THE COVVI HAND

COVVI Go App

Anything Is Possible

COVVI Go App

11.1 COVVI Go

Everything you need to configure a COVVI Hand is within the COVVI Go App, which is compatible with iOS version 12.0+ and Android version 8.0+. The App has been designed to support you and your patient through every step of their journey, being designed from the ground-up to be easy to configure, which helps your patients get the most out of the hand. For those users who have experience with prosthetics, the COVVI Hand has a default setup combining the functionality of other prosthetic devices on the market for efficient interchangeability. For new users, as they become more familiar with their hand, they can test out different setups and make any changes in the App to best suit their daily activities and lifestyle

To download the COVVI Go App, go to our website www.covvi.com, click on the 'COVVI GO APP' dropdown section in the side menu to find links to the Apple Store (for iOS) and Google Play Store (for Android), where you can download the App. You can also search for the App directly in both stores by typing in 'COVVI Go'. When the App has downloaded and installed, the icon will appear on your device's home screen.
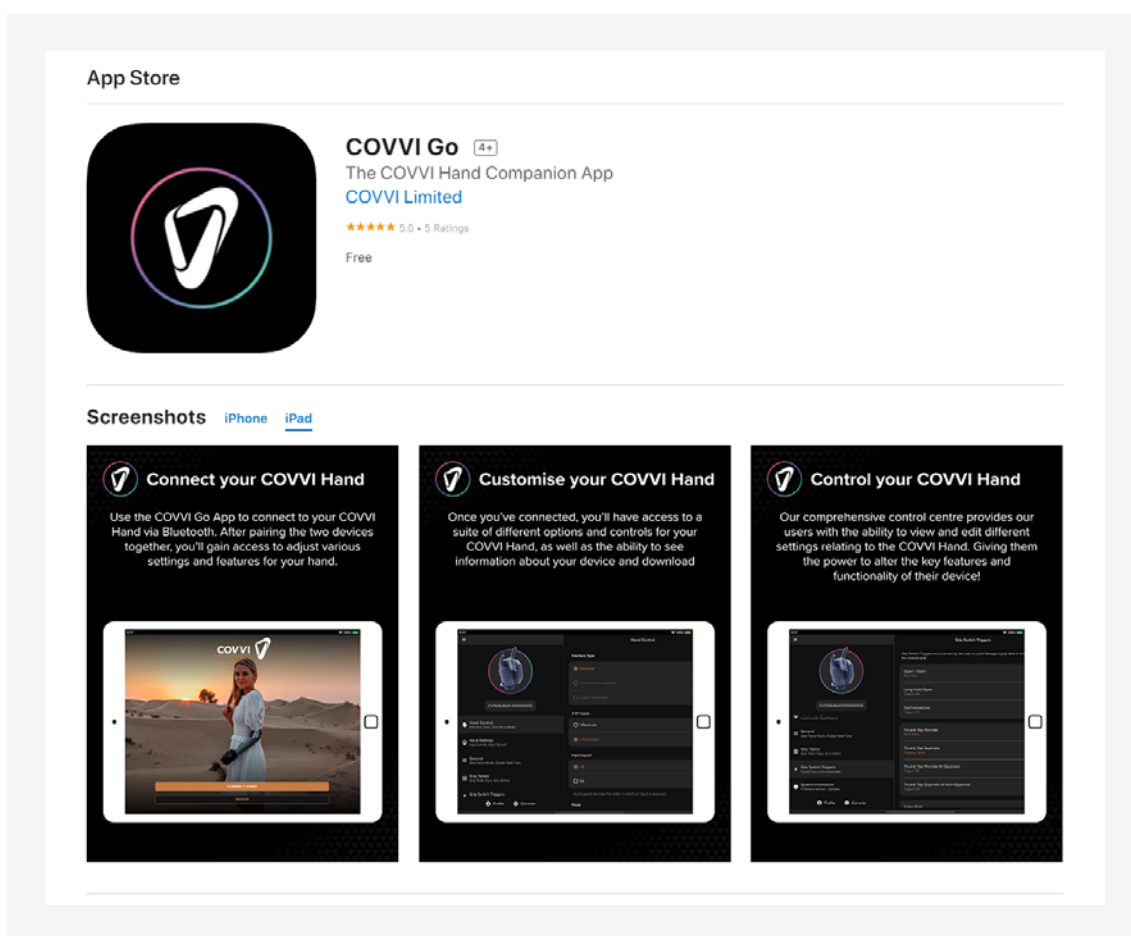
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11.2 Registration

To access all the features in the App, you first need to register an account with COVVI. On our website www.covvi.com, in the 'COVVI GO APP' dropdown section in the side menu, click on Register Your Interest. Fill out the registration form with all the information requested and click on Submit Request.

You will receive an email within 24 hours with an activation link and a temporary password. Click on the link to verify your email. This will then take you to the sign in page for our Web Portal. Use your email and temporary password to sign in. You will then be asked to verify your details and create a new password. After entering your new password and pressing 'Submit', your account will be activated, and you can then use your email address and new password to sign into the COVVI Go App on your phone or tablet.

The COVVI Web Portal operates on an invite-only basis. You need to add your patients for them to be able to create an account. Go to our Web Portal portal.covvi.com, on the left-hand side there is an option that says Users, which only appears if you have clinician or distributor access. Click on Users and a list of all the users you have added so far will appear.

Click on the '+' button near the top of the page and you will be taken to a screen where you can add a new user. Fill out and submit the form, then an email invitation with the activation link and temporary password will be sent to your patient. You can choose what access level to give to your patient, which determines what changes they can make. The App can be accessed without an account, but only to view settings, update the firmware and report bugs. No changes can be made to the setup without an account.

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11.3 Hand Selection

When you open the App, the initial screen shows you three options, Sign In, Connect Hand and Support. First click the 'Sign In' button to access your account. If you have forgotten your password, click on Forgot Password option, put in your email address, and click on Send Link. Follow the instructions in your email to reset your password.

If you do not currently have a COVVI Hand or account and would like to try out the App to have an idea of the functionality, you can use the Virtual Hand feature. This feature allows you to go through the App and make changes to a configuration as if you were connected to a hand. Click on 'Connect Hand' then on 'Try Virtual Hand'. Clicking the Support button at the top right will open the Support Console, which will give you additional options such as resetting the Bluetooth settings for the app, opening the video tutorials hub or submitting a support ticket.

Once you have logged in, click on Connect Hand. The Hand Selection box will appear and automatically begin searching for your hand. The COVVI Hand communicates with your device via Bluetooth. Make sure Bluetooth is enabled on both the COVVI Hand and your device. If Bluetooth isn't enabled on your device, the App will notify you.

When you turn the COVVI Hand on, Bluetooth is enabled for 60 seconds before turning off to save battery life. To reactivate Bluetooth, you will need to power the hand off and on again. If you experience connectivity issues you can reset the Bluetooth communication by erasing the data in the BLE module and resetting it. This will set the communication channel back to default and fix all damaged connections. This can be done in the App by selecting the 'Reset Bluetooth Settings' option inside of the Support Console. In addition to this, the settings need to be reset on the hand which can be done by pressing and holding the dorsal button on the back of the hand for 10 seconds. The E-Paper screen will display 'RESET?'. Keep pressing the dorsal button until you hear the start-up beep. This will have cleared the memory and reset the communication channels. If you still have issues connecting to the hand after trying this, please get in contact with COVVI Customer Services.

The hand's serial number will appear as shown in the image above. You can also locate the hand's serial number on the face of the EQD wrist.

When you connect to a hand it takes you to the Hand Overview screen, which shows you a list of the configuration groups that can be changed on the hand, for example, Hand Control and Input Settings. On tablet this section is shown on the left of the screen, with the right side showing your currently selected section.

If you or your patient experiences an issue with their hand, you can click on the 'Console' button at the bottom of the Hand Overview section and select 'Submit A Support Ticket' option. This will allow you to fill out the form, which will be sent to us along with the hand's serial number so we can assist them.
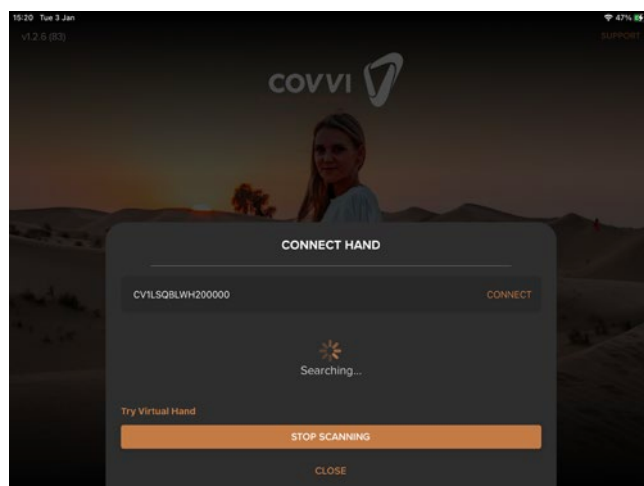
11.4   Hand Control

The first option in the Hand Overview section is Hand Control. This section allows you to select multiple parameters which define how the hand is operated. Below are the parameter which can be set inside of the Hand Control section and what the different options are.

Interface Type: There are three interface types.

Electrodes - These are sensors that detect the user's muscle contractions. A proportional voltage controls the opening and closing of the hand with variable speed and force.

Force Sensitive Resistors - These are resistive devices that vary their electrical signal with the applied force and are useful when you are short on space in the prosthetic socket.

Linear Transducer - These devices offer proportional control of myoelectric components for users with little or no myoelectric signals. These would normally be coupled to a harness and provide an electrical output in response to a linear extension of the device.

Electrodes are the most commonly used interface type.

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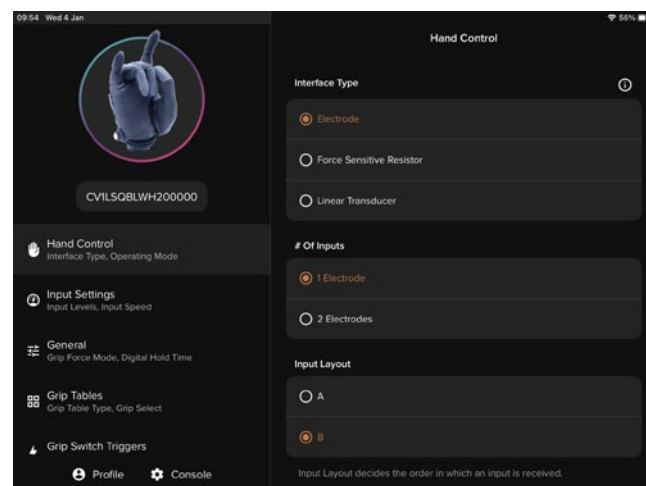
# of Inputs - The COVVI hand can be controlled by single or dual site strategies.

Input Layout - With dual site control, the default setup is Input A for the open signal and Input B for the close signal, but this can be inverted if the electrodes are wired the other way around.

Mode - The COVVI Hand can be controlled using three different operating modes. The modes available will depend on your selection for '# of Inputs'.

If your patient has single site control, a strategy is required to open and close the hand. There are two available methods.

Fast Open/Slow Close - Fast Open/Slow Close is a signal sent and whether that signal crosses the On threshold before or after the Fast Open/Slow Close Time (a time parameter customisable by the user) determines if it is interpreted as an open or close action.

A signal sent before the time parameter is considered a 'fast signal' and interpreted as an open action. A signal sent after the time parameter is considered a 'slow signal' and interpreted as a close action. Once the On threshold is exceeded, the direction is locked and the speed is proportional to the magnitude of the input signal, which works the same as with dual site control.

Single Site Alternating - Single Site Alternating is an initial signal sent which from powering on the hand is interpreted as a close action and the hand therefore starts to close. When this signal is released, the Direction Change Time (a timer customisable by the user) starts and whether the next signal crosses the On threshold before or after the timer determines whether it will be interpreted as an open or close action. If the second signal crosses the On threshold before the timer it will continue the direction of the hand and so is interpreted as a close signal. If the second signal crosses the On threshold after the timer it will change the direction of the hand and so is interpreted as an open signal.

The Direction Change Time only starts once the signal has been released. Therefore, to change grips the user must send a signal after the Direction Change Time to change the direction of the hand from closing to opening, maintain that signal until the hand is fully open and either keep it maintained to activate a Long Hold Open grip switch trigger, or release the signal and reapply another signal before the Direction Change Time, so it is interpreted as another open signal to activate the Open/Open grip switch trigger.

If your patient has dual site control, independent signals open and close the hand. There is one method available.

Dual Site Open/Close: - This is the most common operating mode used with the COVVI Hand. It has two input sites, the default setup is Input A for an open signal and Input B for a close signal. All grip switch triggers work in this mode and give the user the most flexibility.

11.5   Input Settings

We advise that you start by setting the Input Settings before programming the grip tables and grip switch triggers, to ensure your patient can first comfortably operate the hand without fatiguing themselves.

There are two available views for the current input signals; a line graph and input dials with the latter being the default. There are three adjustable thresholds for both Input A and Input B; the On, Max and Co-contraction thresholds. The On threshold shows the signal strength needed for the hand to move and the Max threshold shows the signal strength needed for the hand to move at full speed. The Co-contraction threshold will only appear in the Input Settings if you map Co-contraction in the Grip Switch Triggers section.
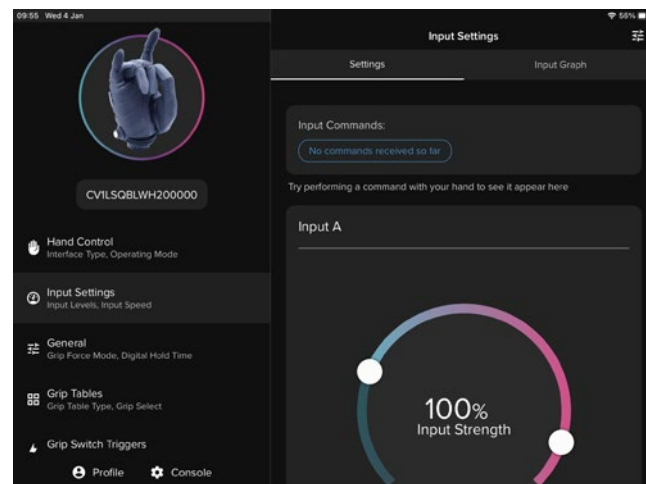
At the top right of the screen, you will see an icon which when clicked takes you to a new screen that allows you to set the Input Speed for both Input A and Input B, which can also be adjusted if you click either 'Set Input A Level' or 'Set Input B Level'. The input level adjusts the input range to the signals the user can produce, and the input thresholds are the levels within this range that the hand operates. Click on setup Input A level to automatically set your patient's levels for their input. Once you click on 'Start', your patient will need to give a signal for 5 seconds as the timer counts down. This needs to be the strongest signal they can comfortably produce. It will then notify you that the setting input levels is complete. Click on 'Set Input B Level' to do the same for their close signal.

In the Input Dials view of the Input Settings, you will see round dials which get filled as a signal on either of the inputs is provided. On each of the dials you will see either 2 or 3 sliders which represent the On, Co-contraction and Max thresholds, with Co-contraction being optional depending on if the co-contraction trigger is enabled. Commonly, prosthetic users have background noise also known as baseline interference, which are low level signals detected from the electrodes as they are highly sensitive sensors. Adjusting the On threshold to just above the background noise signals will avoid inadvertent hand movements. If your patient were to send a signal and only reach 50%, the Max threshold can be adjusted to 50% so that they can still move the hand at full speed. If they were to have cross talk where they send input A but show artefacts of input B, this would indicate that their muscle for input B is stronger and has more control, so you can move the On and Max thresholds for input B out of the realm of input A so they have two clean readings.

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Two typical threshold setups are High Control and Easy Speed, both allow the user to exceed the Max threshold without excessive strain. High Control has a large difference between the On and Max thresholds and offers great control over a wide speed range, but it does require the user to be able to achieve high magnitude signals without fatigue.

Easy Speed has a small difference between the On and Max thresholds and offers high speed without the need for high magnitude signals, but this setup can make it more challenging to get fine control of the hand at lower speeds. The closer the On and Max thresholds are, the less speed control the user will have of their hand.

To change the layout from dials to the line graph, click on the 'Input Graph' at the top of the Input Settings screen. This layout is useful as it shows historic data. When your patient fires a signal, you will see what percentage signal strength they can comfortably achieve with a line on the graph. The bars are also displayed either side of the graph. The left bar represents Input A and the right bar represents Input B. Adjust the sliders to map the speed of the hand to the signals they can comfortably produce.

At the top of the Input Dials view there is a box titled 'Input Commands' which is designed as a training tool for the user to see they can successfully do the Open/Open, Long Hold Open, Co-contraction as well as other Grip Switch Triggers. As a signal is given a new bubble with the triggers name is added to the box. The furthest left bubble is the most recent trigger given. This is another way for you to determine if you need to adjust your patient's thresholds for easier control.

11.6 General

If you select the 'General' section inside of the Hand Overview, you will be taken to a range of configuration options for the COVVI Hand. If you are unsure of what a particular feature does, click on the section and the sub-options will be shown, as well as a description of what the function does.

Beep - The beep is an audible alert to notify the user of any activity. It can be assigned to all functions, only power on and standby, only power on or it can be turned off.

Vibration - There is also the option to be alerted of activity with a vibration. Like with the beep, it can be assigned to all functions, only power on and standby, only power on or it can be turned off.
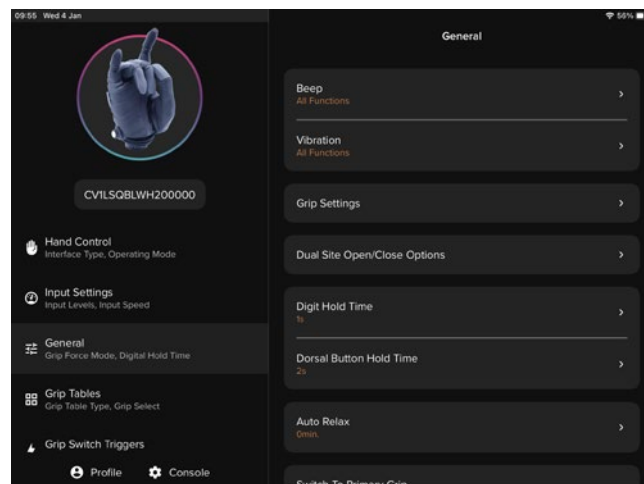
Grip Settings:

Maximum Finger Strength - The Maximum Grip Strength is the strength at which the fingers grasp an object. It can be set between 20% and 100%. Click on the plus (+) or minus (-) symbol to adjust the percentage.

Maximum Thumb Strength - The Maximum Thumb Strength allows the grip strength to be controlled by one of two modes: fixed or proportional. In fixed mode the hand uses the same grip strength regardless of the user's input signal. It moves the maximum grip force down. In proportional mode, the grip strength is proportional to the user's input signal. Their signal not only controls the force applied to the object but the speed at which the hand moves. It offsets the maximum grip force from their input signal.

Auto Grip - Auto Grip works in power grip, tripod grip, precision open and precision closed. If the fingers sense an object is starting to slip, they reapply a small continuous force or pulse to gently grasp the object. It monitors the grip every half a second.

Auto Relax - After a certain period of inactivity, the hand moves into a relaxed position. The time parameter is user adjustable. If Auto Relax is off, it will say 0 min. Clicking on the plus (+) symbol will turn it on and set it to 1 minute, click on the plus (+) symbol to increase the time again to 2 minutes or click on the minus (-) symbol to decrease the time and turn Auto Relax off.

Switch to Primary Grip - After a certain period of inactivity, the current grip changes back into the primary grip in table A. The time parameter is user adjustable. If Switch to Primary Grip is off, it will say OFF. Clicking on the plus (+) symbol will turn it on and set it to 15 seconds. The time can be increased in 15 second intervals up to a minute. Click on the minus (-) symbol to decrease the time and turn Switch to Primary Grip off.

Digit Hold Time - This is the time you have to apply pressure on the FSR for the grip switch trigger to be activated. Click on the plus (+) or (-) symbol to increase or decrease the time.

Dorsal Button Hold Time - This is the time you have to hold the dorsal button down for the grip switch trigger to be activated. Click on the plus (+) or (-) symbol to increase or decrease the time.

Mode Specific Parameters

For Dual Site Open/Close the following parameters can be established:

Open/Open Time - This is the time in which a second open signal must be sent after the hand is fully opened or after the first open signal for the Open/Open grip switch trigger to work.

Long Hold Open Time - This is the time an open signal must be maintained once the hand is fully opened for the Long Hold Open grip switch trigger to work.

Co-Contraction Time - This is the time in which both inputs must pass the Co-contraction thresholds after the On threshold has been reached.

Input A and B Speed - The maximum speed of the fingers and thumb can be reduced. It can be set between 50% and 100%. If Input A is the open signal and Input B the close signal and you reduce the percentage for both inputs, the speed of opening and closing the hand will be reduced. If you just reduce the percentage for Input A, only the speed at which you open the hand will be reduced. This is a feature designed to aid new users who are still adapting to using a prosthetic device.

For Fast Open/Slow Close the following parameters can be established:

Fast Open / Slow Close Time - A signal sent within this time is interpreted as an open signal and a signal sent after this time is interpreted as a close signal.

Long Hold Open Time - This is the time an open signal must be maintained once the hand is fully opened for the Long Hold Open grip switch trigger to work.

Input A or B Speed - The maximum speed of the fingers and thumb can be reduced. It can be set between 50% and 100%. As the one input is used for both opening and closing the hand, if you reduce the percentage the speed of opening and closing the hand will be reduced. You cannot reduce the speed for just opening or just closing the hand. This is a feature designed to aid new users who are still adapting to using a prosthetic device.

For Single Site Alternating the following parameters can be defined:

Direction Change Time - A signal sent after this time will change the direction of the hand and a signal sent within this time will keep the direction of the hand the same.

Long Hold Open Time - This is the time an open signal must be maintained once the hand is fully opened for the Long Hold Open grip switch trigger to work.

Input A or B Speed - The maximum speed of the fingers and thumb can be reduced. It can be set between 50% and 100%. As the one input is used for both opening and closing the hand, if you reduce the percentage the speed of opening and closing the hand will be reduced. You cannot reduce the speed for just opening or just closing the hand. This is a feature designed to aid new users who are still adapting to using a prosthetic device.

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11.7   Grip Tables

To enter the Grip Tables section, click on the 'Grip Tables' option on the Hand Overview screen. You can populate up to four tables with up to six grips in each. Tables B, C and D can be empty, but Table A must contain at least one grip, so the hand always has a grip to go into. This grip is called the primary grip.

For new users, its recommended to start with one or two grips in either one or two tables. For advanced users, all the tables can be populated with grips for daily activities, for example one table for grips used at home, another for grips used when at work.

If the hand is to be used with a COAPT system, refer to the 'Default Config Setup' section, which will explain how to set up the hand for a COAPT system.
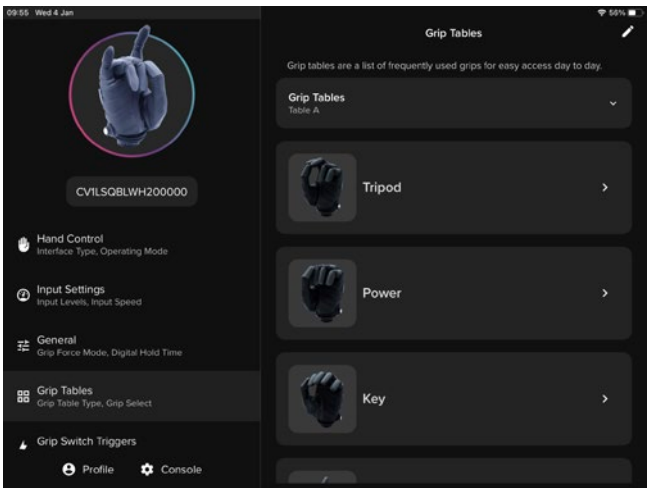
Default Grip Tables:

The default setup has two tables populated with the following grips. These are a mix of opposed and non-opposed grips. Tables C & D are empty and therefore disabled.

A	B	C	D
Tripod	Key	Empty	Empty
Power	Column	Empty	Empty
Key	Tripod	Empty	Empty
Column	Power	Empty	Empty
Empty	Empty	Empty	Empty
Empty	Empty	Empty	Empty

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Adding Grips:

Choose which table you would like to populate from the dropdown list at the top of the screen, whichever defaults to Table A. Below this you will see a list of the current grips in that table. If there is space in the grip table for more grips there will be a row with a '+' icon in a circle.

Click on the plus '+' row and a list of grips will appear divided into different groups. If you are unsure of what a particular grip does, select one to see a video showing the hand closing and opening with that grip. Choose the desired grip and click the back button at the top left. The grip will now appear in the next available position. Grips are added one-by-one.
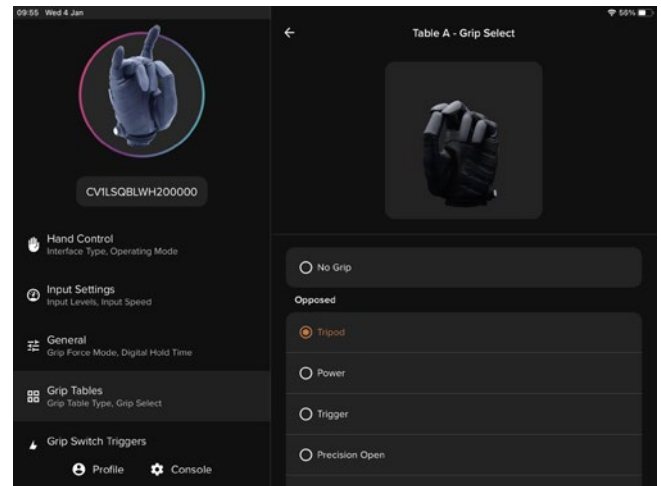
Removing Grips:

To remove grips from a table, click on the pencil symbol in the top right of the screen. Clicking this will show a red trash icon at the right of each of the grips. Clicking the trash icon next to a particular grip will remove it from the table.

Changing Grips:

To change a grip in a specific table, click on one of the grips inside of a grip table. A list of all the available grips will now show with the current grip in that position selected. Clicking on one of the grips will allow you to change that selected grip.

Press the back button to make the change. Selecting 'No Grip' at the top of this list will also remove the grip from the table.

11.8   User Defined Grips

In addition to the 14 standard grips available, your patient can request any custom grip they have in mind by contacting the COVVI Customer Service team. We can then incorporate it into our Grip Library so that it can then be downloaded from the cloud onto your patient's hand.

To install a User Defined Grip, the hand must have the firmware version 4.5.4 or higher. In the 'Add Grip Tables' screen, when the list of grips divided into different groups appears, scroll down to the last group which is called 'User Defined Grips'. You can store up to six User Defined Grips at once.

Click on one of the spaces. If it doesn't have a grip assigned you only need to click it once, if it does have a grip already assigned you will need to double click it. This will bring up a list of all the available User Defined Grips in our library. Choose the grip you would like to add to your configuration. If you have already assigned this grip, it will be faded in grey as you can only assign it once. All available grips are in white. If you are unsure of what a particular grip does, click on the grip to see a video showing the hand closing and opening in that grip. Click on the back button and the grip will now appear in the first list of grips under User Defined Grips. Click on the grip you would like to add into the table you are populating, click the back button again.
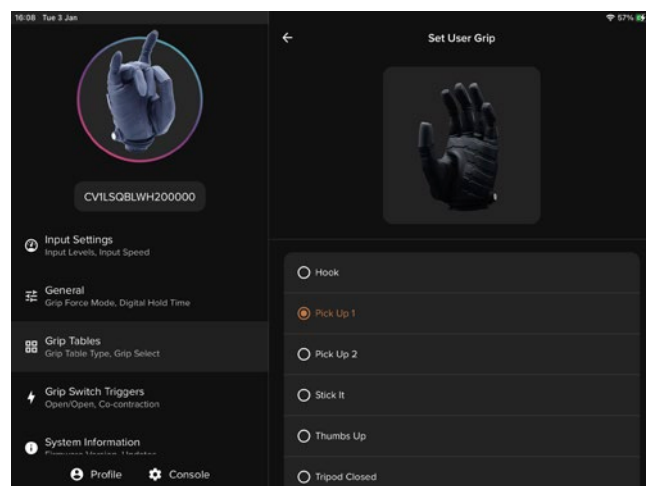
11.09   Grip Switch Triggers

Click 'Grip Switch Triggers' to set how your patient will switch between the grips and grip tables. All available triggers are shown in the list and all actions can be seen when you make a selection. The action assigned to a trigger can be seen in orange below its name.

Any trigger can be assigned to any action, you can only assign a grip switch trigger once, but you can assign the same action to multiple grip switch triggers. If you are unsure of what a particular trigger does, click on it and on the action selection screen you will see a description at the top of the screen.
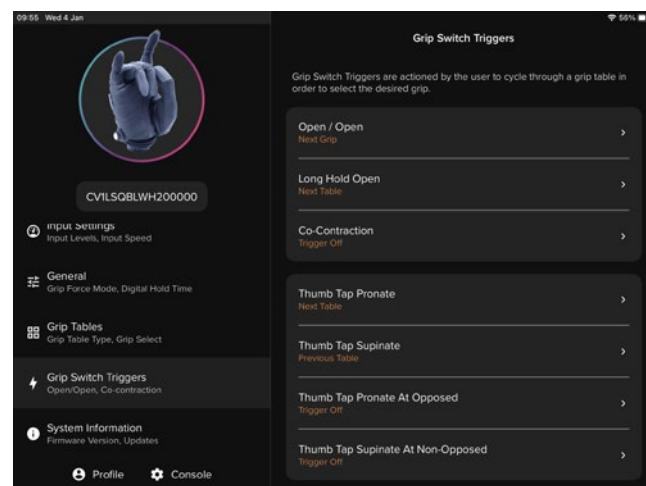
The available Grip Switch Triggers are:

Open/Open - An Open/Open signal is an open signal to fully open the hand followed by another open signal. The second open signal must be sent before the Open/Open time.

Long Hold Open - A Long Hold Open signal is an open signal maintained. The hand can be closed, partially closed or fully open. The signal must be maintained for the Long Hold Open time once the hand is fully open.

Co-Contraction - Co-contraction is when both inputs cross the Co-contraction thresholds within an amount of time from the On threshold being surpassed. The first input to cross the On threshold initiates the Co-contraction time (a timer customisable by the user) and if both inputs cross their Co-contraction thresholds before the Co-contraction time there will be a successful Co-contraction trigger.

In the Input Graph the Co-contraction thresholds must be higher than the On thresholds. Co-contraction only works when the hand is fully open. Co-contraction can be assigned to any action, however, we would recommend that it is mapped to switching between devices, for example, an elbow to a wrist.

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Thumb Tap Pronate - The thumb is tapped inwards and will move into an opposed position, unless assigned to switch to a non-opposed grip where it will remain in a non-opposed position. The hand must be fully open.

Thumb Tap Supinate - The thumb is tapped outwards and will move into a non-opposed position, unless assigned to switch to an opposed grip where it will remain in an opposed position. The hand must be fully open.

Thumb Tap Pronate at Opposed - The thumb is tapped inwards but will remain in an opposed position. If this trigger is assigned to switch to a non-opposed grip, the thumb will move to a non-opposed position. The hand must be fully open.

Thumb Tap Supinate at Non-Opposed - The thumb is tapped outwards but will remain in a non-opposed position. If this trigger is assigned to switch to an opposed grip, the thumb will move to an opposed position. The hand must be fully open.

Index Hold - Pressure is applied to the force sensitive resistor in the index finger for two seconds. The hand must be fully open.

Thumb Hold - Pressure is applied to the force sensitive resistor in the thumb for two seconds. The hand must be fully open.

Four Finger Hold - Pressure is applied to the force sensitive resistors in the four fingers for two seconds. The hand must be fully open.

Dorsal Button Hold - Hold the dorsal button next to the E-Paper screen for two seconds. The hand must be fully open.

The available actions are:

Trigger Off - No action is assigned.

Next Grip - The next grip in the table is selected.

**Previous Grip -** The previous grip in the table is selected.

Next Table - The first grip in the next table is selected.

Previous Table - The first grip in the previous table is selected.

Switch to Table A / B / C / D - The first grip in Table A, B, C or D is selected.

Map to Grip - This action allows you to assign the grip switch trigger to go into a specific grip. The grip does not need to be in the grip tables to be mapped.

Auto Grip - Auto Grip will be turned on and off.

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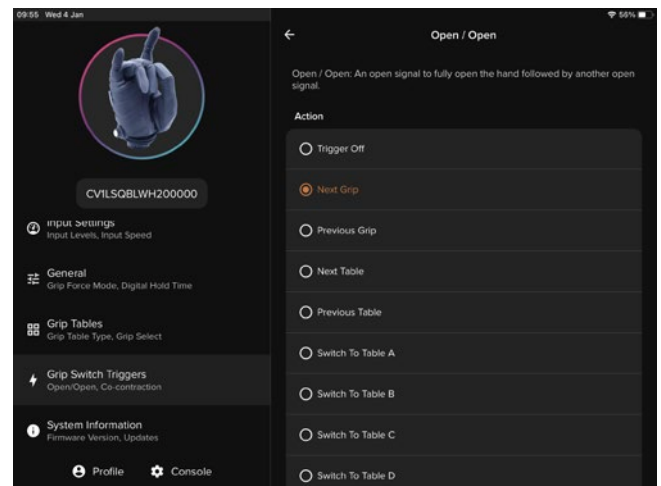
11.10 System Information

The final section in the Hand Overview is the 'System Information' section. You will be able to find key information on the hand here, as well as the login status on the app.

There are some additional sections inside of here which you will be able use. These are Config Library (formerly Config History), Default Config Setup, Backup and Restore Live Config and Software Update. Each of these features will be covered specifically in the following sections.
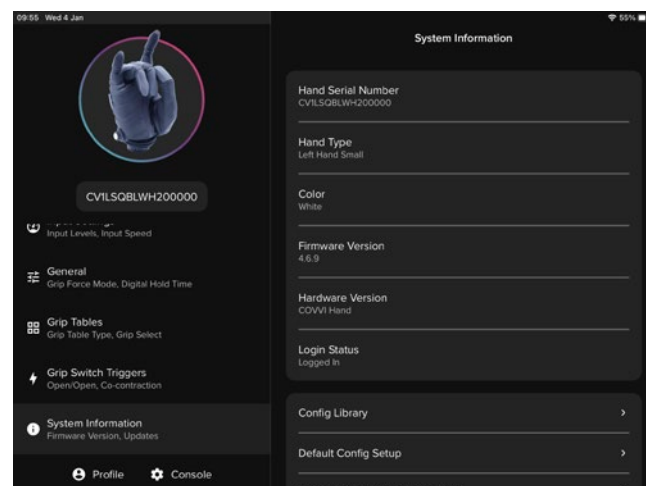

11.11 Config Library

The Config Library is a backup option which allows the user to save their configuration and revert to it later.

Click on 'Config Library' option in the System Information section. This will bring up a list of all the configurations saved to your hand, with the names and dates that they were last saved. If you want to add a new configuration, click on the (+) symbol in the top right of the screen. Provide a name for the new config and then click 'Save' to add it to the Config Library. You must be connected to the internet to save a new config.

If you want to view a configuration, then click the name of the config. You will be navigated to a screen which will show a breakdown of the entire configuration.

If you want to delete the configuration, click on trash icon at the top right of the screen. If you want to restore the configuration, click on 'Restore' at the bottom of the screen, which will send that configuration to the hand.

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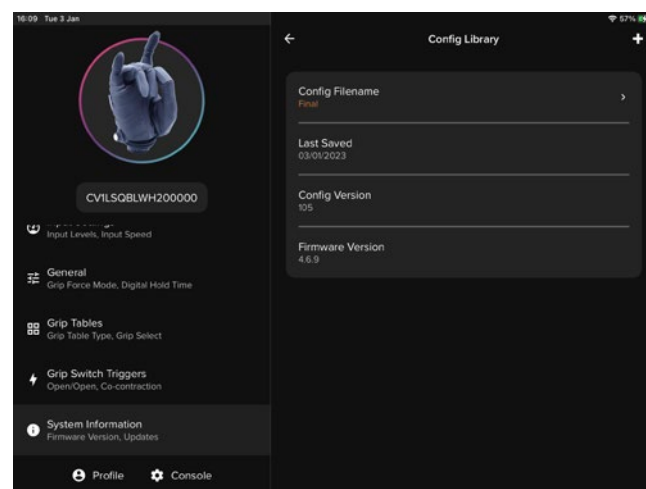
11.12 Default Config Setup

We have made it easier than ever to quickly setup the COVVI Hand. Inside of the 'Default Config Setup' section, which can be found inside of System Information, you will find four options. These are:

COVVI Setup - This takes you through the Setup Wizard. It would be useful to use this when you first setup a new hand as it takes you through all the configuration options and changes are made in real time.

COVVI Default - This allows you to reset a hand back to the default configuration, just as it came out of the box.

Thumb Switching - This is a configuration which makes use of two grip tables. In one of the grip tables you will have opposed grips and the other will have non-opposed grips. Switch between the tables by using the thumb rocker.

COAPT - This is a configuration setup which we recommend for COAPT systems.
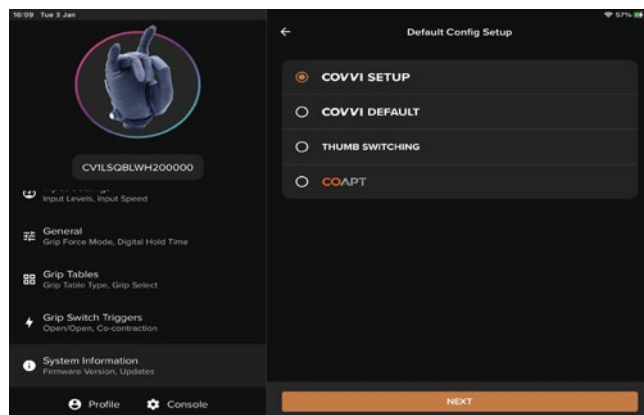
11.13 Backup and Restore Live Config

In case you ever want to copy a configuration from one hand to another, we have created 'Backup and Restore Live Config' section, which is found within the System Information screen. When you first go into here, you will see the 'Backup Data' option at the bottom of the screen. Clicking this will store the configuration for the hand locally onto your device.

If you reconnect with a new device and navigate back to here, you will instead see the option to 'Restore Config'. Clicking this will write the configuration from the original hand to the newly connected one.

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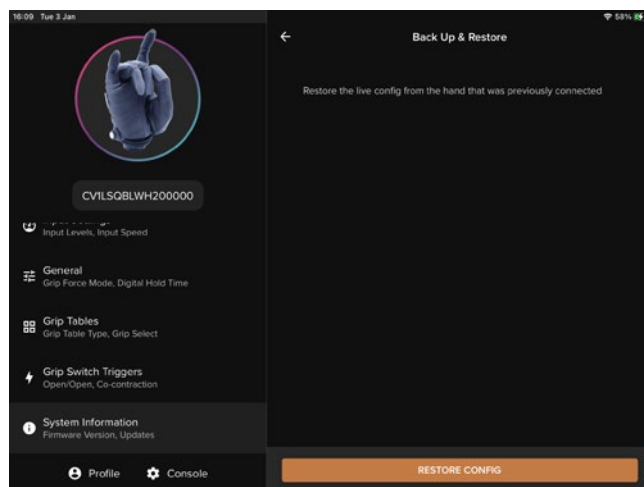
11.14   Software Update

To continuously improve the COVVI Hand, an integrated update feature runs on the device firmware. These updates include improvements, new features, bug fixes, etc. These updates do not require the user to send their hand into a COVVI repair centre to be updated, they can be downloaded to the hand remotely from the cloud.

Click the 'Check For Updates' option in the System Information screen to check if an update is available; if no update is available, you will be notified. If an update is available, you will be shown the option to select one or more updates. Please complete the Firmware update first, then carry out the Gateware update.

To perform the update, click on it and a select 'Download and Install'. The update first downloads from the app onto the hand, then the update will be installed to the hand. This process can take upto 30 minutes, so we recommend keeping the hand close to the device to ensure a strong Bluetooth connection is maintained and download speeds are optimal. The E-Paper screen will change to indicate an update is taking place. The hand will also need to remain connected to a power source until the update is complete. If it is disconnected from power, it will stop the update, which means it will need to start again. It cannot be connected to a charger during the update because this will turn the hand off. Once the update is complete the hand will reboot. If you also have a Gateware update available, navigate back to the Software Update section and select the 'Gateware' option, which follows the same process.

Note: You will not be able to update Gateware if there is an outstanding Firmware update at the same time.
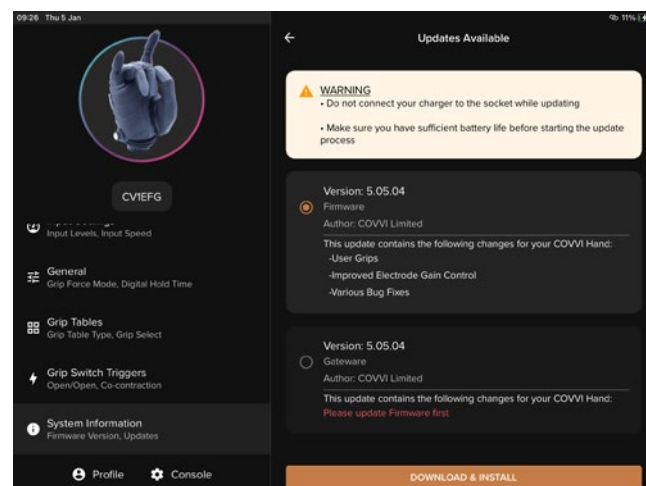
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