A secure remote access system for users of the UMCG-PARTREC accelerator

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Recent geopolitical and health crises have highlighted the need to provide accelerator users with the means to perform experiments with minimal in situ personnel. At UMCG-PARTREC, a user-friendly system was developed to provide online access to irradiation controls (beam on, fluence, energy, etc) without compromising the IT system's security.

The system is composed of a Python server residing in the restricted accelerator network, which can receive user commands as text strings and interact with the pre-existing LabVIEW irradiation control system. Users do not have direct access to this network and can only communicate with the server over a serial connection. Due to its simplicity, the attack surface of said connection is minimal.

Users are given a client device (optionally their own laptop) that connects to the serial interface and exchange text strings with the server. The client is connected to PARTREC's unprivileged network and can be accessed via VPN. Camera feedback from the irradiation room and a non-interactive screen grab of the control system are available on the client.

The remote access system is available on request. New features and a GUI will be added based on interest.