USER'S MANUAL

ZMK Programming Engine

KB360-Pro

Proudly designed and hand-assembled in the USA since 1992

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Kinesis® Advantage360 Professional Keyboard with the ZMK Programming Engine

Keyboard models covered by this manual include all KB360-Pro series keyboards (KB360Pro-xxx). Some features may require a firmware upgrade. Not all features supported on all models. This manual does not cover setup and features for the Advantage360 keyboard which features the SmartSet Programming Engine.

May 25, 2023 Edition

This manual covers features included up through the firmware version 2.0 PR #128, commit 8c14317 (April 7, 2023)

If you have an earlier version of firmware, not all features described in this manual may be supported. The latest versions of firmware can always be found here:

github.com/KinesisCorporation/Adv360-Pro-ZMK

360

FCC Radio Frequency Interference Statement

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

Warning

To assure continued FCC compliance, the user must use only shielded interfacing cables when connecting to computer or peripheral. Also, any unauthorized changes or modifications to this equipment would void the user's authority to operate.

INDUSTRY CANADA COMPLIANCE STATEMENT

This Class B digital apparatus meets all requirements of the Canadian Interface-causing Equipment Regulations.

Cet Appareil numerique de la classe B respecte toutes les exiginces du Reglement sur le material broilleur du Canada.

Table of Contents

360

1.0 Read Me First

1.1 Health and Safety Warning
Continuous use of any keyboard may cause aches, pains, or more serious cumulative trauma disorders such as tendinitis and carpal tunnel syndrome, or other repetitive strain disorders.
- Exercise good judgement in placing reasonable limits on your keyboarding time every day.
- Follow established guidelines for computer and workstation setup (see Appendix 13.3).
- Maintain a relaxed keying posture and use a light touch to press the keys.

Keyboard is not a medical treatment
This keyboard is not a substitute for appropriate medical treatment! If any information in this guide appears to contradict your health care professional's advice, please follow your health care professional's advice.

Establish realistic expectations
- Ensure that you take reasonable rest breaks from keyboarding during the course of the day.
- At the first sign of stress-related injury from keyboard use (aching, numbness, or tingling of the arms, wrists, or hands), consult your health care professional.

No warranty of injury prevention or cure
Kinesis Corporation bases its product designs on research, proven features, and user evaluations. However, because of the complex set of factors believed to contribute to computer-related injuries, the company can make no warranty that its products will prevent or cure any ailment. Your risk of injury may be affected by workstation design, posture, time without breaks, type of work, non-work activities and individual physiology.

If you currently have an injury to your hands or arms, or have had such an injury in the past, it is important that you have realistic expectations of your keyboard. You should not expect an immediate improvement in your physical condition simply because you are using a new keyboard. Your physical trauma has built up over months or years, and it may take weeks before you notice a difference. It is normal to feel some new fatigue or discomfort as you adapt to your Kinesis keyboard.

1.2 Preserving Your Warranty Rights
Kinesis does not require any product registration to obtain warranty benefits, but you will need your purchase receipt in the event you need a warranty repair.

1.3 Quick Start Guide
If you are eager to get started, please consult the included Quick Start Guide. The Quick Start Guide can also be downloaded from the Advantage360 Pro Resources Page. Consult this full manual for advanced features.

1.4 Read This User's Manual
Even if you don't normally read manuals or you are a long-time user of Kinesis Contoured keyboards, Kinesis strongly encourages you to review this entire manual. The Advantage360 Professional uses an open-source programming engine called ZMK and features a totally different way of customizing the keyboard from prioer contoured keyboards from Kinesis.

If you unknowingly execute a programming shortcut or key combination, you could inadvertently alter the performance of your keyboard, which could have unintended consequences for your work and might necessitate a hard reset of the keyboard.

1.5 Power Users Only
Like it says in the name, this Advantage360 Professional keyboard was designed specifically for professional users. The programming engine is not nearly as user-friendly as Kinesis SmartSet Engine found on the "base" model Advantage360. If you want to customize your layout but are used to using Kinesis onboard programming THIS MAY NOT BE THE RIGHT KEYBOARD FOR YOU.

1.6 Sleep Mode
To maximize battery life and speed up charging, the keyboard is equipped with a 30 second sleep timer. Each key module will go to sleep after 30 seconds with no activity. The next keypress will wake the key module nearly instantaneously so as not to disrupt your work.

360

2.0 Overview

2.1 Geometry and Key Groupings
If you are new to a Kinesis Contoured keyboard, the first thing you will notice about the Advantage360™ keyboard is its sculpted shape, designed to conform to the natural postures and shapes of your hands— which reduces the physical demands of keyboarding. Many have imitated this striking design but there is no substitute for its unique three-dimensional shape. While the Advantage360 looks very different from other keyboards, you'll find that making the transition is actually quite easy because of its intuitive form factor, thoughtful key layout, and its unparalleled electronic configurability. The Advantage360 keyboard features distinctive key groupings not found on traditional or "natural style" keyboards.

2.2 Keyboard Diagram

Keypad Layer Key

Mod Layer Key

Hotkeys

LED Indicator Lights

Thumb Clusters

Fn Layer Keys

On/Off Switches

Off<>On   On<>Off

Charging Ports
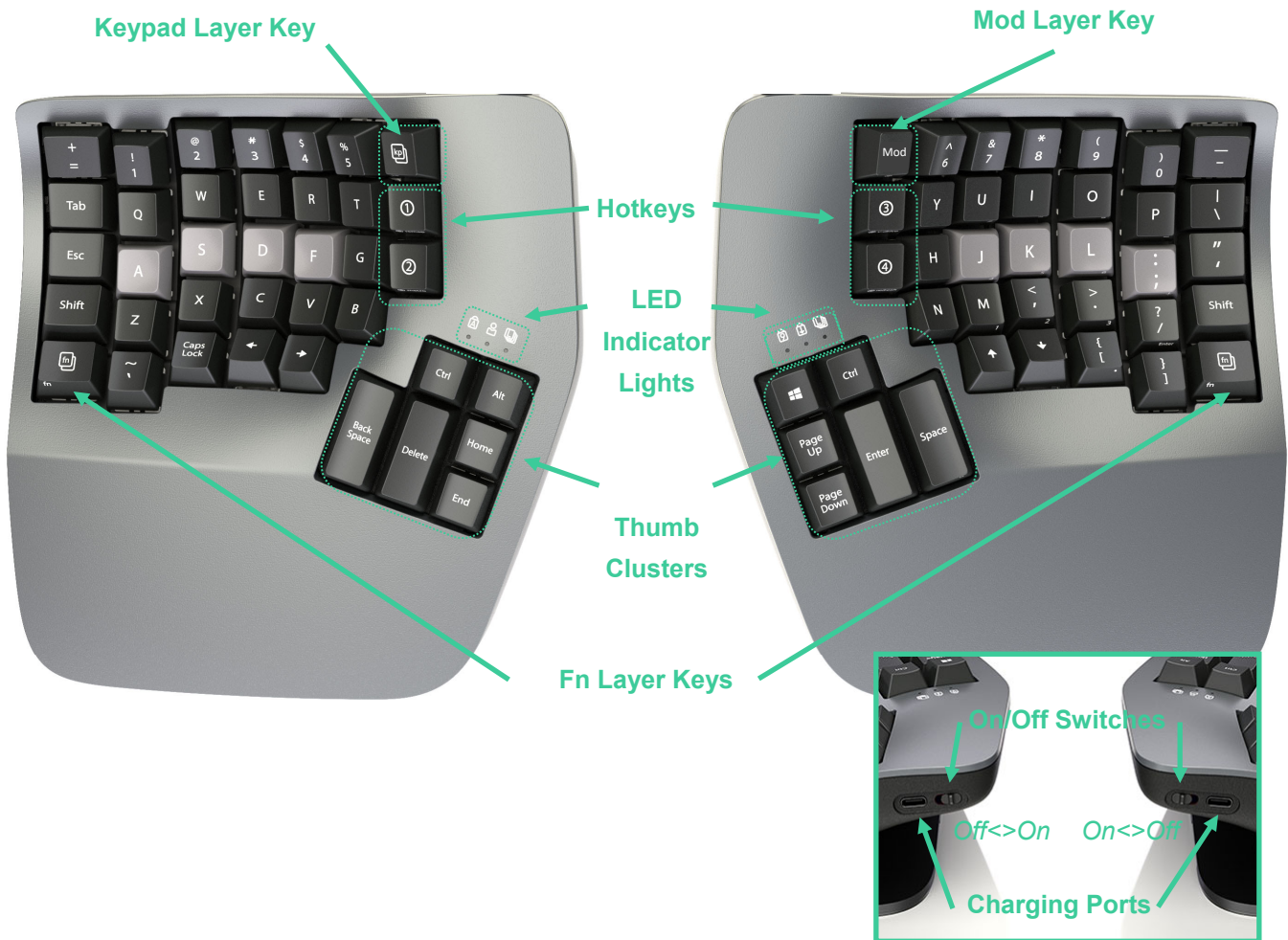
2.3 Ergonomic Design and Features
The design of the Advantage360 keyboard traces its roots to the very first Contoured^TM keyboard introduced by Kinesis in 1992. The original objective was to develop a design informed by generally accepted ergonomic design principles to maximize comfort and productivity, and minimize the major health risk-factors associated with typing. Every aspect of the form factor was thoroughly researched and tested.

Learn More: kinesis.com/solutions/keyboard-risk-factors/

Fully split design
Separating the keyboard into two independent modules allows you to position the keyboard so you can type with straight wrists which reduces abduction and ulnar deviation which are harmful postures that can lead to repetitive strain injuries such as carpal tunnel syndrome and tendonitis. Straight wrists can be achieved by a

mixture of sliding the modules apart to approximately shoulder-width and/or rotating the modules outward. Experiment with different positions to find what is most comfortable for you body type. We recommend starting with the modules close together and gradually moving them apart. Thanks to wireless linking you can position the modules wherever you want without having to clutter your desk with a link cable.

Bridge Connector
If you aren't ready to go to full separation, attach the included Bridge Connector to recreate the classic separation of the one-piece contoured keyboard. Note: The Bridge Connector is NOT designed to bear the weight of the keyboard, it's a simple spacer for desktop use. So do not pick the keyboard up by one module with the Bridge Connector attached.

Integrated palm supports
Unlike most keyboards, the Advantage360 features integrated palm supports and an optimal cushioned palm pads, now magnetic and washable (sold separately). Together these enhance comfort and reduce stressful extension and pressure on the wrist. The palm supports provide a place to rest the hands while they are not actively keying, though many users prefer to rest while typing to take weight off the neck and shoulders. You should not expect to be able to reach all the keys without rocking your hands forward at times.

Separate thumb clusters
The left and right thumb clusters feature commonly used keys such as Enter, Space, Backspace, and Delete. Modifier keys such as Control, Alt, Windows/Command. By moving these commonly used keys to the thumbs, the Advantage360 redistributes the workload from your relatively weaker and overused little fingers, to your stronger thumbs.

Vertical (orthogonal) key layout
Keys are arranged in vertical columns, unlike conventional "staggered" keyboards, to reflect the optimal range of motion of your fingers. This shortens reaches and reduces strain, and can also make it easier to learn touch typing for new typists.

Concave keywells
The keywells are concave to reduce hand and finger extension. Hands rest in a natural, relaxed position, with the fingers curled down to the keys. Keycap heights are varied to match the different lengths of your fingers. Conventional flat keyboards cause longer fingers to arch up over the keys and results in extension of the muscles and tendons in your hands, which causes rapid fatigue.

Low-force mechanical key switches
The keyboard features full-travel mechanical switches known for their reliability and durability. The standard brown stem switches features "tactile feedback" which is a slightly elevated force around the midpoint of the stroke of the key which lets you know the switch is about to be activated. A tactile response is preferred by many ergonomists, because it cues your fingers that activation is about to occur and is thought to reduce the incidence of "bottoming out" the switch with a hard impact.

If you are coming from a laptop keyboard or a membrane-style keyboard, the additional depth of travel (and noise) may take some getting used to, but the benefits are huge.

Adjustable Tenting
The contour design of the Advantage360 naturally positions your hands so that your thumbs are approximately twenty degrees higher than pinky fingers when the keyboard is in its lowest position. This "tented" design helps to minimize stresses associated with pronation and static muscle tension, while enabling maximum keying productivity. Using the buttons on the underside of the keyboard you can quickly and easily choose between three available heights to find the settings that feels most natural for your body. We recommend starting on the lowest setting and working your way up until you find the sweet spot.

2.4 LED Indicator Lights

There are 3 RGB light emitting diodes (LEDs) above each thumb cluster. The Indicator LEDs are used to indicate the status of the keyboard and provide programming feedback (See Section 5). *Note: Not all functions are supported over Bluetooth on all Operating Systems.*

Left Key Module

Left = Caps Lock (On/Off)

Middle = Profile/Channel (1-5)

Right = Layer (Base, Kp, Fn, Mod)

Right Key Module

Left = Num Lock (On/Off)

Middle = Scroll Lock (On/Off)

Right = Layer (Base, Kp, Fn, Mod)

Default Layers: Base: Off, Kp: White, Fn: Blue, Mod: Green
Default Profiles: 1: White, 2: Blue, 3: Red. 4: Green. 5: Off

2.5 Open-Source Programmability via ZMK

Kinesis contoured keyboards have long featured a fully-programmable architecture that allowed users to create macros and custom layouts and the Advantage360 Professional is no exception. Based on popular demand from power users, we built the Pro model using the revolutionary open-source ZMK engine which was specifically designed to support Bluetooth and wireless linking of split keyboard. The beauty of open-source is that the electronics grow and adapt over time based on user contributions. We hope that <u>YOU</u> will become a member of the ZMK community and help take this technology to new and exciting places

What's different about ZMK

Unlike prior versions of the Advantage, ZMK <u>does not</u> support onboard recording of macros or remapping. Those actions take place through the 3rd party site <u>Github.com</u> where users can write macros, customize layouts, add new layers and much more. Once you've built your custom layout you simply download the firmware files for each module (left and right) and "install" them on the keyboard's flash memory. ZMK does support a variety of "other" onboard programming commands which are accessed using the dedicated "Mod" key found on the right module.

5 Profiles but only 1 Layout

ZMK supports multi-channel Bluetooth which means you can pair your keyboard with up to 5 Bluetooth enabled devices and instantly switch between them using the Mod-shortcut (Mod + 1-5). Note: Each of the 5 Profiles features the same underlying key Layout configuration. If you need additional key actions you will need to add them by creating additional Layers. The default Layout has 3 layers (4 if you count the Mod Layer) but you can add dozens more to suit your workflow.

2.6 Rechargeable Lithium Ion Batteries and On/Off Switches

Each module contains a rechargeable lithium ion battery and an on/off switch. Slide each switch AWAY from the USB port to turn ON the battery, and slide the switch TOWARDS the USB port to turn OFF the battery. When using the keyboard wirelessly you must have each module switched ON and a sufficiently charged battery. Batteries are designed to last for several months with the LED backlighting DISABLED. If you use backlighting you will need to charge the battery much more often. *Note: The left module is "primary" module and as such it consumes more power than the right module, so it is normal to charge that side more often.*

2.7 Reset Button

Each key module features a physical reset button which can be accessed via a paperclip pressed into the thumb cluster at the intersection of the 3 keys shown at right. If you have difficulty finding the spot, remove the keycaps or use a flashlight. Reset button functionality is described later in this Manual.

360

3.0 Installation and Setup

3.1 In the Box
- Quick Start Guide
- Two Charging Cables (USB-C to USB-A)
- Additional keycaps for customization and keycap removal tool
- Bridge Connector

3.2 Compatibility
The Advantage360 Pro keyboard is a multimedia USB keyboard that uses generic drivers provided by the operating system, so no special drivers or software are required. To connect the keyboard wirelessly you will need a Bluetooth enabled PC or a Bluetooth dongle for your PC (sold separately).

3.3 Choice of USB or Bluetooth
The 360 Pro is optimized for wireless *Bluetooth Low Energy ("BLE")* but it can be used via USB. However, the left and right modules will always communicate with each other wirelessly, wired-linking is not supported.

Note: Always power-on the left module first, then the right module to allow the modules to sync with each other. IF the right side is flashing red, power-cycle both modules to re-establish the connection between them.

3.4 Recharging the Battery
The keyboard ships from the factory with only a partially charged battery. We recommend plugging both modules in to your PC to charge them fully when you first receive the keyboard (See Section 5.6).

3.5 USB Mode
To use the keyboard over USB, simply connect the left module to a full-size USB 2.0 port using one of the included charging cables. To power the right module you can either 1) toggle the On/Off switch to the "On" position and use battery power, or 2) connect the right module to a USB 2.0 port and use "shore" power. *Note that if you choose <u>not</u> to connect the right module you will need to charge it eventually.*

3.6 Bluetooth Pairing
The Pro can be paired with up to 5 Bluetooth enabled devices. Each Profile is color coded for easy reference (See Section 5.5). The keyboard defaults to Profile 1 ("White"). The Profile LED will flash rapidly to signal it is ready to be paired.
1. Toggle the left switch to the "On" position, then the right (away from the USB port)
2. Navigate to your PC's Bluetooth menu
3. Select the "Adv360 Pro" from the menu and follow the prompts
4. The keyboard's Profile LED will go "solid" when the keyboard pairs successfully

Pairing with additional devices
1. Hold the Mod key and tap 2-5 (2-Blue, 3-Red, 4-Green, 5-Off) to toggle to a different Profile
2. The Profile LED will change color and flash rapidly to indicate the keyboard is now discoverable
3. Navigate to the new PC's Bluetooth menu and select "Adv360 Pro" to pair this channel (Repeat)

4.0 Getting Started

4.1 Positioning and Work Area Setup
Thanks to its separate key modules, unique thumb clusters, and built in tenting, the Advantage360 forces you to adopt an optimal typing position when you place your fingers over the home row. The Advantage360 uses the conventional home row keys (ASDF / JKL;). The home row keys feature special, cupped keycaps designed let you quickly find the home row without taking your eyes off of the screen. Despite the unique architecture of the Advantage360, the finger you use to press each alphanumeric key is the same finger you would use on a traditional keyboard.

Position your fingers on the color-contrasted home row and relax your right thumb over the Space Key and your left thumb over Backspace. Raise your palms slightly above the palm rests while typing. This position provides the necessary mobility for your hands so that you can comfortably reach all the keys. *Note: Some users may need to move their arms slightly while typing to reach some distant keys.*

Workstation configuration
Since the Advantage360 keyboard is taller than a traditional keyboard and features integrated palm supports, it may be necessary to adjust your workstation to achieve a proper typing posture with the Advantage360. Kinesis recommends the use of an adjustable keyboard tray for optimal placement.

Learn More: kinesis.com/solutions/ergonomic-resources/

4.2 Adaptation Guidelines
Many experienced typists <u>overestimate</u> the amount of time it will take them to adapt to the key layout. By following these guidelines you can make adaption fast and easy, regardless of your age or experience.

Adapting your "kinesthetic sense"
If you are already a touch typist, adapting to the Kinesis Contoured keyboard does not require "re-learning" to type in the traditional sense. You just need to adapt your existing muscle memory or kinesthetic sense.

Typing with long fingernails
Typists with long fingernails (i.e., greater than 1/4") may have difficulty with the curvature of the keywells.

Typical adaptation period
You will need a little time to adjust to the new shape of the Advantage360 keyboard. Laboratory studies and real-world testing show that most new users are productive (i.e., 80% of full speed) within the first few hours of starting to use an Advantage360 keyboard. Full speed is typically achieved gradually within 3-5 days but can take up to 2-4 weeks with some users for a few keys. We recommend not switching back to a traditional keyboard during this initial adaptation period as that can slow your adaptation.

Initial awkwardness, fatigue, and even discomfort is possible
Some users report awkwardness when first using a Contoured keyboard. Mild fatigue and discomfort may occur while you adjust to new typing and resting postures. If you experience severe pain, or symptoms persist for more than a few days, stop using the keyboard and see Section 4.3.

After Adaptation
Once you have adapted to the Advantage360, you should have no problem switching back to a traditional keyboard, though you may feel slow. Many users report an increase in typing speed because of the efficiencies inherent in the contoured design and the fact that it encourages you to use proper typing form.

If You Are Injured
The Advantage360 keyboard is designed to reduce the physical stress that <u>all</u> keyboard users experience– whether or not they are injured. Ergonomic keyboards are not medical treatments, and no keyboard can be

guaranteed to cure injuries or prevent the occurrence of injuries. Always consult your health care professional if you notice discomfort or other physical problems when you use your computer.

Have you been diagnosed with RSI or CTD?
Have you ever been diagnosed with tendinitis, carpal tunnel syndromes, or some other form of repetitive strain injury ("RSI"), or cumulative trauma disorder ("CTD")? If so, you should use special care when using a computer, regardless of your keyboard. Even if you simply experience modest discomfort when using a traditional keyboard you should use reasonable care when typing. To achieve the maximum ergonomic benefits when using the Advantage360 keyboard, it is important that you arrange your workstation in accordance with generally accepted ergonomic standards and take frequent "micro" breaks. For individuals with existing RSI conditions it may be advisable work with your health care provider to develop an adaptation schedule.

Establish realistic expectations
If you currently have an injury to your hands or arms, or have had such an injury in the past, it is important that you have realistic expectations. You should not expect an immediate improvement in your physical condition simply by switching to the Advantage360, or any ergonomic keyboard for that matter. Your physical trauma has built up over months or years, and it may take a number of weeks before you notice a difference. At first, you may feel some new fatigue or discomfort as you adapt to the Advantage360.

A keyboard is not a medical treatment!
The Advantage360 is not a medical treatment nor a substitute for appropriate medical treatment. If any information in this Manual contradicts the advice you have received from a health care professional, please follow your health care professional's instructions.

When to begin using your new keyboard
Consider beginning to use your Advantage360 keyboard after you have a taken a break from traditional keyboarding– perhaps after a weekend or a vacation, or at the very least first thing in the morning. This gives your body a chance to rest and make a fresh start. Trying to learn a new keyboard layout can be frustrating, and if you are working long hours or under a deadline that can make matters worse. Do not overtax yourself early on, and if you have not been using a keyboard regularly, build up slowly. Even if you are symptom free, you are still susceptible to injury. Do not dramatically increase your keyboard usage without first consulting your health care professional.

If your thumbs are sensitive
The Advantage360 keyboard is designed for increased thumb usage compared to a traditional keyboard which places more strain on the little fingers. Some new Kinesis contoured keyboard users initially experience fatigue or discomfort as their thumbs adapt to the increased workload. If you have a preexisting thumb injury, be especially careful to move your hands and arms when reaching for thumb keys and consider customizing your layout to reduce thumb workload.

Guidelines for using your thumbs
Avoid stretching your thumbs to reach the furthest keys in the thumb clusters. Instead move your hands and arms slightly, being careful to stay relaxed, and keep your wrists straight. If your thumbs are especially sensitive, consider using your index fingers instead of your thumbs to activate these keys. You may want to speak with your health care professional about these options. If pain persists for more than several days, stop using the Advantage360 keyboard and contact your health care professional for advice.

360

5.0 Basic Keyboard Use

5.1 Base, Multi-Layer Layout
The default layout is a great place to start to learn the Advantage360. The keyboard comes pre-configured for QWERTY typing on a Windows PC but the layout can be reconfigured using the web-based GUI and by rearranging any number of keycaps.

The Advantage360 Pro is a multi-layer keyboard which means that each physical key on the keyboard can perform multiple actions. The default layout features 3 easily accessible layers: The primary "Base Layer", and two secondary layers ("Fn" and "Keypad") which offer auxiliary key actions. The user can use the 3 dedicated layer keys in the default layout to move between the layers as needed. Most keys perform the same action in all 3 layers by default, but keys that have unique actions in the auxiliary layers have additional legends on the front of the keycap. Navigating layers can be intimidating at first but with practice it can actually boost your productivity and improve your comfort by keeping your fingers on the home row.

Note: Power users can add dozens more layers using the GUI.

Each Layer is color coded and indicated by the right most LED on each module (See Section 2.4)
* Base: Off
* Kp: White
* Fn: Blue
* Mod: Green

Function Keys (F1 - F12) reside in the new Fn Layer
Long time users of our contoured keyboard will note that we have eliminated the 18 half-size function keys resulting in a more compact layout. The Function Key actions now reside in the new "Fn Layer" as secondary actions for the traditional number row (offset by one). The Fn Layer can be accessed by pressing either of the two new "pinky" keys labeled with "fn". By default these two Fn Layer Keys momentarily shift the keyboard to the Fn Layer. Example: To output F1, press and hold either of the Fn Layer Keys and then tap the "=" key. When you release the Fn Layer Key you return to the Base Layer and the primary key actions.

By default the Fn layer features 12 unique key actions (F1-F12) which are legended on the front left edge of the keycaps but any custom key actions can be written to this layer.

Numeric 10 Key resides in the Keypad Layer
The new full-size Keypad Layer Key (left module, labeled with "kp") toggles the keyboard into the Keypad Layer where the standard numeric 10-key actions are found on the right module. Unlike the Fn Layer Keys, the Keypad toggles layers. Example: To output "Num Lock", tap the Keypad Layer key once to move in the Keypad Layer, and then tap the "7" key. Then tap the Keypad Layer Key again to return to the Base Layer.

By default the Keypad layer features 18 unique key actions on the right module (traditional 10 key) which are legended on the front right edge of the keycaps but any custom key actions can be written to this layer.

5.2 Four new Hotkeys
The Advantage360 features 4 keys in the middle of the keyboard labeled 1-4 inside of a circle. By default these keys output 1-4 for factory testing, but these four keys can be programmed to perform any single key action, or macro, or disabled altogether. And a different action can be assigned in each layer. Use them in whatever way you see fit, or simply ignore them.

5.3 Disable Indicator LEDs
If you find the indicator LEDs annoying, not useful, or want to maximize battery life you can disable all indicator LEDs with the shortcut Mod + Space. See Section 2.4 for LED assignments.

360

5.4 Adjust backlighting
The Pro features 5 levels of brightness and Off. Using the backlight will significantly affect battery life so we recommend disabling the backlight except when needed. To adjust the backlight up or down through the 6 levels, hold the Mod key and tap either set of arrow keys (Up to increase and Downto decrease). You can also quickly toggle backlighting on/off using the shortcut Mod + Enter.

On Version 2.0+, you can increase the brightness by editing the left and right "defconfig" files on GitHub to set a brightness value up to "100" and then flashing the firmware.
* GitHub File Location: Adv360-Pro-ZMK/config/boards/arm/adv360/
* Edit Line: CONFIG_ZMK_BACKLIGHT_BRT_SCALE=25

5.5 Toggling between the 5 Profiles
The Pro can be paired with up to 5 different Bluetooth enabled devices (See Section 3). Use the shortcut Mod + 1-5 to toggle between the 5 Profiles to pair from scratch or reconnect with a previously paired device.
* Profile 1: White
* Profile 2: Blue
* Profile 3: Red
* Profile 4: Green
* Profile 5: Off (Use this profile for maximum battery life)

5.6 Battery Level
For a real time update on *approximate* battery level in each module, hold the Mod key and then hold Hotkey 4. The indicator LEDs will temporarily display the charge level for each key module. Note: The left module will drain the battery faster because that is the primary module and uses more CPU power. If you are not getting your desired battery life, dim the backlighting (or turn it off all together). You can also use Profile 5 which does not have a static Profile LED and/or disable indicator lighting as well.
* Green: More than 80%
* Yellow: 51-79%
* Orange: 21-50%
* Red: Less than 20% (Charge soon)

5.7 Bluetooth Clear
If you wish to re-pair one of the 5 Bluetooth Profiles with a new device (or are having trouble connecting to the current device), use the Bluetooth Clear shortcut (Mod + Right Windows) to erase the connection with PC for the current Profile. If you are simply trying to re-pair with the same device we recommend disconnecting/ removing the "Adv360 Pro" from the target PC and performing the Bluetooth Clear command for a clean slate.

5.8 Indicator LED Feedback
* Profile LED Flashing Rapidly: The selected Channel (1-5) is ready to be paired with a Bluetooth device.
* *Profile LED Flashing Slowly*: The selected Channel (1-5) is currently paired BUT the Bluetooth device is not in range. If that device is on and in range, "try clearing" the pairing connection and starting again.
* *Right Side LEDs are flashing Red*: The right module has lost connection with the left side. Try power-cycling both modules, left than right to restore connection.

5.9 Bootloader Mode
The bootloader is used to gain access to each key module's flash memory for installing new firmware or performing a Settings Reset. Use the key command Mod + Hotkey 1 for the Left Module, or Mod + Hotkey 3 for the Right Module. You can also double-click the Reset Button twice (See Section 2.7). Tap the button once to exit bootloader mode or power-cycle the module.

Important Notes: The key module must be connected to your PC to open the bootloader, the removable drive cannot be mounted wirelessly. The keyboard will be disabled when in bootloader mode.
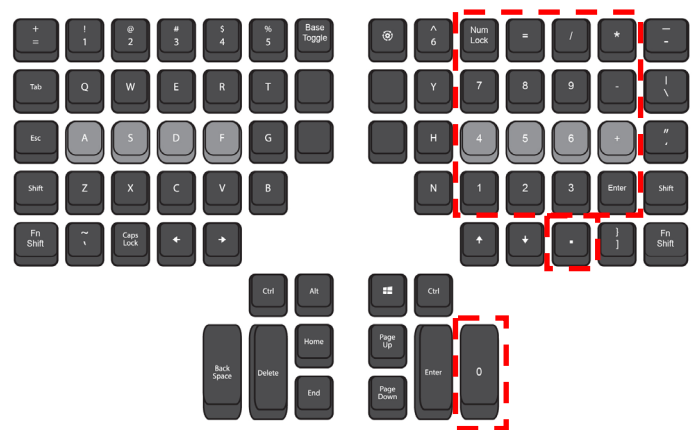
360

5.10 Default Layout Map

### Base Layer

Function Layer ("Fn")

### Keypad Layer ("Kp")

6.0 Customizing your Keyboard

Custom programming your Advantage360 Pro keyboard happens on Github.com, a 3rd party site where open-source collaborators share and host projects like ZMK.

6.1 Setting up your GitHub Account
1.   Visit Github.com/signup and follow the prompts to create and verify your account
2.   Once your account has been set up, log-in to Github and visit the main 360 Pro code "Repository" at github.com/KinesisCorporation/Adv360-Pro-ZMK
3.   Click the "Fork" Button in the upper corner to create your own personal Advantage360 "repo"
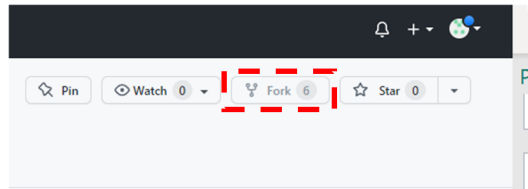
4.   Click the Actions Tab and the click the green button to enable "Workflows"
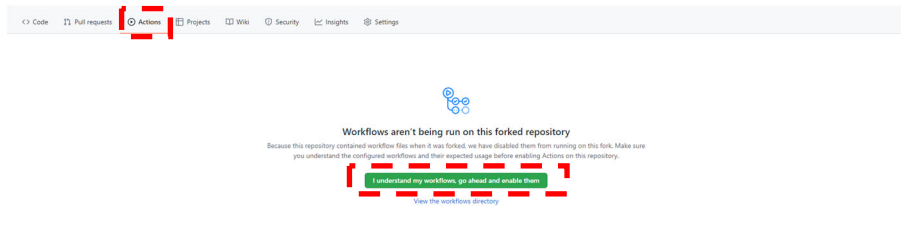

Note: To obtain the benefits of new features and bug fixes you will need to sync your fork to the main Kinesis repo periodically when prompted by GitHub

6.2 Using the Keymap Editor GUI
The graphical interface for custom programming the Advantage360 is web-based so its compatible with all operating systems and most browsers. Visit the URL below and log-in with your GitHub credentials. If you have multiple Repositories in your GitHub account, select the "Adv360-Pro-ZMK" repo and select the desired ZMK branch. A graphical representation of the keyboard will appear on screen. Each "tile" represents one of the keys and displays the current action.

Advantage Pro Keymap Editor GUI: https://kinesiscorporation.github.io/Adv360-Pro-GUI/

*   Navigate between the 4 default layers using the circular buttons at left (Click "+" to add a new layer).
*   To "remap" a key, first click the upper left corner of the desired tile to designate the type of "behavior" (*Note: "&kp" represents a standard keypress but there are many other options for power users to choose from, see Section 6.4)*. Then click the center of that tile to choose the desired key action.
*   Simple text-string macros can be written by clicking the "Edit Macros" button. You can edit one of the demo macros or create your own. Once your macro has been created, add it to the desired key above using the "&macro" behavior.
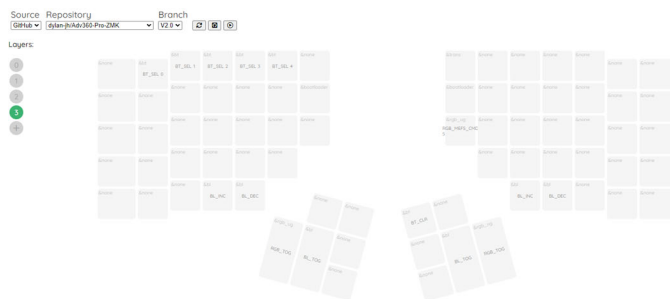
When you have finished all your changes click the green "Commit Changes" button at the bottom of the screen to compile a new firmware file with this layout.
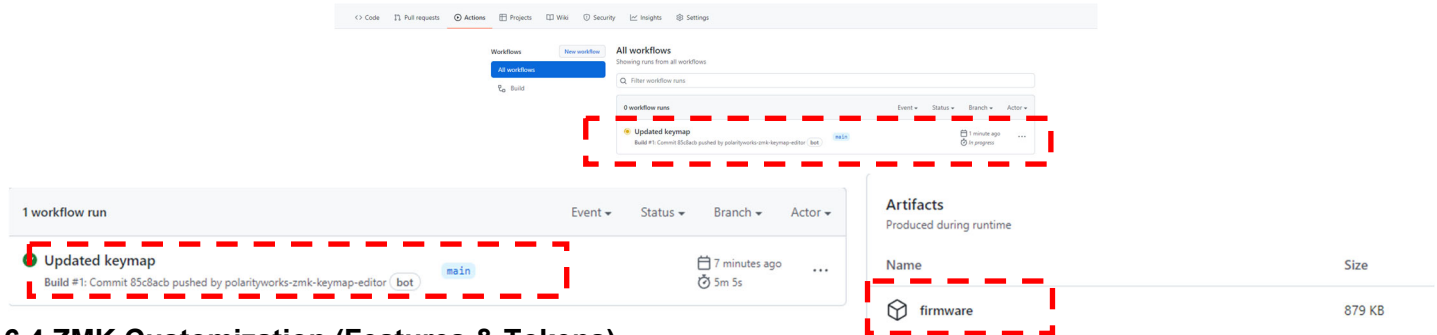
6.3 Building Firmware

Anytime you "Commit Changes" you can navigate to the Actions tab in your Adv360 ZMK Repo where you will see a new workflow entitled "Updated Keymap". GitHub will automatically build a new set of left and right keyboard firmware files with your custom layout. The yellow dot indicates the build is in progress. Each build will take several minutes so be patient.Once the build is complete, the yellow dot will turn green. Click the "Updated keymap" link to load the build page and then click "firmware" to download both the left and right firmware files to your PC. Then follow the firmware update instructions in the next chapter to "flash" the firmware onto the keyboard.
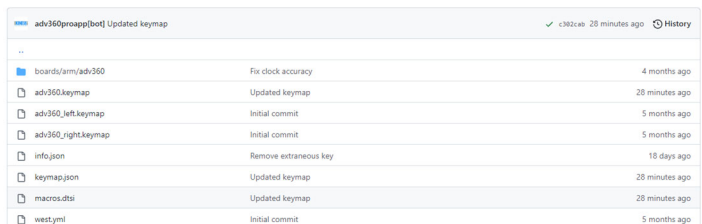

6.4 ZMK Customization (Features & Tokens)

ZMK supports a wide array features that have been implemented since our first production release of firmware. Make sure you are always building from the updated default branch of firmware named "2.0" to gain access to the latest features (described below). ZMK supports a wide arrary of keyboard actions (letters, numbers, symbols, media, mouse actions). Visit the link below for a handy list of tokens to reference when programming your keyboard. *Note: Not all tokens may be supported in your version of ZMK as ZMK is constantly evolving and improving*.

ZMK Features: https://zmk.dev/docs
ZMK Tokens: https://zmk.dev/docs/codes/

6.5 Creating Macros via Direct Programming

The ZMK engine does <u>not</u> support recording macros on-the-fly like earlier versions of the Advantage. Macros can be created by direct programming the macros.dtsi file on GitHub (or via the GUI as described in Section 6.2). Open the "Code" tab on GitHub, then open the "config" folder, and then the macros.dtsi file. Click the pencil icon to edit the file. There are several example macros stored in this file already and we recommend editing one of those macros. First change the name to something short and memorable in all 3 locations. Then input the desired sequence of keys on the bindings line using the tokens linked above. Then click the "Commit changes" button.

Example macros.dtsi Syntax

```
macro_name: macro_name {
  compatible = "zmk,behavior-macro";
  label = "macro_name";
  #binding-cells = <0>;
  bindings = <&kp E>, <&kp X>, <&kp A>, <&kp M>, <&kp P>, <&kp L>, <&kp E>;
};
```

Once you've written your macro to the macros.dtsi file, navigate back to the "config" folder and open the "adv360.keymap" file. Click the pencil icon to edit this file and then assign your macro to the desired key position in the desired layer using the syntax "&macro_name". Click "Commit changes" and now navigate to the Actions tab and follow the instructions (See Section 7.1) to download and install your new firmware file with the updated keymap.

7.0 Firmware Update

Your Advantage360 Pro keyboard comes from the factory with the latest "official" Kinesis version of firmware. Kinesis may at times release new versions of firmware to improve performance and/or compatibility. And 3rd party contributors to ZMK may publish experimental features that you wish to test out. And each time you update your layout (aka "keymap") you will need to install a your new custom version of firmware.

You will need to sync your fork to the main Kinesis repo periodically when prompted by GitHub to gain access to some new features/fixes.

7.1 Firmware Update Process
1. Obtain the desired Advantage360 Pro firmware update files (".uf2" files) from GitHub or Kinesis (*Note: There are separate Left and Right versions so be sure to install them on the correct modules*)
2. Connect the <u>left</u> module to your PC using the included cable
3. Then place the <u>left</u> module into bootloader mode using a paperclip to <u>DOUBLE-CLICK</u> on the Reset Button (*Important Note: keystrokes on the keyboard will be disabled while in bootloader*).
4. Copy and paste the <u>left</u>.uf2 firmware update file to the removable "Adv360 Pro" drive on your PC
5. The keyboard will automatically install the file and disconnect the removable drive. DO NOT DISCONNECT THE KEYBOARD UNTIL THE "ADV360 PRO" DRIVE EJECTS ITSELF.
6. Now connect the <u>right</u> module to your PC and place the <u>right</u> module into bootloader mode using its Reset Button
7. Copy and paste the <u>right</u>.uf2 firmware update file to the removable "Adv360 Pro" drive on your PC
8. The keyboard will automatically install the file and disconnect the removable drive.
9. Once both sides have been updated you are ready to go. DO NOT ATTEMPT TO RUN DIFFERENT VERSIONS OF FIRMWARE ON THE MODULES.

Note: The Shortcuts Mod + Hotkey 1 (Left side) and Mod + Hotkey 3 (Right side) can also be used to place the respective modules into bootloader mode if you prefer.

7.2 Settings Reset
If you run into problems with your build, or your modules are not syncing properly, it may be necessary to perform a Hard Reset by installing the "Settings Reset" firmware file on to each module.

1. Navigate to the "Code" tab on your Adv360 Repo
2. Click the "settings-reset.uf2" link and then click the "download" button
3. Follow the instructions above to install settings-reset.uf2 on to both the left and right key modules
4. Once the settings-reset file has been installed on both modules, proceed to install the new firmware files of your choice. Proceed with the Left side first and then Right.
5. The Left and Right modules will need to re-sync with each other after a Settings Reset. If it does not happen automatically, power-cycle the Left side and then the right in rapid succession.

Important Note: The keyboard will be inoperable until new firmware is installed so you may want to have an alternate keyboard handy.

7.3 Finding New Firmware
To pull the latest firmware from Kinesis, click the Fetch Upstream button from the "Code" tab. Then you can visit your workflows in the "Action" tab and select the desired build, and then click "Re-Run all Jobs" to rebuild your keymap in the new firmware.
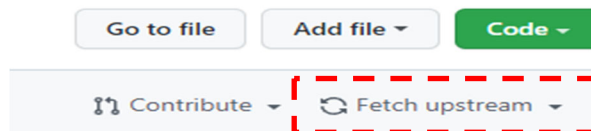
8.0 Troubleshooting, Support, Warranty, and Care

8.1 Troubleshooting
If the keyboard behaves in unexpected ways, there are a variety of easy "DIY" fixes you can experiment with:

Stuck Key, Stuck Indicator LED, keystrokes not sending etc
With the keyboards unplugged, simply toggle the on/off switch on the Left then Right module refresh the keyboard. Connect the left module over USB to see if keystrokes are working.

Trouble pairing
The Profile LED will flash <u>rapidly</u> if the keyboard is unpaired and discoverable. The Profile LED will flash <u>slowly</u> if the keyboard is having pairing difficulties. If you are having trouble pairing (or re-pairing) use the Bluetooth Clear shortcut (Mod + Right Windows) to erase the PC from the keyboard's active Profile. Then need to remove the keyboard from the corresponding PC. Then attempt to re-pair from scratch.

Right module not sending keystrokes (Flashing Red Lights)
It may be possible for your modules to lose "sync" with each other. To re-sync the left and right modules as a "set" simply disconnect them from power and turn the modules off. Then turn them back on in rapid succession, first left, then right. They should automatically re-sync.

Still not working?
If you are still having difficulties, try installing the settings-reset.uf2 file or a fresh firmware file (See Section 7).

For more FAQs and troubleshooting tips visit: kinesis.com/support/kb360pro/.

8.2 Contacting Kinesis Technical Support
Kinesis offers, to the original purchaser, free technical support from trained agents based in our US headquarters. Kinesis has a commitment to deliver best-in-class customer service and we look forward to helping if you experience any problems with your Advantage360 keyboard or other Kinesis products.

For technical, please submit a Trouble Ticket at kinesis.com/support/contact-a-technician.

8.3 Warranty
Visit kinesis.com/support/warranty/ for the current terms of the Kinesis Limited Warranty. Kinesis does not require any product registration to obtain warranty benefits. Proof of purchase is required for warranty repairs.

8.4 Return Merchandise Authorizations ("RMAs") and Repairs
For any repair by Kinesis, regardless of warranty coverage, first submit a Trouble Ticket to explain the problem and obtain a Return Merchandise Authorization ("RMA") number and shipping instructions. Packages sent to Kinesis without an RMA number may be refused. Keyboards will not be repaired without information and instructions from the owner. Products normally should be repaired by qualified personnel only. If you wish to perform your own repairs, contact Kinesis Tech Support for advice. Unauthorized or inexpertly carried-out repairs may jeopardize the safety of the user and may invalidate your warranty.

8.5 Battery Specs, Charging, Care, Safety and Replacement
This keyboard contains two rechargeable lithium-ion polymer batteries (one per module). Like any rechargeable battery the charge capacity degrades overtime based on the number of charge cycles of the battery. The batteries should only be charged using the included cables and when connected directly to a low-power USB device such as a personal computer. Charging the battery in another way can impact performance, longevity, safety and will void your warranty. Installing a 3rd party will also void your warranty.
Note: The left keyboard module consumes more power so it is perfectly normal for the left module to need more frequent recharging.

360

Battery Specifications (model # 903048)
Nominal Voltage: 3.7V
Nominal Charge Current: 750mA
Nominal Discharge Current: 300mA
Nominal Capacity: 1500mAh

Maximum Charge Voltage: 4.2V
Maximum Charge Current: 3000mA
Nominal Discharge Current: 3000mA
Cut Off Voltage: 2.75V

Max Ambient Temperature: 45 Degrees C max (charge) / 60 Degrees C max (discharge)

Like all lithium-ion polymer batteries, these batteries are potentially hazardous and can present a serious risk of FIRE HAZARD, SERIOUS INJURY and/or PROPERTY DAMAGE if damaged, defective or improperly used or transported, or used beyond their intended life span of THREE YEARS. Follow all guidelines when travelling with or shipping your keyboard. Do not disassemble or modify the battery in any way. Vibration, puncture, contact with metals, or tampering with the battery can cause it to fail. Avoid exposing the batteries to extreme heat or cold and moisture.

By purchasing the keyboard, you assume all risks associated with the batteries. Kinesis is not responsible for any damages or consequential damages by using the keyboard. Use at your own risk.

Kinesis recommends replacing your batteries every three years for maximum performance and safety. Contact sales@kinesis.com if you would like to purchase a replacement battery.

Lithium-ion polymer batteries contain elements that may pose health risks to individuals if they are allowed to leach into the ground water supply. In some countries, it may be illegal to dispose of these batteries in standard house-hold trash so research local requirements and dispose of the battery properly. NEVER DISPOSE OF THE BATTERY IN A FIRE OR INCINERATOR AS THE BATTERY MAY EXPLODE.

8.6 Cleaning
The Advantage360 is hand-assembled in the USA by trained technicians using premium components. It is designed to last for many years with proper care and maintenance, but it is not invincible. To clean your Advantage360 keyboard, use a vacuum or canned air to remove dust from the keywells. Using a water-moistened cloth to wipe the surface will help keep it looking clean. *Avoid excess moisture!*

8.7 Use caution when moving keycaps
A keycap removal tool is provided to facilitate changing keycaps. Please be delicate when removing keycaps and note that excessive force can damage a key switch and void your warranty. *Note: that the Advantage360 uses a variety of key cap heights/slopes so moving keys may result in a slightly different typing experience.*

360