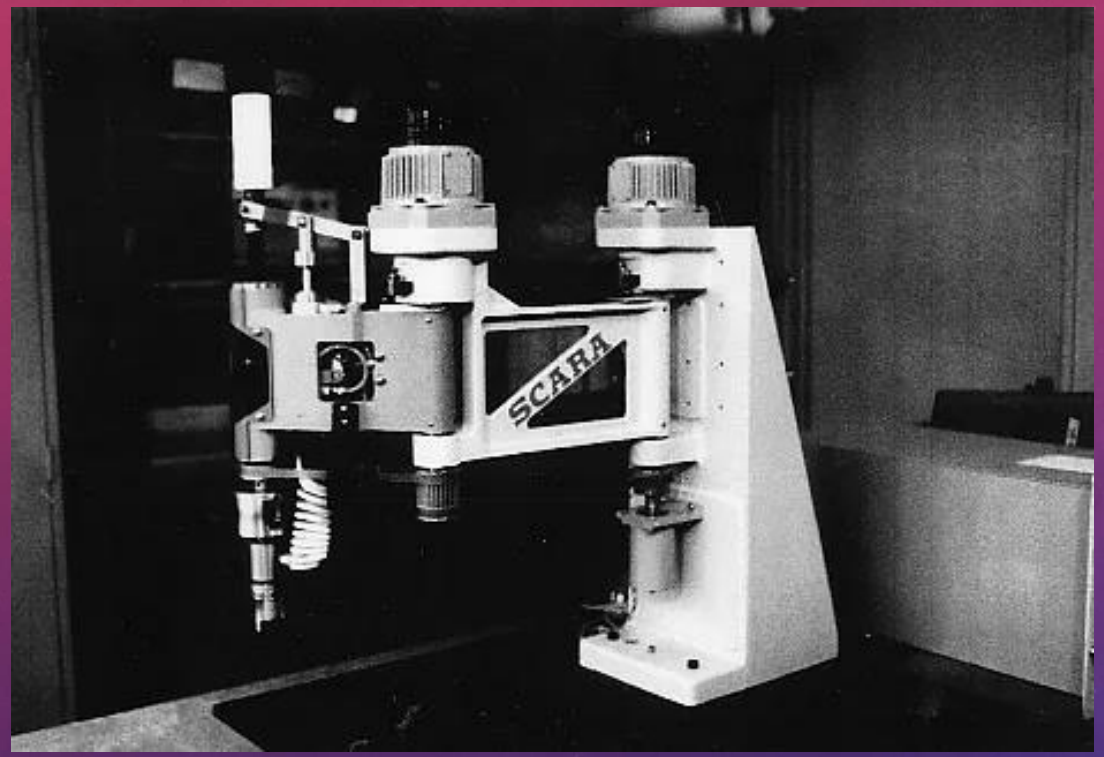
SCARA ROBOT

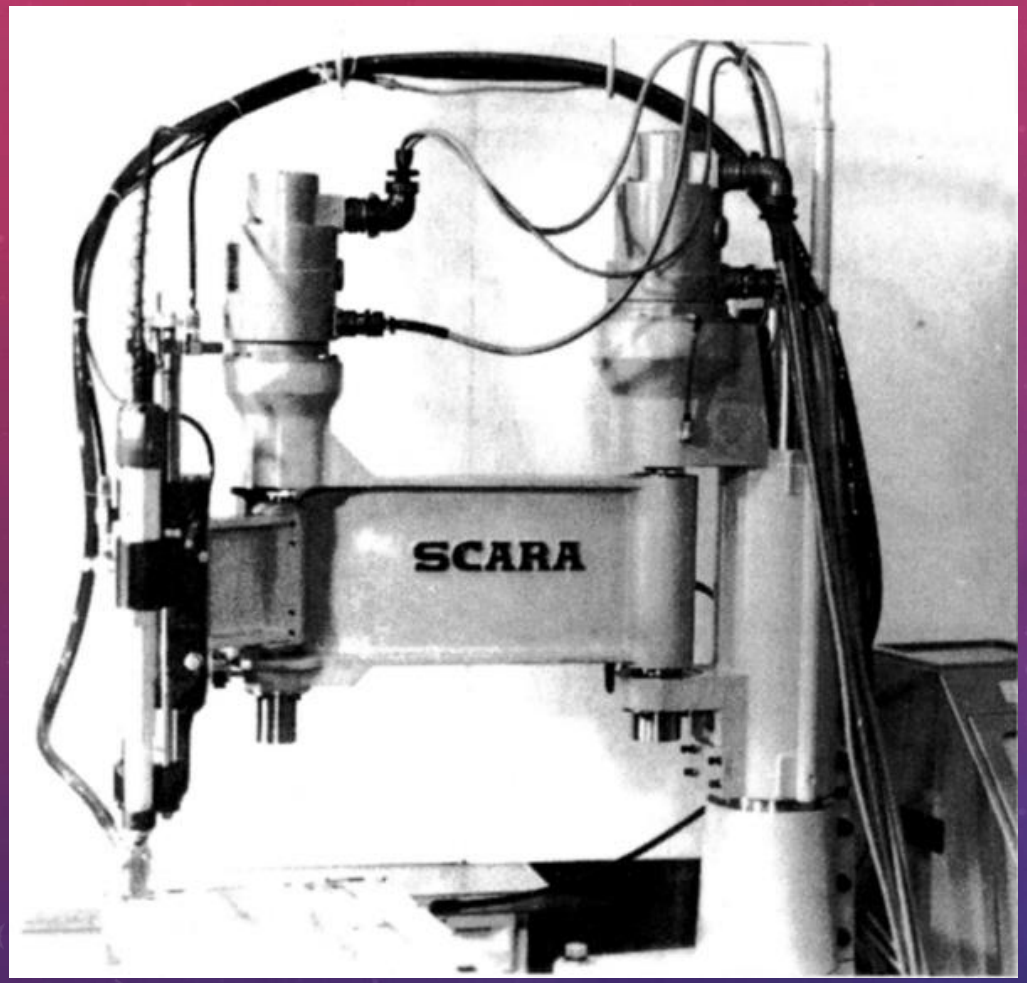
HISTORY OF THE ROBOT



The first prototype of the SCARA, Hiroshi Makino

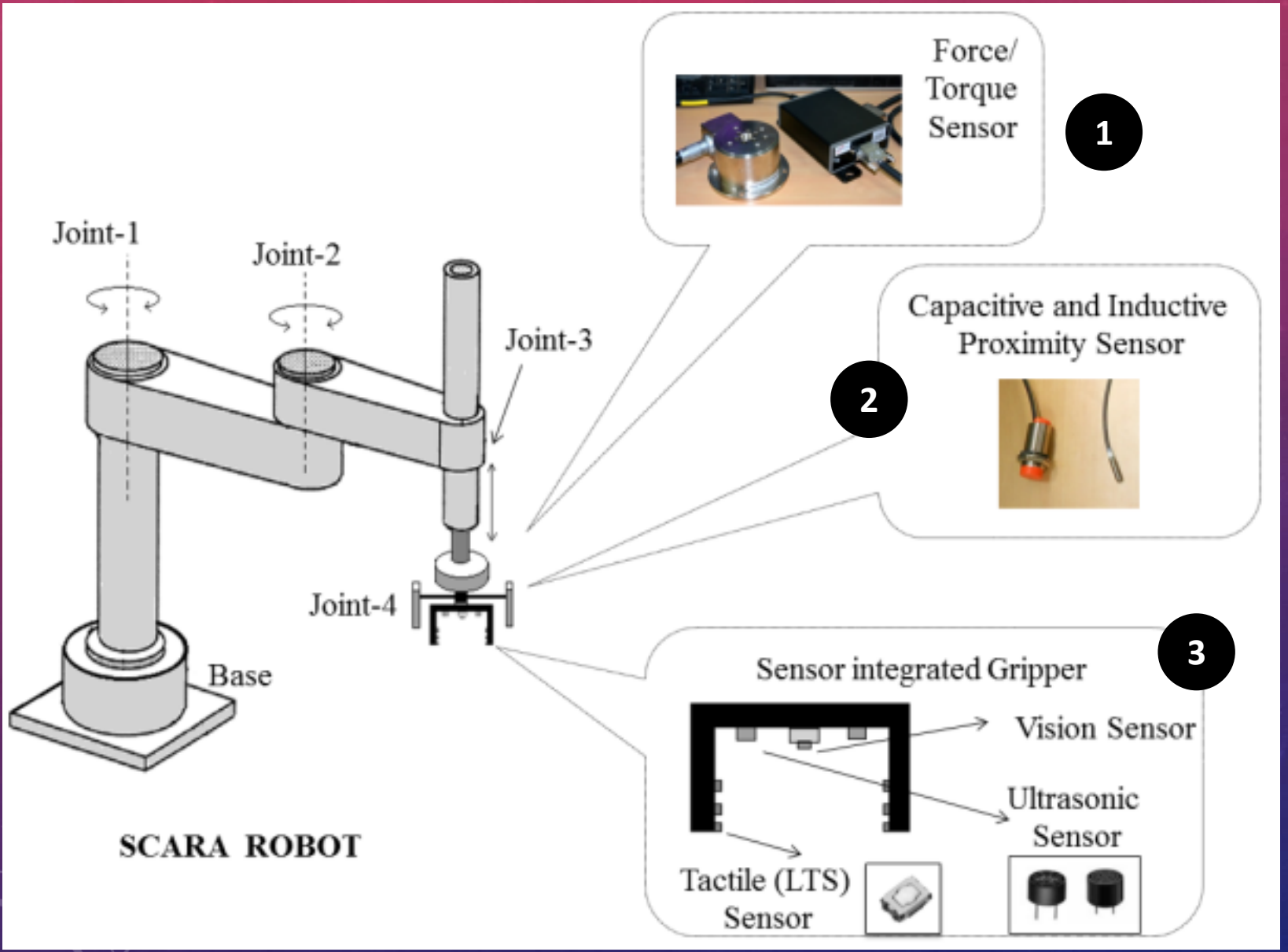
The first SCARA robot was created as a revolutionary prototype in 1978, in the laboratory of Professor Hiroshi Makino, at Yamanashi University in Japan. The 4-axis SCARA was designed as no other robot arm at the time. Its simplicity was brilliant-with less motion it could do more, with high speed and precision. The acronym SCARA stands for Selective Compliance Assembly Robot Arm. The robots themselves may vary in size and shape but all SCARA arms are consistent in a unique 4-axis motion. SCARA excels in “pick and place” in its unique ability to pick up industrial components from one location and place them in another, with precision, speed, and smooth motion.

HISTORY OF THE ROBOT



The SCARA arm behaves somewhat like the human arm in that joints allow the arm to move vertically and horizontally. However, the SCARA arm has limited motion at the wrist; it can rotate but it cannot tilt. The limited motion of the wrist is advantageous for many types of assembly operations, such as pick-and-place, assembly, and packaging applications. SCARA robots were introduced to commercial assembly lines in 1981 and still offer the best price/performance ratio regarding high-speed assembly. The Japanese flexible assembly system, based on the SCARA robot, created a worldwide boom in small electronics production, creating products which drove the economy and changed the world forever.

COMPLETE SYSTEM ARCHITECTURE



Integrated sensors with SCARA robot

The primary objective of the robot is to recognition, pick and manipulate the correct part for assembly and to carry out the operation for mating the parts to build the final products with the help of applied integrated sensor shown in the figure.

1. Force/Torque Sensor
2. Capacitive and Inductive Proximity Sensor
3. Sensor Integrated Gripper

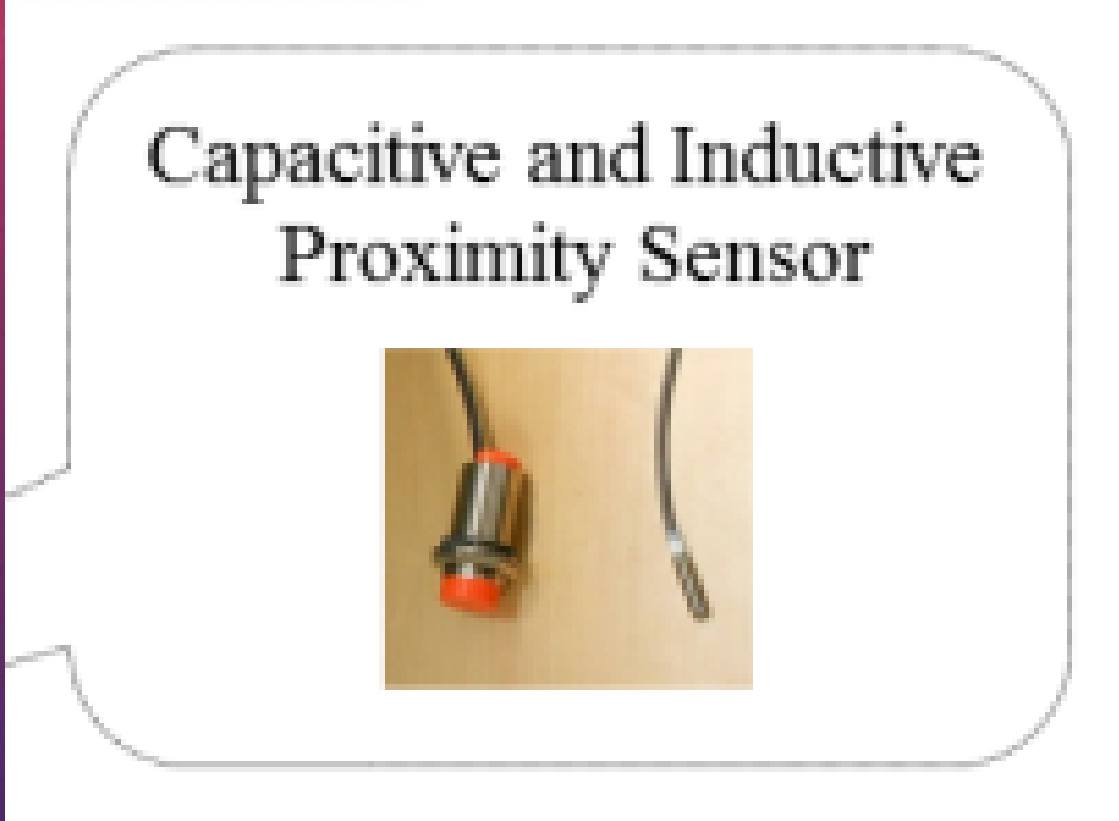
COMPLETE SYSTEM ARCHITECTURE

1. Force/Torque Sensor

The six axes Force/Torque sensor, mounted on the wrist of a SCARA robot fitted with suitable gripper, is used to sense the force and/or torque coming on the manipulator during an 'Obstacle encounter'.

COMPLETE SYSTEM ARCHITECTURE

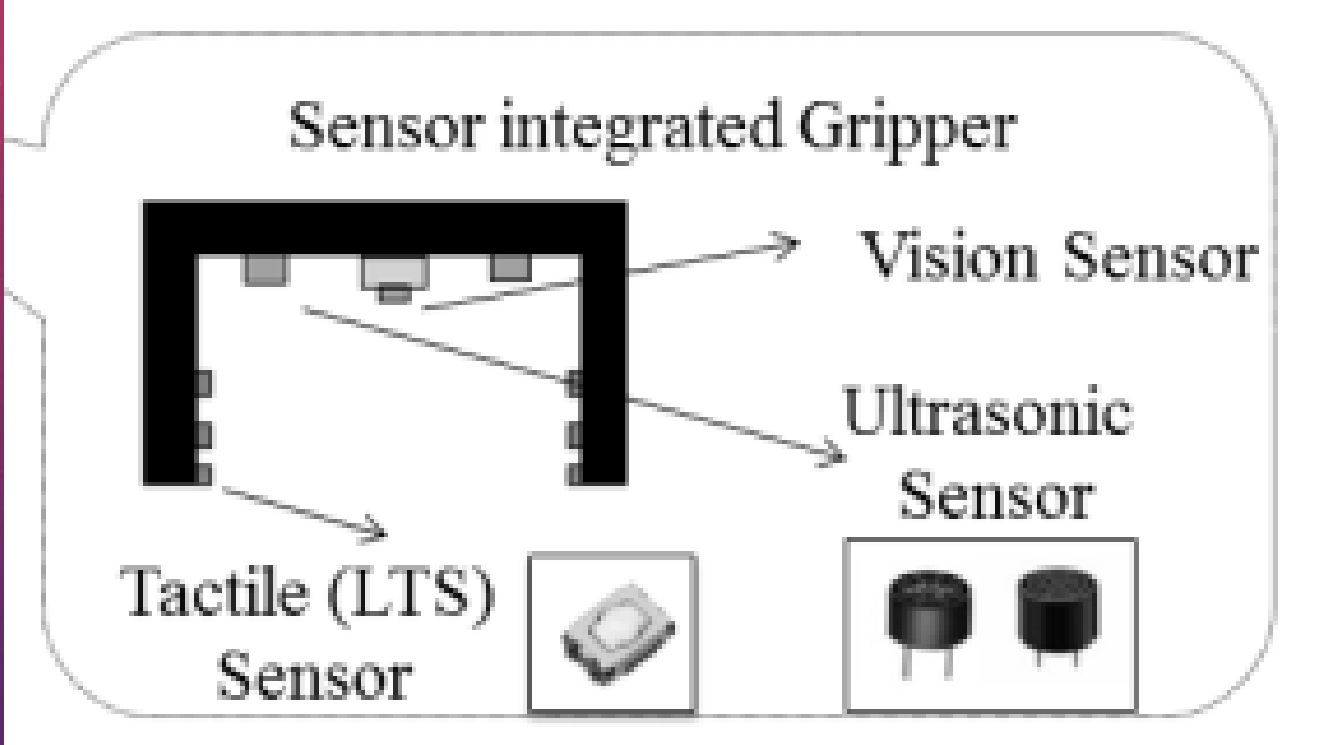
2. Capacitive and Inductive Proximity Sensor



Two proximity sensors both capacitive and inductive are mounted in the robot gripper to detect the presence or absence of any object; the specification of the proximity sensor used for the purpose is as follows. These sensors give ON-OFF type signals, which are being interfaced with Programmable Logic Controller (PLC).

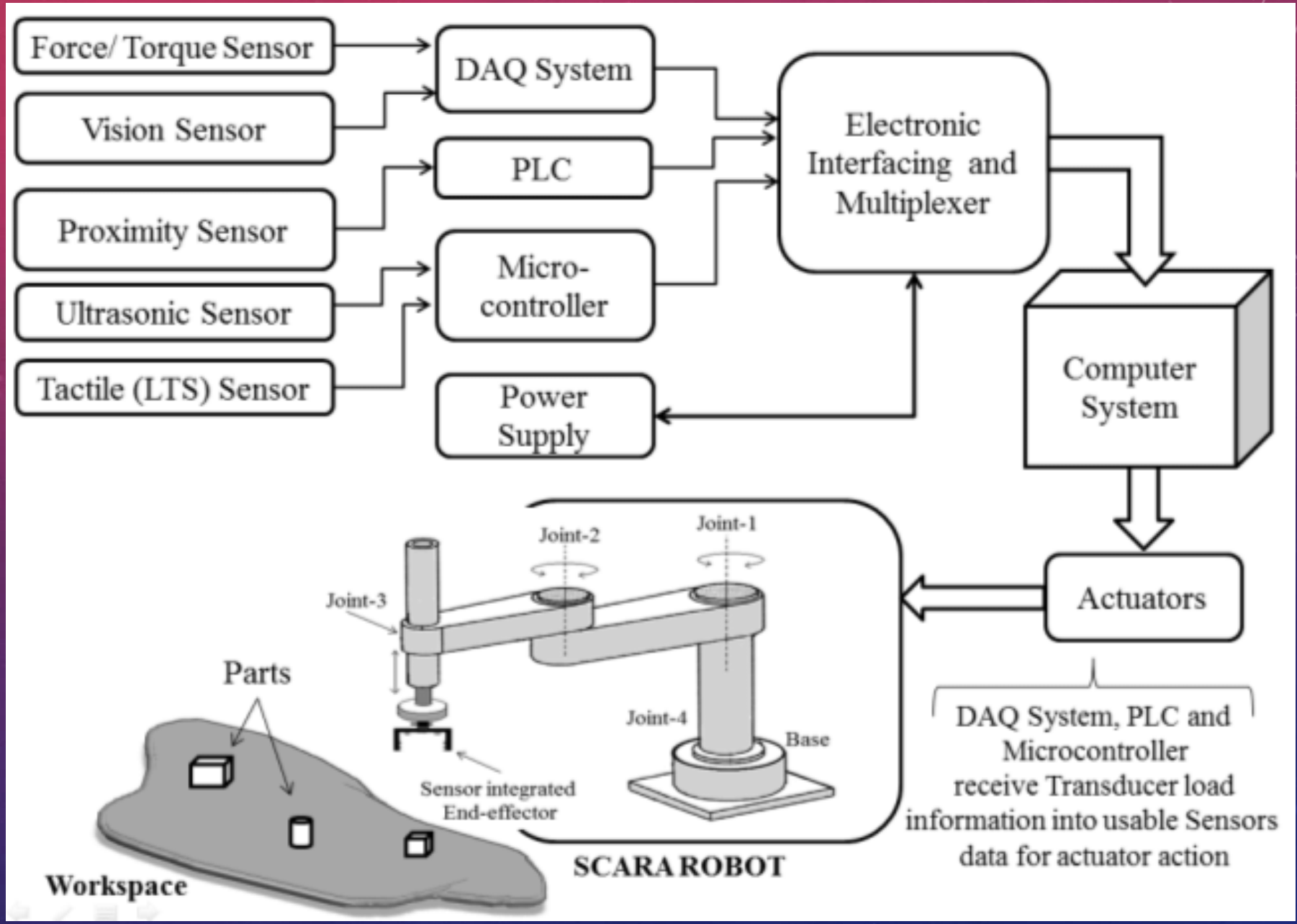
COMPLETE SYSTEM ARCHITECTURE

3. Sensor Integrated Gripper



Ultrasonic Sensor and Tactile Sensor is also mounted on the end-effector of a SCARA robot to sense the distance of the target object from the end-effector, and to indicate the applied pressure of the gripper to the targeted object respectively.

COMPLETE SYSTEM ARCHITECTURE



ROBOTICS HARDWARE COMPONENTS

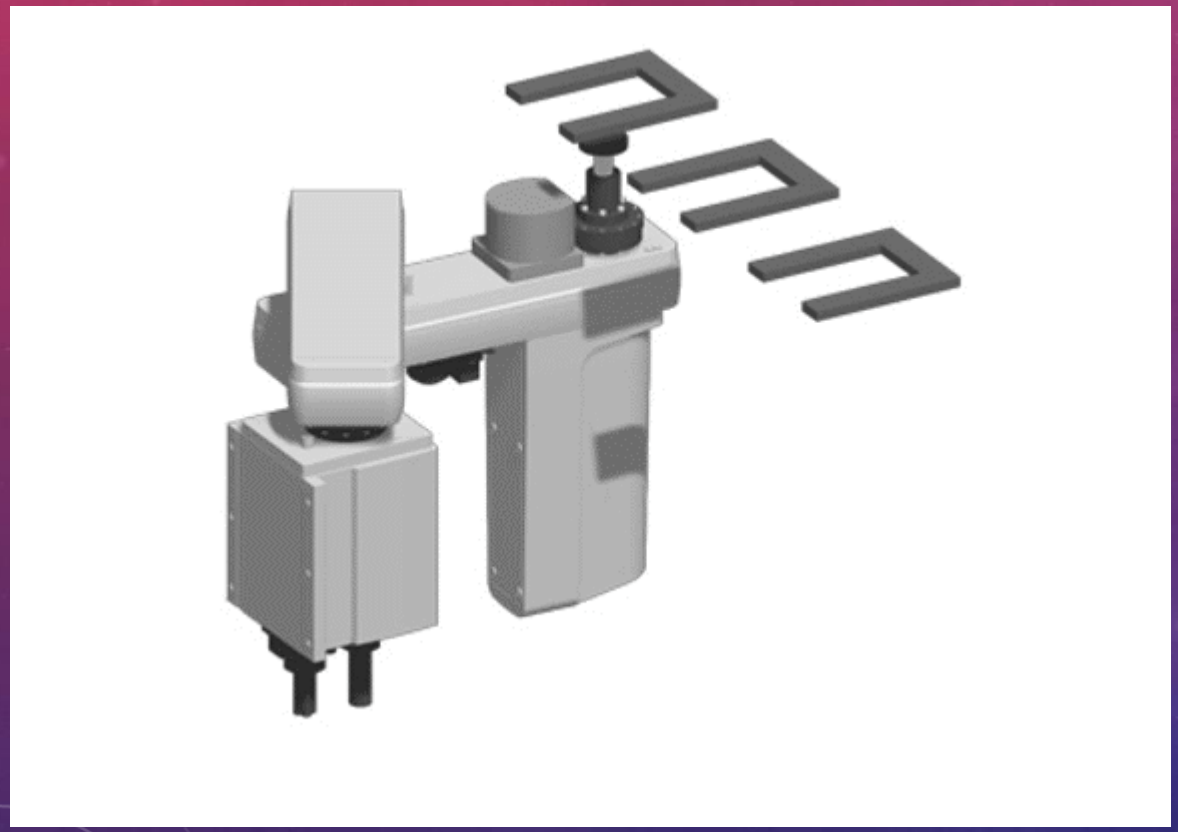
1. ROBOT BODY DESIGN VS. TASKS

Screw tightening work using robot vision iVY system

- Various conditions can be handled by adding the iVY system's position detection function. For example, the robot can be easily incorporated in cases such as when the screw hole positions are inconsistent, the workpiece position on the conveyor is not consistent, or when multiple types of workpieces are supplied.
- The iVY system can be calibrated with simple operations. The teaching process can be reduced, so the system startup time can be shortened, and labor costs can be reduced, etc.

1. ROBOT BODY DESIGN VS. TASKS

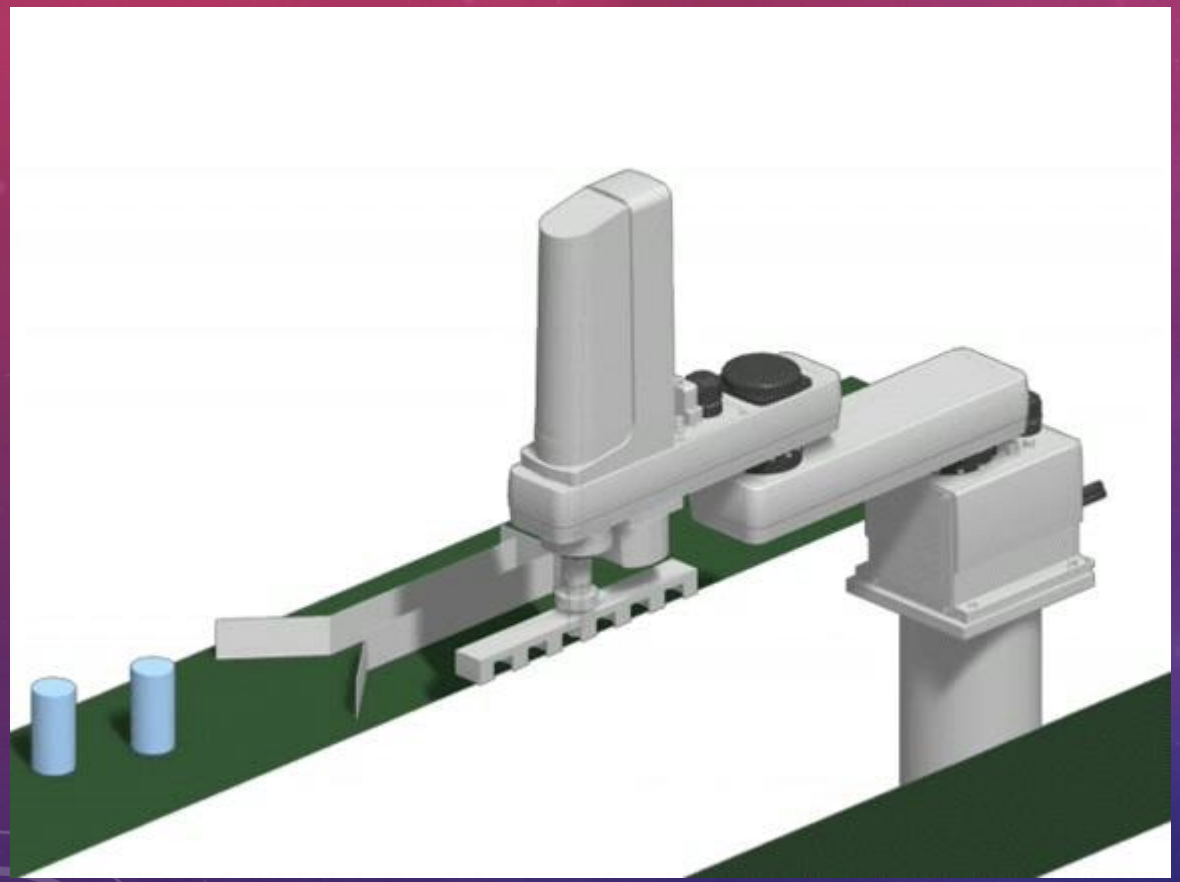
Process-to-process transfer using inverse specifications



- The inverse specifications allow the workpiece to be held from below, so the dropping of foreign matter onto the workpiece being transferred can be prevented.
- The robot mechanism performance is equivalent to the standard specifications. The high performance of the YK-XG Series can be utilized.
- Three installation patterns can be selected: the Yamaha Scalar robot's standard floor installation, wall mounting and this inverse specification. Yamaha proposes various ideas when designing your system.

1. ROBOT BODY DESIGN VS. TASKS

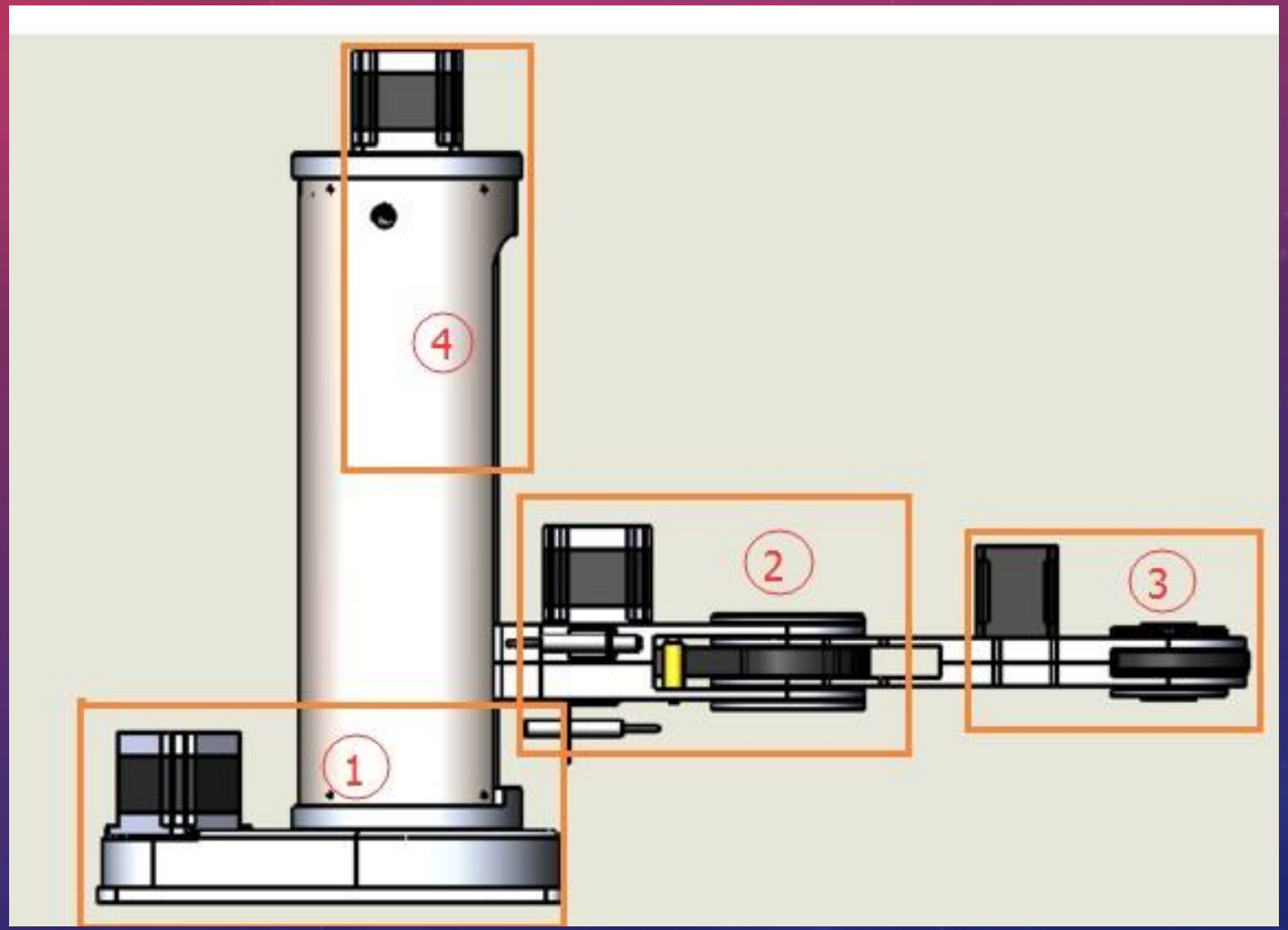
Process-to-process transfer of heavy workpieces



- The timing belt-less drive using the built-in structure realizes a high tolerable inertia for the R axis.
- A large hand can be used with this high tolerable inertia for the R axis. The transferrable quantity per session increases, and attains a higher efficiency.
- With a low inertia, the R axis can be moved with a high acceleration, and the cycle time can be shortened.
- Harmonic gears are adopted for the XYR axis reduction gears.

2. ACTUATORS/LOCOMOTIONS

STEP SCARA (Closed-loop Stepper Motors)



2. ACTUATORS/LOCOMOTIONS

STEP SCARA (Closed-loop Stepper Motors)

Sanyo Denki 24 V Unipolar Hybrid, Single Shaft Stepper Motor, 0.12Nm Holding Torque, 5mm Shaft Diameter

SANYO DENKI

RS Stock No.: **878-7657** | Mfr. Part No.: **SH3533-12U40** | Manufacturer: Sanyo Denki

5 In Global stock for delivery within 4 - 6 working days

1 units

Add to basket

Real time qty checker

Price Each

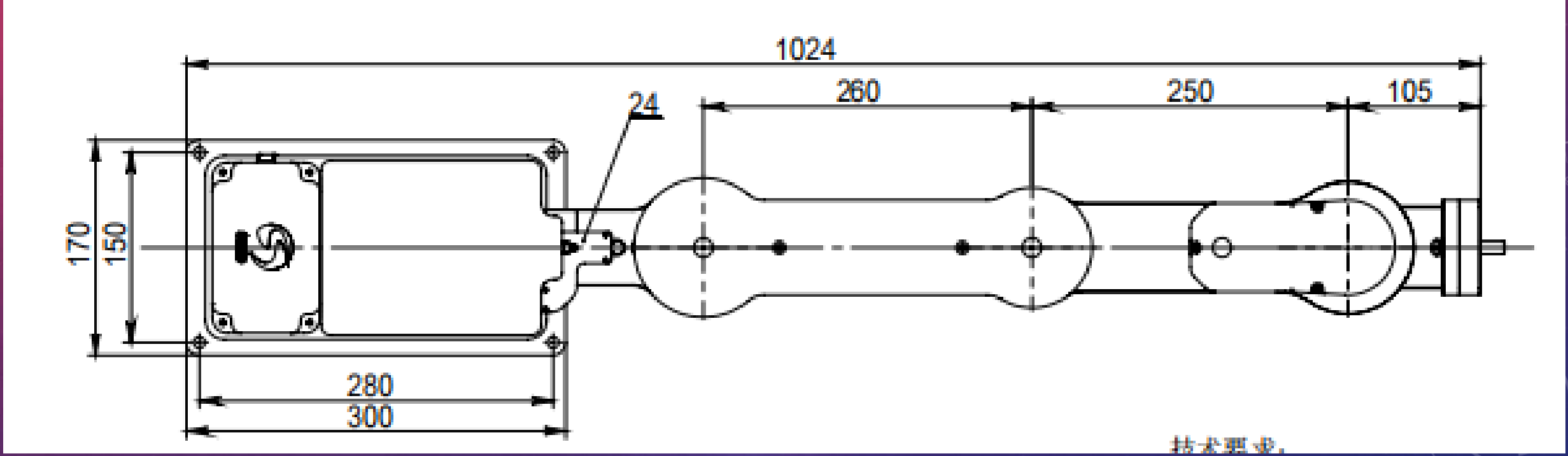
MYR586.04

units	Per Unit
1 +	MYR586.04

View all Stepper Motors

2. ACTUATORS/LOCOMOTIONS

SERVO SCARA (Servo Motors)



2. ACTUATORS/LOCOMOTIONS

SERVO SCARA (Servo Motors)

Image shown is a representation only. Exact specifications should be obtained from the product data sheet.

MSME082G1A

Digi-Key Part Number	1110-3757-ND
Manufacturer	Panasonic Industrial Automation Sales
Manufacturer Product Number	MSME082G1A
Description	SERVOMOTOR 3000 RPM 200V
Manufacturer Standard Lead Time	14 Weeks
Detailed Description	AC Motor Servomotor 3000 RPM 750W Incremental 200VAC
Customer Reference	Customer Reference
Datasheet	Datasheet

1 In Stock

Can ship immediately

QUANTITY

Quantity

Add to Cart

Add to List

All prices are in MYR

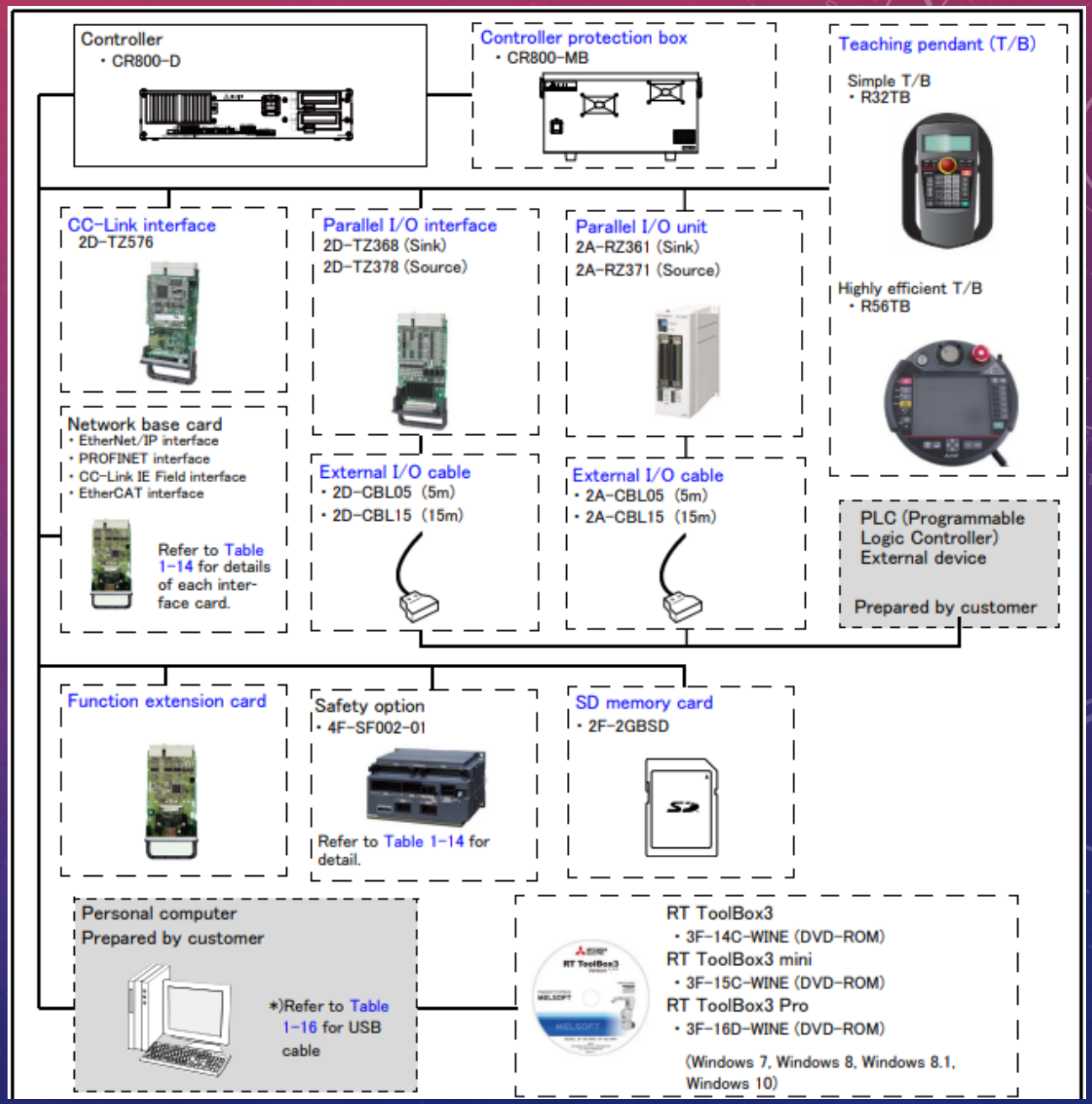
Bulk

QTY	UNIT PRICE	EXT PRICE
1	RM2,710.08000	RM2,710.08
5	RM2,574.59600	RM12,872.98

Product Attributes

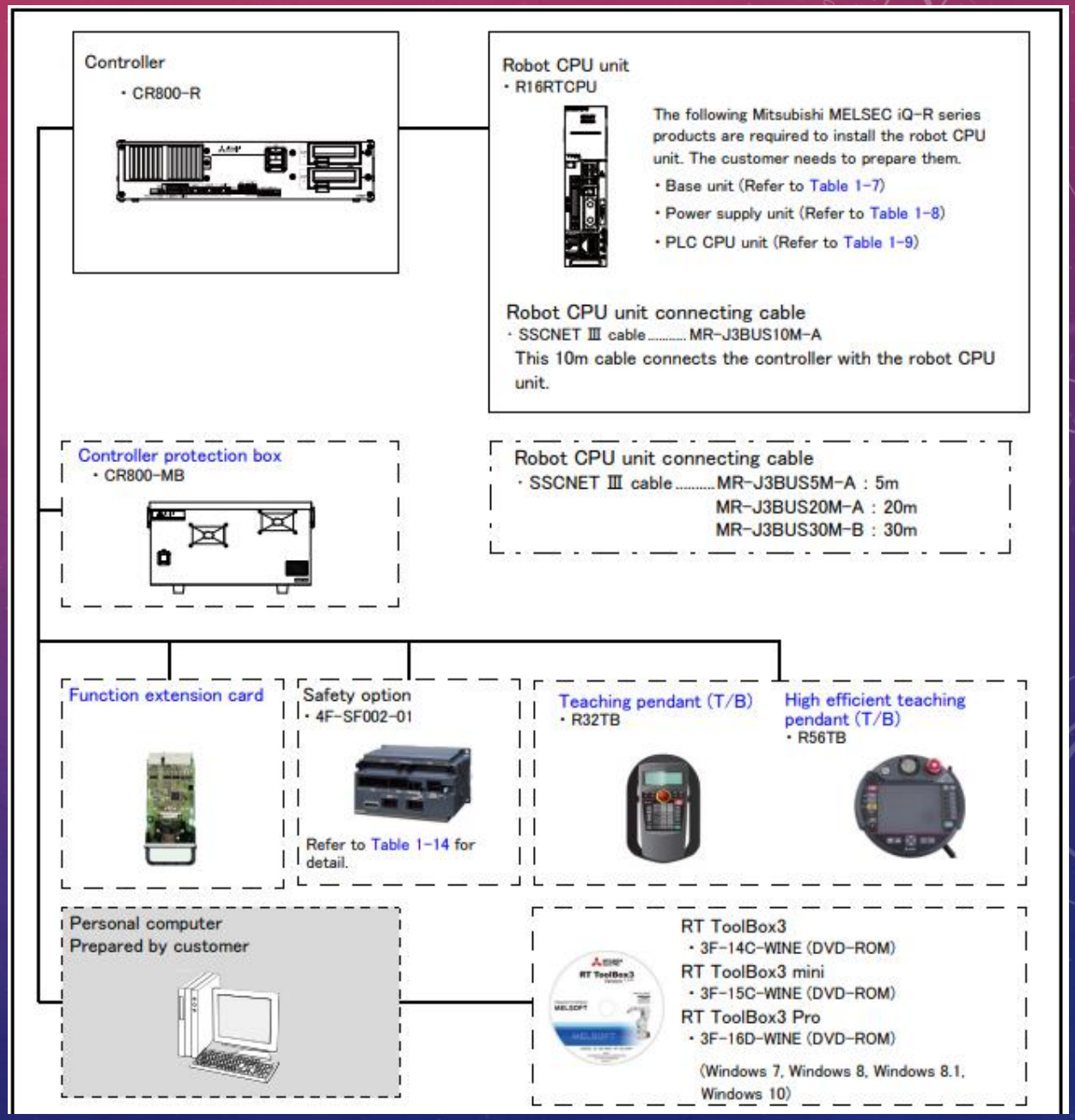
3. NAVIGATION SYSTEM & CONTROLLER

Mitsubishi CR800-D Controller



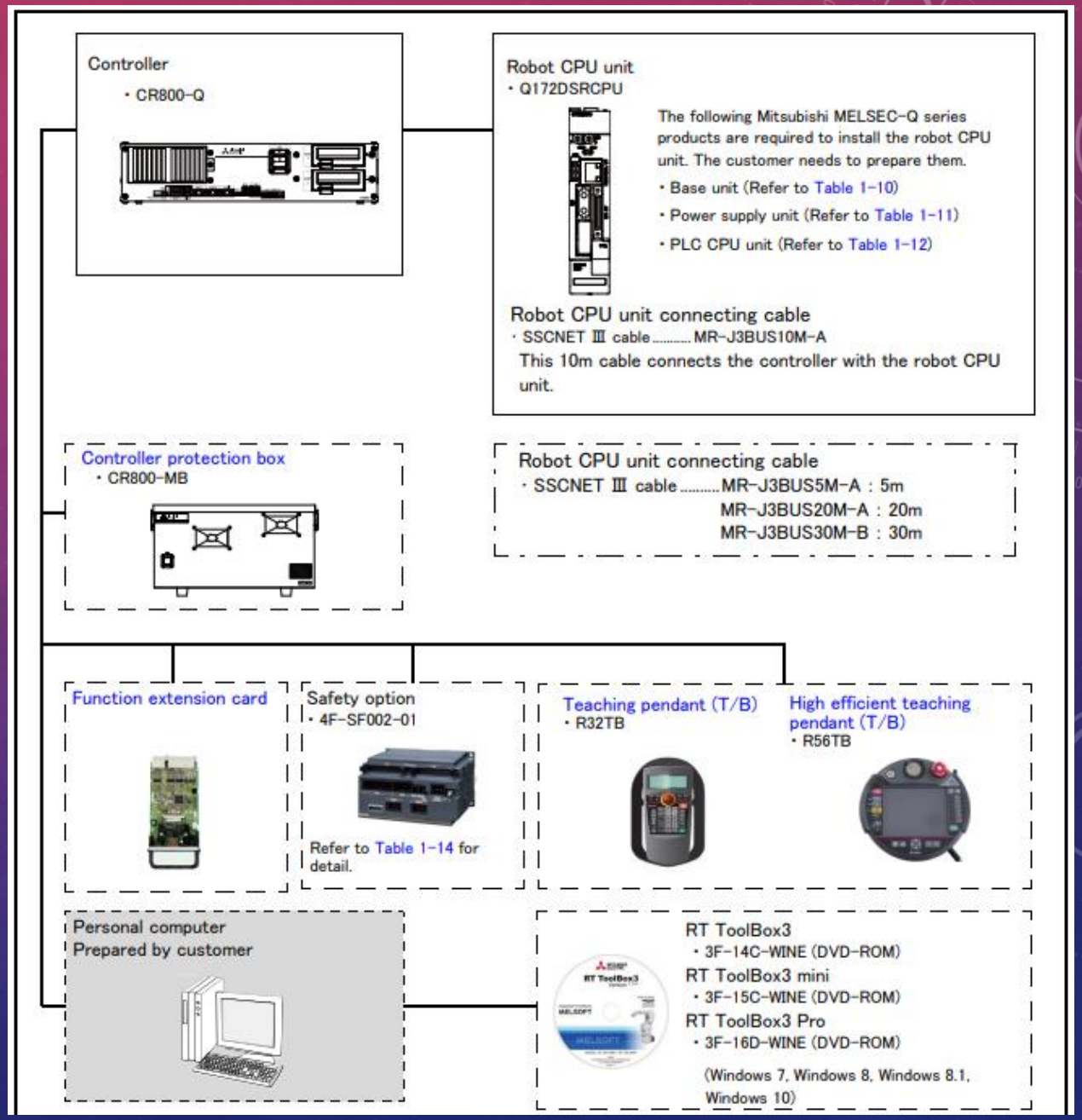
3. NAVIGATION SYSTEM & CONTROLLER

Mitsubishi CR800-R Controller



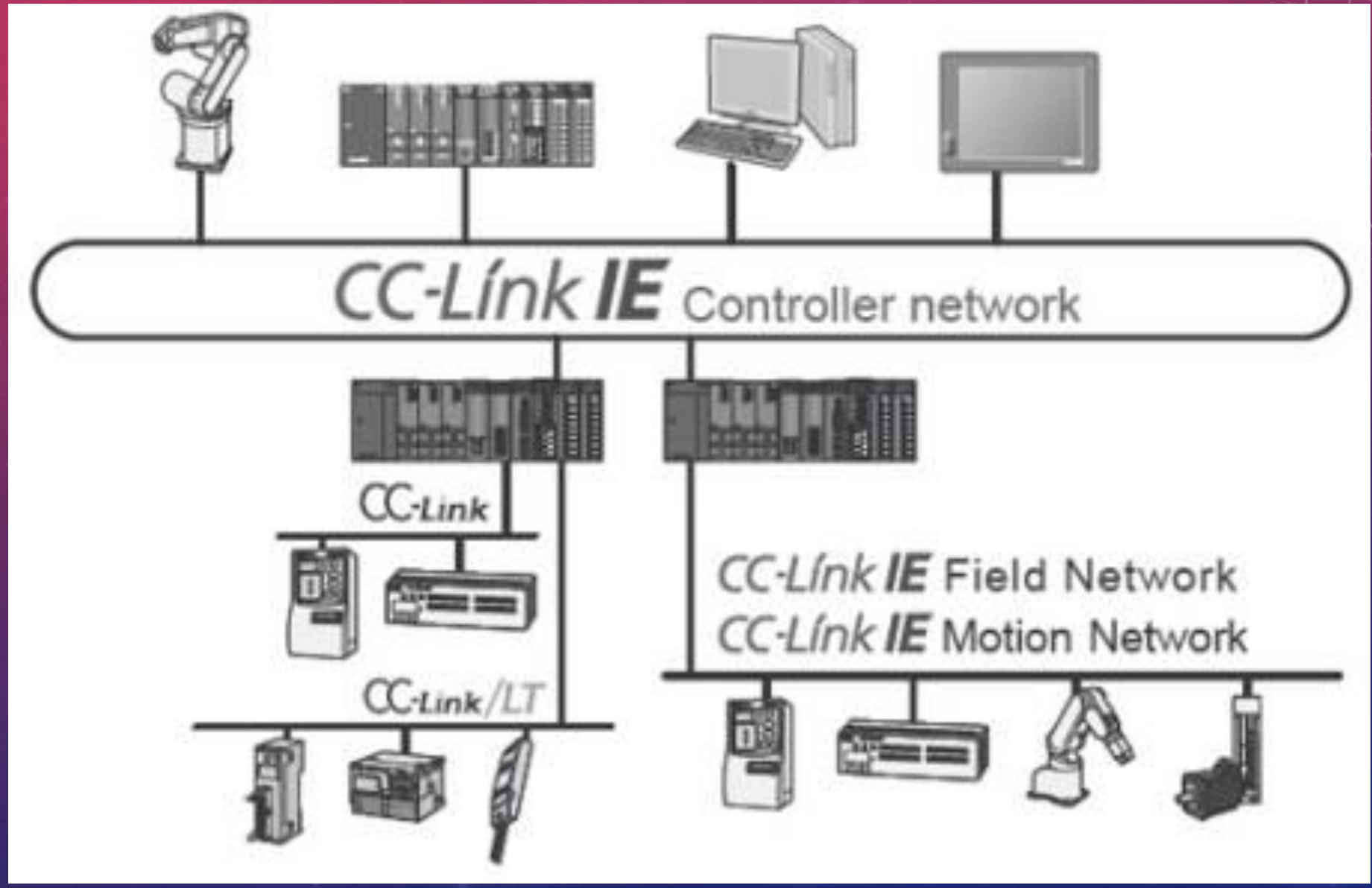
3. NAVIGATION SYSTEM & CONTROLLER

Mitsubishi CR800-Q Controller

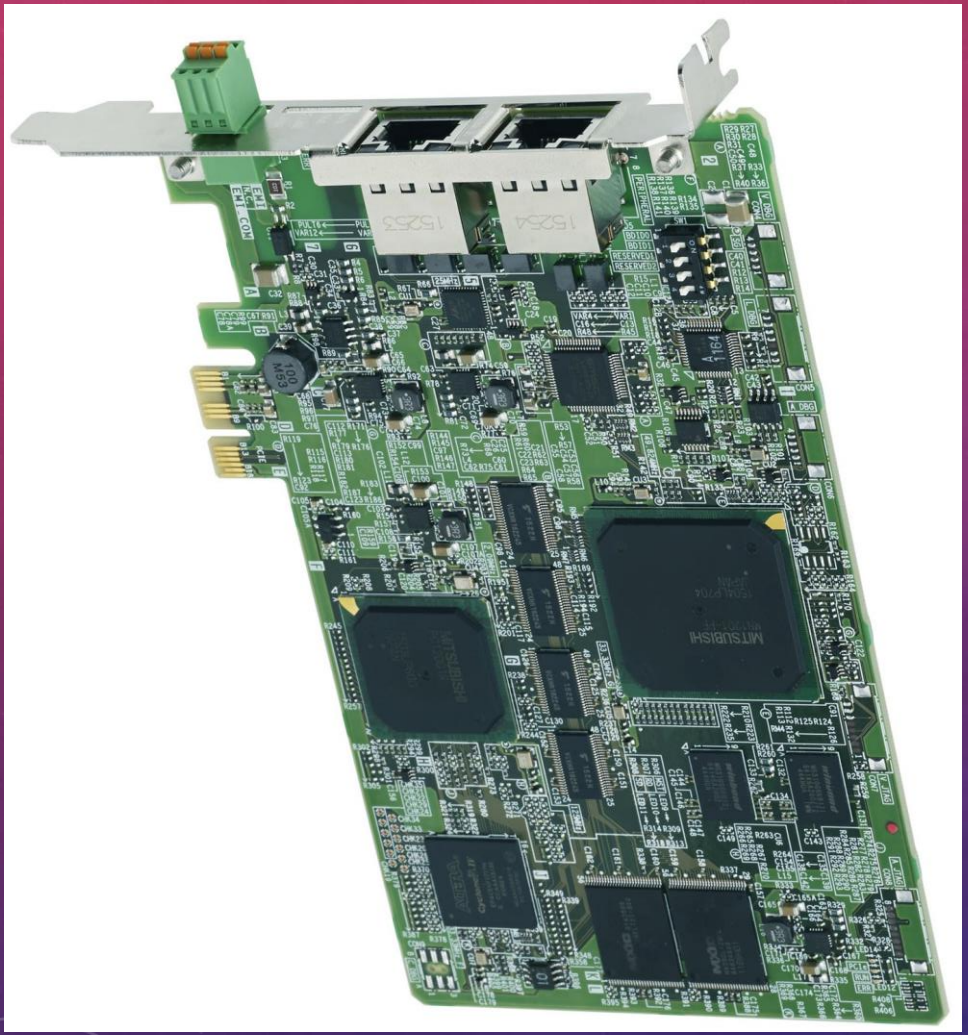


4. DATA COLLECTION

CC-Link interface



4. DATA COLLECTION



CC-Link interface

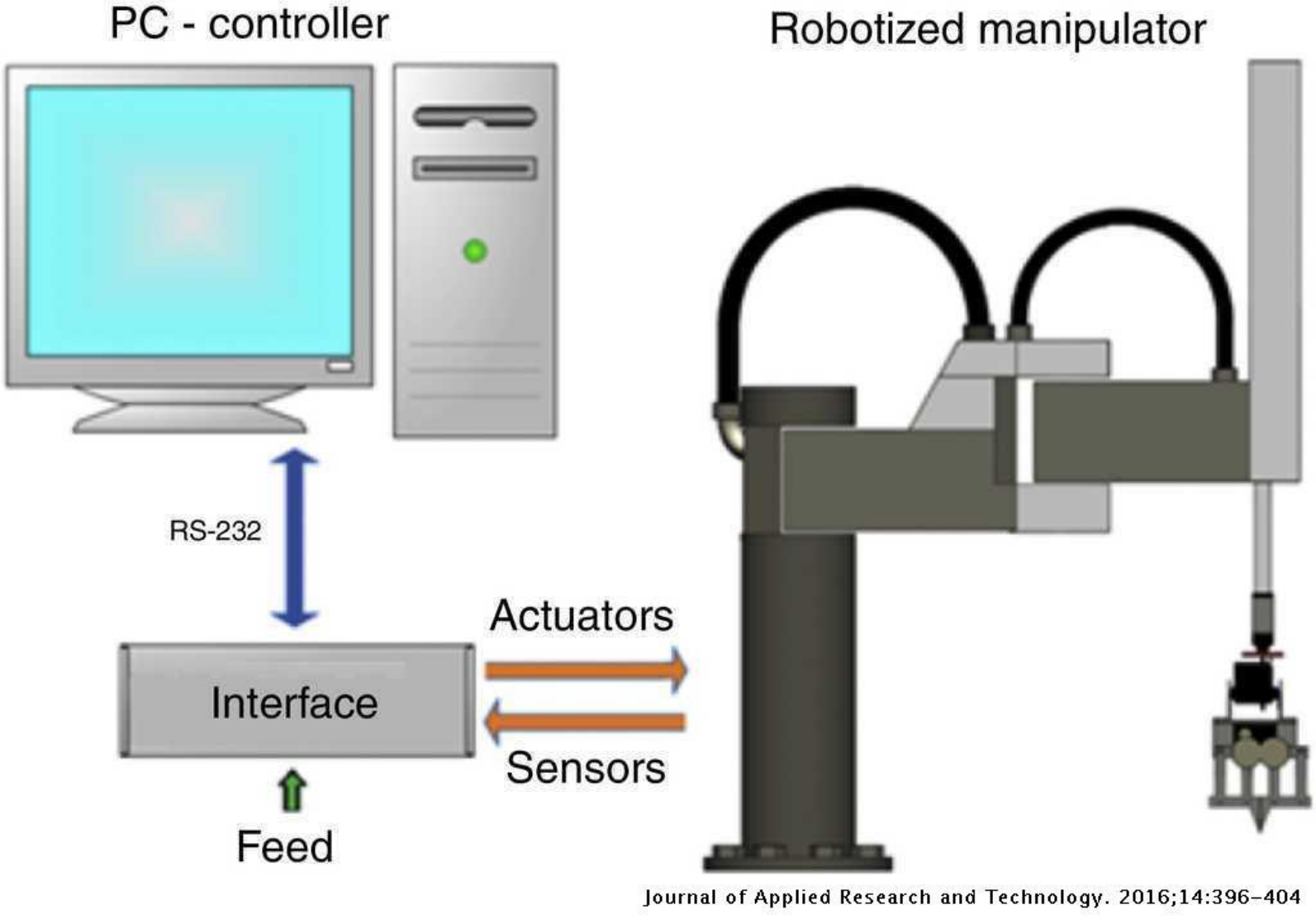
CC-Link is an abbreviation of Control & Communication Link. Its purpose is to integrate system control and communication. CC-Link is an open network. Its specifications have been disclosed widely to vendors of sensors and valves to be used in FA environments. The CC-Link interface is the option interface to not only add bit data to the robot controller, but also to add CC-Link field network function that allows cyclic transmission of word data.

4. DATA COLLECTION

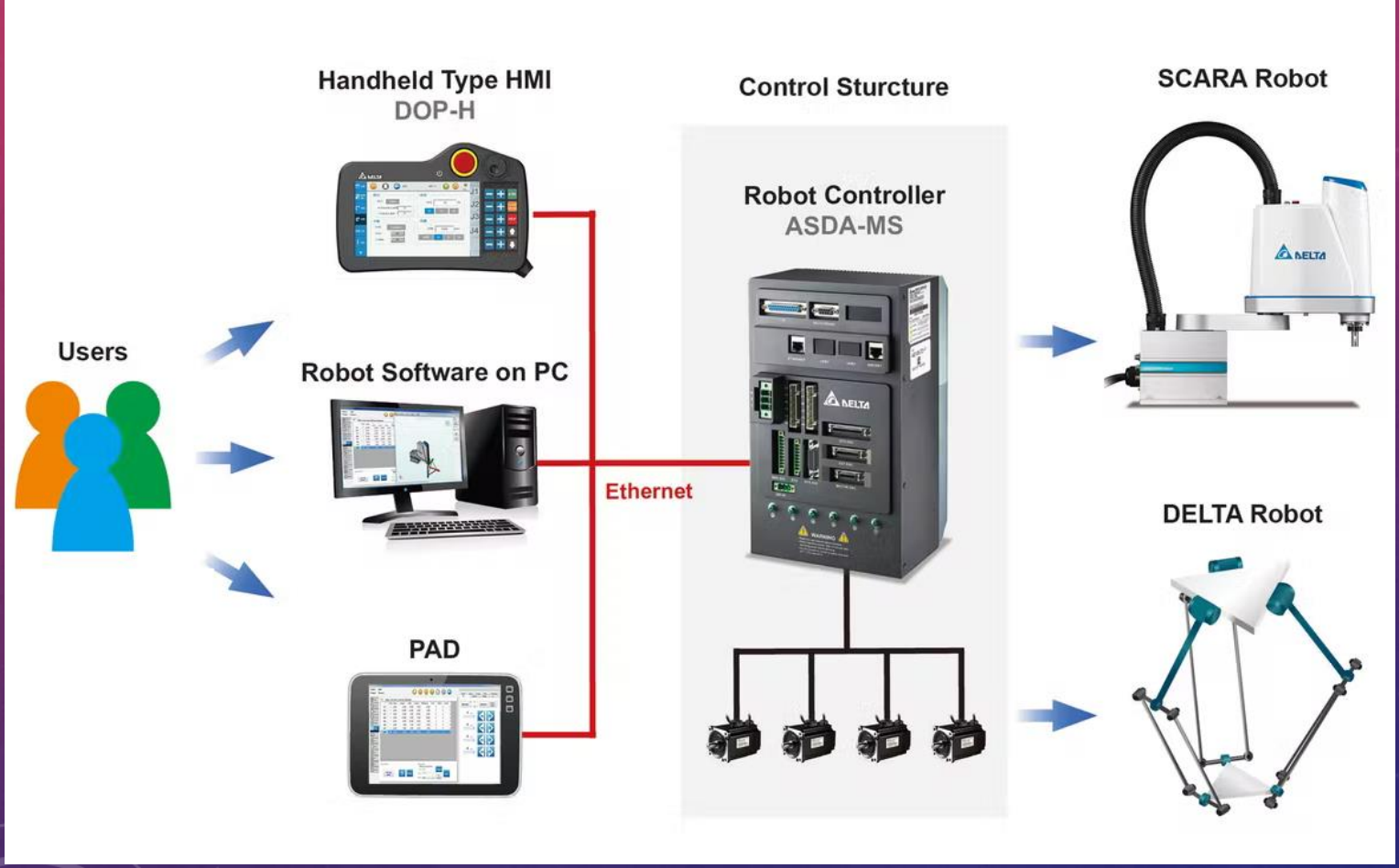
SD Card

A Secure Digital (SD) card is a tiny flash memory card designed for high-capacity memory and various portable devices, such as car navigation systems, cellular phones, e-books, PDAs, smartphones, digital cameras, music players, digital video camcorders and personal computers. This card is used as an extended memory. Insert this card to the slot (SD CARD) on the front of the controller, and store robot programs, logging data, or other data.

5. DATA TRANSMISSION



5. DATA TRANSMISSION

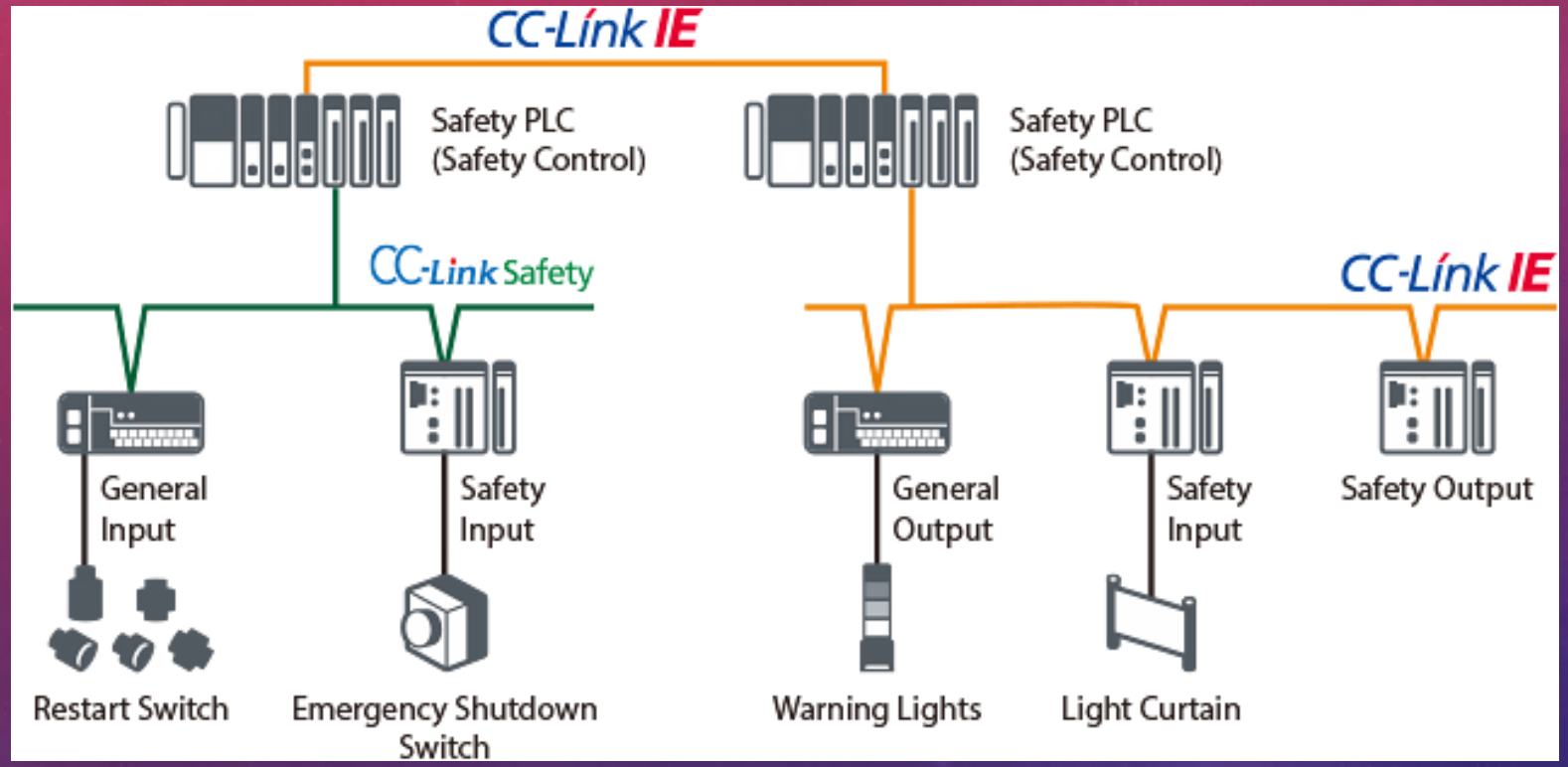


Ethernet

Ethernet Industrial Protocol is built on standard TCP/IP (IEEE 802.3) and communications use existing network infrastructure. Ethernet physical layer technology is used along TCP and UDP ports (44818 and 2222). Its main advantage comes from the inerrant progress of physical Ethernet, from 10 Mbits/s to 10/100 Mbits/s to 1 Gbits/s and more. EtherNet/IP also ensures Internet and enterprise connectivity for remote control.

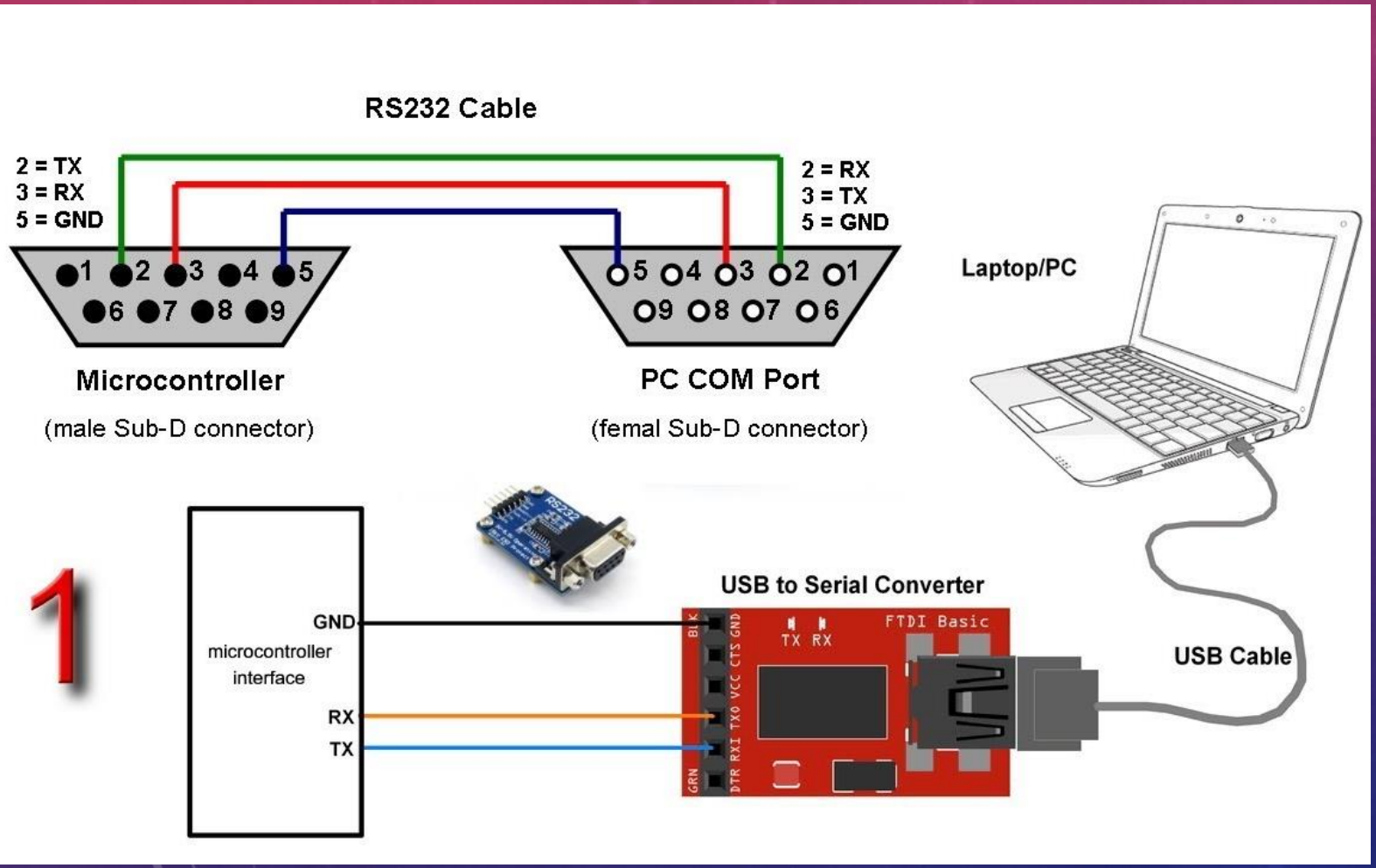
5. DATA TRANSMISSION

CC-Link



An open protocol for industrial networks that include protocols for the information network, the controller network, and the device field network. The version of CC-link depends on the physical layer being used. The protocol can normally have up to 64 nodes and have speed going from 10 Mbps at 100 meters to 156 Kbps at 1200 meters.

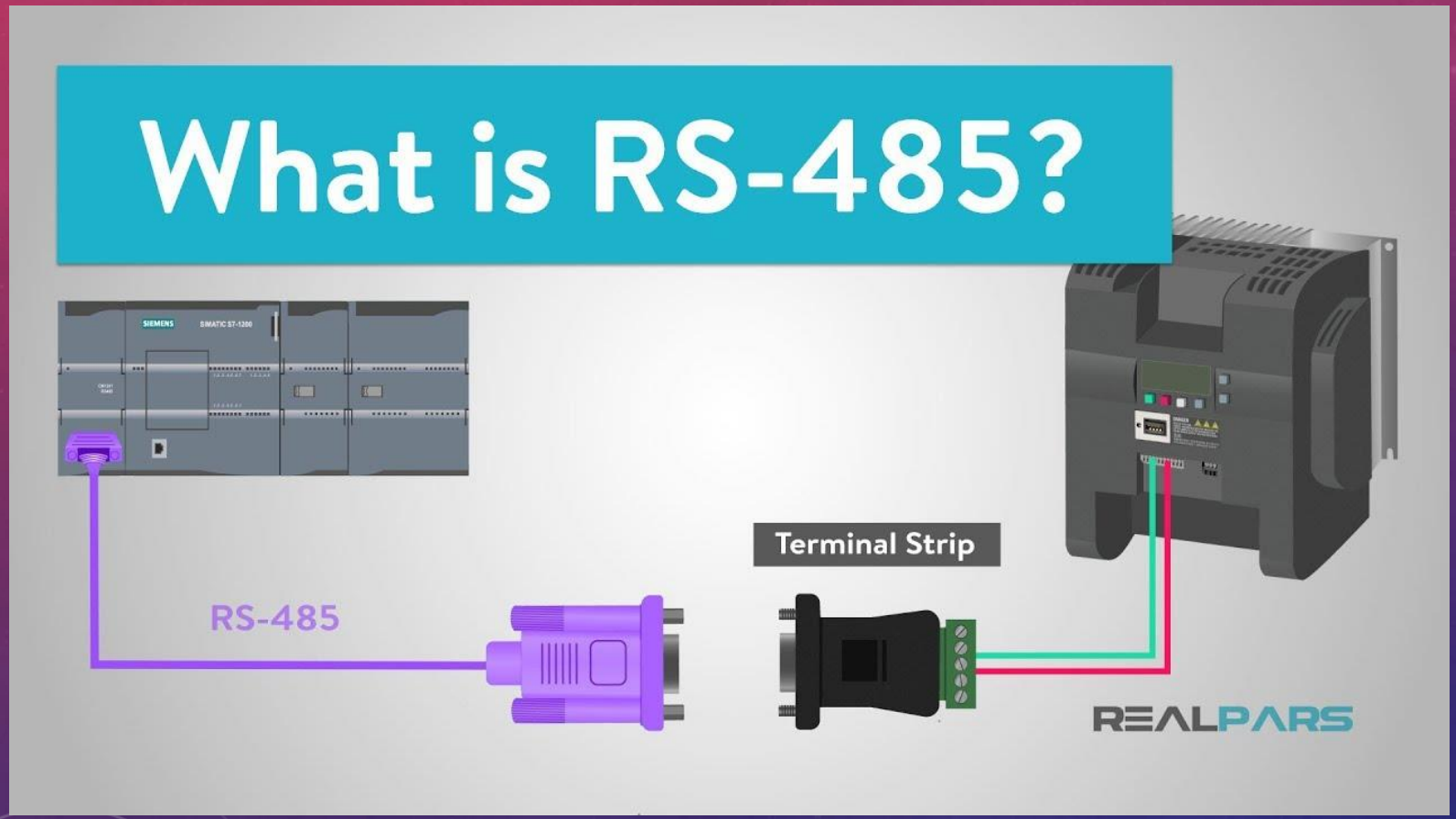
5. DATA TRANSMISSION



RS-232

RS232 is a Serial Communication Standard developed by the Electronic Industry Association (EIA) and Telecommunications Industry Association (TIA). RS232 defines the signals connecting between DTE and DCE. Here, DTE stands for Data Terminal Equipment and an example for DTE is a computer. RS232 works on the two-way communication that exchanges data to one another. There are two devices connected to each other, (DTE) Data Transmission Equipment& (DCE) Data Communication Equipment which has the pins like TXD, RXD, and RTS& CTS. Now, from DTE source, the RTS generates the request to send the data.

5. DATA TRANSMISSION



RS-485

RS-485 is a duplex communication system in which multiple devices on the same bus can communicate in both directions. RS-485 is most often used as half-duplex, as shown in the figures above, with only a single communication line ('A' and 'B' as a pair). The MODBUS RS485 protocol articulates communication between hosts (AKA “Masters”) and devices (AKA: “Slaves”), allowing a query for device monitoring and configuration. Messages transmitted by MODBUS provide basic read and write operations via binary registries (known as “Coils”), and 16-bit words.

6. POWER SYSTEM MANAGEMENT

Robot controller model		YRCX
Basic specifications	Number of controllable axes	4 axes maximum (Control simultaneously: 4 axes) Expandable up to 16 axes (4 robots) using YC-Link/E
	Controllable robots	SCARA robots
	Maximum power consumption	2500 VA
	Capacity of the connected motor	1600 W or less (in total for 4 axes)
	Dimensions (WxHxD)	355x195x130 mm
	Weight	6.2 kg
	Power supply voltage	Single phase 200 to 230 VAC, +/-10% maximum, 50/60 Hz

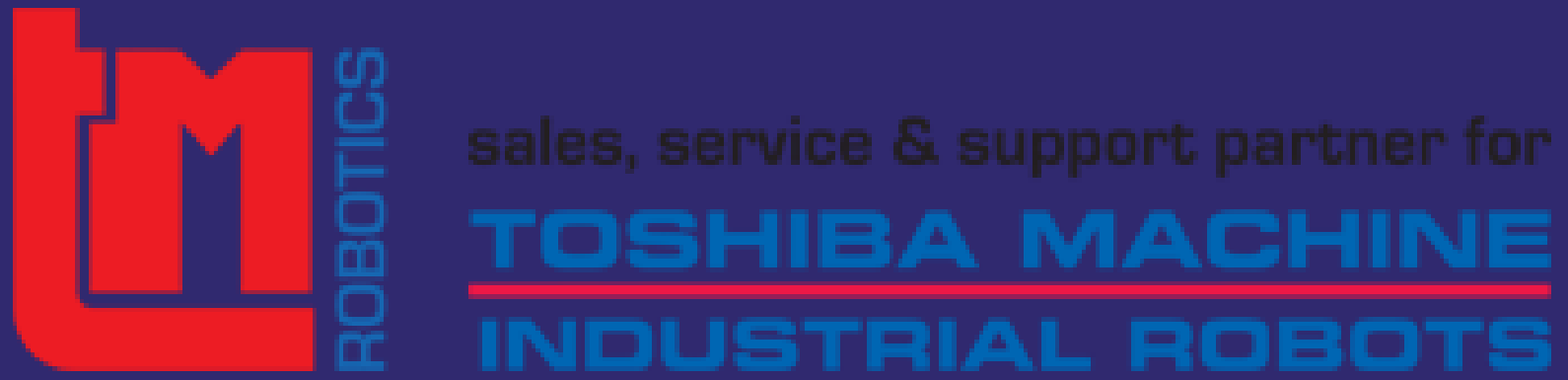
LIST OF SCARA ROBOT COMPANIES

The **EVS Tech** company was founded in 2017 and is in Sichuan, China. As the leading robotic arm manufacturer, EVS offers innovative and flexible industrial robotic arms for sale for a wide variety of applications and is the exclusive global market partner of QJAR robots. The firm supplies top-of-the-line scara robots for industrial applications including Assembly operations, Palletizing, and Material handling. EVS scara robots have 4-axis robot arms with 6Kg and 3Kg payloads and varying arm reach. All their components are sourced from premium brands, and they deliver integrated services with no snags.

LIST OF SCARA ROBOT COMPANIES

Stäubli was established in 1892 in Zurich but now has its headquarters in Pfäffikon, Switzerland. It provides mechatronic solutions and has a dedicated robotics department. It operates in 29 countries worldwide. The scara robots from Stäubli comprise 4-axis and 6-axis models. The company recommends them for various applications including sterile environments such as food processing plants and pharmaceutical factories. Each robot has a corresponding controller developed in-house.

LIST OF SCARA ROBOT COMPANIES



TM Robotics has been in the robotics industry for over 20 years. It has two main head offices in Hertfordshire, United Kingdom, and Grove Village, Illinois, USA. It is the official sales partner of Shibaura Machine. TM scara robots are categorized in series based on what they offer. They are grouped as THL - Energy-efficiency, THE - High load performance with synchronization and precision tracking features, TH - Strong payload capacities, THP - High-speed series

LIST OF SCARA ROBOT COMPANIES

Based in Turin, Italy, **Comau** was begun in 1970 and operates out of 14 countries worldwide. Comau prides itself on producing high-speed scara robots that are ideal for pick and place tasks in production processes. It offers 3 models in its Rebel S range which are all 4-axis robots with payloads of 6 Kgs. They, however, have different horizontal arm reaches of lengths of 450mm, 600mm, and 750mm.

LIST OF SCARA ROBOT COMPANIES

YASKAWA

Yaskawa was founded in 1915 and has its operations based in Kitakyushu, Fukuoka, Japan. The company, nevertheless, has a presence in America, Europe, Asia Pacific, the Middle East, and Africa. Scara robots from Yaskawa are mainly flexible 4-axis models with payloads of 6-10Kgs and a horizontal reach of 450 to 850mm. They operate at high-speed and can be fitted with vision functionality. The company also offers controllers for each scara robot.

LIST OF SCARA ROBOT COMPANIES

Kawasaki
Kawasaki Robotics

Kawasaki Robotics is located in Wixom, Michigan, and is a subsidiary of Kawasaki Heavy Industries. It was established in 1987 as a supplier of robotic solutions. Among others, the firm offers unique dual-arm scara robots with payloads of 2Kgs and 3Kgs. They are 4-axis robots that have vision systems and arm reach lengths of between 150mm to 550mm. They are efficient in tasks such as PCB assembly, material handling, and serving of beverages.

LIST OF SCARA ROBOT COMPANIES

The **Yamaha** headquarters is located in Shingai, Iwata-shi, Japan. The company was founded in 1955 as a motor company but has since diversified and now has a robotics department. Scara robots from Yamaha can be mounted in different positions depending on the application. They offer ceiling, wall-mount, and table-top robots among others. For clean areas, they have dust-proof and drip-proof models with adequate IP ratings.

LIST OF SCARA ROBOT COMPANIES

Epson was founded in 1984 and has 8 international locations. In America, the company headquarters is in Carson, California. There are approximately 300 Epson scara robot models. Some are designed to meet various manufacturing needs such as slide alternatives and the ability to fit in small spaces. The brand also offers heavy-duty scara robots with vast work envelopes of up to 1100mm. Some have IP ratings as well to facilitate usage in special areas.

LIST OF SCARA ROBOT COMPANIES

KUKA

KUKA was established in 1898 and has its head office in Augsburg, Germany. It is a supplier of automation solutions and has multiple international locations. KUKA scara robots are compact designs with payloads of 6Kgs and arm reach of between 500-700mm depending on the model. They are designed to be low-maintenance and highly adaptable to different production setups. Additionally, they have an internal media supply for power and data to support their intelligent features.