispense Mode)
DW= Dispensed Weight	CW = Cumulative Weight (Weight Dispense Mode)
SW = Sample Weight	DW = Diluent Weight (Weight Ratio Mode)
P1 = Pressure, psi	ST = Pump Status
AL = Alarm (HP)	HP = High Pressure (1=OFF, 2=Alarm only, 3- Pump stop)
CW = Clockwise Pump Direction	CCW = Counter Clockwise Pump Direction

Installation of SciLog® Universal USB Drivers:

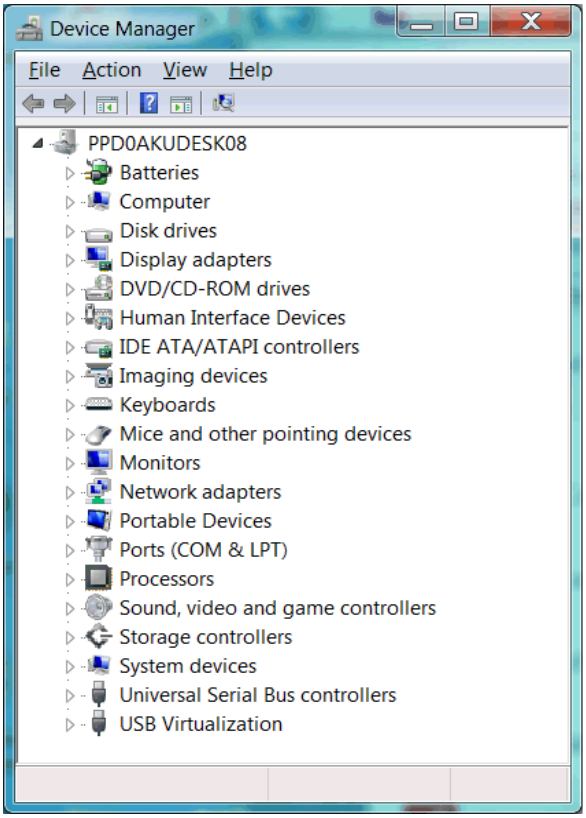
Note: Administrative rights to your computer are required for this procedure

Please follow the procedure below:

- Find and connect the white USB thumb drive labeled SciDoc.
- This will contain a folder labeled: SciLog® Universal Driver V3.0.0.
- Connect the laboratory system (LabTec™, ChemTec™, PureTec®, etc.) to the computer with the USB cable and power it up.
- Click on the computer's 'Start' button, find and open the control panel, then find and open 'Device Manager'.
- Expand the list of 'Other Devices'.
- Find the listed system, and double-click.
- On the Driver Tab, choose 'Update Driver'.
- On the next screen choose 'Browse My Computer' and browse the drive containing the USB thumb drive mentioned in the step above, click on 'OK' or 'Next'.
- If prompted, confirm that you want to install the driver, and press 'OK'.
- Review 'Device Manager' and expand the list under Ports. The system will now be identified as 'SciExpert USB' with a COM port number assigned. Make note of this number for future use.

Note: This is a USB based COM Port. It only is shown when the device is connected and powered on. If disconnecting / reconnecting is required, or cycling the power on the unit is required, please provide at least 20 seconds of time before reconnecting or powering back up. Doing this too quickly can change the COM Port number assigned to the unit stored in "Edit 1" through "Edit 10".

Device Manager Image



Quick Start: “Automated Weighing and Dilution of Food Samples for Bacteriological Analysis”

Equipment: You will need the following items to get started:

Parker Part N°.	Description	Quantity
N/A	Any container	1pc
200-LABT-1682	LabTec™ CP-200 w/1082 Head	1pc
100-VIPER6	Mettler ICS Model (6 Kg x 0.1 g)	1pc
080-072ICS	Scale Cable for ICS Models	1pc
080-059	Foot Switch	1pc
400-124	Silicone #24 Tubing	1pc 25ft
400-491A	Dispensing Tips	1 pkg
N/A	Any container	1 pkg

Hardware Setup

1. Unpack all the components, visually identify and inspect for damage.
2. At the dispensing station, place the solution container to the far left, the LabTec™ to its right and the scale to the right of the LabTec™. Place the container to be filled on the scale.
3. Connect the footswitch to the rear of the LabTec™, secure the screws, and place the footswitch in a convenient
   location on the counter or floor.
4. Connect the interface cable between the LabTec™ and the scale.
5. Plug in and power up both units.
6. Cut approximately 10 feet of the #24 silicone tubing and install the dispensing tip on one end. Mount that end of the tubing in the tubing clamp and position it so that it is just above the container.
7. Route the tubing to the LabTec™, open the head by rotating the lever 180 degrees counter clockwise, and place the tubing over the upper set of rollers. Confirm that the tubing is under the centering springs and close the head by rotating the lever back to its original position.
8. Route the remaining tubing to the solution container and attach it as appropriate.

Software / Program Setup:

1. For weight ratio applications such as this one, the only thing that must be setup prior to editing and running the program is the scale (or scale) that is in use. If purchased from Parker, this has already been done. If purchased separately, obtain the needed settings from Parker Technical Support.

2. On the front panel of the LabTec™, press the “Exit” key until you reach the main or “Mode Select” menu.

3. Press the “Up” or “Down” key until you reach the “Setup” mode.

Mode Select SETUP		
Up	Down	Select
A	B	C

4. Press “C” to select the Setup mode, and “A” as needed to move up to “Scale”. Then press “C” to select “Scale” and again to select “Scale Manuf”.

-SELECT- SCALE MANUF.		
Up	Down	Select
A	B	C

5. Use “A” or “B” to move up or down thru the list, and when “METLER” is shown, press “C” to select it. Then press the “Exit” key until you return again to the main or “Mode Select” menu and you are ready to proceed to editing and running a program.

SCALE MANUF: METLER		
Up	Down	Select
A	B	C

Program Editing and Execution:

1. From the main menu, press “Up” or “Down” to scroll between the modes until you reach “WT RATIO”, and “Select” it.

2. From this screen, you can now “Prime” the system with fluid, or enter either an “Exec” (Execute) or “Edit” mode.

   The LabTec™ will allow you to Edit, store and Execute ten different sets of dilution parameters depending on your needs.

- WEIGHT RATIO -		
Up	Down	Select
A	B	C

3. At this point, you need to consider the parameters of the dispensing that you are going to do.

The following is a list of the various parameters available, and their defaults. We strongly suggest that you use #24 Silicone tubing and these defaults initially, and then optimize your system after a review of your results during the first few days of operation.

WGT FACTOR: Defines the weight ratio (multiplier) that is applied to the actual sample weight, as determined by the scale, to arrive at the required diluent weight. WGT FACTOR = 9.00 is the default, and will yield a 10-fold dilution. You may increase or decrease this to any ratio desired. Select a WGT FACTOR = 99.00 if you want a 100-fold dilution.

SNIFFLE: The sniffle function consists of a brief pump reversal at the end of the dispensing cycle to suck in the droplet that typically hangs at the end of the dispensing tip. When a filter is in use it will relieve the pressure so it does not drip. Select SNIFFLE = 0.3. (The default is 0.0.)

SLOW FACTOR: Defines the diluent weight that is dispensed slowly at the end of the dispensing cycle.The default SLOW FACTOR = 25.0 grams. This may be adjusted if necessary.

DIRECTION: Defines the rotation of the pump head. This parameter can be changed from clockwise (CW) to counter clock-wise (CCW). (Default = CW)

PUMP RATE: Defines the relative pup speed (0% to 100%) with which the diluent is being dispensed. The default PUMP RATE = 80%. This may be adjusted as needed. Higher speeds are not recommended.

TIME DELAY: Not used in Weight Ratio Dispensing mode. Defines the time interval, in seconds, between dispensing cycles. (Default = 00.01)

COUNT: Not used in Weight Ratio Dispensing mode. Defines how often the dispensing cycle will be repeated. For example, when COUNT = 10, then the selected DISP. WEIGHT will be dispensed 10 times. (Default = 1)

4. Press “Exec” key, select “Exec 1”, the LabTec™ will show the following display:

SCALE INITIALIZATION
Please Wait

While the message is being displayed, the LabTec™ checks the scale communication and the following display is shown if all is well:

WGT RATIO SET: 9.00
Press RUN When Ready

Press the “RUN” key or alternatively, press the foot switch:

Press RUN When
VESSEL IS ON SCALE

Place the sample bag or container onto the scale and underneath the dispensing tip. Press “RUN” key or the foot switch. The LabTec™ will show the following display:

REMOVING TARE WEIGHT
Please Wait

This display is followed by:

Press RUN When
SAMPLE IS IN VESSEL

5. Place the sample into the bag or container, only an approximate sample weight is needed. The weight ratio will be applied to the actual sample weight as determined by the scale. Press “RUN” key or the foot switch, the LabTec™ will start dispensing and display the progress:

SW: 10:00 G	RUN
DW: 50:00 G	SC 001

SW stands for the actual sample weight and DW represents the delivered diluent weight. When the dispensing cycle is completed, following displays are shown.

SW: 10:00 G	FINISH
DW: 50:00 G	SC 001

DISPENSING

Completed

Remove the filled sample bag or container and initiate the next dispensing cycle.

Note: If you have more than one WGT FACTOR, store one WGT FACTOR in “Edit 1”, e.g. “9.00”, while a second WGT FACTOR is stored in “Edit 2”, e.g. “99.00”. Up to ten different sets of parameters can be stored in “Edit 1” through “Edit 10”.

Note: The following may affect your accuracy, and should be considered:

1. Parker suggests you use #24 tubing, and move the portion inside the pump 3-4 inches toward the discharge side of the pump periodically to avoid wearing it out. As the tubing becomes worn, your dilutions may take longer, and you may get debris in the diluent.
   #35 tubing can cause target weight overruns, and is generally considered to be too large for this application.

2. Sniffle Factor. This is a parameter that can be adjusted to minimize the drips that occur after the dilution, thereby eliminating overruns. These procedures suggest an initial factor of 0.3. If you are using a filter, this may need to be increased as the filter becomes plugged.

3. Slow Factor and Pump Rate. These parameters can be optimized further depending upon your specific application. Increasing the Slow Factor will help if your scale response time is long, and decreasing the Pump Rate will help if the default of 80% is causing too much backsplash that can’t be eliminated in some other manner. The settings cited work best with a Mettler Toledo model scale.

Quick Start: “Dispensing by Volume”

Equipment: You will need the following items to get started:

Parker Part N°.	Description	Quantity
N/A	Any Container or Solution Reservoir	1 pc
200-LABT-1682	LabTec™ CP-200 w/1082 Head	1pc
400-124	Silicone #24 Tubing	25ft (1 pkg)
400-491A	Dispensing Tips	1pkg
N/A	Container to be filled	1pc

Hardware Setup:

1. Unpack all the components, visually identify and inspect for damage.
2. At the dispensing station, place the solution reservoir to the far left, and the LabTec™ to its right. Position the dispensing tip over the appropriately sized container.
3. Plug in and power up the LabTec™.
4. Cut approximately 10 feet of the #24 tubing and install the dispensing tip or filter on one end. Mount that end of the tubing in the tubing clamp and position it so that it is just above the container.
5. Route the tubing to the LabTec™, open the head by rotating the lever 180 degrees counter clockwise, and place the tubing over the upper set of rollers. Confirm that the tubing is under the centering springs and close the head by rotating the lever back to its original position.
6. Route the remaining tubing to the solution reservoir and attach it as appropriate.

Note: If you purchased the LabTec™ with your aliquot sizes preprogrammed by Parker the calibrations have been done for you. If this is not the case, or you have performed a Factory Reset, you will need to edit the individual aliquots (Edit 1-10) as shown below.

Calibration:

1. The LabTec™ will come configured for the installed motor and pump head. This example will assume a 600 rpm motor and a ™ 1082 head is installed. If you have a different head, please refer to the manual or contact Parker for assistance. Each EDIT (1 – 10) allows a choice of tubing, and then accesses built-in master calibration curves.
   In addition to adjustments to the motor speed and slow factor, fine tuning of the calibration is accomplished by using the Re-Cal feature accessible directly from the “RE-CAL” button on the front of the LabTec™.

2. The RE-CAL feature is accessible from the keypad of the LabTec™ using the “RE-CAL” button located in the lower right-hand corner. To do this accurately, it is important that you have a scale available to dispense the aliquot onto that has a readability of 0.1 gm or better.
   A graduated cylinder may also be used. This feature is active when the following type of display is shown:

VOLUME SET: 10:00 mL
Press RUN when Ready

3. After checking to be sure that the system is primed, Press the RUN key and dispense 10.00 mL into the container on the scale. Record the weight, and do this for a minimum of 3 times, and determine the average (AV) aliquot weight. For example, assume you obtained the following values:

   Trial 1 10.25 gm
   Trial 2 10.30 gm
   Trial 3 10.20 gm

   AV = Average Value 10.25 gm

4. Press the “RE-CAL” key on the front panel of the LabTec™, and the following display will appear:

DV = 10:00		AV = 10:00
Incr.	Decr.	Select
A	B	C

5. Only the AV parameter can be changed in this display, use the “A” and “B” keys to adjust the value. In the above example, you would increase the AV value to 10.25. Press the “C” key to Select and the stored calibration curve will be updated. You may wish to repeat the RE-CAL as necessary for improved dispensing accuracy.

6. This procedure is performed after all of the EDIT parameters explained below have been entered into the LabTec™ for that particular aliquot.

Program Editing and Execution

At this point, you need to consider the parameters of the dispensing that you are going to do. The following is a list of the various parameters available, and their defaults. Adjust these parameters based on the volume that you are dispensing.

DISPENSE VOLUME: Defines the volume to be dispensed in milliliters. (The default volume is 10.0 mL).

PUMP TUBING: This choice exists if a peristaltic head has been installed. Choices are 13, 14, 16, 25, 17, 18, (thin-walled, 1081 Head) 15, 24, 35 (thick-walled, 1082 Head). The built in master calibration for that tubing is then utilized. (Default = 13)

SNIFFLE: The sniffle function consists of a brief pump reversal at the end of the dispensing cycle to suck in the droplet that typically hangs at the end of the dispensing tip. It also will relieve the pressure on a filter if you are using one so that it does not drip. (The default Sniffle = 0.3, please start at 0.0 if not using a filter.)

SLOW FACTOR: Defines the solution volume that is dispensed slowly at the end of the dispensing cycle. This should be set between 1-10 mL depending the volume being dispensed and the tubing size to avoid overshooting the target volume. For example, if you're using #15 tubing, and the target volume is 100 mL, a slow factor of 1 or 2 mL will work fine. The default Slow Factor = 1.00 mL. This may be adjusted as necessary.

DIRECTION: Defines the rotation of the pump head, this parameter can be changed from clockwise (CW) to counter clock-wise (CCW). (Default = CW).

PUMP RATE: Defines the relative pump speed (0% to 100%) with which the solution is being dispensed. The default Pump Rate = 100%. This may be adjusted as needed, slower pump rates may be desirable to increase precision and minimize back splashing.

TIME DELAY: Defines the time interval, in seconds, between dispensing cycles. (Default = 1.0).

COUNT: Defines how often the dispensing cycle will be repeated. For example, when COUNT = 10, then the selected Dispense Volume will be dispensed 10 times. (Default = 1).

1. For this example, the tubing will be #24, and a dispense volume of 100.00 mL. From the Mode Select screen, use "A" or "B" to go up or down to the "Volume" mode, and Press "C" to select it. The Volume mode will give you the following display.

- VOLUME DISPENSE -		
Exec	Edit	Prime
A	B	C

2. Press "B" to enter the Edit Menu, and use "A" or "B" to scroll to "EDIT 1".

- EDIT 1 -		
Up	Down	Select
A	B	C

3. Press “C” to select EDIT 1, and “C” again to select “DISP VOLUME”. Use the “A” or “B” keys to increase or decrease the selected volume to 100.00 mL. Then press “C” to select.

DISP VOLUME:		100.00
Inc	Decr	Select
A	B	C

4. Use the “B” key to scroll down to “PUMP TUBING” and press “C” to select. Use the “A” and “B” keys to choose the correct size tubing.

PUMP TUBING:		24
Inc	Decr	Select
A	B	C

5. Next, use the “A” and “B” keys again to scroll to “SLOW FACTOR” and press “C” to select. Use the “A” key to increase this based on your tubing size. For this example, increase it to 2.00 mL, and press “C” to select.

SLOW FACTOR:		2:00
Incr	Decr	Select
A	B	C

6. All other parameters will be left at their defaults. Press the exit key to return to the “Volume” screen and Press the “Exec” key, this will show the Exec program that matches the Edit program you were just in. Continuing with this example, press “C” to select, and the LabTec™ will show the following display:

VOLUME SET:	100.00 mL
Press RUN when Ready	

7. Press the “RUN” key, and the LabTec™ will dispense 100.00 mL, and show the following screen:

DV=100.00 mL	P1=0.0
CV= 100 mL	SC=001

Where DV=Dispensed Volume, CV=Cumulative Volume, SC=Sample Count # for the volume dispensed, will increment by one for each occurrence, and P1=Back Pressure (will be 0.0 if no pressure sensor is in use). The display will then alternate between this screen and the one before it.

8. At this time it is appropriate to use the RE-CAL procedure mentioned in the earlier Calibration section to fine tune the process. Once satisfied with the results, you can continue pressing the run key until you have finished the needed number of aliquots.

Documentation

The LabTec™ will output data to a printer or a PC at the completion of each dispense for archival purposes. The following is an example of that data, and the abbreviations used.

09/24/09; 16:12; LABT 0.11X; Volume; CW; Tubing=15; Units=psi; Exec 1; Volume set=10.00 mL; Count= 1; Rate= 95.0%;
Slow Factor = 3.00; Sniffle = 0.00; Alarms:HP=1; HT=1; Limits; HP=20.0; HT=35.0;

MT,	SC,	DV,	CV,	P1,	T,	ST,
16:12:29,	1,	10.17,	10.2,	--.-,	0.0,	FINISH,
16:12:33,	2,	10.17,	20.3,	--.-,	0.0,	FINISH,
16:12:37,	3,	10.17,	30.5,	--.-,	0.0,	FINISH,

MT = Military Time
SC = Sample #
DV = Dispensed Volume
CV = Cumulative Volume P1
= Pressure
T = Temperature
ST = Pump Status

The following chart shows tubing dimensions and the available flow rates based on tubing,pump head and motor size choices:

Tubing Size	13	14	16	25	17	18	15	24	35
Tubing ID*: in	0.030	0.060	0.125	0.190	0.250	0.310	0.190	0.250	0.310
Tubing OD*:in	0.157	0.189	0.251	0.314	0.376	0.439	0.376	0.439	0.500
Tubing Wall*:in	0.063	0.063	0.063	0.063	0.063	0.063	0.093	0.093	0.093

Pump Rate Range*:	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min
CP-8 8RPM	0.03 - 0.45	0.10 -.63	0.43 - 6.38	0.9 - 12.6	1.14-18.3	1.7 - 24.3	0.45 - 13	0.65 - 20	NR
CP-120 160RPM	0.5 - 10.0	1.7 - 35.2	6.3 - 129.0	12.5 - 283.0	18.5 - 405.0	24.7 - 554.0	9.0 - 260.0	13.0 - 435.0	NR
CP-200 600RPM	2.0 - 34.0	8.6 - 132.0	29 - 533	49.0 - 974.0	70.0 - 1048.0	103.0 - 1515.0	59.0 - 993.0	85.0 -1348.0	111.0-2258.0

*Nominal Values

Pump Head Model:	1081	1082

Note: The following may affect your accuracy, and should be considered:

1. Parker suggests you use #15 or 24 tubing, and move the portion inside the pump 3-4 inches toward the discharge side of the pump periodically to avoid excessive wear. As the tubing becomes worn, you will want to run the RE-CAL feature again.
   #35 tubing will allow you to pump at higher flow rates, but a larger slow factor should be implemented.

2. Sniffle Factor. This is a parameter that can be adjusted to minimize the drips that occur after dispensing, thereby eliminating overruns. These procedures suggest an initial factor of 0.0. If you are using a filter, this may need to be increased as the filter becomes plugged.

3. Slow Factor and Pump Rate. These parameters can be optimized further depending upon your specific application. The Slow Factor should be set to 1 or 2 mL for most tubing, and up to as much as 5 mL if you are using large diameter tubing. Decreasing the Pump Rate will help if the default of 100% is causing too much backsplash that can't be eliminated in some other manner, or if the dispense volume is small.

Quick Start: “Dispensing by Weight”

Equipment: You will need the following items to get started:

Parker Part N°.	Description	Quantity
N/A	Solution Reservoir	1 pc
200-LABT-1682	LabTec™ CP-200 w/1082 Head	1 pc
100-VIPER6	Mettler ICS425 6kg Scale	1 pc
400-124	Silicone #24 Tubing	25ft (1pkg)
400-491A	Dispensing Tips	1 pkg
N/A	Container to be filled	1 pc

Hardware Setup:

1. Unpack all the components, visually identify and inspect for damage.

2. At the dispensing station, place the solution reservoir to the far left, the LabTec™ to its right and the scale to the right. Position the dispensing tip over the container to be filled.

3. Connect the interface cable between the LabTec™ and the scale paying close attention to the labels on the cable and those on the rear of the LabTec™.

4. Plug in and power up both units.

5. Cut approximately 10 feet of the #24 tubing and install the dispensing tip on one end. Mount that end of the tubing in the tubing clamp and position it so that it is just above the container.

6. Route the tubing to the LabTec™, open the head by rotating the lever 180 degrees counter clockwise, and place the tubing over the upper set of rollers. Confirm that the tubing is under the centering springs and close the head by rotating the lever back to its original position.

7. Route the remaining tubing to the solution reservoir and attach it as appropriate.

Note: If you purchased both the LabTec™ and the scale from Parker, all the settings for both units have been configured. If the display shows “Scale Error, Press any key” after trying to initialize the scale, check Setup: Scale: Scale Manuf., and confirm the proper choice for the scale you have purchased. If the scale was not purchased from Parker, contact Parker Technical Customer Service for instructions on setting up your scale.

Program Editing and Execution

At this point, you need to consider the parameters of the dispensing that you are going to do. The following is a list of the various parameters available, and their defaults. Adjust these parameters based on the weight that you are dispensing. Consult Part C, Section 5.0, of the LabTec™ Manual to edit your weight dispensing parameters.

DISP. WEIGHT: Defines the weight to be dispensed in grams. For example, if you want to dispense 50.00 grams, use the “Incr” and “Decr” keys to scroll to 50.00 and press “Select”. (The default Disp. Weght = 100.00 gm).

SNIFFLE: The sniffle function consists of a brief pump reversal at the end of the dispensing cycle to suck in the droplet that typically hangs at the end of the dispensing tip if a filter is used by reducing the back pressure. Select Sniffle = 0.0 (Adjust as needed if a filter is used).

SLOW FACTOR: Defines the solution weight that is dispensed slowly at the end of the dispensing cycle to allow for stabilization of the scale. This should be 10-15% of the total weight if the aliquot is less than 50 gm. For aliquots larger than 50 gm, the default of 25 gm will usually work well. This can be adjusted based on the pump rate and the tubing size to avoid overshooting the target weight. (The default Slow Factor = 25 gm).

DIRECTION: Defines the rotation of the pump head, this parameter can be changed from clockwise (CW) to counter clock-wise (CCW). (Default = CW).

PUMP RATE: Defines the relative pump speed (0% to 100%) with which the solution is being dispensed. The default Pump Rate = 80%. This may be adjusted as needed. Slower pump rates may be desirable to increase accuracy and minimize back splashing.

TIME DELAY: Defines the time interval, in seconds, between dispensing cycles. (Default = 00.01).

COUNT: Defines how often the dispensing cycle will be repeated. For example, when COUNT = 10, then the selected Dispense Weight will be dispensed 10 times. (Default = 1).

1. For this example, set a dispense weight of 200.00 gm. From the Mode Select screen, use “A” or “B” to go up or down to the “Weight” mode, and Press “C” to select it. The Weight mode will give you the following display:

- WEIGHT DISPENSE -		
Exec	Edit	Prime
A	B	C

2. Press “C” momentarily to prime the tubing and remove all the air from the system. Then press “B” to enter the Edit Menu, and “C” to select “Edit 1”.

- EDIT 1 -		
Up	Down	Select
A	B	C

3. Press “C” again to select “DISP WEIGHT”. Use the “A” key to increase the selected weight to 200.00 mL. Then press “C” to select.

WEIGHT		200.00gm
Incr.	Decr.	Select
A	B	C

4. Next, use the “A” and “B” keys again to scroll to “SNIFFLE” and press “C” to select. Use the “A” key to increase this to 0.3, and press “C” to select.

SNIFFLE		0.3
Incr.	Decr.	Select
A	B	C

5. All other parameters will be left at their defaults. Press the “EXIT” key to return to the “Weight” screen and Press the “Exec” key, this will show theExec program that matches the Edit program you were just in. Continuing with this example, press “C” to select, and the LabTec™ will initialize the scale and show the following display:

WEIGHT SET:	200.00 G
Press RUN when Ready	

6. Press the “RUN” key, or the foot switch if you are using one, and the LabTec™ will Tare the scale, dispense 200.00 gm, and show the following screen:

DW= 199.95 gm	FINISH
CW= 199.9 gm	SC=001

Where DW = Dispensed Weight, CW = Cumulative Weight, and SC = Sample # for the weight dispensed, which will increment by one for each occurrence. The display will then alternate between this screen and the one before it. Continue pressing the “RUN” key until you have finished dispensing the needed number of aliquots.

Documentation

The LabTec™ will output data to a printer or a PC at the completion of each dispense for archival purposes. The following is an example of that data, and the abbreviations used.

09/24/09; 16:42; LABT 0.11X; Weight; CW; Tubing=15; Units=psi; Exec 1; Weight set= 100.00G; Count= 1; Rate= 80.0%;
Slow Factor = 25.00; Sniffle = 0.00; Alarms: HP=1; HT=1; Limits; HP=20.0; HT=35.0;

MT,	SC,	DW,	CW,	P1,	T,	ST,
16:43:01,	1,	100.00,	100.0,	--.-,	0.0,	FINISH,
16:43:13,	2,	100.10,	200.1,	--.-,	0.0,	FINISH,
16:43:24,	3,	100.00,	300.1,	--.-,	0.0,	FINISH,

MT = Military Time
SC = Sample #
DW = Dispensed Weight
CW = Cumulative Weight,
P1 = Pressure
T = Temperature
ST = Status

The following chart shows tubing dimensions and the available flow rates based on tubing, pump head and motor size choices:

Tubing Size	13	14	16	25	17	18	15	24	35
Tubing ID*: in	0.030	0.60	0.125	0.190	0.250	0.310	0.190	0.250	0.310
Tubing OD*: in	0.157	0.189	0.251	0.314	0.376	0.439	0.376	0.439	0.500
Tubing Wall*: in	0.063	0.063	0.063	0.063	0.063	0.063	0.093	0.093	0.093

Pump Rate Range*:	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min	mL / min
CP-8 8RPM	0.03 - 0.45	0.10 - 1.63	0.43 - 6.38	0.9 - 12.6	1.14 - 18.3	1.7 - 24.3	0.45 - 13.0	0.65 - 20.0	NR
CP-120 160RPM	0.5 - 10.0	1.7 - 35.2	6.3 - 129.0	12.5 - 283.0	18.5 - 405.0	24.7 - 554.0	9.0 - 260.0	13.0 - 435.0	NR
CP-200 600RPM	2.0 - 34.0	8.6 - 132.0	29.0 - 533.0	49.0 - 974.0	70.0 -1048.0	103.0 -1515.0	59.0 - 993.0	85.0 - 1348.0	111.0 - 2258.0

*Nominal Values

Pump Head Model:	1081	1082

Note: The following may affect your accuracy, and should be considered:

1. Parker suggests you use #15 or 24 tubing, and move the portion inside the pump 3-4 inches toward the discharge side of the pump periodically to avoid excessive wear. #35 tubing will allow you to pump at higher flow rates, but a larger slow factor should be implemented.

2. Sniffle Factor. This is a parameter that can be adjusted to minimize the drips that occur after dispensing, thereby eliminating overruns when a filter is used. These procedures suggest an initial factor of 0.0. If you are using a filter, this may need to be increased as the filter becomes plugged.

3. Slow Factor and Pump Rate. These parameters can be optimized further depending upon your specific application. The Slow Factor should be set to 25 gm for most aliquots, and adjusted up or down based on aliquot size and scale response time. Increasing it beyond 40 gm will just slow down your dispense times without a corresponding increase in accuracy. Decreasing the Pump Rate will help if the default of 80% is causing too much backsplash that can't be eliminated in some other manner, or if the dispense weight is small.

4. When executing the "Weight Dispense" cycle, the pump begins at the specified pump rate. The LabTec™ will slow down during the last 25 gm (as defined by the "Slow Factor") to avoid overshooting the target weight. After dispensing 98% of the target weight, the LabTec™ stops momentarily. At this point, the scale will reach a steady state, and the LabTec™ will calculate the precise amount needed to reach the target weight. If the LabTec™ does not stop at the 98% of target weight point, it will have overshot the target weight. Either increase the"Slow Factor", or decrease the chosen "Pump Rate" so that the pump performs in this manner.

Part A: LabTec™ Hardware:

1.0 Hardware Overview

The LabTec™ has been designed to automate batch-dispensing of liquids from the low milliliter (0.5 mL) to liter range. The LabTec™ allows you to optimize the dispensing rate per aliquot as well as the dispensing precision and accuracy, while monitoring pressure if a fi er is in use. A high pressure alarm may be set to stop the pump when a user-defined value has been achieved. The LabTec™ can be used for either sterile or non-sterile dispensing applications as well as for aqueous and nonaqueous batch dispensing.

In automated batch dispensing, three (3) important parameters, namely, dispensing rate, precision and dispensing accuracy need to be considered. The LabTec™ has typical precision and accuracy levels consistently in the 0.3% to 1.0% range; however the actual precision and accuracy levels are somewhat dependent on the dispensing speed or pump rate.

In general, the higher the dispensing rate is, the poorer the dispensing precision and accuracy will be. Conversely, the dispensing precision and accuracy generally will improve with lowering of the pumping rate.

The two-channel Tandem™ 1081 peristaltic pump head can accommodate PharMed and Platinum-cured Silicone pump tubing, sizes 13, 14, 16, 25, 17 & 18. If equipped with the ™ 1082 model, sizes 15, 24 & 35 can be accommodated. All pump tube sizes are factory calibrated, however, the user can easily recalibrate any tube size with a single keystroke from the LabTec® front panel in Constant Rate mode.

The ™ pump head delivers fl w rates ranging from 0.03 mL / min. to 2200 mL / min. for each of the two pump channels depending on motor rpm. Two pump heads can be mounted together to provide a four-channel pumping capability, and drastic reduction in pulsation when two upper or lower channels are combined into one with appropriate Y-type connectors.

Note: The LabTec™ usually is configured with a 600-rpm motor and one of the aforementioned pump heads. However, if your dispensing needs require, the LabTec™ is available with piston or magnetic gear pump heads and appropriate motors that work well for both aqueous and non-aqueous solutions.

2.0 Front Panel: Data Entry & Display

The front panel consists of a user interface, which includes an alphanumeric display and a membrane keypad to select operational modes and alarm settings. The display is a two line, 20 character each, liquid crystal display (LCD). The display is backlit to allow easy viewing over a wide range of lighting conditions.

The lower line on the LCD is used to signify the function of the “soft keys” marked “A”, “B” and “C”. The “soft key” current labels are displayed in the lower line of the LCD. If you press these keys, then the function displayed above it will be performed.

The main keypad consists of eight “hard” keys whose function does not change. These keys are used for basic control and programming of the LabTec™.

RUN Executes the selected operational mode and starts pump.

STOP Interrupts current operational mode and stops pump.

AMOUNT This button acts as a “shortcut’ key to change the amount dispensed without exiting the dispensing mode. Use in Manual mode to change the motor speed.

PRIME This is used to prime the tubing. It is a momentary switch and only runs the motor while it is depressed.

COUNT Another shortcut key used to change the number of sequential dispenses without leaving the dispensing mode.

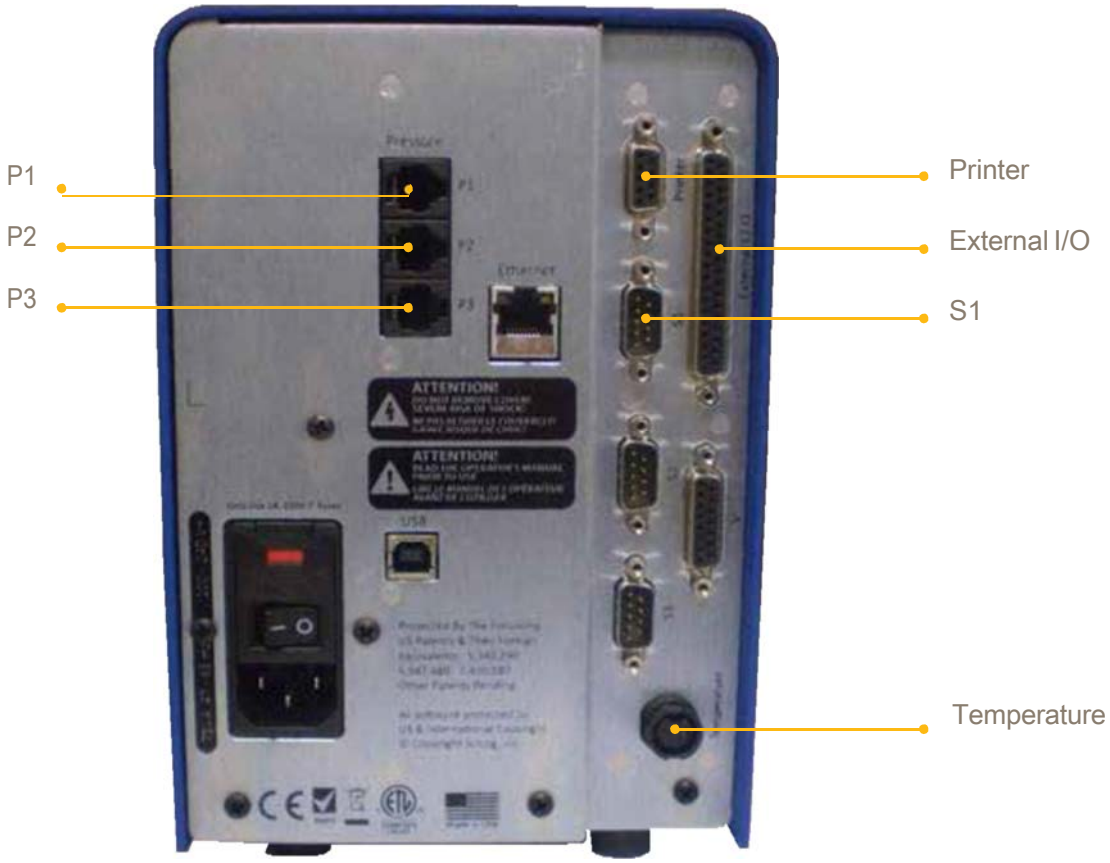
DELAY Another shortcut key used in conjunction with Count above to set the delay time between sequential dispenses without leaving the dispensing mode.

EXIT Used to Exit the current operational mode or menu level, stops pump.

RE-CAL Used for re-calibration of the dispensed amount in Volume Dispense Mode.

Two LED’s are also on the front panel, just to the left of the main keypad. These indicate the current pump status. A green light indicated the pump is in motion; the red light indicated that the pump has stopped.

3.0 Back Panel: Interface Options



The LabTec™ back panel provides interfacing ports for:

- Parker Printer (P/N: 080-095) or PC RS-232 connection: Female DB9, labeled "Printer".
- Electronic Scale: Male DB9, labeled "S1". (S2 and S3 are not utilized in the LabTec™.)
- Foot Switch (P/N: 080-059) or SciLog® SciCon® Monitor: Male DB37, Labeled "External I/O".
- SciLog® SciPres® Pressure Sensors: 3 RJ11 jacks, one for each pressure sensor. Labeled "P1, P2, P3". The LabTec™ uses only one sensor. (Do not connect the LabTec™ to a telephone system, these are for the sensors only.)
- SciLog® SciTemp® Temperature Sensor: Conxall 2 pin connector. Labeled "Temperature".

3.1 Printer Port

The LabTec™ can be connected to a PC for data collection or to a Parker Printer via the female DB9 RS-232 port labeled “Printer”. You need a Parker RS-232 cable (P/N 080-073) to connect to a PC for data archival.
Alternatively, a USB cable (090-158) may be used. A printer cable (080-096) is required to make the connection between the Parker serial printer and the LabTec™. As both are available, one may gather data in both methods simultaneously.

3.2 Scale Ports

The male DB9 ports labeled “S1”, “S2” and “S3” are RS-232 ports for electronic scales. For the LabTec™, only S1 is used. (Please do not remove the covers on the unused ports.) This port allows you to interface with a number of different electronic scales: i.e. Mettler, Ohaus, and Sartorius top-loading scales. The following scale cables are required:

- Mettler: PGS, PM, Viper Models: P/N: 080-067PGS
- Mettler: ICS425 Series: P/N: 080-072ICS
- Ohaus: GT, “Precision Advanced” & STET “Explorer” & “Voyager” Models: P/N: 080-066
- Ohaus: IP Series High Capacity: P/N: 080-067
- Ohaus: Adventurer Series: P/N: 080-067PGS
- Sartorius: Most Series Scales : P/N: 080-068

In the LabTec™ Setup: Scale mode, select the scale manufacturer; the LabTec™ will automatically implement the correct communications parameters. Check that the proper communications parameters are also implemented in the scale being used.

3.3 Pressure Sensor Ports

RJ11 jacks for the SciPres® pressure sensors, labeled “P1”, “P2”, and “P3”. The pressure sensors plug into these jacks using the included cables. The LabTec™ uses only one sensor, any of the three may be chosen as the source location.

3.4 Temperature Sensor Port

The SciTemp® Temperature Sensor connects to this port with a twist-lock connector cable (P/N: 080-609). Temperature is measured in degrees Celsius.

3.5 Valve V Port

Not used in conjunction with the LabTec™.

3.6 USB Port

Used for connection to a PC, providing a Com Port. Can be used for data collection as an alternative to the Printer port. The driver is included on the USB thumb drive that contains this manual.

3.7 Ethernet Port

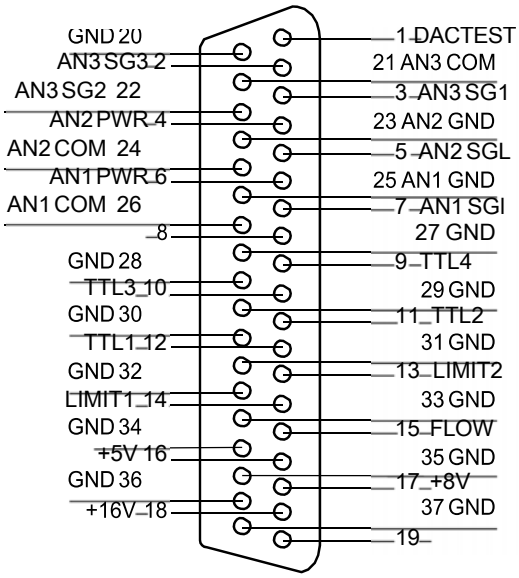
Reserved for future development, Non-functional.

3.8 External I/O Connector

DB37 connector used to interface with various devices on other Parker Lab System models. It is used on the LabTec™ to interface with a foot switch (P/N: 080-059) and allows remote Start / Stop control of the LabTec™.

When used, a Footswitch or External Run / Stop Cable is connected to, Pins 19 and 37.

Pinout of DB37 External I/O Connector on Rear Panel:



4.0 ™ Dual Channel Peristaltic Pump Head

The peristaltic pump head is specifically designed for use with the LabTec™ system.

The Parker pump heads (models 1082 & 1081) will provide you with rugged reliability as long as common sense maintenance and good quality pump tubing are used. For most dispensing applications, you should be using the 1082 (P/N: 080-1082) together with either #24 or #15(thick-walled) silicone pump tubing.

For most dispensing application in the 10 mL to 500 mL range the 1082 (P/N: 080-1082) together with thick-walled, #24 silicone tubing is the most appropriate and useful pump head / tubing combination. Use #15 thick-walled silicone pump tubing for dispensing applications in the 2.5 to 10 mL range.

For dispensing applications below 2.5 mL, the 1081 (P/N: 080-108) together with thin-walled tube sizes (#13, 14, 16) is the most appropriate pump head / tubing combination.

The pump head is typically driven by a 600 RPM, high-torque motor. The pump motor is optically encoded and servo-controlled, thus the pump head will maintain a constant output over a wide range of dispensing conditions.

However, when the pump head requires excessive torque because of pump tube failure or "freezing" of the pump head, then the LabTec™ control software will recognize this condition and go into a stand-by mode, the pump motor is turned off and the following message is displayed:

CHECK PUMP HEAD

Press Any Key

Before continuing with your pumping application, remove the defective pump head / tubing and either clean or replace with a functional pump head. This feature (PumpSense™) has been implemented by Parker to protect your pump motor and electronics.

Note: There is nothing wrong with the LabTec™ controller when you see this display. The problem lies with the pump head and / or pump tubing you are using. When you "Press Any Key" to leave the stand-by mode, you will return to the previous Menu. After you check and replaced your pump head / tubing, you may re-initialize your application.

4.1 Pump Head Installation

1. Identify the front and back of the . Two 8-32 mounting cap screws, as well as the pump shaft tang that extends from the back of the pump head.

2. Facing the front of the , open the pump head by moving the black lever 180° to the left. The upper and lower pump shoe will move in opposite directions, thereby exposing the inside of the upper and lower pump shoe channels.

3. With the pump head completely opened, locate the mounting holes for the two 8-32 cap screws inside the lower pump channel.

4. On the front panel of the LabTec™, locate the mounting holes and the slotted pump head coupler.

5. Before fastening them, align the two mounting screws and pump shaft tang of the with the holes and slotted coupler of the LabTec™ front panel mounting plate.
   The tang should have a grey plastic piece pressed on its end.

6. Make sure the pump shaft tang is properly seated in the mating slot of the pump head coupler, before fastening the to the front panel of the LabTec™.

4.2 Peristaltic Pump Tubing / Rate Selection

For most sterile, liquid dispensing applications larger than 10.00 mL, the 1082 together with thick-walled, #24 pump tubing is the most useful pump head / tube combination.

For dispensing applications in the 2.5 mL to 10 mL range, the 1082 together with #15 thick-walled-walled pump tubing is the most useful pump head / tubing combination.

The following chart lists the nominal flow rates of the available motor / tubing combinations:

Approved Tubing Size		13	14	16	25	17	18	15	24	35
	Silicone Part #	400-113	400-114	400-116	400-125	400-117	400-118	400-115	400-124	400-135
	PharMed Part #	400-313	400-314	400-316	400-325	400-317	400-318	400-315	400-324	400-335
Your Motor	Pump Rate Range	mL /min	mL /min	mL /min	mL /min	mL /min	mL /min	mL /min	mL /min	mL /min
❑	CP-8 8RPM	0.03-0.45	0.1-1.6	0. 4-6.4	0.9-12. 6	1.1-18. 3	1.7-24. 3	0.5-13	0.6-20	---
❑	CP-120 160RPM	0.5-10.0	1.7-35.0	6.3-129.0	12.5-283.0	18.5-405.0	24.7-554.0	9.6-240.0	14.0-412.0	---
❑	CP-200 600RPM	2.0-34.0	8.6-132.0	29.0-533.0	49.0-974.0	70.0-1048.0	103.0-1515.0	59.0-993.0	85.0-1348.0	111.0-2258.0
Pump Head Model:		1081						1082		

Note: Differences in pump tube formulation / manufacture, as well as pump tube wear over time may cause the LabTec™ pump output to change. Thus for very high pump rate accuracy you may want to re-calibrate the LabTec™ with your particular pump tubing in place. Recalibration of the LabTec™ pump is very easy and straight forward.

4.3 Pump Tube Installation

Note: Do NOT mount or dismount the pump head while the LabTec™ is powered. Do NOT change pump tubing while the LabTec™ is powered. When using both upper and lower pump channels simultaneously, the same type of tubing should be used in each channel.

1. Open the pump head by moving the black loading lever 180° to the left. If you are going to use the upper pump channel, slip the tubing into the upper channel; this is over the pump roller cage. If the lower pump channel is used, feed the tubing through the lower channel; this is under the pump roller cage.

2. Lock the tubing in place by pushing the loading lever 180° to the right. The tube retainer spring will automatically place the correct tension on the pump tubing to prevent tube "walking".

3. With the pump head closed, lightly pull the two ends of the tubing in opposite directions and away from the pump head. This pulling action insures that the pump tubing is taut and within the pump channel.

4.4 Pump Tube Replacement

1. The pump tubing section located in the pump head should be advanced at regular time intervals, i.e.: daily, if the LabTec™ is heavily used.

2. When advancing pump tubing, the used pump tube section must be moved to the pump discharge side, i.e. dispensing side. The used pump tube section is weakened and tends to collapse when placed on the suction side of pump head.

3. When you advance or replace the pump tubing, break-in the new pump tube section by letting the pump run for a few minutes before attempting RE-CAL. The pump output will have stabilized during the break-in period, thus your calibration will be more accurate.

5.0 Magnetic Gear Pump Head: Model 201

The LabTec™ with a Magnetic Gear Pump Head is recommended for large-volume dispensing applications. Used mainly for dispensing clean organic solvents. This is not considered a sterile pump head.

The Model 201 magnetic gear pump head is an external type gear pump, which produces a pulse-less flow. The spur gears rotate and intermesh inside the pumping chamber, thereby creating a pressure differential between the inlet and outlet of the pump.

Note: An in-line check valve (P/N: 400-530) must be installed on the discharge side of the pump head in order to avoid back-siphoning of solution between dispensing cycles and avoid losing prime by allowing the pump head to remain dry. Make sure that the dispensing tip is located above the solution reservoir level.

The rotating gears of the magnetic gear pump head generate significant shear, thus shear-sensitive solutions, i.e. enzyme or protein preps, should be dispensed with the peristaltic pump.

Only clean fluids, without particulates or abrasives should be dispensed with magnetic gear pump heads. Any particulates or abrasives will rapidly wear down the rotating gears and will decrease pumping capacity. A gear replacement kit for the 201 (P/N: 080-320) is available from Parker.

Note: Dispensing liquids with a viscosity greater than 1000 centipoises should be avoided. Such high viscosity can cause magnetic de-coupling of the pump head. Reduce the LabTec™ pump speed when dispensing fluids with viscosity greater than 300 centipoises.

Magnetic de-coupling occurs when the torque limit of the driving magnet has been exceeded. Once de-coupling occurs, the driving magnet (this is the magnet fastened to the motor shaft) turns by itself while the driven magnet (inside the pump head) is motionless. The Magnets will automatically re-align and re-couple when the motor stops.

Important: When your dispensing task is completed, flush distilled water or an appropriate solvent through the pump head for approximately two (2) minutes or until the solution appears clear. Do not leave the dispensing solution in the pump head overnight.

Mag 122, 120, and 040 heads are also available if slower flow rates are required, the same comments above apply.

6.0 FMI Piston Pump Heads: General Information

The LabTec™ FM-200 and FM-520 pumps use rotating, reciprocating piston pump heads of various sizes. In this style of pump head, the rotating piston moves to and from inside a cylinder; sucking in fluid at the inlet while transferring and releasing the fluid at the outlet. Flow rates for piston pumps are varied by changing either the motor speed or the stroke length. The FMI pump heads are excellent for precise fluid dispensing in non-sterile applications.

Note: Piston heads should not be used for pumping biological fluids or liquids containing biological cells or cellular components. Piston heads generate high local shear forces and produce strong mechanical agitation, which may destroy cells and fragment large molecular weight components, such as DNA or large protein molecules.

6.1 FMI Pump Heads: Construction / Motors / Pump Rates LabTec™ FM-200 Model:

The LabTec™ FM-200 comes with a 600 RPM optically encoded, servo-controlled motor and a FMI piston pump head.
Materials of Construction: Pump head fi s are either made out of Kynar or Tefzel. Pump piston and body are made out of ceramic. Exception: RHOO pump head model has stainless steel (1/8"ID) piston. "LF" designation refers to a "Low Flow / Low Dead Volume" pump connection, utilizing ¼ - 28 HPLC fi s. All FMI piston pump heads have a maximum pressure rating of 100 psi (6.89 bar).

Pump Head Model:	Max. RPM:	Pumping Range:
RHOO, 0 – 0.025 mL / stroke	600 RPM	0.08 – 15.0 mL / min
RHO, 0 – 0.050 mL / stroke	600 RPM	0.17 – 30.0 mL / min
RH1, 0 – 0.10 mL / stroke	600 RPM	0.33 – 60.0 mL / min

Note: The cited pumping ranges are based on the following assumptions: Maximum pump rate = (Max. Stroke Volume) x (450RPM); with the stroke vernier setting at 450. Minimum pump rate = (Min. Stroke Volume) x (18 RPM); stroke vernier setting at 50.

LabTec™ FM-520 Model: The LabTec™ FM-520 comes with a 3400 RPM motor and a FMI piston pump head. All head specifications are like those listed for the FM-200 above.

Pump Head Model:	Max. RPM:	Pumping Range:
RHOO, 0 – 0.025 mL / stroke	3400RPM	0.50 – 85.0 mL / min
RHO, 0 – 0.050 mL / stroke	3400RPM	1.00 – 170 mL / min
RH1, 0 – 0.10 mL / stroke	3400RPM	2.00 – 340 mL / min

Note: The cited pumping ranges are based on the following assumptions: Maximum pump rate = (Max. Stroke Volume) x (3400RPM); with the stroke vernier setting at 450. Minimum pump rate = (Min. Stroke Volume) x (102 RPM); stroke vernier setting at 50.

6.2 FMI Pump Heads: Installation

The following are directions to mount a FMI pump head on a LabTec™ controller. If you purchased the LabTec™ controller with a FMI pump head already mounted, you can disregard these directions. However, if you purchased your FMI pump head separately, you will need to mount the pump head. The same instructions should also be used when dismounting an old pump head, which you may want to replace with a new one:

1. Disconnect the power cable from the LabTec™.

2. Remove the two screws (6-32 x ½¨) from the underside of the LabTec™. These hold the motor mounting plate in place.

3. Remove the four (6-32 x 3/8¨) Philip screws from the faceplate at the front of the LabTec™.

4. Carefully remove the pump / motor subassembly from the LabTec® controller. Disconnect the motor cable (cable connecting the motor to the electronic board) before completely removing the pump / motor assembly from the LabTec™ controller.

5. Mate the FMI pump head shaft to the flexible pump motor coupling. Fasten the shaft to the coupling (the set screw on the coupling requires a 3/32 hex bit).

6. Fasten the FMI pump head with two screws (8-32 x ½") to the back of the faceplate (use an offset screwdriver).

7. Reconnect the pump motor cable and carefully place the pump / motor assembly back into the LabTec™ controller.

8. Fasten the faceplate of the pump / motor assembly to the chassis with the four screws removed in Step 3.

9. Fasten the motor mounting plate to the underside of the LabTec™ with the two screws removed in Step 2.

10. Test the LabTec™ with the FMI pump head in place. Make fluid connections to the pump head. Do not let the pump head run dry without fl id for any prolonged period of time.

6.3 FMI Pump Heads: Stroke Volume Adjustment

The knurled adjustment ring (black decal with markings, not the small knurled knob) on the FMI pump head controls the stroke length and thus controls the output per motor revolution.

The adjustment ring is factory set at “200,” however, by turning the Adjustment Ring clockwise; the stroke length and the pump output are reduced. However, do not turn the Adjustment Ring below “50”. When turning the adjustment ring counter clock-wise from “50” to “450”, the maximum stroke length / volume is obtained. Do not turn the adjustment ring above the “450” setting.

The maximum stroke volume for the RHOO pump head is 25 µl, for the RHO pump head the stroke volume is 50 µl while the RH1 pump head has a maximum stroke vole of 100 µl.

6.4 FMI Pump Heads: Cleaning

Cleaning of Pump Head: Routine flushing with solvent before shutdown will work for most applications. Set the LabTec™ for maximum pump speed, let the pump run until solvent appears clear at discharge port. This should be for a minimum of 2 minutes. Do not leave process material in the pump head overnight. Preventive maintenance is very valuable and ensures a long operational pump life.

Important: Ceramic piston / cylinder sets are sensitive to neglect and may "freeze" if allowed to dry out without adequate cleansing. Fill a loop of flexible tubing with fluid that will thin or neutralize the last fluid pumped. Then connect one end of the tube to the pump suction port, the other to the discharge port. With the loop positioned above the pump head, the ceramic surfaces and seal areas stay moist and mobile for extended idle periods.

However, if a piston freezes in the cylinder, **Do Not Force It Free! Be gentle.** Try to remove the pump head from the base assembly so the whole pump head can be soaked in a suitable solvent. If the head is not conveniently removable, the tube loop discussed in the previous paragraph may permit solvent to dissolve the "frozen" residue in reasonable time.

6.6 FMI Pump Heads: Chemical Compatibility

FMI pump heads are well known for their robustness and overall chemical compatibility with many process fl ids. The materials used in manufacturing FMI pump heads are inert to most chemicals, however, the following exceptions must be observed:

When pumping: Toluene, Methylethylketone, Acetone, Ethanol, Hexyl Alcohol, Isobutyl Alcohol or Isopropyl Alcohol, FMI pump heads with Tefzel (ETFE) housings must be used: RH1-CTC; RHO-CTC; RHOO-CTC. The "T" in CTC designates Tefzel housing.

Tefzel has also excellent chemical resistance to most acids, bases or solvents.

Tefzel pump heads can be used in pump applications not exceeding 90°F and 100 psi (0 - 6.89 bar).

For pump applications involving fl ids above 90°F, FMI pump heads with Kynar (PVDF) housings must be used: RH1-CKC, RHO-CKC, or RHOO-CKC, the "K" in CKC stands for Kynar.

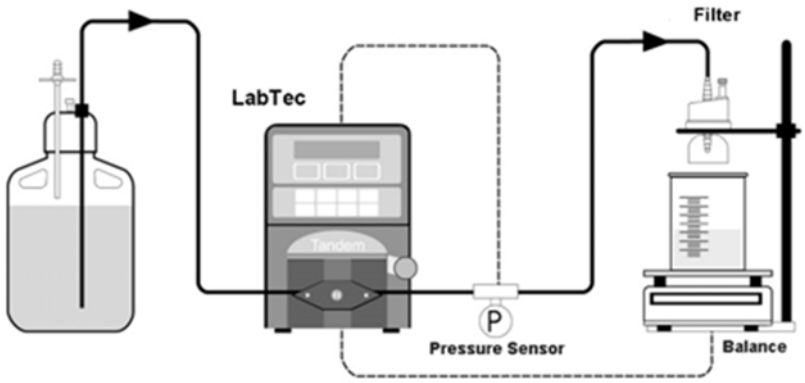
Kynar has good chemical resistance to most fluids; however, Kynar pump heads must not be used with Acetone, Ketones or Esters.

6.7 FMI Pump Heads: Viscosity Effects

The LabTec™ FM-200 is capable of pumping high viscosity fl ids. When pumping high viscosity liquids, you should always use large bore tubing ($^1/_4$" OD), slow pump rates and large stroke volumes (set knurled Adjustment Ring to "400") in order to avoid pump cavitations.

The LabTec™ FM-200 together with either a RHO or RH1 pump head can handle fluid viscosities up to 2000 cps, and fluid viscosities up to 5000 cps when the fl id reservoir and feed line connected to the pump inlet port are pressurized.

7.0 Pressure Sensor Installation



The SciLog® SciPres® pressure sensors are connected in-line with the tubing and used in a flow through manner. The SciPres® sensors have polysulfone and silicone wetted surfaces.

The SciPres® sensors are available in 5 different sizes. Luer units ship with the LabTec™ under normal situations, but they are available in 3/8¨ and 1/2¨ hose barb, as well as 3/4¨ and 1.0¨ Ladish TC styles. The SciPres® pressure sensors re easy to change when the need arises, and are readily available from Parker in packs of 5. They may be sanitized using several methods, CIP with NaOH or alcohol, autoclaved up to twice, or gamma irradiated.

Caution: Make sure you have secured all of the connecting tubing for the pressure sensors with nylon cable ties.

Part B: LabTec™ Software

1.0 Software Overview: Main Menu

The main menu of the LabTec™ consists of five (5) operational modes as shown on the next page. By using the “Up” and “Down” keys, one can readily scroll through the main menu. Press the “Select” key to enter a chosen operational mode, i.e. WGT RATIO (Weight Ratio). By pressing the “Select” key the first level submenu is entered, which provides access to the “Exec” and “Edit” functions. In the “Edit” submenu, the parameters for the dispensing application are selected. The LabTec™ has three (3) dispensing modes, namely, Weight Ratio Dispensing, Volume Dispensing and Weight Dispensing.

WGT RATIO: In the Weight Ratio Dispensing mode, the LabTec™ is connected to an electronic, top-loading scale and allows automatic sample weighing and dilution: The LabTec™ will tare the scale after the sample container has been placed onto the scale. The sample to be diluted is then placed into the container and the sample weight is captured and displayed by the LabTec™. The diluent is automatically dispensed by the LabTec™ based on the user-defined sample to diluent weight ratio. Monitoring and Alarm of backpressure is available in this mode.

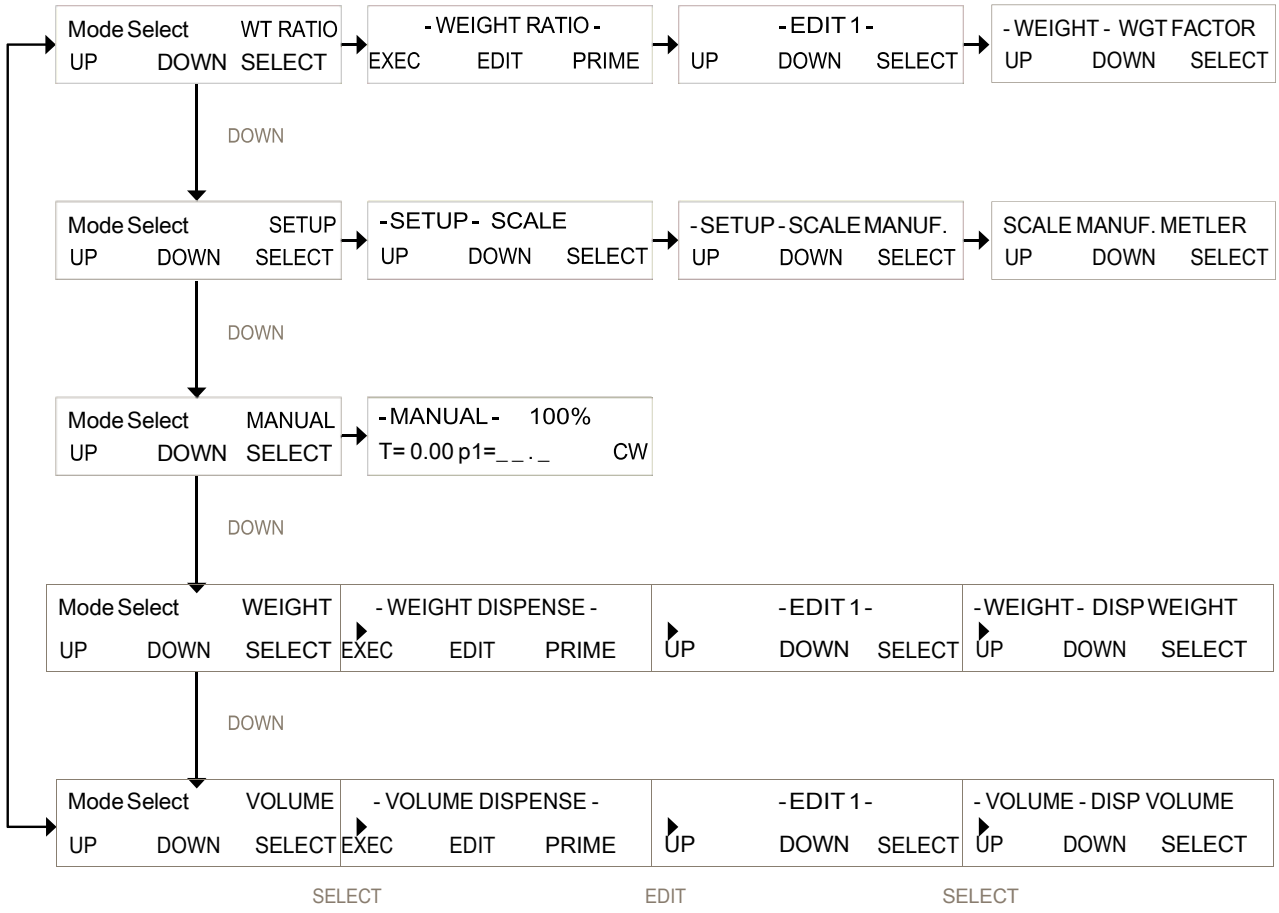
VOLUME: In the Volume Dispensing mode, the LabTec™ dispenses user-defined volumes. In this operational mode, the LabTec™ utilizes factory installed master calibration curves. These calibrations are valid for a given pump head, motor and pump tubing combination. Typically the calibration is carried at or near 100% motor speed although a lower pump speed setting may be advisable for smaller volumes. A Re-Cal feature, available from the front panel, is used to fine-tune this calibration, and to compensate for pump output changes due to peristaltic pump tube wear. Both the Slow Factor and the Sniffle functions are available in the Volumetric Dispensing mode, as well as Monitoring and Alarm of backpressure.

WEIGHT: In the Weight Dispensing mode, the LabTec™ is connected to an electronic, top-loading scale while dispensing solutions by weight. In this operational mode, the LabTec™ does not require calibration since dispensing by weight involves an already calibrated scale. Typically, dispensing by weight is somewhat slower than dispensing by volume. The main reason for this slow-down lies with the limited response speed of electronic scales. Both the Slow Factor and the Sniffle functions are available in the Weight Dispensing mode, as well as Monitoring and Alarm of backpressure.

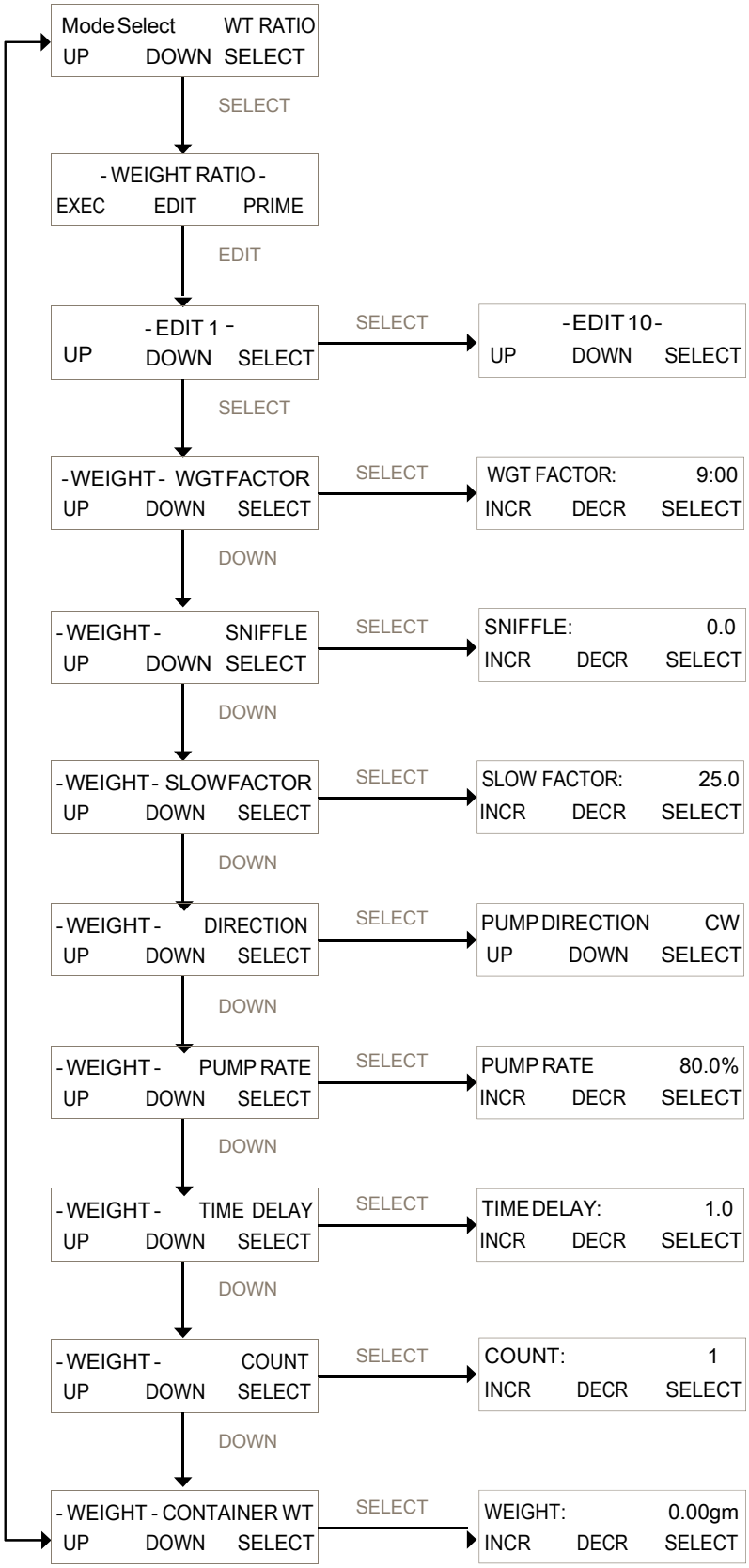
MANUAL: Allows manual pump speed control.

> Note: Monitoring and Alarm of backpressure is available in this mode, but no data output is available.

SETUP: This operational mode allows selection of various user preferences and interface options.


Mode Select WT RATIO
UP DOWN SELECT
- WEIGHT RATIO -
EXEC EDIT PRIME
- EDIT 1 -
UP DOWN SELECT
- WEIGHT - WGT FACTOR
UP DOWN SELECT
DOWN
Mode Select SETUP
UP DOWN SELECT
- SETUP - SCALE
UP DOWN SELECT
- SETUP - SCALE MANUF.
UP DOWN SELECT
SCALE MANUF. METLER
UP DOWN SELECT
DOWN
Mode Select MANUAL
UP DOWN SELECT
- MANUAL - 100%
T= 0.00 p1=_ _ . _ CW
DOWN
Mode Select WEIGHT
UP DOWN SELECT
- WEIGHT DISPENSE -
EXEC EDIT PRIME
- EDIT 1 -
UP DOWN SELECT
- WEIGHT - DISP WEIGHT
UP DOWN SELECT
DOWN
Mode Select VOLUME
UP DOWN SELECT
- VOLUME DISPENSE -
EXEC EDIT PRIME
- EDIT 1 -
UP DOWN SELECT
- VOLUME - DISP VOLUME
UP DOWN SELECT
SELECT
EDIT
SELECT

2.0 Weight Ratio Mode: Edit Menu



2.0 Weight Ratio: Weight Ratio Dispensing; Edit

SUMMARY: In the Weight Ratio Dispensing mode, the LabTec™ provides automated sample weighing and sample dilution. With this operational mode, the LabTec™ must be connected to an electronic, top-loading scale. The SETUP: Scale sub mode provides electronic scale options, i.e. scales that can be interfaced with the LabTec™: Mettler, Ohaus, and Sartorius. The selected scale is connected to Port S1. The LabTec™ also has provisions for printing / documenting your dispensing data. The printer (P/N: 080-095) is connected to the LabTec™ via the Printer Port. Use SETUP: Printer for setting up the printer communications parameters. Back pressure of any filter in the system can be monitored by use of a SciPres® Pressure Sensor, enabling the pressure alarm in SETUP: Press Sensor, and setting a user-defined limit.

When executing the Weight Ratio Dispensing mode, the LabTec™ will display “SCALE INITIALIZATION / Please Wait”. While this message is being displayed, the LabTec™ checks the scale communication. If scale communication fails the LabTec™ will display “SCALE ERROR / Press any key”. Check the RS-232 cable connection as well as the communications parameters in the scale. Also make sure the correct scale manufacturer is selected in the SETUP: Scale submenu.

WGT FACTOR: Defines the weight ratio (multiplier) that is applied to the actual sample weight, as determined by the scale, to arrive at the required diluent weight. For example, if the WGT FACTOR is set at 9.00 (default value), and the actual sample weight is 10.0 grams, then the diluent target weight is 90.0 grams resulting in a 10-fold sample dilution by weight.

SNIFFLE: The SNIFFLE function consists of a brief pump reversal to suck in the droplet that typically hangs at the end of the dispensing tip. The length of time for the pump reversal is user-selectable from 0 to 2.0 seconds. The SNIFFLE function is implemented at the end of each dispensing cycle thereby avoiding carry-over between cycles and a cleaner dispensing environment.

SLOW FACTOR: Defines the diluent weight that is dispensed slowly at the end of the dispensing cycle. For example, if the diluent weight is 90.0 grams, then the SLOW FACTOR is selected to be 25.0 gm. When the LabTec™ initiates diluent dispensing, the first 65 gm. will be dispensed at a high pump rate (e.g. 80% of max.), while the last 25 gm will be dispensed in a multiple step ramp down of flow to avoid overshooting the diluent target weight. The SLOW FACTOR as well as the LabTec™ pump rate is user-selectable.

PUMP DIRECTION: Defines the rotation of the pump head; this parameter can be changed from clock-wise (CW, default) to counter clock-wise (CCW).

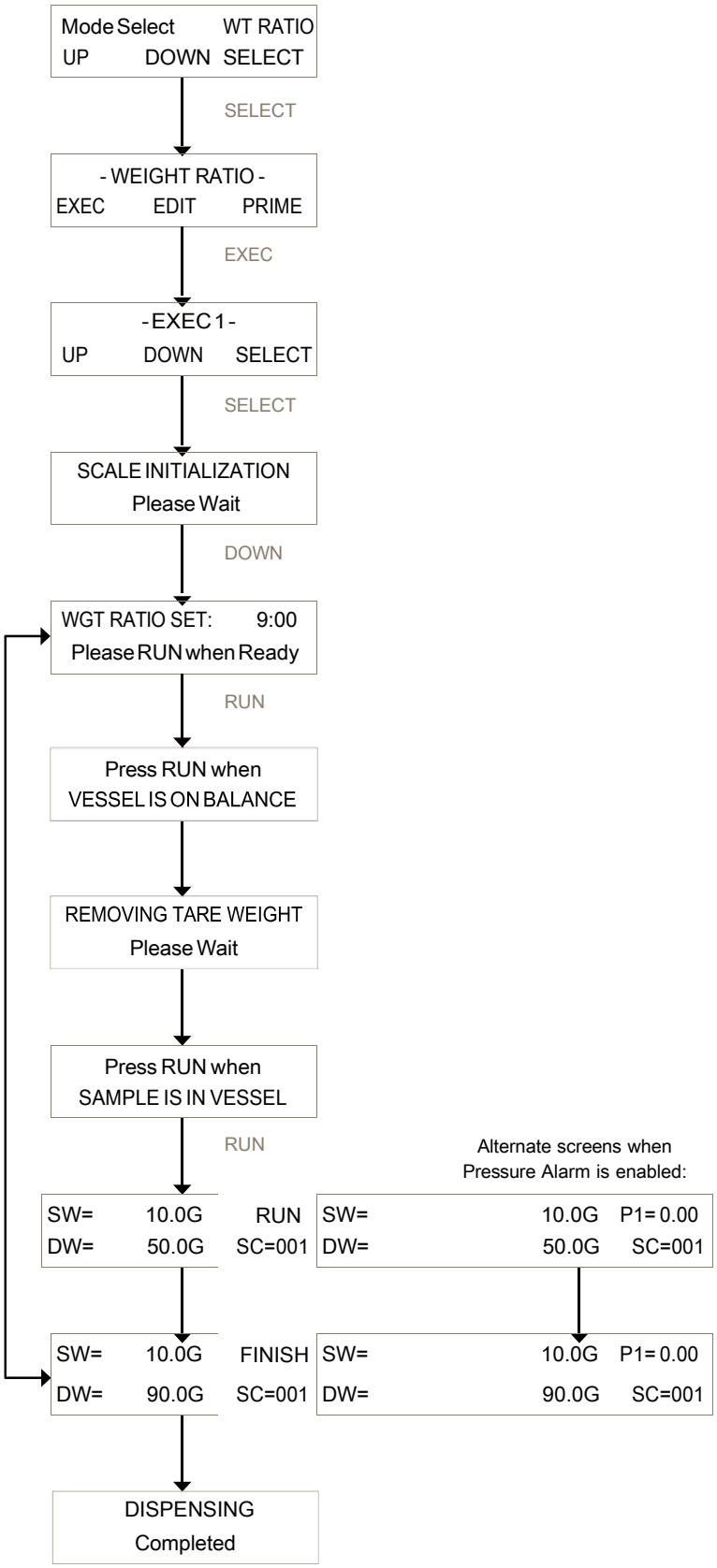
PUMP RATE: Defines the relative pump speed (0% to 100% of max.) with which the diluent is being dispensed. Typically, this parameter is set at 80% (default), however, a slower pump speed setting is advisable if excessive back-splashing should occur.

TIME DELAY: Not used in the Weight Ratio mode, should be set to 1.0 (default).

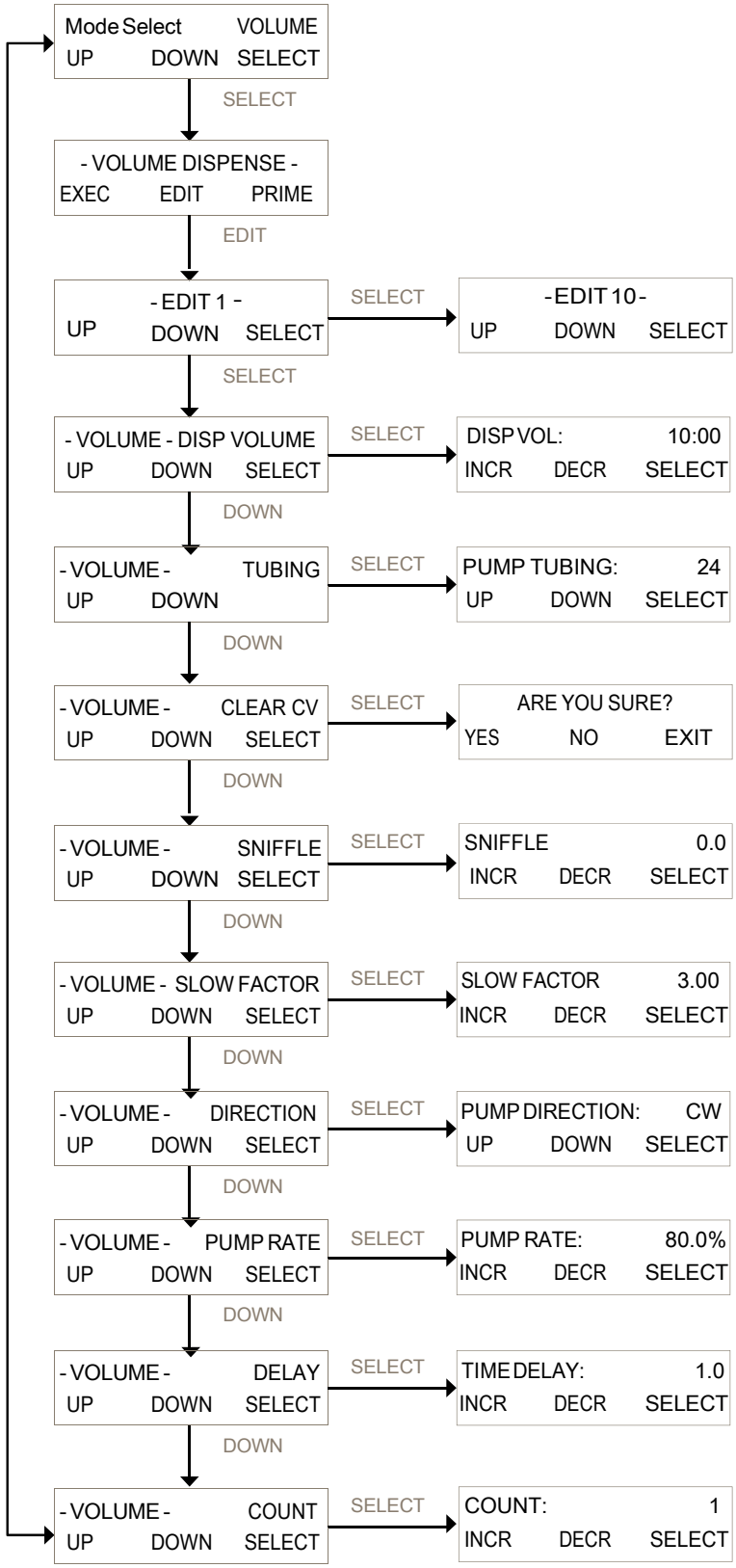
COUNT: Not used in the Weight Ratio Dispensing mode, should be set to 1 (default).

CONTAINER WEIGHT: Enter the weight of a standard container or bag, and it will automatically be deducted from the total weight of container and sample to arrive at the sample weight. The pump will then proceed to dispense the calculated diluent weight, skipping the “Press RUN When Sample is in Vessel” step and the initial tare of the scale.

2.1 Weight Ratio Mode: Execute Menu



3.0 Volume Dispense Mode: Edit Menu



3.1 Volume: Dispensing By Volume, Edit

SUMMARY: In the Volume Dispensing mode, the LabTec™ output must be optimized for a particular pump head / motor / tubing combination. Once optimized and calibrated, the LabTec™ dispenses user-programmable batch volumes with dependable precision and accuracy.

> Note: If you requested pre-configured aliquots from Parker, then the LabTec™ was delivered to you optimized, calibrated and ready for use.

A simple Re-Cal feature is available on the front panel to fine-tune the calibration, and compensate for output changes due to peristaltic tube wear. In general, the LabTec™ should be re-calibrated (Re-Cal key) at least daily, for very high accuracy dispensing applications a more frequent re-calibration schedule is advisable.

For volumetric batch dispensing, the typical precision and accuracy ranges from 0.5% to 1.0% depending on the dispensing rate. In general, the higher the dispensing (pump) rate, the poorer the dispensing precision and accuracy.

Volume units are milliliters by default. To change to liters or microliters (µl), access Setup, Pump; Volume Units.

DISP. VOLUME: Defines the volume to be dispensed in terms of milliliters. For example, to dispense 50.00 mL, use the “Incr”, key to scroll to 50.00, then press “Select”. Default = 10.00.

TUBING: Defines the tubing used in the Head. Accesses appropriate factory calibration curve. Choose between 13, 14, 16, 25, 17, & 18 for thin-walled in a 1081, and 15, 24, & 35 thick walled when using a 1082.(This option not displayed if RH series head or Mag gear head is chosen) Default = 13.

CLEAR CV: This clears the Cumulative Volume (CV) value without having to cycle the system power, which also clears this value. Press Yes, No, or Exit.

SNIFFLE: The SNIFFLE function consists of a brief pump reversal to suck back the droplet that typically hangs at the dispensing tip. The amount reversal is user-selectable from 0 to 2.0 revolutions. The SNIFFLE default value is set at 0.3. The SNIFFLE function allows you to avoid carry-over between dispensing cycles and provides for a cleaner dispensing environment.
Default = 0.3 sec.

SLOW FACTOR: Defines the solution volume that is dispensed slowly at the end of the dispensing cycle. For example, if the solution volume to be dispensed is 100 mL, then the SLOW FACTOR is selected to be approximately 10% or 10 mL. When the LabTec™ initiates volumetric dispensing, the first 90 mL (90% of total) will be dispensed at a high pump rate (e.g.100% of max.), while the last 10 mL (10% of total) will be dispensed slowly to avoid overshooting the solution target volume.
Default = 1.00 mL.

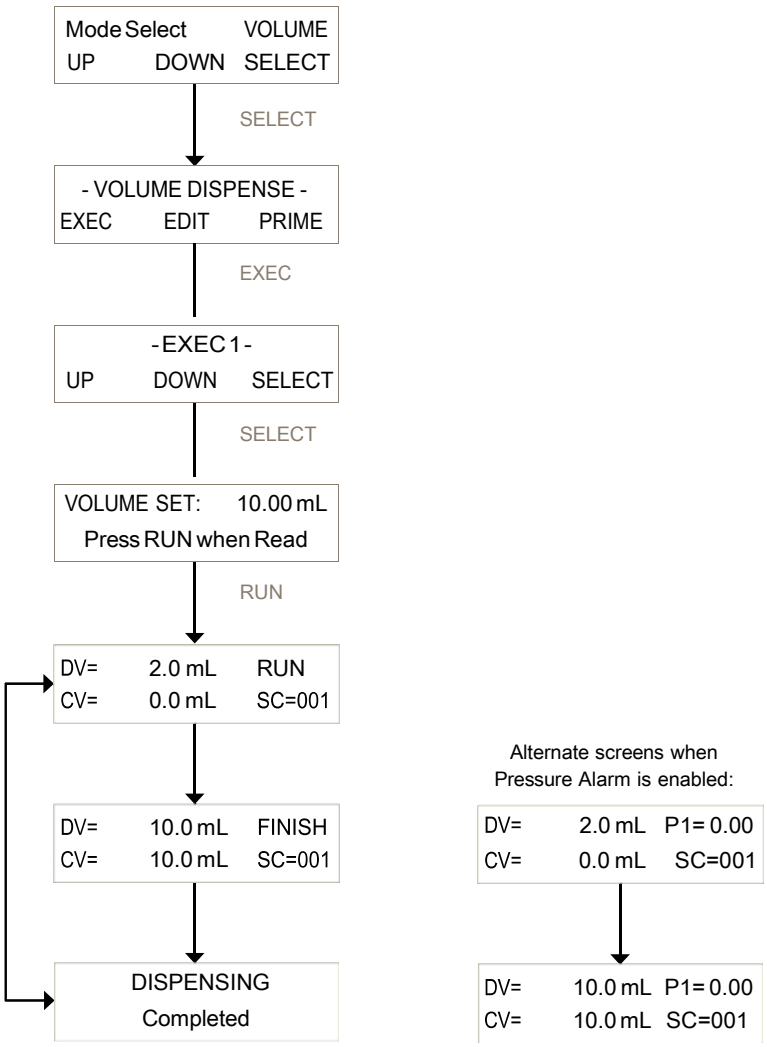
PUMP DIRECTION: Defines the rotation of the pump head; this parameter can be changed from clock-wise (CW, default) to counter clock-wise (CCW). Default = CW.

PUMP RATE: Defines the relative pump speed (0% to 100% of max.) with which the batch volume is being dispensed. Typically, this parameter is set at 100% (default), however, a slower pump speed is advisable if excessive back-splashing occurs. Default = 100%.

TIME DELAY: Defines the time interval between dispensing cycles (0.1 to 60 seconds).
Default Setting: 1.0 sec.

COUNT: Defines the number of repeats of the dispense that occur. For example, when COUNT=10, then the selected DISP. VOLUME will dispense10 times. Default Setting = 1.

3.2 Volume Dispense Mode: Execute Menu



3.3 Volume Dispense Mode: Calibration

The LabTec™ has two volumetric calibration features, built in Factory Calibrations as well as a Re-Cal feature.

The LabTec™ utilizes a number of factory calibrations. The LabTec™ accesses built in calibration curves based upon the motor rpm setting in SETUP: Pump: Motor RPM, the head setting in SETUP: Pump: Pump Head and the Tubing setting. When using a peristaltic head, select the correct tubing and you're ready to optimize and finally perform a RE-CAL (see below).

Calibrations for RH series heads are based on a vernier setting of 200, and those for the Magnetic gear heads are specific to that head. Again, a simple optimization and RE-CAL, and you're done. If you have not requested Parker to pre-configure and optimize the dispensing aliquots for you, or are editing a new one, you need to confirm the aforementioned settings.

Optimization involves choosing and fine-tuning the Pump Speed and Slow Factor settings to obtain fast, precise aliquots without overshooting. Small aliquots require slower pump speeds than large ones, and a similar relationship with aliquot size, pump speed and Slow Factor exists. Faster pump speeds will require larger Slow Factors. Please refer to Part C of this manual for example dispensing parameters that will provide a good starting point.

The Re-Cal feature allows you to quickly update the Factory Calibration. For peristaltic pumps in particular, slow pump tube wear will change the pump output over time. The Re-Cal function will compensate for this change in pump output by
adjusting the stored calibration curve.

For re-calibration purposes, you should dispense at least three (3) aliquots (distilled water) of your selected volume; e.g. 150.00 mL. Record the weight of each aliquot, and then determine the average (AV) aliquot weight. Use an electronic top-loading scale to weigh each aliquot.

For example, assume that you obtained the following values:

Trial 1 152.50 g
Trial 2 151.80 g
Trial 3 152.10 g
AV = Average Value: 152.13 g

In this example, you would adjust (assume 1.00 mL = 1.00 grams) the AV parameter to 152.13; the LabTec™ will automatically correct the factory calibration curve.

The Re-Cal feature is accessible through the Re-Cal key on the LabTec™ front panel. As shown on the opposite page, the Re-Cal feature is active when the following is displayed.

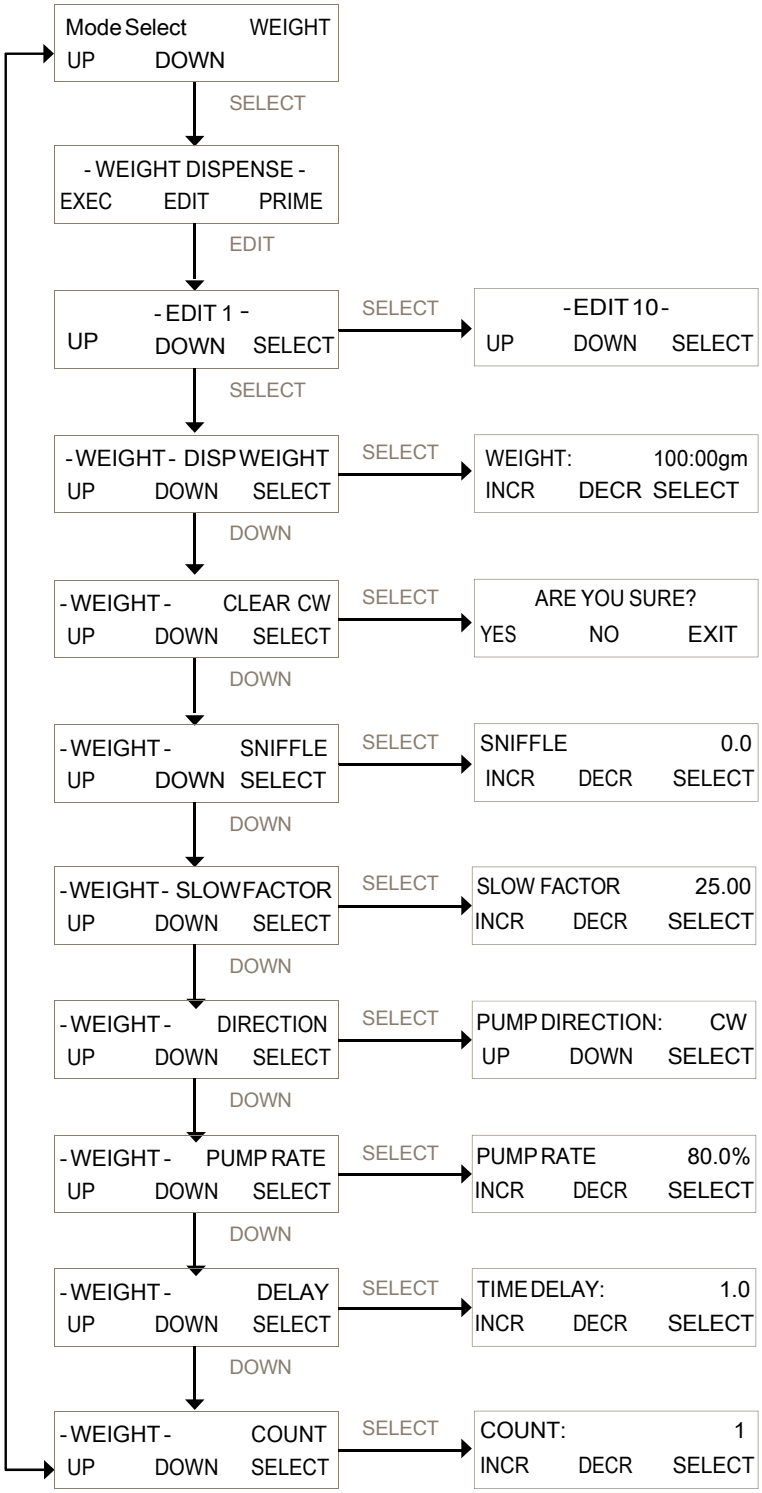
DISPENSING
Completed

Press the Re-Cal key on the front panel, and the following display appears:

DV = 150.00		AV = 150.00
Incr.	Decr.	Select

Only the AV parameter (AV= Average Value) can be changed in this display, use the "Incr." and "Decr." keys to adjust the AV parameter to match the amount collected. You may want to repeat the Re-Cal in order to check the improved dispensing accuracy.

4.0 Weight Dispense Mode: Edit Menu



4.0 Weight Dispense Mode: Edit Menu, Continued

SUMMARY: In the Weight Dispense mode, the LabTec™ is connected to an electronic, toploading scale while dispensing by weight. The SETUP: Scale submenu provides electronic scale options, i.e. scales that can be interfaced with the LabTec™: Mettler, Ohaus, and Sartorius. The selected scale is connected to port S1 on the rear panel of the LabTec™.

When executing the Weight Dispensing mode (press "Exec") the LabTec® will display "SCALE INITIALIZATION/Please Wait". While this message is being displayed, the LabTec® checks the scale communication. If scale communication is not possible the LabTec™ will display "SCALE ERROR/Hit any key". Check the RS 232 cable connection as well as the communications parameters in the scale; also make sure you have selected the correct scale manufacturer in the LabTec™ SETUP: Scale submenu.

Note: Use "Up" and "Down" keys to make a selection, then press, "Select" to implement the selection.

DISP. WEIGHT: Defines the dispensed weight in terms of grams. For example, to dispense 50.00 grams, use the "Incr", key to scroll to 50.00, then press "Select" Default = 100.00 gm.

CLEAR CV: This clears the Cumulative Volume (CV) value without having to cycle the system power, which also clears this value. Press Yes, No, or Exit.

SNIFFLE: The SNIFFLE function consists of a brief pump reversal to suck in the droplet that typically hangs at the end of the dispensing tip. The amount of pump reversal is userselectable from 0 to 2.0 revolutions. The SNIFFLE function allows you to avoid carry-over between dispensing cycles and provides for a cleaner dispensing environment. Default=0.0.

SLOW FACTOR: Defines the weight that is dispensed slowly at the end of the dispensing cycle. For example, if the desired weight is 100.0 grams, then the SLOW FACTOR is selected to be 25.0 gm. When the LabTec™ initiates dispensing, the first 75 gm. will be dispensed at a high pump rate (e.g. 80% of max.), while the last 25 gm. will be dispensed in a multiple step ramp down of flow to avoid overshooting the diluent target weight. The SLOW FACTOR as well as the LabTec™ pump rate is user-selectable. Default = 25.0.

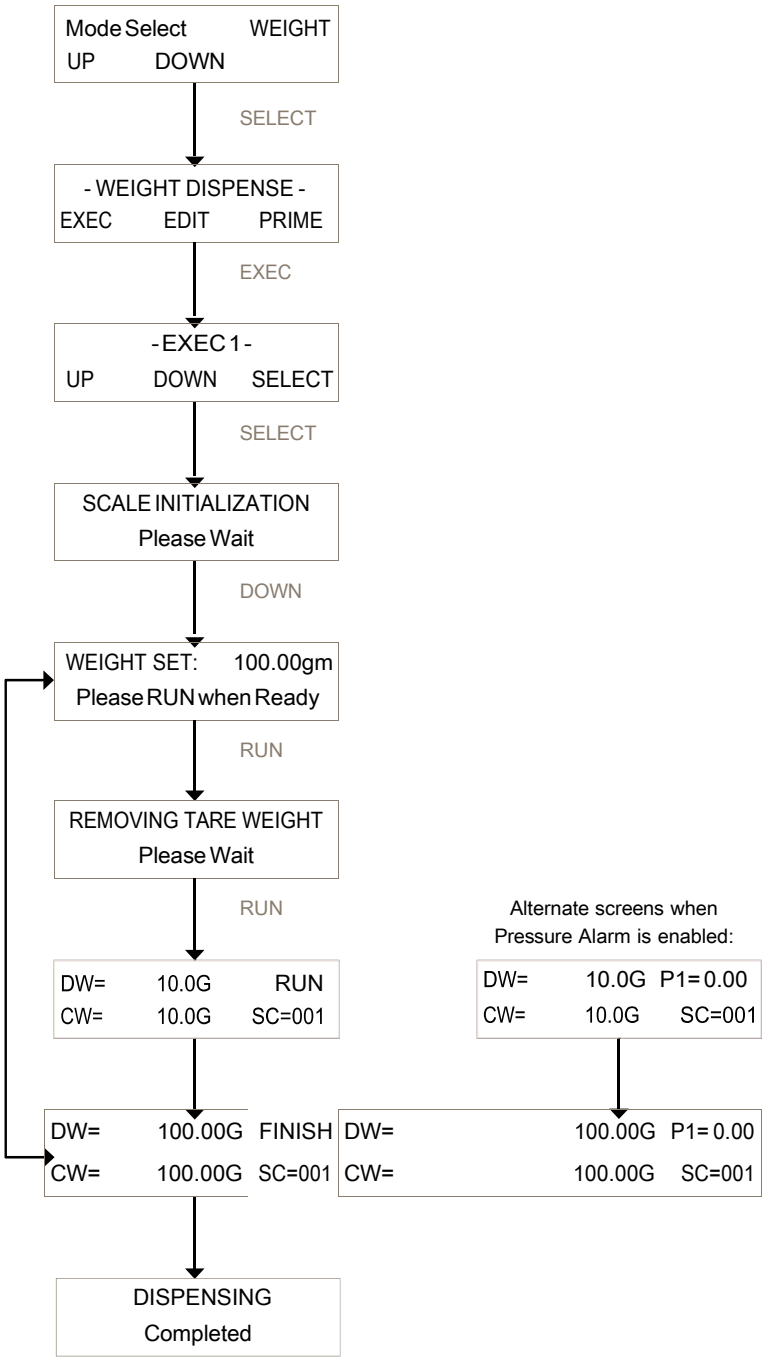
PUMP DIRECTION: Defines the rotation of the pump head; this parameter can be changed from clock-wise (CW, default) to counter clock-wise (CCW). Default = CW.

PUMP RATE: Defines the relative pump speed (0% to 100% of max.) with which the solution is being dispensed. Typically, this parameter is set at 80% (default), however, a slower pump speed is advisable if excessive back-splashing should occur.

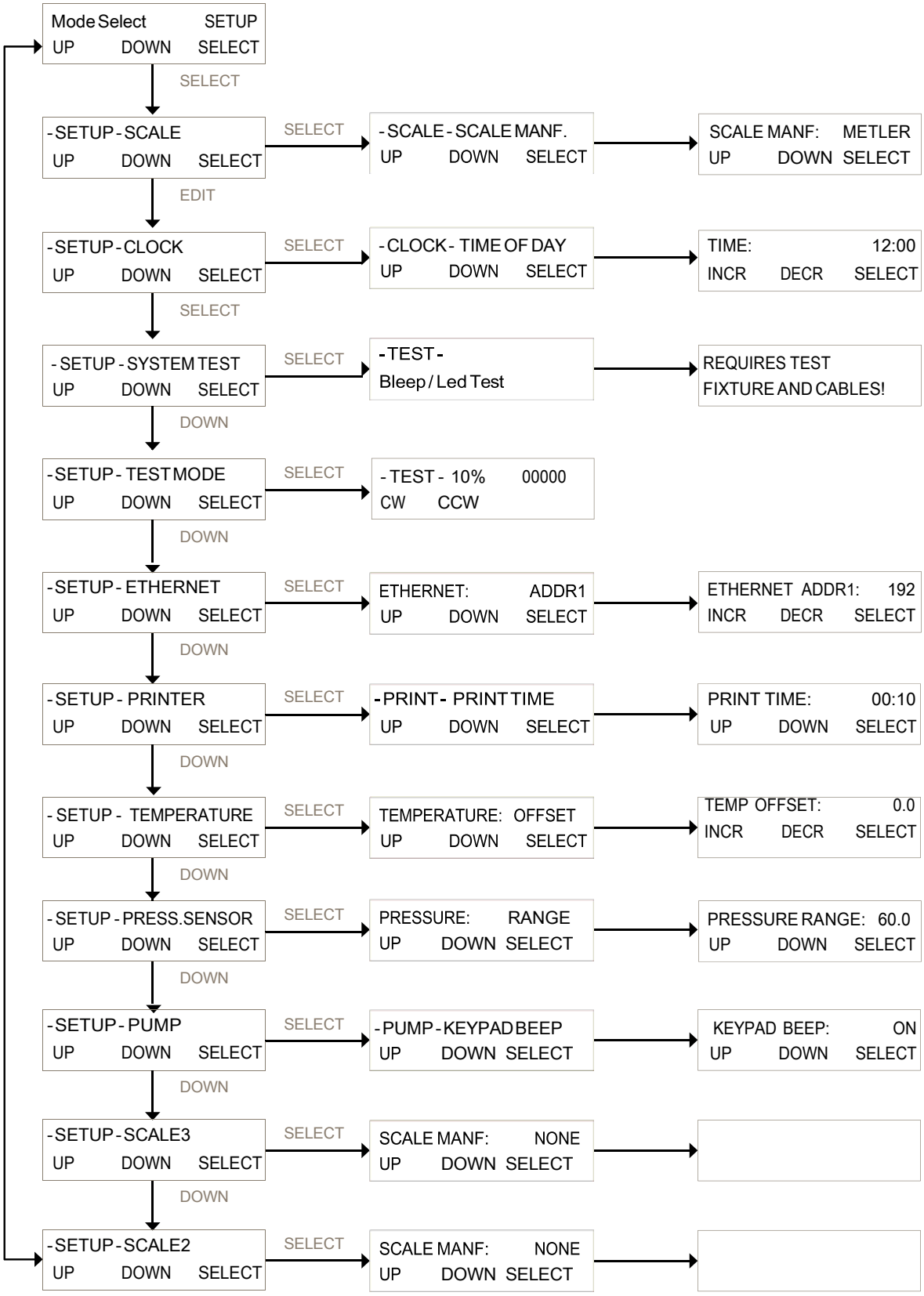
TIME DELAY: Defines the time interval, in seconds, between dispensing cycles. Default = 1.0.

COUNT: Defines how often the dispensing cycle will be repeated. For example, when COUNT = 10, then the selected DISP. WEIGHT will be dispensed 10 times. Default = 1.

4.1 Weight Dispense Mode: Execute Menu



5.0 Setup


Mode Select SETUP
UP DOWN SELECT
SELECT
-SETUP-SCALE
UP DOWN SELECT
SELECT
-SCALE-SCALE MANF.
UP DOWN SELECT
SCALE MANF: METLER
UP DOWN SELECT
EDIT
-SETUP-CLOCK
UP DOWN SELECT
SELECT
-CLOCK-TIME OF DAY
UP DOWN SELECT
TIME: 12:00
INCR DECR SELECT
SELECT
-SETUP-SYSTEM TEST
UP DOWN SELECT
SELECT
-TEST-
Bleep/Led Test
REQUIRES TEST
FIXTURE AND CABLES!
DOWN
-SETUP-TEST MODE
UP DOWN SELECT
SELECT
-TEST- 10% 00000
CW CCW
DOWN
-SETUP-ETHERNET
UP DOWN SELECT
SELECT
ETHERNET: ADDR1
UP DOWN SELECT
ETHERNET ADDR1: 192
INCR DECR SELECT
DOWN
-SETUP-PRINTER
UP DOWN SELECT
SELECT
-PRINT-PRINT TIME
UP DOWN SELECT
PRINT TIME: 00:10
UP DOWN SELECT
DOWN
-SETUP-TEMPERATURE
UP DOWN SELECT
SELECT
TEMPERATURE: OFFSET
UP DOWN SELECT
TEMP OFFSET: 0.0
INCR DECR SELECT
DOWN
-SETUP-PRESS.SENSOR
UP DOWN SELECT
SELECT
PRESSURE: RANGE
UP DOWN SELECT
PRESSURE RANGE: 60.0
UP DOWN SELECT
DOWN
-SETUP-PUMP
UP DOWN SELECT
SELECT
-PUMP-KEYPAD BEEP
UP DOWN SELECT
KEYPAD BEEP: ON
UP DOWN SELECT
DOWN
-SETUP-SCALE3
UP DOWN SELECT
SELECT
SCALE MANF: NONE
UP DOWN SELECT
DOWN
-SETUP-SCALE2
UP DOWN SELECT
SELECT
SCALE MANF: NONE
UP DOWN SELECT

5.1 Setup, Continued:

SUMMARY: The Setup Menu consists of the following items; the following sections provide further explanation:

SCALE: This is used to set the proper communications for the various scale manufacturers. While Mettler is preferred, other scales from Ohaus or Sartorius may be used. Submenu allows setting of Scale Manuf., Units, Alarm, and Tare. Default = "METLER".

CLOCK: Set the time of day (military), day, month, and year. Print Enable allows choice of Time of Day, or Relative (Run) Time for printout and display. In most cases the clock will be set at the factory for the destination time zone. Default = Time of Day.

SYSTEM TEST: Allows testing of the I/O's of the LabTec™, requires purchase of IQ/OQ Document. Use Test Mode if needed for trouble shooting.

TEST MODE: Allows independent testing of the LabTec™ I / O's. Motor, Keypad, Scale, Pressure, Temperature, Valves, Analog, TTL switches.

ETHERNET: Allows setting of the IP Address, Subnet Mask and Gateway values for Modbus TCP / IP communication via the Ethernet Port. Modbus communication not available at the time of this printing.

PRINTER: Select communications parameters for Parker printer (P/N 080-095) or PC. Default settings are Print Time (Default = 30 sec.), Type (Seiko), Baud Rate (9600), Stop Bits (2), Parity (None), Word Length (8), Print Delay (0 sec). Controls these settings for both the Printer and USB ports.

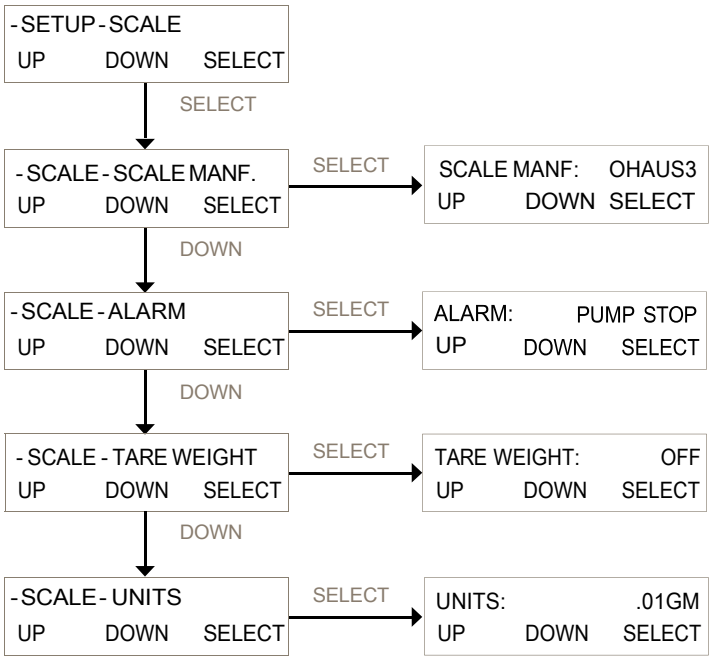
TEMPERATURE: Allows setting of a Temperature Alarm and Limit, as well as an Offset for the SciTemp® Temperature sensor if needed.

PRESS. SENSOR: Allows user to Zero all three SciPres® pressure sensors. (Span is used for factory calibration.) Source is used to select the desired sensor for related alarms and control in all modes. Units: Choose from psi (default), bar, or kpa. Range: Default is 60, can be set lower, will require re-calibration of the input. Contact Parker Customer Service for assistance.

PUMP: Select the following user preferences: Keypad Beep: (On / Off), Switch Configuration: (Level / Pulse), Switch Polarity: (Normal / Inverted), TTL1:On-Off: (Yes / No), Motor Start: (Hard / Soft-Ramp), Motor RPM: (3400, 600, 160, 8), Pump Head: (Peristaltic / RH1 / RH0 / RH00), Pump Tubing: (13 / 14 / 16 / 25 / 17 / 18 / 15 / 24 / 35), Power Up: (Mode / Menu / Run), External Run-Stop: (Pulse / Level), ASCII Feedback (On / Off), Factory Reset: (Resets all variable parameters to their original factory defaults).

SCALE2 and SCALE3: Not utilized with the LabTec™. Must remain set to "**None**". Do not remove the covers on the unused scale ports.

5.1 Setup: Scale



SCALE MANUF: Select the appropriate value for the scale in use. Options: Ohaus, Ohaus2, Ohaus3, Mettler, Metler2, Sartor, Sartor2. Default = Mettler. Proper configuration of the scale's parameters is required, as well as correct interface cable.

- Ohaus3: Adventurer Pro, Adventurer, (New version available in 2015)
- Ohaus2: Adventurer, old (pre-2002), Explorer, Explorer Pro.
- Mettler: Viper, Series 4, IND560.
- Metler2: Speedweigh, Panther.
- Sartor2: Current default Sartorius setting, all series.

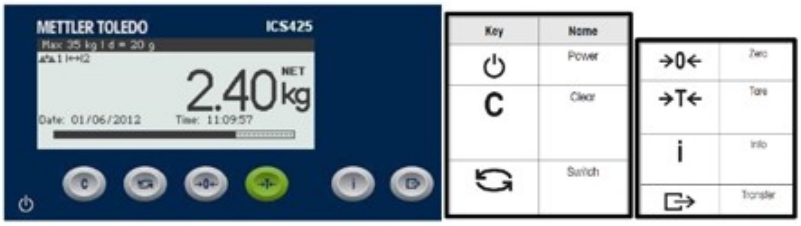
ALARM: Triggered if communication with the scale is lost. Options: Pump Stop, Alarm Only or Off. Default = Pump Stop.

TARE WEIGHT: Determines if the system tares the scale upon pressing Execute and Run in the main operational modes. This is counterintuitive. Options: On, Off. Default = OFF, which causes the system to tare the scale. ON will cause the tare to not occur.

UNITS: Select from: .001 gm, .01 gm, 0.1 gm, Kg, T, Lbs, OzT, Oz, C, Dwt. Default = .01 gm.

A Mettler Toledo ICS425 series scale is the most frequently purchased scale sent with the system. If a different scale is required, please contact Parker for configuration information.

5.11 Mettler Toledo ICS425 Scale Parameters



To enter the Setup mode, press and hold the “Transfer” key until the word CODE appears on the display. Then press “Zero”, “Zero”, “Zero”, “Transfer”, and an interactive menu screen is presented. Use the displayed arrows and the related buttons to navigate the menu and confirm the following settings are enabled.

Level 1	Level 3	Level 3	Selected Menu Item
SCALE	Disp Unit & Res	Disp Unit 1	**g**
		Disp Unit 1	**g**
		Disp Resolution	OFF (sets to default value)
	Zero Filter	AZM	**OFF**
		Vibration	Medium
		Process	**Dosing**
		Stability	Standard
Comm	COM1	Mode	Dialog
		Param RS 232	Baud 9600
			Parity 8 None
			H. Shake OFF

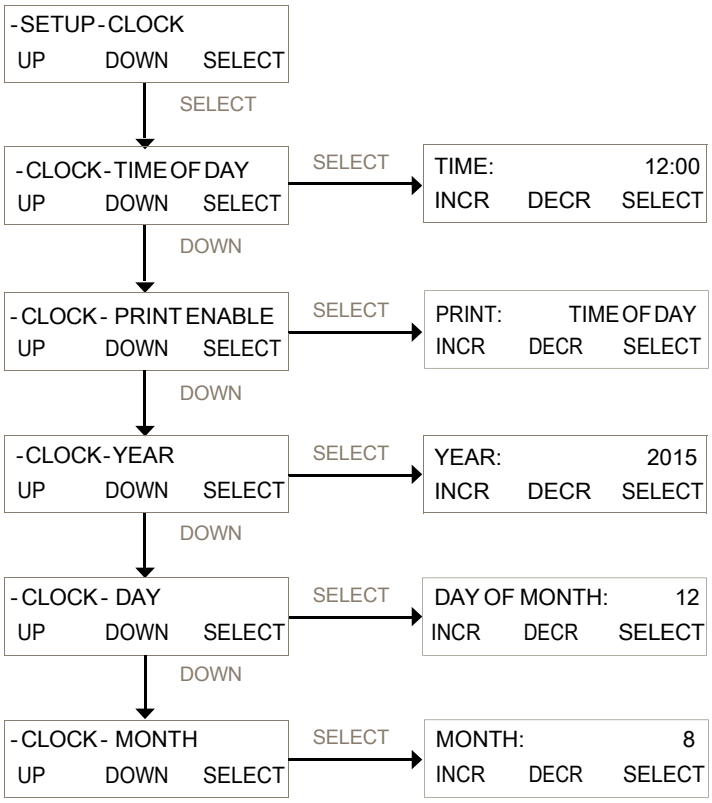
When exiting the Menu a prompt to save occurs, press OK to save the changes.

Note: The **bold** parameters listed are the only custom settings needed for communication with Parker systems. All others should remain at factory defaults. Consult your scale manual for help navigating through the scale menu. If stability is an issue, adjust the Vibration and Stability settings as needed.

Setup Mode, select “METLER”, see SETUP: SCALE: MANUF. By making this selection, the system will implement the correct parameters for communicating with this scale.
You will also need P/N 080-072ICS Cable, Mettler Balance, ICS M-12.

Scales purchased with the system through Parker will be configured and tested to- gether with the LabTec™ as a system at the factory.

5.2 Setup: Clock



CLOCK: Is used to set the Date and Time in the LabTec™ real time clock, and control the displayed and output time format.

TIME OF DAY: Press Select and use the Incr. and Decr. buttons to set the current time in 24 hour format. This should be preset by the factory prior to shipping.

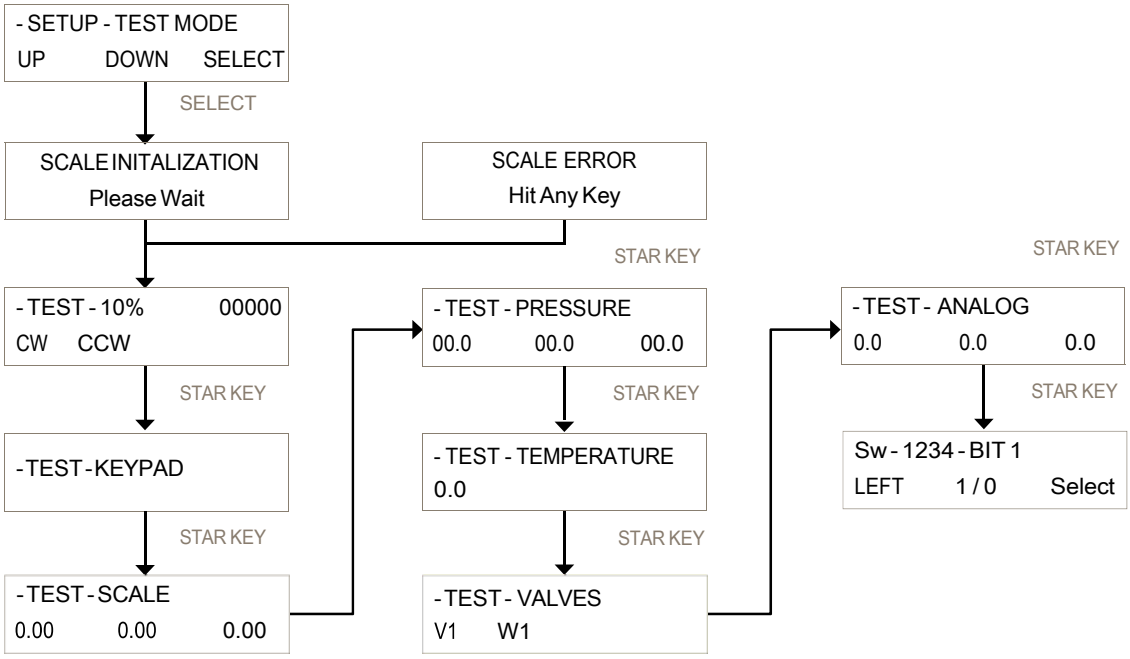
PRINT ENABLE: Controls displayed and output time. Choose between Time of Day and Relative Time. Time of Day yields current time, and Relative Time starts at 00:00:00 at the beginning of a processing run. Default = Time of Day.

YEAR: Press Select and use Incr. and Decr. to set the current year.

DAY OF MONTH: Press Select and use Incr. and Decr. to set the current day of the month.

MONTH: Press Select and use Incr. and Decr. to set the current month.

5.3 Setup: Test Mode:



TEST MODE: Provides the ability to test the inputs and outputs (I / O's) of the LabTec™ outside of the normal operational modes. Upon pressing Select, the LabTec™ will attempt Scale Initialization. If it passes, the next Test appears. If it fails, press any key and the next Test appears. Use the Star (*) button to move between tests.

MOTOR: This tests the motor. Use the Rate / Pressure button to change the motor speed. Use the Run / Stop buttons, and the CW / CCW keys to exercise the motor. The encoder pulses / second is displayed.

KEYPAD: This tests the keypad. Press the buttons in any order, and an appropriate number is displayed. Left to right, top to bottom, they are numbered 1 through 0, the Star key passes if it moves to the next test.

SCALE: If a scale is connected and is communicating properly, the value here will match that of the scale. (There are three shown, due to the three interfaces, but only one is used with the LabTec™.)

PRESSURE: If SciPres® pressure sensors are connected, they will display the measured pressure, P1, P2, P3. By pressing the A, B, or C keys, the sensors may be zeroed. If there is no sensor connected, --.- will be displayed.

TEMPERATURE: If a SciTemp® pressure sensor is connected, the measured temperature in C will be displayed. If no sensor is connected, 0.0 is displayed.

VALVES: If Valve V or W is connected, press the A or B button to test them. Not used with the LabTec™.

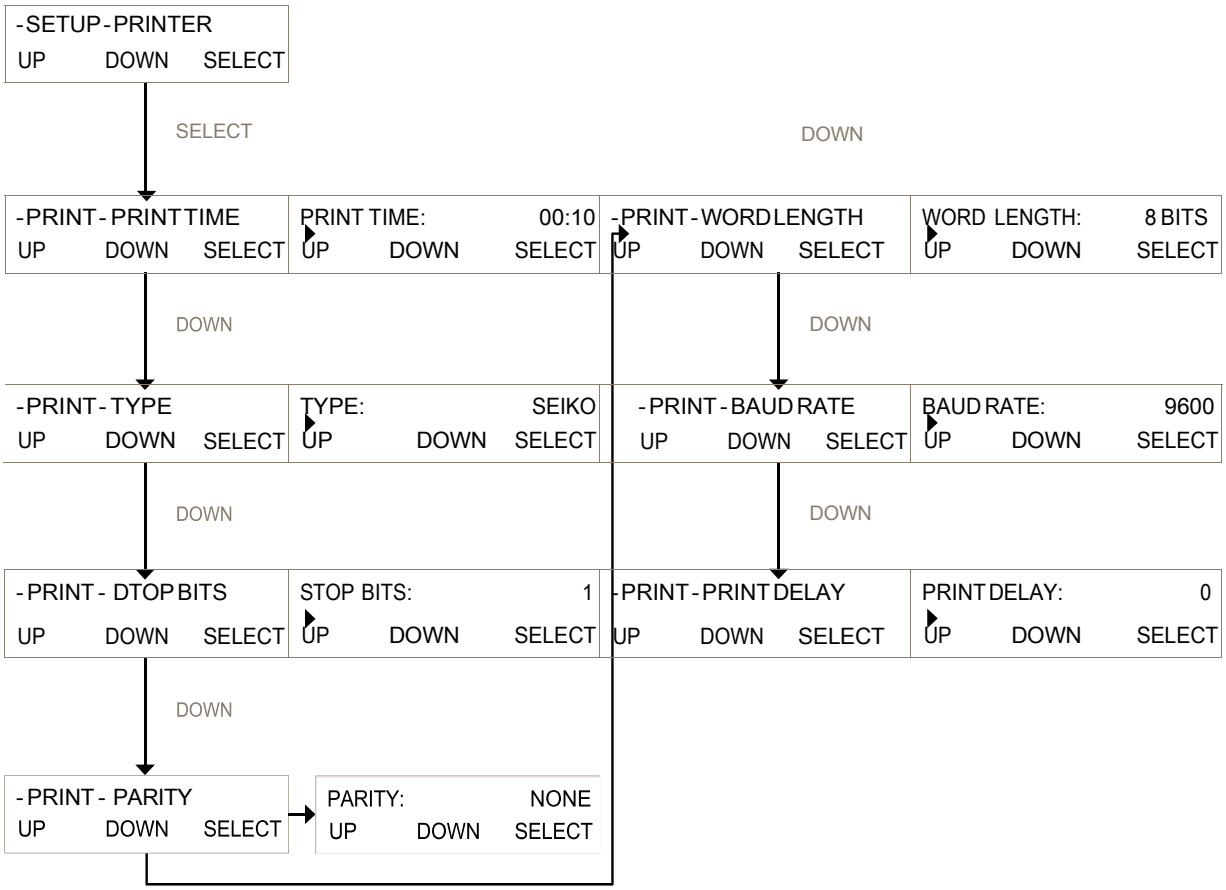
ANALOG: Displays the analog value for Channels 1, 2 and 3 based upon input and Hi / Lo range settings. Not used with the LabTec®.

TTL SWITCHES: By using Left and 1 / 0 to change the BIT setting, the TTL outputs may be tested. You must have a DMM connected to measure the voltage, it will be 0.0 if Switch is set to 0, and 5.0 Vdc if set to 1. (The display is 1234 if all are high, 0000 if all are low.)

5.4 Setup: Ethernet

Ethernet is currently non-functional and is reserved for future development.

5.5 Setup: Printer



PRINTER: Allows the setting of RS-232 communication parameters needed for connection to a Parker serial printer or to a PC for data collection. These settings control the output for both the Printer and USB Ports.

PRINT TIME: Controls how fast the LabTec™ sends data points in Minutes: Seconds. Max is 30:00 minutes; Min is 00:05 seconds. Default = 00:30 seconds.

TYPE: Allows use of two styles of small serial printers, Seiko, a thermal unit, and Starr, a dot matrix. For all other printers, and PC communication, Seiko setting is used and is the default.

STOP BITS: Select 1 or 2. Default = 1.

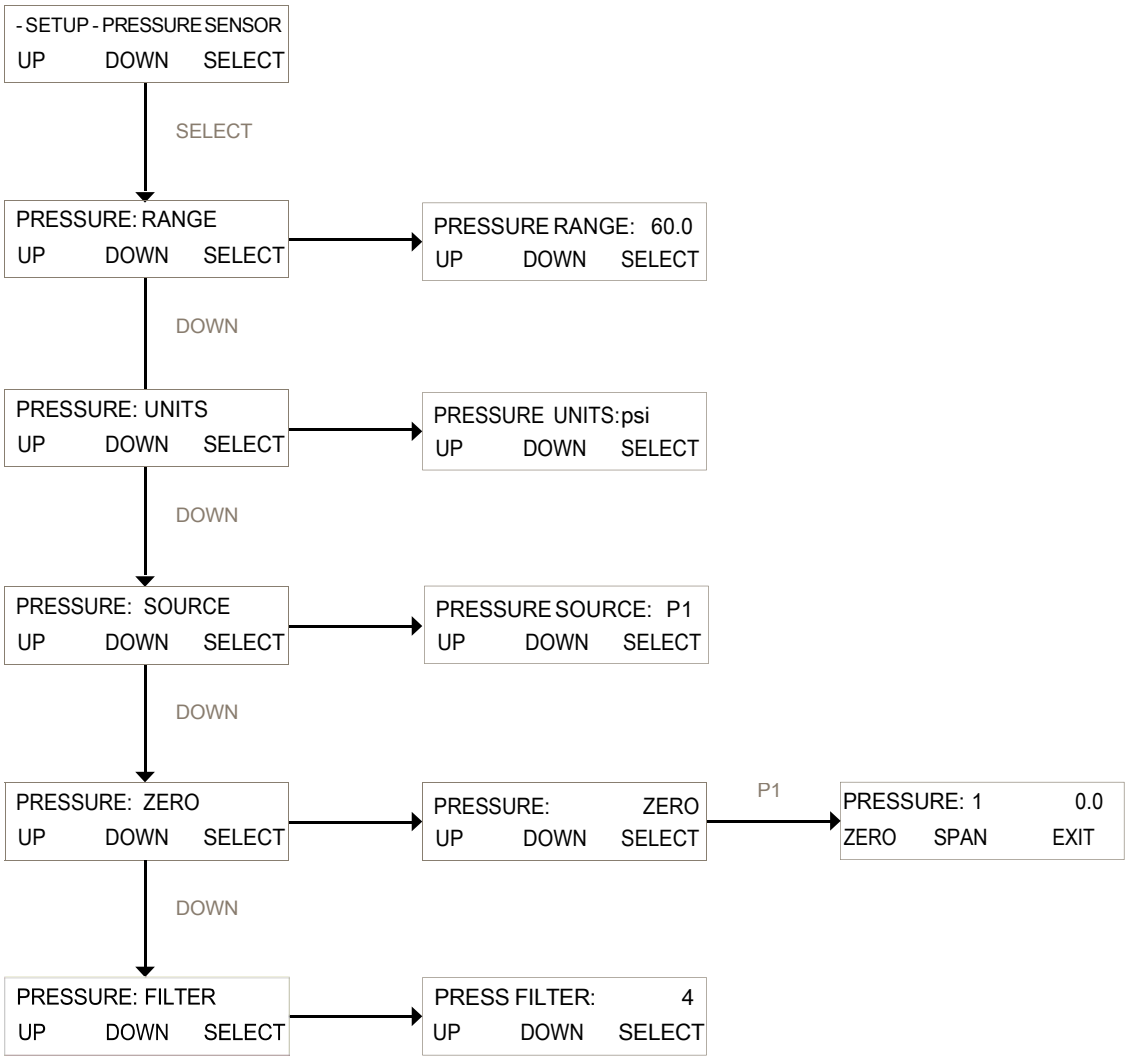
PARITY: Select Even, Odd or None. Default = None.

WORD LENGTH: Select 7 or 8 Bits. Default = 8 Bits.

BAUD RATE: Select 300, 600, 1200, 2400, 4800, 9600, or 38.4. Default = 9600

PRINT DELAY: Used to slow down the output for printers with small buffers. Select 0 – 5 seconds. Default = 0 seconds.

5.6 Setup: Pressure Sensor



PRESSURE SENSOR: Is used to configure settings related to the SciPres Pressure Sensors. The following can be configured; Range, Units, Source (control and alarms), Filter (signal noise) and Zero / Span. The LabTec™ uses only one sensor port, choice is made with the Source setting below.

RANGE: Set the overall pressure range, the Default is 60.0 psi (4.14 bar), and is the maximum. Changing this setting requires re-calibration of the sensor signals.

UNITS: Select between psi, bar, and kpa. Default = psi.

SOURCE: Controls the source pressure sensor for monitoring and alarms. Select between P1, P2 or P3. Default = P1

ZERO: Used to "**Zero**" the sensors to establish the zero offset cause by the circuitry and any inherent hydraulic pressure in your tubing beyond the pump head. Connect the sensor, and remove any pressure from the system. Select the sensor, P1, P2 or P3 and press "Zero". You are prompted to confirm the action. "Span" should not be used on a routine basis, as it sets the max input value.

Note: Do not Zero P1, P2 or P3 unless a sensor is connected. This will cause the sensor to read 0.0 all of the time, regardless of the actual pressure.

FILTER: This feature filters out the pulsations in the pressure signal due to the peristaltic nature of the pump head. This provides better control and easier to read values, as well as improved graphed data. Select from 1 to 7, 1 = no signal filter,
7 = maximum filter. Default = 4.

5.7 Setup: Pressure Sensor, Calibration

The LabTec™ has built in calibration curves for the SciPres® pressure sensors that are inherently very accurate for the installed default range of 0 – 60 psi (0 - 4.14 bar), and there should be no need for you to change it. If your metrology department insists that they calibrate them periodically, the procedure follows.

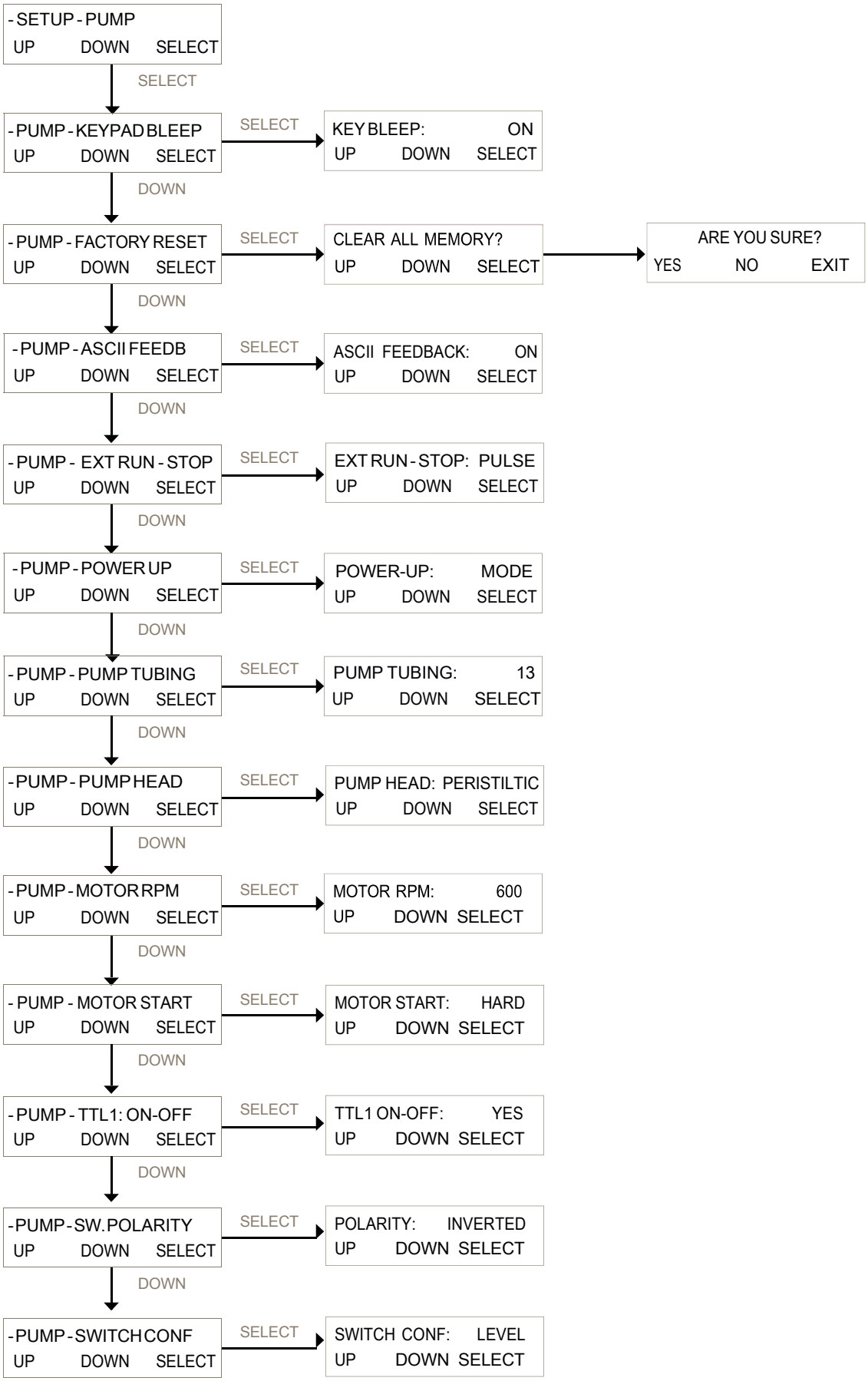
To calibrate the LabTec™ / SciPres® Sensors:

1. Obtain a NIST traceable regulated source of compressed gas (i.e. air, nitrogen) and pressure gauge.
2. Go to Mode Select; Setup; Pressure Sensor, then to Pressure: Range, and note the range specified, change if desired. Default is 60 psi (4.14 bar).
3. Press Exit and scroll to Pressure: Zero.
4. Choose P1.
5. With no pressure on the sensor, press Zero (“A” button).
6. Connect regulated pressure source to P1, and carefully increase to match range noted in step 2.

Note: Pressurizing the SciPres® Sensors beyond 60 psi (4.14 bar) can damage the sensor.

7. Press Span (“B” button).
8. Turn off pressure source, Press exit.
9. Repeat steps 5 – 8, choosing P2 and then P3.
10. You have now recalibrated (spanned) all 3 SciPres® sensors. It is still advisable to zero each sensor again with no pressure in the system, prior to running your tests via the Edit: Press. Sensor menu in the operating mode of choice.

5.8 Setup: Pump



5.8 Setup: Pump, continued:

SETUP: Pump provides configuration of global settings related to the pump. Generally, the default values here do not need to be changed. Any changes required for a particular system will be made at the factory, and would only need to be modified if a "Factory Reset" is performed.

KEYPAD BEEP: Determines if the buttons "**beep**" when pressed. Default = ON.

FACTORY RESET: Resets the system to the factory default settings for all menus.
Requires pressing "YES" to both the "**Clear All Memory?**" and "Are You Sure?" prompts.

ASCII FEEDBACK: Controls responses sent to a PC upon receipt of a remote command.
Default = ON.

EXTERNAL RUN-STOP: Controls action of the Footswitch connection, which is part of the External I/O DB37 connector (pins 19 and 37). Choose Pulse for footswitch type control where the contacts are closed and then opened. Choose Level for contact closure control where closed = Run and open = Stop. Run key is disabled when this is set to Level except in Manual Mode. Default = Pulse.

POWER UP: Controls the action of the system upon power-up. Choose from Menu, Mode, or Run. Menu = the system returns to the top of the Menu. Mode = the system returns to the last Mode it was in. Run = the system returns to the last Mode it was in and starts the process.

PUMP TUBING: If Pump Head is set to Peristaltic, all nine standard tubing sizes can be chosen. Used with Motor RPM setting to determine proper calibration curve. Default = 13.

PUMP HEAD: Choose between Peristaltic, RH1, RH0, RH00, Mag 201, Mag 122, Mag 120, and Mag 040. Used to access the proper calibration curve. Default = Peristaltic.

MOTOR RPM: Choose between 8, 160, 600 and 2400 rpm, matching the motor installed in the system. This will be set at the factory. It will need to be reset after a Factory Reset if other than the default. Default = 600.

MOTOR START: Controls how fast the motor starts. Hard is fast, Soft is slow. Default = Hard.

TTL 1 ON-OFF: Controls action of TTL Switch 1, used for Master / Slave control of another system or device with TTL input control. Set to Yes, TTL 1 changes states from High to Low when the system is told to run the motor. Set to No, it does not. Default = Yes.

SWITCH POLARITY: Controls the polarity of the TTL switches. Inverted = High when not activated, Low when activated. Normal = Low when not activated, High when activated. Default = Inverted to allow for proper Master/Slave control.

SWITCH CONFIGURATION: Sets the action of the TTL switches. Choose between Level and Pulse.
Default = Level to allow for proper Master/Slave control.

5.9 Manual:

Summary: In the Manual Mode the LabTec™ can be manually operated. The pump speed can be set by pressing the “Amount” key. The pump will also display the pressure indicated on SciPres® Sensor P1 and the Temperature if a SciTemp® is connected.

Note: When in Manual mode, the pump speed can be adjusted in terms of % motor speed while the pump is running. Just press the “Amount” key, make the appropriate adjustment, and press “Select”. There is no Data output in Manual Mode.

6.1 Data Acquisition:

SUMMARY: Parker has available a software package called SciDoc that includes data collection software and a Custom Excel spreadsheet that is automatically populated when any of the modes are executed except Manual. It also has charts that are automatically populated as the data is generated. See Section 7.1 below.

Either the Printer Port or USB Port may be used for data collection. The instructions for installing the USB driver appear at the beginning of this manual. The LabTec™ Printer Port is required for use with a Parker thermal serial printer. By using both ports, the data can be simultaneously captured on a PC and a Printer.

When a PC is connected, all data generated in Weight Ratio, Volume and Weight Modes can be sent to the PC for archiving. Please use the Parker SciDoc Data Collection Software described below. Alternatively, a PC running “HyperTerminal” or other terminal programs, may be used to capture the data. The HyperTerminal settings are provided for you in section 6.2 entitled “PC HyperTerminal Settings.” When interfacing with a PC you will need a separate RS-232 cable (P/N: 080-073) or USB cable (P/N: 090-158).

Note: For a successful connection with your PC, the LabTec™ and the PC must use the same communications protocol. Make sure that the communication parameters in Setup: Printer are the same as those listed in for HyperTerminal below or the default values.

The LabTec™ is also equipped with a USB port that can be connected to your PC. You will find the driver for this connection on the thumb drive this manual came on. You will need to look in Device Manager on your PC to determine the Com Port number assigned to the LabTec™.

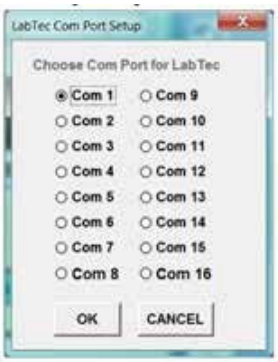
The LabTec™ is also equipped with an Ethernet Port. Please note that it is for future development, and not currently functional.

6.2 LabTec™ SciDoc Data Collection Software:

SciDoc is a software package that captures the data output of the LabTec™ and places it in an Excel spreadsheet. It consists of a copy of WinWedge32 from TalTech Inc. and a custom spreadsheet with built in macros. It requires the use of an RS-232 cable, (P/N: 080-073) or USB cable, (P/N: 090-158) to connect your LabTec™ to an available Com Port on your PC.

Minimum system requirements are Windows 98 and Excel 2000. WinWedge32 v3.4.3 is included in the package and is compatible up to an including Windows 8 and both 32 and 64 bit systems. A 64 bit version of the spreadsheet is available for Excel 64 bit users. Installation instructions are included with the package.

Once installed, click on the shortcut for the spreadsheet, and the following dialog box is presented:

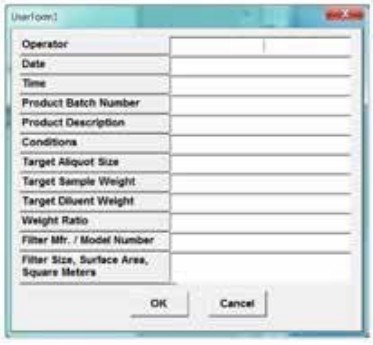


If you do not get this screen, click on “Enable Content” in the yellow information bar at the top of the spreadsheet window.Choose the Com Port the LabTec™ is connected to. Click on the OK button and WinWedge32 will start, showing itself as an icon in the PC’s system tray.

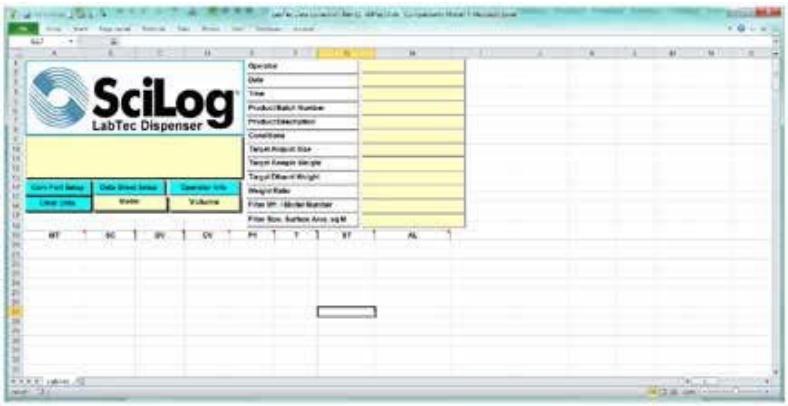
If you chose cancel on the Setup dialog box, WinWedge32 won’t be in the system tray, and you will need to click on the “Com Port Setup” button to complete this task in order for data collection to be possible.

The next screen will prompt you for a choice of Operational Mode, setting the column headings appropriately.

Once this is complete, the User Information dialog is presented:

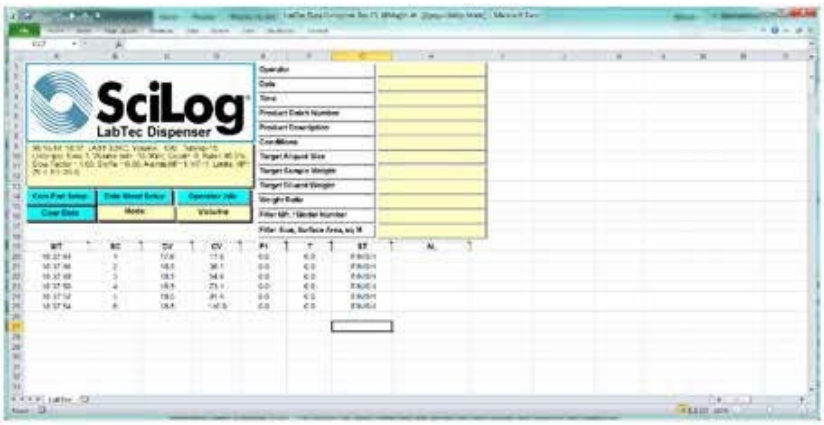


Clicking on OK leaves the operator this screen, ready to start collecting data from the LabTec™.



When ready, press Exec on the LabTec™, and then RUN. The data will automatically be placed in the cells of the spreadsheet. The text box in the upper left of the spreadsheet contains the header information, listing the Mode, the date and time, all operating parameters, alarm settings and alarm limits.

A finished run could look like this:



Note: The column headings on the spreadsheet will change based on the mode. When finished with a run, click on File-Save as: and choose an appropriate file name. For another run, simply press the “Clear Data” button, or close and re-open the original file.

The STOP and RUN keys on the LabTec™ may be used to interrupt the filtration process. The LabTec™ only sends data at the end of the dispense cycle.

6.3 PC HyperTerminal Settings:

LabTec™ to PC: For PC Connections via the Printer Port a Parker RS-232 Cable (P/N: 080-073) is needed. When not using the Parker printer, this allows process data to be “dumped” into a PC for archiving. The list of settings below must match those in
Setup: Printer of the LabTec™, and Print Delay should be set to “0”. Alternatively, the USB port may be used. The driver for the USB connection is on the thumb drive this manual is on, and may be obtained from Parker Technical Support. The following terminal setting procedure is intended for PCs with a Window 98/XP software installation: Press the START button in the lower left corner of your screen, select “Programs” then select and open “Accessories”, select
“Hyper Terminal”.

(If using Windows 7 or 8, HyperTerminal may be purchased on line, or any other terminal program may be used.)

From the “Connection Description” screen, select an icon and enter a file name, i.e. LabTec™. Press “OK”

From the “Connect To” screen, select “Direct to Com 1” in the box labeled “Connect Using” or the Com Port assigned to the LabTec® and Press “OK”.

From the “Com 1 Property” screen, select the following parameters:

Bits per Second:	9600
Data Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	None

Press “OK”

Press “OK” at the bottom of the “LabTec® Setup” screen.

A window with a blinking cursor will be presented, and the data stream from the LabTec™ will be displayed as it occurs.

Part C: LabTec™ Dispensing Applications

1.0 Weight Ratio Dispensing: General Information

The Weight Ratio Dispensing mode is designed for automated weighing and diluting of samples. In this operational mode, the LabTec™ is connected to an electronic, top-loading scale. The LabTec™ will tare the scale after the sample container has been placed onto the scale. The sample is then placed into the container and the sample weight is stored and displayed by the LabTec™. The diluent is automatically dispensed by the LabTec™ based on a user-defined sample to diluent weight ratio. For example, if the sample weight happens to be 10.00 grams and the user-selected weight ratio is 9.00, then the LabTec™ will dispense 90.00 grams of diluent to provide 10-fold dilution by weight. Regardless of the sample weight, the desired dilution ratio will be maintained. Only an approximate sample weight needs to be placed into the sample container.

1.1 Sterile Dispensing:

When sterile liquids need to be dispensed, two (2) pump dispensing options are available:

First, the LabTec™ CP-200 mounted with the 1082 peristaltic pump head is the method of choice when dispensing pre-sterilized solutions. Utilizing autoclavable Silicone pump tubing and 0.2 µm filter cartridge, sterility of the liquid can be readily maintained during the dispensing process. The sterilized solution comes only in contact with the sterilized #24 Silicone pump tubing.

Second, the LabTec™ MP320 mounted with a Magnetic Gear Pump Head (Model 201) and used together with a 0.2 µm filter cartridge, allows in-line filter sterilization of solutions while dispensing. This method avoids the need for pre-sterilizing, i.e. autoclaving of solutions; a significant savings both in labor and energy. Here the magnetic gear pump head is recommended because of the high output capacity (3.5 liters per minute).

In-line filter sterilization is recommended when large batch volumes of sterile solutions are needed, e.g. dilution of combined samples in Salmonella bacteriological testing which typically require 2-4 liters of sterile diluent per sample. By using a SciLog® SciPres® Pressure Sensor, you can monitor the backpressure generated as the filter becomes plugged, and set a user definable limit to either Alarm Only (audible beep) or Pump Stop (stops pump and beeps).

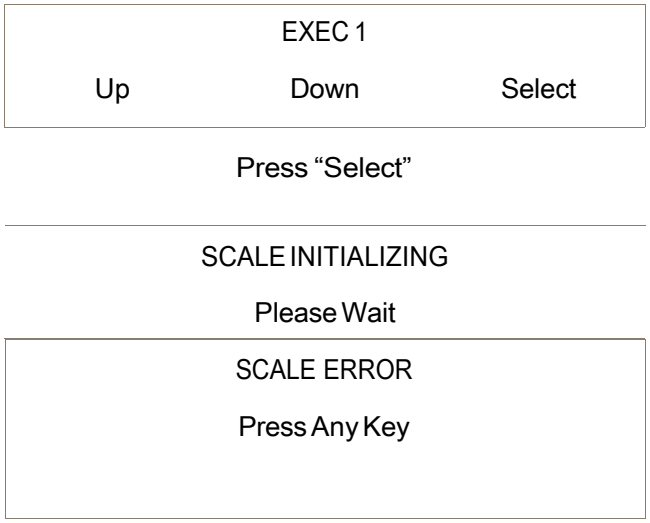
In-line filter sterilization is also recommended for large volume dispensing applications in media kitchens. Utilizing large surface area filtration devices, i.e Parker PROPOR SG DEMICAP P/N: ZESGB-020-HH-PS3, 1500 to 2000 liters of media can be dispensed with a single filter cartridge. However, the actual filtration capacity is heavily dependent on the particulate load of the solution to be filtered. Your Parker Territory Manager can help identify the filter suited for your application.

When using the LabTec™ with a 201 magnet gear pump head, you need to install an in-line check valve (P/N: 400-530) preferably at the pump discharge side.

1.2 Scale Installation:

In the Weight Ratio Dispensing mode, the LabTec™ must be connected to a top loading electronic scale. The scale parameters which are relevant to the particular scale must be entered and stored in the scale's memory. Carefully check that all required parameters have been entered and accepted by the scale.

In the LabTec™ Setup: Scale submenu, select the scale manufacturer; the LabTec™ will automatically implement the correct communications parameters. Connect the appropriate Scale to LabTec™ cable to the "Scale" port of the LabTec™, as well as to the serial port of the scale. To test the serial communication between LabTec® and scale, enter the Weight Ratio mode and select the "EXEC 1"display, then press "Select":



The "Scale Error" display indicates that communications attempts by the LabTec™ have failed, carefully check the RS-232 connection between the two devices. Also review the communications parameter stored in the scale and the LabTec™, then try again.

2.0 Weight Ratio Dispensing: How to Get Started

If a data printout is desired, connect the cable (P/N: 080-096) between the LabTec™ "Printer" port and the Parker printer (P/N; 080-095). In the LabTec™ Setup: Printer submenu, make sure all the printer communications parameters have been entered. Turn on the printer, in the LabTec™ select the Weight Ratio mode, then press "Exec" key; the fi st line to be printed will consist of weight ratio dispensing parameters.

Install the pump tubing: For most weight ratio dispensing applications, #24 thick-walled silicone pump tubing is recommended (requires a 1082 peristaltic pump). Use approximately six (6) feet of #24 tubing; install the tubing such that two feet of tubing is located on the discharge side while four feet of tubing are located on the suction side of
the . (These lengths are guidelines only.)

> Note: This arrangement allows used pump tube sections located in the to be replaced with new tube section located at the suction side of the pump. When advancing pump tubing in this manner, the used pump tube sections end up on the pump discharge side.

If you use a 201 Magnetic Gear Pump Head, #24 Silicone pump tubing is also recommended. However in this case, pipe adapters (¼ x 1/8", male, P/N: 400-500) are installed at the inlet and outlet ports of the 201 magnetic gear pump head. The #24 Silicone tubing slips tightly over the inlet and outlet pipe adapters.

The scale should be located next to the LabTec™. On the discharge side, fasten the pump tubing to a ring stand (P/N: 400-420) using nylon ties. The dispensing tip should be secured with a clamp and located above the scale with sufficient clearing to allow the easy removal of any sample bags or containers. On the suction side of the LabTec™, secure the pump tubing to the solution reservoir. Press the "Prime" key at the LabTec™ front panel until all of the tubing is filled with solution.

Consult the Weight Ratio Edit section of the manual to edit the weight ratio dispensing parameters.

Press "Exec" key, select "Exec 1", the LabTec™ will show the following display:

```
SCALE INITIALIZING
Please Wait
```

While the message is being displayed, the LabTec™ checks the scale communications parameters and the following display is shown:

```
WGT RATIO SET:   9:00
Press RUN When Ready
```

Press the "RUN" key or press the foot switch:

```
Press RUN When
VESSEL IS ON SCALE
```

Place the sample bag or container onto the scale and underneath the dispensing tip. Press “RUN” key or the foot switch. The LabTec™ will show the following display:

REMOVING TARE WEIGHT
Please Wait

This display is followed by:

Press RUN When
SAMPLE IS IN VESSEL

Place the sample into the sample bag or container, only an approximate sample weight is needed. The weight ratio will be applied to the actual sample weight as determined by the scale. Press “RUN” key or the foot switch, the LabTec™ will start dispensing and display the progress:

SW= 10.00 G	RUN
DW= 50.00 G	ID 001

SW stands for the actual sample weight and DW represents the delivered diluent weight. When the dispensing cycle is completed, following displays are shown.

SW= 10.00 G	FINISH
DW= 50.00 G	ID 001

DISPENSING
Completed

WGT RATIO SET:	9.00
Press RUN When Ready	

Remove your filled sample bag or container and initiate the second dispensing cycle.

Note: If you have more than one WGT FACTOR, store one WGT FACTOR in “Edit 1”, e.g. “9.00”, while a second WGT FACTOR is stored in “Edit 2”, e.g. “99.00”. Up to ten different sets of parameters can be stored in “Edit 1” through “Edit 10”.

2.1 Weight Ratio Dispensing: Parameter Guide, 1082 Silicone: #15 & #24

The following information should be used as a general guide in selecting optimal dispensing parameters: This data was collected with a 600 RPM LabTec™ Dispenser mounted with a 1082 pump head; the "Tube Size" parameter refers to thick walled silicone pump tubing size #24.

The "Slow Factor" is implemented at the end of each dispensing cycle to allow the electronic scale to stabilize. Thus a Slow Factor of 20.00 mL indicates that the last 20 mL will be dispensed at reduced pump speed.

Note: The LabTec™ will stop pumping just prior to reaching the target weight; once the scale has stabilized, the LabTec™ will complete the dispensing cycle.

The end of the dispensing cycle will be indicated by a "beep" followed by the display "Dispensing Completed". The "Sniffle", i. e. momentary pump reversal at the end of the dispensing cycle, is set at its default value of 0.3.

Edit Parameter Settings: All dispensing was done with #24 Silicone pump tubing

EDIT 1: Wgt Factor = 9.00, Sniffle = 0.3, Slow Factor = 20.00 gr, Pump Rate = 80%, Time Delay = 00:00, Count = 1

EDIT 2: Wgt Factor = 99.00, Sniffle = 0.3, Slow Factor = 20.00 gr, Pump Rate = 80%, Time Delay = 00:00, Count = 1

Sample Weight	Theoretical Diluent Weight	Ave. Delivered Diluent Weight	RSD (%)	Dispensing Time per Aliquot
EXEC 1: Wgt. Factor = 9.00				
10.00 gr	90.00 gr	89.99 gr	0.12%	12 sec
20.00 gr	180.00 gr	180.03 gr	0.04%	16 sec
EXEC 2: Wgt. Factor = 99.00				
1.00 gr	99.00 gr	99.01 gr	0.11%	11 sec
2.00 gr	198.00 gr	198.00 gr	0.07%	18 sec

Note: Weights were used as surrogate samples. Weight sizes: 1.00 gr, 2.00 gr, 10.00 gr and 20.00 gr were placed on PGS Mettler scale. Distilled water was used as a diluent; five (5) separate measurements were made for each of the four (4) sample weights, their average Delivered Diluent Weight and the Relative Standard Deviation (RSD) are summarized above.

2.2 Weight Ratio Dispensing: Parameter Guide, Magnetic Gear Pump:

The following information should be used as a general guide in selecting optimal dispensing parameters. This data was collected with a 3400-RPM LabTec™ Dispenser mounted with a 201 Micropump Head. A check valve (P/N: 400-530) was used as a dispensing spout.

The "Slow Factor" is implemented at the end of each dispensing cycle to allow the electronic scale to stabilize. Thus a Slow Factor of 25 mL indicates that the last 25 mL will be dispensed at reduced pump speed.

Note: The LabTec™ will stop pumping just prior to reaching the target weight; once the scale has stabilized, the LabTec™ will complete the dispensing cycle.

The end of the dispensing cycle will be indicated by a "beep" followed by the display "Dispensing Completed". The "Sniffle" function is turned off i.e. Sniffle = 0.0

Edit Parameters: All dispensing was done with a 201 Micropump Head.

EDIT 1: Wgt Factor = 9.00, Sniffle = 0.0, Slow Factor = 25.00 gr, Pump Rate = 50%, Time Delay = 00:00, Count = 1

EDIT 2: Wgt Factor = 99.00, Sniffle = 0.0, Slow Factor = 25.00 gr, Pump Rate = 50%, Time Delay = 00:00, Count = 1

EDIT 3: Wgt Factor = 6.79, Sniffle = 0.0, Slow Factor = 25.00 gr, Pump Rate = 50%, Time Delay = 00:00, Count = 1

Sample Weight	Theoretical Diluent Weight	Ave. Delivered Diluent Weight	RSD (%)	Dispensing Time per Aliquot
EXEC 1: Wgt. Factor = 9.00				
10.00 gr	90.00 gr	89.93 gr	0.11%	8 sec
20.00 gr	180.00 gr	179.98 gr	0.11%	12 sec
EXEC 2: Wgt. Factor = 99.00				
1.00 gr	99.00 gr	98.70 gr	0.40%	8 sec
2.00 gr	198.00 gr	197.50 gr	0.35%	12 sec
EXEC 3: Wgt. Factor = 6.79				
26.00 gr	176.54 gr	176.52 gr	0.07%	10 sec

Note: Weights were used as surrogate samples. Weight sizes: 1.00 gr, 2.00 gr, 10.00 gr and 20.00 gr were placed on PGS Mettler scale. Distilled water was used as a diluent; fi e (5) separate measurements were made for each of the four (4) sample weights, their average Delivered Diluent Weight and the Relative Standard Deviation (RSD) are summarized above.

3.0 Dispensing By Volume: General Considerations:

3.1 Dispensing of Pre-sterilized Solutions:

1. For volumetric batch dispensing of pre-sterilized, i.e. autoclaved solutions, the 1082 peristaltic pump head is recommended together with thick walled (#24 or #15) Silicone pump tubing.

2. For volumetric batch dispensing in the 2.5 mL to 10 mL range, use #15 Silicone pump tubing (P/N: 400-115).

3. For volumetric batch dispensing in the 10 mL to 500 mL range, use # 24 Silicone pump tubing (P/N400-124).

4. Both #15 and #24 Silicone pump tubing can be autoclaved repeatedly.

3.2 Dispensing with In-Line Filter Sterilization:

- For volumetric batch dispensing with in-line filter sterilization, the 1082 peristaltic pump head is recommended together with thick-walled (#15 or #24) Silicone pump tubing.
- For volumetric batch dispensing in the 10 mL to 500 mL range, use # 24 Silicone pump tubing (P/N: 400-124). The large-capacity Parker PROPOR SG DEMICAP P/N: ZESGB-020-HH-PS3 is recommended.
- For large-volume batch dispensing with in-line filter sterilization in the multi-liter range, use the 201 Micropump Head. The large-capacity PROPOR SG DEMICAP P/N: ZESGB-020-HH-PS3 is recommended.
- Your local Parker representative can help you determine the correct filter for your application.

3.3 Dispensing of Non-Sterile Solutions:

Either the 1082 or the 201 Micopump Head can be used. For batch volumes up to 500 mL, the 1082 pump head is recommended. For larger batch volumes, the 201 Micropump Head provides a faster dispensing capability. However, the 201 Micropump Head is not recommended for solutions containing particulates or shear sensitive solutions.

Note: If you requested a custom calibration from Parker, then the LabTec™ was delivered to you calibrated and is ready for use.

4.0 Dispensing by Volume: How to get started

Select your pump tubing; use #24 or #15 Silicone tubing if you have a 1082 peristaltic pump head. Select #24 tubing if you intend to dispense aliquots larger than 10 mL, use #15 pump tubing if you intend to dispense aliquots smaller than 10 mL.

Consult, Volume Dispense Mode: Edit, go to the following display:

- VOLUME DISPENSE -		
Exec	Edit	Prime

After having connected the tubing to the solution reservoir, fill the tubing with solution and expel all air from the tubing by pressing the "PRIME" key at the LabTec™ front panel. You are now ready to setup your dispense using the built-in calibration; go to the following display and press "Edit" key.

Select the following parameters for "Edit 1":

"DISP VOLUME"	enter "50.00 mL"
"TUBING"	choose "24"
"SNIFFLE"	enter "0.3"
"SLOW FACTOR"	enter "2.5 mL"
"PUMP RATE"	enter "80%"
"TIME DELAY"	enter "0.1 sec"
"COUNT"	enter "1"

First press "Exit", then press "Exec" (key "A"), and then "Select" for Exec 1. The following display will appear:

VOLUME SET: 50:00 mL
Press RUN When Ready

When you press the "RUN" key, the LabTec™ will dispense one (1) 50.00 mL aliquot.

At this point you may want to check the accuracy of the LabTec™. For this purpose use an electronic scale with 0.01-gram readability, e.g. Mettler PG5002-S or equivalent. Dispense at least three 50.00 mL aliquots of distilled water, record the weight of each aliquot, and then determine the average aliquot weight. For example, assume that you obtained the following results:

Trial 1 50.80g
Trial 2 50.50g
Trial 3 51.10g
AV = Average Value: 50.80g

After you have dispensed the third aliquot, press the RE-CAL key, the LabTec™ will show the following display:

DV: 50.00		AV: 50.00
Incr.	Decr.	Select

Use the "Incr." And "Decr." Keys until AV = 50.80, the average aliquot size, then press "Select". The Calibration has now been corrected and will compensate for the inaccuracy.

4.1 Dispensing By Volume: Parameter Guide, 1082: Silicone: 15 & 24

The following information should be used as a general guide in selecting optimal dispensing parameters: This data was collected with a 600 RPM LabTec™ Dispenser mounted with a 1082 pump head; the "Tube Size" parameter refers to thick walled silicone pump tubing sizes: 15 and 24.

The "Slow Factor" is implemented at the end of each dispensing cycle to avoid overshooting of the target volume. Thus a Slow Factor of 1.00 mL indicates that the last 1.0 mL will be dispensed at reduced pump speed. Typically, for dispensed volumes less than 50 mL, the "Slow Factor" is approximately 5% of the selected Dispensed Volume. The "Sniffle, i. e. momentary pump reversal at the end of the dispensing cycle, is set at its default value of 0.3.

Note: After changing pumping parameters, i.e. changing pump tubing, Pump Speed, Slow Factor or Sniffle settings, you should re-calibrate the LabTec™ Dispenser (see Re-Cal feature) in order to maintain a high accuracy / precision level.

Dispensed Volume (mL)	Tube Size	Pump Speed (Max. 600 RPM)	Slow Factor	Tpical Precision (RSD)	Dispensing Time / Alliquot (RSD)
5.00 mL	#15	25%	0.75 mL	1.00%	4.2 sec
10.00 mL	#15	50%	1.20 mL	1.00%	4.5 sec
25.00 mL	#15	50%	1.80 mL	0.20%	7.5 sec
50.00 mL	#15	75%	2.00 mL	0.20%	8.0 sec
100.00 mL	#15	100%	1.50 mL	0.20%	11.0 sec
150.00 mL	#15	100%	3.00 mL	0.15%	14.0 sec
200.00 mL	#15	100%	3.50 mL	0.15%	18.0 sec
10.00 mL	#24	15%	1.00 mL	0.50%	4.0 sec
25.00 mL	#24	20%	1.50 mL	0.50%	9.0 sec
50.00 mL	#24	50%	2.50 mL	0.15%	7.5 sec
100.00 mL	#24	75%	2.50 mL	0.15%	8.5 sec
200.00 mL	#24	100%	4.50 mL	0.10%	12.0 sec
400.00 mL	#24	100%	4.50 mL	0.10%	21.0 sec
500.00 mL	#24	100%	5.00 mL	0.10%	24.0 sec

Note: For each "Dispensed Volume", ten (10) separate measurements were made; the average "Dispensed Volume" the Standard Deviation and Relative Standard Deviation (RSD, %) as well as the "Dispensing Time per Aliquot" were determined. Distilled water was used as a diluent, each "Dispensed Volume" was verified by weight using a MettlerPG 5002-S, 0.01 gram resolution.

4.2 Dispensing By Volume: Parameter Guide, 1081 PharMed: #13, 14, 16, 25, & 17

The following information should be used as a general guide in selecting optimal dispensing parameters This data was collected with a 600 RPM LabTec™ Dispenser mounted with a 1081 pump head; the "Tube Size" parameter refers to thin-walled PharMed™ pump tubing sizes: 13, 14, 16, 25 & 17.

The "Slow Factor" is implemented at the end of each dispensing cycle to avoid overshooting of the target volume. Thus a Slow Factor of 1.00 mL indicates that the last 1.0 mL will be dispensed at reduced pump speed. Typically, for dispensed volumes less than 50 mL, the "Slow Factor" is approximately 5% to 10% of the selected Dispensed Volume. The "Sniffle, i. e. momentary pump reversal at the end of the dispensing cycle, is set at its default value of 0.3.

Note: After changing pumping parameters, i.e. changing pump tubing, Pump Speed, Slow Factor or Sniffle settings, you should re-calibrate the LabTec™ Dispenser (see Re-Cal feature) in order to maintain a high accuracy / precision level.

Dispensed Volume (mL)	Tube Size	Pump Speed (Max. 600 RPM)	Slow Factor	Tpical Precision (RSD)	Dispensing Time / Alliquot (RSD)
0.50 mL	#13	50%	0.05 mL	<0.5%	5.0 sec
1.00 mL	#13	50%	0.05 mL	<0.5%	7.0 sec
2.00 mL	#13	75%	0.10 mL	0.5%	9.0 sec
4.00 mL	#13	100%	0.20 mL	0.5%	12.0 sec
2.00 mL	#14	50%	0.15 mL	<0.5%	4.5 sec
4.00 mL	#14	50%	0.20 mL	<0.5%	6.5 sec
10.00 mL	#14	75%	0.30 mL	<0.5%	8.5 sec
20.00 mL	#14	100%	0.40 mL	<0.5%	11.0 sec
10.00 mL	#16	50%	0.80 mL	0.5%	6.0 sec
20.00 mL	#16	50%	1.00 mL	0.5%	9.0 sec
50.00 mL	#16	75%	1.00 mL	0.5%	11.5 sec
100.00 mL	#16	100%	1.50 mL	0.5%	15.0 sec
50.00 mL	#25	50%	1.50 mL	0.7%	8.0 sec
100.00 mL	#25	75%	3.00 mL	0.7%	12.5 sec
150.00 mL	#25	100%	4.00 mL	0.7%	13.0 sec
200.00 mL	#25	100%	5.00 mL	0.7%	14.0 sec
100.00 mL	#17	75%	5.00 mL	<1.0%	9.0 sec
200.00 mL	#17	100%	5.00 mL	<1.0%	14.0 sec
400.00 mL	#17	100%	7.00 mL	<1.0%	25.0 sec
500.00 mL	#17	100%	7.00 mL	<1.0%	24.0 sec

Note: For each "Dispensed Volume", ten (10) separate measurements were made; the average "Dispensed Volume" the Standard Deviation and Relative Standard Deviation (RSD, %) as well as the "Dispensing Time per Aliquot" were determined. Distilled water was used as a diluent; each "Dispensed Volume" was verified by weight using a Mettler PG 5002-S, 0.01 gram resolution.

4.3 Dispensing By Volume: Parameter Guide, Magnetic Gear Pump: 201 Micropump Head

The following information should be used as a general guide in selecting optimal dispensing parameters. This data was collected with a 3400 RPM LabTec™ Dispenser mounted with a 201 Micropump Head. A check valve (P/N: 400-530) was used as a dispensing spout.

The "Slow Factor" is implemented at the end of each dispensing cycle to avoid overshooting of the target volume. Thus a Slow Factor of 1.00 mL indicates that the last 1.0 mL will be dispensed at reduced pump speed. Typically, for dispensed volumes less than 50 mL, the "Slow Factor" is approximately 5% to 10% of the selected Dispensed Volume. Because of the check valve installation, the "Sniffle" function is turned off i.e. Sniffle = 0.0.

Note: After changing pumping parameters, i.e. Pump Speed or Slow Factor settings, you should re-calibrate the LabTec™ Dispenser (see Re-Cal feature) in order to maintain a high accuracy / precision level.

Dispensed Volume (mL)	Pump Head	Pump Speed (Max. 3400 RPM)	Slow Factor	Tpical Precision (RSD)	Dispensing Time / Alliquot (RSD)
10.00 mL	#201	10%	1.50 mL	0.40%	3.0 sec
25.00 mL	#201	15%	1.50 mL	0.20%	4.5 sec
50.00 mL	#201	25%	2.00 mL	0.20%	4.5 sec
100.00 mL	#201	40%	2.50 mL	0.12%	5.0 sec
200.00 mL	#201	50%	3.00 mL	0.10%	8.0 sec
400.00 mL	#201	75%	5.00 mL	0.05%	10.0 sec
1000.00 mL	#201	100%	10.00 mL	0.05%	18.0 sec

Note: For each "Dispensed Volume", ten (10) separate measurements were made; the average "Dispensed Volume" the Standard Deviation and Relative Standard Deviation (RSD, %) as well as the "Dispensing Time per Aliquot" were determined. Distilled water was used as a diluent, each "Dispensed Volume" was verified by weight using a Mettler PG 5002-S , 0.01 gram resolution.

5.1 Dispensing By Weight: How to Get Started

If a data printout is desired, connect the cable (P/N: 080-096) between the LabTec™ "Printer" port and the Parker printer (P/N; 080-095). In the LabTec® Setup: Printer submenu, make sure all the printer communications parameters have been entered. Turn on the printer, in the LabTec™ select the Weight mode, then press "Exec" key; the first line to be printed will consist of weight dispensing parameters.

Install the pump tubing: For most weight dispensing applications, #24 thick-walled silicone pump tubing is recommended (requires a 1082 peristaltic pump). Use approximately six (6) feet of #24 tubing; install the tubing such that two (2) feet of tubing are located on the discharge side while four (4) feet of tubing are located on the suction side of the .
(The lengths here are only guidelines.)

> Note: This arrangement allows used pump tube sections located in the to be replaced with new tube section located at the suction side of the pump. When advancing pump tubing in this manner, the used pump tube sections end up on the pump discharge side.

If you use a 201 Magnetic Gear Pump Head, #24 Silicone pump tubing is also recommended. However in this case, pipe adapters (¼ x 1/8¨, male, P/N: 400-500) are installed at the inlet and outlet ports of the 201 magnetic gear pump head. The #24 silicone tubing slips tightly over the inlet and outlet pipe adapters.

The scale should be located next to the LabTec™. On the discharge side, fasten the pump tubing to a ring stand (P/N: 400-420) using nylon ties. The dispensing tip should be secured with a clamp and located above the scale with sufficient clearing to allow the easy removal of any sample bags or containers. On the suction side of the LabTec™, secure the pump tubing to the solution reservoir. Press the "Prime" key at the LabTec™ front panel until all of the tubing is filled with solution.

Consult Weight Dispensing Mode: Edit for editing your weight dispensing parameters.

DISP. WEIGHT: Defines the dispensed weight in terms of grams. For example, to dispense 25.00 grams, use the "Incr," key to scroll to 25.00, then press "Select".

SNIFFLE: The sniffle function consists of a brief pump reversal at the end of the dispensing cycle to suck in the droplet that typically hangs at the end of the dispensing tip. Select SNIFFLE = 0.0.

SLOW FACTOR: Defines the diluent weight that is dispensed slowly at the end of the dispensing cycle. For example, if the diluent weight is expected to be 100 grams, then the SLOW FACTOR is selected to be approximately 25% or 25.00 grams.

PUMP DIRECTION: Defines the rotation of the pump head, this parameter can be changed from clock-wise (CW) to counter clock-wise (CCW).

PUMP RATE: Defines the relative pup speed (0% to 100%) with which the diluent is being dispensed. Select PUMP RATE = 80%.

TIME DELAY: Defines the time interval, in seconds, between dispensing cycles.

COUNT: Defines how often the dispensing cycle will be repeated. For example, when COUNT = 10, then the selected DISP. WEIGHT will be dispensed 10 times.

Press “Exec” key, select “Exec 1”, the LabTec™ will show the following display:

SCALE INITIALIZATION
Please Wait

While the message is being displayed, the LabTec™ checks the scale communications parameters and the following display is shown:

WEIGHT SET: 25:00 G
Press RUN When Ready

Place the sample bag or container onto the scale and underneath the dispensing tip. Press “RUN” key or the foot switch. The LabTec™ will show the following display:

REMOVING TARE WEIGHT
Please Wiat

The LabTec™ starts dispensing while the following display is shown:

DW= 00.00 G	RUN
CW= 00.00 G	ID 001

DW stands for the Dispensed Weight and CW represents the delivered Cumulative Weight. When the dispensing cycle is completed, the following displays are shown:

DW= 25.00 G	FINISH
CW= 25.00 G	ID 001

DISPENSING
Completed

WEIGHT SET: 25.00 G
Press RUN When Ready

Remove your filled sample bag or container and initiate the second dispensing cycle.

Note: If you have more than one DISP. WEIGHT, store one DISP. WEIGHT in “Edit 1”, e.g. “10.00G”, while a second DISP. WEIGHT is stored in “Edit 2”, e.g. “100.00G”. Up to ten different sets of parameters can be stored in “Edit 1” through “Edit 10”.

5.2 Dispensing By Weight: Parameter Guide, 1082; Silicone: 15 & 24

The following information should be used as a general guide in selecting optimal dispensing parameters: This data was collected with a 600 RPM LabTec™ Dispenser mounted with a 1082 pump head; the "Tube Size" parameter refers to thick walled Silicone pump tubing sizes: 15 & 24.

The "Slow Factor" is implemented at the end of each dispensing cycle to allow the electronic scale to stabilize. Thus a Slow Factor of 20.00 mL indicates that the last 20 mL will be dispensed at reduced pump speed.

Note: The LabTec™ will stop pumping just prior to reaching the target weight; once the scale has stabilized, the LabTec™ will complete the dispensing cycle.

The end of the dispensing cycle will be indicated by a "beep" followed by the display "Dispensing Completed". The "Sniffle",i. e. momentary pump reversal at the end of the dispensing cycle, is set at its default value of 0.3.

Edit Parameters: All dispensing was done with #15 and #24 Silicone pump tubing

EDIT 1: #24 Pump Tubing: Disp. Weight = 200.00 gr, Sniffle = 0.3, Slow Factor = 20.00 gr, Pump Rate = 80%, Time Delay = 00:01, Count = 5

EDIT 2: #15 Pump Tubing: Disp. Weight = 50.00 gr, Sniffle = 0.3, Slow Factor = 14.00 gr, Pump Rate = 80%, Time Delay = 00:01, Count = 5

Weight Set	Ave. Dispensed Weight	RSD (%)	Dispensing Time per Aliquot
#24 Silicone Pump Tubing			
200.00 gr	199.95 gr	0.03%	16 sec
150.00 gr	150.00 gr	0.11%	14 sec
100.00 gr	100.01 gr	0.11%	13 sec
50.00 gr	49.96 gr	0.18%	12 sec
25.00 gr	25.05 gr	0.25%	10 sec
#15 Silicone Pump Tubing			
50.00 gr	50.03 gr	0.10%	13 sec
25.00 gr	25.06 gr	0.22%	12 sec
15.00 gr	15.04 gr	0.60%	12 sec
10.00 gr	10.02 gr	0.65%	12 sec

Note: Distilled water was used as a diluent; five (5) separate measurements were made for each of the sample weights. Each aliquot was weighed on a PGS Mettler scale, readability 0.01 gr. The average Delivered Diluent Weight and the Relative Standard Deviation (RSD) are summarized above.

5.3 Dispensing By Weight: Parameter Guide, Magnetic Gear Pump:

The following information should be used as a general guide in selecting optimal dispensing parameters. This data was collected with a 3400 RPM LabTec™ Dispenser mounted with a 201 Micropump Head. A check valve (P/N: 400-530) was used as a dispensing spout.

The “Slow Factor” is implemented at the end of each dispensing cycle to allow the electronic scale to stabilize. Thus a Slow Factor of 25 mL indicates that the last 25 gr will be dispensed at reduced pump speed.

Note: The LabTec™ will stop pumping just prior to reaching the target weight; once the scale has stabilized, the LabTec™ will complete the dispensing cycle.

The end of the dispensing cycle will be indicated by a “beep” followed by the display “Dispensing Completed”. The “Sniffl ” function is turned off i.e. Sniffle = 0.0.

Note: Increase the Slow Factor 35gr or 45gr if the pump does not stop prior to completion of the dispensing cycle. If the pump does not stop, it is an indication that the pump has either overshot the target weight or that the dispensed weight is within specified margin of error.
Edit Parameters: All dispensing was done with a 201 Micropump Head.

Edit 1: Dispensed Weight 2000 to 500 gr: Disp. Weight = 2000 gr, Sniffle = 0.0, Slow Factor = 25 gr, Pump Rate = 100%, Time Delay = 0.1 sec, Count = 5.

Edit 2: Dispensed Weight 500 to 100 gr: Disp. Weight = 500 gr, Sniffle = 0.0, Slow Factor = 25 gr, Pump Rate = 70%, Time delay = 0.1 sec, Count = 5

Weight Set	Ave. Dispensed Weight	RSD (%)	Dispensing Time per Aliquot
EXEC 1: Pump Rate = 100%, Slow Factor = 80 gr			
2000.00 gr	2000.7 gr	0.02%	42 sec
1500.00 gr	1501.2 gr	0.02%	34 sec
1000.00 gr	1001.2 gr	0.04%	24 sec
500.00 gr	501.2 gr	0.04%	16 sec
EXEC 2: Pump Rate = 80%, Slow Factor = 50 gr			
500.00 gr	500.5 gr	0.08%	19 sec
400.00 gr	400.9 gr	0.05%	17 sec
300.00 gr	300.6 gr	0.05%	13 sec
200.00 gr	200.5 gr	0.11%	11 sec
100.00 gr	100.6 gr	0.25%	9 sec

Note: Distilled water was used as a diluent; five (5) separate measurements were made for each of the sample weights. Each aliquot was weighed on a PG 5002-S Mettler scale, readability 0.01 gr. The average Delivered Diluent Weight and the Relative Standard Deviation (RSD) are summarized above.

6.0 Care and Use of Sterilizing Filters

Many laboratories use sterilizing filters instead of autoclaving to sterilize media. Using filters instead of autoclaving increases productivity in the laboratory and protects technicians from handling hot and / or heavy containers. Autoclaving is very labor intensive and also uses a great deal of energy.

When using filters, as with any technology, there is a protocol you should develop and always should be followed to safely and effectively implement your application. The following are guidelines you should consider making part of your sterilizing protocol.

Procedure for Filtering:

1. To "Prime" a filter means to push all the air out that is in the new un-used filter and to fill the filter with the solution that needs to be filtered. You want to prime a filter slowly to avoid creating "air pockets" within the filter.

2. Be sure to open the vent on your filter before you prime it.

3. You will connect the filter to your LabTec™ tubing. Set the pump rate at a low value, such as 25% of maximum speed when you are priming the filter.

4. Press "RUN" on the LabTec™ while you are in the Manual Mode.

5. Periodically Tap the filter as it is being primed; this will dislodge any bubbles and send them on their way.

6. If you pump too quickly while you are priming the filter, air bubbles may remain trapped in the filter. These air bubbles will continually come out during dispensing and affect the precision of your volumetric dispenses. The air bubbles will not affect your weight-ratio or gravimetric dispenses.

7. Flush the filter with the vent open until solution comes out of the vent. This means the filter is completely full of liquid, and the priming process is complete.

Autoclaving the Filter:

1. The sterilizing filters you have received are sterile as long as the packaging is unopened. Make sure you do not open the filter package until you are ready to use.

2. Repeated autoclaving may distort different parts of the filter. Distortion will result in rupturing the filter. Thus, you should autoclave the filter only once.

3. Autoclave for at least 20 min. Typical maximum autoclave temperature is 134 °C at 2 bar.

Pumping Heated Solutions through the Filter:

1. If the solution to be pumped is hot, make sure you heat the solution gradually.

2. Maintain a constant temperature.

3. Maximum temperature for prolonged pumping through your filter is 180 °F.

Troubleshooting the Filters:

1. Your filter should be changed on a regular basis. Try to choose a filter size that will accommodate the total volume you need filtered in a day, the flow rate you need through the filter.

2. Sterilizing filters have a pore size of 0.22 microns. If you have a very “dirty” solution, you may want to send your solution through a series of filters, such as first through a pore size of 5 microns to catch the very big, chunky particulate matter and then through the 0.22 micron filter to sterilize

3. Be sure that you have dissolved your media before beginning to filter.

4. You may want to heat the media a little to ensure and speed the dissolving.

5. Be sure to slow the pump down during the priming of the filter.

6. If you are filtering a broth when the solution is hot, allow the temperature to decrease a little before you filter.

7. Go to the next larger size filter if you need to higher capacity or need to use a much faster pump speed.

Reusing Sterilizing Filters:

1. Chose a filter size that will accommodate the total volume you typically need in a day. For best results use the proper sized filter for your job size.

2. If you have a large sterilizing cartridge filter and you have “used” only a fraction of its life, you can carefully remove it from its tubing connections and wrap it in plastic wrap and place in your refrigerator. There it must be kept at 4 °C. It can be stored in this manner for several days. When you want to reuse the filter, carefully reattach tubing connections and use.

3. If you have a “used” filter and would like to reuse it, it is possible to back flush the filter with sterile water, autoclave and then reuse. This procedure should not be repeated more than once, since there is the possibility of repeated autoclaving separating the filter housing from the filter layers. This procedure is not recommended, but is possible.

4. For best results use the proper sized filter for your job size. Consider the costs of a sterilizing filter as a consumable, which is less expensive than autoclaving.

5. “Squeezing” too much life out of a filter will tend to produce unacceptable results.

Part D: Troubleshooting - Peristaltic Pump Heads

When this occurs:	Check the following:	Possible solution
When "Check Pump Head" error occurs with your peristaltic head.	1. Does "Check Pump Head" occur with no tubing in the head? 2. Confirm the tubing sizes you are using.	1. If it occurs with no tubing in the head, call Parker. You may need a new motor. 2. If no, make sure you are using the correct size tubing. Thick walled tubing in a thin wall pump head will cause this, and may break the head.
When peristaltic pump head turns, but no fluid flows.	1. Check the tubing size and pump head type, as you may be using the wrong size for that head. 2. Tubing Size is ok	1. 1081 is for thin walled tubing, and 1082 is for thick-walled tubing. Thin-walled tubing in a thick walled head won't produce much flow. Use the correct size tubing. 2. The pump head may be cracked from being forced closed with the tubing crosswise or the wrong size tubing. Contact Parker for repair or replacement parts.
When the pump head turns ok with no tubing installed, won't turn when you put tubing in, and you don't get a "Check Pump Head" error.	The coupler is loose or broken.	Contact Parker for technical support, or to arrange for service and an RGA#.
When "Scale Error" "Hit any key" shows on your screen.	1. Is your scale turned on, and are the cables tight? 2. Ok, the scale is on, cables are ok, and it still won't work? 3. Ok, the scale is chosen correctly, and it still doesn't work. Now what?	1. Press any key to clear the error, tighten the cables, turn on the scale, and try it again. 2. Check Section 4, Setup: Scale of this manual, then go to Setup Mode of the pump, select Scale, then Scale Mfr, and confirm the selection is correct. 3. Either refer to the same manual section mentioned above to check the scale settings, or call Parker tech support for help correcting them.
When the pump is acting behaving strangely. The aliquots are all wrong; it gets data from the scale, but slows down way too early; etc.	1. Has someone else used your LabTec™? 2. Have you had electrical problems in the building lately?	1. If someone other than yourself or your supervisor has changed the settings without your knowledge, you can to return them to their original settings. 2. Power spikes and brown outs can cause problems. Enter Setup; Pump, and then select Factory Reset. This step is a last resort. This will return the unit to the factory default values. You will need to return to Setup; Pump; Motor RPM, and verify its setting, as well as Setup, Pump; Pump Head to verify it as well. You will also need to reenter your aliquots and recalibrate them. Call Parker tech support if needed.

Piston and Magnetic Gear Heads

		1. If you believe the head is stuck due to being dried out, you can try wetting it by placing an appropriate solvent in the upper tubing overnight. 2. If it still won't turn, contact Parker to arrange an RGA to send your pump in for service, or purchasing a service kit if you have a magnetic gear head.
When "Check Pump Head" error occurs with your piston or magnetic gear head. When your piston pump head seems to turn and the motor runs, but no fluid flows.	1. When was the last time you had the head serviced? 2. Are you pumping a gritty solution, or one that can crystallize if allowed to dry out? Either the piston is broken, or the coupler is loose.	Contact Parker for tech support or to arrange for service for your pump and RGA#.
When your magnetic pump head seems to turn and the motor runs, but no fluid flows.	1. Has the unit run dry? 2. Is it a high viscosity fluid?	1. Magnetic gear head pumps do not dry prime well after they have been broken in. You must keep the pump wet. Be sure you are using a check valve as your dispensing tip so the fluid doesn't run back into the container. 2. Magnetic gear heads do not perform well with viscous fluids, as they can decouple. Either reduce the viscosity, provide head pressure, or choose a different style of head.
When "Scale Error" "Hit any key" shows on your screen.	1. Is your scale turned on, and are the cables tight? 2. Ok, the scale is on, the cables are ok, and it still won't work? 3. Ok, the scale is chosen correctly, and you still get no data?	1. Press any key to clear the error, tighten the cables, turn on the scale, and try it again. 2. Check Section 4. Setup: Scale of this manual, then go to Setup Mode of the pump, select Scale, then Scale Mfr. and confirm the selection is correct. 3. Either refer to the same manual section mentioned above to check the settings on the scale itself, or call Parker for technical support help in correcting them.
When the pump is behaving strangely. The aliquots are all wrong; it gets data from the scale, but slows down way too early; etc.	1. Has someone else used with your LabTec™? 2. Have you had electrical problems in the building lateley?	1. If someone other than yourself or your supervisor has changed the settings without your knowledge, you can return them to their original settings. 2. Power spiked and brown outs can cause problems. Enter Setup; Pump, and then select Factory Reset. This step is a last resort. This will return the unit to the factory default values. You will need to return to Setup; Pump; Motor RPM, and verify its setting, as well as Setup, Pump; Pump Head to verify it as well. You will also need to re-enter all your aliquots and re-calibrate them. Call Parker domncik hunter for technical support if needed.

SciDoc Documentation Software

When this occurs:	Check the following:	Possible solution
When you get a "Device Error, Com Port Not Available" error from your computer.	This is a computer related error, not one generated by the pump. The Com port you specified is in use or does not exist on your computer.	1. Check Device Manager from the properties page of the My Computer Icon. Expand the + next to Ports, Com and LPT. What Com ports exist, and are they functioning properly? 2. If all in Device Mgr is fine, then some other program is using the Com Port, consult your IT or MIS dept. for assistance. You may have to specify a different Com Port for use with the SciDoc spreadsheet. 3. Known devices/programs that cause this error: a. Installed but not used Serial Mouse. b. RS-232 bar code reader installed on the same Com port. c. Hot Sync or Synchronize program for your PDA. d. An already open instance of SciDoc using that Com port.
You have SciDoc open, and the LabTec™ running, but no data is being collected.	There is no communication between the spreadsheet and the LabTec™. 1. Check that you are using the correct cable, and that it's installed correctly. 2. WinWedge may not be running. 3. WinWedge may not be able to access the Com Port.	1. The RS-232 cable for the PC can look nearly identical to that used for the scale. They should be labeled. 2. Check the System Tray for the WinWedge Icon. If it's not there, click on the Setup Button, and indicate which port you are using. 3. You will find a button on the Taskbar indicating a "Device Error", refer to the previous troubleshooting subject for help with Com Port errors.

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