



Approach to Instrumentation

Prepared by: Bob Morrison
STLCC-CPLS , Instrumentation Specialist

Original: April 2008, Revised Aug 2014

Approach to Instrumentation; Guidelines

- **Review SOPs (Standard Operating Procedures)**
- **Safety Issues**
- **Analog vs. Digital vs. PC**
- **Get help**

Approach to Instrumentation; SOPs

- **Review SOPs (Standard Operating Procedures) or other materials**
 - Visit Users website before you try to use the instrument
 - Jump to a specific instrument from the title page by detecting on the pictures
 - Use Search option if you don't see what you are looking for
 - Review the pictorial SOPs and any Quick Start Guides
 - Note hotlinks that will take you to online copies of manuals and other information
- **Get help**
 - If this is your first time using the instrument, seek help from others who may have experience with the instrument: instructor, staff, classmates
 - Use onboard HELP options or quick start guides
 - Return to SOPs and investigate other pages and/or online user manuals

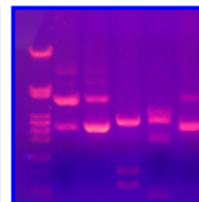
STLCC CPLS Website: Equipment, SOPs, Protocols, Training, News\ <http://users.stlcc.edu/departments/fvbio>



St. Louis Community College (STLCC)

Center for Plant and Life Sciences (CPLS)

Join us on facebook, Search for: Stlcc-fv Biotech or FVBioTech



- [Instrumentation: Description, SOPs, Protocols](#)
- [Education: How-to, Lab Manuals, Training](#)
- [CPLS Brochure](#)
- [CPLS Facility: Layout, Labs, Instrumentation](#)
- [CPLS Organization](#)
- [CPLS Class Schedules](#)
- [Biotechnology Program](#)
- [Bridge to STEM-Life Science Program \(B2SLS\)](#)
- [Chemical Technology Program](#)
- [Clinical Lab Program](#)
- [Contract Research Organization Bio-Bench Projects](#)
- [Horticulture Program](#)
- [Mobile Technology Center](#)
- [News, Visitors, Press Releases, Job Info](#)



Cepheid SmartCycler

**Logon: Cepheid/cphd
(delete this before publishing)**



MJ Research PTC-220



BioRad Model PTC-1148



MJ Research Model PTC-150

Thermal Cyclers PCR, qPCR

Standard Operating Procedures



BioRad MyCycler

Select Picture to Jump to that Section/device



HYBAID-PCR, Omn-E



Stratagene qPCR Mx3005P

**Logon: Admin/3000hanover
(delete this before publishing)**

Prepared by: Bob Morrison
FVCC, Instrumentation Specialist
June 2008, Latest Revision Oct 2011

Approach to Instrumentation; Guidelines, Safety

- Look for safety guidelines regarding chemicals or electrical handling before you turn it on**
- If the “on” button is not obvious, trace power cord to the instrument and on/off toggle is often nearby. Also look for [|] or “0/1” symbol.**
- Check Ready/on (green) lights or any warning (red/amber) lights before proceeding**
- Don’t force anything; pushing or twisting harder on knobs, switches, or screen menus is not the answer and may damage the instrument or cause shock.**

Electrophoresis : Typical Gel Setup (Safety example)

On/Off

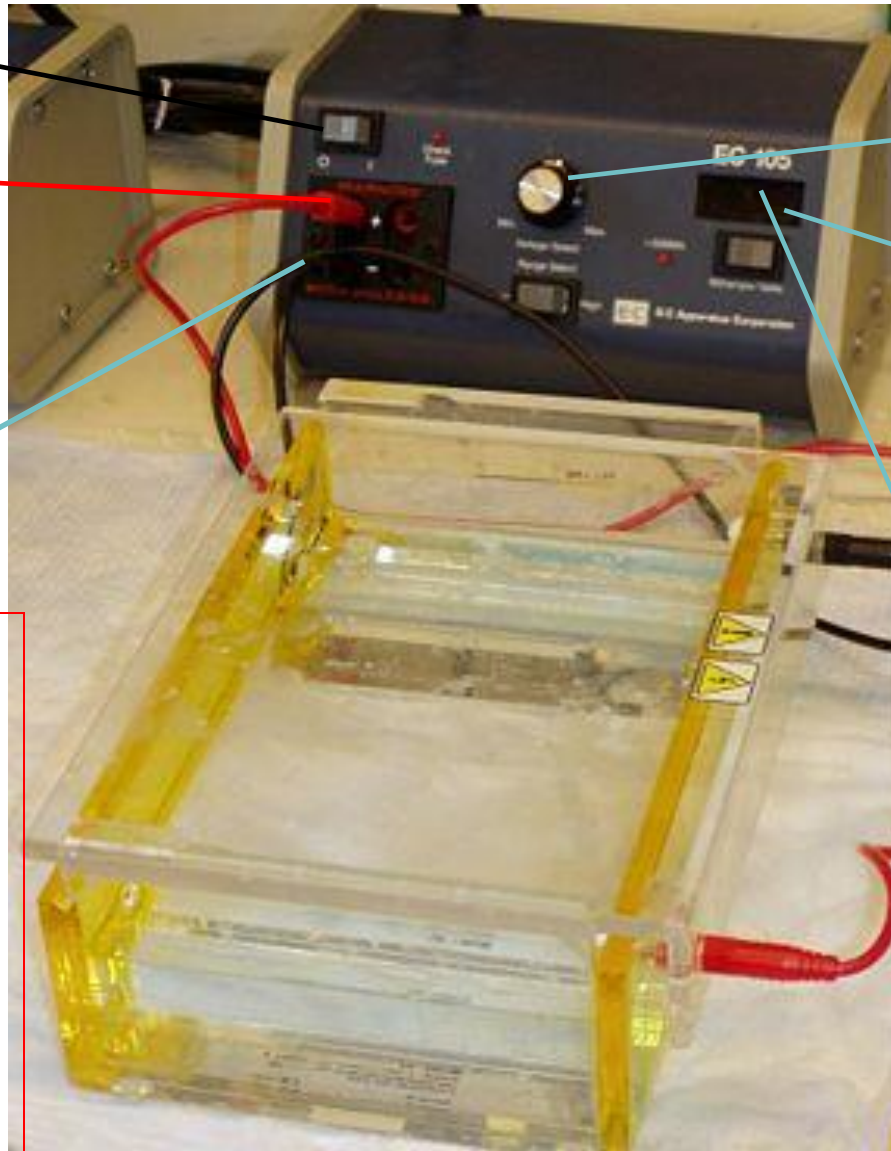
Red (+) Electrical Probe; leads to far or receiving end of plate. If lose or pops out, expose metallic end and expand thin strips.

Black (-) Electrical Probe; leads to well or start end of plate

Voltage or Amps dial control. Typically set to maintain 95 volts during run.

Digital Volt or Amp readout Window

Rocker Switch: Set to constant Volts (or Amps) per lab procedure. Typically 95 Volts DC.



Safety Notes:

- 1) Connect all wiring and probes before turning the unit on.**
- 2) Never touch the probes or power supply box while the device is on.**
- 3) Turn off the device before disconnecting electrical probes.**
- 4) Do not handle the device with wet hands or on wet countertop.**

Electrophoresis: E-gel Basic Operations (SOP and Safety example)

1. **Before putting an E-gel cartridge in the powerbase**, attach the circular end plug of the power adapter cord into the hole in the base and then plug the adapter itself into the 110V outlet. A brief self-test of flashing lights and beeping will occur, then no lights until step 2 is completed.
2. Insert the E-gel cartridge into the base right side first, then press the left side down. There should be an click sound as the cartridge snaps into place and a **steady red light will appear (Ready Mode)**. No button pushes are required to reach this state.
3. ***A two minute “pre-run” with the E-Gel comb in place is required before you will load samples into the wells.*** Press and hold either the 15 or 30 min button for a few seconds as the **steady red light** turns into a **flashing green light for the 2-minute run**.
4. At the end of the “pre-run”, the flashing green light will turn to flashing red and a rapid beep will sound. Press and release either button to stop the beeps and return to a steady red.
5. Remove the comb from the E-gel cartridge carefully lifting straight out and then clear up any gel residue near the wells.
6. Prepare and load your samples into the wells per the E-gel manual guidelines.
7. For a single-comb gel, press the 15 min button, **a steady blue light will appear for the duration of the run**.
8. For a double-comb gel, press the 30 min button, a **steady green light will appear**.
9. *You may interrupt the run at any time by pressing either button once and then again to restart but you must manually time the remaining portion to avoid overrunning the gel.*
10. At the end of the run periods, the steady light will return to a flashing red light and beeps will sound. Press either button to stop the beeping and return the light to a steady red.
11. Remove the E-gel carefully from the powerbase and you are now ready for the transilluminator and/or other analysis. Bands will diffuse within 20 minutes however!

Thermal Cycler: MyCycler, Basic Operations (Power example)

STOP key will pause a protocol when running.

Pressing STOP again will terminate the protocol



1. Plug in the unit to provide power, there is no toggle on/off switch.
2. Turn on by pressing the Stand-by key once
3. To put into Stand-by mode conserving power, hold down for > 3 sec
4. Turn off completely by unplugging the unit, there is no on/off switch.

HELP menus are available

From the HOME/startup screen, select F5-Help to review topics and display an index of features.

[Hot link to Bio-Rad MyCycler User Manual ... 45 pgs pdf](#)

Approach to Instrumentation; Guidelines

- **Analog vs. Digital vs. PC**
 - Analog : Dials to set and then generally a Start or Run button; follow order in SOP to avoid problems
 - Digital: Small screen with arrows to navigate (like a cellphone), not always a back or return option
 - Avoid SETUP menus unless the SOP directs you to change or set them
 - PC: More complex instruments use PC application, logon with ID/password, select Icon, follow menus

Centrifuge: Floor, Avanti J-20XP, Control Panel @BRDG, (Analog example)

3. Set dial to match installed rotor

5. Set Speed
6. Set Time (hr/min)
7. Set Temp (C)

4. Press SET, press again to see Actual readings

10. Press START; will blink until set values are reached.

8. Press ACCEL to set rate
9. Press DECEL to set rate

1. Turn ON MasterSwitch
2. Depress foot pedal to release door and install rotor

STOP; will blink until rotor stops

Actual Set

Max Slow

Max Slow Off

Door

ACCEL

DECEL

START

STOP

BECKMAN CULTER Avanti J-20 XP

4

pH Meter: VWR Symphony, Automatic Read Mode (Digital Example)



Current
Temperature of
sample

1. Press and
hold for 2 sec to
turn unit on/off

2. Press bottom
of key to turn on
or off lighted
display



3. System should start in
Automatic Read Mode with
"AR" blinking

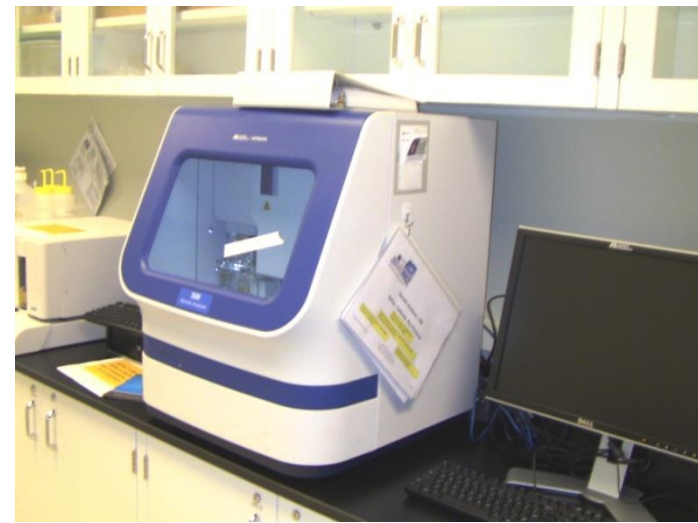
4. Remove probe and insert in
your sample

5. Wait until the AR and small
pH display stop blinking.
This is the Measured pH.

6. Rinse probe with DI water
and return to stand

Press once if needed
to go to Automatic Read Mode

Genetic Analyzer: ABI Maintenance, Calibration, and Supplies (PC Driven Instrument)



ABI @BRDG, R126B



Supplies

**Windows Logon ID: 3500-User
Password: 3500-USER**

**Delete LOGON boxes
before publishing)**

**3500 Run/Data Acquisition Logon ID: Administrator
Password: Administrator1**

**Sequence Analysis Logon ID : SLCC3500
Password: password**

**Gene Mapping Logon ID :gm
Password: SLCC3500**

[Link to ABI 3500 User Manual...pdf \(18mb\)](#)

Prepared by: Bob Morrison
STLCC-CPLS, Instrumentation Specialist
Initiated: Sep 10, Last Update Jan 2012

Genetic Analyzer: Genetic Analyzer ABI, (PC example)

3500 Data Collection Software

Dashboard Edit

Library Maintenance Tools Manage Preferences Help Log Out

Maintenance

Applied Biosystems

Calibrate

Spatial

Spectral

Performance Check

Sequencing Install Standard

Fragment Install Standard

HID Install Standard

Maintenance Wizards

Planned Maintenance

Notifications Log

Service Log

Schedule

Main Workflow

View Summary Report View Detail Report E-Signature Print

Run View History View

Calibration Settings

Chemistry Type: General Sequencing

Number of Wells: 96 96-FastTube 384

Plate Position: A B

☒ Keep Spectral Calibration Data

Scoring Settings

CRL Pass/Fail Threshold: 500

Read Length Start: 40

Read Length End: 350

Current Instrument Consumables

0%

1. Under Performance, Select Seq Install Standard

2. Select General Sequencing

3. Select 96, and A position

4. Check this box to Keep/save Sequenced and Calibration Data

Capillary Run Data

Capillary	1	2	3	4	5	6	7	8	Median	SD
Spectral Calibration Run										
Contiguous Read Length (CRL)										
CRL Pass/Fail										
Comparison with Ref Sequence										
CRL Basepair Accuracy										
Basepair Accuracy										
Read Length										

Passed Failed Borrowed Not Calibrated

Quality Value: Condition #: Status: Message:

Intensity vs Scan Number

Calibrated Data

0 4000 8000 12000 16000 20000 24000 28000 32000

Intensity vs Scan Number

Sequence Comparison to Sample (Capillary 1)

Base Position

Reference

Sample

... 1350 ... 1360 ... 1370 ... 1380 ... 1390 ... 1400 ... 1410 ... 1420 ... 1430 ... 1440 ... 1450 ... 1460 ... 1470 ... 1480 ... 1490 ...

Intensity vs Pixel Number (Capillary 1)

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

Intensity vs Pixel Number

Accept Reject

STLCC_CPLS_Morrison 8/25/2014

Page 14

Approach to Instrumentation; Guidelines Review

- **Review SOPs (Standard Operating Procedures) or other materials**
 - Visit Users website before you try to use the instrument
 - Jump to a specific instrument from the title page by detecting on the pictures
 - Use Search option if you don't see what you are looking for
 - Review the pictorial SOPs and any Quick Start Guides
 - Note hotlinks that will take you to online copies of manuals and other information
- **Get help**
 - Seek help from others who may have experience with the instrument; instructor, staff, classmates
 - Use onboard HELP options or quick start guides
 - Return to SOPs and investigate other pages and/or online user manuals
- **Safety Issues**
 - Look for safety guidelines regarding chemicals or electrical handling before you turn it on
 - If the “on” button is not obvious, trace power cord to the instrument and on/off toggle is often nearby
 - Don't force knobs, dials, or press harder on screen menu as this may harm you and the instrument
 - Look for Ready/on (green) lights or any warning lights before proceeding
- **Analog vs. Digital vs. PC**
 - Analog : Dials to set and then generally a Start or Run button; follow order in SOP to avoid problems
 - Digital: Small screen with arrows to navigate (like your cellphone), not always a back or return option
 - Avoid SETUP menus unless the SOP directs you to change or set them
 - PC: More complex instruments use PC application, logon with ID/password, select Icon, follow menus

Join Us on FACEBOOK
for News on Plant and Life Sciences
Search for: FVBiotech or Stlcc-fv Biotech

facebook

2

Search

Stlcc-fv Biotech

Find Friends

Home

St. Louis Community College at FV, Biotechnology Program

Center for Plant and Life Sciences, BRDG Park Facility

Wall

Info

Photos (4)

Notes

Friends

Subscriptions

Friends (139)

Soumya Mallikarjunaiah

Nour Al-hiyari

Giselle Mungal-Hornaday

Tarak Patel

Stlcc-fv Biotech

Lives in Saint Louis, Missouri

Add where you work

Add your school

Edit Profile

Update Status

Add Photo / Video

What's on your mind?

Stlcc-fv Biotech

added 9 new photos to the album Clyde C Miller Workshop 18 Nov 2011.

Like · Comment · Share · November 18 at 10:13am

Stlcc-fv Biotech

UMSL

Edit Profile

View As...

People You May Know

See All

David Willis

3 mutual friends

Add Friend

Jennifer Florida

2 mutual friends

Add Friend

Brian L Baker

2 mutual friends

Add Friend

Megan Wurst

2 mutual friends

Add Friend

Sponsored

See All

Friends of Clowder House

Please help kitties in the St. Louis area by "liking" our page!

Like · 263 people like this.

Grab Your

Chat (Offline)