AVANCE™ Track

- MRI Upgrade Program

Innovation with Integrity

Preclinical Imaging

Efficient Performance, Guaranteed

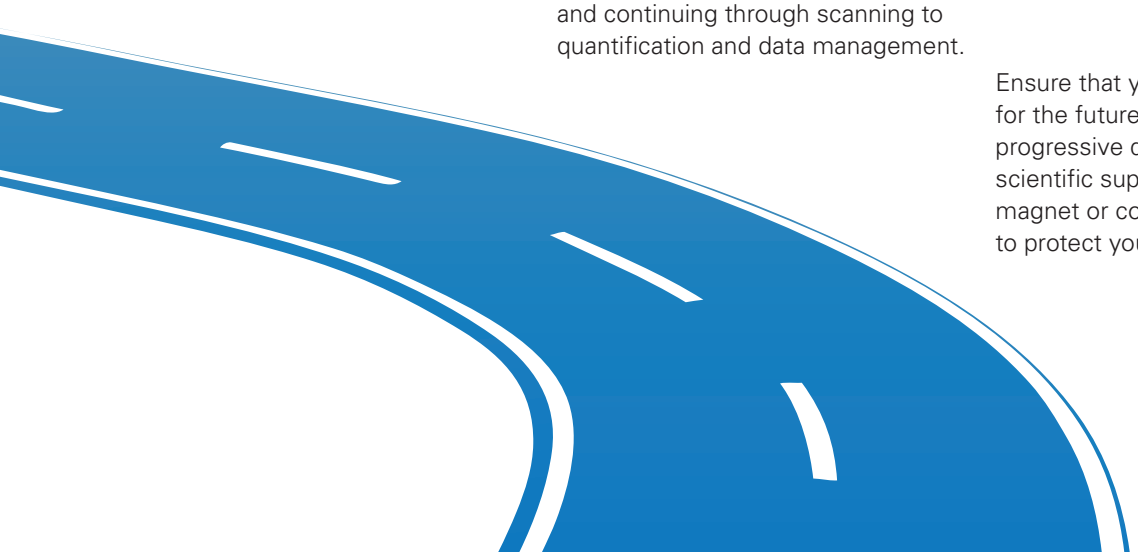
Your research depends on the scientific advances that you make with your MRI instrument. You need an instrument that you can rely on to perform from day to day and well into the future. Take your instrument and your career to the next level by accessing cutting edge technologies. Ensure that your instrument is prepared for tomorrow's explorations. Most importantly, protect this highly valuable investment, which keeps you in the pole position when attractive interests arise.

Maintain the viability and sustain the lifetime of your instrument with an upgrade of your Bruker or other manufacture instrument.

Join the AVANCE Track & Keep your MRI on Track

Maximize the performance of your instrument with the latest innovations of AVANCE NEO electronics and ParaVision 360 software combined with optimal RF coil technology.

Profit from most efficient workflows beginning with the hardware set-up and continuing through scanning to quantification and data management.



Ensure that your instrument is prepared for the future by securing access to progressive developments, Bruker's scientific support, and an all-important magnet or complete maintenance program to protect your most valuable investment.

The Right Upgrade Option for You

Joining the AVANCE Track is fast and simple. Existing Bruker customers will appreciate the streamlined procedure that expedites the upgrade process, while owners of MRI instruments from other vendors, such as Agilent, will value the individual attention to their particular needs.

For owners of other vendor instruments, the upgrade process starts with an on-site survey by a skilled engineer, who will analyze the current configuration of your instrument. Based on this information, upgrade alternatives that suit your instrument are provided and you have the flexibility to define the elements of your AVANCE track that meet your scientific and budget requirements, since potential options are clear and transparent. Once you have specified your configuration, service engineers will implement the conversion, letting you unleash the power of your rejuvenated instrument.

Existing Bruker customers have the possibility to maintain state-of-the-art technology by upgrading to AVANCE NEO electronics with ParaVision 360 software. According to the current instrument configuration, individual upgrade options containing components such as shim, gradient, and AVANCE NEO console upgrades are delineated. This makes the step to AVANCE NEO and ParaVision 360 and the corresponding transformation to the software and hardware platform of the future a fast and easy procedure.

Increased Performance

An Unsurpassed Foundation

Create the best basis for your MRI instrument by equipping it with maximum performance gradient and shim coils combined with AVANCE NEO electronics.

With high power shim amplifiers, artifacts are minimized in extremely shim sensitive sequences such as TrueFSIP and quality maximized in EPI, which is the staple house of DTI and fMRI studies.

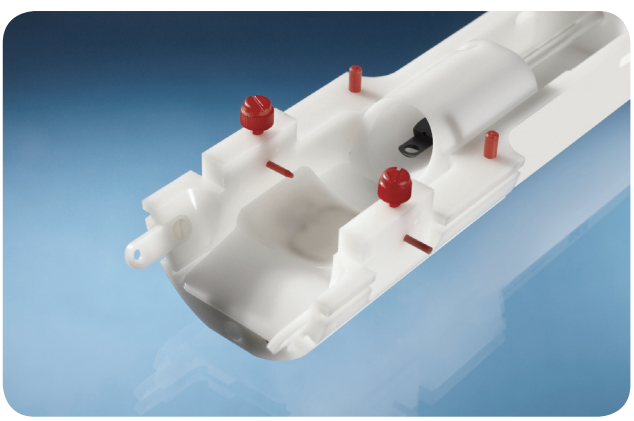
In addition to optimal EPI shim, mouse whole brain fMRI, for instance, requires extremely thin slices in order to approach the cellular level, while at the same time a large number of slices is needed to cover the entire brain so that all connectivities can be visualized. Furthermore, to properly observe stimuli, all of these slices must be acquired within the shortest time frame. The leading duty cycle performance of BGA S HP high power gradients allows conduction of highly demanding sequences such as fMRI or first pass tracer uptake in the heart, in which large numbers of slices in a short time frame are necessary.

AVANCE NEO electronics take gradient performance even further, allowing gradient resolutions of 1 µs. AVANCE NEO comprises a novel architecture, which includes enhanced pulse program functionalities and allows even faster real time decisions. Higher integration of the system console architecture leads to a more compact footprint, opening up more space in your laboratory, while allowing for a flexible configuration of up 24 transmit and 16 receive channels that ensures that your instrument performance is scalable for future applications.

Largest Preclinical Coil Portfolio

Combine your revitalized console with the ultimate in coil technology. Bruker's unique mouse, rat, and phased array MRI CryoProbes boost your SNR, increasing the sensitivity of a 9.4 T magnet, for example, to the equivalent of an ultra-high field magnet of about 16 T. This increase in sensitivity allows for up to 6 times faster measurements, benefiting both you and your animals, since examination times for instable models can be decreased, thus improving their welfare. For stable models, you can choose to increase resolution to observe even smaller structures and delineate regions more precisely. If resolution is not at the focus of your studies, an MRI CryoProbe allows you to increase the number of subjects examined within a defined time frame, allowing for improved study statistics. Core imaging facilities can utilize the faster measurement times to service greater numbers of scientists.

The MRI CryoProbe is the pinnacle of Bruker's preclinical coil portfolio, which is larger than any other company on the market. To address our customers' needs, Bruker also offers specialized coils, such as ASL- and optogenetic coils. Of course, the full range of classic room-temperature ^{1}H- and X-nuclei are available as well as Parallel Transmit coils with up to 8 channels and receive phased array coils with up to 16 channels. These multi-transmit and multi-receive coils are optimally supported by the inherently multi-transmit-receive AVANCE NEO electronics.



Arterial Spin Labeling coil

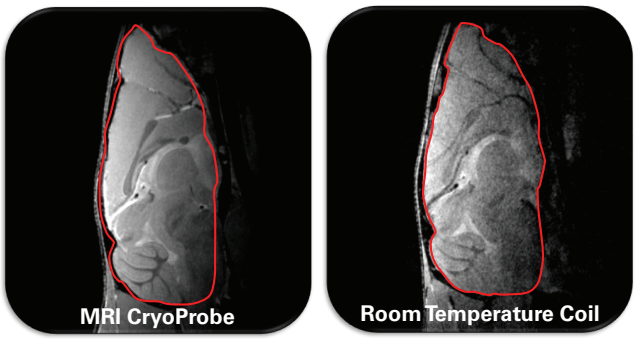
ParaVision 360's Leading Methods

AVANCE NEO electronics and ParaVision 360 go hand in hand and provide an unmatched number of preclinical methods. In addition to all common spin- and gradient echo and spectroscopy methods, Bruker offers all standard, EPI and short echo imaging methods, such as DTI-spiral, UTE, and T1 EPI, for diffusion, perfusion, fMRI, flow imaging, and relaxometry.

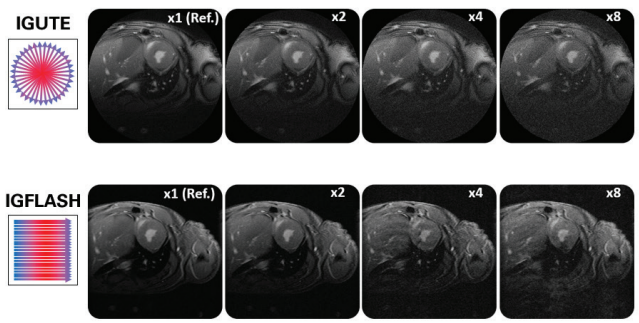
Bruker leads the field in cardiac imaging with the unique IntraGate based FLASH and UTE methods for self-gated wireless cardiac and respiratory imaging. IntraGateUTE allows for full murine heart coverage in a fraction of the time necessary with conventional imaging. Within less than 15 minutes, the entire mouse heart can be recorded with minimized flow artifacts thanks to the radial readout of UTE. This facilitates streamlined evaluation with automatic cardiac analysis software.

Fat chemical shift artifacts are also corrected in RARE, which additionally provides the possibility to record individual fat or water images and navigators guarantee that even extended *ex vivo* phenotyping studies yield crispest highest resolution morphology images.

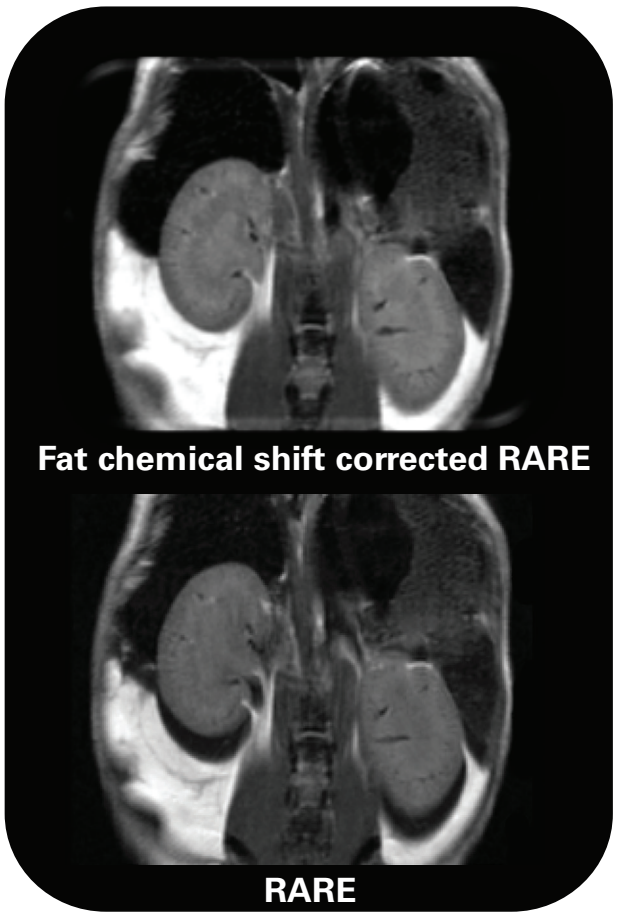
AVANCE NEO electronics open up imaging possibilities such as B1 shimming and mapping as well as dynamic shimming in multi-slice EPIs, greatly improving diffusion and fMRI studies, in which geometric fidelity is of greatest importance.



MRI CryoProbe leads to average SNR increase of factor 2.8 as opposed to room-temperature mouse brain coil at 9.4 T in mouse brain. Acquisition details: FLASH, resolution: (78 x 78 x 500) µm³, TR: 400 ms, TE: 3.8 ms, total time: 3 min. 24 s



Due to the short echo time and radial readout of UTE, self-gated IntraGateUTE demonstrates reduced flow and motion artifacts in mouse cardiac images at 9.4 T as opposed to IntraGateFLASH even when accelerated. Acquisition details: TE: 0.4/1.5 ms (IgUTE/IgFLASH), TR: 9 ms, Resolution: (98 ×98) µm², slice thickness: 800 µm, cine frames: 14



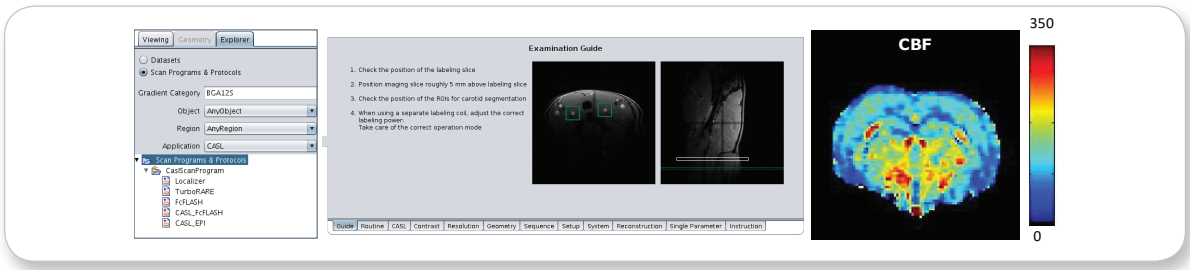
Fat-water separation imaging in RARE enables fat chemical shift corrected images, particularly visible around the kidneys, in mouse at 7 T. Acquisition details: TE: 24 ms, TR: 350 ms, Resolution: (208 x 188) µm², Slice thickness: 1 mm, TA: > 1 m 7 s resp. trig. per slice

Simplified and Expedited Workflows

Expedited Set-ups

Optimized workflows begin with your instrument set-up. Design your coil set-up to ideally meet your needs, combining up to 4 RF coils with active detuning as combinations of transmit volume coils with receive only surface coils simultaneously. As part of AVANCE NEO's full hardware recognition, these coils are automatically recognized just as gradient and shim coils are. This leads to software-controlled peak power limits for ideal coil protection, providing you with peace of mind.

Animals are also quickly prepared in cradles with provisions for anesthesia, life monitoring, warming, triggering, and tracer injection and are easily transferred to the scanning position, letting you spend minimal time on set-ups and maximal time acquiring data.



Arterial Spin Labeling Examination Guide - Courtesy: E. Barbier, L. Hirschler, J. Warnking, Grenoble Institute of Neuroscience
The CASL Workflow Package was developed in cooperation with Emmanuel Barbier, Grenoble Institute of Neuroscience

Efficient Scanning

The efficient and consistent workflow continues during the scanning procedure. Subjects are quickly registered, and scanning started with ready-to use, *in vivo*, pre-optimized protocols and scan programs, guaranteeing best results from day one.

Data consistency is even further maximized with the ASL examination guide, which minimizes user interaction from scan setup of sequences including CASL FcFLASH to quantification with CBF maps. This is of particular value in longitudinal studies of stroke or tumor in which effected regions are delineated, as user bias is significantly reduced.

Just as the ASL examination guide leads to straightforward user interaction minimized scanning with reliable results, so does IntraGateUTE, which allows full heart cardiac assessment to be performed faster than ever before, yet without the need for cumbersome electrode set-up or toiling triggering.

These methods are part of ParaVision 360's software that has the ease of use of a clinical software combined with Bruker's open sequence programming framework. New methods and reconstructions developed at the console or the processing workplace are quickly implemented using the compile-and-go capability for fastest realization of individual projects.

Expansive Reconstruction and Analysis

ParaVision 360's extensive capabilities go beyond scanning and image display to fast and accurate post-processing. The extensive reconstruction and quantification platform allows 2D and 3D image co-registration for PET and/or MRI data, fused images, image analysis with profiles, histograms, and real-time update of ROI values. Image time course analysis and multi-parametric fitting, surface and volume rendering, and image stitching are just some of the many features that take your images to quantitative data faster.

Manage your data professionally with customizable reports containing all scan parameters and access data easily within the database which has a hierarchical sorting function as well as a free text search. Data can further be processed on the remote workplace and transferred in DICOM or NIfTI format for simple exchange within collaborations.

A Protected Investment

An Instrument Prepared for the Future

Bruker enters a new age with its AVANCE NEO electronics. Be a part of this and guarantee access to software upgrades including future methods, sequences, and modules. Assure that your instrument is attractive to collaborators and is fully compatible with those leading the field. Create an instrument that enables the extension of ParaVision's imaging platform to fully integrate PET/MR instruments and workflows, providing optimal clarity during scanning and simple and uniform operation across the range of instrumentation. Take your instrument from a ridged one to one that is prepared for the future. Do not be left behind.

Continuous Support

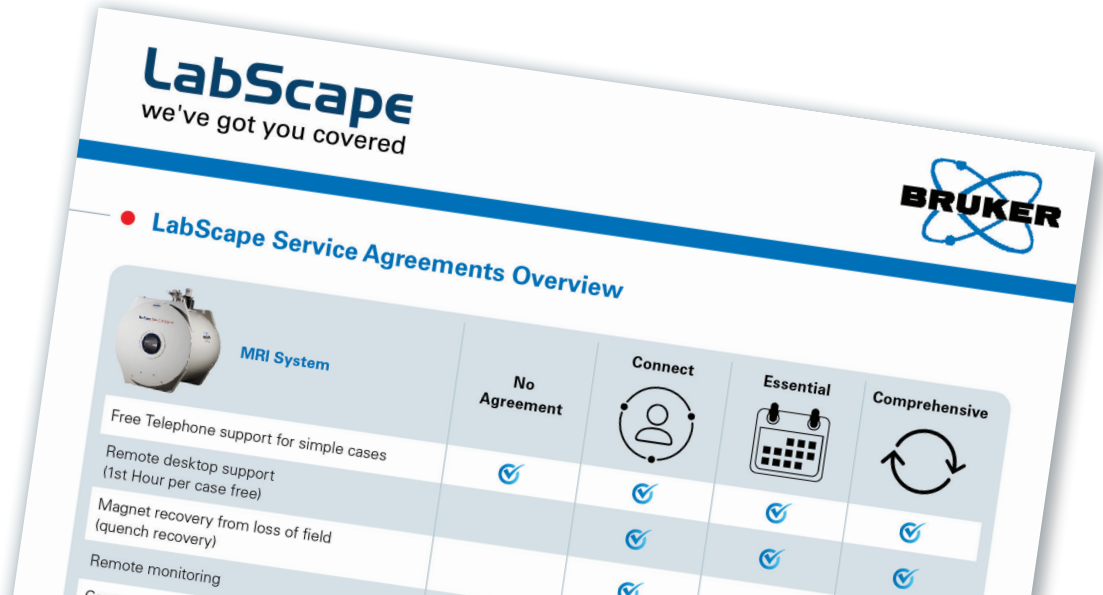
Bruker's time-honored customer commitment will accompany you for the long run with supportive services throughout your entire career. Starting with a solid on-site introduction to your instrument and continuing with in-house educational courses, webinars, and free email and phone hotlines, Bruker's application scientists address your questions as your needs develop.

A Secured Investment

Your magnet itself is the most costly element of your instrument. Protect this component and ensure that your research is sustained with LabScape Service for magnets and refrigeration systems.

Bruker LabScape maintenance agreements offer solutions to fit and match individual customer requirements to ensure the highest standards of reliability and productivity. Rigorous and fully documented quality procedures provide enhanced support and peace of mind in even the most demanding and highly regulated environments.

LabScape Comprehensive is an all-inclusive agreement covering all technical issues up to and including full system replacement and guaranteeing the highest priority and shortest response times. Our total peace of mind package covers all parts and labor required to repair any faults or malfunction including factory repairs where necessary. This agreement places you firmly in control of costs, safeguards regulated environments, and optimizes your laboratory workflow.



	AVANCE II	AVANCE III	AVANCE III HD	AVANCE NEO
Full integration of PET/MR[1]				✓
Animal Transport System[2] with touchscreen control				✓
12.5 ns RF synchronization				✓
Up to 24 transmit and 16 receive channels				✓
1 µs gradient resolution possible				✓
Intelligent power management			✓	✓
Simplified instrument tune-up with automatic signal routing detection			✓	✓
Access to all MRI CryoProbes			✓	✓
Hardware recognition of RF, gradients, and shim coils		✓	✓	✓
Parallel transmit technology up to 8 channels		✓	✓	✓
Parallel receive technology	✓	✓	✓	✓
Low noise preamplifiers High Power Low Noise Amplifier	✓	✓	✓	✓

[1]PET/MR instruments only
[2]BioSpec 3T and PET/MR Inline instruments only

	ParaVision 5.0	ParaVision 5.1	ParaVision 6	ParaVision 360
IntraGateUTE for accelerated self-gated cardiac imaging				✓
ASL perfusion examination guide				✓
Dynamic shimming in EPI				✓
Fat-chemical shift corrected images				✓
Interactive data quantification tool				✓
Scan programs for automated study execution			✓	✓
Interactive parameter conflict handling			✓	✓
Fully searchable database			✓	✓
Susceptibility Weighted Imaging reconstruction		✓	✓	✓
UTE and ZTE for minimized motion sensitivity and sample imaging		✓	✓	✓
Self-gated cardiac imaging with IntraGate FLASH	✓	✓	✓	✓
In vivo optimized protocols	✓	✓	✓	✓

Bruker BioSpin

info@bruker.com
www.bruker.com