SSAEPL Manipulator Systems

Precision Underwater Manipulation for ROV Operations

Brochure & Technical Datasheet | SSAEPL S / M / X / L Series

Subsea Sales and Engineering Pte. Ltd.

Integrated Land, Air & Sea Technology Solutions

Who We Are

Subsea Sales and Engineering Pte. Ltd. is a technology and engineering solutions provider delivering products and integrated systems across the marine, land and air domains, working with world-class technology partners.

- Advanced robotics and autonomous systems
- AI-powered inspection and defect detection
- Digital transformation and digital twin platforms
- Lifecycle engineering and technical support



Why Choose SSAEPL

- Integrated Land, Air & Sea solutions
- Partnerships with global technology providers
- Experienced engineering and support team
- Complete turnkey project delivery
- After-sales service and training
- Regional support across Southeast Asia

The SSAEPL Manipulator System

A high-performance underwater robotic arm delivering precise, reliable manipulation for inspection, intervention and recovery. Engineered for integration with observation-class and work-class ROVs, it lets operators perform complex subsea tasks while minimising diver intervention.

4	S / M / X / L	Electric	Modular
Product series	Payload classes	Servo actuation	End-effector interface

Available from Subsea Sales and Engineering Pte. Ltd. — supplied, integrated and supported regionally.

Key Features

Compact & robust

Lightweight, compact construction built for confined ROV envelopes.

Electric actuation

High-precision servo-driven joints with proportional control.

Multi-function gripper

Secure object handling across varied payload geometries.

Modular design

Fast integration, field servicing and component replacement.

Marine-grade build

Corrosion-resistant materials, hard-anodised surface treatment.

Pressure rated

Qualified for demanding subsea operating depths.

Efficient power draw

Low consumption with high operational efficiency.

Broad compatibility

Integrates with a wide range of ROV platforms.

Product Range: Underwater Electric Manipulators

Series	Positioning	Typical Duty	Operating Method
SSAEPL S	Lightweight operation	Observation-class ROVs, sampling, shearing, light tooling	Manual / master control
SSAEPL M	Medium payload operation	Jaw and shearing work, tool handling, intervention support	Manual / master / remote
SSAEPL X	High-precision operation	Dexterous multi-axis tasks, detachable gripper, research	Master / ROS controller
SSAEPL L	Heavy payload operation	Heavy intervention, construction and recovery tasks	Master / teach & controller

Common Architecture

- Electric servo drive across all series
- Multiple degrees of freedom by model
- Hard-anodised, corrosion-resistant build
- Chassis-mount installation, standard cable set

Selection Guidance

- Match payload class to ROV lift and power budget
- Confirm depth rating against site conditions
- Choose end effector by task, not by arm alone
- SSAEPL sizes the package with your ROV team

Specification Framework

Every model is defined against the same four parameter groups — use this framework when comparing series or issuing a technical enquiry.

Mechanical Parameters

- Dexterity / degrees of freedom
- Weight in air and in water; rated load
- Waterproof depth
- Material, surface treatment, installation

Electrical Parameters

- Drive mode (servo motor)
- Peak and rated power; rated voltage
- Communication protocol
- Endpoint and repeat positioning accuracy

Gripper / End Effector

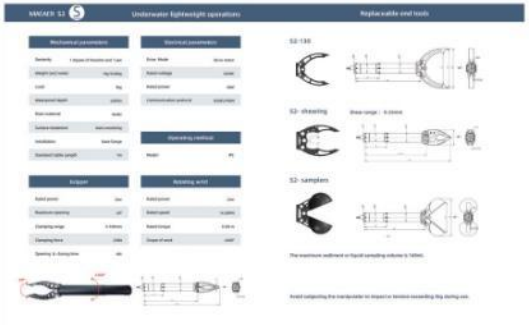
- Rated power
- Maximum jaw opening and clamping range
- Clamping force; cutting or shear range
- Rotating wrist torque and speed

Operation & Control

- Operating method; control mode
- Master or remote control
- Range of motion and speed per joint
- Controller and interfaces

SSAEPL S Series — Lightweight Operations

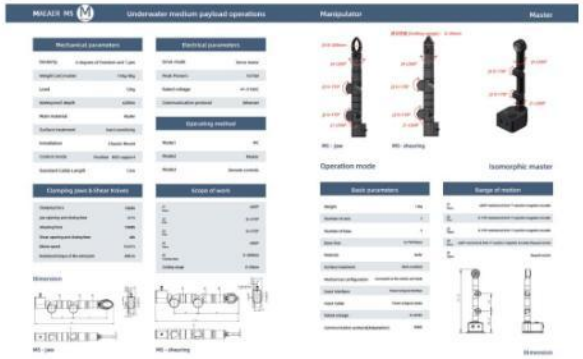
Parameter	S Series Definition
Dexterity	Degrees of freedom plus jaw, per model (S1 / S2 / S3 / S5)
Mechanical	Weight in air and water, rated load, waterproof depth
Materials	Marine-grade main material with hard-anodised treatment
Installation	Chassis mount, standard cable length supplied
Electrical	Servo drive, rated voltage, peak power, communication protocol
Gripper	Rated power, maximum opening, clamping range and force
Operation	Manual, position or speed control; master option on S3 / S5



Interchangeable end tools include jaw, shearing, shear-spreading and sampling heads — model figures are confirmed per configuration.

SSAEPL M Series — Medium Payload Operations

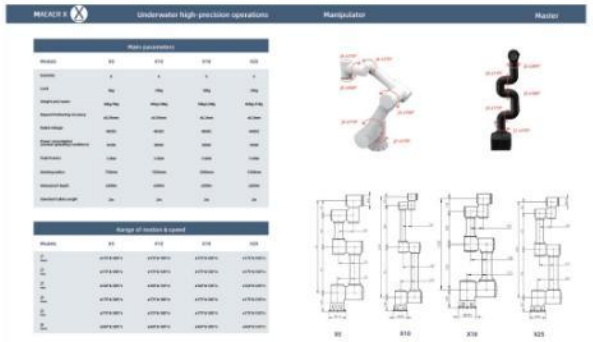
Parameter	M Series Definition
Dexterity	Multiple degrees of freedom plus jaw (M3 / M5)
Mechanical	Rated load, weight in air and water, waterproof depth
Installation	Chassis mount; position and speed control modes
Electrical	Servo drive, peak power, rated voltage, Ethernet class link
End effector	Clamping jaws and shear knives; rotating wrist available
Wrist	Rated torque, rotation speed and scope of work per model
Operation	Manual, master control and remote control options



Optional heavy tools — hydraulic-class cutter and circular saw — are commonly fitted to the end of the M-series arm.

SSAEPL X Series — High-Precision Operations

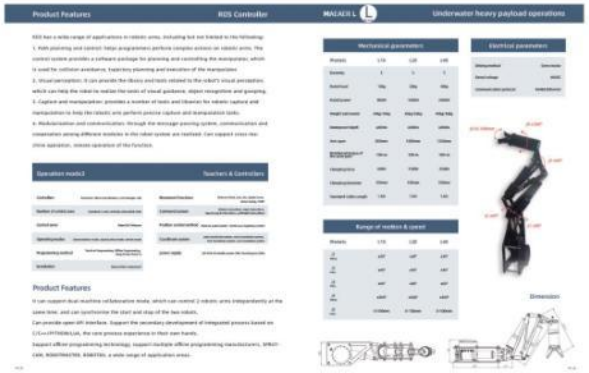
Parameter	X Series Definition
Models	X5 / X10 / X15 / X20 payload variants
Dexterity	Six-axis arm with a detachable seventh-axis gripper
Precision	Repeat positioning accuracy specified per model
Mechanical	Rated load, weight in air and water, waterproof depth
Electrical	Rated voltage and power consumption at typical duty
Motion	Range of motion and speed defined joint by joint
Control	Isomorphic master control and ROS controller support



Reachable-envelope charts and per-joint motion ranges are published for each X-series model.

SSAEPL L Series — Heavy Payload Operations

Parameter	L Series Definition
Models	L10 / L20 / L40 heavy-duty variants
Dexterity	Multi-axis heavy arm for intervention and construction
Mechanical	Rated load, weight in air and water, waterproof depth
Electrical	Servo drive, rated voltage, communication protocol
Motion	Range of motion and speed specified per joint
Control	Teaching pendant, controller and master control modes
Dual arm	Two arms can operate independently or in coordination



Secondary development is supported via C/C++, Python and Lua, with SDKs and industrial protocol support.

Control, Operation Modes & Integration

Operation Mode 1

- Isomorphic master control
- Operator moves a scale replica arm
- Intuitive one-to-one joint mapping
- Fast operator familiarisation

Operation Mode 2

- ROS controller package
- Path planning and trajectory control
- Visual perception and defect capture
- Multi-machine cooperation and remote operation

Interfaces

- Servo drive with proportional control
- Ethernet / RS485 class communication
- Input and output power interfaces
- Integrates with existing ROV control systems

Integration Options

- Observation-class ROVs and work-class platforms
- Autonomous underwater platforms
- Custom underwater robotics and inspection systems

Software & Development

- ROS software package for planning and control
- Secondary development in C/C++, Python, Lua
- Message queuing for cross-machine operation

End Effectors & Optional Tooling

End Effector	Application
Parallel jaw gripper	General handling, tool and equipment positioning
Three-finger gripper	Irregular objects and secure retrieval
Soft-touch gripper	Delicate scientific and biological sampling
Shearing / shear-spreading	Rope, cable and line cutting tasks
Cutting tool	Cutting duty defined by tool rated power and diameter
Circular saw	Heavier cutting, typically fitted to M-series arms
Torque tool	Valve operation and fastener actuation
Sampling device	Fluid, biological and geological sample collection
Custom tooling interface	Mission-specific tools on a standard interface

Note

- Maximum jaw opening, clamping range and force are specified per gripper model

Applications

Inspection & Intervention

- Valve operation
- Sample collection
- Tool handling
- Sensor deployment
- Equipment positioning

Offshore Oil & Gas

- Pipeline intervention
- Subsea structure maintenance
- Equipment retrieval
- Asset inspection support

Marine Construction

- Cable installation support
- Hardware installation
- Underwater assembly
- Recovery operations

Research & Scientific Exploration

- Biological sampling
- Geological sample collection
- Instrument deployment
- Environmental monitoring

Defence & Security

- Explosive ordnance support
- Search and recovery
- Evidence collection
- Underwater object manipulation

Why Choose SSAEPL Manipulator Systems

SSAEPL manipulators deliver the dexterity and reliability modern subsea operations demand — from delicate scientific sampling to heavy offshore intervention.

Safer operations

Enables remote underwater work and reduces dependence on commercial divers.

Higher efficiency

Faster task execution with precise, repeatable manipulation.

Lower cost of work

Cuts dive spread requirements and shortens intervention windows.

Easy integration

Works with existing ROV control systems and platforms.

Long service life

Built for harsh marine environments with field-serviceable modules.

Supported locally

Engineering, spares and training delivered from Singapore.

Services, Quality & Lifecycle Support

Our Services

- Technology consulting
- Engineering & system integration
- Equipment supply
- Installation & commissioning
- Operations & maintenance
- Technical training
- Spare parts management
- 24/7 technical support

Service Commitment

- 100% quality inspection before delivery
- Strict water pressure and pressure test on every unit
- Servo products and intelligent systems supported on opening
- Pre-use counselling from your sales engineer
- Do not plug or unplug the waterproof connector while energised

Wider Portfolio

- Work-class & observation ROVs
- Underwater manipulator systems
- Underwater thrusters
- Sonar & imaging systems
- Subsea cable assemblies
- AI inspection technologies
- Engineering integration & lifecycle support

Request a Specification Pack

Tell us your ROV platform, payload class, working depth and task profile — we will return the matched model datasheet, end-effector selection and integration plan.

Subsea Sales and Engineering Pte. Ltd.
Integrated Land, Air & Sea Technology Solutions
enquiry@ssaepl.com