similar signal. Although Figure 2A depicts a binary predetermined signal of low and high values, the predetermined signal could be non-binary.

Figure 2B depicts a predetermined signal based on a pressure exceeding a threshold value. For predetermined signals based on a threshold value of a wellbore condition (*e.g.*, pressure), on-board electronics 112 may be configured to execute instructions in response to being above a threshold value, being within a range of values, remaining under a threshold value, or crossing a threshold value a certain number of times.

Figure 2C depicts a predetermined signal based on the duration or dwell time of one or more pressures. For predetermined signals based on duration or dwell time of a wellbore condition (*e.g.*, pressure), the on-board electronics 112 may be configured to execute instructions in response to the wellbore condition being at, above, or below a particular value for a particular period of time, or in response to the absence of the wellbore condition for a particular period of time or both.

Figure 2D depicts a predetermined signal based on increases and decreases in pressure. For predetermined signals based on increases and/or decreases of a wellbore condition (*e.g.*, pressure), the on-board electronics 112 may be configured to execute instructions in response to, for example, a specific pattern of the wellbore condition over time, the amount of change in the wellbore condition, the duration over which the wellbore condition remains changed, or whether the wellbore condition increased, decreased, or both more than a threshold value. The increase and/or decrease of the wellbore condition may be independent of the absolute magnitude of the increase or decrease, so long as the increase or decrease in wellbore condition is above a threshold amount.

In certain embodiments, actuator 108 may actuate to move one or more components of electronic initiator sleeve 100 in response to the output from on-board electronics 112 to transition sleeve 106 from a closed position (Fig. 1A) to an open position (Fig. 1B). In certain embodiments, as shown in Figure 1A, electronic initiator sleeve 100 may comprise a hydraulic chamber 116 comprising oil and an electro-hydraulic lock that comprises, for instance, a rupture disk 114 and a piercing mechanism 117. In such embodiments, the electro-hydraulic lock may hold sleeve 106 in the closed position under the electro-hydraulic lock is removed. In such embodiments, the electro-hydraulic lock may be removed by actuator 108 moving piercing mechanism 117 in response to the output from on-board electronics 112 based on the predetermined signal detected by sensor 110 thereby causing it to break (*e.g.*, rupture, puncture, and/or perforate) rupture disk 114, as shown in Figure 1B. The oil may evacuate hydraulic

chamber 116 upon the breaking of rupture disk 114 creating a pressure imbalance that causes sleeve 106 to transition from the closed position to the open position. Alternatively, in certain embodiments, electronic initiator sleeve 100 may comprise a valve connected to hydraulic chamber 116 that holds sleeve 106 the closed position while the valve is closed. In such embodiments, actuator 108 may open the valve in response to the output from on-board electronics 112 based on the predetermined signal detected by sensor 110 thereby causing the oil to evacuate hydraulic chamber 116. A pressure imbalance may result causing sleeve 106 to transition from the closed position to the open position.

In other embodiments, electronic initiator sleeve 100 may comprise a compressed spring connected to sleeve 106 and actuator 108 that holds sleeve 106 in the closed position when compressed. In such embodiments, actuator 108 may release the compressed spring in response to the output from on-board electronics 112 based on the predetermined signal detected by sensor 110 thereby causing sleeve 106 to transition from a closed position to an open position. In other embodiments, electronic initiator sleeve 100 may comprise a baffle connected to sleeve 106, and actuator 108 may be coupled to a valve. In such embodiments, actuator 108 may open the value in response to the output from on-board electronics 112 based on the predetermined signal detected by sensor 110 causing a ball to be released down the closed wellbore. The ball may contact the baffle thereby causing sleeve 106 to transition from a closed position to an open position.

In other embodiments, sleeve 106 and actuator 108 may be coupled to one or more motors. In such embodiments, actuator 108 drive the one or more motors in response to the output from on-board electronics 112 based on the predetermined signal detected by sensor 110 thereby causing sleeve 106 to transition from a closed position to an open position. In other embodiments, sleeve 106 and actuator 108 may be coupled to one or more pumps. In such embodiments, actuator 108 drive the one or more pump in response to the output from on-board electronics 112 based on the predetermined signal detected by sensor 110 thereby causing a fluid to be pumped into the closed wellbore. The fluid may cause the sleeve 106 to transition from a closed position to an open position. The electronic initiator sleeves, systems, and methods of the present disclosure may utilize any combination of the foregoing embodiments to transition sleeve 106 from the closed position to the open position.

In certain embodiments, as shown in Figure 1A, electronic initiator sleeve 100 may also comprise one or more shear pins 118. In such embodiments, shear pins 118 may shear or break once the pressure inside electronic initiator sleeve 100 reaches a predetermined pressure. The