FELIX INSTRUMENTS – APPLIED FOOD SCIENCE SALES TRAINING

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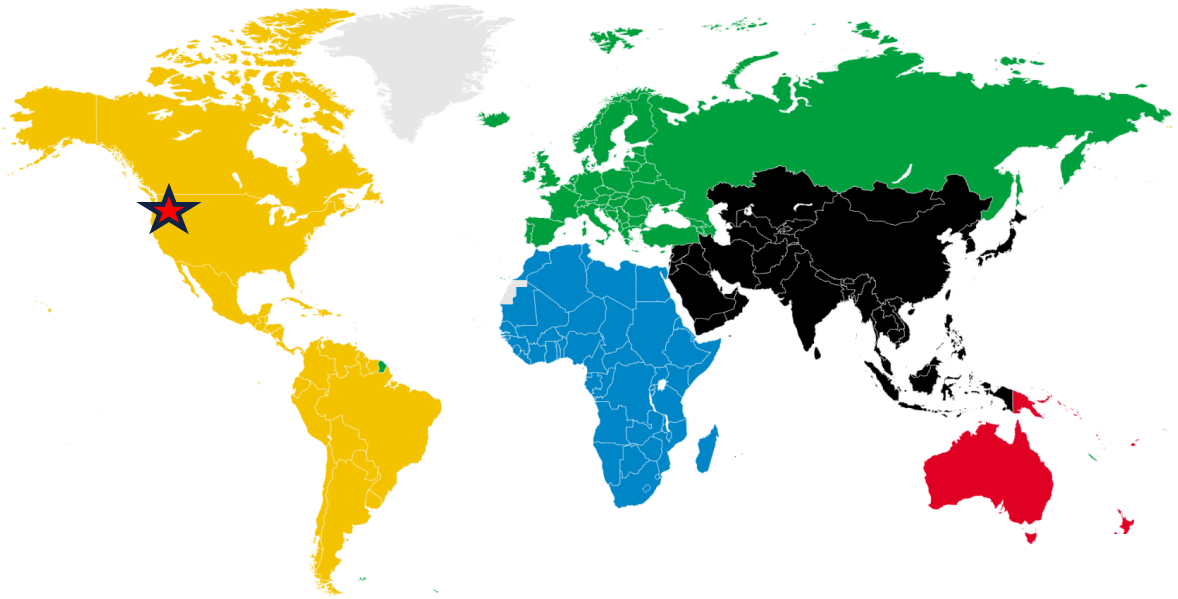
OVERVIEW

- Introduction to Felix Instruments
- Explanation of each product
  - Why it's important
  - How it works
  - Use cases and Applications
  - Advantages
- Sales opportunities

FELIX INSTRUMENTS
APPLIED FOOD SCIENCE

DESIGN | ENGINEER | BUILD

All instruments built in
Camas, WA USA



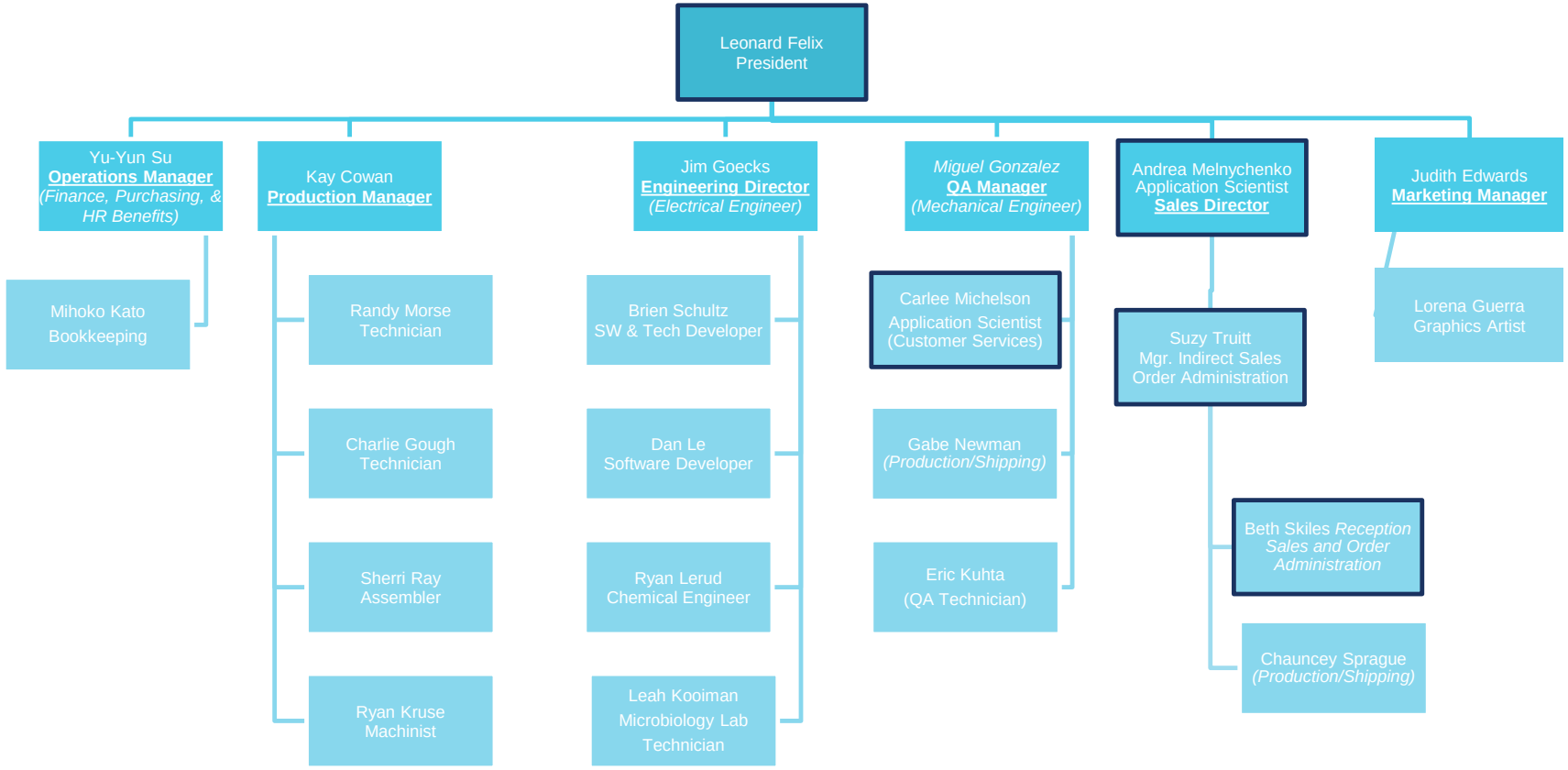
FELIX INSTRUMENTS
APPLIED FOOD SCIENCE

CID Bio-Science INC.
Tools that work where you work.

ABOUT FELIX INSTRUMENTS – APPLIED FOOD SCIENCE

- Engineering, Manufacturing, and Business under one roof
- Started in 2012
- Subsidiary of CID Bio-Science, Inc.
  - Portable Instrumentation for Plant Physiology Measurement
  - Founded in 1989
- Created to expand our market to commercial food producers

OUR COMPANY


Leonard Felix
President
Yu-Yun Su
Operations Manager
(Finance, Purchasing, & HR Benefits)
Mihoko Kato
Bookkeeping
Kay Cowan
Production Manager
Randy Morse
Technician
Charlie Gough
Technician
Sherri Ray
Assembler
Ryan Kruse
Machinist
Jim Goecks
Engineering Director
(Electrical Engineer)
Brien Schultz
SW & Tech Developer
Dan Le
Software Developer
Ryan Lerud
Chemical Engineer
Leah Kooiman
Microbiology Lab Technician
Miguel Gonzalez
QA Manager
(Mechanical Engineer)
Carlee Michelson
Application Scientist
(Customer Services)
Gabe Newman
(Production/Shipping)
Eric Kuhta
(QA Technician)
Andrea Melnychenko
Application Scientist
Sales Director
Suzy Truitt
Mgr. Indirect Sales
Order Administration
Beth Skiles Reception
Sales and Order
Administration
Chauncey Sprague
(Production/Shipping)
Judith Edwards
Marketing Manager
Lorena Guerra
Graphics Artist

FULL FELIX INSTRUMENTS PRODUCT LINE

F-750

Produce Quality Meter

F-900

Portable
Ethylene Analyzer

F-950

Three Gas Analyzer

F-920

Check It! Gas Analyzer

Bringing plant science technology from the laboratory and into the hands of the commercial produce industry.

All Felix Instruments feature:

- SD Card for internal data-logging
- GPS for mapping sample locations

NEW FELIX INSTRUMENTS PRODUCTS

Gas Analyzers for CO2, O2… and ethylene!

F-940

Store It! Gas Analyzer

F-960

Ripen It! Gas Analyzer

Launching Summer 2016

GAS ANALYZERS

F-900 Portable Ethylene Analyzer

F-950 Three Gas Analyzer

RIPENING GASES – WHY THEY ARE IMPORTANT

C_2H_4: Many fruits ripen faster with **ethylene** present

- Ethylene is **made** by fruits **and sensed** by fruits
- Ethylene can quickly lead to **decay** and **spoilage** in sensitive commodities
- Ethylene can be added to **stimulate ripening** or degreening

CO_2: Produce respires **carbon dioxide** as it breaks down sugars for energy.

- Determine **metabolic activity** by measuring CO_2
- Artificially elevating CO_2 through **modified atmosphere packaging** or in **controlled atmosphere storage** can slow respiration rates, making produce last longer.

O_2: Produce needs **oxygen** to maintain cellular function

- Decreased O_2 can **extend lifetimes** of produce during long-term storage
- At very low O_2, **anaerobic respiration** occurs, damaging produce and causing spoilage

THE F-900 PORTABLE ETHYLENE ANALYZER

Ethylene Range: 0-200 ppm

Lower Detection Limit: 0.04 ppm

Optional Sensors

0-2000 ppm

0-20%

0-100%

THEORY OF OPERATION – ETHYLENE SENSOR

- Real-time measurement device
- Open or Closed System
- Two electrochemical sensor
  - PPB sensor: Down to 0.040 ppm (40 ppb)
  - PPM sensor: Up to 200 ppm

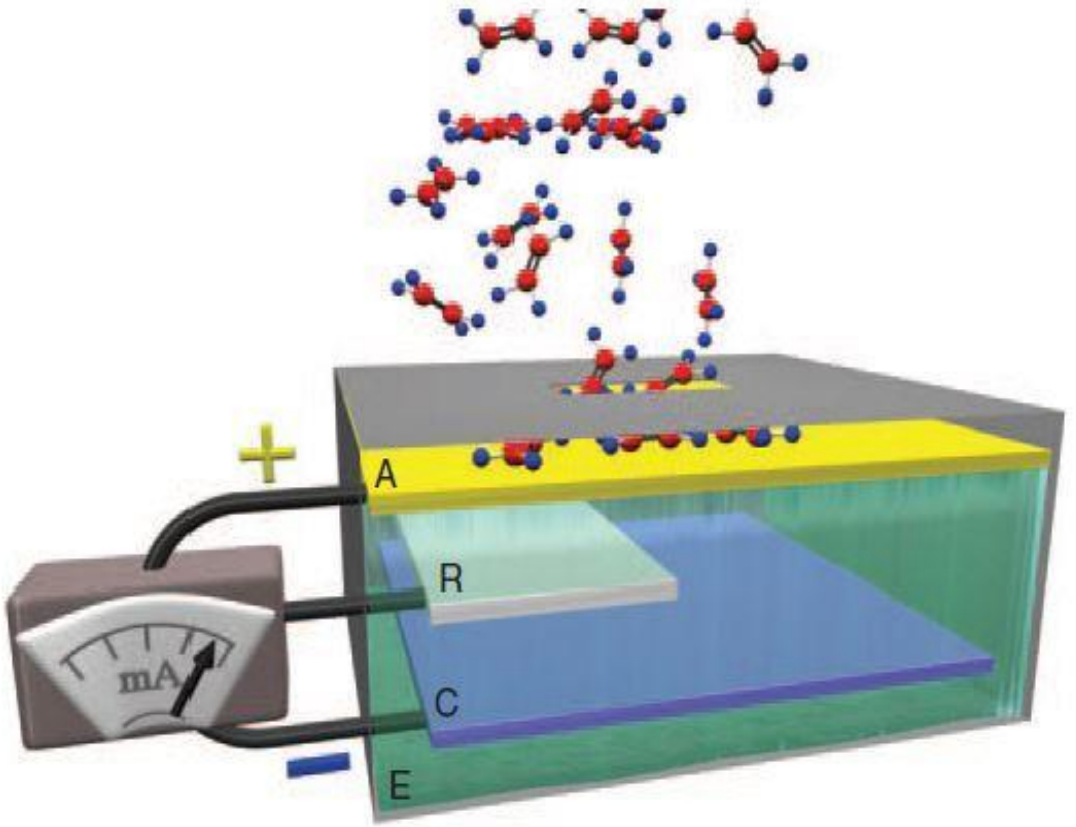
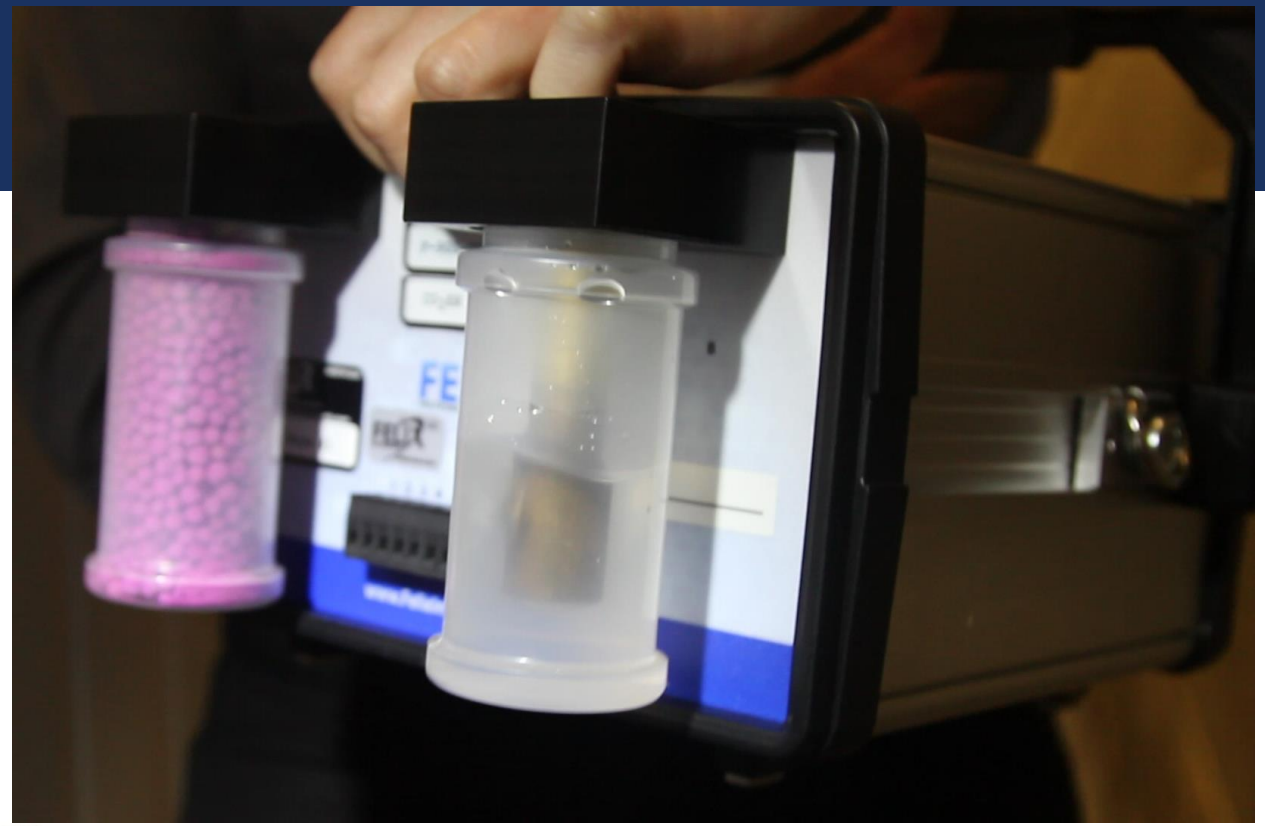
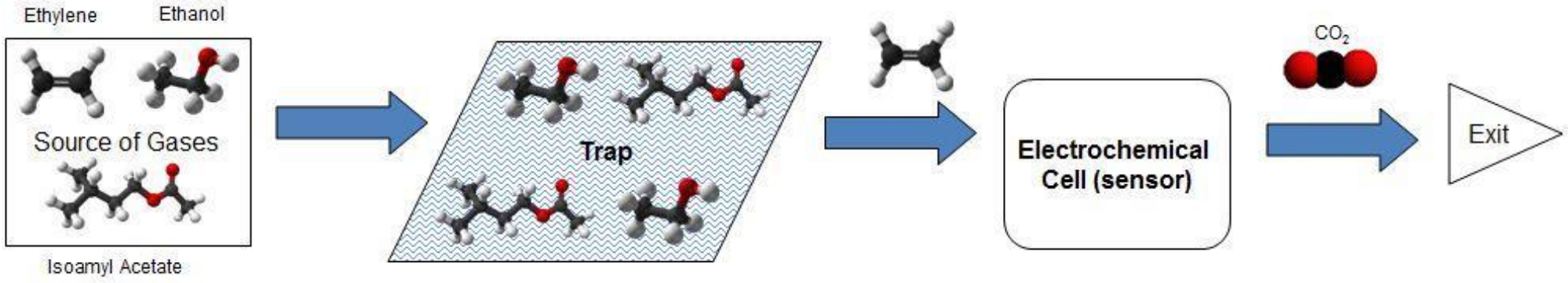


image credit: doi:10.1093/aob/mcs259



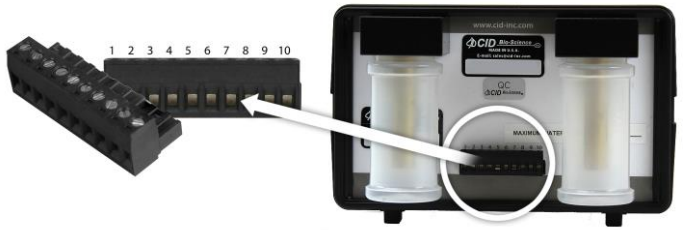
PolarCept™

Patented water filter removes competing gases from the sample gas stream



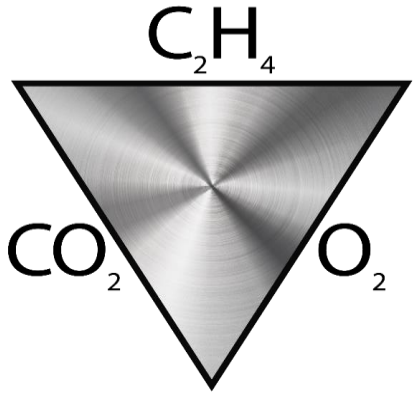
APPLICATIONS

- Continuous monitoring
  - Storage facility, greenhouse
- Inspection device
  - CA rooms, containers
- Fluxes from fruits and leaves
  - Pre-harvest, post-harvest
- Headspace accumulation
  - Small volume samples



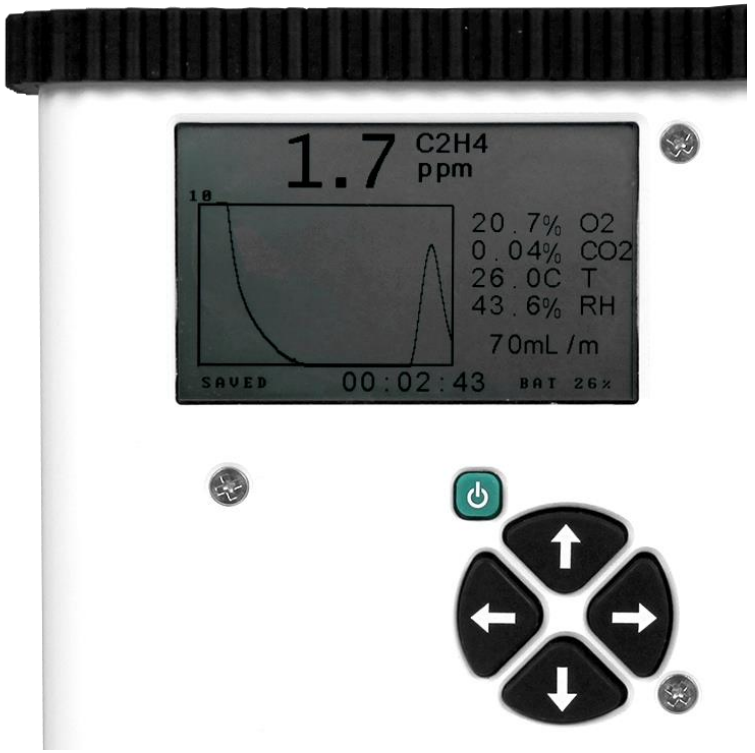
F-950 THREE GAS ANALYZER

- Measures CO2, O2 and ethylene (C2H4) in real time
  - Ethylene from 0.5 ppm to 200 ppm
  - CO2 from 0-20%
  - O2 from 0-100%
- Data-logged internally
- Open or closed system measurements



APPLICATIONS – CONTINUOUS MODE

- Continuous Mode
  - Live-updating graphs of gas concentrations
  - Data saved every one second
- For measurements in a changing environment
- Use for tracking down areas of high gas accumulation



APPLICATIONS – TRIGGER MODE

- Trigger Mode
  - Continuous flow-through until stable value is reached
  - One final value is reported and recorded
- Inspection tool
- Ideal for gas levels checks of static locations

APPLICATIONS – FIXED VOLUME MODE

- Fixed Volume Mode
  - 10-15 mL samples pulled into instrument
  - Gas is recirculated and a single concentration is reported
- Measurements from Modified Atmosphere Packaged
- Measurements of headspace accumulation in jars

NEW GAS ANALYZERS – F-920 CHECK IT! GAS ANALYZER

- Measure CO2 and O2
- 0-100% range for both sensors
- Displays results in under 6 seconds
- Single-mode for rapid measurement
- Ideal for MAP bags or inspection

NEW GAS ANALYZERS – F-940 STORE IT! GAS ANALYZER

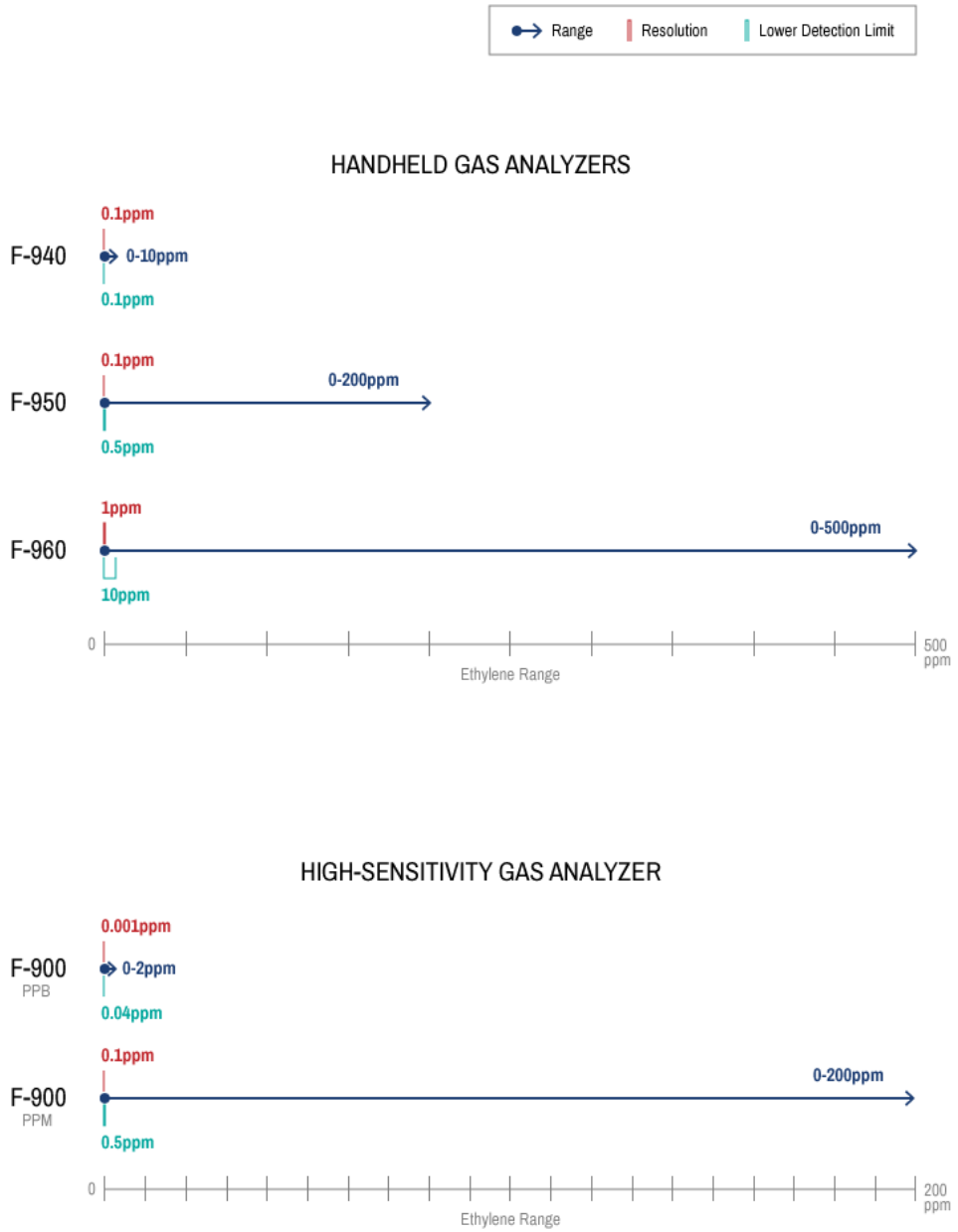
- CO2, O2, and Ethylene (C2H4)
- CO2 and O2 0-100%
- Ethylene 0-10 ppm
- Lower detection limit 0.1 ppm
- All modes and functionality of F-950
- Improved response time (15 seconds)
- Ideal for measurements of ethylene-sensitive commodities

NEW GAS ANALYZERS – F-960 RIPEN IT! GAS ANALYZER

- CO2, O2, and Ethylene (C2H4)
- CO2 and O2 0-100%
- Ethylene 0-500 ppm
- Lower detection limit 10 ppm
- All modes and functionality of F-950
- Improved response time (15 seconds)
- Ideal for forced ripening applications

BLOG POST AND INFOGRAPHIC

- Ethylene Range Chart
- Blog post "How to choose the best gas analyzer for you"



CALIBRATIONS

Instrument	Sensor	Zero	Span	Full
F-900	PPB Ethylene	Daily	Weekly	Annually
F-900	PPM Ethylene	Daily	Bi-annually	Annually
F-900	CO2 PPM	Weekly	Bi-annually	Annually
F-900	CO2 PERCENT	Bi-annually	Bi-annually	Annually
F-900	O2	Weekly	Bi-annually	Annually
F-950	PPM Ethylene	Daily	Bi-annually	Annually
F-950	CO2 PERCENT	Bi-annually	Bi-annually	Annually
F-950	O2	Bi-annually	Bi-annually	Annually

COMPETITORS

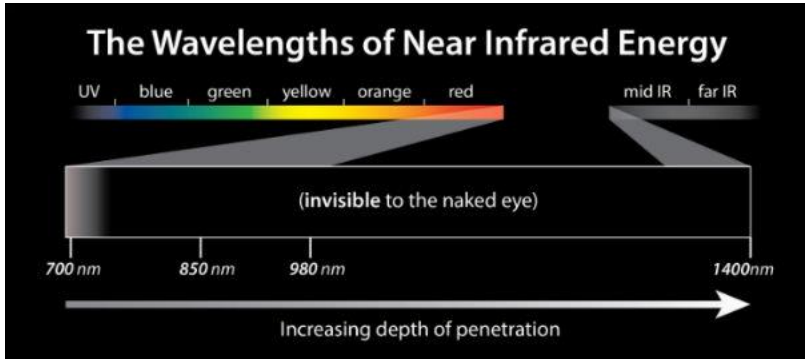
	F-900	F-950	EMS MACView	Mocon	OxyBaby
Ethylene range	0.04-200 ppm	0.5-200 ppm	0-5 ppm	Not available	Not available
CO2	Optional 0-2000 ppm Optional 0-20%	0-20%	Not available	0-30%	0-100%
O2	Optional 0-100%	0-100%	Not available	0-100%	0-100%
Calibration	Weekly, Bi-annually	Annually	Weekly	Annually	Annually

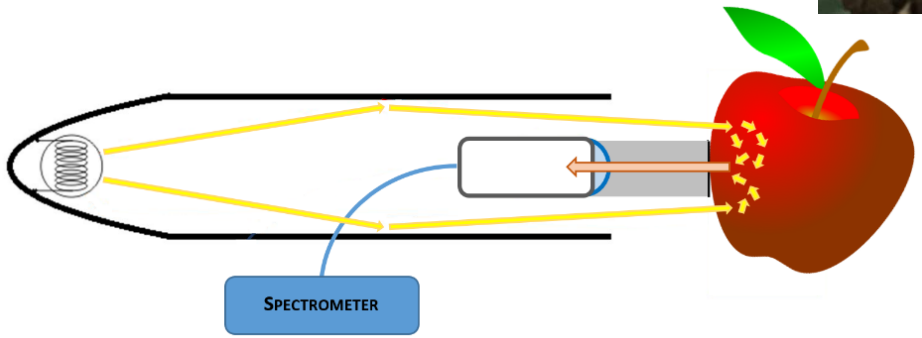
F-750 PRODUCE QUALITY METER – WHY WE NEED IT

- Fruit is complex
  - Sugars
  - Acids
  - Dry Matter
- Molecules inside the fruit change as fruit ripens
- Consumers prefer different types of flavors
- Need a non-destructive, standardized way to measure quality!

F-750 PRODUCE QUALITY METER – HOW IT WORKS

- Non-destructive tool for rapid quality assessment
- Acts like a high-powered flashlight – light enters fruit and returns to F-750
- Measures light interactance with groups of molecules
- NIR and visible spectrometer 310-1100 nm
- Builds models tailored to specific commodities
- Measures internal qualities of produce in under 6 seconds





Lets you see tissue instead of skin

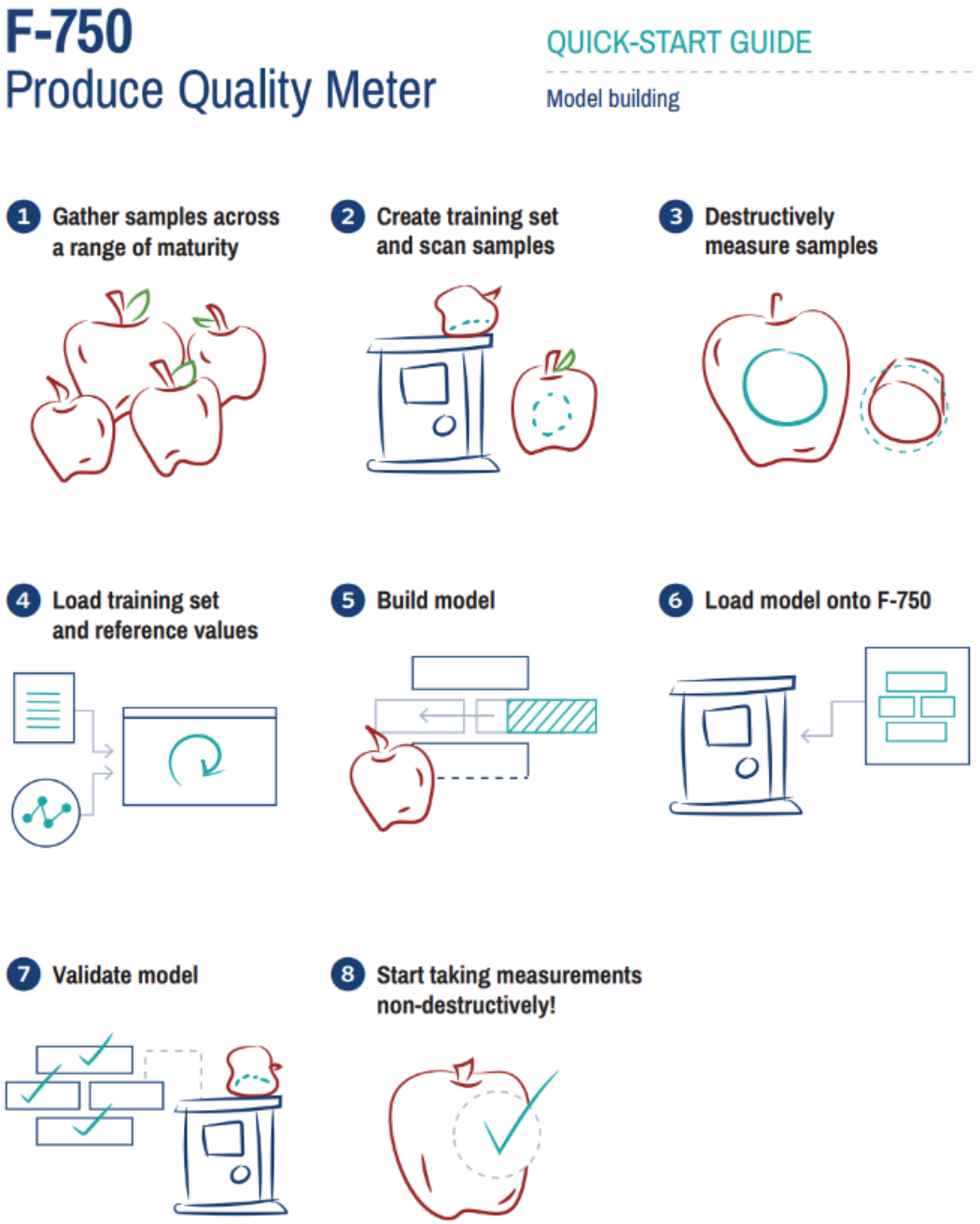
F-750 PRODUCE QUALITY METER – CALIBRATION

- Equipped with generic demonstration models
- Users build their own custom model

1. Scan fruits and vegetables to create a training set
2. Make destructive, reference measurements from scanned fruits
3. Use the F-750 Model Builder Software package to marry the training set scans to the reference values and create a model with accuracy metrics
4. Use the new model to measure hundreds of samples non-destructively

QUICK START GUIDE

- Online!
- Available under F-750 “Manuals”



F-750 PRODUCE QUALITY METER - USES

- Use as a crop management tool
- Time harvest with periods of peak quality
- Assign incoming produce to various controlled atmosphere storage
- Assess quality at import locations
- Assign produce to specific retail markets
- Inspection tool for retail outlets

F-750 PRODUCE QUALITY METER - ADVANTAGES

- Non-destructive measurements
- No technique required once models are built
- Models are specific to the qualities and commodities of the user
- Improved fruit quality means produce can sell for a higher cost
- Consistency builds brand or commodity appreciation

F-750 COMPETITORS

	F-750	NIRvana
Wavelength	303- 1070 nm	350-1100 nm
Resolution	8-13 nm	8-13 nm
Battery life	16,000 samples	Full day of operation

New instruments may compete in the future, but all released until now do not have the functionality and flexibility of the F-750

CONFERENCES TO PRESENT FELIX INSTRUMENTS

- Tradeshows
  - Produce Marketing Associations
  - Regional produce conferences
- Academic Conferences
  - Horticultural conferences
  - Postharvest conferences
- Commodity-specific events

pma

Postharvest Unlimited
ISHS International Conference
10-13 June 2014 • Cyprus

NW Hort Expo

III International Symposium
postharvestbari2015

International Society for Horticultural Science

World Conference on Horticultural Research
17-20 June 1998 in Rome, Italy

ISHS

KEY CUSTOMERS

- **Companies focused on Brand and Quality**
  - Quality Assurance Managers
  - Fieldmen
  - Crop consultants
  - Warehouse Managers
  - Research and Development Staff
  - Importers
  - Exporters
  - Fruit Surveyors
- **Academic fruit and vegetable Researchers**

Earthbound Farm ORGANIC

DOW Dow AgroSciences

Driscoll's ONLY THE FINEST BERRIES

WHOLE FOODS MARKET

Del Monte Quality

SALES OPPORTUNITIES

- Customer visits
- **Evaluations are key!**
- Commodity-specific brands
- Regional knowledge of the marketplace
- Annual maintenance recommended for all
  - Revenue opportunity after sale if performed by distributor
- Model Building Service for revenue

FELIX INSTRUMENTS DIRECT SALES PIPELINE

RESOURCES

Sales Team Website

sales.felixinstruments.com

- Brochures
- Photos
- Graphics
- Logos
- Videos
- Certificates
- Press Releases
- Manuals
- Specifications Documents
- Training
- Newsletters

QUESTIONS

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