BL32B2
R&D-BM

1. Introduction

BL32B2 is allocated to the R&D beamline for facility-related problems and challenges, which are relevant to a bending-magnet beamline. This beamline was rebuilt and restarted along with two experimental hutches (EH1 and EH2) in FY2018. Thereafter, BL32B2 has undergone the following updates: the replacement of the counter/timer module and the pulse motor–driving system (FY2019), the installation of a flight tube-retracting mechanism in EH1 to facilitate the handling of a huge tube (FY2019), and the introduction of SPEC software for instrument control and data acquisition (2020).

The optics consist of two transport-channel slits: a SPring-8 standard double-crystal monochromator and a pair of total-reflection mirrors. To utilize high-energy X-rays, a net plane of a silicon-crystal pair can be switched from Si(111) to Si(311). Two types of mirror coating, platinum, and rhodium, are available to eliminate higher-order harmonics. In addition to a mirror-bending mechanism for vertical focusing, the cylindrical shunt can be selected on the second mirror for horizontal focusing. EH1 is dedicated to R&D studies and has dimensions of 5.0 m (W) × 3.0 m (D) × 3.3 m (H). An optical bench is placed inside this hutch. It accommodates six XY carriers and five Y carriers, which can load user test benches. An 8-channel counter/timer module (CT08-01E) can count at rates up to 300 MHz for FAST NIM and 100 MHz for TTL. Ionization chambers, high-speed transimpedance amplifiers, voltage-to-frequency converters, and high-voltage power supplies are also provided to users. A 16-channel pulse motor controller (PM16C-16) can run all subordinate motors simultaneously. The default setting is 16 Type-II pulse motor driver units. Four Type-I pulse motor driver units can be used if necessary. Motor cables are wired into the hutch and have a TRIM TRIO connector (8P socket plug type) on the motor side. A GPIB instrument control device (GPIB-ENET/1000) intermediates between the SPEC and legacy instrument components. EH2 is now devoted to the RISING3 Project of NEDO and Kyoto University. The beam path in EH1 should be bridged by a wide-bore vacuum flight tube during experiments at EH2, which means that the long-term installation of any equipment in EH1 is prohibited.

2. Recent activities

In 2021, the beamline interlock system was upgraded. The new interlock system can hold the remote mode beyond the experimental hutch opening and closing, which made it unnecessary for users to activate the remote mode by manual operation on a graphic control panel. The MBS button is not displayed on the graphic control panel in USER MODE to prevent an erroneous operation (see Fig. 1). It will appear only when MBS is ready for opening operation. Furthermore, an active experimental hutch can be switched on the new interlock system without closing MBS (see Fig. 2). These new features contribute to enhancing the thermal stability of the monochromator.

Several R&D studies were carried out at EH1 for the performance improvement of a two-

dimensional detector and a monochromator crystal cooling system. Alternatively, various user experiments were conducted at EH2 for investigations on battery science by NEDO and Kyoto University.

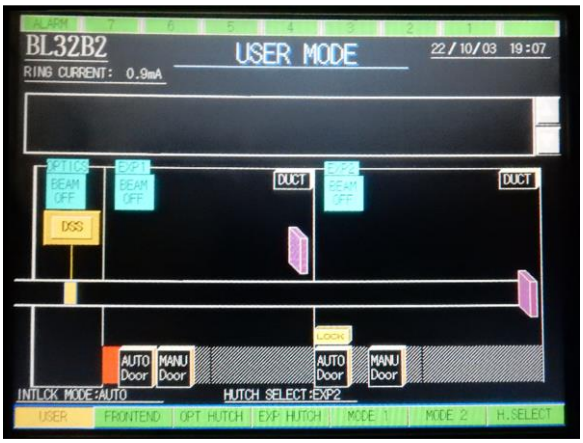

Fig. 1. Appearance of a graphic control panel for USER MODE. The MBS button is not displayed to prevent an erroneous operation.

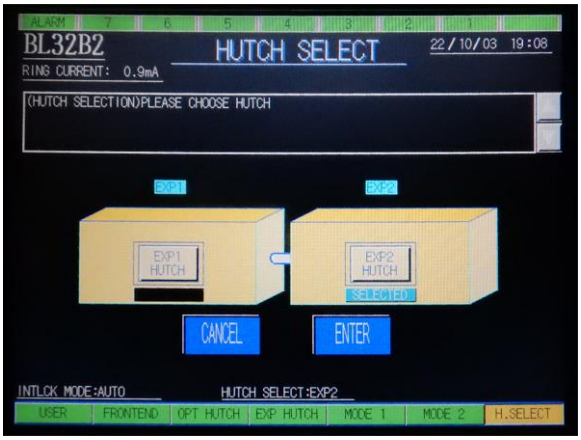

Fig. 2. Appearance of a graphic control panel for HUTCH SELECT. Users can switch the active experimental hutch without closing MBS.

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