What is claimed is:

1. A sensor, comprising:

a flow cell, including:

a passivation layer having opposed surfaces and a reaction site at a first of the opposed surfaces; and

a lid operatively connected to the passivation layer to partially define a flow channel between the lid and the reaction site;

a detection device in contact with a second of the opposed surfaces of the passivation layer, the detection device including an embedded metal layer that is electrically isolated from other detection circuitry of the detection device; and

a controller to ground the embedded metal layer.

2. The sensor as defined in claim 1, wherein the detection device further includes:

an optical sensor electrically connected to the other detection circuitry of the detection device to transmit data signals in response to photons detected by the optical sensor; and

an electrically non-conductive gap between the embedded metal layer and the other detection circuitry.

3. The sensor as defined in claim 2, further comprising a second controller electrically connecting the optical sensor to the other detection circuitry.

4. The sensor as defined in claim 1, further comprising a reagent introduced into the flow channel, the reagent having a pH ranging from 6.5 to 10 and having a conductivity ranging from 45 mS/cm to 85 mS/cm.

5. A sensor, comprising:

a detection device, including:

an optical waveguide;

an optical sensor operatively associated with the optical waveguide; and

device circuitry, including:

a first embedded metal layer; and

a second embedded metal layer electrically connected to the optical sensor;

wherein the first embedded metal layer is spaced from the second embedded metal layer by an electrically isolating gap;

at least a portion of a passivation layer being in contact with the first embedded metal layer and an input region of the optical waveguide, the at least the portion of the passivation layer having a reaction site at least partially adjacent to the input region of the optical waveguide;

a lid operatively connected to the passivation layer to partially define a flow channel between the lid and the reaction site;

a first controller electrically connected to the first embedded metal layer to selectively ground the first embedded metal layer; and

a second controller electrically connecting the second embedded metal layer to the optical sensor to transmit data signals in response to photons detected by the optical sensor.

6. A method, comprising:

introducing a reagent to a flow channel of a sensor that includes:

a flow cell, including:

a passivation layer having opposed surfaces and a reaction site at a first of the opposed surfaces; and

a lid operatively connected to the passivation layer to partially define the flow channel between the lid and the reaction site;

a detection device in contact with a second of the opposed surfaces of the passivation layer, the detection device including an embedded metal layer that is electrically isolated from other detection circuitry of the detection device;

performing a sensing operation of the sensor in response to a reaction at the reaction site involving at least some reaction component of the reagent; and

during the sensing operation, grounding the embedded metal layer, thereby providing passive protection to the embedded metal layer.

7. The method as defined in claim 6, wherein:

the detection device further includes an optical sensor electrically connected to the other device circuitry;

the embedded metal layer is spaced from the other device circuitry that is electrically connected to the optical sensor by an electrically isolating gap; and

the grounding of the embedded metal layer is orthogonal to the sensing operation.

8. A sensor, comprising:

a flow cell, including:

a passivation layer having opposed surfaces and a reaction site at a first of the opposed surfaces; and

a lid operatively connected to the passivation layer to partially define a flow channel between the lid and the reaction site;

a detection device in contact with a second of the opposed surfaces of the passivation layer, the detection device including an embedded metal layer;

a reagent electrode positioned to be in contact with a reagent to be introduced into the flow channel; and

a controller electrically connecting the reagent electrode and the embedded metal layer to selectively apply an electrical bias that renders the reagent electrode one of an anode or a cathode and the embedded metal layer the other of the cathode or the anode.

9. The sensor as defined in claim 8, wherein the reagent electrode is connected to at least a portion of an interior surface of the lid.

10. The sensor as defined in claim 8, wherein the reagent electrode:
is connected to a portion of an interior surface of the lid; and
forms a sidewall of the flow channel.

11. The sensor as defined in claim 10, wherein the sidewall electrically connects and directly mechanically connects to a metal conductor or connector, and wherein the metal conductor or connector electrically connects to the controller.

12. The sensor as defined in claim 10, wherein the sidewall electrically connects to the controller through a portion of the reagent electrode connected to the portion of the interior surface of the lid and through a conductive component.

13. The sensor as defined in claim 8, wherein:
the lid includes a feature that defines a sidewall of the flow channel; and
the reagent electrode includes a layer disposed on the feature.

14. The sensor as defined in claim 8 wherein the reagent electrode includes a layer:
connected to a portion of an interior surface of the lid; and
disposed on at least a portion of a fluidic port defined in the lid.

15. The sensor as defined in claim 8, wherein the reagent electrode includes a layer:
connected to a portion of an exterior surface of the lid; and
disposed on at least a portion of a fluidic port defined in the lid.

16. The sensor as defined in claim 8, wherein a portion of the passivation layer has the reagent electrode defined on or embedded into the passivation layer.

17. The sensor as defined in claim 8, wherein a portion of the passivation layer has an aperture defined therein, and wherein the reagent electrode is exposed through the aperture.

18. The sensor as defined in claim 8, wherein the detection device further includes:

an optical sensor;

device circuitry electrically connected to the optical sensor to transmit data signals in response to photons detected by the optical sensor; and

an electrically non-conductive gap between the device circuitry and the embedded metal layer.

19. The sensor as defined in claim 8, wherein the detection device further includes:

an optical sensor; and

device circuitry electrically connected to the optical sensor and to the embedded metal layer.

20. The sensor as defined in claim 8, wherein the detection device further includes:

an optical waveguide optically connecting the reaction site to an optical sensor; and

a shield layer in contact with at least a portion of the second opposed surface of the passivation layer, and having an aperture at least partially adjacent to an input region of the optical waveguide.

21. The sensor as defined in claim 8, further comprising the reagent introduced into the flow channel, the reagent having a pH ranging from 6.5 to 10 and having a conductivity ranging from 45 mS/cm to 85 mS/cm.

22. A sensor, comprising:

a detection device, including:

an optical waveguide;

an optical sensor operatively associated with the optical waveguide; and

device circuitry, including:

a reagent electrode;

a first embedded metal layer electrically connected to the reagent electrode; and

a second embedded metal layer electrically connected to the optical sensor;

wherein the first embedded metal layer is spaced from the second embedded metal layer by an electrically isolating gap;

at least a portion of a passivation layer being in contact with the first embedded metal layer and an input region of the optical waveguide, the at least the portion of the passivation layer having a reaction site at least partially adjacent to the input region of the optical waveguide; and

a lid operatively connected to the passivation layer to partially define a flow channel between the lid and the reaction site;

wherein the reagent electrode is positioned to be in contact with a reagent to be introduced into the flow channel;

a first controller electrically connecting the reagent electrode and the first embedded metal layer to selectively apply an electrical bias that renders the reagent electrode an anode and the first embedded metal layer a cathode; and

a second controller electrically connecting the second embedded metal layer to the optical sensor to transmit data signals in response to photons detected by the optical sensor.

23. The sensor as defined in claim 22, wherein the reagent electrode:
is connected to a portion of an interior surface of the lid; and
forms a sidewall of the flow channel.

24. The sensor as defined in claim 23, wherein the sidewall is one of:
electrically connected to, and directly mechanically connected to a metal conductor or connector, and wherein the metal conductor or connector is electrically connected to the first controller; or
electrically connected to the first controller through a portion of the reagent electrode connected to the portion of the interior surface of the lid and through a conductive component.

25. The sensor as defined in claim 22, wherein the reagent electrode is connected to at least a portion of an interior surface of the lid.

26. The sensor as defined in claim 22, wherein:
the lid includes a feature that defines a sidewall of the flow channel; and
the reagent electrode includes a layer disposed on the feature.

27. The sensor as defined in claim 22, wherein the reagent electrode includes a layer:
connected to a portion of an interior surface of the lid; and
disposed on at least a portion of a fluidic port defined in the lid.

28. The sensor as defined in claim 22, wherein the reagent electrode includes a layer:
connected to a portion of an exterior surface of the lid; and
disposed on at least a portion of a fluidic port defined in the lid.

29. The sensor as defined in claim 22, wherein an other portion of the passivation layer has the reagent electrode defined on or embedded in a passivation layer aperture.

30. The sensor as defined in claim 22, wherein an other portion of the passivation layer has an aperture defined therein, and wherein the reagent electrode is exposed through the aperture.

31. A method, comprising:

introducing a reagent to a flow channel of a sensor that includes:

a flow cell, including:

a passivation layer having opposed surfaces and a reaction site at a first of the opposed surfaces; and

a lid operatively connected to the passivation layer to partially define the flow channel between the lid and the reaction site;

a detection device in contact with a second of the opposed surfaces of the passivation layer, the detection device including an embedded metal layer; and

a reagent electrode electrically connected to the embedded metal layer and positioned to be in contact with the reagent introduced into the flow channel;

performing a sensing operation of the sensor in response to a reaction at the reaction site involving at least some reaction component of the reagent; and

during the sensing operation, applying an electrical bias that renders the reagent electrode one of an anode or a cathode and the embedded metal layer the other of the cathode or the anode, thereby providing cathodic protection or anodic protection to the embedded metal layer.

32. The method as defined in claim 31, wherein:

the detection device further includes an optical sensor and device circuitry electrically connected to the optical sensor;

the embedded metal layer is electrically connected to the device circuitry;

the embedded metal layer is operative in the performing of the sensing operation; and

the electrical bias is applied to the embedded metal layer.

33. The method as defined in claim 31, wherein:

the detection device further includes an optical sensor and device circuitry electrically connected to the optical sensor;

the embedded metal layer is spaced from the device circuitry that is electrically connected to the optical sensor by an electrically isolating gap; and

the application of the electrical bias is orthogonal to the sensing operation.

34. The method as defined in claim 31, further comprising adjusting the electrical bias based on a pH of the reagent introduced to the flow channel of the sensor.