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## Development of a full-scale readout for the active scintillator layers of the HGND detector at the BM@N experiment

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The BM@N experiment, located at the Nuclotron facility in Dubna at the Joint Institute for Nuclear Research (JINR), is a fixed-target experiment designed to investigate heavy ion collisions at beam energies up to 4 A GeV. A novel Highly Granular Neutron Detector (HGND) is being designed and constructed for the experiment to measure neutron spectra and yields using time-of flight method in the kinetic energy range of 0.5–4 GeV. These observables will be very important to study contribution of symmetry energy in the equation of state of dense nuclear matter. The high granularity of this detector is crucial for accurate neutron identification and represents the main design challenge of the HGND. The detector is constructed as a layered structure composed of copper absorbers and readout layers, each containing an 11x11 grid of plastic scintillators, along with a Multi-Pixel Photon Counter (MPPC) based board and an LED calibration board. Multi-Pixel Photon Counter (MPPC)-based board and an LED calibration board. This work details the design, production, and testing of these boards, as well as the progress on the mechanical fixtures and support structures required for the assembly of the detector.

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