

FUTURA sensors

Measure live cell concentration
on-line with the FUTURA

ABER

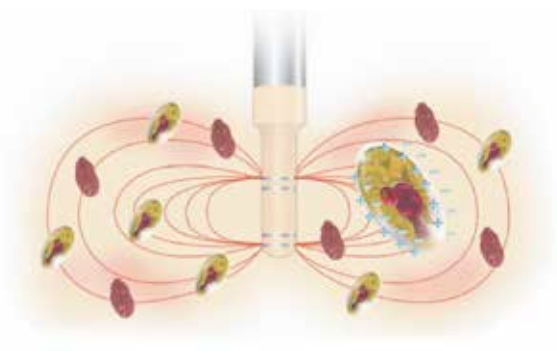


Setting the benchmark

Aber's pioneering work in the development and use of dielectric instrumentation to monitor biomass, by measuring cell membrane capacitance and media conductivity, has regularly set new standards. In the biotech market, our current FUTURA range is seen as the benchmark in determining live cell concentration online in bioreactors.

Principle of ABER's Cell Capacitance Technology

Cells with Intact Plasma membranes in a fermenter can be considered to act as tiny capacitors under the influence of an electric field. The non-conducting nature of the plasma membrane allows a build up of charge. The resulting capacitance can be measured: it is dependant upon the cell type and is directly proportional to the membrane bound volume of these viable cells.



The ABER System & probe provides an electrical field and measures LIVE cell concentration online.

Aber's technology converts capacitance into a live biomass reading, typically Cells/ml or g/l. However, other units can be derived from the raw capacitance measurements; these may be more relevant to the chosen application.

FUTURA also measures the Conductivity of the medium, in millisiemens per centimeter (mS/cm). Conductivity is not used to measure biomass but is indicative of the production or utilization of ions by the cell suspension, e.g. pH control and other fermentation processes.

FUTURA

Widely adopted by the world's leading biotech companies in both R&D and cGMP, ABER's products are small and light but deliver powerful capabilities and great application flexibility.

The FUTURA system's three primary hardware components are: The Probe, the FUTURA Instrument (Head Amplifier) and the Transmitter or Connect hub

Probe(s)



Futura(s)



Tramitter(s)



12 mm Probe

For small bioreactors
Headplate mounting



Standard Remote

For restricted space



Connect 1

Single channel, Current
Loop, Modbus, USB



Connect 4

4 channel, Current Loop,
Modbus, USB



25 mm Probe

For larger bioreactors
DN25 port



Standard Futura

For larger bioreactors



Connect 8

8 channel, Current Loop,
Modbus, USB



V350 - Panel

1 Channel Current Loop
Colour Touch screen



The ABER FUTURA probe



This, the 'sensor' component of the system, conforms to the requirements of FDA and USP Class VI. We have advanced its design leveraging our wealth of experience, it offers:

- Robust platinum electrodes.
- A probe arrangement perfected over many years - benefiting from our leading expertise in capacitance measurement.
- An annular electrode design providing a surface free of entrapment areas - ideal for applications where cells may collect in wells or crevices.

12mm Probe

An alternative, highly robust, 25mm probe with flush electrodes - often used in cGMP bioreactors for cell culture.

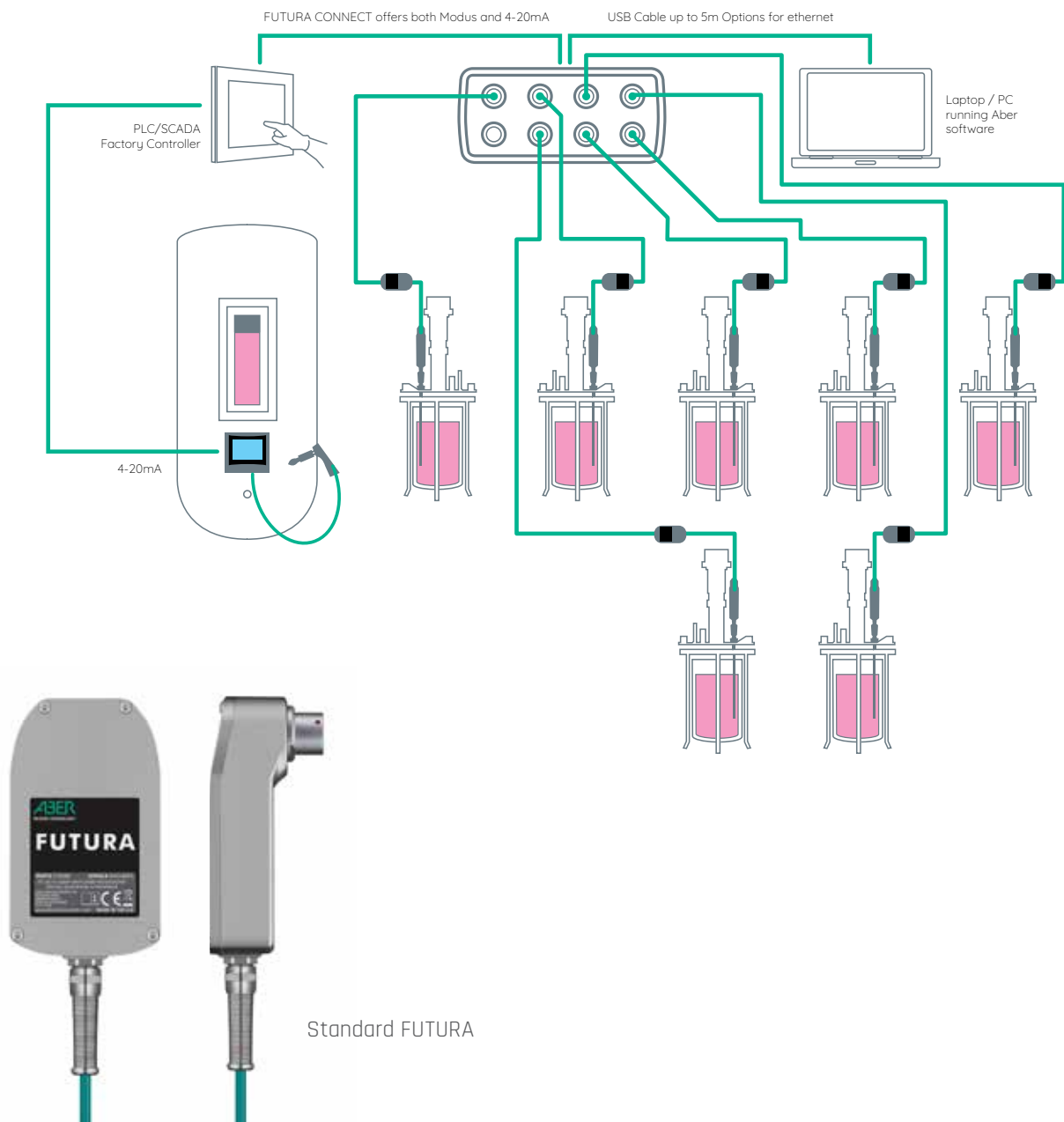


25mm Flush Probe

The FUTURA Instrument

The **FUTURA** instrument (or head amplifier) is the system's main processing engine, powering the probe and transferring critical data to the chosen output. It is available in two distinct variants for reusable bioreactor systems.

The FUTURA can be easily incorporated into most PC's, bioreactor controllers and SCADA systems. FUTURAS can be mixed and matched.







Standard remote futura

The design of the Standard Remote Futura is best suited to small vessels where the available head space is often limited to a small footprint. It incorporates a slim, light-weight pre-amplifier making it ideal for small bioreactors with as low as 100ml working volume.

To summarize, the Standard Remote Futura offers the following benefits -

- A slim, light-weight pre-amplifier
- Can be used in fermenter vessels with as low as 100ml working volume
- Probe and Pre-amplifier can be orientated in any position.



Standard remote FUTURA



V350 Touchscreen

The V350 Touchscreen is ideal when a local biomass control screen is needed near the bioreactor. Its advantages include:

- Both visibility and control functionality over the connected FUTURA and probe.
- Monitoring of the FUTURA's signal at a glance.
- Communication output directly into the bioreactor control system.



V350 Touchscreen

Connect

ABER's CONNECT Modules and V350 Touchscreen add communication capabilities to the FUTURA system.

The FUTURA CONNECT is a multifunctional hub interfacing with the outside world. It provides:

- USB, Modbus and current loop connections, allowing you to connect the FUTURA's signals to any bioreactor control system and integrating FUTURA fully within the proces system.
- Options for offering one, four or eight channel models, to give greater flexibility in system configuration.



FUTURA
Connect

FUTURA Software

These three hardware components are complemented by ABER's FUTURA software which enhances the capabilities of the FUTURA biomass monitoring system and gives greater insight. FUTURA Tool and FUTURA Lite are useful set-up and simple analysis tools provided free with each system.

FUTURA SCADA adds further data analysis and mining functions, and brings useful insights into cell culture throughout the online biomass measurement process. Key features include multi-channel options, flexible and retrospective data analysis and the ability to export to other established data mining tools such as SIMCA from Umetrics.

FUTURA SCADA is a GAMP 5 compliant software package that allows the end user, on one screen to:

- Set up and then optimise each individual FUTURA system
- Provide continuous data collection for any number of FUTURA systems with an events time line.
- Provide frequency scanning to calculate some additional parameters

(including delta C, critical frequency, Cole-Cole alpha) and derive information on the cells including cell bio-volume and diameter.

- Carry out retrospective analysis of separate data sets from different experiments - data is easily exported to excel via simple csv files.
- Monitor probe life parameters



FUTURA Scada software



aberinstruments.com

Europe & Rest of the World:

+44 (0)1970 636 300

US:

+1 925 683 3673

sales@aberinstruments.com

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