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Design considerations for CERN's second-generation Beam Interlock System

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The Beam Interlock System (BIS) is the backbone of the machine protection system throughout the accelerator complex at CERN, including the LHC. The present BIS needs to be upgraded to ensure the required level of dependability and maintainability for the lifetime of the HL-LHC, which is planned to become operational in 2029. The present BIS, designed more than 15 years ago, has proven its reliability but is becoming obsolete and can no longer be deployed in new installations. In this paper we present the progress towards the deployment of a new beam interlocking solution for the CERN accelerators, including several identified new requirements for the HL-LHC. The prototypes of the main interlock boards have been produced and the first tests to validate their functionality were conducted and are described in detail.

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Footnotes

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Yes

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