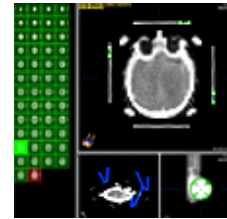


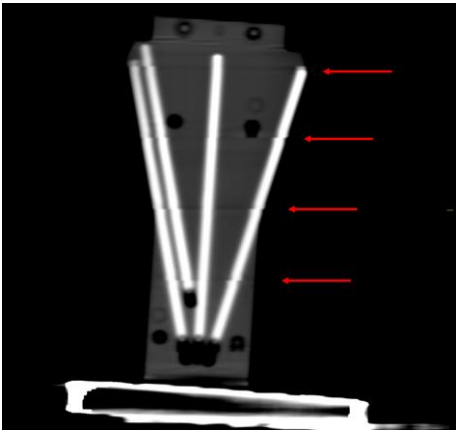
Scan Protocol Stereotactic Localization



How to scan data for proper stereotactic localization in Brainlab
iPlan 2.x and iPlan 3.x:

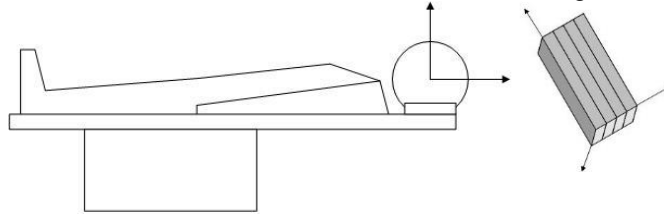
General Information	<ul style="list-style-type: none"> Brainlab recommends stereotactic localization based on CT images. Stereotactic localization based on MR images is not as accurate and reliable as it is for CT images
Field of View	<ul style="list-style-type: none"> All localizer rods must be completely visible on the slices The localizer rods may not touch the edge of scan area Include the region of interest Do not include the table in the field of view It is recommended to scan the full localizable range (i.e. the complete localizer geometry) <p>Warning:</p> <ul style="list-style-type: none"> Always use stabilization ring when scanning Fischer Revision U localizer Especially when using Fischer (Revision U or Revision A) localizer, scanning only a few slices might annul safety features in case of too many ignored slices. Localizer plates must be mounted according to manufacturer specifications to prevent misdetection of rods.
Patient Orientation	<ul style="list-style-type: none"> Strict supine position Orientation "Head first" (recommended) or "Feet first"
Slice Thickness	<ul style="list-style-type: none"> Sequential scans 1-2 mm, contiguous or overlapping slices. Do not scan with gap! Note: Slice distance of 1 mm is recommended in most cases for CT-only localizers. For combined localizers suitable for CT as well as MR, a slice distance of 2 mm is acceptable for CT scans as well. Spiral/Helical Scans pitch (table-scan ratio) = 1:1. Reconstructed images are allowed (slice increment less than or equal to 2mm). Slice distance can be changed during the scan.
Scan Direction	<ul style="list-style-type: none"> Cranial to caudal
Image/Pixel Size	<ul style="list-style-type: none"> Pixel size must be square Must remain the same during the scan.
Table Height	<ul style="list-style-type: none"> Must remain the same during the scan.
Image Compression	<ul style="list-style-type: none"> Save images in uncompressed format.
Matrix Size	<ul style="list-style-type: none"> Recommended: 512 x 512

<p>Scan Modalities, Properties</p>	<p>CT</p> <ul style="list-style-type: none"> • Axial only • Contrast agents allowed • Scan for soft tissue windowing (with Kernel of about 40). <p>Warning: CT scans acquired for localization must not show artifacts like shown in screenshot on the right.</p> <p>MR</p> <p>Stereotactic localization based on MR images (especially in coronal or sagittal) is not as accurate and reliable as it is for CT images, as e.g. distortions from the magnetic field of the scanner might occur.</p> <p>It is not recommended to use MR localization for stereotactic procedures. The preferred solution for planning the treatment and calculating stereotactic settings is an accurately localized CT image series fused to a diagnostic MR image series. The localization accuracy depends on:</p> <ul style="list-style-type: none"> • Image distortions • Changing gray values (caused by e.g. bias field) • Intrinsic limitations of MR localization equipment itself like e.g. insufficiently visible localizer rods (imaging fluids) or smaller radial geometry of localizer geometry • Use of non-rigid/stable MR compatible materials (plastic plates) • Less localizer rods in coronal or sagittal scanning orientation <p>Warning: MR scans acquired for localization must prioritize localization quality over diagnostic quality. Brainlab recommends creating separate scans for localization and tissue definition. Using a scan with insufficient scan data for localizing a patient could cause critical injury.</p> <p>If you decide to use an MR for localization, you must fulfill the following minimum requirements:</p> <ul style="list-style-type: none"> • Assure low distortion (over the whole area of scanning!) • Scan with T1-weighting to provide low distortion and good representation of rods <p>Verify that the contrast of the scanned localizer rods and surrounding area does not vary significantly within the scanned area. Always use 3D distortion correction if available.</p>
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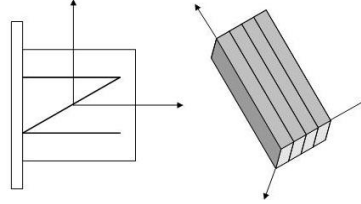


**Gantry Tilt,
Angulation**

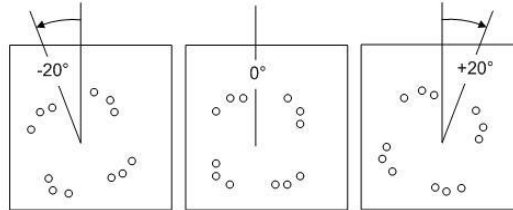
- Image set Gantry Tilt or Obliqueness (scanned slices are oblique to patient table) can be up to +/- 5 degrees in all directions. Positive and negative values are allowed, but have to **remain the same** during scanning:



- The resulting total obliqueness of the Localizer Geometry relative to the scanned slice can be up to +/- 10 degrees in all directions:



- The localizer can be rotated effectively within the slice up to +/- 20 degrees:



If you need additional information please contact BrainLAB Support.