In cognitive sensor networks, achieving consensus among the sensor nodes without requiring centralized control is an important attribute that can enable quick and reliable network decisions. Existing efforts in this area have mostly been devoted to accelerating the consensus rate when desired the consensus value is known. In this study we proposed an approach that each individual node determines its consensus state by looking at its own state gradient. That is, only local knowledge is required. We show that a good estimate of the consensus value can be obtained with much less iteration that this approach is robust to topology variety and link failures. We have developed a criterion that requires fewest iterations for a given topology and have shown criteria is also influenced by the desired consensus precision. This method has the potential to significantly improve the energy efficiency of reaching consensus in distributed systems. Numerical simulations show the good performance of the proposed method and hardware implementation has shown that the approaches are practically realizable.