The GPS Analysis and Positioning Software (GAPS) is a GPS precise point positioning (PPP) application developed at the University of New Brunswick (UNB). GAPS exists in two forms: a web-based positioning service, to which users can upload GPS observations to be processed, and a command-line executable version, which can be used to process large amounts of GPS data in a fast and convenient manner. The objective of this paper is to review the PPP approach, specifically the approach used in GAPS; to review the modelling options available to the user through the online interface and the impact these have on position results; to assess the accuracy and precision of GAPS by processing a global network of IGS stations for a period of several years; and to assess the achievable internal consistency and accuracy of GAPS by comparing the results with external sources and similar evaluations encountered in the literature. Results obtained indicate that GAPS compares favourably with other state-of-the-art PPP software.