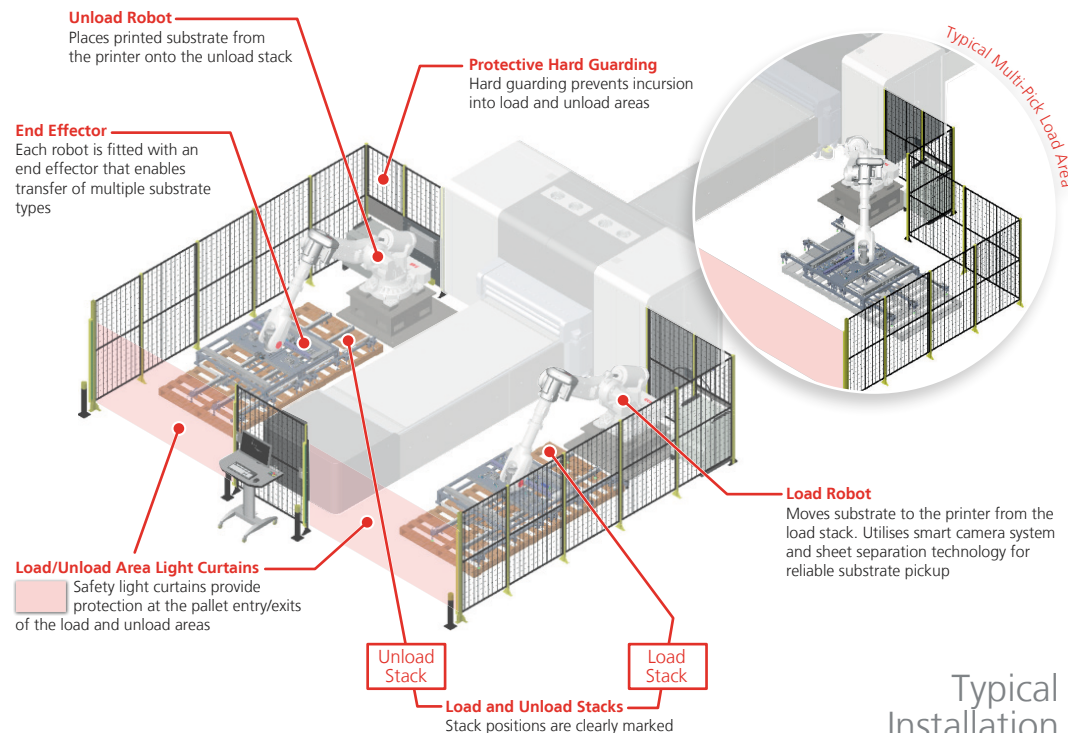


# Robotic Substrate Handling System

## Full Automation Dual Robot



Typical  
Installation  
Single Pick, Short Edge Access

## Why choose a Robotic Substrate Handling System?

### System Configurations

- Non-standard customisation to suit your business needs and market applications is available as a separate solution. The solution will be scoped, costed and proposed accordingly via a consultative project for delivery separate to the standard system configurations available.

### Increased Productivity with Onset X HS

- Automated end effectors, and optimised robot and printer synchronisation minimise job changeover time to maximise productivity with the Onset X HS.

### Range of Load and Unload Options

- Load from a single stack to 1, 2 or 3-up on the vacuum table using the Load robot. Unload from the vacuum table to an uncollated stack using the Unload robot. Multiple stack pick capability available as part of non-standard configuration options.

### Ease of Use

- Range of controls within the user friendly GUI allows optimisation of the material handling from

stack to printer to stack, including precise substrate placement onto the table and unload stack.

### Supports an Array of Substrate Types

- Smart camera system used on the Load effector supports fully automated printing of substrate down to 1.5 mm in thickness. Cameras require the substrate to be either white or brown for detection.
- Optional Load effector upgrades to optimise sheet separation for problematic substrates.
- Semi-Automated operation mode enables printing of a large range of flexible materials using manual loading.

### 'High-5' Option (Double-Sided Printing)

- Fully automated double-sided printing supported by the purchase of the 'High-5' functionality.

### Reliable and Accurate Substrate Placement

- ABB robots have outstanding position repeatability and excellent path accuracy permitting accurate loading to the table and unloading to the stack.

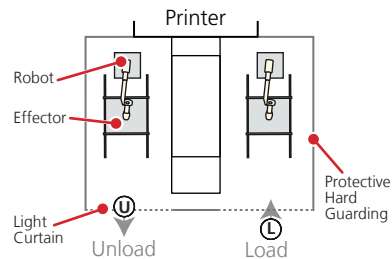
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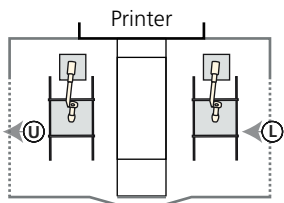
### Technical Specification

#### Standard Configurations

##### Single Pick, Short Edge Access



##### Single Pick, Long Edge Access



Robots	
Manufacturer	ABB Ltd.
Maximum Height <sup>1</sup>	3 m (118.1 in)
Supply	400-480V ±10%; 3-phase and Protective Earth/Ground; 25 A per phase
Energy Consumption	ISO-Cube: 2.85 kW

<sup>1</sup> Maximum operational height when installed using standard 500 mm plinth.

End Effectors (Manufactured by Inca Digital)			
Quantity	1 Load; 1 Unload		
Vacuum Bars	3 per effector (2 adjustable)		
Vacuum Bar Positioning	Automatic (Onset X HS), Manual (Onset X)		
Suction Cups	36 per effector to handle multiple substrate sizes		
Smart Camera System (Load effector only)	Two vertically-mounted digital cameras identify substrate position		
Compressed Air (per effector)	6 bar (88 psi)	Volume (at 6 bar)	1.3 m³/minute
Compressed Air Supply	20 mm diameter push fitting		

Productivity <sup>2,3</sup> (/hr)		Single-sided			Double-sided ('High-5')		
Mode	Finish	Beds	m²	ft²	Beds	m²	ft²
2 pass	Satin	233	1,193	12,841	104	532	5,726
3 pass	Gloss	153	783	8,428	68	348	3,746
4 pass	Satin	201	1,029	11,076	87	445	4,790

<sup>2</sup> Productivity on an Onset X3 HS is based on an approximate material handling time that is suited to the media type, media proximity location via the robot camera alignment, stack height and a relative ink density (RID) of 100% (maximum possible output). The final productivity is also determined by the quality of media, image used, coverage and curing properties which satisfies post print performance.

<sup>3</sup> Final productivity is dependent on the number of picks if utilising the multi-pick option.

Standard Configurations	
Configurations	4 - choice of single or multi-pick with short or long edge access
Footprint	Footprints configuration-specific. Details available on request
Minimum Ceiling Height	4.1 m (161.4 in) for unimpeded 'High-5' operation

Media - Full Automatic Operation				
Maximum Distortion	25 mm (1 in) measured over maximum sheet size on pallet			
Supported Media Types	Check media specification and test performance before printing. White or brown coloured rigid substrates at least 1.5 mm thick <sup>4</sup>			
Corrugated Flute Grades <sup>5</sup>	Micro, E, S, B, C, EB, BC			
Number of Sheets	Single Pick	Single sheet	Multi-Pick <sup>6</sup>	Up to 3 sheets
Maximum Sheet Size	Length (X)	3,220 mm (126.8 in)	Width (Y)	1,600 mm (63 in)
Minimum Sheet Size	Length (X)	805 mm (31.7 in)	Width (Y)	800 mm (31.5 in)
Gauge (Thickness) <sup>7</sup>	Minimum: 1.5 mm (0.059 in); Maximum 50 mm (2 in)			
Maximum Weight	Single Sided	10 kg (22 lb)	'High-5'	5 kg (11 lb)
Maximum Weight Distribution	Single Sided	2 kg/m²	'High-5'	1 kg/m²

<sup>4</sup> Colouring required for camera recognition.

<sup>5</sup> Micro and E grades should be tested to ensure repeatable sheet separation before printing.

<sup>6</sup> Maximum number of sheets and collation ability dependent on installation layout, end effectors fitted and range of robotic movement available. 'Optimal' solution to be scoped during sales process.

<sup>7</sup> Maximum thickness reduced to 46 mm (1.81 in) when adjustable (sliding) skin fitted to table.

Handling - Full Automatic Operation				
Maximum Stack Height	Load	1,400 mm (55.1 in)	Unload <sup>8</sup>	1,400 mm (55.1 in)
Table Loading Accuracy	At Origin	± 1 mm (0.039 in)	Angular	± 0.06°
Unload Stack Accuracy	± 1 mm (0.039 in) with optimised unload delay			
'High-5' Registration	± 2 mm (0.079 in) side-to-side			

<sup>8</sup> Solid pallet required to ensure accurate sensing.

Safety System	Components and specification are installation specific
Load & Unload Area Light Curtains <sup>9</sup>	Entry into load and unload areas is detected by invisible infra-red light curtains; breaking a curtain stops printer and robot operation
Programmable Laser Scanning System <sup>10</sup>	Configured with multiple exclusion (or safety) zones and controlled by multiple safety scanners to monitor equipment area for presence of (unprogrammed) obstacles and motion
Protective Hard Guarding	Protective hard guarding prevents incursion into the load/unload areas

<sup>9</sup> Active in Automatic and Semi-Automatic modes only.

<sup>10</sup> Incursions will stop printer when operating (robots non-operational in Manual mode).