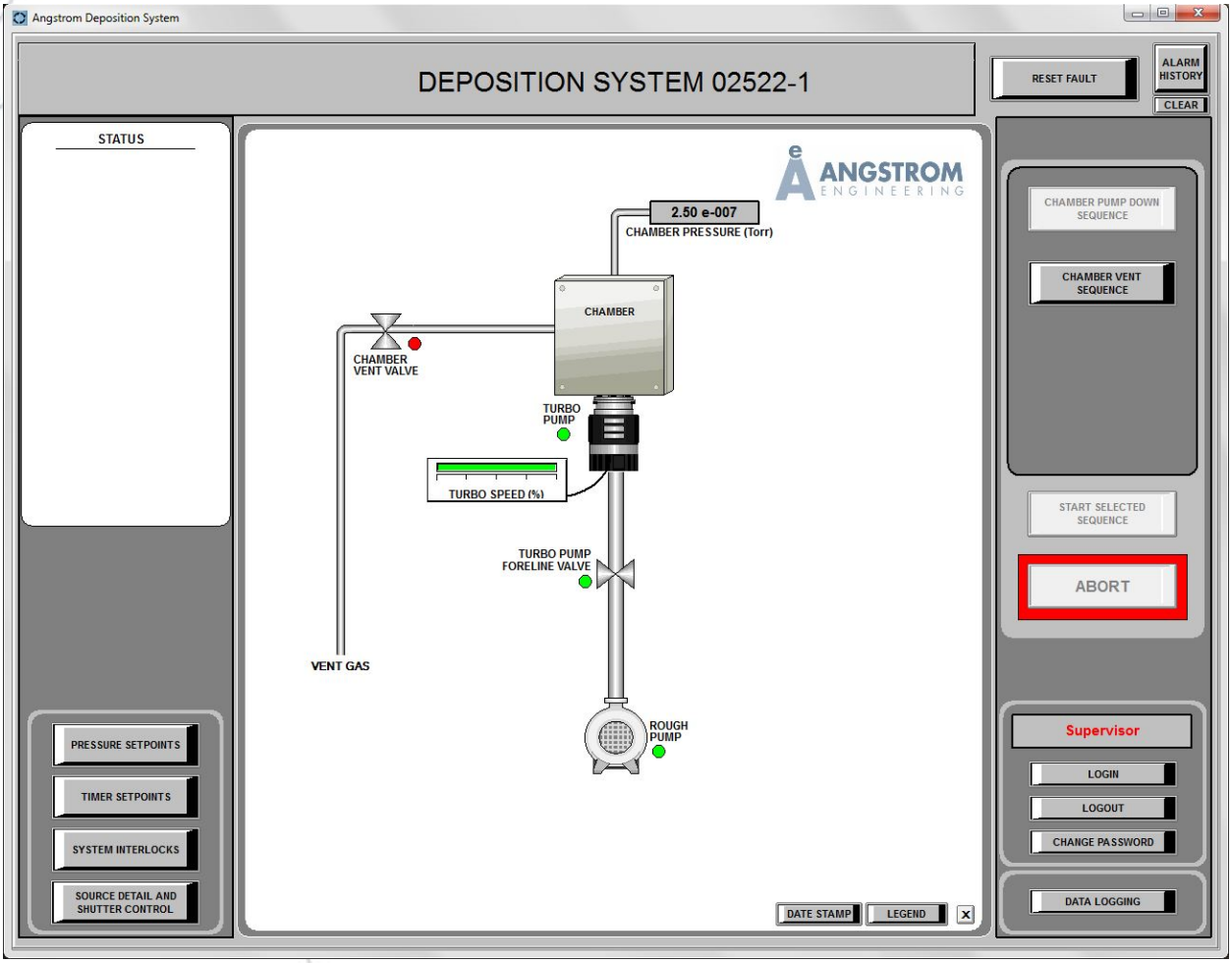
Chapter 1 – System Control Overview

Welcome to your Angstrom Engineering Nexdep vacuum deposition system manual. The following pages cover all aspects of the operation of this system.



Shown above is the control software main page where all machine control is available except for deposition control. Deposition control is handled by the Inficon deposition software which opens as a separate program. See Chapter 4 – Depositing Materials for information on the Inficon deposition software.

The control software is windows based and serves as the user interface for the SCADA software which in turn communicates with the system PLC. The PLC code allows the SCADA (Supervisory Control And Data Acquisition) software to control all of the system's basic functions. Examples of these functions include powering solenoids to opening and closing valves, controlling contactors and relays to turn on pumps and motors, and receiving input from gauges, switches and other items that provide feedback. The user, through the SCADA software, activates automated sequences programmed into the PLC for chamber pumping, venting, and other routines.
The main page is constructed of many small windows. These include the alarm window at the top of the screen, the Status window on the left side of the screen, and the main system schematic with all of the manual controls in the centre. Other buttons open windows to display the system interlocks, the source detail and shutter controls, setpoints pages and the login and logout windows. Abort and reset fault buttons are also on the display. All of the system operations and functions are explained in detail throughout the next few chapters of this manual.

The PLC or Programmable Logic Controller executes a program of commands and sequences, which in conjunction with the SCADA software allow the user to operate and control the system. The SCADA software communicates with the PLC through a serial cable from the PC. The PLC program is stored in the PLC memory and is not affected by the system PC. Once the system is running, the PC can be turned off without affecting operations in the PLC. If the computer must be rebooted for any reason or if it needs repair, it can be turned off and even removed for periods of time. However, if an alarm occurs in the system and the PLC takes appropriate action, the user will be unable to react to the alarm unless the SCADA software is running on the PC.

Electron Beam Source and Power Supply Safety Overview

At Angstrom Engineering operator safety is a primary concern. This Electron Beam system is equipped with a power supply capable of producing up to 8000 volts DC. This voltage level is potentially fatal.

> NOTE: Please consult the Telemark Cheetah TT Series Electron Beam Power Supply Manual, which is included in electronic format in this manual, for important operator safety information. It is imperative that all operators review the safety information in this and the Telemark manual before attempting to operate this system. Also note that the grounding in place is a requirement for the safe operation of the power supply. Please consult with Angstrom Engineering Inc. before tampering with or servicing any ground connections.

The high voltage power supply is mounted in the system frame and warning labels have been applied to the cabinet exterior panels to warn of the presence of deadly voltages. If any troubleshooting is required inside the cabinet it is a requirement that the main system input power disconnect is open. Please consult Angstrom Engineering before any electrical work is to be performed within the cabinet.

Various interlocks have been implemented to ensure operator safety. The high voltage power supply input power is interrupted when either of the chamber doors is opened. A number of water and vacuum interlocks must also be met in order for the power supply output to be enabled. Tampering with or overriding any interlock or safety device voids all warranties, and endangers the health and safety of all operators.