CLAIMS

What is claimed is:

1. A downhole control method for use in a wellbore, comprising:

positioning an outer completion pipe within the wellbore, wherein the outer completion pipe has an inner surface that defines a flow passage;

measuring a first downhole fluid parameter using a downhole sensor;

receiving, by a downhole controller, the first measured downhole fluid parameter from the downhole sensor; and

actuating a first inflow control device, based on the first measured downhole fluid parameter received from the downhole sensor by the downhole controller, using a first stand-alone hydraulic reservoir and the downhole controller;

wherein the downhole controller is positioned within the flow passage of the outer completion pipe.

2. The method of claim 1, further comprising positioning the first inflow control device in an open-hole section of the wellbore utilizing the outer completion pipe.

3. The method of claim 2, wherein actuating the first inflow control device using the first stand-alone hydraulic reservoir comprises opening an orifice in the outer completion pipe.

4. The method of claim 1, wherein positioning the outer completion pipe within the wellbore comprises carrying the first inflow control device across an interface between an open-hole section of the wellbore and a cased section of the wellbore.

5. The method of claim 1, wherein positioning the outer completion pipe within the comprises hanging the outer completion pipe from a cased section of the wellbore such that the outer completion pipe at least partially extends within an open-hole section of the wellbore.

6. The method of claim 1, further comprising:

measuring a second downhole fluid parameter; and

actuating a second inflow control device, based on the second measured downhole fluid parameter, using the first stand-alone hydraulic reservoir.

7. The method of claim 1, further comprising:

measuring a second downhole fluid parameter; and

actuating a second inflow control device, based on the second measured downhole fluid parameter, using a second stand-alone hydraulic reservoir.

8. The method of claim 1, wherein the first stand-alone hydraulic reservoir and the first inflow control device comprise an open-hole completion system.

9. The method of claim 1, further comprising maintaining hydraulic pressure in the first stand-alone hydraulic reservoir using an accumulator that is positioned within the flow passage of the outer completion pipe.

10. The method of claim 2, wherein actuating the first inflow control device results in controlling flow of a fluid into the flow passage of the outer completion pipe.

11. The method of claim 2, further comprising operating a packer to isolate a first zone from a second zone of the open-hole section of the wellbore while maintaining hydraulic communication between the first zone and the second zone of the open-hole section of the wellbore.

12. A downhole completion apparatus for use in a wellbore, comprising:

an outer completion assembly, comprising:

a casing having an inner surface that defines a flow passage;

a sensor carried by the casing to measure a fluid parameter at an external surface of the casing; and

an inflow control device carried by the casing to control flow of a fluid into a flow passage of the casing;

a stand-alone, downhole hydraulic reservoir hydraulically coupled to the inflow control device; and

a downhole controller in communication with the sensor and the stand-alone, downhole hydraulic reservoir;

wherein the downhole controller is configured to actuate the inflow control device in response to data, received by the downhole controller from the sensor, regarding the measured fluid parameter; and

wherein at least a portion of each of the downhole controller and the stand-alone, downhole hydraulic reservoir is positioned within the flow passage of the casing.

13. The apparatus of claim 12, further comprising a motor in communication with a pump and the downhole controller, wherein the pump is hydraulically coupled to the standalone, downhole hydraulic reservoir; and

an accumulator that forms a portion of the stand-alone, downhole hydraulic reservoir; wherein the motor, the accumulator, and the pump are positioned within the flow passage of the casing.

14. The apparatus of claim 12, wherein the apparatus forms a portion of an open-hole completion system.

15. A downhole control method for use in a wellbore, comprising:

positioning a plurality of downhole devices along an outer completion pipe in an open- hole section of the wellbore;

measuring a downhole fluid condition using a downhole sensor;

transmitting data regarding the measured downhole fluid condition from the downhole sensor to a downhole controller; and

actuating one of the plurality of downhole devices using a downhole, stand-alone hydraulic reservoir that is hydraulically coupled to the one of the plurality of downhole devices to control flow of fluids into a flow passage of the outer completion pipe;

wherein the downhole controller is positioned within the flow passage of the outer completion pipe;

wherein actuating the one of the plurality of the downhole device is in response to the downhole controller receiving the data regarding the measure downhole fluid condition from the downhole sensor.

16. The method of claim 15, further comprising actuating another one of the plurality of downhole devices using the downhole controller and the downhole, stand-alone hydraulic reservoir in response to another measured downhole fluid condition.

17. The method of claim 2, further comprising powering the downhole controller using a stand-alone power source that is positioned within the flow passage; wherein the power source is coupled to the downhole controller.

18. The apparatus of claim 12, further comprising a stand-alone power source positioned within the flow passage; wherein the power source is coupled to each of the downhole controller and the stand-alone, downhole hydraulic reservoir.

19. The method of claim 15, further comprising powering the downhole controller using a stand-alone power source that is positioned within the flow passage; wherein the power source is coupled to the downhole controller.