ROBOTICS

# Dynamic Assembly Pack

## Compliant real-time vision for assembly tasks on moving & unstable targets

Dynamic Assembly Pack enables automating assembly processes in continuous movement, for any transport system despite irregularities and uneven floors that result in shaking and vibrations. And with maximum flexibility to cope with any variant.

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01 Dynamic Assembly Pack examples for cockpit and door assembly

So far, automated assembly tasks in lines in the continuous movement has been very difficult due to the inherent instabilities of the movement. It was only possible in very limited cases, with high assembly tolerances and using vision. The new functionality opens the possibility of automating many more applications with the car-body in movement and without having to change the current layouts dramatically.

Although the Automotive Industry is the market where is currently mainly addressed, the **Dynamic Assembly Pack** allows to perform assembly tasks in any case marker/segment /Industry, like logistics, for instance, where the target is unstably moving.

**Innovating technology**
To assemble parts to moving car bodies, a particular type of vision with additional capability is required: continuous vision tracking to cope with movements, irregularities, and vibrations.

Realtime Vision allows robots to continuously adapt their movement to a sequence of vision-captured reference images, with a frequency of captures ranging between 20-50 per second.

Real-time Vision uses feedback information from a vision sensor to compensate for movements and vibrations. Instead of moving according to a programmed path, the robot's movements are guided by the information provided by the vision sensor(s) through **EGM** (External Guided Motion).

In addition to EGM, ABB robots use the **Integrated Force Control** sensor. By using it, the robot adapts its movements based on force and torque inputs resulting from contact with a car body (compliant mechanical behavior). The sensor is normally installed between a tool and the robot's wrist.

The combination of inputs provided by Real-Time Vision and Force Control makes robots behave emulating the human operator way of performing assembly tasks.

**Cost savings**
Costs are a critical in automotive industry.Automation can reduce costs increasing. competitiveness level of the Automotive companies.

**Ergonomics & Quality**
Very hard and exhausting tasks for operators like overhead operations.

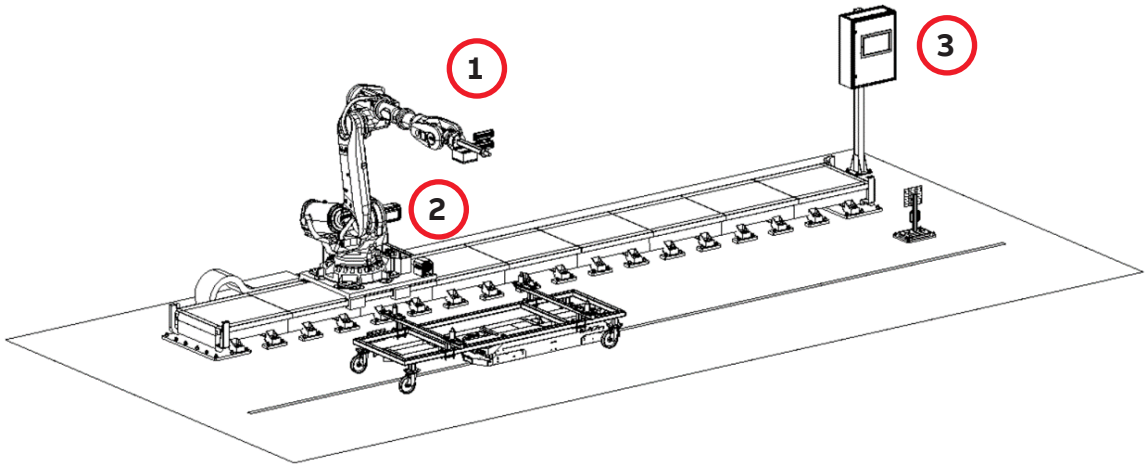
Lack of ergonomics use to affect the quality is independent from dexterity of each operator.

**Dynamic Assembly Pack**
The Dynamic Assembly Pack may include two independent modules:

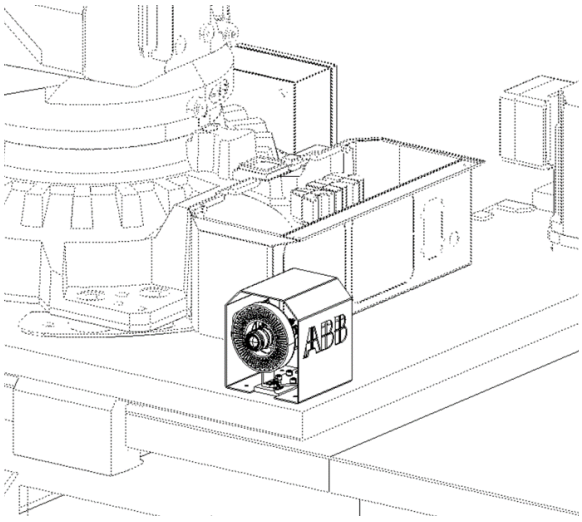
- Universal Vision Tracking (1)
- Compliant Vision Guidance (2)

Depending on application case, only Universal Vision Tracking (UVT) or both modules will be required.

A cabinet hosts the vision computer (3) and has also the operator panel function through its HMI located on the door.



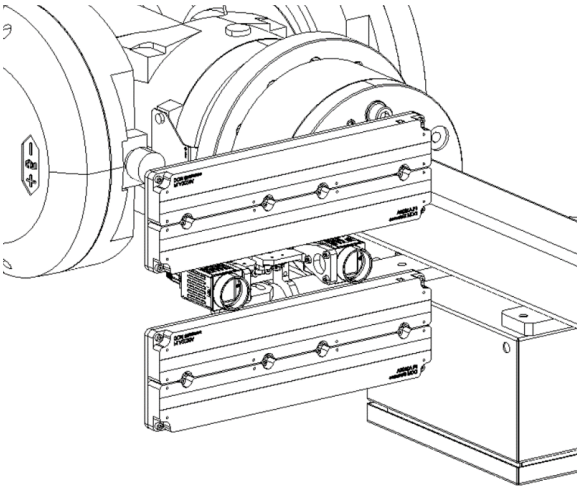

## Universal Vision Tracking (UVT)




The Universal Vision Tracking (UVT) synchronizes the robot movement with the transport system that carries the target object (e.g.: car-body).

In some application cases, without high accuracy requirement, only this module may be required to complete the task.

## Compliant Vision Guidance (CVG)



The Compliant Vision Guidance (CVG), with one or two cameras embarked on the robot tool, taking captures in a range of 30-40 Hz, compensates residual deviations over the pseudo static environment achieved by the UVT.

The combination of vision guidance and compliant behavior provided by Integrated Force Control, permits to perform the assembly task despite the moving unstable environment.

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