



SOUTHERNIMPLANTS®

Innovative Treatment Solutions

MAX Implants
Surgical Manual





Southern Implants® is a leading provider of unique and innovative dental implant products with a focus on top-end professional users who want more choices. Southern's expertise in research, development and manufacturing of dental implants allows us to provide Innovative Treatment Solutions that will reduce treatment times and improve patient outcomes.

Striving for excellence and meeting customer needs, has led to our wide product range characterised by Unique and Innovative products which include:

- Multiple interfaces, to suit customer preference.
- INVERTA® implant, featuring a Body-Shift® design, engineered for primary stability and suitable for immediate loading.
- Co-Axis® , Subcrestal Angle Correction® implants, available in angulations of 12°, 24° and 36° and various internal and external connections.
- MAX implant, specifically designed for immediate molar tooth replacement.
- The ZYGAN , ZYGEX and ZYGIN implants for severely resorbed maxilla and craniofacial reconstruction.
- The Machined Surface Coronally (MSC) dental implant surface treatment offers practitioners an innovative way to take advantage of the best characteristics of both smooth and moderately rough implant surfaces.

Our product portfolio is in synchronised evolution with protocol improvements and technological advances.

My sincere thanks to all specialists, dentists and technicians who put their trust in our company.


Graham Blackbeard
Managing Director, Southern Implants

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For more information scan the below



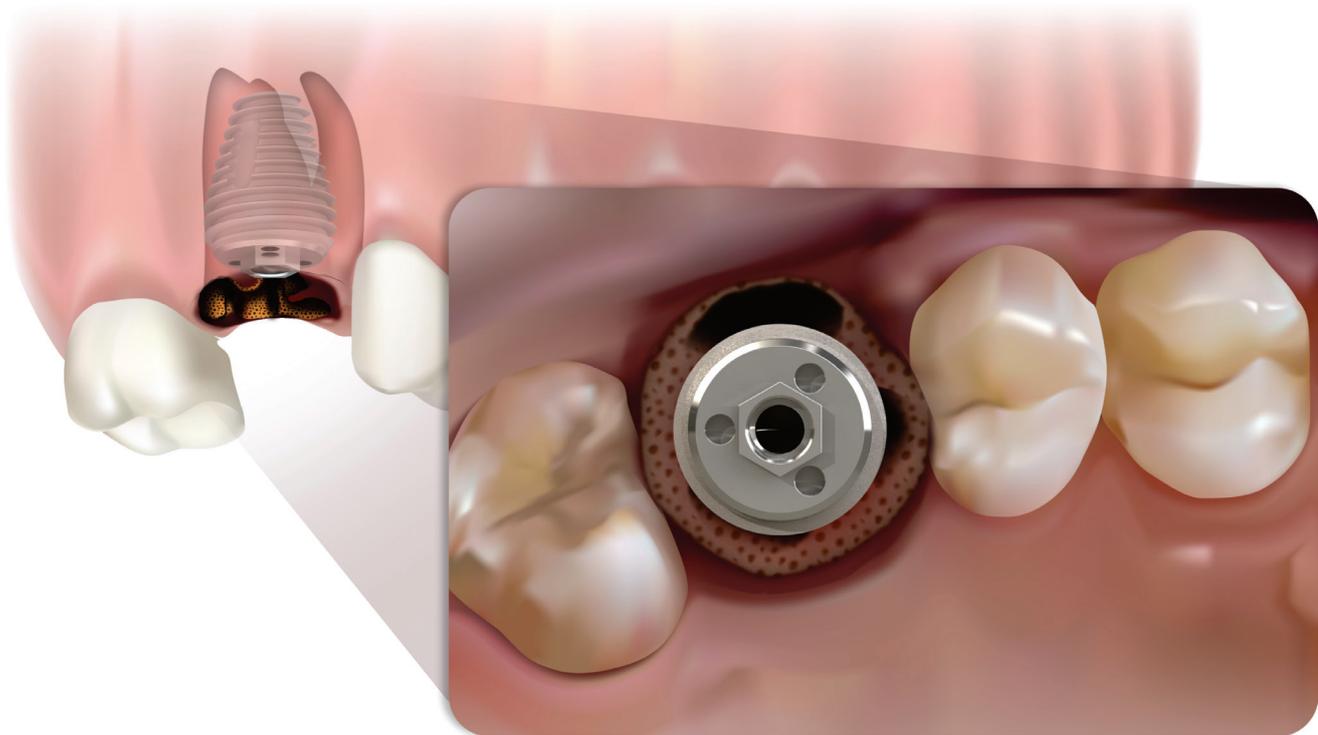
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Overview of the MAX Surgical Manual

The Southern Implants MAX implant is a revolutionary innovation specifically designed for immediate placement into molar extraction sockets. It overcomes the clinical limitations of conventional implants in these sites by addressing the challenges of molar socket anatomy, including multi-rooted morphology and low inter-radicular bone contact.

MAX implants are intended for use in the posterior mandible and maxilla, where primary stability is typically compromised. By utilising a wider diameter and strong taper, the MAX implant ensures enhanced mechanical engagement with the socket walls and inter-radicular septum, even in sockets with limited septal bone.



Key features of this manual include:

1. Southern Implants MAX Implant Features
2. MAX connections and implant range
3. Surgical Considerations: Access, visibility, torque control, angulation, and anatomical zones.
4. MAX Protocol Synopsis (Root Classifications): Outlining the 3 different root morphologies.
5. Understanding the Product Range and Catalogue: Indications for each system, compatibility, and component codes.
6. Surgical procedures covering different surgical approaches, compatible placement tools, prosthetic options and workflows and troubleshooting guidelines.

NOTE: This manual is written for surgeons placing implants and assumes familiarity with general dental implant surgical principles. Southern recommends prior hands-on training and education before clinical application to learn proper techniques, bio-mechanical requirements and radiographic evaluation. This surgical manual is not intended as a substitute for adequate training. Additionally, these guidelines do not substitute the MAX Implants Instructions For Use (IFU). The MAX Implants IFU (CAT-8060) can be found on our website: www.southernimplants.com/ifu. It is the surgeon's responsibility to select the most appropriate products for each clinical situation.

NOTE: Not all products are cleared for sale in all countries.

1. Introduction to Southern Implants' MAX Implants

Implant features

Available in 4 different connection types to meet clinician preference

EXTERNAL HEX



INTERNAL HEX
(PROVATA)



INTERNAL OCTOGON
(IT)



TRI-NEX



High strength
grade 4 Titanium
(UTS >900 MPa)



Built-in platform shift in each of the available configurations



Strong taper designed to achieved optimal primary stability



Rounded apex to avoid perforation of the maxillary sinus



Machined surface collar minimising plaque adhesion

2. MAX Connections and Implant Range

Implant Type		Connection Type	Diameters (mm)	Lengths (mm)	MSC Variant Available
	MAX	External Hex	6 / 7 / 8 / 9	6 / 7 / 9 / 11	Yes
	PROMAX	Internal Hex	6 / 7 / 8 / 9	7 / 9 / 11	Yes
	TRI-MAX	TRI-NEX: tri-lobe internal connection	7 / 8 / 9	7 / 9 / 11	No (has a machined collar)
	MAXIT	Internal Octagon	7 / 8 / 9	7 / 9 / 11	No (has a machined collar)

Note: Implant seating depth and collar design vary between connections. For example, MAXIT and TRI-MAX implants include machined coronal collars that may extend above the crestal bone.

3. Surgical Considerations

For a comprehensive list of indications, contraindications and additional details about the MAX implant range, refer to the MAX Implants IFU (CAT-8060).

The surgical use of MAX implants requires thoughtful planning and a clear understanding of anatomical, biomechanical, and prosthetic factors. The following considerations are critical to ensure optimal outcomes.

Indications for MAX Implants

The Southern Implants® MAX Dental Implants are indicated for the functional and aesthetic restoration of the upper or lower jaw in cases of partial or full edentulousness, congenital tooth loss, failing/problematic natural dentition, or as part of the revision/replacement of previous dental restorations where the placement of a narrower or otherwise standard diameter implant is deemed inappropriate and would increase the risk of poor primary stability and related failure, complications or the requirement for further surgical intervention.

The Southern Implants® MAX Dental Implants are suitable for immediate loading in all indications where sufficient primary stability is achieved with appropriate occlusal loading, except in single tooth restorations on implants shorter than 8 mm or in soft bone (type IV) where implant stability may be difficult to obtain and/or immediate loading deemed inappropriate.

Contraindications

The contraindications of all device groups used as part of the specific treatment or procedure apply. Therefore, the contraindications of the systems/medical devices utilized as part of implant surgery/therapy should be noted and the relevant documents consulted.

The contraindications specific to this device group include:

- patients medically unfit for oral surgical procedures,
- cases where an adequate number of implants cannot be placed to provide full functional support of the prosthesis,
- patients with inadequate bone quality/quantity,
- patients with uncontrolled bleeding disorders,
- presence of infection at the implant site,
- patients with severe vascular impairment,
- patients with uncontrolled endocrine disorders,
- patients undergoing high dose steroid therapy,
- patients with metabolic bone disease,
- patients with incomplete mandibular or maxillary growth,
- patients with a weakened immune system or inadequate wound healing capacity
- patients with allergies or hypersensitivity to the material used (titanium).

The Southern Implants® MAX implants feature a wide diameter and are specifically indicated for the posterior region of the oral cavity; therefore, the Southern Implants® MAX implants are contraindicated for use in the anterior region.

Bone quality and quantity

- Choose the correct diameter and length based on available bone volume.
- Take care to avoid anatomical structures such as the maxillary sinus, mandibular nerve, or adjacent tooth roots.
- Always place implants at least 2 mm subcrestal to allow for bone remodeling.
- Do not allow contact with the buccal plate.

Access and Visibility

Molar regions, particularly in the maxilla, often present challenges in access due to limited visibility and restricted intraoral space. To improve surgical access:

- Consider decoronating the tooth to gain better access to the root structure.
- Use long-shank drills and dedicated contra-angle instruments when adjacent teeth limit direct access.
- Adequate flap elevation is recommended to visualise bony landmarks and socket morphology.

Torque Control

MAX implants feature a strong tapered geometry that enhances primary stability but may result in high insertion torque, especially in dense bone. The recommended maximum insertion torque is 100 Ncm.

If high resistance is encountered:

- Remove the implant.
- Use the appropriate MAX Tap to refine the osteotomy.
- Reattempt placement with torque monitoring.

Angulation and Insertion Axis

Implant trajectory should be planned in relation to:

- The buccal and lingual bone plates to avoid thread exposure.
- The inter-radicular septum, which often dictates the optimal insertion path.
- Final prosthetic restoration, ensuring an ideal emergence profile and aesthetic outcome.

Pilot drilling should be initiated slightly lingual to centre in the mandible and mesial-lingual in the maxilla to compensate for drift and avoid buccal wall contact.

Anatomical Zones and Cautions

Maxilla:

- Avoid sinus perforation by selecting the correct implant length and depth control.
- Do not place the implant in contact with the buccal wall (this increases risk of dehiscence).

Mandible:

- Be aware of the mental foramen and inferior alveolar nerve.
- Dense cortical bone may require more irrigation and slower drilling.
- Do not place the implant in contact with the buccal wall (this increases risk of dehiscence).

Soft Tissue Considerations:

- Place the implant 2 mm subcrestal to allow for bone remodelling and soft tissue adaptation.
- Maintain sufficient keratinised tissue during flap design and closure to support long-term tissue stability.

Loading times

The standard healing period for MAX implants is typically 3 to 4 months in the mandible and 4 to 6 months in the maxilla. However, immediate loading may be considered in cases where good primary stability is achieved, particularly when the implant is part of a splinted, multi-unit restoration. In such cases, it is essential that the provisional prosthesis be kept out of occlusion and that the patient adheres to a soft diet for a period of 6 to 12 weeks to minimise mechanical stress on the implant. Careful case selection and patient compliance are critical to the success of immediate loading protocols.

Troubleshooting

- **Implant mobility during insertion:** If the implant is very loose, consider removal and replacement with a wider diameter fixture (if possible) without further drilling, or consider placement in a new site adjacent to the first.
- **Exposed threads:** If surface roughened implant threads are exposed in the coronal region, perform a bone augmentation procedure.
- **Sinus membrane perforation:** Depending on the perforation, it is advised to manage the perforation with collagen membrane placement.
- **Difficulty with prosthetic access:** In cases with poor prosthetic emergence use approved angled abutments designed for MAX implants.

NOTE: All complications should be documented and patients should be informed of findings and corrective steps. Periodic follow-up and imaging are essential to monitor resolution or progression.

Warnings

These instructions are not intended as a substitute for adequate training.

- To ensure the safe and effective use of dental implant, it is strongly recommended that specialised training be undertaken. This training should include hands-on methods to gain competency on the proper technique, the system's biomechanical requirements and radiographic evaluations required for the specific system.
- Improper technique can result in implant failure, damage to nerves/vessels and/or loss of supporting bone.
- Use of the device with incompatible or non-corresponding devices can result in the poor performance or failure of the device.
- When handling devices intraorally, it is imperative that they are adequately secured to prevent aspiration, as aspiration of products may lead to infection or physical injury.
- The use of non-sterile items can lead to secondary infections of the tissue or transfer infectious diseases.
- Failure to adhere to appropriate cleaning, re-sterilization, and storage procedures as outlined in the Instructions for Use can result in device damage, secondary infections, or patient harm.
- Exceeding the number of recommended uses for reusable devices can result in device damage, secondary infection or patient harm.
- The use of blunt drills may cause damage to the bone, potentially compromising osseointegration.

Breakage

Implant and abutment fractures can occur when applied loads exceed the tensile or compressive strength of the material. Potential overloading conditions may result from: an inadequate number, length, or diameter of implants to support the planned restoration; excessive cantilever length; incorrect abutment seating; abutment angles greater than 30 degrees; occlusal interferences causing excessive lateral forces; patient parafunction (e.g., bruxing, clenching); loss or changes in dentition or functionality; inadequate prosthesis fit; and physical trauma. Additional treatment may be necessary when any of the above conditions are present to reduce the possibility of component complications or failure.

During surgery

- Care must be taken that parts are not swallowed during any of the procedures, thus rubber-dam application is recommended when appropriate.
- Care must be taken to apply the correct tightening torque of abutments and abutment screws.
- Drill at high speed (1000 - 2000 rpm) with copious irrigation (saline at room temperature). Drill with continuous back and forth motion, to avoid overheating of the bone.

Post-surgery

- Regular patient follow-up and proper oral hygiene must be maintained and are essential for favourable long-term results.

Handling procedure and sterility

Precautions should be taken to maintain the sterility of the implant

Care must be taken to maintain the sterility of the implant by proper opening of the packaging and handling of the implant. The outer rigid plastic box and the outside of the inner plastic blister tray-lid are not sterile; do not touch the outside with sterile gloves and do not place the plastic box or blister tray-lid onto the sterile field.

Inside the plastic box, the sealed inner plastic blister and peel back TYVEK lid is sterile only on the inside.

Follow the instructions below to remove the sterile implant.

Step 1: open implant package in the non-sterile field, with non-sterile gloves, tear the tamper-proof label to open the box. With non-sterile gloves remove the inner blister.

Step 2: the sealed blister must be opened by an assistant (non-sterile gloves). Peel back the TYVEK lid and present the open blister to the surgeon.

Step 3: without touching the outside of the blister, an assistant can drop or pass the sealed implant tube into the sterile field without contamination. Take care to not touch the implant.

Step 4: In the sterile field, open the tube cap and attach the implant insertion tool directly to the implant or fixture mount without touching the implant. Carefully remove the implant and proceed with placement.

Do not attempt to re-sterilise or reuse any components. If sterility is compromised, the implant must be discarded. Always verify the expiry date and inspect packaging for damage prior to use.

4. MAX protocol synopsis

Successful placement of Southern Implants MAX implants relies heavily on accurately assessing the root anatomy and available inter-radicular bone following molar extraction. Understanding the morphology of the extraction socket is critical in determining the most appropriate surgical approach. The MAX protocol recognises three primary socket types based on the classification system adapted from Smith and Tarnow (JOMI 2013).



Socket Type A – Abundant Inter-Radicular Bone

In this morphology, the implant is completely contained within the inter-radicular septum. These cases typically present with widely divergent roots and thick septal bone, offering a highly stable environment for immediate implant placement.

Surgical Approach:

The osteotomy can be prepared after tooth extraction or through retained roots. Both approaches offer reliable implant positioning and orientation. This type allows excellent primary stability and is the most predictable scenario for immediate placement.



Recommended Strategy:

Either extract and drill or drill through root, then extract. Socket preservation may be optional.



Socket Type B – Limited Inter-Radicular Bone

This is the most common presentation, where the inter-radicular septum is thin and may not fully contain the implant. Implants are partially stabilised by septal bone but also rely on engagement with the socket walls.

Surgical Approach:

Do not extract the tooth initially. Instead, decoronate and prepare the osteotomy through the retained root structure. Retained roots provide drill guidance, enhance accuracy, and reduce the risk of lateral displacement. Once drilling is complete, the roots are elevated, and the site is debrided for implant placement.



Recommended Strategy:

Drill through root, then extract. Socket healing or grafting may be considered if gaps are significant.



Socket Type C – No Inter-Radicular Bone

This scenario presents fused or convergent roots with minimal or no septal bone. The implant must derive primary stability by engaging the inner socket walls and/or apical bone.

Surgical Approach:

In most cases, immediate placement is not advised. A delayed placement protocol may be preferable, allowing the site to heal with or without socket preservation techniques. If placing immediately, special care must be taken to avoid buccal plate engagement and to select the correct implant diameter and apical trajectory.



Recommended Strategy:

Delay placement or engage apical bone cautiously. Drill through root is not advised.

Summary Table of Socket Classifications

Socket Type	Description	Stability Source	Surgical Strategy
Type A	Wide, divergent roots with thick septum	Inter-radicular septum	Extract and drill or drill through root
Type B	Convergent roots with thin septum	Septum + socket walls	Drill through root, then extract
Type C	Fused roots or no septal bone	Socket walls and apical bone (if present)	Delay placement or engage apical bone

The catalogue is structured as follows:

Section 1 – Implant Codes and Lengths

This section lists the implant codes alongside all available diameters and lengths. Use this section to select the appropriate implant based on patient anatomy, socket morphology, and the chosen surgical protocol.

For example, if a PROVATA MAX implant is required with the dimension of Ø6 in diameter and 7 mm in length, the corresponding code will be PROMAX607.

Section 2 – Surgical Components

For clinicians performing a two-stage surgery, cover screws are available to protect the implant interface during the healing period. If soft tissue contouring is required, a healing abutment can be placed after initial healing to shape the tissue prior to prosthetic restoration.

Sections 3–4 – Prosthetic Workflow

These sections outline the direct restorative protocol for Southern Implants' MAX implants.

The flowchart is organized into columns. At the top of each column, the group category of the items is displayed. Each column contains a render of the product, with the product name used for ordering shown above the render and the available configurations indicated underneath.

Section 3 – Impression and Model Components

This section outlines all necessary items for taking impressions using open and closed tray techniques. It includes the corresponding laboratory analogue used in stone models following a traditional analogue workflow. Additionally, it details the scan flag used during intra-oral scanning procedures and the corresponding digital lab analogue inserted into a 3d-printed model. This forms part of Southern Implants' fully digital workflow, which is termed SI-DIGITAL.

Section 4 – Final Prosthetic Abutments

Provides a range of prosthetic abutments compatible with the selected workflow. Once the final abutment is chosen, the appropriate prosthetic screw and its torque value (listed below each retaining screw) should be used to secure the prosthesis.

For a comprehensive guide on prosthetic handling, procedures, and troubleshooting, refer to CAT-4100 – Southern Implants Prosthetic Manual.

6. Surgical procedures

In order to place a MAX implant, it is important to familiarise yourself with the components in the surgical tray as well as the components used with the implants (as specified in the above section).

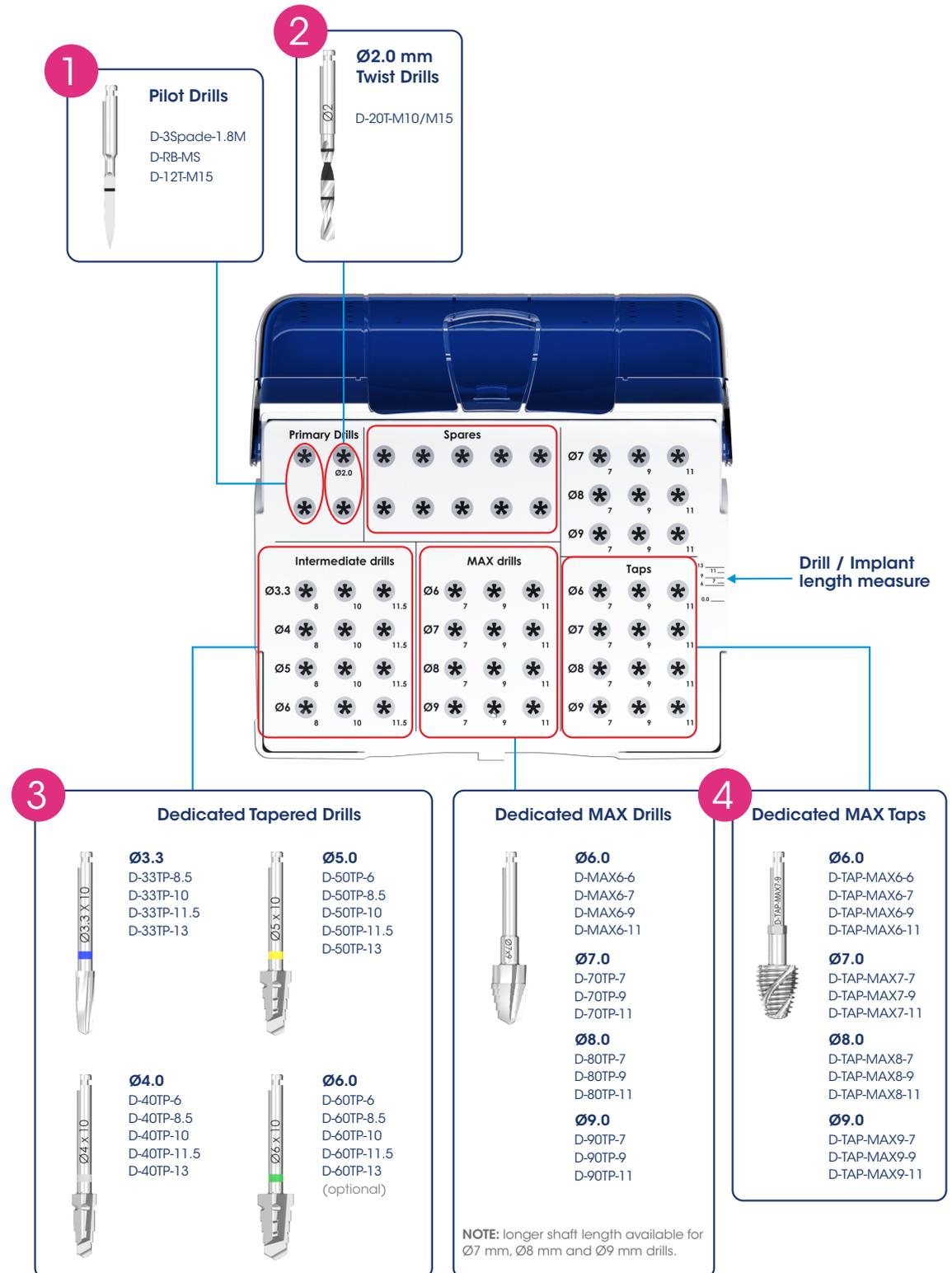
6.1. Surgical tray contents

Below outlines the different instruments available in the tray with a brief description of its use (exert from CAT-2020 - External Hex Product Catalogue).

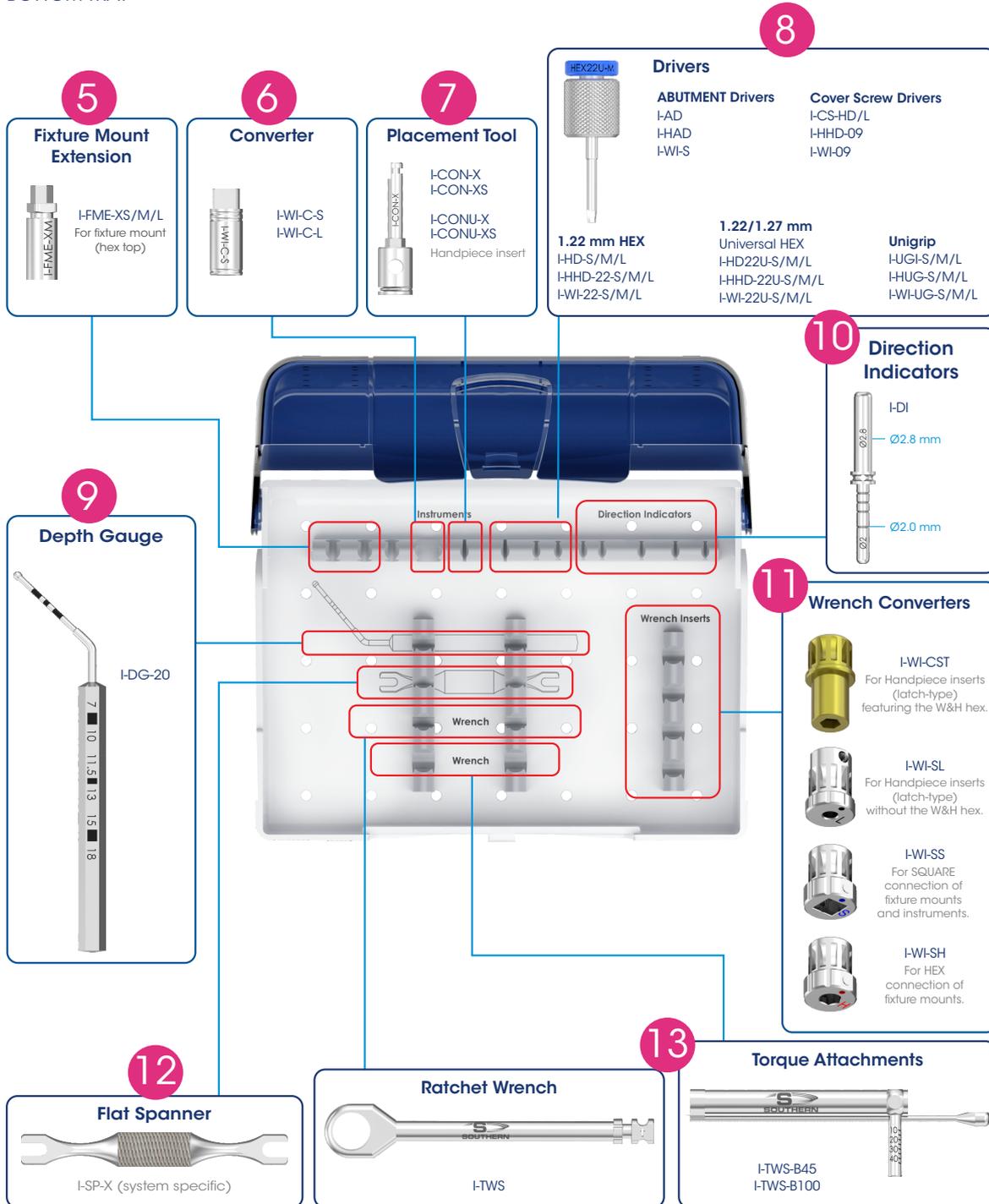
I-MAX-EG for surgical placement of MAX® Implants

INSTRUMENT TRAY

TOP TRAY



BOTTOM TRAY



NOTE:

- the surgical kit has an intuitive layout to guide the surgeon through the drill sequence.
- most instruments are available in various lengths.
- all instruments and tooling used during the procedure must be maintained in good condition, cleaned and sterilized prior to use. Please consult the Instructions for Use: Southern Implants instrument tray and reusable instruments (CAT-8003 and CAT-8070) for guidance concerning the maintenance of instruments and surgical trays. Please consult the corresponding drill Instructions for Use regarding care and maintenance of drills.
- refer to CAT-8021 for more information on bone mills.

No.	Item Category	Item indication
1	Pilot drills	Used to establish the initial osteotomy along the planned trajectory. It ensures the correct angulation and serves as the guide path for sequential drilling.
2	Twist drills	Used following the pilot drill to incrementally widen the osteotomy to the required diameter for implant placement. Multiple diameters may be used based on implant size.
3	Dedicated tapered drills	Used to progressively shape the osteotomy in accordance with the selected implant diameter and length. These drills are designed to match the tapered geometry of the MAX implant, ensuring optimal implant fit and primary stability while preserving inter-radicular bone.
4	Dedicated MAX taps	Used to refine the osteotomy to the exact thread dimensions of the selected MAX implant. Particularly useful in dense bone or when high insertion torque is encountered, the tap allows for controlled depth verification and smoother implant insertion, reducing the risk of implant binding or bone fracture.
5	Fixture mount extension	Used to extend the height of the implant's fixture mount during placement, improving visibility and access in deep or difficult-to-reach surgical sites.
6	Converter	Converts the hex of the fixture mount to a square interface, enabling compatibility with a square torque wrench or manual ratchet. Used during implant placement when precise torque application or manual control is required.
7	Placement tools	Used to engage the fixture mount (if applicable) or the implant to carry the implant to the prepared site. Insertion can be done with a surgical motor, particularly during the initial insertion phase as it provides the speed and torque values which is useful to determine initial insertion torque and bone to implant engagement. These tools also allow controlled insertion via the use of a manual wrench (using an I-WI-CST wrench converter).
8	Drivers	<p>Cover screw driver (0.9 Hex) - Used to place cover screws in two-stage surgeries, protecting the implant interface during the healing phase.</p> <p>Abutment screw drivers - Used to insert and secure healing abutments, retaining screws for final prosthetic abutments, and angled Compact Conical abutments.</p> <p>Compact Conical abutment drivers - Used to place and torque Compact Conical (Multi-Unit) Abutments onto the implant.</p>
9	Depth gauges	Inserted into the osteotomy to confirm the length and depth of the preparation before implant insertion.
10	Direction indicators	These simulate the final implant trajectory and help verify angulation prior to actual implant placement. Useful for visual confirmation during complex cases.
11	Wrench converters	Used to adapt a torque wrench to various driver connection types, such as latch-type handpiece drivers (W&H Hex), straight latch inserts, square drivers, or hex interfaces. These converters enable a single torque wrench to be used across multiple implant systems and prosthetic components.
12	Flat spanner	A dual-ended tool designed to stabilise the fixture mount during removal of the fixture mount retaining screw. One side engages the square interface, and the other side engages the hex interface on the fixture mount, allowing flexibility depending on the implant system used. This tool is particularly useful in cases of low primary stability, where it is essential to prevent unintentional rotation or dislodgement of the implant while removing the fixture mount.
13	Ratchet wrench	Used to manually advance the implant when tactile control is preferred or when the handpiece torque is insufficient. Also useful for final seating.
	Try-in implants (angle indicators)	These simulate the final implant trajectory and help verify angulation prior to actual implant placement. Useful for visual confirmation during complex cases.

6.2. Drilling protocol overview

The drilling protocol for Southern Implants' MAX implants is designed to preserve inter-radicular bone, achieve optimal primary stability, and accommodate immediate placement in molar extraction sockets. Due to the tapered geometry and wide diameter of MAX implants, the osteotomy must be carefully prepared using a progressively enlarging drill sequence tailored to the implant diameter, bone density, and socket morphology.

General Guidelines

1. Drill Speed:
 - i. Twist drills: 1000–1500 rpm.
 - ii. Tapered drills: ≤ 800 rpm.
 - iii. Use copious irrigation throughout to avoid thermal damage.
2. Technique:
 - i. Use intermittent drilling (in and out motion) with light apical pressure.
 - ii. Monitor angulation, depth, and orientation continuously—especially in fresh extraction sites.
3. Depth Control:
 - i. Drill depth must allow for 2 mm subcrestal placement of the implant relative to the most apical bone crest.
 - ii. Use intraoperative radiographs or depth gauges as needed.
 - iii. NOTE: twist drills may cut ~1 mm deeper than the implant length—account for this when drilling near vital structures.

Clinicians should determine their preferred osteotomy preparation protocol based on the bone density and the diameter of the implant being placed. Modifications to the standard drilling sequence may be made at the clinician's discretion to achieve ideal primary stability in varying bone conditions.

Below outlines the overall drilling protocol:

Round burr	Pilot drill	Ø2.0 Twist drill	Direction indicators	Ø3.0 Twist drill	Tapered drills	MAX Tap	Implant placement
(Optional)			(Optional)	(Optional)			
Modify the curvature or entrance point of the osteotomy site.	Initiates the osteotomy in septal or inter-radicular bone	Begins the osteotomy along the planned trajectory.	Verifies the depth and angulation of the osteotomy; confirms implant length.	Widening of the osteotomy.	Expand the osteotomy progressively to match implant diameter.	Highly recommended to finalise osteotomy shape and depth, especially in dense bone.	Implant is inserted using either a handpiece or manual driver.
							
D-RB-MS	D-3SPADE-1.8M	D-20T-M10 D-20T-M15	<u>DEPTH GAUGE</u> I-DG-20 <u>INDICATORS</u> I-DI	D-30T-M10 D-30T-M15 D-30T-M20	Ranging from Ø3 to Ø9 mm dedicated tapered drills. Refer to the Product catalogue to determine the compatible drills.	Ranging from Ø6 to Ø9 mm dedicated MAX taps. Refer to the Product catalogue for the list of compatible taps. Do not use MAX taps in combination with drill extensions.	

Refer to the corresponding catalogue to determine what range of drills and drill variations are available.

6.3. Surgical procedure

The MAX implant surgical protocol can be performed using one of two primary methods, depending on the clinical presentation and available anatomy:

1. **Root-as-Guide Method:** Utilises retained tooth roots to guide osteotomy preparation, providing increased stability and precision during drilling.
2. **Extraction Site Method:** Performed in fresh extraction sockets after complete removal of the tooth and roots, relying on anatomical landmarks for drill guidance.

Although these methods differ in their initial osteotomy approach, both follow a common sequence for final osteotomy preparation, implant placement, and achieving optimal primary stability.

The following sections detail each method individually, followed by a shared protocol outlining the steps for implant placement, seating, and verification, regardless of the initial drilling technique used.

NOTE: all drilling should be done at 800 -1200 rpm unless specified otherwise.

6.3.1. Preoperative preparation

Clinical Assessment

- Review systemic health, medications, allergies, and contraindications to implant surgery.
- Assess soft tissue quality, occlusion, and available keratinised tissue.
- Confirm root stability as mobile roots should be extracted and an alternative method considered.

Radiographic Evaluation

- CBCT to measure septum height/width, identify anatomical structures (maxillary sinus, inferior alveolar nerve), and plan drill pathway.
- Periapical radiographs to confirm root orientation relative to the planned osteotomy.

Prosthetic-Driven Planning

- Plan the ideal implant angulation, diameter, and length to match the desired prosthetic outcome.
- Ensure compatibility with the intended prosthetic platform.

Surgical Preparation

- Ensure complete MAX surgical tray is available, including dedicated tapered drills, MAX taps, fixture mount, placement tools, and periostomes.
- Maintain strict sterile protocol.
- Administer local anaesthetic to achieve profound soft tissue and bone anaesthesia.

Patient Communication

- Explain the Root-as-Guide approach and its benefits (precise positioning, bone preservation).
- Discuss risks (root fracture, septum damage, need for alternative method).
- Obtain informed consent.

6.3.2. Root-as-Guide method

The Root-as-Guide method takes advantage of the retained tooth roots, specifically their inter-radicular anatomy, to guide and stabilise osteotomy preparation for immediate MAX implant placement. This technique provides excellent drill trajectory control, preserves bone, and improves primary stability, particularly in molar extraction sites with intact or partially retained roots.



Loosen the tooth

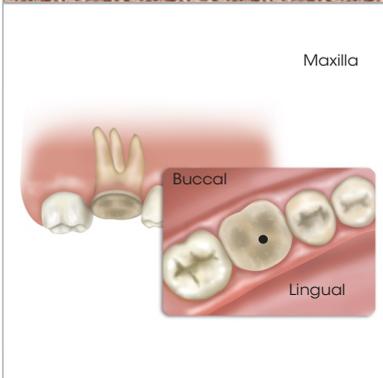
Carefully loosen the molar by manipulation of the tooth with extraction forceps. Do not remove the tooth from the socket (this step will make it easier to remove the root segments later on).

NOTE: the tooth should remain in the socket and be minimally mobile.



Decoronate the tooth

Decoronate the tooth just above the gingival level using a high-speed handpiece.



Prepare guide hole in dentine

Initiate the pilot hole preparation into the coronal dentine surface by using a carbide bur in a high-speed handpiece. This technique allows for accurate positioning and preparation of the pilot hole.

In the maxilla: the starting point for the pilot hole should be positioned slightly to the mesial and lingual of the midpoint of the cross section of the tooth. This will avoid the implant being positioned too close to the buccal plate and will compensate for the inherent distal drifting of the subsequent drilling sequence.



In the mandible: the starting point should be positioned slightly to the lingual of the midpoint of the cross section of the molar. This will ensure that the prepared site is kept away from the buccal danger zone.

Once the correct starting point is achieved, the pilot hole can be deepened to penetrate through the tooth into the inter-radicular bone below.



Pilot drilling - Ø2 mm Twist Drill

Pilot drilling with the 2 mm twist drill should aim at establishing correct position, depth and axis of the implant site from the outset. The depth of the preparation should extend minimally beyond the depth of the root apices, where anatomically safe and possible to do so. Control the drilling depth by using intra-operative radiographs to ensure that anatomical structures are respected and that the implant can be seated at least 2 mm below the margin of the most apical bone crest.

Depth marks on the drills are referenced to the cut dentine surface.

CAUTION: expect that the lengths of drills used for preparation through the tooth, will be greater than the implant placed. The use of intra-operative radiographs is recommended.

Control mesio-distal and bucco-lingual position, depth and axis of the osteotomy whilst pilot drilling, making corrections as needed.

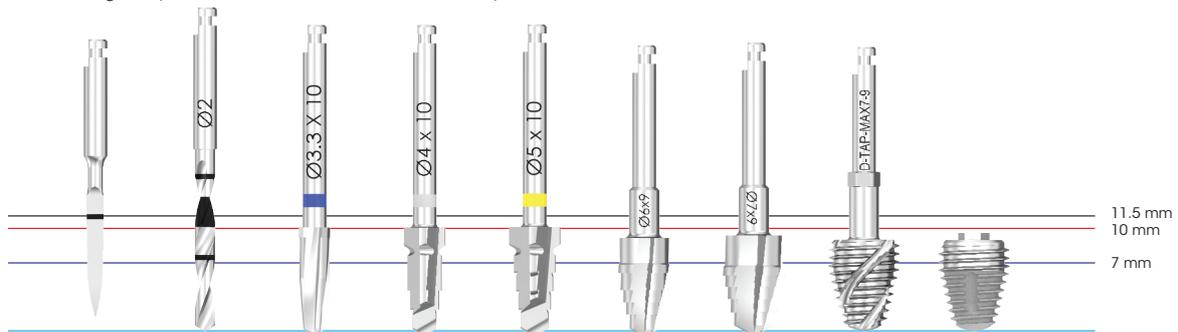
Drilling should be performed at a speed of 1000-1500 rpm for twist drills and 800 rpm for tapered drills, with thorough irrigation. An intermittent technique should be used to avoid overheating the bone.

Incrementally enlarge the osteotomy

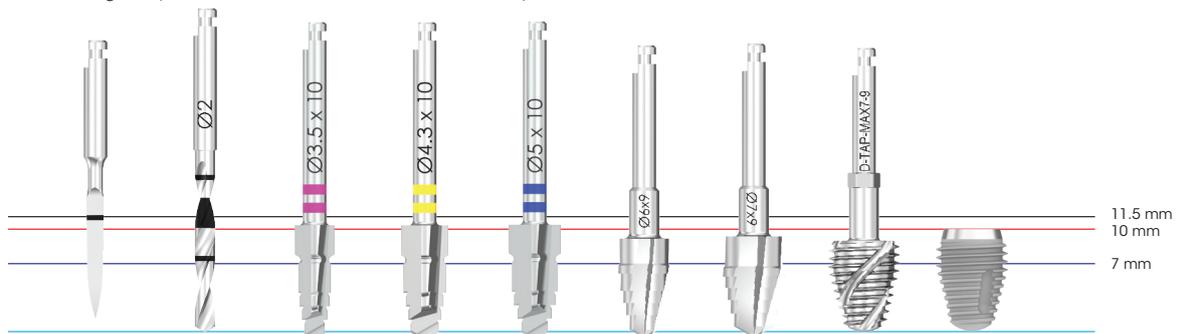
Progressively enlarge the diameter of the osteotomy by drilling through the root and inter-radicular bone with a sequence of tapered implant drills. Control the depth, axis, meso-distal and bucco-lingual positioning throughout the drilling sequence.

Follow the applicable drilling protocol for your tapered implant system, finishing with the appropriate tapered drill with the roots still in place.

Illustrating the placement of a Ø7 x 9 mm MAX Implant



Illustrating the placement of a Ø7 x 9 mm TRI-MAX Implant





Finalize the osteotomy

Split the remnant tooth according to the root anatomy and elevate each root segment towards the central void that has been created. Remove any remnant tooth fragments. Debride and assess the site for suitability to proceed with implant placement, particularly the integrity and proximity of the buccal bone wall.

Use the MAX tap of suitable diameter and length to finalize the preparation. A tapered drill of 6 mm diameter used prior to extraction will allow access of a 7 mm diameter MAX tap post extraction. The use of the MAX tap is the most predictable method to properly verify final depth of implant placement, insertion torque and stability. If the bone is dense (as typical in a mandibular site), further drilling with the dedicated MAX drill may be necessary to achieve adequate site preparation. Achieving correct depth of placement with good primary stability is very important, but may be difficult to achieve with a greatly tapered implant where under preparation may result in the implant becoming stuck in a too shallow position. The most predictable way of finalizing the preparation is, therefore, by use of the dedicated length and diameter of MAX tap to verify depth of placement and primary stability. By varying the selected length and/or diameter of MAX tap, the operator will be able to determine the optimal size of implant to be placed and achieve the optimal final seating of the implant.



Use a graduated probe to measure the depth of the tap below the most apical bone crest, with a view to achieving a depth of 2 mm below the most apical crest of bone. A radiograph should be taken with the MAX tap in site to verify the final seating of the implant to be placed, checking the apical depth relative to anatomical structures.

Do not use MAX taps in combination with drill extensions.

6.3.3. Extraction site method

The extraction site method is performed in fresh molar extraction sockets where the tooth and roots are fully removed prior to osteotomy preparation. This approach is commonly used when retained roots are unsuitable for guiding the drill, such as in cases of advanced root mobility, infection, or severe decay, and relies on anatomical landmarks to establish the correct implant position.

	<p>Extract the tooth</p> <p>The molar is carefully extracted with a view of maximum preservation of the alveolus and inter-radicular bone. This may include initial manipulation of the tooth with extraction forceps, followed by splitting of the tooth according to the root anatomy to facilitate elevation of the individual roots from the socket. Debride the site to remove any tooth fragments or infectious material, and assess the site for suitability to proceed.</p> <p>The inter-radicular septum and the buccal bone-wall should be kept intact.</p>
	<p>Flatten inter-radicular crest</p> <p>If there is a slender inter-radicular crest, use a high speed carbide bur to flatten the crest to create a wider platform.</p>
	<p>Initial drilling</p> <p>Initiate the osteotomy by drilling into the inter-radicular bone septum, using a 20:1 handpiece with irrigation. The D-3SPADE-1.8M drill is used to initiate the osteotomy.</p> <p>All drilling should be performed at a speed of 1000-1500 rpm for twist drills and 800 rpm for tapered drills, all with copious irrigation. An intermittent technique should be used to avoid overheating the bone.</p>



Pilot drilling - Ø2 mm Twist Drill

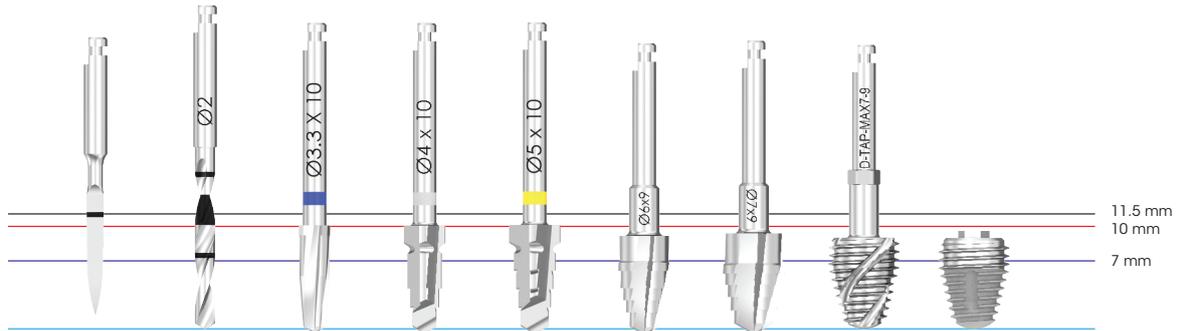
Drill to the appropriate depth, with reference to the depth markings on the twist drill. Control drilling depth to ensure that the implant will be seated at least 2 mm below the most apical margin of the alveolar crest.

Incrementally enlarge the osteotomy

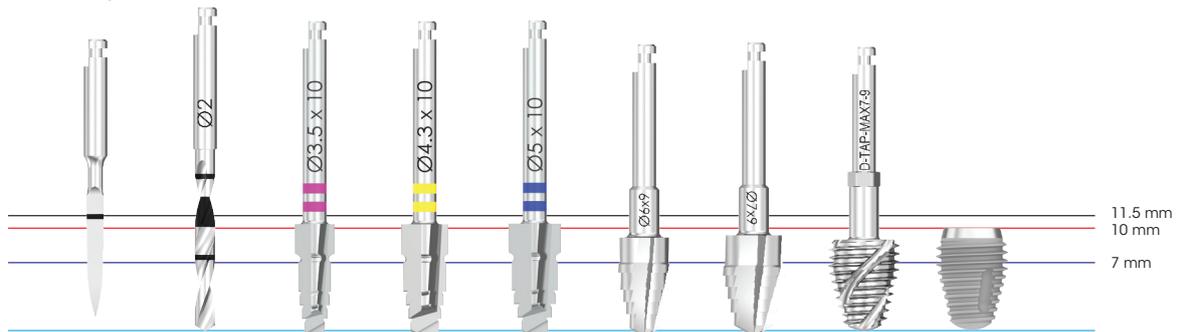
Progressively enlarge the diameter of the osteotomy with a sequence of tapered implant drills. Control the depth, axis, meso-distal and bucco-lingual positioning throughout.

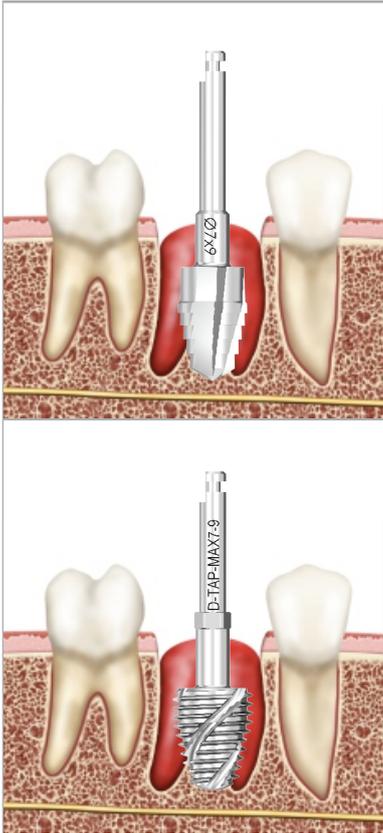
Use of intra-operative intra-oral radiographs is highly recommended. Follow the applicable drilling protocol for your chosen tapered implant system.

Illustrating the placement of a Ø7 x 9 mm MAX Implant



Illustrating the placement of a Ø7 x 9 mm TRI-MAX Implant





Finalize the osteotomy

Debride and assess the site for suitability to proceed with implant placement. If the bone is dense (as in a mandibular site), drilling with the dedicated MAX drill may be needed to achieve adequate preparation.

Use the MAX tap of suitable diameter and length to finalize the preparation. A tapered drill of 6 mm diameter used prior to extraction will allow access of a 7 mm diameter MAX tap post extraction. The use of the MAX tap is the most predictable method to properly verify final depth of implant placement, insertion torque and stability. If the bone is dense (as typical in a mandibular site), further drilling with the dedicated MAX drill may be necessary to achieve adequate site preparation. Achieving correct depth of placement with good primary stability is very important, but may be difficult to achieve with a greatly tapered implant where under preparation may result in the implant becoming stuck in a too shallow position. The most predictable way of finalizing the preparation is, therefore, by use of the dedicated length and diameter of MAX tap to verify depth of placement and primary stability. By varying the selected length and/or diameter of MAX tap, the operator will be able to determine the optimal size of implant to be placed and achieve the optimal final seating of the implant.

A radiograph should be taken with the MAX tap in site to verify the final seating of the implant to be placed, checking the apical depth relative to anatomical structures.

6.3.4. Implant placement guidelines

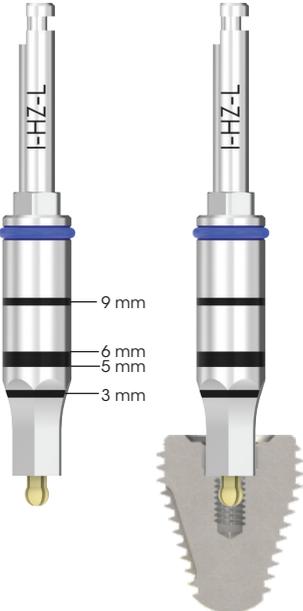
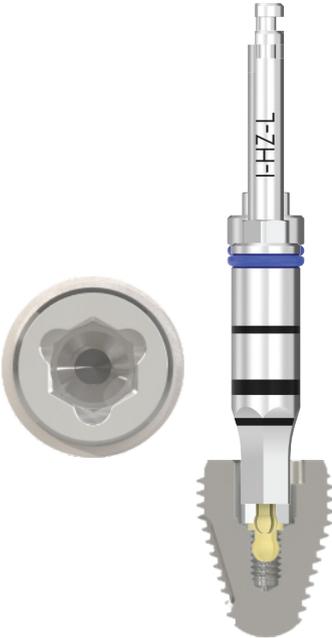
	<p>Implant placement</p> <p>Connect the insertion tool to the hand piece to carry the implant to site. Insert the implant at low speed (15 rpm) with the drive unit set to a maximum torque of 40 Ncm. The MAX implant often requires a high insertion torque, due to the large surface area and greater tapered design. Final seating would, therefore, usually be completed using a surgical hand-wrench. Appropriate adaptors for the hand wrench are available for the various implant connection types.</p> <p>In cases where the implant is fitted with a fixture mount, it is ensure that the fixture mount screw is tightened sufficiently before inserting the implant. Refer to CAT-1217 for further information in regard to removing a fixture mount.</p> <p>It is important that the threaded portion of the implant body is fully seated to a depth of 2 mm below the alveolar bone crest of the extraction socket and not in contact with the buccal wall. This will avoid possible exposure of the implant thread after healing of the socket.</p>
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Site preparation will not differ for MAX, PROMAX, MAXIT or TRI-MAX. The seating depth of the implant may differ due to variance in design of the neck of the implant types. In the case of the TRI-MAX and MAXIT implants which have machined coronal collars, the threaded portion of the implant should be 2 mm sub-crestal while the machined coronal areas may rise above the bony crest as shown below.

	<p>MAX</p> 	<p>PROMAX</p> 	<p>TRI-MAX</p> 	<p>MAXIT</p> 	<p>Illustrations are for 9 mm length implants.</p>
------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------	----------------------------------------------------

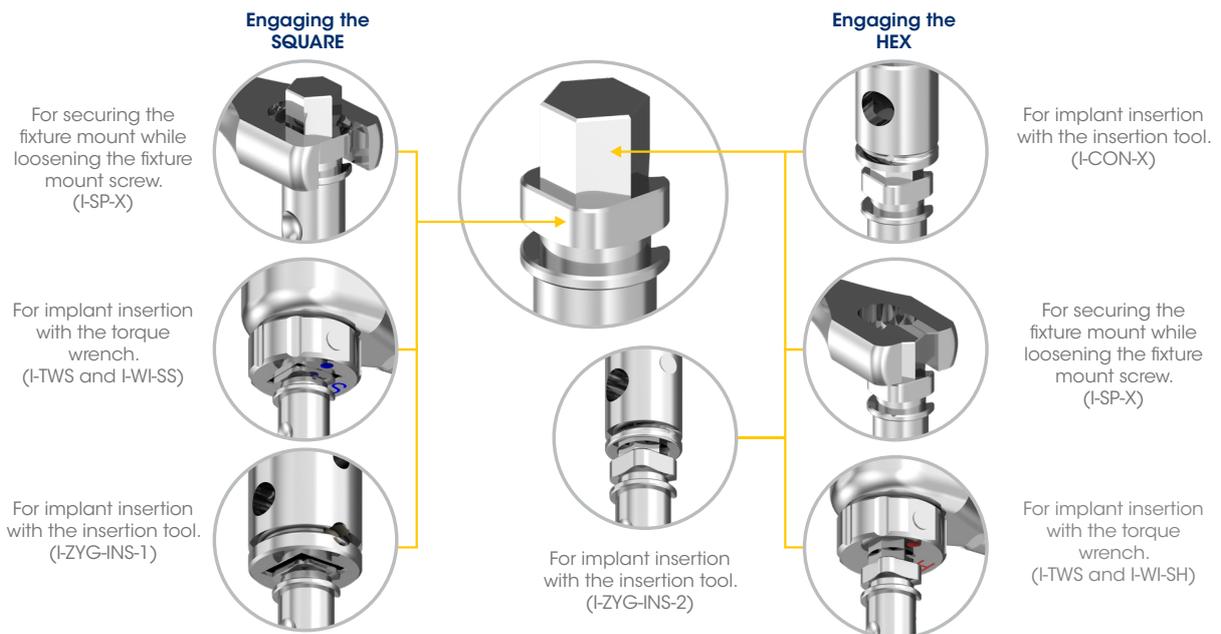
Implant pick-up and placement procedures

MAX (External Hex)	MAXIT (Internal Octagon)	<p>MAX and MAXIT pick-up and placement procedure MAX and MAXIT implants are packaged with a fixture mount attached to the implant. The connector to handpiece, I-CON-X or I-CON-IT, is inserted into the hand piece and used to pick up the fixture mount with attached implant. The implant is inserted by motor into the site at 15 rpm and 40 Ncm torque value, with gentle apical pressure. When the flutes are no longer visible, irrigation can begin. After implant insertion using the motor, the torque wrench with the corresponding wrench adapter (I-WI-CST), can be used to complete the insertion manually by hand wrenching. A high insertion torque should be anticipated due to the strongly tapered geometry of the implant.</p>
<p>I-CON-X</p> 	<p>I-CON-IT</p> 	

PROMAX (Internal Hex)	TRI-MAX (TRI-NEX)	PROMAX and TRI-MAX pick-up and placement procedure
<p data-bbox="229 322 335 342">HZ-S / M / L</p>  <p data-bbox="108 999 453 1037">Laser markings at 3, 5, 6 and 9 mm from the implant platform.</p>	<p data-bbox="587 322 740 342">I-HLH50 GS / M / L</p>  <p data-bbox="475 992 849 1048">The dimples of the tool and lobes of the implant should line up. This allows alignment of the lobe buccally</p>	<p data-bbox="863 271 1492 300">The latch grip handpiece tool I-HLH or I-HZ-S / M / L is used to pick up the implant from the packaging. The hexagon of the insertion tool must be fully engaged into the implant before torque is applied. The hexagon is fully engaged when the parallel sided portion of the hexagon tool is completely sunken into the implant. The implant is placed into the prepared site and driven with a motor unit at 15 rpm while applying gentle apical pressure. After implant insertion using the motor, the torque wrench with the corresponding wrench adapter (I-WI-CST), can be used to complete the insertion manually by hand wrenching. A high insertion torque should be anticipated due to the strongly tapered geometry of the implant.</p>

6.4. Correctly engaging the implant insertion tool

The fixture mount may be engaged either on the square portion or the hex.



7. Prosthetic considerations when restoring MAX implants

Restoration of MAX implants requires careful attention to prosthetic design, component selection, and bio-mechanical principles to maximise long-term success. The posterior location, larger implant diameters, and anatomical variations demand precise planning to ensure optimal load distribution and prosthetic stability.

Prosthetic Considerations for Restoring MAX Implants

MAX implants can be restored using either direct or indirect workflows, with the exception of the MAXIT tissue-level implant, for which compact conical abutments are not available. The choice of workflow will depend on clinical requirements, available restorative space, and the treating clinician's preferred protocol.

For accurate selection and compatibility, all prosthetic components are listed in the respective product catalogues corresponding to each implant connection type. These catalogues outline the complete range of components, their ordering codes, and their intended use, ensuring a predictable and prosthetically driven outcome.

Abutment Selection

- **Height:** Choose abutment height based on soft tissue thickness and emergence profile requirements.
- **Angulation:** In cases of suboptimal implant trajectory, angulated Compact Conical Abutments options may be used to correct the prosthetic axis.
- **Width:** Ensure compatibility between abutment width and planned prosthetic framework to avoid interference with adjacent teeth or soft tissues.

Prosthetic Workflow

- **Analogue Workflow:** For conventional impressions, use open- or closed-tray impression copings compatible with the selected MAX implant connection. Verify complete seating radiographically if needed, and secure the coping to the recommended torque to prevent movement during impression taking.
- **Digital Workflow (SI-Digital):** For intra-oral scanning, use the designated Scan Flag compatible with the specific MAX connection type. Pair the scanned data with the matching digital laboratory analogue for accurate 3D-printed model fabrication. Follow SI-Digital scanning guidelines, ensuring proper scan body alignment, clear capture of surrounding soft tissue and occlusal anatomy, and correct insertion of the digital analogue into the printed model to maintain precision in the digital workflow.

Occlusal Scheme

- Maintain reduced occlusal contacts in posterior segments to minimise lateral forces.
- Immediately loaded prostheses must be kept out of occlusion during the initial healing phase.
- Consider group function or mutually protected occlusion, depending on case-specific factors.

Splinting Considerations

In immediate loading or multi-unit cases, splinting MAX implants with additional implants (standard or other MAX units) is recommended for optimal stability and load sharing.

Maintenance and Retrievability

Whenever possible, restorations should be designed for screw-retention to facilitate easy removal for hygiene maintenance, repairs, or adjustments over time. Patients should be thoroughly educated on correct oral hygiene techniques specific to their restoration, as well as the importance of adhering to routine follow-up appointments to ensure long-term function and health of the implant-supported prosthesis.

Loading times

Healing period is generally 3-4 months in the mandible and 4-6 months in the maxilla; however, healing periods may vary for each patient. When a shorter healing time or immediate loading is being considered, the assessment must be based on the individual clinical situation (i.e. bone quality, bone quantity, primary stability achieved, loading conditions, design of super-structure, etc.). Implants may be immediately temporized on single or splinted multiple-unit restorations, if good primary stability is achieved. Immediately temporized restorations should be kept out of occlusion. The patient should adhere to a soft diet and place minimal forces on the restoration for 6-12 weeks.

Step-by-Step Protocol

1. Restoration Pathway Selection

After the designated healing period, or immediately in cases of immediate loading, determine whether the restoration will be made direct-to-implant or indirect using Compact Conical Abutments.

Select the appropriate abutment based on tissue thickness and implant connection, as outlined in the relevant product catalogue. Ensure the interface is clean and dry, then seat the abutment with the appropriate abutment driver and torque the screw/compact conical to the recommended torque value in the product catalogue using a calibrated torque wrench.

Note: MAXIT tissue-level implants do not have Compact Conical Abutment options.

2. Impression Taking

- Direct-to-Implant (Analogue): Use open or closed tray impression copings compatible with the MAX implant connection. Confirm seating clinically and, if necessary, radiographically. Use high-precision materials such as PVS or polyether.
- Direct-to-Implant (Digital): Use the designated Scan Flag and corresponding digital laboratory analogue, following SI-Digital scanning protocols for accurate capture.

3. Model fabrication

Laboratory technicians should use the appropriate analogue—either direct-to-implant or Compact Conical—to fabricate the master model. Ensure accurate soft tissue replication to support optimal emergence profile design.

4. Framework and prosthesis design

Design the prosthetic framework (e.g., screw-retained bridge or bar) to be fully supported by the selected restoration pathway. Avoid mixing direct-to-implant and Compact Conical abutments within the same arch unless clinically justified and planned for bio-mechanical stability.

6. Try-In and Final Prosthesis Delivery

Verify a passive fit of the framework. Secure prosthetic retaining screws to the torque values specified in the product catalogue or packaging. Check occlusion, aesthetics, and phonetics. Apply final torque to all abutments or direct-to-implant screws and seal access holes with suitable material.

7. Post-Delivery Instructions

It is important to provide hygiene instructions focusing on access beneath the prosthesis. Schedule regular maintenance visits to monitor peri-implant tissues and prosthesis integrity.

8. Ten commandments of the MAX Implant

Compliments of Dr André Hattingh, BChD
Private Practice, Kent, UK

1. Select for Purpose

The MAX implant was originally designed for immediate placement in multi-rooted molar sockets. Always ensure case selection aligns with this intended purpose.

2. Avoid Use in Thin Bio-types

While thin bio-types are generally contraindicated for all implants, this is especially critical for MAX. The socket must be intact in all four directions. If not, perform augmentation and delay placement.

3. Do Not Perform Conventional Extractions

This is particularly important for molars with divergent roots. Use forceps only for initial loosening. The preferred protocol is to decoronize the tooth, separate the roots while preserving all inter-radicular bone, and then elevate the fragments.

4. Prepare the Site Incrementally

Flatten sharp inter-radicular crests with a carbide burr to create a wide V-shaped profile, positioned 4–5 mm above the socket apex (verify with a probe). Follow the appropriate drilling protocol to match the surgical approach.

5. Avoid Buccal Wall Engagement

The implant should not fill the socket completely. Maintain a “jump gap” of 1–2 mm between the implant and buccal wall.

6. Place at Correct Depth

Position the implant platform 1–2 mm beneath the lowest buccal wall point. Establish depth early, as subsequent drills are designed to widen the site, not deepen it.

7. Verify Position Before Placement

Confirm both clinically and radiographically. Using a tap also allows assessment of insertion torque.

8. Expect High Insertion Torque

Because torque increases exponentially with implant diameter, MAX implants often achieve high torque values. This is normal and safe.

9. Support Soft Tissue and Close Voids

Use a wide healing abutment and suture for optimal soft tissue support. For large voids, consider haemostatic collagen sponge, although leaving the clot is equally acceptable.

10. Commit to Follow-Up

Advise patients to avoid rinsing for one week post-op. Schedule follow-ups to assess healing, prosthetic stability, and to contribute to protocol refinement.

9. Additional resources

For detailed specifications, compatible components, and extended surgical and prosthetic workflows, refer to the following Southern Implants resources:

CAT-2020 – External Hex Implants Product Catalogue

CAT-2060 – PROVATA Implants Product Catalogue

CAT-2004 – TRI-NEX Implants Product Catalogue

CAT-2005 – IT Implants Product Catalogue

For detailed specifications, compatible prosthetic components, and ordering information for each MAX implant connection.

CAT-4100 - Prosthetic Manual

Includes all prosthetic components and relevant workflows and torque values for restorative procedures.

CAT-2063 Digital Workflow Guide (SI-Digital)

For clinicians using intra-oral scanning and CAD/CAM workflows, the SI-Digital guide outlines scan body compatibility and digital restorative options for MAX-supported cases.

CAT-6043 MAX Implants Brochure

For a list of all features and a case study utilising a MAX implant.

CAT-8060 MAX Instruction for Use

Stipulates the technical indications, materials and regulatory information about the MAX implant range.

CAT-1217 How to remove a fixture mount that is too tight

Advises the protocol on how to handle an implant that has a fixture mount that is too tight.

To access these catalogues and additional surgical resources, visit the official Southern Implants MAX Implant web page: southernimplants.com/max-implants

For the latest Instructions for Use (IFU), including surgical protocols, sterilisation processes, and regulatory information, please refer to:

southernimplants.com/ifu

For more information scan below



to contact your Southern Implants Representative
or visit southernimplants.com



South Africa - Headquarters 1 Albert Road, Irene, RSA
T: +27-12-667-1046 | **E:** info@southernimplants.com

EC REP

Southern Implants Europe AB Holmgatan 30, S-791 71, Falun, Sweden
E: ecrep@southernimplants.com

Subsidiaries

Australia

Southern Implants Australia
T: +61-8 -9466-2627
E: info@southernimplants.com.au

Spain and Portugal

Southern Implants Ibérica
T: +34-935-053-507
E: info@southernimplants.es

United Kingdom and Ireland

Southern Implants UK
T: +44-20-805-94490
E: info@southernimplants.co.uk

USA and Canada

Southern Implants North America Inc.
T: +1-561-472-0990
E: customercare@southernimplants.com

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