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New RPC Link System Remote Programming for the CMS Phase 2 Upgrade

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The CMS Phase 2 Upgrade has been decided to upgrade most of its subsystems. These subsystems will be modified with brand new electronics, and in some cases, some will install the new version of detectors. Based on this idea, the RPC subsystem plans to upgrade the electronics of the present RPC chambers in the η region up to $|\eta| < 1.9$ and install the new version of improved RPC chambers in the high η region. Installation of the new RPC Backend electronics that support both electronics in these two regions has also been foreseen for the Phase 2 upgrade. The main focus of this work is to explain how the electronics of the present RPC chambers, known as the Link System, will be reprogrammed remotely. This electronics will be installed on the balcony of the CMS in the UXC cavern, and during the experiment run, no one will have access to it. As a result, developing a system that can remote program safely and flashback to its main original golden configuration in an unstable condition is mandatory. This work will explain how this remote programming procedure works, how it has been implemented into the new Link System Control Board, and how the new Slow Controller emulator handles these chains.

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