SyncBotic

Research & Education Robot Platform

Free-move BOT of Industry

Features

- Omnidirectional Mobile Robot platform
- Provide 200 x 190mm free space for robot controller
- Integrated Zephyr OS and EtherCAT master on MCU board
- Up to 80Kg payload for others sensor and robot arm
- Build-in 4x 400W TECO servo motor
- Support adds gearbox (optional)
- 720W 48V DC battery with BMS feature
- Provide 24V and 12V power output for sensor
- Provide 3x Gigabit Ethernet port with M12 X-coded
- Provide 4x USB 3.0 Gen1 type A
- Support 8x camera kit for Intel realsense, ToF camera (optional)
- 1x Emergence button, 3x status LED indicator
- Wide operating temperature up to 0°C to 40°C

Introduction

The Education robot default controller is based on Intel® processor, operation system is Ubuntu 20.04 and ROS 2 foxy framework, provide an open platform let you upgrade it for your PoC project or learning the ROS 2 software package.

Maximal freedom of movement with the omnidirectional wheel system. The robot platform is idea for research, education, and application development especially in the field of logistics and navigation, whether for motion planning, autonomous driving with sensor or actors and quipped with an integrated robot controller, it is possible to work on a board spectrum of topics.

HYPER-TECH Systems

14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il

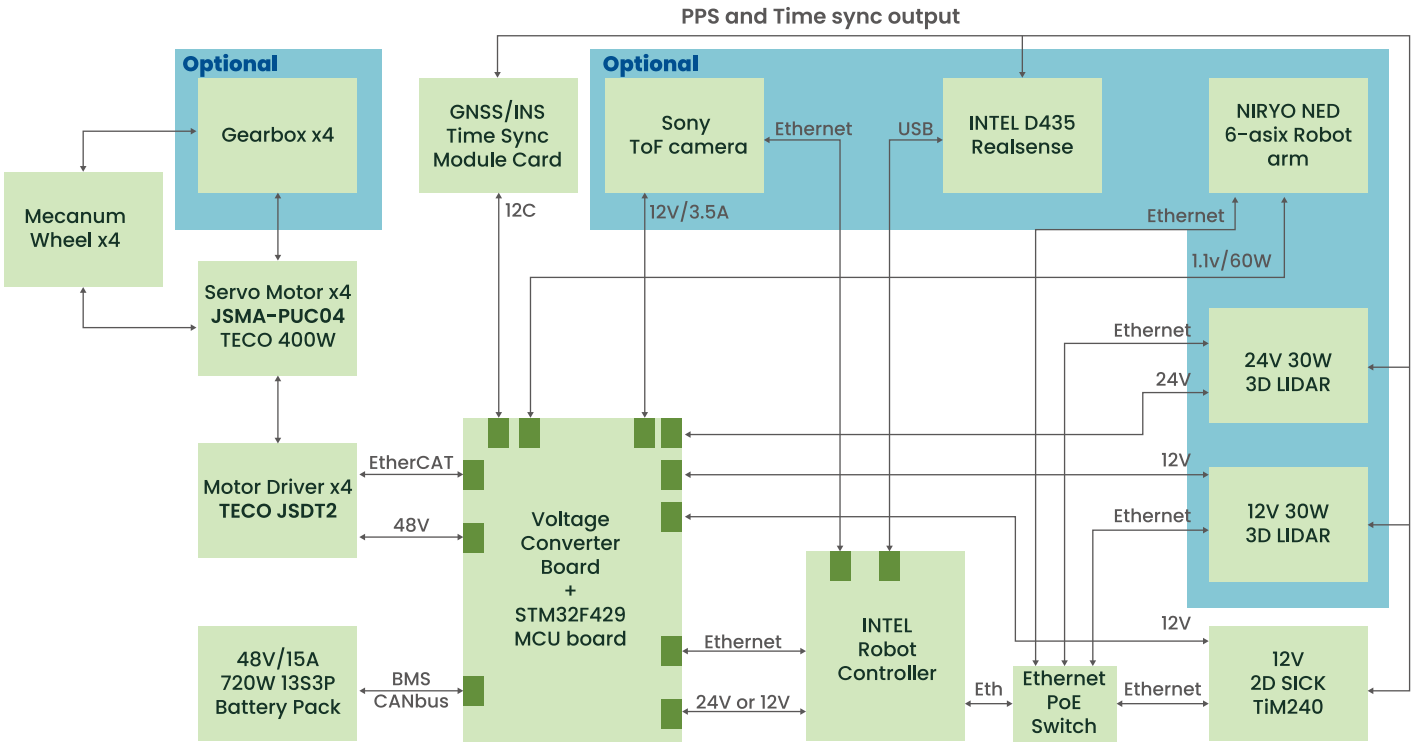
Specification

Model Name	EDU-1000 series
Robot Controller Platform	
Robot controller	SyncBotic A100 evaluation ki (Apollo Lake E3940) SyncBotic SBC-T800 series (Intel 11th gen Core) SyncBotic SBC W series (Intel 11th gen Core, waterproof version) SyncBotic NSync-200 series (NVIDIA NX)
AMR controller space	7.874 x 7.48 inch (200 x 190 mm)
Robot Dimension and Weight	
Wheel	5-inch Mecanum wheel x4
AMR Length	23.62 inch (600mm)
AMR Width	15.748 inch (400mm)
AMR Height	7.874 inch (200mm)
AMR Clearance	0.784 inch 20mm
Weight	20kg
Payload	80kg
Speed	0.6m~1m/s
External Power Output and I/O interface	
Power Output	All power output support OVP, OCP, Short circuit protection 2x 11.1V / 6A with circle connectors 1x 12V / 2A with circle connector 1x 24V / 2A with circle connector
I/O interface	3x Gigabit Ethernet with M12 connector, 4x USB 3.0 Gen1 type A connector
Button and LED indicator	
Power ON/OFF button	1x Power button with LED indicator
Power Sequency	<3sec for Power ON, >5sec for Power OFF
Emergency	1x Emergency button
LED indicator	Blue: 1x Robot controller ready, 1x servo motor ready Red: 1x servo motor alarm OFF: Robot controller not ready, servo motor not ready, motor no alarm

Motion Control Board	
Operation System	Zephyr RTOS
Ethernet Port	1x 10/100 port for EtherCAT master for servo motor control 1x 10/100 port for other propose
CANbus Interface	1x CANbus for Battery BMS 1x CANbus for other propose
DI/DO interface	24V DI/DO for status control, monitor
Power Output for Servo Motor	Integrated 48V 600W power module and support 4x stable 48V output with 15A fuse for servo motor *Support upgrade to 1200W power budget
I/O interface	2x I2C, 5x PWM GPIO, 2x SPI, 2x UART on terminal block, 1x micro USB port
MCU programing interface	Provide 1x USB JTAG interface for upgrade F/W
Power Input	Max 48V / 15A power input
Battery and Charging specification	
Battery Voltage	Normal: 48V DC, Range: 39V to 54.6V, 13S3P LG21700 Li-ion cell
Recommended Continue Current	Standard: 15A output
Max continues discharge current	30A for heavy loading
Max discharge current (pulse)	45A, only 3 sec
End of discharge voltage	42V
Minimum discharge voltage	38V
Maximum charger current	15A
Standard charger current	5A
Charging Method	CC-CV
Standard charging voltage	53.8V
Max charging voltage	54.6V
Power Input / output connector	Anderson XT60
BMS port	1x CANbus with M12 A-coded, 4-pin
Servo Motor / Motor driver / Gearbox	
Motor Driver	4x TECO motor driver
Servo Motor	4x TECO 48V / 400W servo motor, 3000RPM
Gearbox (optional)	4x LIMING gearbox, ratio: 15, 2-stage with input flange
Power Input	48V DC, 8A continue, 11A for inrush
Communication Port	4x USB, EtherCAT IN/OUT
Motor DI/DO	Provide 6x 24V DI, 4x 24V DO, 1x DICOM, 1x DOCOM

Robot Sensors and Robot ARM	
2D LIDAR	1x SICK TiM240 SLAM LiDAR on front side
3D LiDAR (Optional)	1x Voledyne VLP-16 or Ouster OS0-32 3D LiDAR
SyncBotic TSMC card (Optional)	1x TSMC card (9-axis IMU + L1 GPS)
Camera (Optional)	Support INTEL Realsense D435i, D405 oToBrite ToF camera, oToCAM500
Robot ARM (Optional)	Support NIRYO Education Robot ARM, Ned
Reliability	
Warranty	1 years

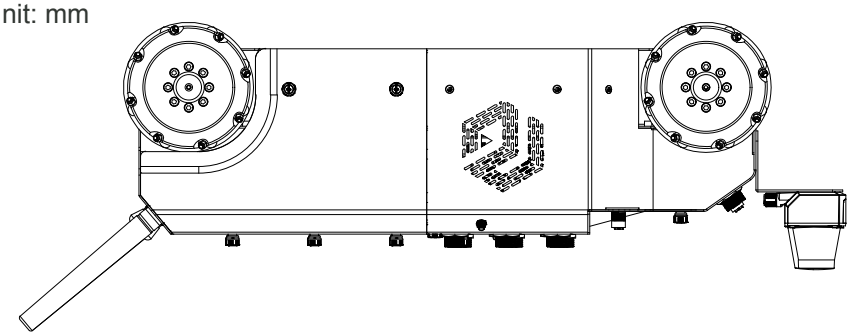
System Block Diagram

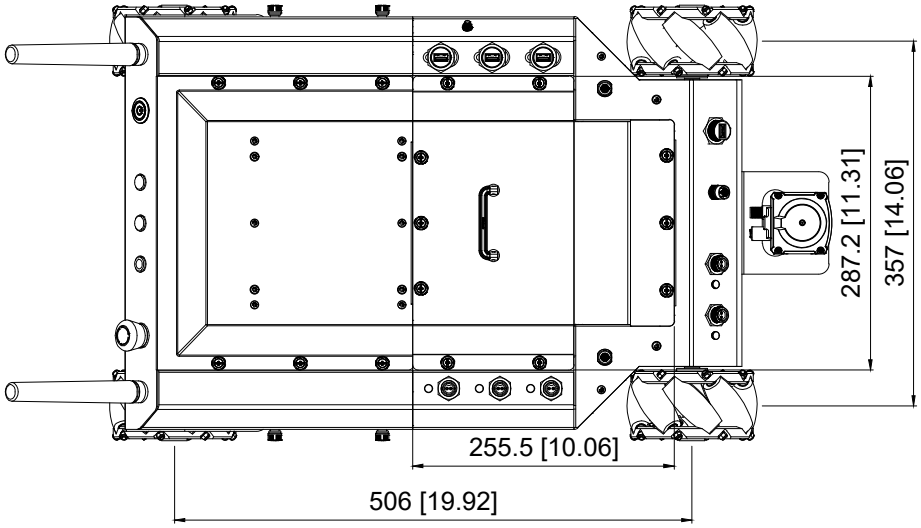


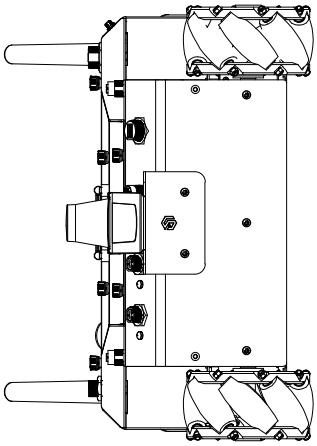
HYPER-TECH Systems
14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il

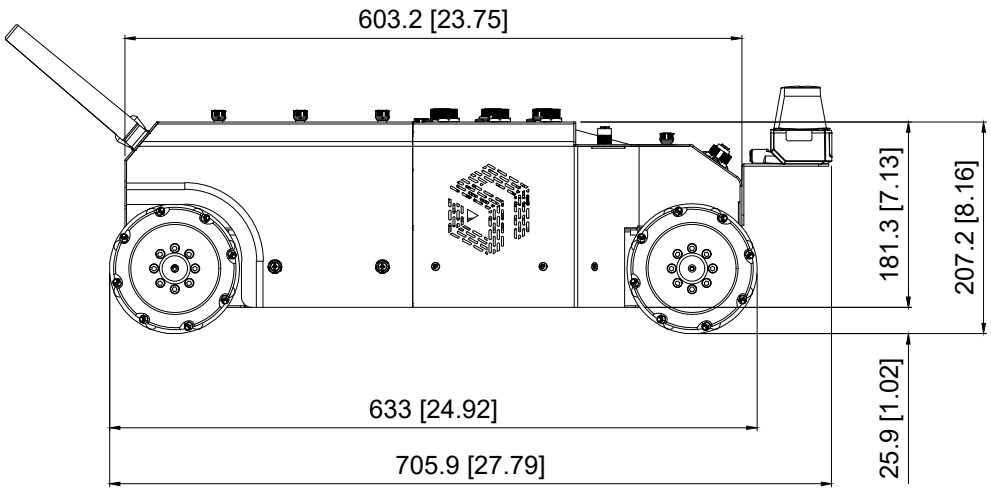
Dimensions

Unit: mm









HYPER-TECH Systems
14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il

Ordering Information

Model Name	Description
EDU-1000	Education robot platform, w/ SICK 2D LiDAR, MCU board
EDU-1010	Education robot platform, w/ SICK 2D LiDAR, MCU board, TSMC module card
EDU-1200	Education robot platform, w/ SICK 2D LiDAR, MCU board, SBC-T850 controller
EDU-1210	Education robot platform, w/ SICK 2D LiDAR, MCU board, TSMC module card, SBC-T850 controller
EDU-1300	Education robot platform, w/ SICK 2D LiDAR, MCU board, NSync-200 controller
EDU-1310	Education robot platform, w/ SICK 2D LiDAR, MCU board, TSMC module card, NSync-200 controller

Optional Accessory

Model Name	Description
AMR bracket kit	Full accessory bracket kit (Include 4x bracket for realsense, 1x bracket for VLP-16, 4x bracket for ToF camera, 1x 60x45 cm panel, power cable, Ethernet cable
Bracket for realsense	Mounting Kit for INTEL realsense D435i, D435
Bracket for 3D LiDAR	Mounting kit for VLP-16 or OS0-32
SBC-T870	Intel® Core™ i7-1185G7E, 32G DDR4, 1TB SSD
SBC-T850	Intel® Core™ i5-1145G7E, 16G DDR4, 512G SSD
Battery	48V / 720W battery with BMS function
Charger	54.6V / 3A adapter for Battery charging
Gearbox	LIMING, ratio: 15, 2-stage with input flange
Robot ARM	NIRYO Ned 6-axis robot arm
GPS antenna_L1	L1 GPS antenna
GPS antenna_RTK	RTK GPS antenna
TSMC-210	GNSS/INS Time synchronization with 8x channel, L1 GPS module
TSMC-220	GNSS/INS Time synchronization with 8x channel, RTK GPS module
oToCAM500	oToBrite ToF camera
OToCAM264ISP-C120M	oToBrite IMX390+GW5200, 120° GMSL2 camera