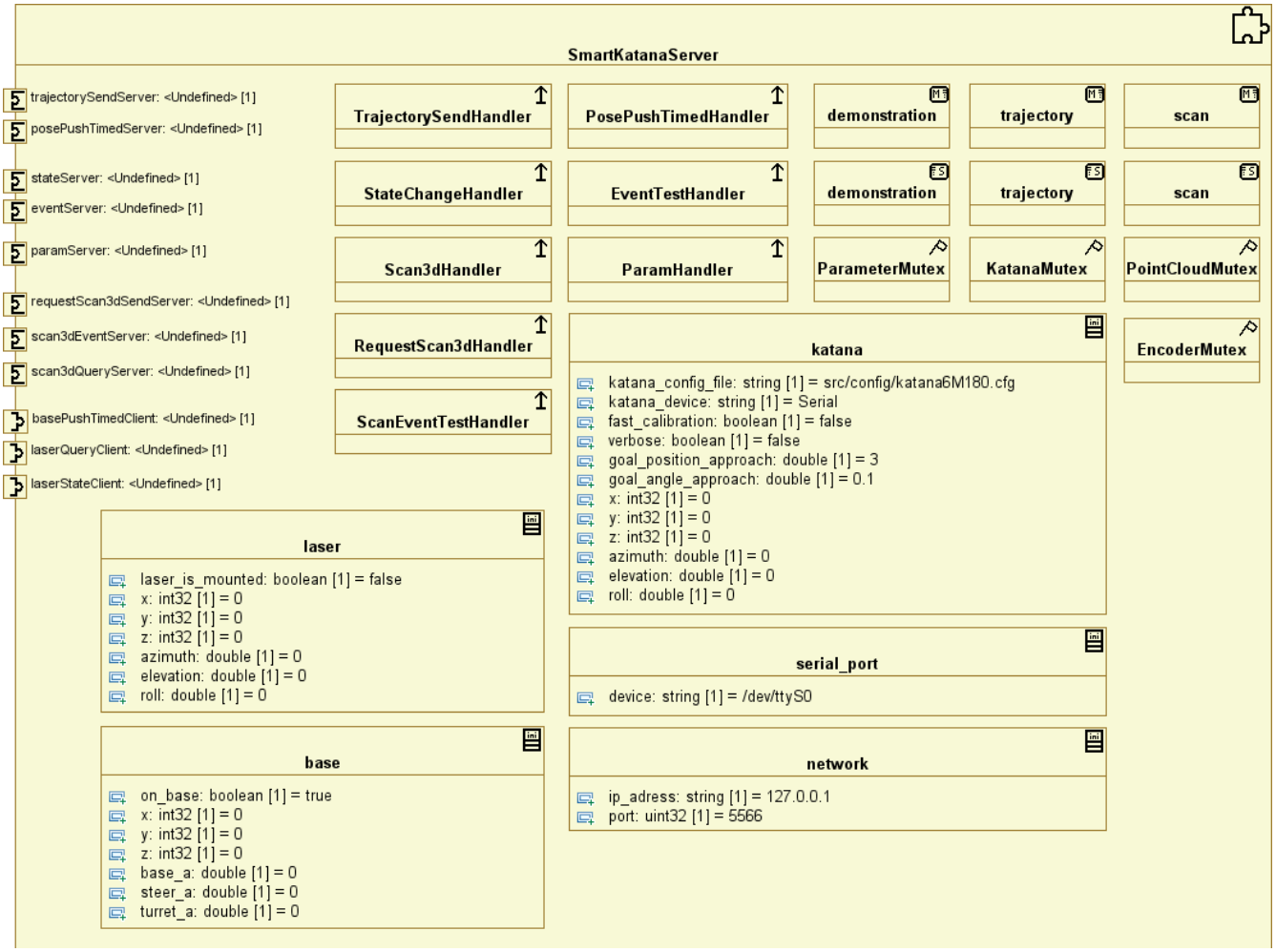
SmartKantaServer

This component controls a Katana manipulator. It is possible to perform trajectories consisting of a sequence of points. The arm can also be set to demonstration where it is possible to move the arm by hand. Further, if a laser ranger is mounted on the Katana, it is possible to request a 3d laser scan, which is then captured by the component.



States

The component has four states “neutral”, “trajectory”, “demonstration”, “scan”.

- In “neutral” state the Katana does not perform any trajectory. Although the posePushTimedServer is stopped.
- In “trajectory” state given trajectories are performed by the Katana.
- In “demonstration” state the Katana deactivates its motors, so that the arm can be moved by a person. It is important to bring the arm in a save position before the state change, so it does not fall down on the robot.
- In “scan” state and if a laser ranger is mounted on the Katana it is possible to capture 3d point clouds by the manipulator.

Parameters

Possible parameters are:

- TRAJECTORY: all poses of the trajectory are used.
- SINGLE_POSE: only the first pose of the trajectory is used.
- The velocity limit of all joints can be set.
- The velocity limit of the gripper can be set.

Server Ports

trajectorySendServer

SmartSendServer

- commObject: CommManipulatorTrajectory
- serviceName: performTrajectory

If the component is in “trajectory” state, a new trajectory (one or more points) which is send to the Katana is performed. The trajectories are stored in a queue. The next trajectory is performed if the last point from the current trajectory is send to the Katana. The component does not wait until the Katana reaches the last position, but it fires an event. (see eventServer)
The poses of the trajectory must be given in the robot coordinate system.

posePushTimedServer

SmartPushTimedServer

- cycle: 100 ms
- commObject: CommMobileManipulatorState
- serviceName: currentPose

The current pose of the manipulator (tcp pose, angles, …) is pushed to all clients which are interested. In “trajectory” state when a dense trajectory is performed the poses of the given trajectory are pushed if the Katana is occupied by the move command. In “demonstration” state the current pose is always read from the Katana.

stateServer

SmartStateServer

- serviceName: stateServer

Allows to switch between the described states.

eventServer

SmartEventServer
- eventParameter: CommManipulatorEventParameter
- eventResult: commManipulatorEventResult
- serviceName: eventServer

Returns information such as “Goal reached”, “Collision”, “No Solution Found”, “Value out of Range”.
- The “Goal reached” event is fired when the arm reaches the position specified by the last trajectory.
- A “Collision” event is fired when the arm collides with an obstacle.
- The “No Solution Found” event is fired if the given tcp pose is not reachable by the Katana.
- The “Value out of Range” event is fired if an angle specified in a trajectory is not reachable by the Katana.

paramServer

SmartParameterServer
- commObject: CommManipulatorParameter
- serviceName: param

Allows the parametrization of the component.

requestScan3dSendServer

SmartSendServer
- commObject: CommManipulatorRequestScan3d
- serviceName: request3dscan

If the component is in “scan” state and a laser ranger is mounted on the manipulator, it is possible to request a 3d laser scan. The scan is then performed in the specified area and if the scan is finished an event is sent.

scan3dEventServer

SmartEventServer
- eventParameter: CommVoid
- eventResult: CommManipulatorId
- serviceName: newScan

If a new 3d laser scan was captured an event with an id is fired. The id allows to get the 3d point cloud from the component.

scan3dQueryServer

SmartQueryServer
- commRequestObject: CommManipulatorId
- commAnswerObject: Comm3dPointCloud
- serviceName: 3dscan

A 3d point cloud for the specified id is returned. The component only saves the last point cloud. If the id of the last point cloud is different from the requested one, an empty cloud is returned.

Client Ports

basePushTimedClient

SmartPushTimedClient
- commObject: CommBaseState

Connect this client service to the base component on which the manipulator is mounted on.

laserQueryClient

SmartQueryClient
- commRequestObject: CommVoid
- commAnswerObject: CommMobileLaserScan

If it should be possible to capture 3d laser scans a laser must be mounted on the last joint of the Katana. Connect this client service to the component that is responsible for this laser ranger.

laserStateClient

SmartStateClient

If it should be possible to capture 3d laser scans a laser must be mounted on the last joint of the Katana. Connect this client service to the component that is responsible for this laser ranger.