Registering for AL Confirmed Services may be necessary e.g. in following cases:

■ Servo Drive with use of Distributed Clock (Synchronization)

In Motion Control appliances it is of utmost importance that all devices work synchronized. Therefore drives often use a Phased Locked Loop (PLL) to synchronize their local control loop with the bus cycle. Before this has not happened, the device is not allowed to proceed to OPERATIONAL (see reference #6). Using AL Confirmed services, an application can delay the start up process and synchronize their local control loop first. After the local PLL has "locked in", the device may proceed to OPERATIONAL.

■ CoE Slave with dynamic PDO mapping

CoE Slaves with dynamic PDO mapping allow a flexible arrangement of process data. The master configures the layout of the process data which the slave has to transmit during cyclic operation. Therefore CoE Slaves often delay the transition to SAFE_OPERATIONAL and set up copy lists before eventually proceeding to the requested state. This approach allows the slaves just to process the copy lists in cyclic operation, regardless to the configured mapping, which is very fast.

When using LFW or SHM API, AL Confirmed Services are based upon a packet mechanism. For registering the service use **ECAT_ESM_SET_QUEUE_CNF_AL_CONTROL_REQ**. To unregister use **ECAT_ESM_CLR_QUEUE_CNF_AL_CONTROL_REQ.**

After registering for AL Confirmed Services, the stack informs an application via **ECAT_ESM_ALCONTROL_CHANGE_IND** packet each time when a master has requested a state change of the ESM via AL Control register (0x0120). The stack will remain in the current state until the application triggers a state change via **ECAT_ESM_ALSTATUS_CHANGE_REQ**. This enables an application to delay or even interrupt a state change. Furthermore it can signalize errors to the master using AL Status Codes (again see reference #6).

There will no indications be sent when switching downwards, for instance when switching from Operational down to Init state.