



microTargeting™ Drive System for Stereotactic Positioning

Accurate

Confidently place Deep Brain Stimulating™ (DBS™) or lesioning electrodes with assurance of cellular -level confirmation of target.

Efficient

Perform all electrode operations through integrated drive and guide tube system using precise, precalibrated components.

Sample additional tracks without repositioning drive or stereotactic frame.

All components are steam sterilizable or isolated with pre-sterilized drape sleeve.

Proven

Hundreds of surgical teams already use FHC's innovative microelectrode technology derived from our over 30 years experience as the world's leading manufacturer of research and clinical microelectrodes.

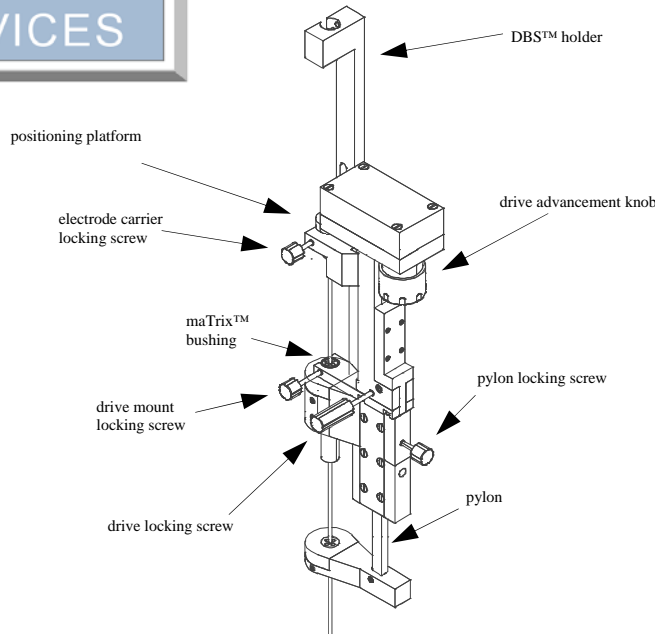
Innovative

FHC's research heritage and custom fabrication capabilities allow us to work closely with field leaders to further enhance microTargeting™ technology.

Reliable

FHC supports microTargeting™ products with comprehensive training, technical support and service.

All microTargeting™ products are cleared for clinical use within the United States and European Union.



FHC's microTargeting™ Drive System with maTriX™ Mount is adaptable to all major stereotactic systems and allows the neurosurgeon to position probes or instruments such as microelectrodes, stimulation electrodes, DBS™ electrodes or lesion electrodes precisely and efficiently in the brain. When the drive system is equipped with the maTriX™ guides, these electrodes can be positioned in 5 positions: a central track aligned with the stereotactic Z axis and 4 parallel tracks offset by 2mm (on center) from the center track.

The microTargeting™ System is set up so that it can be used to position lesion or DBS™ electrodes after microelectrode recording without removing the drive. Microelectrode assemblies are available which include micro and macro recording surfaces and which feature protective tube design to prevent tip damage.

Two Insertion Tube Sets are available for use with the maTriX™ drive.

The **Single Electrode System** includes an insertion tube/stylet and two electrode carriers. An electrode (ordered separately) can be positioned in any one of the five tracks and then, if additional data are required, it can be repositioned in one of the other tracks. A spacer tube provided and used to assure alignment of the thinner recording electrode is removed prior to positioning the DBS™ electrode or lesion electrode. Depth stops for custom electrodes are also available.

The **Array System** is designed to minimize the insertion tube/electrode volume. The electrode and the insertion tube move together in this configuration. When a track is selected, the electrode insertion tube and lower guide must be removed and a DBS™ electrode insertion tube/stylet is then positioned in the same track.

When the microTargeting™ drive system is used with microTargeting™ type BP or AR microelectrodes, distances are factory preset using stops so no adjustment or calibration is necessary.

- Advance electrodes along selected track or along four parallel tracks 2mm orthogonal to the original without readjusting stereotactic
- Drive has 50 mm travel, with 5 micron setting precision
- Entire system can be steam sterilized for rapid re-use
- Integral lower guide simplifies alignment and improves stability
- Bracket included for holding DBS™ electrode without repositioning drive
- Shielded, simplified electrical connections
- Adapters available for most stereotactic frame systems
- Uses available microTargeting™ micro-electrodes with lengths calibrated to eliminate pre-operative measurements and set up.

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microTargeting™ Drive System Specifications & Ordering Information

Specifications

microTargeting™ drive:

Drive travel: 50mm.

Drive advancement knob: 25µm graduation, 1 mm movement per revolution.

Micro-, lesion or DBS™ electrode position: 30 mm from predicted target when drive retracted to 0.00 with electrode fully extended.

Macroelectrode position: position determined from electrode configuration dimensions.

maTriX™ spacing: 2.00 mm from center.

maTriX™ guide hole diameter: 1.88mm.

Guide configuration: center guide hole on stereotactic axis with 4 holes offset by 2.00 mm on center and orthogonal to the center hole.

Materials: type 6061 aluminum with Nituff and Nickel plating, Radel, Rulon, Type 304 Stainless Steel, Type 17-4PH Stainless Steel.

Single electrode insertion tube set:

Insertion tube dimensions/material: 1.8 mm OD, 1.6 mm ID/type 304 Stainless Steel.

Spacer tube dimensions/material: 1.5 mm OD, 1mm ID/type 304 Stainless Steel.

Electrode carrier material: Nickel plated brass.

Electrode stops material: Radel with type 304 Stainless Steel fastener.

Array electrode insertion tube set:

Insertion tube dimensions/material: 1.8 mm OD upper tube, 0.89 mm OD lower tube (portion which enters the brain), 0.6 mm ID/type 304 Stainless Steel.

Lower guide spacer tube dimensions/material: 1.8 mm OD, 0.96 mm ID/type 304 Stainless Steel.

DBS™ Electrode insertion tube dimensions/material: 1.8 mm OD, 1.6 mm ID/type 304 Stainless Steel.

Array electrode carrier material: Nickel plated brass.

Array electrode clamp material: Nituff plated type 6061 aluminum.

Ordering Information

mT™-DS microTargeting™ Drive System including: microTargeting™ Drive, Drive Mount and Lower Guide, maTriX™ Guide Bushings, DBS™ Holder with DBS™/ Lesion Stop (1.9 mmØ), Verification Probe, Sterilization Case, Cleaning Brushes (3) and Hex Wrench.

Stereotactic Adapters (one required):

- 66-FA-RD Radionics CRW™ Adaptation
- 66-FA-LX Leksell Stereotactic System® Adaptation
- 66-FA-BL BrainLAB® / Micromar Adaptation
- 66-FA-RM Leibinger RM™ Adaptation
- 66-FA-ZD Leibinger ZD™ Adaptation
- 66-FA-SF mT™ Platform Drive Adapter (Leibinger Ost-Reg™ or Acustar)
- 66-FA-NM NeuroMate™ Adaptation
- 66-FA-LS Laitinen Stereoguide™ Adaptation

Insertion Tube Sets:

- 66-IT-AR Array Electrode Insertion Tube Set, including six single track microelectrode insertion tubes and stylets, six lower guide spacer tubes, one DBS™ Insertion Tube and Stylet, and an Insertion Tool.
- 66-IT-01 Single Electrode Insertion Tube Set including one insertion tube, stylet, spacer tube and cleaning tool.
- 66-IT-VP Verification Probe Set
- 66-IT-LE Lesion Electrode Insertion Tube Set

Individual components available:

- 66-ZD-MD microTargeting™ Manual Drive
- 66-DM-01 Drive Mount with Lower Guide

Accessories available:

- 66-AC-MB: maTriX™ Guide Bushings
- 66-AC-01 Single Electrode Carriers
- 66-AC-AR Array Electrode Carrier and Clamp
- 66-AC-DS: Electrode Depth Stop Adapters (4)
- 66-AC-KT microTargeting™ Accessories Kit

Also required:

Microelectrodes such as:

mT type D (AR1): microTargeting™ Array Microelectrode

mT type D (BP7): microTargeting™ Single Track Microelectrode

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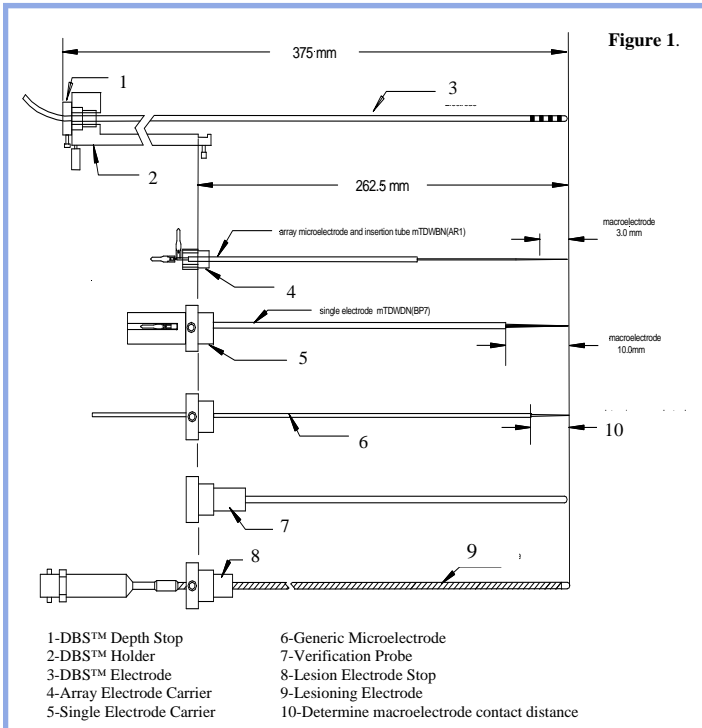


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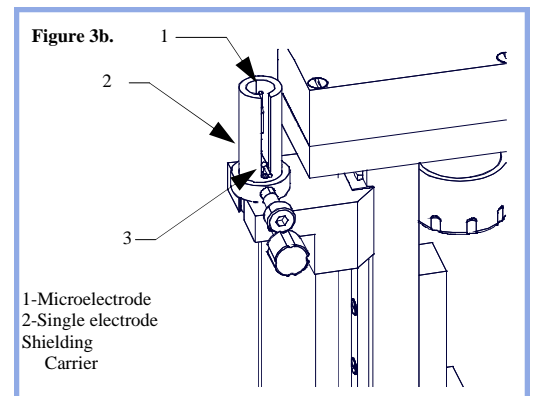
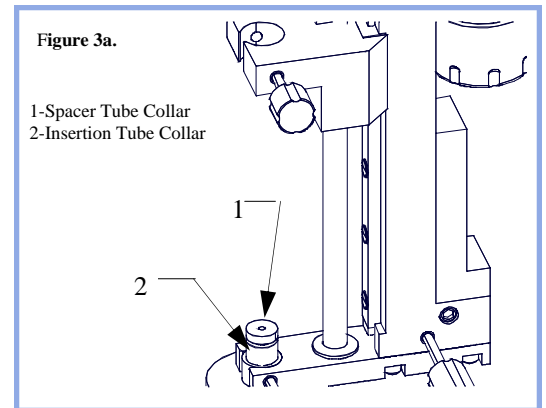
microTargeting™ Drive System Illustrated Procedure

1. Pre-operatively set the depth stop on the DBS™ lead or the lesion electrode. The dimensional considerations are shown in figure 1.



6. For the single electrode system:

- Push the insertion tube with its mating stylet into the hole of the upper maTriX™ bushing corresponding to the selected track, then through the lower guide bushing.
- Remove the stylet and insert the spacer tube insertion tube.
- Insert the electrode assembly (with the microelectrode tip retracted) into the hole of the single electrode carrier corresponding to the selected track. Position the macroelectrode pin in the slot of the single electrode carrier until its stop hits the bottom of the carrier.
- Thread the electrode assembly down through the insertion tube until the single electrode carrier is fully positioned into the drive positioning platform.

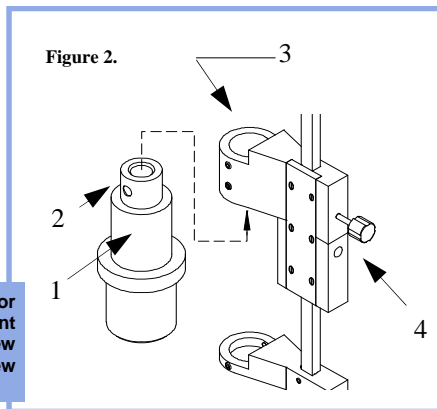


2. Secure the stereotactic adapter to the drive mount using the hex wrench provided. Slide the drive onto the pylon and secure it with the pylon locking screw and the drive

3. Mount the assembled system onto the stereotactic system and secure it.

4. Adjust the stereotactic system so that the predicted target is located in the center of the arc or the selected target location of the system.

5. Adjust the microTargeting™ Drive System to 0.00.



- 1-Radionics Adaptor
- 2-Detent
- 3-Locking Set Screw
- 4-Pylon Locking Screw

e) Establish the electrical connections.

f) Push the microelectrode to its maximum extension. The tip of the microelectrode is now at the distance from the predicted target specified for the stereotactic adaptor. (30mm for Leksell and Radionics)

g) Advance the drive towards the predicted target. As the drive is advanced, the location of anatomical areas is confirmed by identifying typical cell firing patterns and by stimulation, through the macrocontact.

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microTargeting™ Drive System Illustrated Procedure, cont.

h) When the track has been examined, pull the microelectrode back into the macroelectrode tube and remove the microelectrode assembly, electrode carrier and spacer tube.

i) If additional parallel tracks are necessary, remove the insertion tube, select another track, then repeat steps a-f.

j) **If lesioning**, insert the lesion electrode with its depth stop attached through the insertion tube. Secure the depth stop into the positioning platform. Advance to the selected target. Proceed with lesioning procedure. Then remove the lesion electrode and the drive.

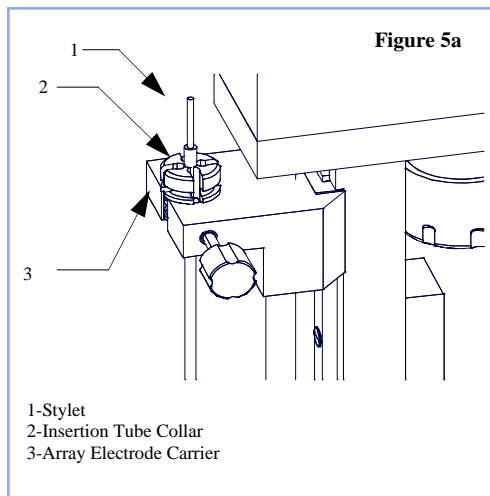
k) **If DBS™**: Attach the DBS™ holder to the drive positioning platform. Insert the DBS™ lead with its depth stop pre-operatively attached into the insertion tube. Secure the depth stop into the DBS™ holder. Confirm the DBS™ location. The system is designed with sufficient space above the insertion tube so it can be retracted and pulled up into the DBS™ holder with the lead in position. When the lead is exposed, hold it with tweezers near the skull and remove the stylet. Remove the drive system by sliding it up over the lead connection or alternatively pull the lead down through the drive system and then remove it.

a) Position the Array Electrode Carrier in the drive positioning platform;

b) Position the short spacer tubes into the lower guide (this may be done pre-operatively).

c) Push the insertion tube(s) with mating stylet through the array electrode carrier,

d) Slide the array electrode clamp over the array electrode carrier.

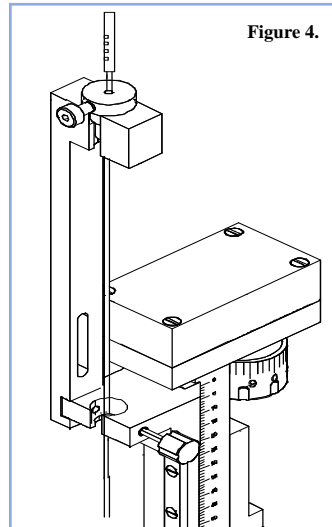


e) Remove the stylet(s) and thread the electrode assemblies (with microelectrode retracted) into the insertion tube until the stop rests on the insertion tube collar.

f) Establish the electrical connections.

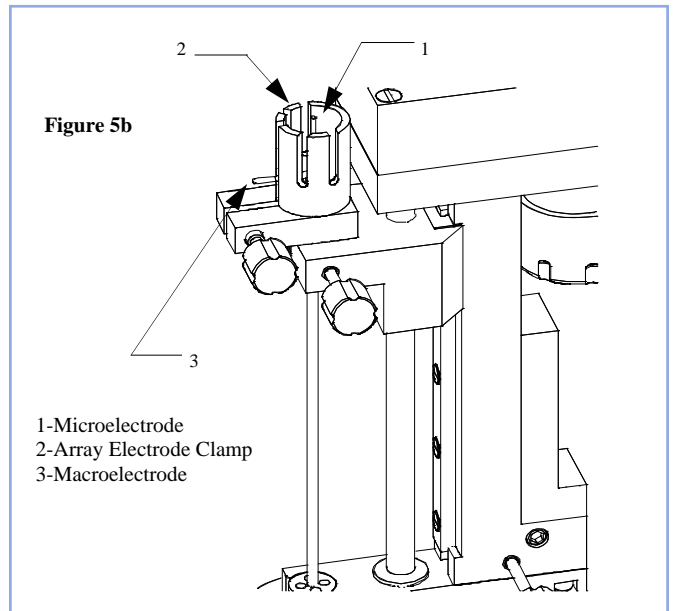
g) Push the microelectrode to its maximum extension. The tip of the microelectrode is now at the distance from the predicted target specified for the stereotactic adaptor. (30mm for Leksell and Radionics)

h) Advance the drive toward the predicted target. As the drive is advanced toward the target, the location of anatomical areas is confirmed by identifying typical cell firing patterns and by stimulation.



i) When the track has been examined and the target location confirmed, loosen the array electrode clamp and remove the microelectrode assemblies, insertion tubes and lower guide spacer tubes.

j) **If lesioning**, position the lesion insertion tube with stylet in the selected track. Remove the stylet and position the lesion electrode. Advance the drive to position the tip. Proceed with lesioning procedure. Then remove the lesion electrode insertion tube and the drive.



k) **If DBS™**: Push the DBS™ insertion tube with the mating stylet into the corresponding hole in the array electrode carrier. Attach the DBS™ holder to the positioning platform. Remove the DBS™ insertion tube stylet. Insert the DBS™ lead and secure stop. Advance to the selected target. Confirm the DBS™ location. The system is designed with sufficient space above the insertion tube so it can be retracted and pulled up into the DBS™ holder with the lead in position. When the lead is exposed, hold it with tweezers near the skull and remove the stylet. Remove the drive system sliding it up over the lead connection or alternatively pull the lead down through the drive system and then remove it.

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