



FUTURE  
FORWARD

**MISSO**  
ROBOTIC SYSTEM



# Global Inspiration, Transcending Borders

MISSO Robotic System: Empowering Innovation, Engineered in India. Discover the future of robotics with cutting-edge technology designed to meet global demands, proudly developed and manufactured right here in India.

MISSO Robotic System is the most advanced fully active surgical robotic technology assisting surgeons with personalised pre-planning and precise cutting for predictable and consistent results in joint replacement Surgeries.

It is dynamically equipped with optical tracking sensor, 6-axis articulated robotic arm and superior safety sensors. MISSO robotic system also helps surgeon to do real time gap check and intra-op modification of surgical plan.



# At a Glance



## 01 Vision Cart

- Computation power house
- 27" Medical grade touch enabled monitor
- NDI Polaris Optical Tracking System (OTS)
- **"ALWAYS ON"** Robotics for uninterrupted performance
- Futuristic ergonomic design
- Integrated keyboard & track pad
- Operating Software with dual colour scheme



## 02 Robotic Arm

- Human like footprint
- Intelligent sensors for Adaptive performance
- Next generation 6 axis collaborative robot
- Sleek Robotic Arm, Smooth & silent performance
- Adaptive bone tracking
- Multi-directional maneuverability

## 03 MISRO Planner

- Flawless surgical planning
- AI based Segmentation
- Auto implant size detection
- Auto implant overhang & notching detection

# At a Glance

## Product & Class

Automatic Robotic Surgical System (Class 3)

## Planning

3D CT Base Surgical Planning

## Safety

Emergency stop & Manual guide

## Detection

OTS (Optical Tracking System)

## Robot Precision

Submillimetric positioning accuracy

## Cutting

- Fully automatic bone resection
- No cutting guides (jigs) required
- Tibial cut including keel preparation
- Fully finished femur with all the cuts including peg holes

## Robot Cutting

Max. 50mm/sec

## Other Features

- Wide surgical space and high freedom (6 axis articulated robot)
- Patient-Robot Position Guide (surgical space check)
- Speed control during cutting
- Compact hardware, minimize product space

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## Key Features

# 1 Agile

Real-time assistance

# 2 Safety

Emergency stop & less human intervention

# 3 Precision

Submillimeter resection accuracy for optimum implant alignment

# 4 Personalized

Personalized 3D pre-planning

# 1

## Agile

Real-time assistance

MISSO Robotic System is a state-of-the-art technology which provide surgeons with real-time assistance during the procedure, enabling them to make precise adjustments and fine-tune implant placement with unparalleled accuracy. The robotic system's agility allows surgeons to adapt to unexpected challenges or variations in the patient's anatomy, ensuring optimal alignment and fit of the artificial joint components.



- **VARIOUS CUTTING OPTIONS**
  - Full and partial cutting
  - Cutting order based on surgeon's preference
- **PRE/ INTRA/ POST GAP-CHECK**
- **REAL-TIME MEASUREMENTS TO UPDATE PLAN DURING PROCEDURE**

## Saves Time

- Faster segmentation
- Quick system setup
- Optimal surgical procedure cycle

# 2 Safety

Emergency stop & less human intervention

MISSO Robotic System is enabled with Bone movement monitoring which ensures utmost safety during procedure. Resection process stops if the bone movement is observed. Further, the resection will resume with automatic recovery of the bone position.

Any contact, with the person or other object, will immediately stop the moment of the collaborative robot arm.

Fully automatic resection process helps to minimize human errors. Moreover, this reduces human contact with the exposed surgical area.

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# 3 Precision

Submillimeter resection accuracy for optimum implant alignment

Precise cutting with MISSO robotic system represents a significant advancement in Joint replacement surgery. This innovative technology uses optical tracking based navigation and robotic assistance to ensure the utmost accuracy in shaping and aligning the artificial knee joint components. By enhancing precision during the procedure, MISSO robotic system aim to improve post-operative outcomes, reduce complications, and promote faster recovery for patients.

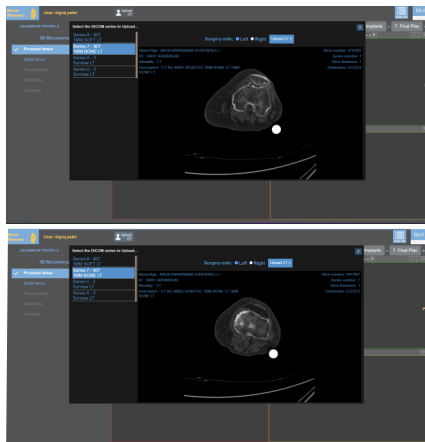


# 4 Personalized

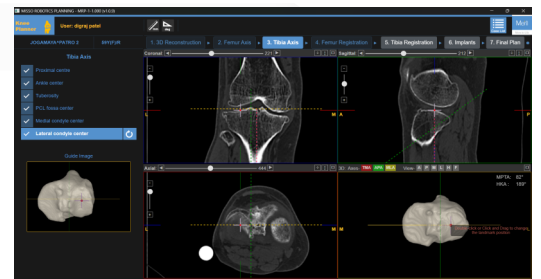
Personalized 3D pre-planning

With MISSO robotic system surgeons can create customized surgical plans, allowing for optimal implant placement, alignment, and fit, tailored to each patient's unique anatomy.

This level of personalization not only enhances surgical accuracy but also contributes to better post-operative outcomes and reduced risks of complications. Patients can expect improved joint function and a quicker return to their daily activities, making knee replacement surgery a more patient-centered and effective solution.



**CT SCAN OF PATIENT  
TRANSFORMED INTO  
3D REPLICA**



**PERSONALIZED PLAN IS CREATED  
AND DISPLAYED BASED ON THE  
PATIENT-SPECIFIC BONE**

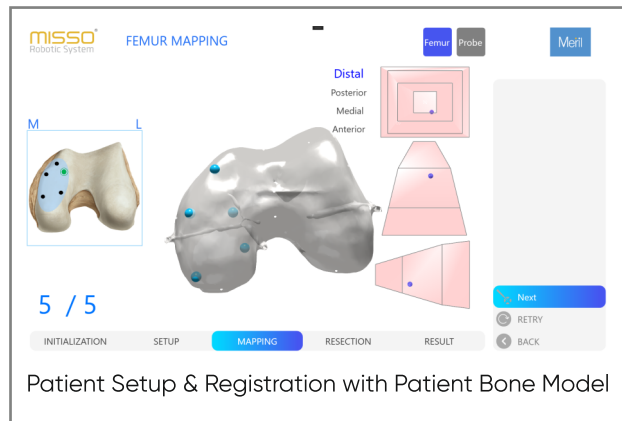
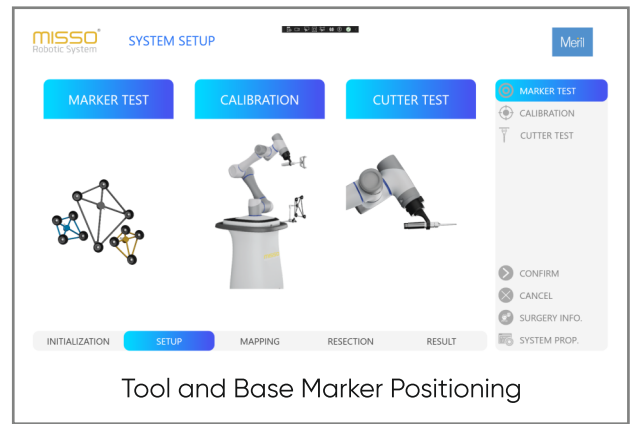
# Automatic Milling Cutting

Precision and accuracy inherent to the robotic arm is utilized to achieve optimal resection for implant placement. The automatic resection process minimizes human errors such as slight vibrations caused while cutting. The milling tool moves precisely and cuts the surface smoothly, which leads to stable implant insertion. It can also easily cut even narrow surfaces such as the peg holes and box cut.



# Surgical Process

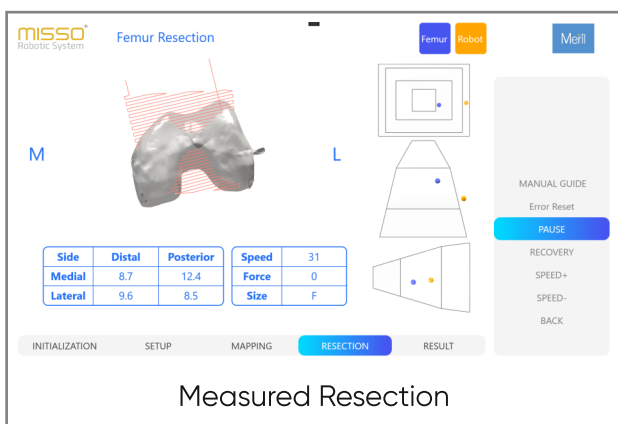
## 1 System Setup



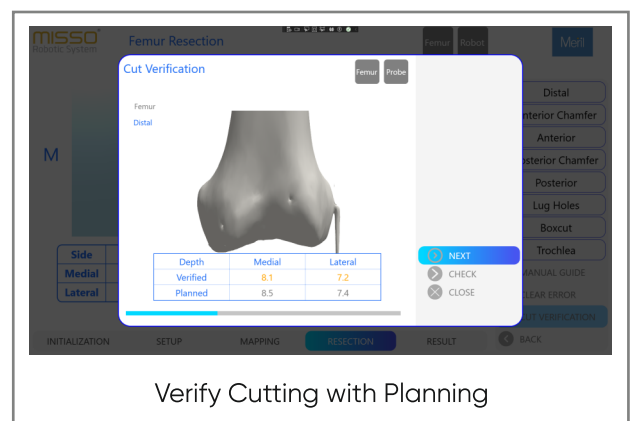
## 2 Registration



## 3 Gap Check



## 4 Cutting



## 5 Surgery Result/ Cut Verification



# Intraoperative Assistance

## 1. Initial Planning

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

IMPLANT PLANNING

FEMUR IMPLANT

TIBIA IMPLANT

RESET

HIDE IMPLANT

CAPTURE

NEXT

BACK

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

External 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 2. Femoral Shift

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

FEMORAL SHIFT

DISTAL 1mm DOWN

DISTAL 1mm DOWN

ANTERIOR 1mm DOWN

ANTERIOR 1mm UP

CLOSE

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

External 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 3. Femoral Rotation

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

FEMORAL ROTATE

Varus 1°

Valgus 1°

Flexion 1°

Extension 1°

Internal 1°

External 1°

CLOSE

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

External 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 4. Femur Implant Size

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

IMPLANT SIZE

Size H

Size G

CLOSE

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

External 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 5. Tibia Shift

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

TIBIAL SHIFT

PROXIMAL 1mm UP

PROXIMAL 1mm DOWN

CLOSE

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

Internal 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 6. Tibia Rotation

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

TIBIAL ROTATE

Varus 1°

Valgus 1°

Flexion 1°

Extension 1°

Internal 1°

External 1°

CLOSE

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

Internal 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 7. Tibia Implant Size

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

IMPLANT SIZE

Size 6

Size 4

CLOSE

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

Internal 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

## 8. Re-planning

**GAP CHECK**

External 2 Valgus 0 Flexion 1

Posterior 12.4  
Medial 13  
Proximal 7.3

Posterior 8.5  
Lateral 9  
Proximal 9

Femur F

Tibia 5

IMPLANT PLANNING

FEMUR IMPLANT

TIBIA IMPLANT

RESET

HIDE IMPLANT

CAPTURE

NEXT

BACK

F/E	Bone	Dist Up/Down	Ant Up/Down	Var/Val	Int/Ext	Flex/Ext	Prox Up/Down
92	Femur	--	--	--	--	--	--
Valgus	Tibia	--	--	--	--	--	--

Internal 0	Varus 0	P.Slope 3
0	0	3

Gap	Medial Capt.	Max.	Lateral Capt.	Max.
Extension	0	0	0	0
Flexion	0	13	0	9

INITIALIZATION SETUP MAPPING RESECTION RESULT

# Why Robotic Surgery?

Greater flexibility | Minimum scars | Minimal pain | Minimal blood loss  
Minimal tissue damage | Faster overall recovery time  
Shorter hospitalization time | Reduced risk of infection  
Quicker return to normal activity | Micro precision



# Robotic TKR



CT Scan



Exact Model  
of patient's  
bone & joint



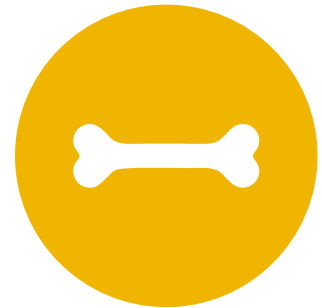
Virtual Planning  
with accurate  
implant placement



Real-time  
intraoperative  
refinement



Fine implant  
alignment



Resection



Less Tissue  
Damage



Recovery

# 35 Meril

## Subsidiaries

# 12 Academies

## Globally



**10000+**  
EMPLOYEES

**250+**  
PRODUCTS

**158+**  
COUNTRIES



Welcome to Merai, where innovation meets healthcare. At Merai, we are dedicated to transforming the future of medical care through cutting-edge robotics and artificial intelligence. Our vision is clear and ambitious: to pioneer advancements that not only enhance the quality of patient care but also redefine the boundaries of medical technology.

Founded with a commitment to excellence, Merai stands at the forefront of the healthcare revolution. Our team of experts, drawn from the fields of engineering, medicine, and AI, works tirelessly to develop solutions that address the most pressing challenges in healthcare today. From robotic surgical systems to AI-driven diagnostics, our products are designed to improve outcomes, increase efficiency, and provide unparalleled support to medical professionals worldwide.

At Merai, we believe that the future of healthcare lies in the seamless integration of technology and human expertise. Our innovative approaches are not just about creating advanced tools but about enabling healthcare providers to deliver better, faster, and more personalized care. We are proud to contribute to a world where technology empowers patients and practitioners alike, leading to a healthier and more connected society.

Join us on our journey as we shape the future of healthcare. Merai – where technology meets compassion, and the possibilities are endless.



More to Life

Meril is a global medical device company dedicated to the design and development of novel, clinically relevant, state-of-the-art and best-in-class devices to alleviate human suffering and improve the quality of life. We span a broad operational canvas ranging from vascular interventional devices to orthopedics, in-vitro diagnostics and endo-surgery.

We share an enduring perseverance to advance healthcare solutions, for more patients to live longer and healthier lives. We have a strong commitment towards R&D and adhere to the best quality standards in manufacturing, scientific communication and distribution known today.

Established in 2006, Meril's launch was in line with the healthcare diversification plan of Bilakhia Group. Located in Vapi, 150km north of Mumbai, and ensconced within the serene hill-sides of Chala town, Meril sits proud in its ultra modern manufacturing facilities.