CONTROL SYSTEM FOR THE LITHIUM BEAM EDGE PLASMA CURRENT DENSITY DIAGNOSTIC ON THE DIII-D TOKAMAK*

J.J. Peavy, W.P. Cary, D.M. Thomas, D.H. Kellman, D.M. Hoyt,
S.W. Delaware,* S.G.E. Pronko,† T.E. Harris‡
General Atomics, Fusion Group, P.O. Box 85608, San Diego, California 92186-5608
*General Atomics, Photonics Division, San Diego, California 92186-5608
†Archimedes Technology Group, San Diego, California
‡General Dynamics, Waltham, Massachusetts
Joel.Peavy@gat.com

An edge plasma current density diagnostic employing a neutralized lithium ion beam system has been installed on the DIII-D tokamak[1]. The lithium beam control system is designed around a GE Fanuc 90-30 series PLC and Cimplicity® HMI (Human Machine Interface) software. The control system operates and supervises a collection of commercial and in-house designed high voltage power supplies for beam acceleration and focusing, filament and bias power supplies[2] for ion creation, neutralization, vacuum, triggering, and safety interlocks. This paper provides an overview of the control system, while highlighting innovative aspects including its remote operation, pulsed source heating and pulsed neutralizer heating, optimizing beam regulation, and beam ramping, ending with a discussion of its performance and a presentation of results.

*Work supported by U.S. Department of Energy Contract No. DE-AC03-99ER54463.

J.J. Peavy
General Atomics
P.O. Box 85608
San Diego, CA 92186-5608
(858) 455-4734
Fax (858) 455-3569
e-mail: Joel.Peavy@gat.com

Prefer:
Oral
✔ Poster

Topic Category: Diagnostics and Data Acquisition

[1] D.M. Thomas, et al., "Prospects for edge current density determination using LIBEAM on DIII-D," Rev. Sci. Instrum. **72**, 1023 (2001)

[2] S. Delaware, et al., published in the "Proceedings of the Fourteenth Topical Meeting on the Technology of Fusion Energy," Vol. 39, No. 2, Part 2, 1126 (2000)