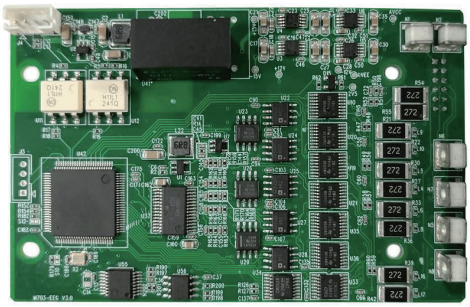
Multi-parameter
Module MEEG4C/MEEG4

Use and stick on the forehead surface of the electrode collection of the brain cortex potential difference, and the subsequent voltage amplification, filtering, digital, feature identification, and algorithm processing, so as to obtain EEG signal, and calculate EEG power, brain wave frequency band ratio and other parameters, then through the application of waveform, parameters, for brain disease and action consciousness evaluation and research, is one of the key technology of high-end monitoring application.



Dimension： 100mm X 62mm X 25 mm

Features

> Measure the 2/4 EEG waveforms in real time.

> Real-time transmission of the power spectrum parameters calculated based on EEG signals.

> Calculate the signal quality index and evaluate the signal quality according to the EEG signals in real time.

> Average time setting function of calculation parameters to obtain different response times of calculation parameters.

> 12V DC power supply, the system with DC / DC power supply, meet the safety isolation requirements.

Performance

Input signal range:+/- 1000uV

Co-mode inhibition ratio > 105 dB

Input noise < 1 uV RMS (1-30 Hz)

Input impedance > 20M （10Hz）

DC current offset voltage > +/- 400 mV

Lease current < 10 uA

Input protection: 2kV

Specifications

Parameter identification	Parameter definition	Formula	value range
EEG	The waveforms of EEG can be decomposed into different frequency bands: delta rhythm (0.5-3 Hz), theta rhythm (4-7 Hz), alpha rhythm (8-12 Hz), beta rhythm (13-30 Hz)	$\mathrm{Rdelta} = \frac{\sum_{i=0*N/fs}^{3*N/fs} P(i)}{\sum_{i=0*N/fs}^{30*N/fs} P(i)} * 100\%$ $\mathrm{Rtheta} = \frac{\sum_{i=4*N/fs}^{7*N/fs} P(i)}{\sum_{i=0*N/fs}^{30*N/fs} P(i)} * 100\%$ $\mathrm{Ralpha} = \frac{\sum_{i=8*N/fs}^{12*N/fs} P(i)}{\sum_{i=0*N/fs}^{30*N/fs} P(i)} * 100\%$ $\mathrm{Rbeta} = \frac{\sum_{i=13*N/fs}^{30*N/fs} P(i)}{\sum_{i=0*N/fs}^{30*N/fs} P(i)} * 100\%$ $\mathrm{betaRatio} = \frac{\sum_{i=30*N/fs}^{47*N/fs} P(i)}{\sum_{i=11*N/fs}^{20*N/fs} P(i)} * 100\%$	Range: 0-100% Accuracy: 0.01% Resolution: 0.01%
TP	Total EEG power TP was defined as the logarithm of the total energy of the EEG power spectrum of 0 – 30 Hz in dB	$TP = 10 \log_{10} \sum_{i=0}^{30*N/fs} P(i)$	Range: 0-100db Accuracy : 0.01db Resolution: 0.01db
EMG	The EMG EMG was defined as the logarithm of the total energy of the EEG power spectrum of 30 – 47 Hz in dB	$EMG = 10 \log_{10} \sum_{i=30*N/fs}^{47*N/fs} P(i)$	Range: 0-100% Accuracy: 0.01% Resolution: 0.01%
MF,SEF95	The edge frequency SEF95 is defined as the frequency value corresponding to below 95% spectral power within 0-30 Hz, and the median frequency MF is defined as the frequency value corresponding to the 50% spectral power within 0-30 Hz	$0.95 * \sum_{i=0}^{30*N/fs} P(i) = \sum_{i=0}^{SEF95*N/fs} P(i)$ $0.5 * \sum_{i=0}^{30*N/fs} P(i) = \sum_{i=0}^{MF*N/fs} P(i)$	Range: 0-30HZ Accuracy: 0.5HZ Resolution: 0.5HZ
BSI	The proportion of the suppression segment duration to the total signal segment length within 60s was calculated to obtain the burst suppression index BSI	$BSI = \frac{\text{Suppression segment duration}}{\text{Total time segment}} * 100$	
SQI	SQI is mainly quantified according to the signal noise of the previous period of time.	$SQI = \frac{\text{Total score of the first 60s signal}}{\text{Maximum score of the first 60s signal}} * 100$	
b_nosie	The b _noise is determined based on the current EEG data of 1s	0: no interference 1: minor EM interference 2: minor EMG interference 3: minorinterference 4: strong interference 5: electrode suspended or electric knife, etc	

Electical Specification

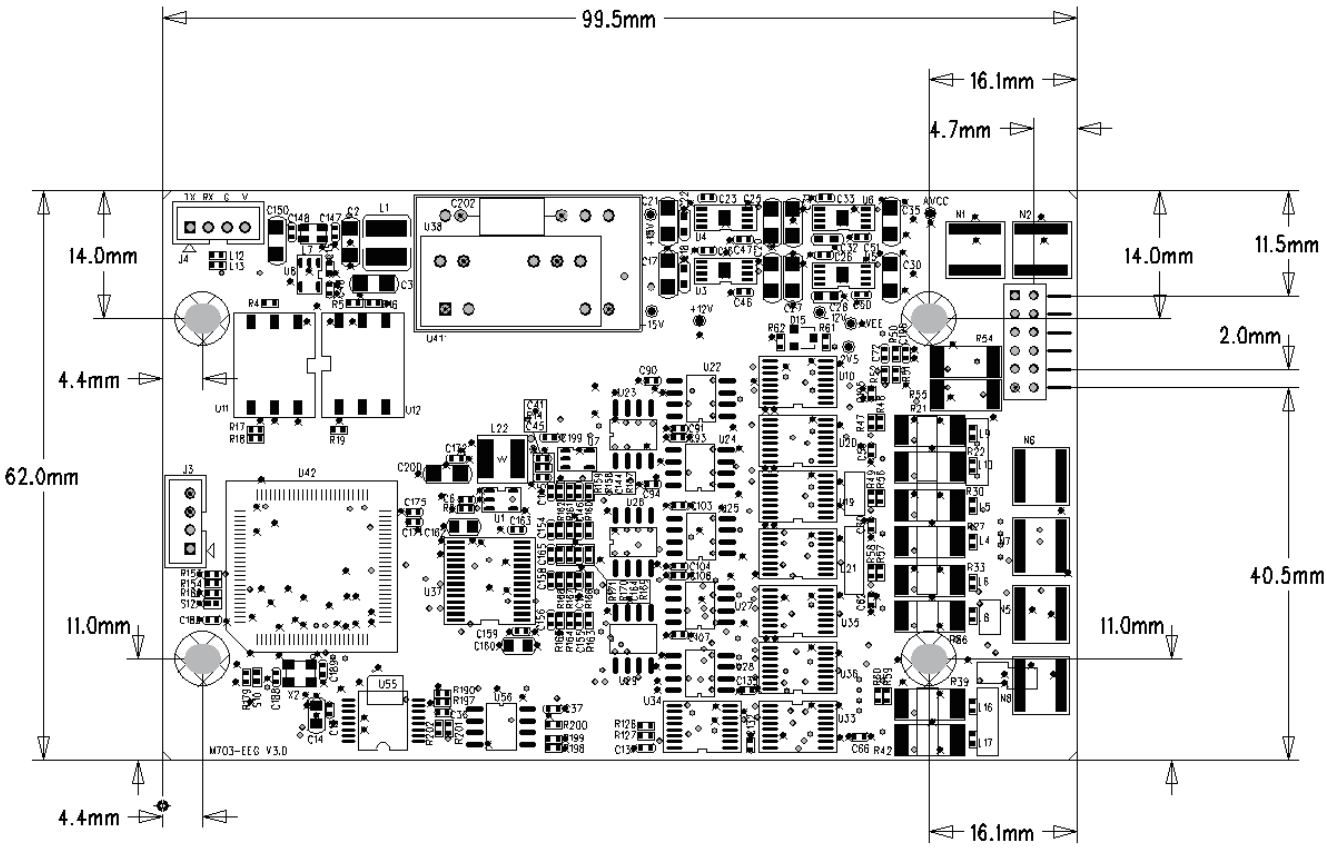
Power supply	DC.12V±5%	
Power consumption	≤3W	
Communication	TTL,USART	
Temperature	Operating 0°C~ 70°C	Storage -40°C~ 70°C
Humidity	5%~95% (no condensation)	Storage: 5%~95% (no condensation)

Compliance

Standard	IEC80601-2-26： 2019

Dimensions

The board dimensions are given in millimeters.



Interfaces

The J2 FPC Interface Definition

The pin number	function symbol	function declaration	
1	EEG1+	Channel 1 with the EEG forward input end	
2	EEG1-	Channel 1 with the EEG negative input end	
3	EEG2+	Channel 2 with the EEG forward input end	
4	EEG2-	Channel 2 with the EEG negative input end	
5	EEG3+	Channel 3 with the EEG forward input end	
6	EEG3-	Channel 3 with the EEG negative input end	
7	EEG4-	Channel 4 with the EEG negative input end	
8	EEG4+	Channel 4 with the EEG forward input end	
9	GND_SHIELD	Mask interface	
10	EEG_FEEDBACK	Feedback interface	
11	GND	grounding electrode	
12	unused	Not connected (reserved)	

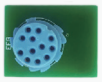
Note: J2 refers to the socket connected to the sensor.

Definition of J1 socket

The pin number	Function symbol	Function declaration	Remarks
1	TXD	Communication terminal (outgoing)	
2	RXD	Communication terminal (received)	
3	CHGND	Landing	
4	DC12V	The 12V power supply input	+12V

Schematic diagram of the J1 socket

Purchase Guider

Code	Name	Quantity	Image
022-100102-00	The 2/4-channel EEG measurement module	x 1	
022-100103-00	Connector	x 1	
041-011012-00	EEG electrode cap	x 1	
041-011011-00	EEG cable	x 1	

* The data is subject to change without notice. Please refer to the manual for the contraindications and precautions

Headquarter
ZUG MEDICAL SYSTEMS SAS
136 Chemin des Breguieres
83170 Brignoles, France

Tel:+33(0)9 84 116 339
sales@zugmed.com
www.zugmed.com