AUTOMATED BLOOD SAMPLER

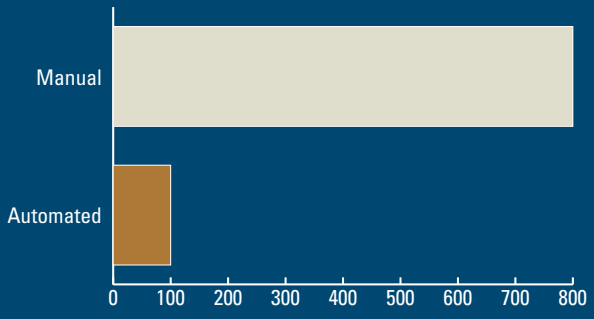
for LABORATORY ANIMAL RESEARCH

INSTECH

The equipment behind the science.

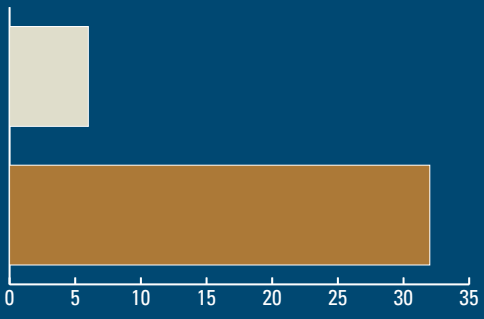
LOWER STRESS

Adrenaline (pg/ml), rats[a]



HIGHER THROUGHPUT

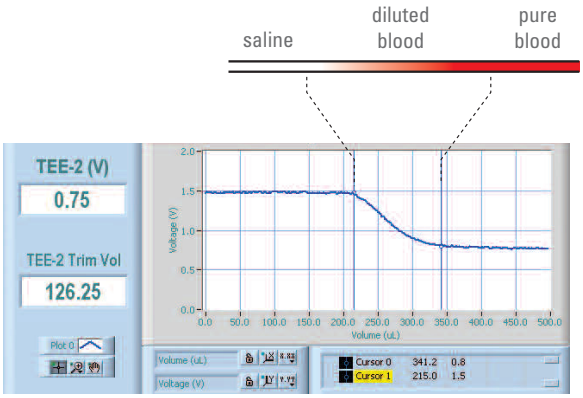
Compounds tested per week per technician[b]



UNIQUE DESIGN

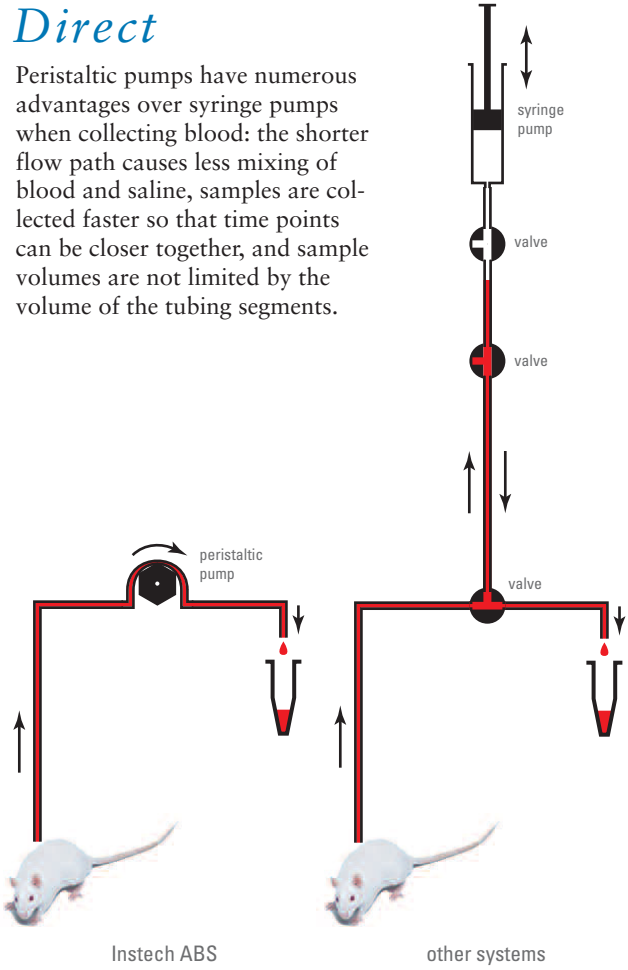
Pure

Sensors in the flow path verify both that a sample is pure blood and that it has been successfully collected at the programmed time.



Direct

Peristaltic pumps have numerous advantages over syringe pumps when collecting blood: the shorter flow path causes less mixing of blood and saline, samples are collected faster so that time points can be closer together, and sample volumes are not limited by the volume of the tubing segments.



Flexible

Thanks to low-loss or standard operational modes and calibration routines that adapt to catheters and tubing sets of your choice, the ABS2 can sample blood from a wide range of species—from mice to rats to large animals.

Automated blood sampling systems can increase the throughput of drug metabolism and pharmacokinetics research groups. They can also improve the accuracy of sample collection and reduce the stress caused by handling.

Instech's second-generation sampler, the ABS2™, withdraws blood from a tethered freely-moving animal according to your programmed schedule, stores the samples in an integrated refrigerated fraction collector, and replaces the withdrawn volumes with IV fluid. You control and monitor sampling schedules, volumes and withdrawal rates for up to twelve animals from a central computer.

HARDWARE

Integrated fraction collector holds 10 samples at 4-6°C. The rotary configuration allows wells to be reused as early samples are removed. Collector temperature is displayed on the monitoring computer.

Precision peristaltic pumps move fluids directly to their destinations without valves.

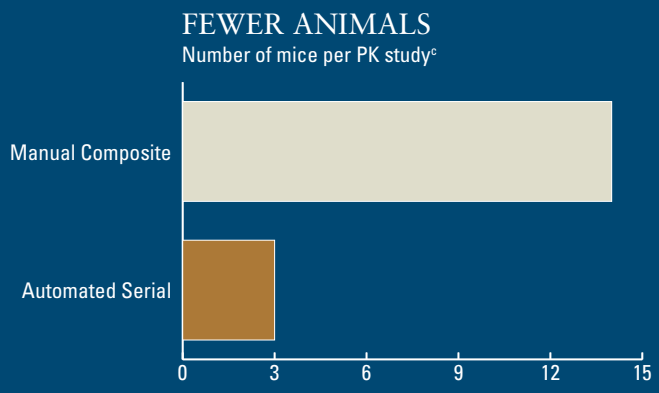
Removable carousel with numbered positions simplifies transport and identification of samples. Carousel is keyed so that the sampler will always place the first sample in position 1.

In-line sensors measure the fluid conductivity to distinguish between pure blood, saline and a mixture of the two. The measurement is sufficiently sensitive and linear that you can use it to monitor hematocrit in real-time.

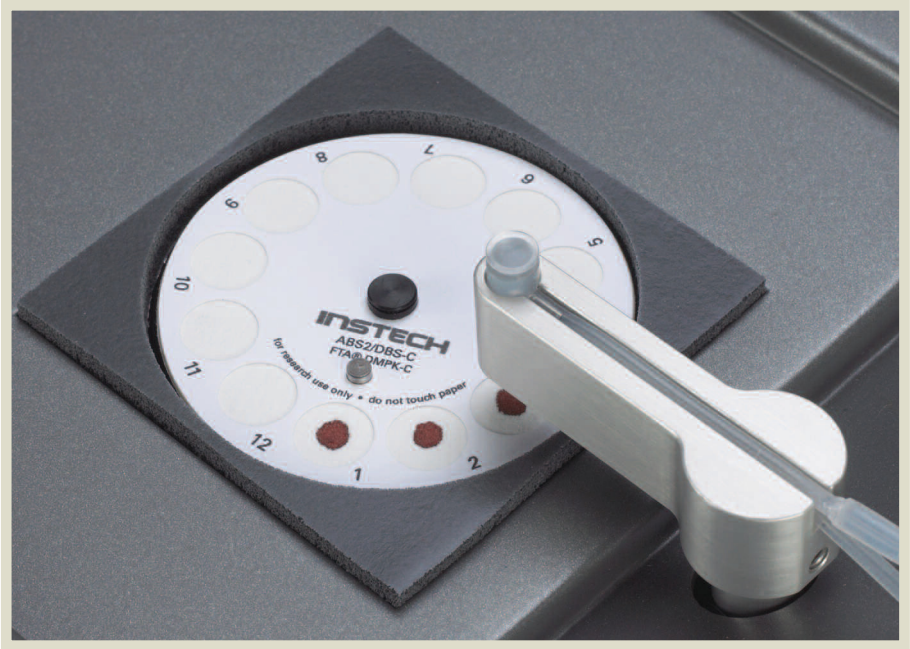
Low-loss reservoir stores the diluted leading edge of a sample so that it can be returned to the animal, cutting wasted blood from 40-80µL to just 2-4µL per sample.

The ABS2 can collect samples as small as 10µL and place them onto dried blood spot paper or into collection tubes.

This means you can now to take a full PK profile from a single mouse, yielding more consistent data and a dramatic reduction in animal use.



MICROSAMPLING



Optional dried blood spot disks, featuring Whatman FTA® DMPK-C paper, measure 6cm in diameter and hold 10 or 12 spots of 10 to 25µL. Blood samples may be spotted singly, in duplicate or in triplicate. Disks are easily replaced when more spots are to be collected.

Alternatively, microsamples of wet blood can be collected in the 0.25ml Griener tubes. Changing between wet blood and DBS is a simple matter of swapping carousels.

COLLECTION TUBES

Instech now supplies the full range of MiniCollect® blood collection tubes from Greiner bio-one. These tubes are ideal for use with Instech's automated blood sampler due to the shape of the tube, which simplifies pipetting, and the wide range of additives and fill volumes.

The ABS/V080C-LIHEPG and ABS/V080C-SCAG models contain a unique inert acrylic gel at the bottom of the tube, under the additive, that moves upward during centrifugation to form a stable barrier between the cells and the plasma.

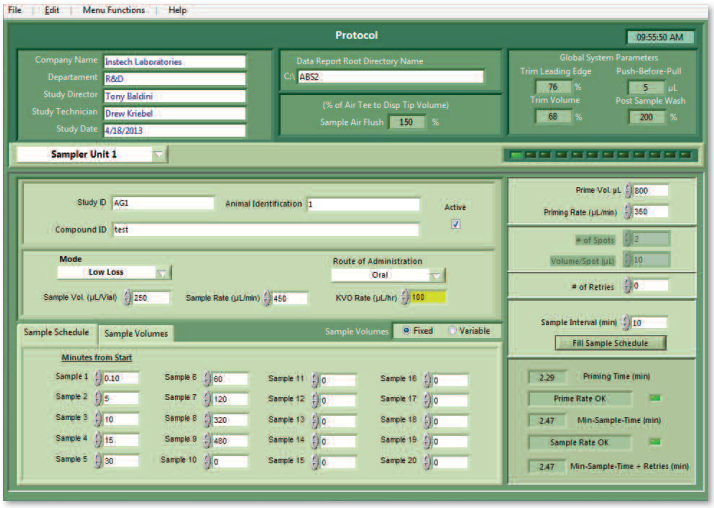
These tubes are also available with the rubber caps removed so that they can be inserted directly into the blood sampler.

Part No.	Description
ABS/V100C-K3EDTA	1ml, K3EDTA, lavender, cap (450474)
ABS/V050C-K3EDTA	0.5ml, K3EDTA, lavender, cap (450475)
ABS/V025C-K3EDTA	0.25ml, K3EDTA, lavender, cap (450476)
ABS/V050C-K2EDTA	0.5ml, K2EDTA, lavender, cap (450480)
ABS/V100C-LIHEP	1ml, Li heparin, green, cap (450477)
ABS/V080C-LIHEPG	0.8ml, Li heparin, gel, lt green, cap (450479)
ABS/V100C-NACIT	1ml, sodium citrate, blue, cap (450413)
ABS/V100C-SCA	1ml, serum clot activator, red, cap (450470)
ABS/V080C-SCAG	0.8ml, serum clot activator, gel, gold, cap (450472)
ABS/V100C	1ml+, no additive, white, cap (450412)

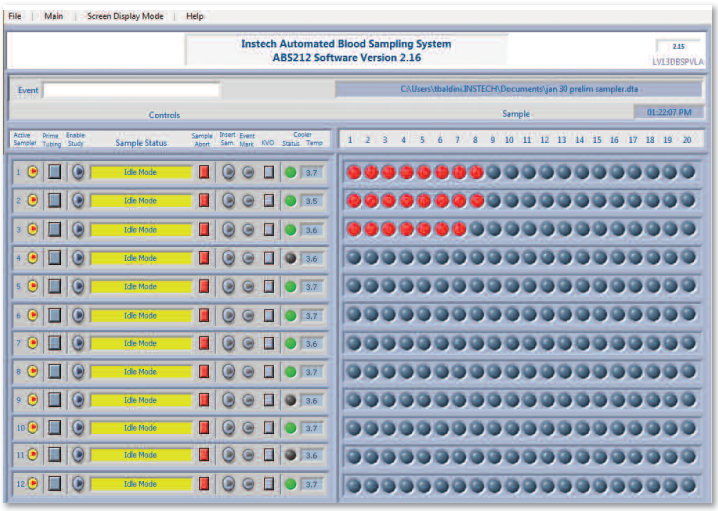
Refined over thirteen years of working with DMPK research groups, Instech's easy-to-use ABS software is used to set protocols, monitor study progress and change system parameters.

More recently Instech has developed a special version of the software to control a single sampler that withdraws blood from an anesthetized animal (rats or large animals) in a PET scanner following administation of radio-labeled compounds. Automating blood collection in PET studies can increase the number of samples taken, leading to more accurate determination of peaks, while reducing handling of radioactive blood.

SOFTWARE (PHARMACOKINETICS)



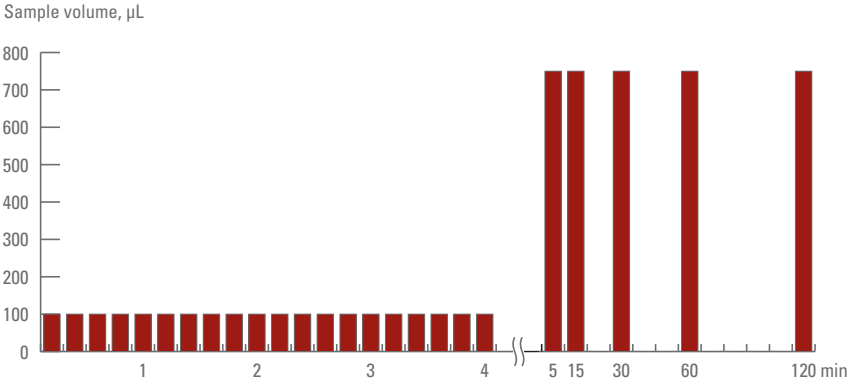
Program the sample times, volumes, rates and other study parameters for each sampler independently or apply a single protocol to all samplers. The volume of each sample can be set independently to minimize the total volume taken when some time points require extra analysis.



Control and monitor up to 12 samplers from a single PC. The main screen displays critical parameters for all units in real time, including which samples have been collected, unit status, cooler temperature and tee sensor readings.

SOFTWARE (PET SAMPLING)

TYPICAL PET SAMPLING PROFILE (NON-HUMAN PRIMATES)



The software will first run the unit in a high-speed sampling mode, collecting as many as 20 samples of 20-100µL in 4-5 minutes, then autuomatically switch to a standard PK sampling mode, taking up to 20 samples over 24 hours or more.

[a] Galgosi A., Merck & Co., "Automated Blood Sampling in Rats; Practical Considerations," presentation at Harlan DMPK Seminar, Frankfurt Germany, 8 June 2011.
[b] Ibid. and customer interviews.
[c] Uyeda C., Fide S. et al, Amgen Inc, "Evaluation of Automated Blood Sampling for Low Volume Serial Sampling and Dried Blood Spot Pharmacokinetic Applications in Mouse and Rat," poster P218 at AALAS conference, San Diego CA, 4 October 2011.

ABS2™ Specifications

Sample collection options	Greiner bio-one MiniCollect® tubes 1.5ml Eppendorf-style centrifuge tubes Instech dried blood spot (DBS) disks featuring Whatman FTA® DMPK paper
Fraction collector type	Rotary, 10 position; additional samples can be collected once initial samples are removed
Sample storage temperature	4-6° C, displayed on control screen in real-time (room temperature in DBS mode)
Maximum number of sampling time points	20
Sample splitting	Samples may be split into 1, 2 or 3 dried blood spots (maximum of 60 spots)
Maximum duration of sampling session	Unlimited
Collection modes	Low Loss, No Low Loss, DBS Low Loss, DBS No Low Loss, Large Animal, Bile Collection
Auto-retry routine	Skips to next sample if user settable number of retries fail to pull in blood
KVO feature for catheter patency	Adjustable from 0-999 µL/hr; 5 µL per pulse
Push-before-pull volume for catheter patency	Adjustable from 5-50µL
Time to take one sample	Varies based on catheter and tubing volume and parameter settings (typically 3-5 min)
Sample volume	Adjustable for each time point
Minimum sample volume	10µL
Maximum sample volume	1ml (MiniCollect), 1.5ml (Eppendorfs), 25µL (DBS)
Max # of 100µL samples from a rat[1]	33
Max # of 15µL samples from a mouse[1]	18
Sample dilution	None
Recommended IV fluid	Normal saline with 5-10 units heparin per ml
Volume of blood withdrawn per sample	Sample volume plus typically 40-80µL; all but sample volume plus 2-4µL returned to animal; sampled blood volume replaced with IV fluid
Tee blood sensors	Electrical impedance technology
Computer system requirements	PC or laptop with Windows 7, >2Gb RAM, USB port
Maximum samplers per computer	12
Communication method	USB via RS-232 converter
Communication cable length	6ft (1.8m) standard; other lengths may be ordered
Power supply	12VDC, 5A; 100-240 VAC input, 47-63 Hz
Power consumption	Less than 50W per unit, excluding computer; UPS recommended
Weight	5 kg (11lbs)
Dimensions (WxDxH)	20 x 25 x 13 cm (8 x 10 x 5 in)

[1] Based on limit of 15% of animal's blood volume from NIH Guidelines for Survival Bleeding of Mice and Rats (Feb 2001). Assumptions: blood volume of 22 ml in 350g rat, 2.2 ml in 30g mouse; trim loss of 3 µL in Low Loss mode.

MiniCollect is a registered trademark of Greiner Bio-One GmbH.

Instech provides direct sales, installation, training and technical support in North America, Europe and India. For more information, or for a list of authorized distributors, please contact us:

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