CLAIM(S):

1. A filter assembly comprising

(a) a housing having a first housing end, a housing body, and a second housing end, the housing containing a generally cylindrical filter comprising a porous filter element, wherein at least the first housing end comprises a removable cover and a first housing end body, wherein the housing is arranged to provide a fluid flow path through the filter, such that fluid is filtered as it passes through the porous filter element;

(i) the filter comprising a first end cap and a second end cap, and the porous filter element comprising a first filter end and a second filter end, the first end cap sealed to the first filter end, and the second end cap sealed to the second filter end;

(ii) an RFID tag secured on, or near, the first end cap or the second end cap;

(iii) a first antenna, arranged in or on the housing body;

(iv) a second antenna, arranged in or on the removable cover, wherein the first antenna and the second antenna are generally coaxially arranged and separated by a gap such that the first antenna and the second antenna are inductively coupled, allowing a wireless signal to pass therebetween;

(v) a third antenna, arranged in or on the first housing end body, wherein the third antenna is spaced from the RFID tag, and the third antenna is arranged to wirelessly send a signal to, and wirelessly receive a signal from, the RFID tag;

(vi) an RFID signal generator/controller; and,

(vii) a first cable, having a first cable first end and a first cable second end, wherein the first cable first end is coupled to the second antenna, and the first cable second end is coupled to the third antenna;

wherein the filter assembly is arranged to allow a signal to pass from the RFID signal generator/controller to the first antenna, from the first antenna to the second antenna, from the second antenna to the third antenna, and from the third antenna to the RFID tag, and to allow a signal to pass from the RFID tag to the third antenna,

from the third antenna to the second antenna, from the second antenna to the first antenna, and from the first antenna to the RFID signal generator/controller.

2. The filter assembly of claim 1, further comprising at least one fluid sensor, arranged to sense a condition of the fluid, wherein the at least one fluid sensor communicates with the RFID signal generator/controller.

3. The filter assembly of claim 1 or 2, wherein the first end cap is a closed end cap.

4. The filter assembly of claim 1 or 2, wherein the first end cap is an open end cap.

5. The filter assembly of any one of claims 1-4, wherein the RFID tag is attached to the first end cap.

6. The filter assembly of any one of claims 1-4, wherein the porous filter element is pleated.

7. The filter assembly of any one of claims 1-6, further comprising a signal device comprising a changeable visual signal indicator, attached to the housing.

8. A system for monitoring fluid processing comprising:

(A) a filter assembly comprising

(a) a housing having a first housing end, a housing body, and a second housing end, the housing containing a generally cylindrical filter comprising a porous filter element, wherein at least the first housing end comprises a removable cover and a first housing end body, wherein the housing is arranged to provide a fluid flow path through the filter, such that fluid is filtered as it passes through the porous filter element;

(i) the filter comprising a first end cap and a second end cap, and the porous filter element comprising a first filter end and a second filter end, the first end cap sealed to the first filter end, and the second end cap sealed to the second filter end;

(ii) an RFID tag secured on, or near, the first end cap or the second end cap;

(iii) a first antenna, arranged in or on the housing body;

(iv) a second antenna, arranged in or on the removable cover, wherein the first antenna and the second antenna are generally coaxially arranged and separated by a gap such that the first antenna and the second antenna are inductively coupled, allowing a wireless signal to pass therebetween;

(v) a third antenna, arranged in or on the first housing end body, wherein the third antenna is spaced from the RFID tag, and the third antenna is arranged to wirelessly send a signal to, and wirelessly receive a signal from, the RFID tag;

(vi) an RFID signal generator/controller; and,

(vii) a first cable, having a first cable first end and a first cable second end, wherein the first cable first end is coupled to the second antenna, and the first cable second end is coupled to the third antenna;

wherein the filter assembly is arranged to allow a signal to pass from the RFID signal generator/controller to the first antenna, from the first antenna to the second antenna, from the second antenna to the third antenna, and from the third antenna to the RFID tag, and to allow a signal to pass from the RFID tag to the third antenna, from the third antenna to the second antenna, from the second antenna to the first antenna, and from the first antenna to the RFID signal generator/controller;

(B) a router gateway providing internet access, the router gateway in communication with the RFID signal generator/controller, and

(C) at least one cloud- or web-enabled device capable of accessing the internet and receiving information regarding the filter assembly.

9. A method for monitoring fluid processing in a filter assembly including an RFID tag and an RFID signal generator/controller, the method comprising:

(A) receiving information regarding fluid passing through a filter assembly comprising

(a) a housing having a first housing end, a housing body, and a second housing end, the housing containing a generally cylindrical filter comprising a porous filter element, wherein at least the first housing end

comprises a removable cover and a first housing end body, wherein the housing is arranged to provide a fluid flow path through the filter, such that fluid is filtered as it passes through the porous filter element;

(i) the filter comprising a first end cap and a second end cap, and the porous filter element comprising a first filter end and a second filter end, the first end cap sealed to the first filter end, and the second end cap sealed to the second filter end;

(ii) the RFID tag secured on, or near, the first end cap or the second end cap;

(iii) a first antenna, arranged in or on the housing body;

(iv) a second antenna, arranged in or on the removable cover, wherein the first antenna and the second antenna are generally coaxially arranged and separated by a gap such that the first antenna and the second antenna are inductively coupled, allowing a wireless signal to pass therebetween;

(v) a third antenna, arranged in or on the first housing end body, wherein the third antenna is spaced from the RFID tag, and the third antenna is arranged to wirelessly send a signal to, and wirelessly receive a signal from, the RFID tag;

(vi) the RFID signal generator/controller; and,

(vii) a first cable, having a first cable first end and a first cable second end, wherein the first cable first end is coupled to the second antenna, and the first cable second end is coupled to the third antenna;

wherein the filter assembly is arranged to allow a signal to pass from the RFID signal generator/controller to the first antenna, from the first antenna to the second antenna, from the second antenna to the third antenna, and from the third antenna to the RFID tag, and to allow a signal to pass from the RFID tag to the third antenna, from the third antenna to the second antenna, from the second antenna to the first antenna, and from the first antenna to the RFID signal generator/controller.

10. The method of claim 9, wherein the information comprises any one or more of: filter differential pressure, flow rate, and filter element part number.

11. The method of claim 9 or 10, comprising accessing the internet using a cloud- or web-enabled device, and receiving the information.

12. A method for monitoring fluid processing in a filter assembly including an RFID tag and an RFID signal generator/controller communicating with a router gateway providing internet access, the method comprising:

(A) accessing the internet using a cloud- or web-enabled device, and

(B) receiving information regarding fluid passing through a filter assembly comprising

(a) a housing having a first housing end, a housing body, and a second housing end, the housing containing a generally cylindrical filter comprising a porous filter element, wherein at least the first housing end comprises a removable cover and a first housing end body, wherein the housing is arranged to provide a fluid flow path through the filter, such that fluid is filtered as it passes through the porous filter element;

(i) the filter comprising a first end cap and a second end cap, and the porous filter element comprising a first filter end and a second filter end, the first end cap sealed to the first filter end, and the second end cap sealed to the second filter end;

(ii) the RFID tag secured on, or near, the first end cap or the second end cap;

(iii) a first antenna, arranged in or on the housing body;

(iv) a second antenna, arranged in or on the removable cover, wherein the first antenna and the second antenna are generally coaxially arranged and separated by a gap such that the first antenna and the second antenna are inductively coupled, allowing a wireless signal to pass therebetween;

(v) a third antenna, arranged in or on the first housing end body, wherein the third antenna is spaced from the RFID tag, and the third antenna is arranged to wirelessly send a signal to, and wirelessly receive a signal from, the RFID tag;

(vi) the RFID signal generator/controller; and,

(vii) a first cable, having a first cable first end and a first cable second end, wherein the first cable first end is coupled to the second antenna, and the first cable second end is coupled to the third antenna;

wherein the filter assembly is arranged to allow a signal to pass from the RFID signal generator/controller to the first antenna, from the first antenna to the second antenna, from the second antenna to the third antenna, and from the third antenna to the RFID tag, and to allow a signal to pass from the RFID tag to the third antenna, from the third antenna to the second antenna, from the second antenna to the first antenna, and from the first antenna to the RFID signal generator/controller.

13. The system of claim 8, further comprising a fluid density sensor.

14. The system of claim 8 or 13, further comprising a volumetric flow rate sensor.

15. The system of claim 8, further comprising at least one fluid condition sensor, arranged to sense a condition of the fluid passing through the filter assembly, wherein the fluid condition sensor communicates with the RFID signal generator/controller.

16. The system of claim 8, further comprising a fluid density sensor and a volumetric flow rate sensor, arranged to determine mass flow, wherein the fluid density sensor and the volumetric flow rate sensor communicate with the RFID signal generator/controller.

17. The filter assembly of claim 1, further comprising a fluid density sensor.

18. The filter assembly of any one of claims 1-7, wherein the RFID tag is mounted to a support inserted in the filter.

19. The filter assembly of claim 3, wherein the RFID tag is mounted to a support inserted in the filter, and the RFID tag faces the first end cap.

20. The system of any one of claims 8, 13, or 14, further comprising at least one sensor node communicating through the router gateway.