MorphoWave
Install & User Guide

Revision 1.6
October 2015
About this Guide

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MorphoWave™ is the world’s first biometric access solution capturing and matching 4 fingerprints with a single hand movement. It implements a patented, truly contactless technology, that not only acquires extremely accurate fingerprint data but also overcomes the challenges wet/dry fingers and latent prints pose to conventional scanning systems.

The dynamic, touchless acquisition capability provided by MorphoWave™ allows users to remain ‘on the move’ when passing through a control point, making it ideal for securing high traffic areas.
What is Covered in This Guide

This guide contains the following sections:

Chapter 1: Introduction
Explains the purpose and contents of this guide, and provides a list related material

Chapter 2: MorphoWave Overview
Provides basic information and specifications for MorphoWave

Chapter 3: Installation
Provides instructions for physical/hardware installation

Chapter 4: Configuration
Provides instructions for software configuration

Chapter 5: How to Use MorphoWave
Provides guidelines on using your MorphoWave product

Chapter 6: Maintenance and Troubleshooting
Provides information on product care, maintenance, and troubleshooting

Related Information

This document is intended to describe how to install and use a MorphoWave product that has been populated by a Finger on The Fly Access Control Package (FACP). Therefore the focus on this guide is the installation, use and maintenance of the physical tower. For more details about the configuration of the internal FACP components (PC, Ethernet Switch, FiOTF, and MA Sigma) please refer to:

• MorphoWave OEM Quick User Guide
• MorphoWave OEM Installation Guide
Congratulations for choosing MorphoWave.

MorphoWave is a biometric access tower used for contactless access control using fingerprint verification and/or identification.

Among a range of alternative biometric technologies, the use of finger imaging has significant advantages: each finger constitutes an unalterable physical signature, developed before birth and preserved until death. Unlike DNA, a finger image is unique to each individual - even identical twins.

MorphoWave offers the following sensor advantages:

- 4 finger “on the fly capture”
- Easily copes with dry and wet fingers
- No ghost images left on scanner
- Mitigates hygiene concerns
- Robust against external light and dust
- 5” WVGA color touchscreen
- Extensive customization capabilities: user dedicated messages, corporate video, wallpapers
- Time & Attendance features

This chapter covers some basics to familiarize you with your new MorphoWave.
Product Physical Overview

*Figure 1. MorphoWave Physical Overview*

- Touchscreen user interface (MA Sigma) that provides visual as well as audible feedback.
- Acquisition area (FiOTF sensor) for contactless acquisition.
- Stainless steel or painted tower enclosure that fits in a variety of environments.
Figure 2 - Overview Rear

- Rear steel cover; removable
- Vents for ventilation and air flow
- Security lock to restrict access to internal components
- Optional Metal base plate for portable setup
Component Overview

MorphoWave is a product that consists of several integrated components. The following sections offer a high level description of the various components that makeup the MorphoWave product. For more detailed information on the core components (FiOTF Sensor, MA Sigma, PC, and Network switch) refer to the FACP Installation and User Guides referenced in the Related Information section above.

Table 1 - Components

<table>
<thead>
<tr>
<th>Components</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MorphoWave Tower</td>
<td>Physical tower that encloses all the other components</td>
</tr>
<tr>
<td>FiOTF Sensor</td>
<td>Finger on the Fly contactless acquisition device</td>
</tr>
<tr>
<td>MA Sigma</td>
<td>Provides touchscreen interface</td>
</tr>
<tr>
<td>Network Switch</td>
<td>Connection point for various devices</td>
</tr>
<tr>
<td>PC</td>
<td>Controller for FiOTF and other devices</td>
</tr>
<tr>
<td>Fan</td>
<td>DC fan used for ventilation</td>
</tr>
<tr>
<td>Wiring Sub-panel</td>
<td>MA Sigma wiring sub-panel</td>
</tr>
<tr>
<td>Power Supply</td>
<td>12V power supply used to power fan, MA Sigma, and FiOTF Sensor</td>
</tr>
<tr>
<td>Power Strip</td>
<td>Universal (100-240V / 50-60Hz) power strip to power components</td>
</tr>
<tr>
<td>C13 Power Box</td>
<td>Custom C13 power junction box for hard wiring</td>
</tr>
</tbody>
</table>
Core Component Overview

The MorphoWave product is made up of the four core components that make up the FACP package. These four components are detailed below. For more information on the specific components refer to the FACP documentation referenced in the Related Information section above.

Figure 3: FACP – Core Component Overview
### Technical Specifications

Technical specifications are listed in the table below.

**Table 2. Technical Specifications**

<table>
<thead>
<tr>
<th><strong>Hardware Features</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model type</td>
<td>MorphoWave</td>
</tr>
<tr>
<td>Capture type</td>
<td>Hand swipe through the active volume without contact</td>
</tr>
<tr>
<td>Capture capacity per swipe motion</td>
<td>Up to 4 fingers</td>
</tr>
<tr>
<td>Max hand speed</td>
<td>0.5 m/s (19.7 in/sec)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Product Dimensions</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
<td>17 x 113 x 31 cm / 6.75 x 44.5 x 12 in</td>
</tr>
<tr>
<td>Dimensions: Optional Base Plate (W x H x D)</td>
<td>41 x .6 x 46 cm / 16 x .25 x 18.25 in</td>
</tr>
<tr>
<td>Weight</td>
<td>31 kg (68 lbs)</td>
</tr>
</tbody>
</table>

**Interface**
### Network
- Ethernet RS485, RS422

### Access Control
- Wiegand In & Out (customizable up to 512 bits), Door Relay, 2 General Purpose Inputs, 2 General Purpose Outputs

### Environmental Conditions

<table>
<thead>
<tr>
<th>Capture Volume (W x H x D)</th>
<th>40mm x 39mm x 80mm / 1.57in x 1.53in x 3.14in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>10°C (50°F) to 35°C (95°F)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>10%–80% Humidity rate, non-condensing</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-25°C (-13°F) to 60°C (140°F)</td>
</tr>
<tr>
<td>Storage Humidity</td>
<td>5%–95% Humidity rate, non-condensing</td>
</tr>
<tr>
<td>Operating Lighting</td>
<td>To be operated indoor in controlled ambient light conditions. The device shall not be exposed to direct sunlight.</td>
</tr>
<tr>
<td>Power</td>
<td>100-240V (50 – 60 Hz)</td>
</tr>
</tbody>
</table>

### Certifications
- CE, UL-294, UL 60950-1, FCC part 15 Class B, RoHS, REACH, WEEE

---

### Power Supply Specifications

<table>
<thead>
<tr>
<th>Voltage</th>
<th>100-240V</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC or DC</td>
<td>AC</td>
</tr>
<tr>
<td>Frequency</td>
<td>50-60Hz</td>
</tr>
<tr>
<td>Number of Phases</td>
<td>1 (single)</td>
</tr>
<tr>
<td>Amps</td>
<td>&lt; 3A</td>
</tr>
</tbody>
</table>

---

![Figure 4 - AC Connector Inlet(IEC320/C14)](image-url)
**Product Marking**

The MorphoWave is marked with the pictograms shown in Figure 5 and Figure 5. Refer to Table 3 for an explanation.

*Figure 5. Product Tag and Markings Inside and Outer Unit*
Pictograms are explained in the table below.

**Table 3. Pictogram Description**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Symbol](image1) | **WEEE**  
This symbol indicates that this product may not be treated as household waste. Please ensure that this product is properly disposed of, as inappropriate waste handling of this product may cause potential hazards to the environment and human health. For more detailed information about recycling of this product, please contact Morpho. |
| ![Symbol](image2) | The product complies with CE regulation. |
| ![Symbol](image3) | The product complies with FCC Part 15 Class A norm. |
| ![Symbol](image4) | The Met Mark is issued by MET Laboratories, a Nationally Recognized Test Laboratory (NRTL). The symbol indicates that the product is found to be compliant and that a pre-certification factory inspection of the manufacturing facility has been successfully completed. |
Safety Instructions

For your convenience and safety, please follow product use as described in this user guide. Device operation and usage not complying with this guide may endanger the safety of users.

Wiring Recommendations

The installation of this product should be made by a qualified service technician and should comply with all local regulations.

MorphoWave is powered by a power strip that is delivered with the product. This power strip requires a 100~240V AC power source.

**Figure 6 - Power Strip**

MorphoWave has two default options with respect to powering the unit: a quick demo or temporary power installation option and a permanent power installation. These two installation options are discussed in more detail in the Hardware installation section below.

European Information

Morpho hereby declares that the Morpho Finger on the Fly product has been tested and found compliant with following listed standards:

- EMC Directive 2004/108/CE
- EN 55022:2010
- EN 50130-4
- EN 61000-3-2
- EN 61000-4-2/3/4/5/6/8/11
- ROHS Directive 2011/65
USA/Canada Information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The following standards are followed by MorphoWay for USA and Canada:

- UL 294;
  - Destructive: Level 1
  - Line Security: Level 3
  - Endurance: Level 3
  - Standby power: Level 1
- UL 60950-1
- CSA C22.2 No. 60950-1
- CB IEC 60950

Other Countries

The following market access packages have been purchased for the MorphoWay product:

- Mexico
- China
- United Arab Emirates
- Saudi Arabia
- South Africa

Eye Safety

MorphoWave respects standards of eye safety. All products are compliant with NF EN 62471 December 2008.
3 HARDWARE INSTALLATION
Verifying Product Contents

Ensure that the following items are in your product package before beginning hardware installation.

The standard MorphoWave product contains:

- One (1) MorphoWave tower that contains internal components including:
  - One (1) MA Sigma
  - One (1) Finger on the Fly sensor with USB 3.0 cable
  - One (1) PC
  - One (1) Network Switch
  - One (1) Power strip compatible with 100-240V (50 – 60 Hz)
  - One (1) 12V Power supply
  - One (1) Power junction box compatible with 100-240V (50 – 60 Hz)
  - One (1) DC powered fan
- One (1) power cord for European standards
- One (1) power cord for US standards
- One (1) mounting base
- One (1) optional mounting base plate
- One (1) set of 2 keys. One key for the back panel and another key tool to enable the tilt mechanism
Installing the Hardware

In order to ensure an optimal installation of the MorphoWave tower, it is recommended
that these guidelines be followed. The MorphoWave product comes with all internal
components pre-wired and connected, therefore, installation consists of mounting the
physical unit and providing power, Ethernet connectivity, and access control data
connection.

The MorphoWave tower can be mounted using three options 1) A soft mount 2) hard
mount option with cables underground 3) hard mount option with cables routed through
conduit. The soft mount option uses a detachable base plate that gives stability to the
tower and allows the tower to be easily moved around. The hard mount option does
not use the optional base plate and instead mounts the base directly to the ground.

Tools Required

Figure 7 - Tools Required
Physical Installation: SOFT MOUNT

The soft mount option is intended for less permanent use such as demos or for situations where holes cannot be drilled into the ground for a hard mount installation. The steps below can be followed for a soft mount physical installation.

For hard mounted towers, the minimum recommended distance from the back of the unit to a wall or other obstruction is 3 inches. Tilting the unit allows for maintenance access when mounted close to a wall, however some installations may require more separation distance (such as if the unit is mounted in a corner). Consideration to each unique location may require more separation.

1. Carefully unpack the MorphoWave items from the box.
2. Remove the punch-outs in the base in order to run cables for Ethernet and Access Control Data. The punch-outs below can be removed by using a metal object to tap the circular areas shown below. After removing the punch-outs, thread the in-cable (Ethernet or Access Control Data) through the grommet and insert the grommet into the hole.

3. **SOFT MOUNT:** Attach the optional base plate to the tower base using the supplied nuts (4). The base and base plate should look like the image below.
Figure 9 - Base with base plate attached

4. Route the power cord through the opening in the base as shown below
Figure 10 - Opening for Power cable in base

Figure 11 - Power cable routed
5. Attach the base and base plate to the MorphoWave tower using the supplied nuts as shown in the image below. Be careful to ensure that power cable is routed through the hole and that the cable is not pinched when the tower is secured to the base.

*Figure 12 - Tower with base attached*
Physical Installation: HARD MOUNT W/ Cables Underground

The hard mount with cables underground option is intended for permanent installations and requires drilling holes into the ground in order to secure the MorphoWave tower. The cables for power and data will be routed underground and up through the opening where the base of the tower will be mounted over.

For hard mounted towers, the minimum recommended distance from the back of the unit to a wall or other obstruction is 3 inches. Tilting the unit allows for maintenance access when mounted close to a wall, however some installations may require more separation distance (such as if the unit is mounted in a corner). Consideration to each unique location may require more separation.

Pre-requisites: The Hard Mount option with cables underground needs the following pre-requisites completed to ensure the proper mounting environment:

1. Four studs are secured on the concrete/flooring per image below.

*Figure 13 - Four studs secured on the concrete flooring*
2. Cables for power and data are routed up through the opening in the hole. Recommended lengths of the cables above the ground are as follows:
   - 3 conductor power cable: 18” (46cm) above ground
   - Ethernet: 24” (61cm) above ground
   - Access Control Data lines: 12” (31cm) above ground

3. Obtain 3, 1/4” push on terminals, as shown in the image below, for wiring of power cables from A/C main source to junction box

Once the Pre-requisites above have been met, the steps below can be followed for a hard mount physical installation

1. Carefully unpack the MorphoWave items from the box.

2. Hard mount base over the opening on the ground using the supplied nuts as shown below. The cables for data and power should be routed up through the hole in the base.
3. Connect AC main power coming up from the opening in the flooring to the MorphoWave junction box using supplied spade connectors as shown in the image below.
4. Secure tower to the already installed base using the supplied nuts as shown in the image below.

**Figure 16 - Secure tower to base**
5. If Ethernet is going to be used then route the Ethernet cable up through the opening of the tower and connect to the Ethernet switch into port 3. Note: The MorphoWave tower back panel will need to be removed in order to access the network switch connection.

6. Data connection for MA Sigma should be connected at the bottom of the tower in the sub-connector panel as shown in the image below. The sub-connector panel has the same connections and has been labeled the same as the MA sigma therefore the specific wiring instructions for the access control data can be obtained from the FACP Installation Guide referenced in the Related Information section above. **NOTE:** Care should be taken when routing the cables on the MA Sigma sub-connection panel so that cables are not pinched by the tilt mechanism or pinched by the panel when re-attaching to the tower.
Figure 17 - Data connection

Figure 18 - C13 to C14 connector
7. Power take C13 connector and plug into the C14 connector on the strip as shown in the figure above.

**Physical Installation: HARD MOUNT W/ Cables Run Through Conduit**

For hard mounted towers, the minimum recommended distance from the back of the unit to a wall or other obstruction is 3 inches. Tilting the unit allows for maintenance access when mounted close to a wall, however some installations may require more separation distance (such as if the unit is mounted in a corner). Consideration to each unique location may require more separation.

The hard mount with cables run through conduit is intended for permanent installations and requires drilling holes into the ground in order to secure the MorphoWave tower. The cables for power and data however will be routed through conduit and into the tower through the punch outs in the base as opposed to the

**Pre-requisites:** The Hard Mount option with cables through conduit needs the following pre-requisites completed to ensure the proper mounting environment:

1. Four studs are secured on the concrete/flooring per image below.
2. Cables for power and data are routed through conduit and into the circle openings (.625” dia) in the base of the tower. Recommended lengths of the cables past the entry point into the tower are as follows:
   - 3 conductor power cable: 18” (46cm) slack from entry point of tower. 12-10 gauge tower is typically used in the U.S.
   - Ethernet: 24” (61cm) slack from entry point of tower
   - Access Control Data lines: 12” (31cm) slack from entry point of tower

3. Obtain 3, 1/4” push on terminals, as shown in the image below, for wiring of power cables from A/C main source to junction box. These connectors depend on the wire used by the installer. 12-10 gauge wire is typically used in the U.S.
Once the Pre-requisites above have been met, the steps below can be followed for a hard mount physical installation

1. Carefully unpack the MorphoWave items from the box.
2. Hard mount base over the opening on the ground using the supplied nuts as shown below.
3. Route the cables for data and power through the conduit and into the tower.

4. Connect AC main power coming in through the conduit into the MorphoWave junction box using supplied spade connectors as shown in the Figure above.

5. Secure tower to the already installed base using the supplied nuts as shown in the image below.

Figure 22 - Bolts to secure tower to base

6. Align hole on piano hinge with studs on base and tighten.
Figure 23 - Mounting points on tower to secure to base
7. If Ethernet is going to be used then route the Ethernet cable up through the opening of the tower and connect to the ethernet switch into port 3. Note: The MorphoWave tower back panel will need to be removed in order to access the network switch connection.

8. Data connection for MA Sigma should be connected at the bottom of the tower in the sub-connector panel as shown in the image below. The sub-connector panel has the same connections and has been labeled the same as the MA sigma therefore the specific wiring instructions for the access control data can be obtained from the MorphoWave OEM Installation Guide. **NOTE: Care should be taken when routing the cables on the MA Sigma sub-connection panel so that cables are not pinched by the tilt mechanism or pinched by the panel when re-attaching to the tower.**

![Figure 24 - MA Sigma sub-connector panel](image)

9. Take C13 connector and plug into the C14 connector on the strip as shown in figure 10 above.
Physical Power Disconnect: Hard Mount and Soft Mount

During servicing, the AC mains power to the MorphoWave tower can be disconnected by removal of the C13 power cable from the power strip (see figure 14) in either hard mount or soft mount installations.

For soft mount installations the power can also be disconnected by unplugging external power cable from the source.

For hard mount installations, the incoming AC power must be over current protected to allow no more than 15A maximum into the unit. In addition, a readily accessible disconnect device shall be incorporated external to the tower on the incoming AC power circuit.
This chapter provides a high level overview on the software used with the MorphoWave product, however, for detailed information refer to the respective guides.

<table>
<thead>
<tr>
<th>Software</th>
<th>Use</th>
<th>Reference Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA Sigma Firmware</td>
<td>Installed on MA Sigma</td>
<td>FACP Installation/User Guide</td>
</tr>
<tr>
<td>FACP Software Installation</td>
<td>Installed on PC to drive FACP components</td>
<td>FACP Installation/User Guide</td>
</tr>
</tbody>
</table>

The MorphoWave product inherits the existing FACP (Finger on the Fly Access Control Package) product (PC, MA Sigma, FiOTF, and network switch) and does not have any non-FACP software. Therefore, for a more information on the software contained within MorphoWave the FACP documentation should be referenced.
5 HOW TO USE MORPHOWAVE
Acquisition Guidelines

MorphoWave is a biometric acquisition terminal which captures fingerprints by the applicant swiping their hand through the active volume. The product can track and capture up to 4 fingerprints at a maximum speed of 0.5m/s.

To acquire fingerprints, the applicant swipes his hand between the product glass and the top protective cap as shown below.
Figure 25 - Capturing Prints

Note: The recommended hand swipe direction is from right to left, even though the sensor will accept both directions.
6 MAINTENANCE and TROUBLESHOOTING
Caring for Your Product

To gain the maximum benefit from your MorphoWave device, please follow the guidelines below for product care and maintenance.

The manufacturer cannot be held responsible for non-compliance of the following recommendations or incorrect use of the terminal.

General Precautions and Guidelines

- Do not attempt to repair the terminal yourself. The manufacturer cannot be held responsible for any damage/accident that may result from attempts to repair components. Any work carried out by non-authorized personnel will void your warranty.
- Do not expose the terminal to extreme temperatures.
- Do not use blunt force on the product.
- Do not scratch the product, particularly on the glass, because the performance of the product depends on the state of the glass surface and its anti-reflective face.
- Do not attach anything to the product.
- Do not place anything on the product.
- Do not attempt to upgrade the product firmware or any other software on the PC or any other settings on the switch.
- Take care when tightening the screws on the unit especially the ones that secure the inner brackets to the frame of the tower as over-tightening can cause indentations on the base of the tower. On these screws it is recommended to not tighten more than a ¼ of a turn past finger tightening.

Areas Containing Combustibles

It is highly recommended not to install the terminal in the vicinity of gas stations or any other installation containing flammable or combustible gases or materials.

Cleaning Precautions

Use a dry cloth to clean the terminal. It is recommended that the product be cleaned daily to ensure the best performance level over its lifetime.

The use of acid liquids, alcohol or abrasive materials is prohibited.
Troubleshooting

This section lists the most common errors and provides some basic recommendations on what to check for before attempting in-depth troubleshooting.

FiOTF Sensor is not Acquiring Prints

Please check and correct the following items prior to contacting support:

- Is the power strip powered and properly functioning
- Is there at least one record in the database
- Is the FiOTF USB 3.0 connection connected to a proper USB 3.0 port on the PC
- Is the power supply of the Finger On The fly properly connected at each point of connection?
  - From main power to power strip
  - Power Strip to the power adapter
  - Low voltage power to the back of device

MA Sigma is not Functioning Correctly

Please check and correct the following items prior to contacting support:

- Is the power supply of the MA Sigma properly connected at each point?
  - From main power to power strip
  - From power strip to 12V power supply
  - From 12V power supply to MA Sigma
- Is the ethernet connection properly connected at each point?
General Maintenance Information

Other than the maintenance specified in this section, repair of the terminal is NOT recommended. The manufacturer cannot be held responsible for any damage/accident that may result from attempts to repair components. Any other work carried out by non-authorized personnel will void your warranty.

Tilt Mechanism

The MorphoWave tower has a tilt mechanism allowing for access to the back of the tower. It is designed to allow easy access to the rear of the unit for maintenance when the tower is mounted with the rear near a wall or object.

The tilt latch is released using the specialized key tool inserted into the side of the tower base and rotating 90 degrees.

When the tilt latch is unengaged, take care to not release tower and permit it to fall forward freely. Slowly tilt the tower forward until it reaches the tilt limit stops that will hold the unit from tilting past 30 degrees from vertical. The tilt limit stops will hold the unit securely in the tilt position as long as no additional downward force is applied to the tower.

CAUTION!! Tilt feature is meant to be engaged ONLY when the unit is bolted to the floor using the hard mount option. Unlatching and tilting the tower when mounted to the base plate (soft mount) is unstable and the tower will fall and be damaged.

Figure 26 - Tilt mechanism access plug
Figure 27 - Tilt mechanism release key
Figure 28 - Tilt mechanism in locked position

Figure 29 - Tilt mechanism dis-engaged

- Assure the wave tower is placed firmly against a static object to insure stability
- Release tilt mechanism by removing plastic cap from side of base insert key, rotate counter clockwise and slowly pivot the wave tower backward.
- After utilizing the tilt mechanism slowly pivot the wave tower forward
- Re-latch the tilt mechanism firmly to the base of the tower

**Switching Tilt Mechanism to Opposite Side of Base**

Below are instructions for switching the tilt release mechanism to the opposite side of the base. This is useful in situations where the tower is obstructed by an object on one side.

- Remove both plastic plugs on the sides of the base

![Figure 30 - Base plastic plug](image)

- Unscrew cylinder screw with large Philip head screw driver from cylinder
- Undo hex nut from cylinder

**Figure 31-Tilt mechanism Cylinder Screw**

**Figure 32 - Tilt mechanism latch**
- Remove latch from cylinder

*Figure 33 - Base with tilt mechanism removed*

- Remove cylinder from left bracket and place it on right bracket (or vise versa) with notches in cylinder at 12 oclock and 3 oclock from top of base (0 and 90)=
  - Replace hex nut on cylinder
  - Replace latch on cylinder
  - Replace both plastic plugs
Replacing the FiOTF Sensor

- Prior to replacing the FiOTF sensor remove power from the tower by removing the rear cover and removing power from the power strip.

*Figure 34. Remove Rear Cover*

After removing the back panel access to the FiOTF power and usb connection will be exposed.

- Remove power connector from the back of the FiOTF sensor
- Disconnect FiOTF USB 3.0 connection from the PC
- Remove screws that are securing FiOTF unit to the tower bracketing and shelving
- Physically remove the FiOTF unit
- Place new FiOTF unit on the shelf where the previous unit was placed. Note the FiOTF unit will have to have the back panel removed as shown in the image below.
• Insert screws underneath the FiOTF that secure the unit to the tower shelf
• Connect FiOTF USB 3.0 cable to PC USB 3.0 port
• Insert power connector to FiOTF
• Once the power and data cable cable are connected, reattach the rear cover and lock with key
Replacing the MA Sigma

Follow the instructions below for replacing the MA Sigma.

- Prior to replacing the MA Sigma, remove power from the tower by removing the rear cover and removing power from the power strip.

After removing the back panel access to the MA Sigma, power and USB connection will be exposed.

- Remove all wires from Ma Sigma terminal blocks
- Remove connection from Network Switch
- Remove the 6 screws that are securing MA Sigma unit to the tower bracketing and shelving.
- Physically remove the MA Sigma unit
Place new MA Sigma unit on the shelf where the previous unit was placed. Note the MA Sigma unit will have to have the back panel removed as shown in the image below.

Replacing the Network Switch

*Figure 24 Replacing Network Switch*

Follow the instructions below for replacing the network switch.
• Disconnect CAT 6 cable to PC (port1)
• Disconnect CAT 6 cable to MA Sigma (port 2)
• Disconnect CAT 6 cable to customer LAN (port3)
• Disconnect Power supply cable from network switch
• Remove the 4 hex nuts (on top and bottom of bracket) that are securing network Switch unit to the tower bracketing and shelving.
• Physically remove the Network Switch unit
• Replace switch and re-assemble.
• Return network cables from devices to specified switch ports noted above

Replacing the PC

Figure 25 Replacing PC

Follow the instructions below for replacing the PC.
After removing the back panel access to the PC power and usb connection will be exposed.

• Remove power connector from the back of the PC
- Disconnect Network Switch connection from the PC
- Disconnect FiOTF USB 3.0 connection from the PC
- Remove 4 screws that are securing PC unit to the tower bracketing and shelving
- Physically remove the PC unit
- Place new PC unit on the shelf where the previous unit was placed. Note the PC unit will have to have the back panel removed as shown in the image below.

Replacing the Power Strip

Follow the instructions below for replacing the Power Strip.

- Prior to replacing the Power Strip, remove power from the tower by removing the rear cover and removing power from the power strip.
After removing the back panel access to the power strip power, power connections will be exposed.

- Power down system.
- Unplug all cords
- Remove screw that ground power strip to cabinet.

*Figure 27 Remove ground wire*

- Remove 2 hex nuts.
- Place new power strip unit on the bracket where the previous unit was placed. Note the PC unit will have to have the back panel removed as shown in the image below.
Replacing the Fuses

Follow the instructions below for replacing the fuses.

- Prior to replacing the fuses, remove power from the tower by removing the rear cover and removing power from the power strip.

After removing the back panel access to the power strip power, power connections will be exposed.

- Locate the fuses attached in the cable at the upper end of the tower near the MA Sigma shown below

Figure 28 Replacing MA Sigma and FotF fuse
Figure 29 Replacing Fan fuse

- Twist the outer shell of the fuse holder exposing the fuse.
- Remove and replace fuse.

Servicing the Filter

The MorphoWave tower is equipped with an air filter on the inside of the back panel as shown in the image below. The filter covers the vents that allow for air inflow to the tower. The air filter is secured with double-sided adhesive. It is recommended that the air filter is removed, washed and reinserted periodically. Frequency of required maintenance may vary depending on the environment the tower is placed in, however,
the unit should be inspected once every 2 months for need of cleaning. Follow the instructions below for servicing the air filter. Note that double sided adhesive may be needed to re-attach the air filter after servicing multiple times.

- Remove the back panel of the tower by unlocking the lock and pulling the panel away from the tower. The air filter will now be visible as shown in the image below.

**Figure 36 - Inside of back panel and air filter**

- Once the back panel is removed, take it to an area away from the tower where it can be comfortably cleaned.
- Leaving the filter attached to the door, use compressed air to remove the dust from the filter and the back panel altogether.
- Take the back panel back to the tower, reattach, and lock the back panel
7 Appendix
Appendix A: OEM Component Block Diagram
Appendix B: MA Sigma to Sub-connector Panel Wiring

MA SIGMA TERMINAL BLOCK

WAVE TOWER TERMINAL BLOCK

A

+12 V

-12 V

1

2

3

4

5

6

NO CON

RED 1

BLK 2

WHT 3

BLK 4

B

1

2

3

4

5

6

NO CON

RED 1

BLK 2

WHT 3

BLK 4

GRN 5

BLK 6

C

1

2

3

4

5

6

NO CON

RED 1

BLK 2

WHT 3

BLK 4

GRN 5

BLK 6

D

1

2

3

4

5

6

NO CON

RED 1

BLK 2

WHT 3

BLK 4

GRN 5

BLK 6