What is claimed is:

1. A downhole fluid flow control system comprising:

a fluidic module having a bridge network with first and second branch fluid pathways each including at least one fluid flow resistor and a pressure output terminal;

wherein a pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to control fluid flow through the fluidic module.

2. The flow control system as recited in claim 1 wherein the first and second branch fluid pathways each include at least two fluid flow resistors.

3. The flow control system as recited in claim 2 wherein the pressure output terminal of each branch fluid pathway is positioned between the two fluid flow resistors.

4. The flow control system as recited in claim 2 wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid viscosity.

5. The flow control system as recited in claim 2 wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid density.

6. The flow control system as recited in claim 1 wherein the first and second branch fluid pathways each have a common fluid inlet and a common fluid outlet with a main fluid pathway.

7. The flow control system as recited in claim 6 wherein a fluid flowrate ratio between the main fluid pathway and the branch fluid pathways is between about 5 to 1 and about 20 to 1.

8. The flow control system as recited in claim 6 wherein a fluid flowrate ratio between the main fluid pathway and the branch fluid pathways is greater than 10 to 1.

9. The flow control system as recited in claim 6 wherein the fluidic module further comprises a valve having first and second positions, in the first position, the valve is operable to allow fluid flow through the main fluid pathway, in the second position, the valve is operable to prevent fluid flow through the main fluid pathway and wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to shift the valve between the first and second positions.

10. The flow control system as recited in claim 9 wherein the fluidic module has an injection mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an outflow of injection fluid shifts the valve to open the main fluid pathway, and a production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of production fluid shifts the valve to close the main fluid pathway.

11. The flow control system as recited in claim 9 wherein the fluidic module has a first production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of a desired fluid shifts the valve to open the main fluid pathway, and a second production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of an undesired fluid shifts the valve to close the main fluid pathway.

12. The flow control system as recited in claim 1 wherein the fluid flow resistors are selected from the group consisting of nozzles, vortex chambers, flow tubes, fluid selectors and matrix chambers.

13. A flow control screen comprising:

a base pipe with an internal passageway;

a filter medium positioned around the base pipe;

a housing positioned around the base pipe defining a fluid flow path between the filter medium and the internal passageway; and

at least one fluidic module disposed within the fluid flow path, the fluidic module having a bridge network with first and second branch fluid pathways each including at least one fluid flow resistor and a pressure output terminal such that a pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to control fluid flow through the fluidic module.

14. The flow control screen as recited in claim 13 wherein the fluid flow resistors are selected from the group consisting of nozzles, vortex chambers, flow tubes, fluid selectors and matrix chambers.

15. The flow control screen as recited in claim 13 wherein the first and second branch fluid pathways each have a common fluid inlet and a common fluid outlet with a main fluid pathway, wherein the first and second branch fluid pathways each include at least two fluid flow resistors, wherein the pressure output terminal of each branch fluid pathway is positioned between the two fluid flow resistors and wherein the fluidic module further comprises a valve having a first position wherein fluid flow through the main fluid pathway is allowed and a second position wherein fluid flow through the main fluid pathway is restricted.

16. The flow control screen as recited in claim 15 wherein the fluidic module has a first production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of a desired fluid shifts the valve to open the main fluid pathway, and a second production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of an undesired fluid shifts the valve to close the main fluid pathway.

17. A downhole fluid flow control system comprising:

a fluidic module having a main fluid pathway, a valve having a first position wherein fluid flow through the main fluid pathway is allowed and a second position wherein fluid flow through the main fluid pathway is restricted, and a bridge network with first and second branch fluid pathways each have a common fluid inlet and a common fluid outlet with the main fluid pathway and each including two fluid flow resistors with a pressure output terminal positioned therebetween;

wherein a pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to shift the valve between the first and second positions.

18. The flow control system as recited in claim 17 wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid viscosity.

19. The flow control system as recited in claim 17 wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid density.

20. The flow control system as recited in claim 17 wherein the fluidic module has a first production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of a desired fluid shifts the valve to open the main fluid pathway, and a second production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of an undesired fluid shifts the valve to close the main fluid pathway.

21. The flow control system as recited in claim 17 wherein the fluid flow resistors are selected from the group consisting of nozzles, vortex chambers, flow tubes, fluid selectors and matrix chambers.

22. A downhole fluid flow control method comprising:

positioning a fluid flow control system at a target location downhole, the fluid flow control system including a fluidic module having a main fluid pathway, a valve and a bridge network with first and second branch fluid pathways each having a common fluid inlet and a common fluid outlet with the main fluid pathway and each including two fluid flow resistors with a pressure output terminal positioned therebetween;

producing a desired fluid through the fluidic module;

generating a first pressure difference between the pressure output terminals of the first and second branch fluid pathways that biases the valve toward a first position wherein fluid flow through the main fluid pathway is allowed;

producing an undesired fluid through the fluidic module; and

generating a second pressure difference between the pressure output terminals of the first and second branch fluid pathways that shifts the valve from the first position to a second position wherein fluid flow through the main fluid pathway is restricted.

23. The method as recited in claim 22 wherein producing a desired fluid through the fluidic module further comprises producing a formation fluid containing at least a predetermined amount of the desired fluid.

24. The method as recited in claim 22 wherein producing an undesired fluid through the fluidic module further comprises producing a formation fluid containing at least a predetermined amount of the undesired fluid.

25. The method as recited in claim 22 further comprising sending a signal to the surface indicating the valve has shifted from the first position to the second position.

What is claimed is:

1. A downhole fluid flow control system comprising:

a fluidic module having a main fluid pathway, a valve having a first position wherein fluid flow through the main fluid pathway is allowed and a second position wherein fluid flow through the main fluid pathway is restricted and a bridge network with first and second branch fluid pathways each having a common fluid inlet and a common fluid outlet with the main fluid pathway and each including at least two fluid flow resistors and a pressure output terminal;

wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid viscosity; and

wherein a pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to shift the valve between the first and second positions, thereby controlling fluid flow through the fluidic module.

2. The flow control system as recited in claim 1 wherein the pressure output terminal of each branch fluid pathway is positioned between the two fluid flow resistors.

3. The flow control system as recited in claim 1 wherein a fluid flowrate ratio between the main fluid pathway and the branch fluid pathways is between about 5 to 1 and about 20 to 1.

4. The flow control system as recited in claim 1 wherein a fluid flowrate ratio between the main fluid pathway and the branch fluid pathways is greater than 10 to 1.

5. The flow control system as recited in claim 1 wherein the fluidic module has an injection mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an outflow of injection fluid shifts the valve to open the main fluid pathway, and a production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of production fluid shifts the valve to close the main fluid pathway.

6. The flow control system as recited in claim 1 wherein the fluidic module has a first production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of a desired fluid shifts the valve to open the main fluid pathway, and a second production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of an undesired fluid shifts the valve to close the main fluid pathway.

7. The flow control system as recited in claim 1 wherein the fluid flow resistors are selected from the group consisting of nozzles, vortex chambers, flow tubes, fluid selectors and matrix chambers.

8. A flow control screen comprising:

a base pipe with an internal passageway;

a filter medium positioned around the base pipe;

a housing positioned around the base pipe defining a fluid flow path between the filter medium and the internal passageway; and

at least one fluidic module disposed within the fluid flow path, the fluidic module having a main fluid pathway, a valve having a first position wherein fluid flow through the main fluid pathway is allowed and a second position wherein fluid flow through the main fluid pathway is restricted and a bridge network with first and second branch fluid pathways each having a common fluid inlet and a common fluid outlet with the main fluid pathway and each including at least two fluid flow resistors and a pressure output terminal;

wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid viscosity; and

wherein a pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to shift the valve between the first and second positions, thereby controlling fluid flow through the fluidic module.

9. The flow control screen as recited in claim 8 wherein the fluid flow resistors are

selected from the group consisting of nozzles, vortex chambers, flow tubes, fluid selectors and matrix chambers.

10. The flow control screen as recited in claim 8 wherein the fluidic module has a first production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of a desired fluid shifts the valve to open the main fluid pathway, and a second production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of an undesired fluid shifts the valve to close the main fluid pathway.

11. A downhole fluid flow control system comprising:

a fluidic module having a main fluid pathway, a valve having a first position wherein fluid flow through the main fluid pathway is allowed and a second position wherein fluid flow through the main fluid pathway is restricted, and a bridge network with first and second branch fluid pathways each have a common fluid inlet and a common fluid outlet with the main fluid pathway and each including two fluid flow resistors with a pressure output terminal positioned therebetween;

wherein the two fluid flow resistors of each branch fluid pathway have different responses to fluid density; and

wherein a pressure difference between the pressure output terminals of the first and second branch fluid pathways is operable to shift the valve between the first and second positions.

12. The flow control system as recited in claim 11 wherein the fluidic module has a first production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of a desired fluid shifts the valve to open the main fluid pathway, and a second production mode, wherein the pressure difference between the pressure output terminals of the first and second branch fluid pathways created by an inflow of an undesired fluid shifts the valve to close the main fluid pathway.

13. The flow control system as recited in claim 11 wherein the fluid flow resistors

are selected from the group consisting of nozzles, vortex chambers, flow tubes, fluid selectors and matrix chambers.

14. A downhole fluid flow control method comprising:

positioning a fluid flow control system at a target location downhole, the fluid flow control system including a fluidic module having a main fluid pathway, a valve and a bridge network with first and second branch fluid pathways each having a common fluid inlet and a common fluid outlet with the main fluid pathway and each including two fluid flow resistors with a pressure output terminal positioned therebetween;

producing a desired fluid through the fluidic module;

generating a first pressure difference between the pressure output terminals of the first and second branch fluid pathways that biases the valve toward a first position wherein fluid flow through the main fluid pathway is allowed;

producing an undesired fluid through the fluidic module; and

generating a second pressure difference between the pressure output terminals of the first and second branch fluid pathways that shifts the valve from the first position to a second position wherein fluid flow through the main fluid pathway is restricted.

15. The method as recited in claim 14 wherein producing a desired fluid through the fluidic module further comprises producing a formation fluid containing at least a predetermined amount of the desired fluid.

16. The method as recited in claim 14 wherein producing an undesired fluid through the fluidic module further comprises producing a formation fluid containing at least a predetermined amount of the undesired fluid.

17. The method as recited in claim 14 further comprising sending a signal to the surface indicating the valve has shifted from the first position to the second position.