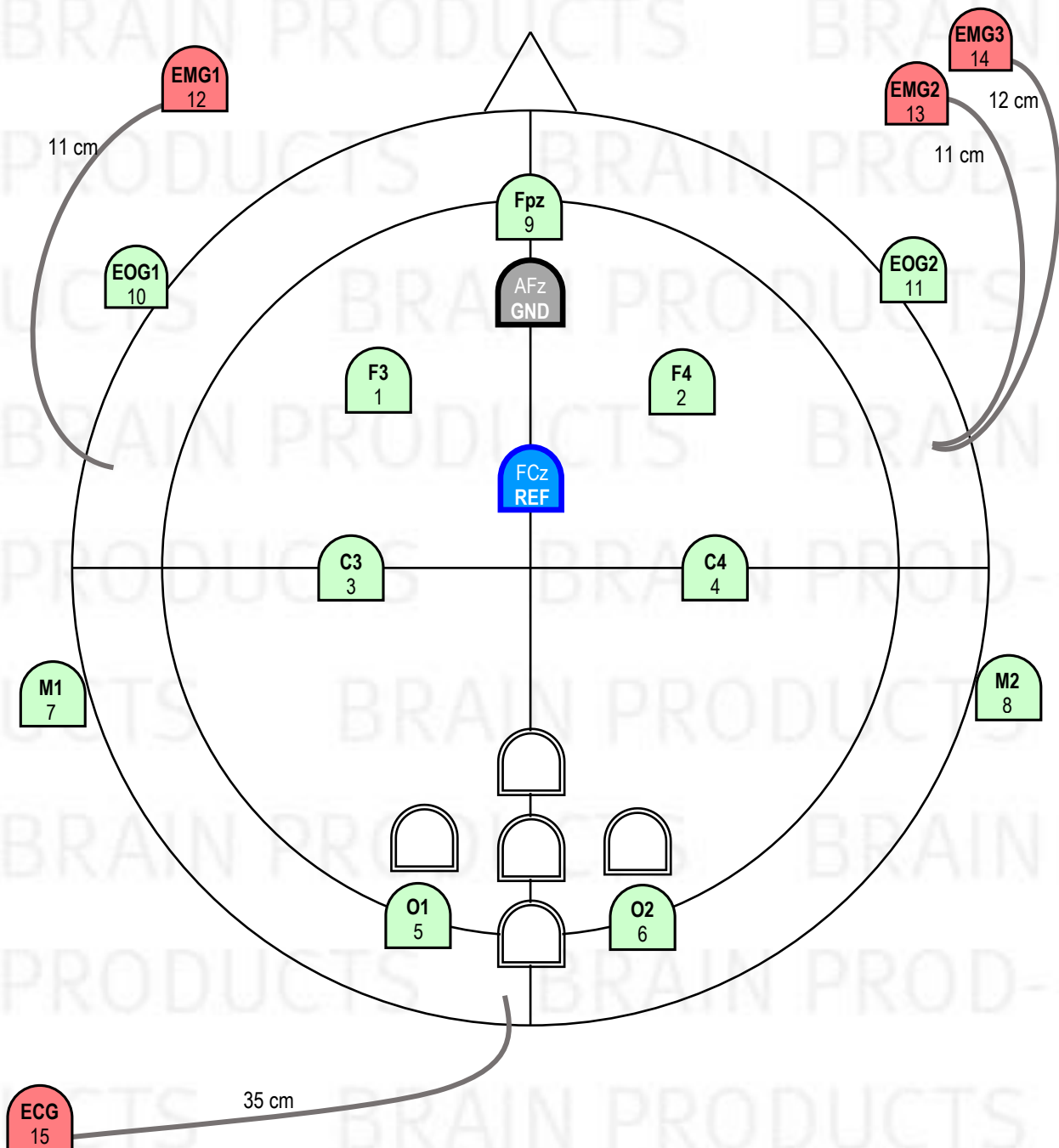




15Ch BrainCap MR for 3T for Sleep Recordings during fMRI

Layout according to American Academy of Sleep Medicine Guidelines 2007,
With EOG for reference to FPz

Electrode Layout and Channel Assignment

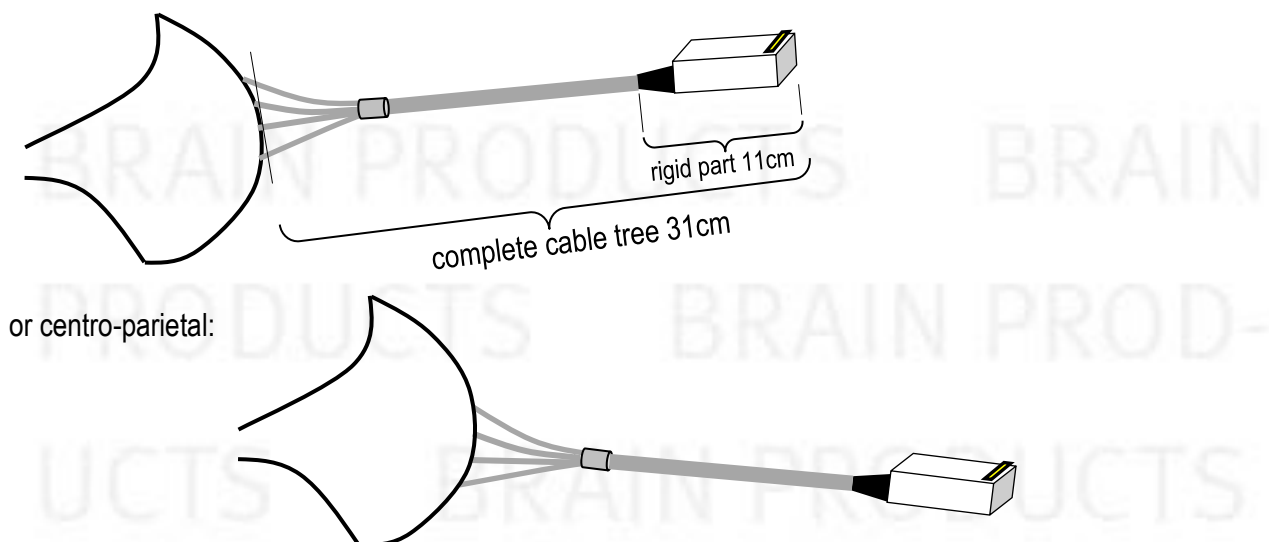


- M1 / M2 are approximately at mastoid positions (TP9' / TP10')
- FCz offers a reliable online recording reference; please reference offline to mastoid position e.g. M2
- EOG1/Fpz and EOG2/Fpz may be used for EOG, they are integrated in the cap for better signal quality
- Additional rings in occipital area offer higher comfort

Details for Users

Exit Point of Cable Tree

In BrainCap-MRS the exit point of the cable tree can be either fronto-central:



The decision depends on the headcoil used. Upon ordering one of these options needs to be chosen.

Ordering Information

For ordering please give **Article Number, Cap Cut, Exit Point, and Size**
(e.g. BC-MRS3-15, C-Cut, Exit FFCz, 56):

- Article Number: **BC-MRS3-15**
- Cap Cut: **C-Cut** or **A-Cut**
- Exit Point: **Cable Tree Exit Frontal (at FFCz)** or **CentroParietal (at CPz)**
- Size (given in cm head circumference):
 - Adult caps: **54, 56, 58, 60, 62, 64** (average male: 58, average female: 56)
 - Children caps: **50** (3-4 years), **52** (5-10 years), **54** (11-14 years)
 - Infant caps: **34, 36** (newborn), **38, 40** (3 months), **42, 44** (7 month), **46, 48** (2 years)

The catalogue-number comprises the cap as described, serial number, and this document. For further information about accessories or consumables, please visit our website or contact our local distributor.

Cap

Standard: SublUnion Cap with integrated chin belt, white

Sizes 52 – 64 made from High Precision Fabric, Sizes 50 and smaller made from High Comfort Fabric

Options: C-Cut or A-Cut, Exit Point, Size. For further variations please contact us.

Electrodes

All electrodes are Multitrodes for MR with sintered Ag/AgCl sensors. They are buttoned directly into the cap (total height less than 3,5 mm) or can be attached to the skin with washers (= double-sided adhesive rings). In the parieto-occipital area, empty electrode housings (double border lines in the layout) provide more comfort.

All electrodes come with current-limiting resistors on both ends, sensor and connector. Drop-down electrodes are made from resistive carbon leadwire. This results in these overall resistor values for each electrode:

- Ch1-11 10kOhm
- Ch 12-15 (drop-down) 20 kOhm
- REF 15kOhm
- GND 15kOhm

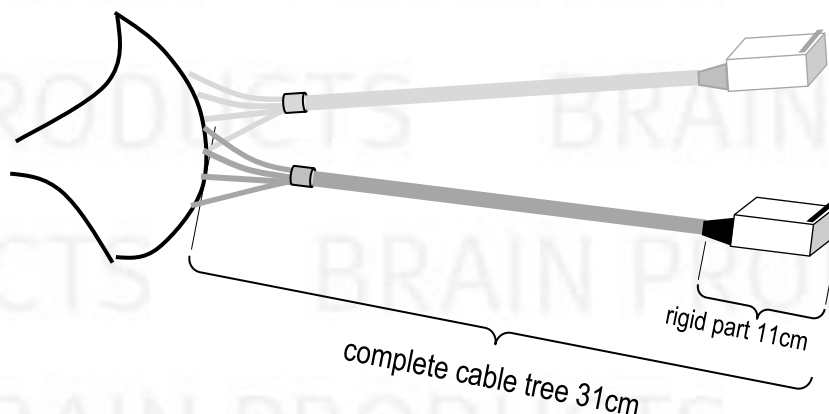
Electrode housing colours are according to the above figure. All cables are white, except Ch 12-15 red sensor and carbon leadwire, REF = blue cable, GND = black cable. All electrodes are name-labelled (Fp1, Fp2, ...) near sensor.

Electrode housing colours are according to the above figure. All cables are white, except Ch 12-15 red, REF = blue cable, GND = black cable. All electrodes are name-labelled (Fpz, ...) near sensor.

The drop-down electrode cable parts outside the cap are covered in spiral tube - to avoid direct contact to skin.

All cables go on the outside of the cap directly to the leaving point of the cable tree. Cables are fixed with double-T-nylon threads. The cables part from the cap in branches of approx. 8 cables. These branches leave radially from the area around FFCz or CPz and straight/tight to a uniting point after approx. 5 cm. After the uniting point, one cable tree continues to the BrainCap-connector-box.

The length of the cable tree until the end of the connector box is approx. 31 cm.



Termination

The cable tree leads into a Connector box. From here the caps are connected to BrainAmp-MR with 10 cm round ribbon-cables. These round ribbon cables are delivered with the BrainAmp MR system (from April 2020 onwards; prior to April 2020 30 cm flat ribbon cables were delivered). The 10 cm round ribbon-cables can be re-ordered from BrainProducts (Cat-No. BP-345-2000) or from Easycap (Cat.-No. KB-P50F-P50F-R-10).

Inside the connector box there is another 5 kOhm-resistor on each channel, REF, GND.

The top side of the connector box is labelled "BrainCap-MR". The bottom side label states

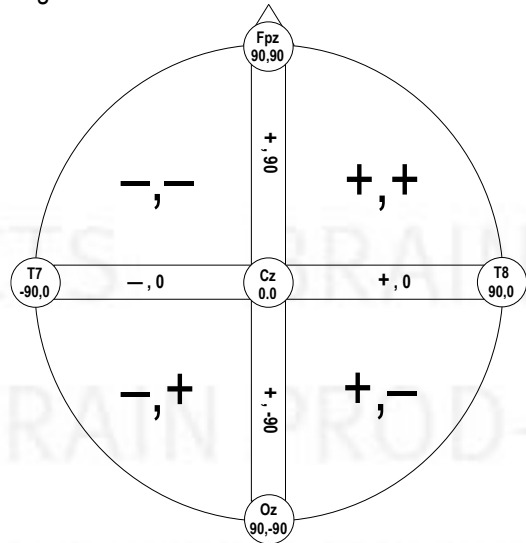
- 10k Ω in cap electrodes
- 20k Ω at drop-down
- 15k Ω at REF, GND
- 15k Ω at REF, GND

Theta / Phi Coordinates for BC-MRS3-15

Channel-Number	Name	Theta	Phi
1	F3	-60	-51
2	F4	60	51
3	C3	-45	0
4	C4	45	0
5	O1	-90	72
6	O2	90	-72
7	M1 (TP9')	-121	18
8	M2 (TP10')	121	-18
9	Fpz	90	90
10	EOG1 (F9')	-121	-30
11	EOG2 (F10')	121	30
12	EMG1	-	-
13	EMG2	-	-
14	EMG3	-	-
15	ECG	-	-
Ref	FCz	23	90
Gnd	Afz	67	90

These values are standardized to a Theta of 90° for the plane through Fpz, T7, T8, Oz.

The signs follow this convention:



EEG data can be referenced offline to mastoid position, e.g. M1/M2, as recommended in AASM manual.

For EOG, please reference the "E1" and "E2" channel offline to Fpz, for EOG left/right:

