SSRC

FANUC Robot CRX-10iAEquipped with omnidirectional mobile collaborative robot_Design proposal

Sensing System Research Center

Production process evaluation research team

Shuichi Ishida

specification

FANUC Robot CRX-10iAOmnidirectional mobile collaborative robot equipped with 500mm controller inside the cube,DCAC, battery, etc. The ball-driven omnidirectional movement mechanism is designed to be as compact as possible.

[Collaborative robot department]

- Collaborative robot:
  FANUC CRX-10iA　robot weight40kg,Payload10kg
- Control device:
  FANUC R-30iB Mini Plus　410 x 277 x 370mm, 20kg
- Battery:
  (tentative)Lead acid battery:G26EP x 2stand　12V, 10time rate26Ah, 176 x 84 x 130, 10kg
- DC-AC:
  (tentative)DenryoSD-1500 1500VA, 283 x 128 x 351, 5.5kg
- flame:
  (tentative)MISUMI 50 x 50mm(The thickness)

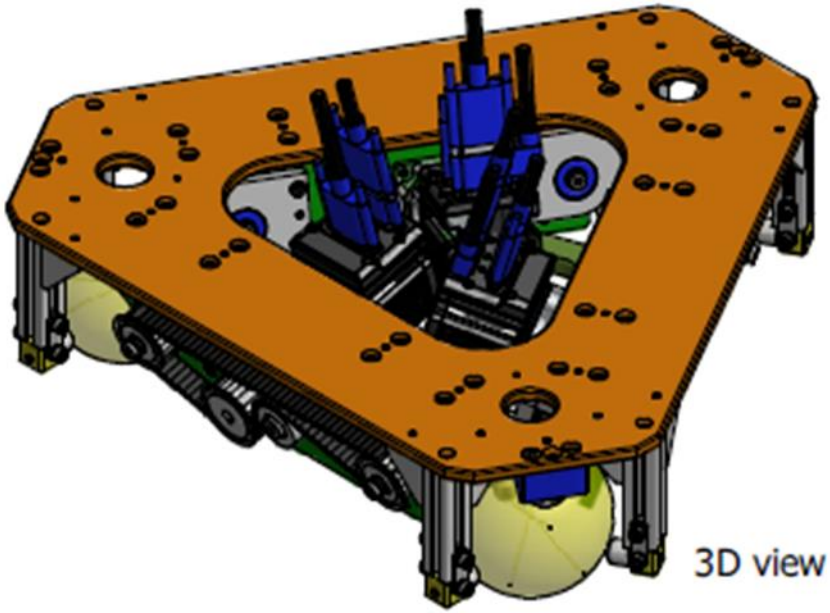
【Drive part】

- Ball-driven omnidirectional movement mechanism
  size(mm):480(W) x 425(D) x 15.47(H)(cable included204.04)
  motor:MOOG SM23165DT, gear head reduction ratio:10:1
  speed:1.135m/s(68.1m/min)3,400rpmhour, maximum4,000rpm:1.335ms(80.1,/min)

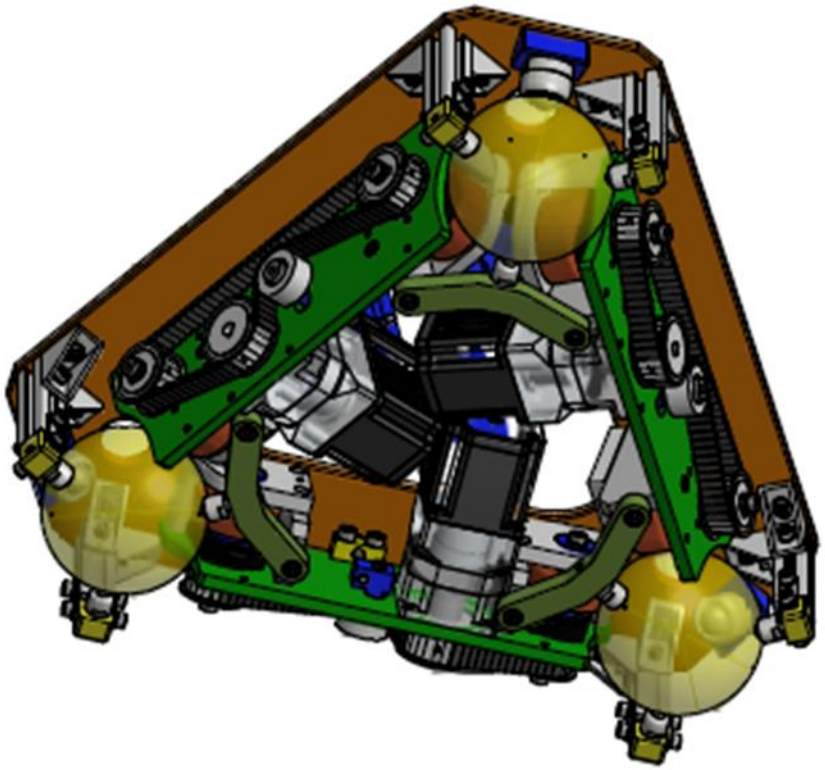
[Environmental awareness]

- LiDAR:
  (tentative)Hokuyo Electric:UST-10LX-H02 x 2

Drive part: assembly

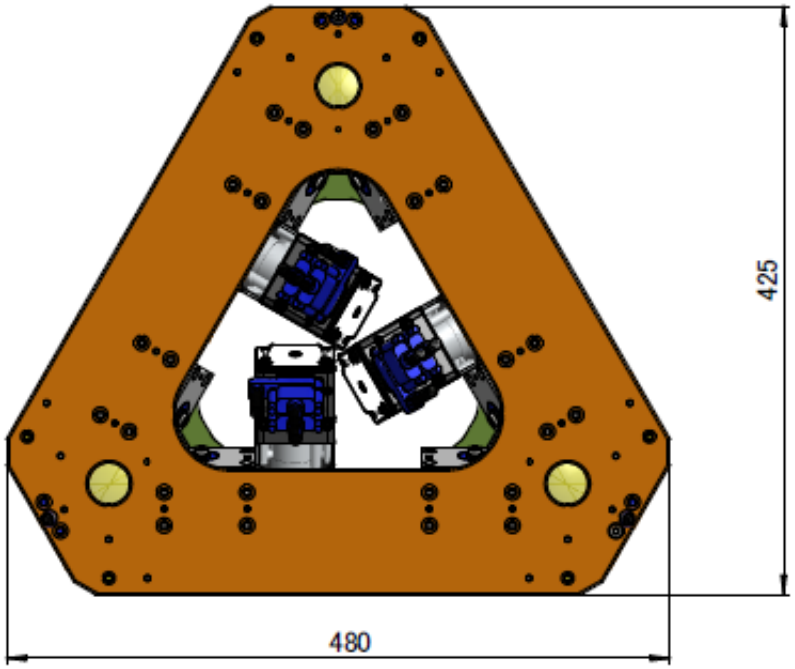


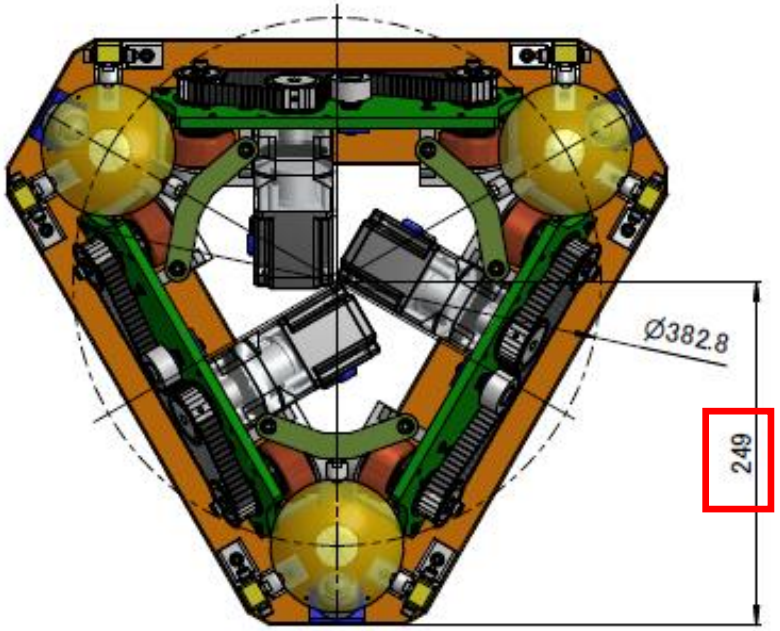
3D view

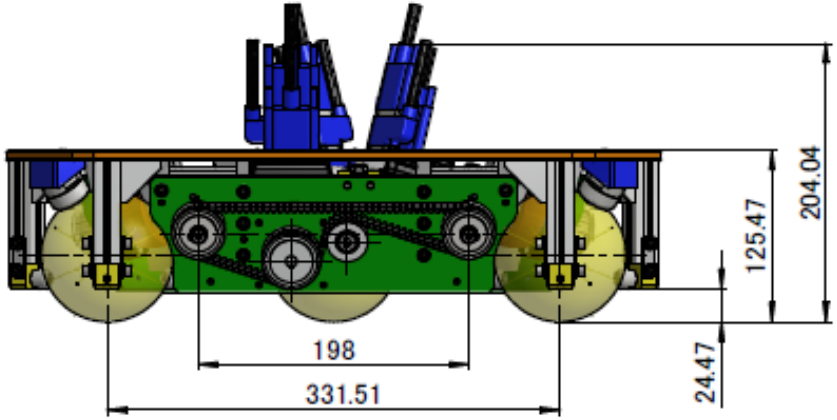


*The cable is on the assembly3It is assumed that the two motors are the same, but in realityp5arrangement of

Drive part_dimensions

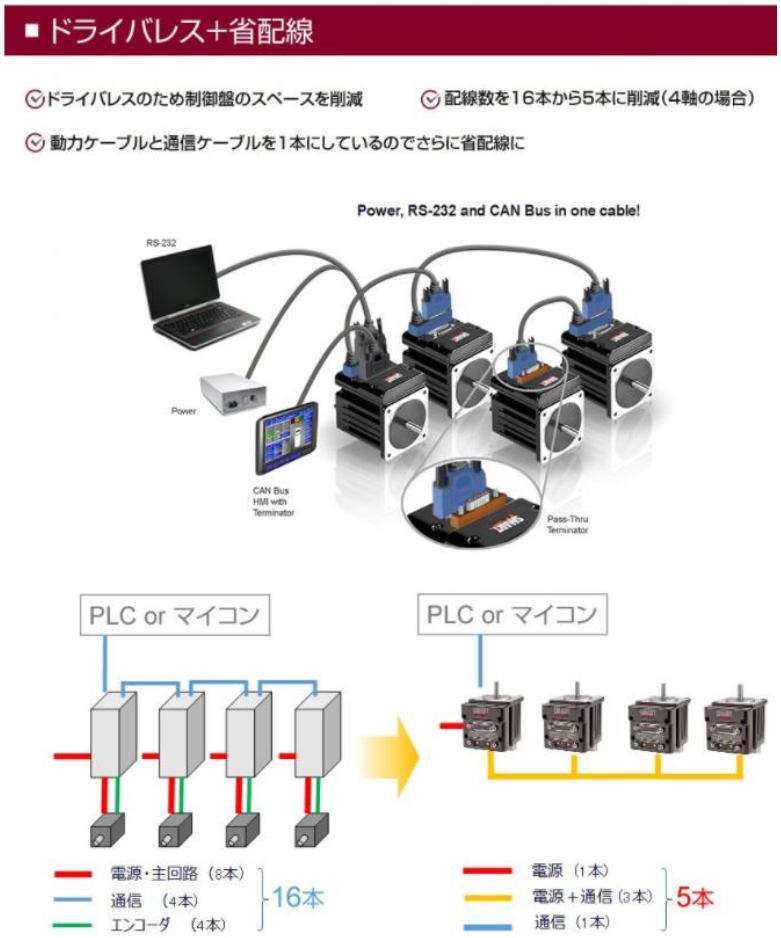




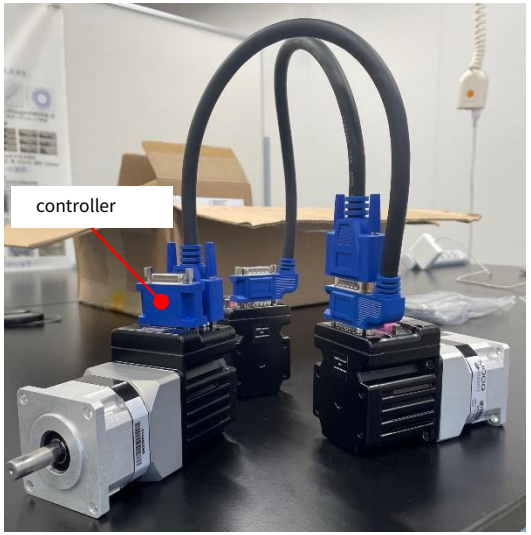


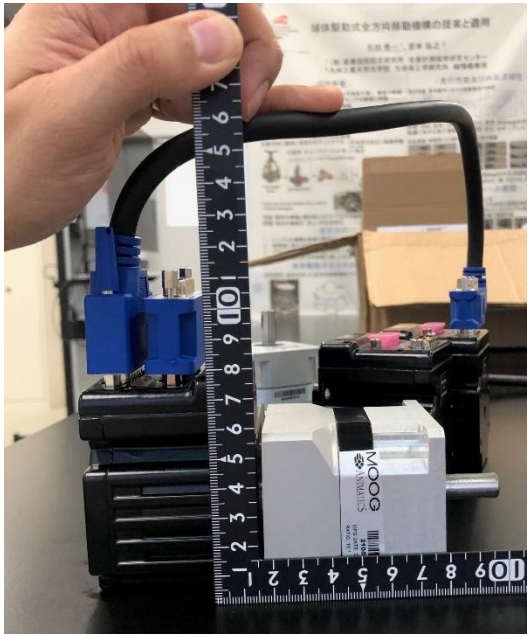
Motor connection/cable layout

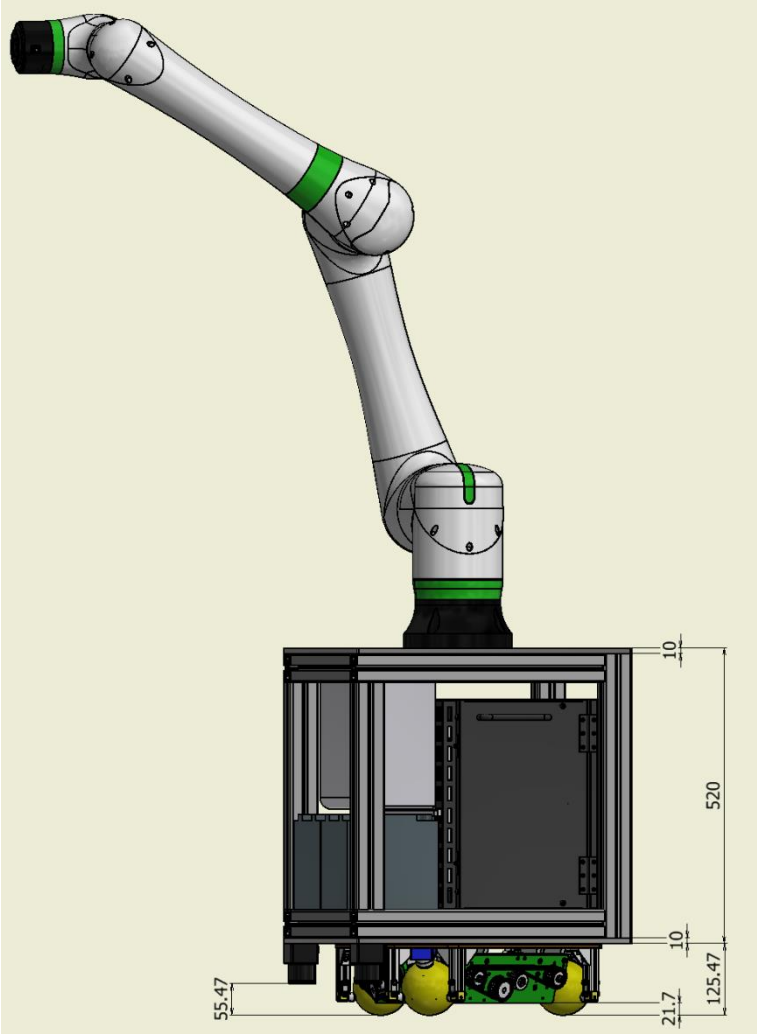
https://www.moog.co.jp/products/motors-servomotors/smartmotor.html

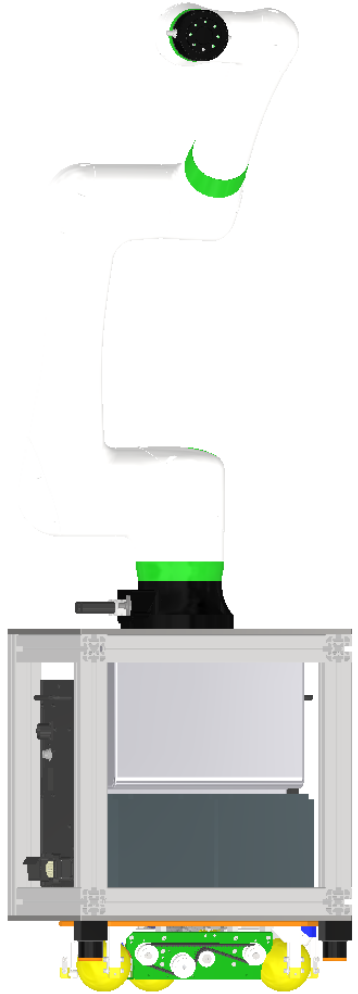


スマートモータ単独でもI/Oで周辺機器を制御できますが、一般的には
PLC・マイコン・PCが上位機器として存在します。






10
520
10
125.47
55.47
21.7



Motor specifications

SM23165DT Specifications

SM23165DT		
Continuous Torque	4.61	in-lb
	74	oz-in
	0.52	N-m
Peak Torque	7.40	in-lb
	118	oz-in
	0.84	N-m
Nominal Continuous Power	204	Watt
No Load Speed	5,200	RPM
Max. Continuous Current* @ 3800 RPM	5.074	Amps
Peak Power @ 3400 RPM	210	Watts
Voltage Constant	9.08	V/kRPM
Inductance	1.31	mH
Encoder Resolution	4,000	Counts/Rev
Rotor Inertia	0.001	oz-in-sec^2
	0.706	10^{-5} Kg-m^2
Weight	1.3	lb
	0.59	kg
Shaft Diameter	0.250	in
	6.35	mm
Shaft, Radial Load	7	lb
	3.18	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available	Yes	
CANopen Available	Yes	

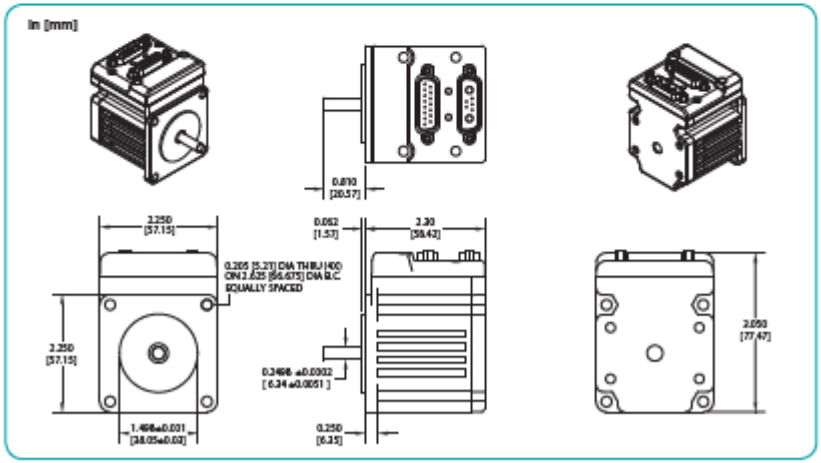
*Default voltage is 48V. See graphs for additional voltages.

Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

CE RoHS

Moog Animatics SmartMotor™ SM23165DT (No Options) CAD Drawing



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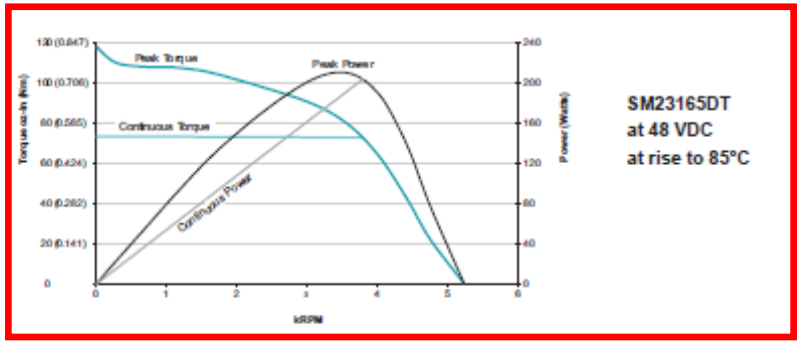
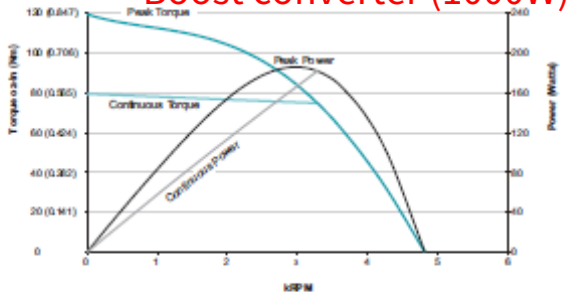
SM23165DT Torque Curves

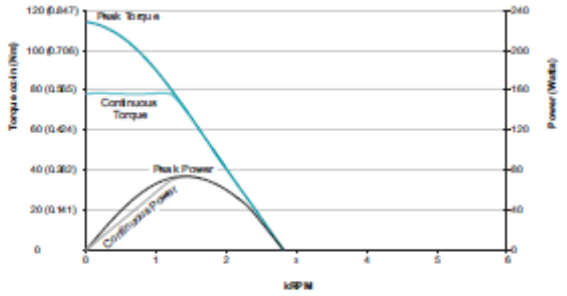


SM23165DT
at 48 VDC
at rise to 85°C

Boost converter (1000W) Planned use



SM23165DT
at 42 VDC
at rise to 85°C



SM23165DT
at 24 VDC
at rise to 85°C

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

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Checklist

current situation,500mmThe center of the cube and the center of the cart can be aligned.

The distance from the center of the cart to the edge is249mm

In the future, I would like to know how I can connect the trolley with the cube you can provide.

→ Instructions on the shape of the top plate, addition of fixing holes, etc.

Also, please turn off the power supply for a while.12V x 2However, what kind of product do you plan to use?

As soon as the above is decided, we will be able to manufacture it, so could you please set up a meeting with the people involved to discuss the detailed specifications?