Robot as a Tool
Robot as a Service
Robots for Every Workplace

neuromeka

Neuromeka provides automation solutions tailored to the needs of small and medium-sized manufacturers, utilizing user-friendly and cost-effective collaborative robots. Our cobots are designed to work alongside humans safely and can be easily programmed to perform a wide range of tasks.

We are actively building an ecosystem for a Robot-as-a-Service (RaaS) platform business centered around cobots. This platform is specifically designed to assist small and medium-sized companies in implementing and managing robot automation, even if they lack in-house expertise in robotics. Our goal is to leverage our advanced robot technology to enhance the productivity of each of our clients.

HISTORY

2013	02	Founded Neuromeka in Namyangju, Gyeonggi
	07	Released NRMKFoundation SDK
	10	Released NRMKPlatform SDK
2014	01	Received Venture Company certification
	01	Established an R&D center
	07	Relocated headquarters to Seongsu, Seoul
	09	Released STEP/PC and STEP/BBB
	10	Released IGoT/HUB
2015	12	Released STEP/iMX and STEP/HPC
	07	Released CONTY app
	08	Released IGoT/WSN
2016	05	Attracted series-A investment
	07	Released STEP2
	10	Released IndyRP
	11	Established Smart Connected Robot Center (SCRC)
2017	02	Received INNOBIZ certification
	03	Released Indy3/5/10
	04	Relocated headquarters to Apgujeong, Seoul
	06	Attracted series B investment
	06	Relocated Smart Connected Robot Center (SCRC) to POSTECH C5 in Pohang
	07	Set up Production Business Unit (BU) in SCRC
	09	Released Indy7
	12	Named Robot Company of the Year (in Industrial Robots)
2018	05	Merged Autopower
	06	Established V-SCRC in Ho Chi Minh City, Vietnam
	07	Established CILab (cobot intelligence laboratory) at POSTECH
	07	Started System Engineering business
	08	Released D (Delta robot series)
	07	Began production of Indy7
	08	Attracted series C investment
	09	Received Red Dot Design Award for Indy7
	10	Started System Engineering Business Unit (BU)
	10	Relocated Production Business Unit (BU)
	12	Named Robot Company of the Year in Industrial Robots
	12	Received KDB NextRound Blue Frog Award
	12	Released STEP3
	12	Launched pilot business for IndyGo
2019	06	Relocated headquarters to Seongsu, Seoul
	09	Released Indy12
	09	Released IndyEye
	10	Released IndyCARE
	10	Relocated to expand Branch Office in Daejeon, Korea
	12	Named Robot Company of the Year in Industrial Robots
	12	Received 2019 Korea Regional Balance Award
2020	06	Attracted bridge investment
	07	Selected as a unicorn startup by the Ministry of SMEs and Startups
	07	Received IR52 Jang Young-shil Award
	12	Received Indy7 New Product Certification (NEP)
	12	Named 2020 Robot Company of the Year in the industrial robot sector
	12	Established China BO in Yancheng
2021	05	Expanded Daejeon branch (Jukdong, Daejeon, Korea)
	06	Recognized as an excellent corporation R&D center by the Ministry of Science and ICT
	08	Attracted series D investment
	12	Named 2021 Robot Company of the Year in the industrial robot sector
	12	Received governmental commendation from the Minister of Trade, Industry, and Energy (merit for industrial technology)
	12	Received Certificate of Innovative Product from the Ministry of Trade, Industry, and Energy
2022	04	Named a 2022 Design Innovation Company by the Ministry of Trade, Industry, and Energy
	11	Listed on the KOSDAQ
	12	Named 2022 Robot Company of the Year in the industrial robot sector
2023	05	Established US Branch Office in Pflugerville, Texas

CONTENTS

Collaborative Robot

Your first industrial robot for small and medium sized manufacturers

Indy

Indy is Neuromeka's flagship cobot model, meticulously designed and manufactured to prioritize worker safety through innovative collision detection algorithms. Indy facilitates a more intuitive approach to direct teaching through impedance control, and it also enables online and offline programming via our dedicated teach pendant app, which is compatible with Android tablets.

The 'Indy' series consists of five models, each tailored to specific payload capacities: Indy 3, 5, 7, 10, and 12, corresponding to 3kg, 5kg, 7kg, 10kg, and 12kg loads, respectively. Additionally, we offer the Indy-RP2, a 7-degree-of-freedom (7-DOF) model. For added versatility, Indy can be equipped with standard tools such as grippers and vision sensors through the standard extension port located at its wrist link.
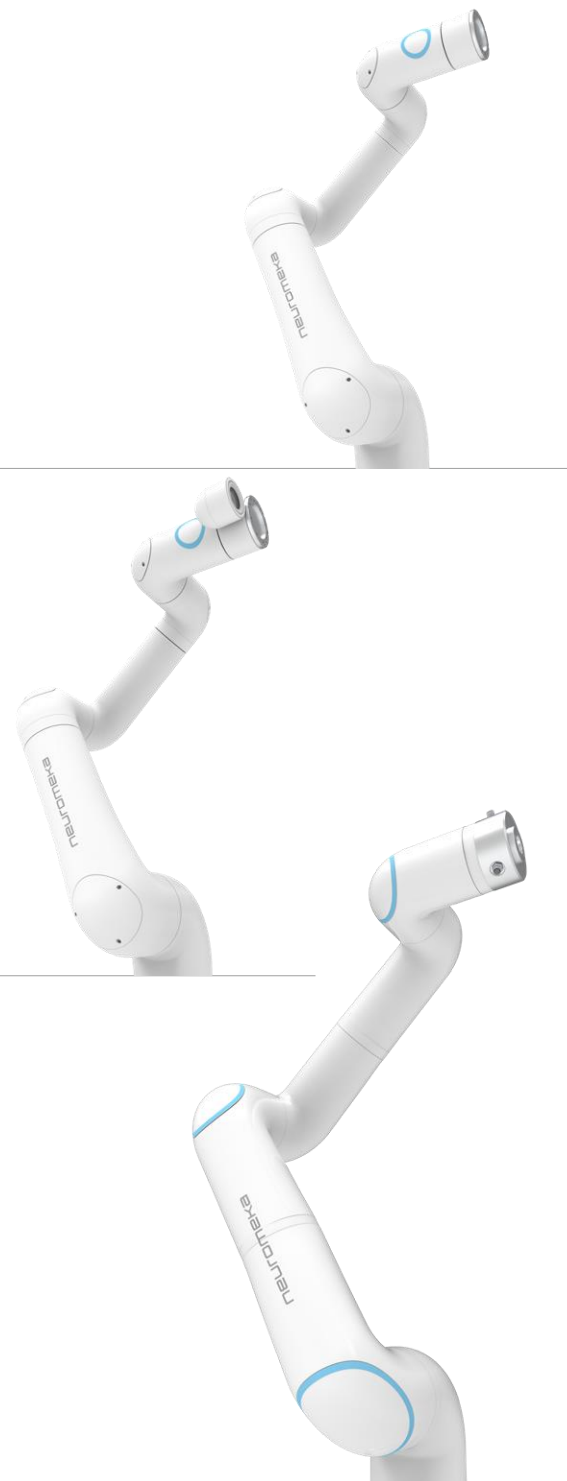
Spec	Indy7
DOF	6 (all revolute)
Payload	7kg
Joint Motion Range	1, 2, 3, 4, 5: ±175 deg | 6: ±215 deg
Maximum Joint Speed	1, 2, 3: 150 deg/s | 4, 5, 6: 180 deg/s
Maximum Tool Speed	1 m/s
Maximum Reach	1.3m
Maximum Workspace w/Full Payload	0.8m
Repeatability	100μm
Weight	28kg

Spec	Indy7 Pro (with IndyEye)
DOF	6 (all revolute)
Payload	7kg
Joint Motion Range	±360 deg for all joints
Maximum Joint Speed	1, 2, 3, 4: 150 deg/s | 5, 6: 180 deg/s
Maximum Tool Speed	1m/s
Maximum Reach	1.3m
Maximum Workspace w/Full Payload	0.8m
Repeatability	50μm
Weight	28kg

Spec	Indy12
DOF	6 (all revolute)
Payload	12kg
Joint Motion Range	±360 deg for all joints
Maximum Joint Speed	1, 2: 120 deg/s | 3, 4, 5, 6: 150 deg/s
Maximum Tool Speed	1m/s
Maximum Reach	1.8m
Maximum Workspace w/Full Payload	1.2m
Repeatability	100μm
Weight	55kg

Vision Solution

Affordable price and reliable performance

IndyEye

IndyEye, a high-performance vision solution based on deep learning, provides cost-effective solutions by combining a low-cost vision sensor and a deep learning server. Unlike previous vision sensors that require specific working conditions, the IndyEye can be flexibly applied to various working environments, regardless of space or lighting conditions. Additionally, the deep learning server sharing allows for the storage of data on working objects, enabling quick responses to customer inquiries.

For small and medium-sized manufacturers that frequently need to adapt to different manufacturing line configurations, IndyEye facilitates a wide range of tasks and quick implementation.

Spec	IndyEye
Size	67mm x 67mm x 74.4mm
Processing Time	250 - 1500ms/img
Field of View (H/V/D)	86º ±5º / 70º ±5º / 100º ±5º
Interface	USB 2.0
Working distance	5cm - 70cm

Robot Controller

Realtime embedded EtherCAT master robot controller

STEP

'STEP' comes with NRMKPlatform SDK, a software framework for development of real-time control applications in a Linux/Xenomai environment, known for its hard real-time operating system (OS). For engineers less familiar with Linux, a development environment running on MS Windows® is also provided to create embedded control applications.

'STEP' seamlessly integrates with EtherLab, a proven open-source EtherCAT master stack for multi-axis synchronized high-speed real-time distributed control. It supports the development of standard EtherCAT-based real-time control applications through the CoE (CANopen-over-EtherCAT) protocol-based programming interface. Software tools are available for automatically generating basic CoE-based application codes. Furthermore, 'STEP' can connect legacy devices with RS485 or CAN interfaces through standard ports. To facilitate CAN-based applications, the NRMKPlatform SDK includes RT CAN and CanFestival (an open-source CANOpen framework software).

'STEP2' serves as the default controller for real-time control of the Indy lineup, running 4kHz model-based impedance control algorithms. On the other hand, 'STEP3' is a high-performance model designed for advanced research and development. It incorporates a high-performance GPU card and the NVIDIA TensorRT library, making it suitable for developing various algorithms based on high-speed deep learning inference computations.

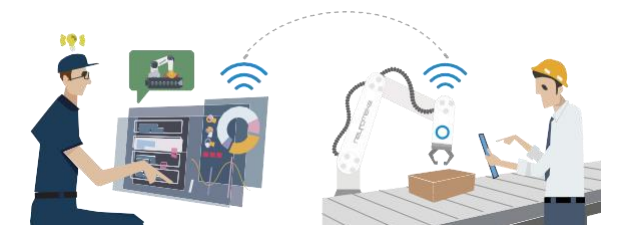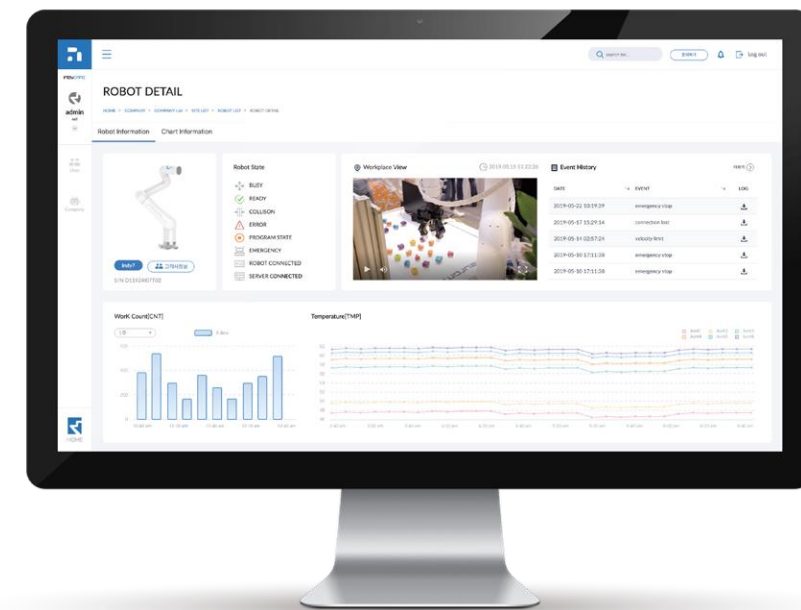| Spec	STEP2	STEP3
Platform	Fanless Braswell Industrial PC	Skylake Industrial PC
CPU	Intel Celeron Braswell soc (4X, 1.6GHz)	Intel Skylake i7-6700K (3.4GHz)
RAM	4GDDR3	8GDDR4
Storage	128G SSD (SATA3)	128G SSD
Ethernet	1 port	1 port
EtherCAT	1 port	1 port
GPIO	16 pin	N/A
RS485/422	1 port	1 port
RS232	2 port	1 port
CAN	1 port	N/A
Dim	204 x 185 x 52	350 x 265 x 182
Optional	-	Geforce GTX 1080 Ti

Remote Management Service

Remote management of robots for smart factory

IndyCARE

'IndyCARE' is a web-based service designed for remote cobot management. With an internet connection, you can access real-time information about your cobot's status, operational data, and event logs from anywhere at any time. The operating data includes three customizable input channels in addition to the cobot's work counts and joint temperatures. Furthermore, 'IndyCARE' offers video streaming services, allowing you to monitor the worksite through the cobot's accompanying web camera.

'IndyCARE' also stores event log files and streaming videos for all instances of collision detection and emergency stops during operations. This helps robot administrators in identifying the root causes of issues and enables engineers to provide remote customer support.

Function	Features
Real-time monitoring of cobots	Check if operations are initiated. Remote management including monitoring collision and emergency stop situations, with an email alert function for abnormal situations.
Store work date	Collect work data, including cobot work counts and temperature measurements of each joint. Customize data values to meet specific user needs. Measure productivity by analyzing work count data and monitoring joint temperatures for anomalies.
Video streaming of worksite	Real-time transmission of worksite conditions to robot administrators using the camera connected to 'IndyCARE'. Visually inspect the cobot's status without physically visiting each worksite.
Event logging	Archive log files documenting changes in the cobots' status, such as collisions and emergency stops. Enable robot administrators to monitor missed situations and perform rapid analysis of cobot anomalies, reducing maintenance time and costs.

Robot Software
Control Engine for Cobots

IndyFramework

'IndyFramework 2.0' is Neuromeka's proprietary software framework, specifically designed for the efficient development of effective cobot applications. Operating within the 'STEP' robot controller environment, it can control a robot at up to 8kHz (when used with STEP3).

This framework is equipped with a versatile and dependable control algorithm library for articulated robots, capable of handling challenges like kinematic singularity and model uncertainties. Additionally, it incorporates an advanced collision detection algorithm, ensuring the safe and stable execution of a wide range of robotic tasks.

Furthermore, the software architecture is designed to accommodate extensions for more features. It includes numerous system functions required for deploying automation systems and conducting remote maintenance, making it a versatile and adaptable solution for various applications.

Function	Features
High-speed control on hard RT OS	Native EtherCAT master running on realtime OS Xenomai optimized for 'STEP'
	Robot control frequency of maximum 8kHz (4kHz for 'STEP2')
General-purpose articulated robot control library	Efficient kinematics and dynamics algorithm for a variety of robot structures
	Nonlinear H-infinity optimal control based robust control algorithm
	Stable task control capability near kinematic singularities
	Impedance control algorithm in three-dimensional space
	A variety of path planning algorithms and trajectory interpolation algorithms in joint and task space
Safety and convenience by operation without fences	Collision detection based 'power and force limiting' feature
	Realtime monitoring and limitation of joint velocities and currents
	Online programming for joint and frame moves by 'CONTY' (Android teach pendant app)
	Direct teaching for joint move programming by physically moving robot joints
	Impedance teaching for frame move programming by physically moving the robot end-effector in selected translation and/or orientation directions
System utility functions to facilitate automation system implementation	Standard tool modules such as electrical grippers, electro-magnetic grippers, vacuum suction tools, automatic bolt runners
	Fully isolated DIO (each 16 channels) and high-performance AIO (each 2 channels)
	Independent EtherCAT port for interface of external slaves (via internal EtherCAT hub)
	TCP/IP, Modbus, and OPC-UA for interfacing external PLCs and/or controllers (SDK programming may be necessary)
	Standard IoT protocols such as MQTT
Smart Connected Maintenance	Remote online SW update ('CONTY' app, realtime robot control runtime, and motor driver firmware)
	Log file transfer for remote diagnosis for system malfunction
	Webcam based operation black-box feature for remote site monitoring
Extendable robot SW architecture	Plugin structure for control logic extension
	Python-based robot motion script programming
	SDK for extension of robot functionalities and algorithms

Teach Pendant
Everyone's teach pendant for cobot programming

CONTY

'CONTY' is an intuitive teach pendant application designed for programming Neuromeka's cobots. It operates on the Android OS, making it compatible with any standard Android tablet. You can seamlessly connect 'CONTY' to the robot controller 'STEP,' whether through wired or wireless communication. This app facilitates both online and offline programming for the Indy lineup, in addition to enabling direct teaching. With its user-friendly interface and abundant features, 'CONTY' ensures that anyone can program Neuromeka's cobots, even without prior experience or expertise in robotics.

*Available with exclusive tablet for 'CONTY'

Spec	CONTY (Offered with Lenovo M10 Plus Tablet)
CPU	Qualcomm SDM680
Display	10.61 inch / 2000 x 1200 (TDDI LCD)
OS	Android 12
Memory / Storage	4GB / 128GB uMCP
Battery	7700mAh
Network	Wi-Fi 2.4GHz / 5GHz (IEEE 802.11 a/b/g/n/AC+BT5.1)
Size / Weight	251.2mm x 158.8mm x 7.45mm / 465g (1.03lbs)
Camera	800 megapixel
Components	Tablet, Charger, Cable, Cover Case

Smart Actuator

Integrated module for your own cobot

CORE

Neuromeka's 'CORE' smart actuators are joint driving modules that incorporate a frameless motor, harmonic drive, magnetic brake, multi-turn absolute encoder, EtherCAT slave board, and motor driver into a unified structure with a hollow axis. This design not only enhances the aesthetics of your robot but also allows motor power and EtherCAT control lines to pass through the hollow axis seamlessly.

The 'CORE' series, which is integrated into the Indy lineup, comprises of four models with varying rated power: CORE100, CORE200, CORE500, and CORE1000 (100W, 200W, 500W, and 1300W, respectively). Each 'CORE' module supports torque command updates at a rate of up to 8kHz. Furthermore, users have the flexibility to implement custom servo algorithms at the application level.

By default, 'CORE' modules are provided without an outer frame, providing users the freedom to design their custom robots with ease.

Spec	CORE100	CORE200	CORE500	CORE1000
Rated Power	100W	200W	500W	1130W
Rated Voltage	48V	48V	48V	48V
Maximum Continuous Current	3.8A	4.8A	11.7A	22.6A
Rated Output Torque	21Nm	50Nm	121Nm	361Nm
Rated Output Speed	180deg/s	150deg/s	150deg/s	120deg/s
Size	Ø80 x 135mm	Ø90 x 145mm	Ø142 x 155mm	Ø178 x 195mm
Weight	1.45kg	1.84kg	4.87kg	9.1kg