The internal module diagram of target area manager and viewer are shown in Figure 9. The target area manager sets the target area in the mobile sensor network field. When a user draggs the mouse to set the target area that requires observation, the manager saves and manages the coordinate. And it sends the information on the target area to the node manager to ensure that sensors are created and operated within the target area. Then, the information is sent to viewer broker in order to visualize the target area in MSNS.

Coordinate system manager of the viewer replaces target area of the target area manager and sensor of the node manager with MSNS screen coordinate based on the map coordinate that is set in the map layer manager. When map object is set by the map layer manager, map coordinate system is set by the boundary box. Screen coordinate system is set according to the size of view panel. If the screen coordinate system and the map coordinate system are set, the number of coordinate converters is calculated for conversion of the two systems, which enables a free conversion of MSNS screen coordinate and the GML map coordinate. The coordinate converter changes the screen coordinate to the map coordinate when a user sets the target area in the mobile sensor network field. And it changes the map coordinate to the screen coordinate when the map, the target area and the sensors are visualized in MSNS.

![Figure 9. Module Architecture of Target Area Manager and Viewer](image)

5. Implementation of Mobile Sensor Network Simulator

Figure 10 shows the initial screen and each control function of MSNS. Components of MSNS are as follows: toolbar; configuration panel, which has internal properties of sensor and provides information such as sensing coverage; status panel, which shows various information when MSNS is in operation; and viewer, which provides the GML coordinate information and status information of sensors. The toolbar consists of the add button to