

# Motorized Microdrive

## Product Features and Description

INSTRUMENTATION AND MICROELECTRODES FOR NEUROSCIENCE RESEARCH

The MCM motor controller module and MCU motor coupling unit are used to advance or retract our 50-12-1C Hydraulic Probe Drive (refer to FHC's website for technical page) to precisely position metal microelectrodes or pipettes. In step mode one, five, or ten micron steps are available. During continuous mode, the electrode can be advanced or retracted at a continuous rate up to 500 microns/sec. Additionally, Multidrive components are available to expand the system to independently control up to 8 electrode channels. (More channels will be available as technology develops.)

The position of the tip of the microelectrode or pipette is shown relative to a user defined zero position to a one micron resolution. This eight-character alphanumeric display also shows the current mode (Step/Continuous), and direction (?or?) of travel.

The MCU is connected to the MCM by a 3 meter cable (other lengths may be specified). A precision magnetic encoder is installed on each motor, which reads to a resolution of 1 micron. The remote MCU packaging permits the drive system to be separated from the MCM by large distances. Another advantage of this setup is

that the electronic cable can be connected through a commutator if the apparatus holding the preparation must be able to move, e.g. rotate.

We offer two intuitive, hand-held remote controls. The DRC-01 utilizes membrane push buttons to control the mode, direction, and rate of travel, as well as setting the zero reference point. The ARC-01 uses a spring-loaded knob to position the drive. Rotating the knob from its center position causes the drive to retract or advance. The rotated distance determines the rate. (up to 500 microns/sec.) The "Zero" button on the ARC-01 sets the reference position.

A serial port on the rear panel of the MCM allows the investigator to interface with any PC using our VRC-01 software (Windows 95/98/NT/2000 compatible) or simple ASCII commands.

The MCM can be placed as a stand-alone unit on a desktop, or mounted in our SAF rack frame



## Features

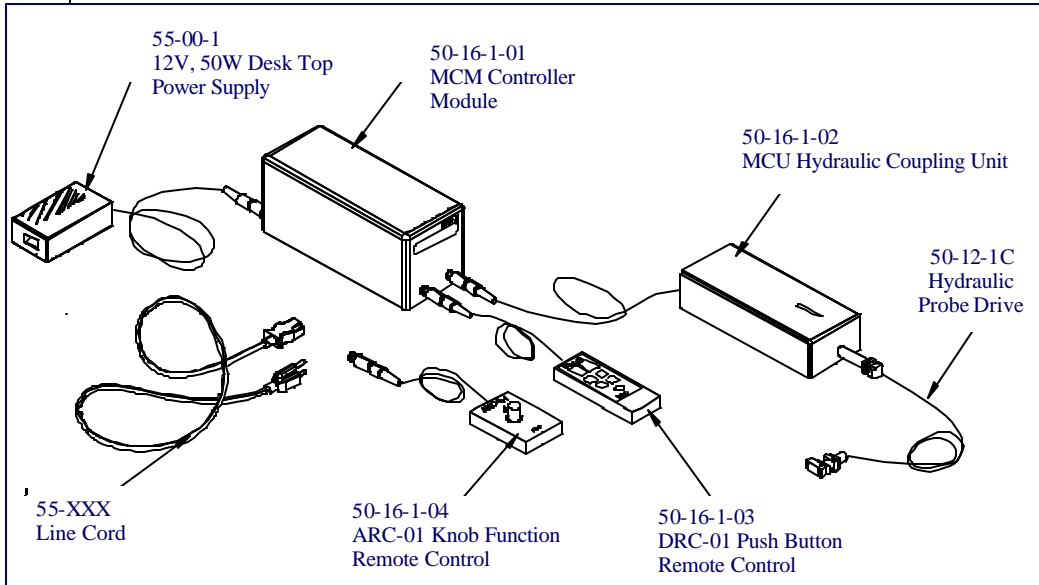
- Integrated magnetic encoder verifies positional accuracy.
- Variable step size - In step mode, 1, 5, and 10 micron step sizes are available.
- In continuous mode, rates between 1 and 500 microns/sec. are available.
- MCM controller module will stand alone on a desktop, or can be mounted in an optional frame for instrument rack use.
- Compact MCU motor coupling unit is separated from the MCM by a 3m (10') cable (other lengths can be specified), which allows noise reduction and commutator applications.
- Controlled via hand-held DRC-01 push button remote, ARC-01 knob function remote, or PC controlled through VRC-01 virtual remote software operated through a provided serial port and cable.
- Power output connector for convenient "daisy-chaining" of other NeuroCraft stand-alone modules.
- Additional Multidrive components available to expand MCM to 8 independently controlled electrode drive channels. Ability to expand more as technology develops.



A. Push Button Remote Control ; B. Knob Function Remote Control; C. MCU Hydraulic Coupling Unit; D. Screen shot of VRC-01 Software

# Motorized Microdrive Specifications & Ordering Information

INSTRUMENTATION AND MICROELECTRODES FOR NEUROSCIENCE RESEARCH



## Description, *cont.*

(cat # 55-11-0) for convenient installation in a standard instrument rack.

Additional Multidrive components are available to expand the system for independent positioning of up to 8 electrodes. More electrode possibilities will be available as the technology expands.

## Specifications

### **MCM:**

**Display:** 8 characters, 1cm height, red, 1 micron resolution  
**Power Requirements:** 12VDC, 2Amp  
**Dimensions:** Height: 13cm (5.22") Width: 10cm (4.20") Length: 25cm (9.75")  
**Weight:** 1.48 Kg (3.26 lbs)  
**Mounting Options:** Tabletop, 4 rubber feet prevent sliding. Rack mountable with SAF-08 Frame (Cat. #55-11-0 Available separately)  
**Mode of Operation:** Step or Continuous (Selectable) Continuous only when using ARC-01 Remote  
**Travel Rates:** Step: 1,5,10 micron steps (user selectable) Continuous: 1- 1000 microns per second (user selectable)  
**Software:** Windows 95, 98, 2000, NT compatible  
**Serial Cable:** Noise shielded 9 pin female D-SUB (both ends), straight through, 3m (9.8")

### **MCU:**

**Range of Travel:** 15mm  
**Dimensions:** Height: 2.5cm (1") Width: 8cm (3") Length: 15cm (6")  
**Weight:** .57 Kg (1.26 lbs)  
**Cable Length/Diameter:** 3m length (9.8') X .35cm O.D. (.014")  
**Connector:** 9 pin indexed, color-coded Blue with strain relief

### **DRC-01 Remote:**

**Step Rate:** 1, 5, and 10 micron rates available.  
**Continuous Rate:** 1 to 500 microns per second.  
**Dimensions:** Height: 5cm (2") Width: 2cm (.75") Length: 14cm (5.5")  
**Weight:** .23 Kg (.5 lbs)  
**Cable Length/Diameter:** 3m length (9.8') X .35cm O.D. (.014")  
**Connector:** 8 pin indexed, color-coded White with strain relief

### **ARC-01 Remote:**

**Rate:** 1 to 1000 microns per second.  
**Dimensions:** Height: 4cm (1.7") Width: 7cm (2.16") Length: 9cm (3.7")  
**Weight:** .19Kg (.44lbs)  
**Cable Length/Diameter:** 3m length (9.8') X .35cm O.D. (.014")  
**Connector:** 8 pin indexed, color-coded White with strain relief

# Motorized Microdrive

## Specifications & Ordering Information

INSTRUMENTATION AND MICROELECTRODES FOR NEUROSCIENCE RESEARCH

### Ordering Information (For Complete Single Electrode System)

**1 ea. 50-16-1-01 MCM Controller Module**

**1 ea. 50-16-1-02 MCU Coupling Unit**

**1 ea. Remote Control option of the following:**

50-16-1-03 DRC-01 Push Button Remote

50-16-1-04 ARC-01 Knob Function Remote

50-16-1-05 VRC-01 Virtual Remote Software Kit

**1 ea. 55-00-1 12V Desktop Power Supply**

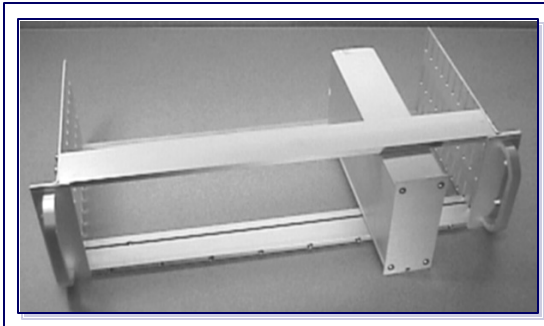
**1 ea. 55-XXX Line cord as specified from the following:**

55-AUS	Australia	55-JA	Japan
55-CH	China	55-SAF	South Africa
55-DAN	Denmark	55-SWI	Switzerland
55-EURO	Europe	55-UK	United Kingdom
55-ISR	Israel	55-USA	North America
55-ITA	Italy		

**1 ea. 50-12-1C Hydraulic Probe Drive** (refer to FHC's website for catalog page 30.)

#### Available Accessories:

55-11-0 SAF Rack Frame



*SAF-08 Rack Frame For Stand-Alone Modules  
(Shown with a neuroCraft Type 2 Module)*

### Illustrative Procedure

- 1) Set up the unit in a convenient manner, positioning the MCM where the display can be easily seen. If using the VRC-01 remote, install the software per instructions in section 2.2.
- 2) Apply power to the MCM. Retract the MCU to its rear limit.
- 3) Install Hydraulic Probe Drive into the MCU. (The piston of the MCU will just engage the Hydraulic Probe Drive) Attach the electrode stage of the Hydraulic Probe Drive to a stereotaxic or manipulator system.
- 4) Install microelectrode or pipette into platform of the Hydraulic Probe Drive.
- 5) Coarsely position the electrode using the stereotaxic or manipulator system to a reference point. (commonly just above the dura, or within 12mm of the target.)
- 6) Set the referenced position on the display of the MCM to zero.
- 7) From this point the electrode can be positioned. It's common practice to use the continuous mode while searching for units, then using the step mode to fine-tune the signal. When using the ARC-01 the unit is always in continuous mode. Discrete steps can be achieved through momentary movement of the knob.
- 8) At the end of the experiment, retract the MCU back to the rear limit for storage. Remove the Hydraulic Probe Drive from the stereotaxic or manipulator system.
- 9) Remove the Hydraulic Probe Drive from the MCU to prevent unnecessary pressure on the hydraulic system.