

# INKLESS ASSEMBLY

KINESYS is best known for ALPS (Assembly Line Production Supervisor). First introduced in 1995, ALPS is the industry's leading wafer map data management and equipment integration software product for inkless assembly. ALPS will:

- ❑ accept any wafer map format, including the new SEMI G85 Map Data Format,

- ❑ work with any SECS II-capable die bonder,
- ❑ support all production steps from wafer sort to die attach (probe/test, mount, inspection and die attach)
- ❑ integrate with existing equipment/systems

One particular challenge presented by inkless assembly is the reliable routing of wafer maps to the destination at the assembly site and their translation into a format that can be used by the assembly equipment. The ALPS Sort feature allows maps to be automatically retrieved from any number of wafer sort areas around the globe. The maps are immediately translated and validated by one of more than 100 format converters now supported by ALPS that are ready to be delivered, on demand, to the assembly equipment.

To reduce the continued proliferation of map formats, KINESYS played a leading role in developing the [SEMI G85 Map Data Format](#) standard, which was approved in late 2001. Until SEMI G85 is widely adopted, however, ALPS will continue to accept any wafer map format.

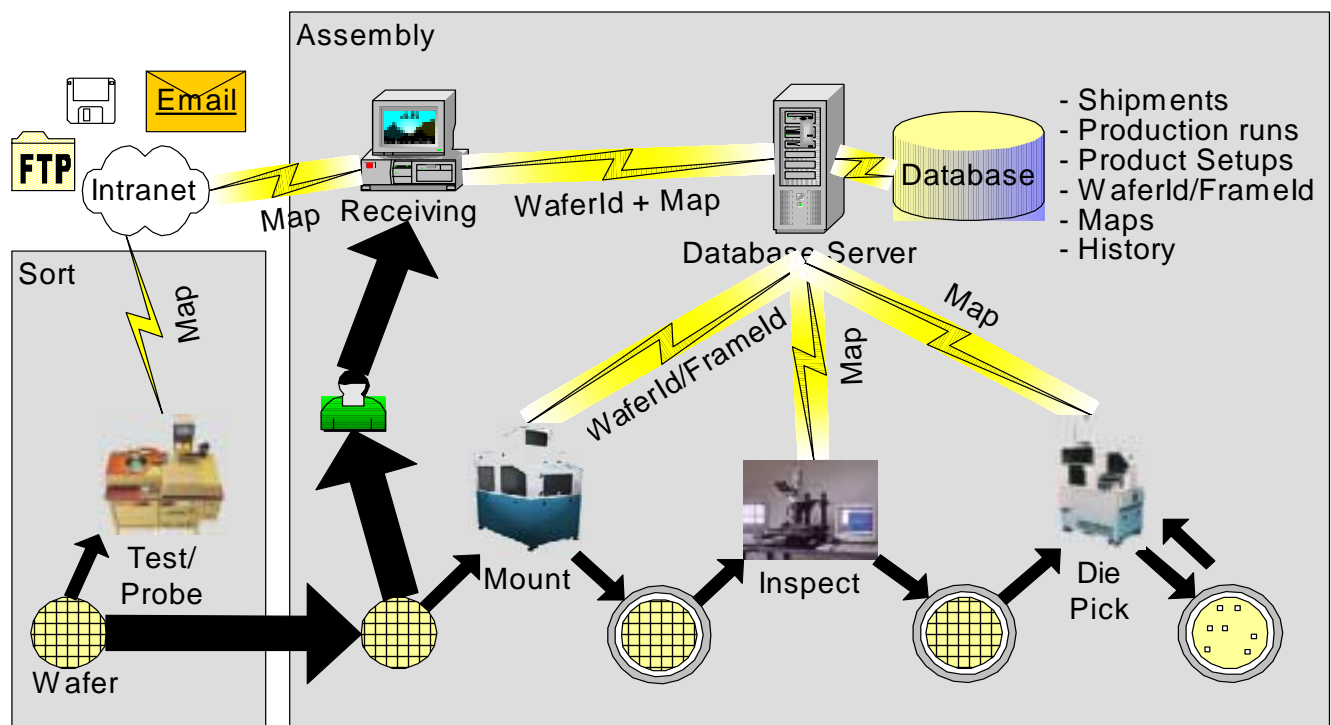


Image Courtesy of KINESYS Software

ALPS performs the crucial process of automatically matching wafers to their maps, as they are received at assembly from probe, and notifies the appropriate personnel in case a map is missing or contains an error. ALPS automatically identifies product that is not yet qualified for production and again notifies the appropriate personnel with the steps that must be taken to resolve the situation.

ALPS communicates with production equipment (such as wafer probers, wafer mounters, visual inspection stations, die pick equipment), human users (equipment operators, production planners, etc.) and proprietary or commercial manufacturing execution systems (MES).

Information is collected from production equipment, human users and proprietary or commercial MES, combined and stored in the ALPS relational database. It then is made available on request by the human users to support efficient, error-free and traceable production. Information processed includes wafer maps, sort lots, assembly lots, wafer-to-frame relationships, device-level material tracking, etc.

## IMPORTING MAPS FROM WAFER SORT

The first problem faced by most inkless assembly projects is how to interpret the map data from wafer sort. This data is provided typically in a set of files in a format that is either specific to the equipment that generated the map, or specific to the wafer manufacturer. These formats, while similar, are all different and incompatible with one another. ALPS resolves this problem by having a large and growing library of [format converters](#) (>100 to date). New formats are developed as a free service to customers. The customer only has to send some sample maps and a specification of the format and a converter for that format is returned, either immediately if the converter is already available, or within a few days. Once the converter is installed maps in that format can be imported and made available to all equipment connected to the ALPS system.

## INTERFACING TO EQUIPMENT

ALPS has been qualified to work with many different equipment models from a wide range of manufacturers. The equipment drivers for all [qualified equipment](#) are included with the product free of charge.

Equipment vendors should contact us to find out how to add their equipment to the qualified equipment list. This basically entails implementing the [SEMI SECS II](#) Stream 12 Wafer Mapping messages. See the [ALPS SECS-II Die Pick Interface](#) for a detailed description of the messages required.

When a customer wishes to connect ALPS to an equipment that is not on the qualified list, Kinesys will enter into an agreement with the equipment vendor in question to develop a driver for that equipment and subsequently support ALPS with that equipment. That way the end user can be assured of a smooth integration and ongoing support from both Kinesys and the equipment vendor.

## INTERFACING TO THE FACTORY AUTOMATION SOFTWARE

ALPS has been carefully designed to allow integration with other factory automation software. A message router that will pass all non-ALPS related GEM/SECS messages to another factory application. GEM/SECS compliant factory applications can therefore share the equipment interface with ALPS without modification.

ALPS API offers a direct interface between ALPS and the factory system. Beyond the technical aspect of integration with such systems, it is crucial that Kinesys has an effective working relationship with the systems integrator in such projects. To this end we are establishing relationships with the leading integrators in the semiconductor industry. Please [contact us](#) to discuss how we might work with your team or selected system integrator to integrate ALPS into your existing or planned inkless assembly system.