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PLUG-AND-PLAY TECHNOLOGY FOR SPACECRAFT CONTROL SYSTEM

Abstract

The plug-and-play (PnP) satellite control system is the important supporting technology to implement operationally satellite platform. The PnP satellite is a modularized one, which has open standard interface. It is composed of self-describing components, and can be auto-configuring. By designing of general interface and PnP modular, the standardization of component and subsystem can be implemented. A satellite can be simply and rapidly assembled with these standardized components, so as to form a set of PnP components and subsystems, which can be commercial off the shelf. Therefore, the main task of satellites designer is to properly combine all kinds of modularized and general components. It is just similar to the assembling of a computer through plugging different independent components together, and finally developing a satellite only cost several days. The design scheme of a kind of PnP fast-assembling satellite control demonstration system was proposed in this paper. The overall architecture of the system was introduced. The on-board computer simulator, the PnP modular and the host computer software were designed respectively. And the PnP time series of satellite control system devices was also described. The proposed PnP satellite scheme can extremely reduce the time of coordination, development and integrated test, cut down the cost of satellite development, and enhance the reliability of spacecraft, so as to lay a good technology foundation for the development of micro-nano satellite and operationally responsive spacecraft.