








CROPS Equipment use workshop

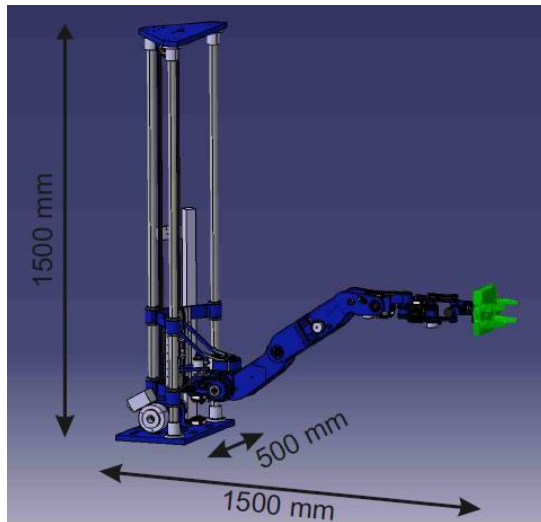
How to connect CROpS platforms to existing equipment

CNH Industrial Belgium N.V.

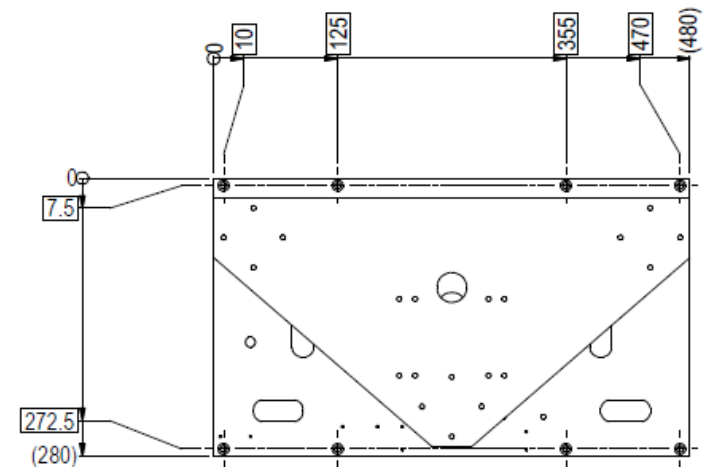
CRO**p**S     
“Clever Robots for Crops”

Robotic arm – main frame

- Robotic arm can be fixed to the vehicle by its bottom plate using 8 screws
- If too much vibration in the application, the robot arm can also be fixed using its top plate as second fixation point



Dimension robot arm



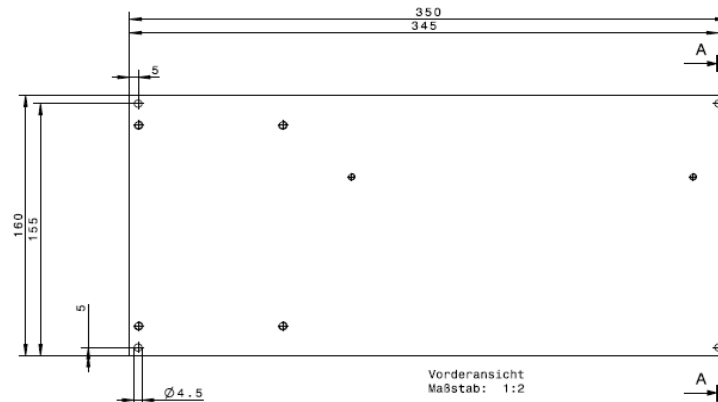
Top view of ground and top fixation plate

Robotic arm – main frame

- Folded the arm is about 650mm long from the backside to the mounting point of the end-effector
- Extended it is about 1450mm long
- For an optimal working distance, depending on the mounted end-effector, a distance of 800-900mm should be used between the backside fixation plate and the target
- The robotic arm and its frame weighs 69 kg
- The robotic arm should be protected from rain and mud projection

Robotic arm – electronic plate

- A small electronic plate has to be installed at maximum 70 cm from the main frame of the robotic arm using 4 screws
- This plate has to be protected from rain and mud projection



Electronic plate of
robotic arm

Robotic arm – Control rack

- The electronics to control the robotic arm is enclosed in a closed rack:

- With IP20 protection
- Dimension of 600 x 800 x 900 mm
- Weight of 60 kg
- Power Supply is 400 V Three-Phase Current
- Power consumption of 2 kW



- This rack can be installed at 5m maximum from the main frame of the robotic arm

Sensory rig – First setup

AVT prosilica
camera

TOF Mesa
camera

General
dimensions

$w=120$ mm;

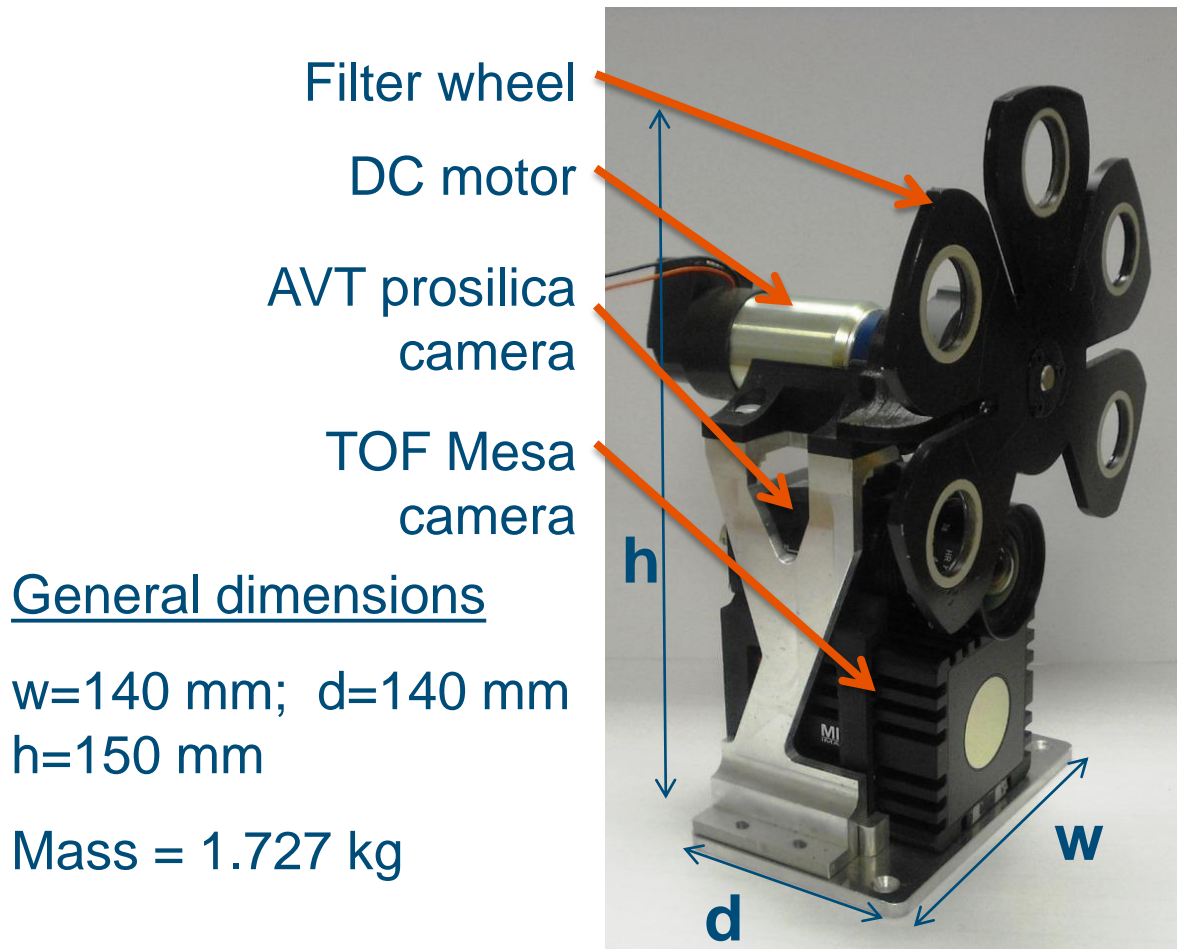
$d=100$ mm

$h=111$ mm

Mass = 0.9243 kg



Sensory rig – Second setup



Sensory rig – power supply requirements

System	Voltage	Current	Electrical Power
RGB-Multispectral camera	220V AC	1.0 A	220 W
TOF camera	220V AC	0.8 A	176 W
Lights	220V AC	4.5 A	1000 W
Motor – Filter Wheel	220V AC <small>(power supply 220V AC -24V DC)</small>	2.0 A	50 W
PC1	220V AC	2.25 A	500 W
PC2	220V AC	2.25 A	500 W
Monitor	220V AC	1.5 A	350 W

Sensory rig

- The sensory rig could require an illumination system depending on the environment of the application
- The sensory rig needs to be protected from:
 - Water
 - Mud projection
 - Direct sunlight to ease the detection algorithms

Compressed air for end effector – air compressor

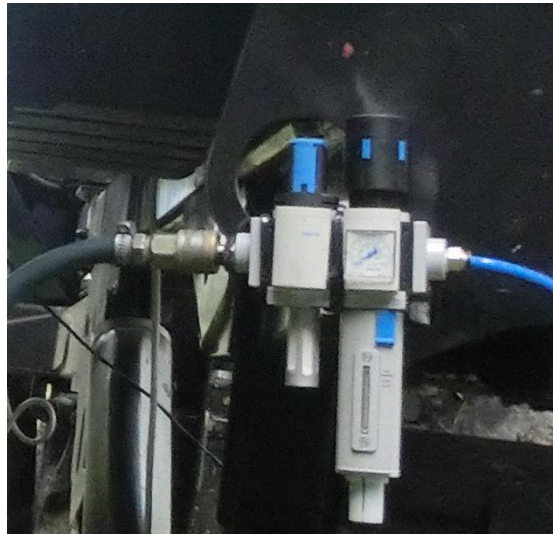
- End effectors are actuated by compressed air with at least the following features:
 - 6 bar
 - Standardized volume flow 100 l/min
- The following air compressor is used:

Model	ABAC FC2/24 CM2 (FCCC404)
Supply	230 V / 50 Hz
Power	1.5 kW
HP	2
IP	20
Pressure	max 8 bar
Flow	220 l/min
Tank capacity	24 l
Dimension (L x W x H)	600 x 255 x 590 mm
Weight	26 kg



Compressed air for end effector – service unit

- The compressed air supplied to the end effector needs to pass through a service unit composed of a particle and condensate separation and a filter cartridges of 40 μm



Power supply – Electric generator

- To supply 400V and 220V to the different systems, the following generator is used:

Model	SDMO Technic 15000 TE
Frequency	50 Hz
Max. power (400 V)	11 kW / 13.75 kVA
Max. power (230 V)	3.7 kW
Nominal voltage	400 V
Number of phase	3
Fuel	Petrol (unlead)
Recommended oil	SAE 10W30
Autonomy	8 h
IP	23
Plugs	1 x 2P+T 230 V 10/16 A socket - circuit breaker 1 x 2P+T 230 V 16 A socket - circuit breaker (CEE17) 1 x 3P+T+N 400 V 16 A socket - circuit breaker (CEE17)
Dimension (L x W x H)	895 x 570 x 770 mm
Weight	165 kg

