[0011A] Disclosed herein is a patch interface, comprising:

a substrate comprising a flexible and stretchable material;

an adhesive coupled to the substrate formulated for attachment to the skin of a subject;

one or more patch interconnects embedded into the substrate for attachment of the patch interface to a module comprising one or more microcircuits; and

at least one of: one or more sensors; and one or more electrodes attached to or embedded onto the surface of the substrate, and arranged, configured, and dimensioned to interface with the subject when the adhesive is attached thereto;

wherein the patch interface is configured to monitor one or more physiologic signals, physical signals, and electrophysiological signals from the subject;

wherein the one or more patch interconnects comprise one or more ferromagnetic regions formed from a stretchable pseudo elastic material, the one or more ferromagnetic regions being printed onto the substrate; and

wherein the one or more patch interconnects provide an electrically conducting interface between the patch interface and the one or more microcircuits of the module.

[0011B] Disclosed herein is a module, comprising:

a housing;

a circuit board comprising one or more microcircuits; and

one or more module interconnects coupled to one or more of the microcircuits configured for placement and coupling of a device onto a patch interface, the patch interface comprising:

a substrate comprising a flexible and stretchable material;

an adhesive coupled to the substrate formulated for attachment to the skin of a subject;

one or more patch interconnects embedded into the substrate for attachment of the patch interface to the modul; and

at least one of: one or more sensors; and one or more electrodes attached to or embedded onto the surface of the substrate, and arranged, configured, and dimensioned to interface with the subject when the adhesive is attached thereto;

wherein the module is configured to monitor one or more physiologic signals, physical signals, and electrophysiological signals from the subject;

wherein the one or more patch interconnects comprise one or more ferromagnetic regions formed from a stretchable pseudo elastic material, the one or more ferromagnetic regions being printed onto the substrate;

wherein the one or more patch interconnects provide an electrically conducting interface between the patch interface and the one or more microcircuits of the module.

[0011C] Also disclosed herein is a device, comprising:

a patch interface; and

a module comprising:

a housing;

a circuit board comprising one or more microcircuits; and

one or more module interconnects coupled to one or more of the microcircuits configured for placement and coupling of the device onto the patch interface;

wherein the one or more module interconnects are sized and dimensioned to interface with one or more path interconnects within the patch interface, and the patch interface is coupled to a subject to form an operable interconnection between the patch interface and the module; and

wherein the device is configured to monitor one or more physiologic signals, physical signals, and electrophysiological signals from the subject;

wherein the one or more patch interconnects comprise one or more ferromagnetic regions formed from a stretchable pseudo elastic material, the one or more ferromagnetic regions being printed on a flexible and stretchable substrate of the patch interface; and

wherein the one or more patch interconnects provide an electrically conducting interface between the patch interface and the one or more microcircuits of the module.

[0012] According to a first aspect there is provided a system for monitoring one or more physiologic and/or physical signals from a subject including one or more patches each in accordance with the present disclosure configured for attachment to the subject, and one or more modules each in accordance with the present disclosure configured and

WHAT IS CLAIMED IS:

1. A patch interface, comprising:

a substrate comprising a flexible and stretchable material;

an adhesive coupled to the substrate formulated for attachment to the skin of a subject;

one or more patch interconnects embedded into the substrate for attachment of the patch interface to a module comprising one or more microcircuits; and

at least one of: one or more sensors; and one or more electrodes attached to or embedded onto the surface of the substrate, and arranged, configured, and dimensioned to interface with the subject when the adhesive is attached thereto;

wherein the patch interface is configured to monitor one or more physiologic signals, physical signals, and electrophysiological signals from the subject;

wherein the one or more patch interconnects comprise one or more ferromagnetic regions formed from a stretchable pseudo elastic material, the one or more ferromagnetic regions being printed onto the substrate; and

wherein the one or more patch interconnects provide an electrically conducting interface between the patch interface and the one or more microcircuits of the module.

2. The patch interface in accordance with claim 1, wherein the adhesive is patterned onto the substrate so as to form one or more exposed regions of the substrate, at least one of the one or more of the sensors and one or more electrodes arranged within the exposed regions; and wherein at least one of the one or more electrodes comprise one of an inherently conducting and an ionically conducting gel adhesive.

3. The patch interface in accordance with claim 1, wherein at least one of the one or more electrodes comprises an electrode feature comprising one or more microfibers, barbs, microneedles, and spikes to penetrate into a stratum corneum of the skin.

4. The patch interface in accordance with claim 3, wherein the electrode feature is configured to penetrate into the skin during engagement therewith one of less than 2mm, less than 1mm, less than 0.5mm, and less than 0.2mm.

5. The patch interface in accordance with claim 2, wherein the gel adhesive is configured to maintain an improved electrical connection to the skin for one of more than one hour, more than one day, and more than three days after one of: the electrode contacts the skin; and pressure is applied to the electrode.

6. The patch interface in accordance with claim 1, further comprising one or more stretchable electrically conducting traces attached to the substrate, arranged so as to couple one or more of the sensors and electrodes with one or more of the patch interconnects.

7. The patch interface in accordance with claim 6, wherein the one or more patch interconnects comprise a plurality of connectors, the connectors physically connected to each other through the substrate; and wherein the patch interface comprises an isolating region arranged so as to isolate one or more of the connectors from the skin while the patch interface is engaged therewith.

8. The patch interface in accordance with claim 1, wherein the patch interface is sufficiently physically frail such that it cannot retain a predetermined shape in a free standing state.

9. The patch interface in accordance with claim 8, further comprising a temporary stiffening member attached to the substrate, the temporary stiffening member configured to provide retention of the shape of the patch interface prior to attachment to the subject, the stiffening member being removable from the substrate after attachment to the subject.

10. The patch interface in accordance with claim 8, wherein removal of the patch interface from the skin of the subject results in a permanent loss in shape of the patch interface without tearing of the patch interface.

11. The patch interface in accordance with claim 1, wherein the adhesive has a peel tack to mammalian skin of one of greater than 0.02 N/mm, greater than 0.1N/mm, greater than 0.25N/mm, greater than 0.50N/mm, and greater than 0.75N/mm.

12. The patch interface in accordance with claim 1, wherein the substrate is formed from a soft pseudo-elastic material and the patch interface is configured to maintain operation when stretched to one of more than 25%, more than 50%, and more than 80%.

13. The patch interface in accordance with a claim 1, wherein the patch interface is configured with a moisture vapor transmission rate of one of between 200g/m2/24hrs and 20,000g/m2/24hrs, between 500g/m2/24hrs and 12,000g/m2/24hrs, and between 1,000g/m2/24hrs and 8,000g/m2/24hrs.

14. A module, comprising:

a housing;

a circuit board comprising one or more microcircuits; and

one or more module interconnects coupled to one or more of the microcircuits configured for placement and coupling of a device onto a patch interface, the patch interface comprising:

a substrate comprising a flexible and stretchable material;

an adhesive coupled to the substrate formulated for attachment to the skin of a subject;

one or more patch interconnects embedded into the substrate for attachment of the patch interface to the module; and

at least one of: one or more sensors; and one or more electrodes attached to or embedded onto the surface of the substrate, and arranged, configured, and dimensioned to interface with the subject when the adhesive is attached thereto;

wherein the module is configured to monitor one or more physiologic signals, physical signals, and electrophysiological signals from the subject;

wherein the one or more patch interconnects comprise one or more ferromagnetic regions formed from a stretchable pseudo elastic material, the one or more ferromagnetic regions being printed onto the substrate;

wherein the one or more patch interconnects provide an electrically conducting interface between the patch interface and the one or more microcircuits of the module.

15. The module in accordance with claim 14, wherein the one or more module interconnects are embedded into the circuit board and the circuit board constitutes at least a portion of the housing.

16. The module in accordance with claim 14, further comprising a three dimensional antenna coupled to at least one of the one or more microcircuits, the one or more microcircuits comprising a transceiver or transmitter coupled to the antenna.

17. The module in accordance with claim 14, further comprising a sensor coupled with at least one of the one or more microcircuits, the sensor configured to interface with the subject upon attachment of the module to the patch interface.

18. The module in accordance with claim 17, wherein the module comprises at least one of: one or more sensors; and one or more microelectronics, configured to interface with a sensor included on the patch interface, at least one of the one or more sensors comprising: an electrophysiologic sensor, a temperature sensor, a thermal gradient sensor, a barometer, an altimeter, an accelerometer, a gyroscope, a humidity sensor, a magnetometer, an inclinometer, an oximeter, a colorimetric monitor, a sweat analyte sensor, a galvanic skin response sensor, an interfacial pressure sensor, a flow sensor, a stretch sensor, and a microphone.

19. The module in accordance with claims 14, wherein the module is hermetically sealed.

20. The module in accordance with claim 14, further comprising a gasket coupled to the circuit board, the gasket formed so as to isolate the region formed by the one or more module interconnects and the patch interconnects from a surrounding environment when the module is coupled with the patch interface.

21. A device, comprising:

a patch interface; and

a module comprising:

a housing;

a circuit board comprising one or more microcircuits; and

one or more module interconnects coupled to one or more of the microcircuits configured for placement and coupling of the device onto the patch interface;

wherein the one or more module interconnects are sized and dimensioned to interface with one or more patch interconnects within the patch interface, and the patch interface is coupled to a subject to form an operable interconnection between the patch interface and the module; and

wherein the device is configured to monitor one or more physiologic signals, physical signals, and electrophysiological signals from the subject;

wherein the one or more patch interconnects comprise one or more ferromagnetic regions formed from a stretchable pseudo elastic material, the one or more ferromagnetic regions being printed on a flexible and stretchable substrate of the patch interface; and

wherein the one or more patch interconnects provide an electrically conducting interface between the patch interface and the one or more microcircuits of the module.

22. The device in accordance with claim 21, wherein the one or more module interconnects comprises one or more electrically conducting magnetic elements,

the one or more magnetic elements arranged so as to physically and electrically couple the module to the patch interface when the one or more magnetic elements are aligned with the one or more ferromagnetic regions.

23. The device in accordance with claim 21, wherein at least one of the module and the patch interface comprises one or more fiducial markings to visually assist with alignment of the module to the patch interface during coupling thereof.

24. The device in accordance with claim 23, wherein both the module and the patch interface comprise one or more fiducial markers to visually assist with alignment of the module to the patch interface during coupling thereof.

25. The patch interface in accordance with claim 1, wherein the patch interface comprises a direction of expected stretch, and wherein the one or more patch interconnects are oriented on the substrate of the patch interface along an axis substantially perpendicular to the direction of expected stretch.