M.2 – UPS

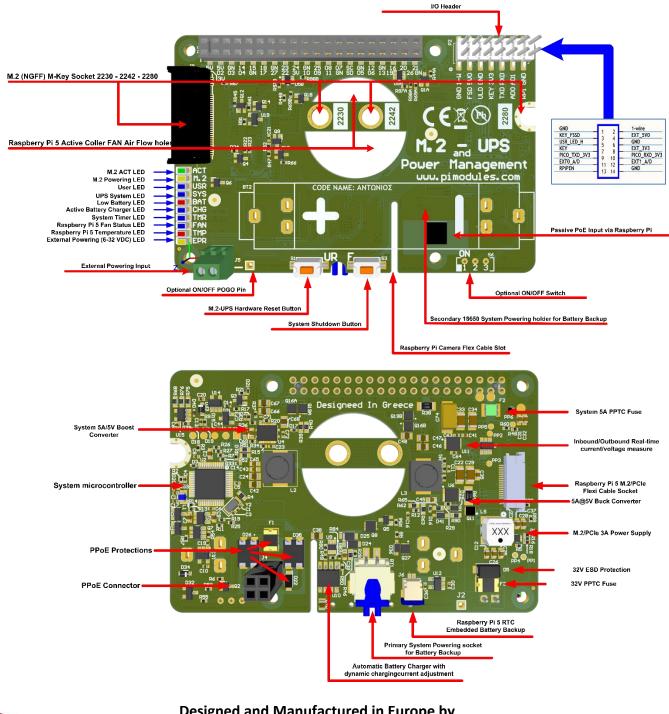
and

Power Management HAT for Raspberry Pi 5

Version Advanced/PPoE

The M.2 Ultimate Power Management System with RTC, Enhanced Peripherals and I²C control Interface

Intelligent Mobile Power Bank Ultra - High Current Extended Buck Supply of 5.0A







The **M.2 – UPS & Power Management HAT** is an Ultimate Power Management System HAT designed especially for **Raspberry Pi® 5** that open the full functionality of their embedded PCIe **M.2(NGFF)** interface and adds a wealth of innovative powerful and development features to the **Raspberry Pi® 5** microcomputer!

It has been designed especially for the **Raspberry Pi® 5** and considers all enhanced power and cooling requirements of the **Raspberry Pi® 5** models. It has been designed to work with **Official Cooler** exploring their enhanced cooling capabilities for **Raspberry Pi** as also for the added **M.2** devices.

The core functionality of the M.2 – UPS & Power Management HAT is to provide an interface for M.2(NGFF) M-Key (2230, 2242 and 2280) and at the same time protect and automatically shut-down your **Raspberry Pi® 5** if there is a cable power failure and can be set to automatically monitor and reboot your Pi once cable power has been restored!

However, it is only a small part of plenty and powerful functionalities that are implemented on this small HAT. The new **M.2 – UPS & Power Management HAT** contains two selectable backup power sources that can be used (once at a time). The wide available on the market Battery **18650** Li-Ion or large selection line of **XH-2.5** connector (600 mAh – 10 000 mAh) cover any extended Battery Backup request.

The new **M.2 – UPS & Power Management HAT** is the <u>only one</u> that supplies the **Raspberry Pi® 5 RTC** with battery backup (**J5**) and eliminates the need to use an additional battery for this purpose.

Last but not least is that implemented M.2 interface is equipped with **32786 kHz clock**, similar to the official **Raspberry Pi® 5** M.2 HAT.

The new **M.2 – UPS & Power Management HAT** <u>does not need any additional powering cable</u> and thanks to the implemented proprietary monitoring algorithm monitors the and current consumption via GPIO and other powering sources.

The new M.2 – UPS & Power Management HAT offers an External Powering Input of 5V0 – 32V0 supply that can be easily used with any existing Solar Panel. Due to implemented Power Tracking and Dynamic Charging Algorithm, adopt the system power needs to the available Solar Power!

The **External Powering** Input and the **GPIO Powering** (via **USB-C**) can be connected at the same time and system decides what Power source will be selected!

In addition to the listed powering sources an extra powering source has been implemented – the **Passive PoE**. Much simpler and much lower cost than the PoE/PoE+. The **M.2** – **UPS & Power Management HAT** can be powered through the Ethernet without expensive equipment, just with a simple power injector that costs 2 EURO. This an ideal solution for a low-cost homemade **PoE Systems** based on the **Raspberry Pi 5** and **M.2** – **UPS & Power Management HAT**





System Specifications

Central Dimension: 85mm x Samm Email broadcating on events (Cable Power Inst/return, Wake-up, User Button, Symport Instruction with stages and the event of the interaction with stages and Continuouity 2044 years and the interaction of the interaction with stages and Continuouity 2044 years and the interaction with stages and Continuouity 2044 years and the interaction with stages and Continuouity 2044 years and the interaction with stages and Continuouity 2044 years and the interaction with stages and Continuouity 2044 years and the interaction with stages and Continuouity 2044 years and the interaction of the interaction with stages and Contreaction of the interaction with stages and the interaction with st	
 System Status) Plug and Play UltraHight System d Demon based on threading GPD (The plat GPD) are available for user application) interaction with Raspberry	P socket cable Batter
Gravity of the field PSD random based on threading Gravity of the PST PSD register of the PST PSD regST PSD regST PSD regST PSD register of the PST PSD register of th	
GPIO free juil GPIOs are available for user application interaction with Rapberry P ⁺ via °C thanced system Monitoring and Programming API Labeled B Raspberry PF GPIO Prios for table spore of the size Shutdown and up Functionality on a Single Buttom Support for UP 108 for the Immune Lipitie Support for UP 108 for the	5V0-32V0 or PPoE
PP via PC Continuous System Monitoring and Programming API Labled JB Rapperry PF ⁶ CHO Pins for Tasy Ping & Piny of experimental cables Standard TH 4 0P in contextor (not soldiered) Embedded APT 4 0P in contextor (not soldiered) Support for Use Pinware Update on remote locations Support for Use Piny and Educated holder on top Support for Use Piny and Educated holder on top Support for Use Piny and Educated holder on top Piny E SROW Management HAT are uning properly, and system Schedid State Mole Piny Be Stot Support for Use S Power Management HAT are uning properly, and system Schedid Piny Piny Be Stot Nort: No	
Standard THT 40 Pin connector (not soldered) Local bootloader for Use Firmware Update on remote locations Local bootloader for Use Firmware Update on remote locations Local bootloader for Use Firmware Update on remote locations Local bootloader for Use Firmware Update on remote locations Local bootloader for Use Firmware Update Supported Battery Types and Capacities System Protection Support of a User Programmer Interface Support for Use Firmware Update on top Support for Use The Support of a User Programmer Interface Support for Use There Interface System Protection Support for Use States with dedicate holder on top Support for Use Support for User Programmer Interface Support for Use States with dedicate holder on top Support for Use Support for User Prove Support Support Support Support Support Support Support For Us	
- ical bootdoater for Live Firmware Update Supports 20 utger Types and Lapacities Supports 20 utger Types and Lapacities Support for LiPer Types and Lapacities Support for LiPer Alexandre Alexand	own/start-up, with
Supported Battery Types and Capacities Supports a wide range of different Chemistry and capacities batteries and Super Capacitor (UPQ/UFP0/LFP0/LF=0/GAL=And) Super Capacitor (UPQ/UFP0/LF=0/GAL=And) Super Capacitor (UPQ/UFP0/LF=0/GAL=And) Super Capacitor (UPQ/UFP0/LF=0/GAL=And) Super Capacitor (UPG) Support for UF 10-B6S Diversity and capacities batteries and Super Capacitor (UPG) Support for UF 10-B6S Diversity and capacities batteries and Super Capacitor (UPG) Support for UF 10-B6S Diversity and capacities batteries and Super Capacitor (UPG) Support for UF 10-B6S Diversity and capacities batteries and Super Capacitor (UPG) Support for UF 10-B6S Diversity and Capacities Diversity Diversi	
 Supports avide range of different Chemistry and capacities batteries and Super Capacitor (UPC)/UFCPO/Linol Support for LiPo 1850 batteries (from Electronic Cigarettes) with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1850 batteries with dedicated holder on top Support for LiPO 1860 batteries with dedicated holder on top Support for LiPO 1860 batteries with dedicated holder on top Support for LiPO 1860 batteries with dedicated holder on top PPC 100 API Interface for Control and Monitoring, with over 50 programming registers BEFAULT: 0.663, 0650, 0650, 0650, 0656, 0657 ALTENATE: 0.663, 0650, 0650, 0650, 0657, 000 regrammable batton - externally accessed Liber Programmable batton - externally accessed System File Safe Shutdowr/Star-up button with additional cale connectivity to external button (ming) for two special based on various internal/external evento: Time stamp, Cale Powering/Los (UPS), Mattery Starbable<td>rry Pi® 5 RTC</td>	rry Pi® 5 RTC
Capactor (UPO/UFP/04/Li-00/ Super Capactor 4006P) Support for UI-01850 low cost batteries (from Electronic Cigarettes) with dedicated holder on top Support for UI-01850 batteries with dedicated holder on top Support for UI-01870 batteries with dedicated holder on top Supp	
Support for LHon 1859 [ow-cast batteries (ifm Electronic Cigarettes) with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated holder on top Support for LHO 18550 batteries with dedicated hol	ound current,
 with dedicate holder on top Support for UF Jog feature Support for UF Jog feature System IE-SES Detarters with dedicated holder on top System IE-SES Detarters with dedicated to 5-V0 and 0-2-SV0-externally accessed Additional B522 3V3 for user applications like System Schedule System IE-SES Detarters with dedicated holder on thop with particular dedicated Case Coming soon Integrated Hardware Real Time Clock (RTC) with Bat	Pi [®] 5 Core and M.2 -
Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with dedicated holder on top Support for LIPO 1850 batteries with over 50 programming registres Support for 4 different users selectable 1°C addresses sets: DEFAULT: 0x68, 0x69, 0x66, 0	
Support for LiFePO1 18650 with dedicated holder on top System Protect duality, that informal system rifegers System Protect duality, that informative, that are running properly, and syste protect dised are management HAT are running properly, and syste protect dised of various internal system triggers System Protection CPIC API Interface PCP Co API Interface CPIC API Interface DFAULT: 0x68, 0x69, 0x66, 0x66, 0x66 NO, PCC: 0x69, 0x68, 0x68, 0x68, 0x66, 0x66 NO, PCC: 0x69, 0x68, 0x68, 0x68, 0x66, 0x68 NO, PCC: 0x69, 0x68, 0x68, 0x68, 0x68, 0x68, 0x68 NO, PCC: 0x69, 0x68, 0x68, 0x68, 0x68, 0x68, 0x68, 0x68 NO, PCC: 0x69, 0x68, 0x68, 0x68, 0x68, 0x68, 0x68, 0x68, 0x68 NO, PCC: 0x69, 0x68, 0x68 NO, PCC: 0x69, 0x68, 0x6	
User/Programmer Interface - System Healthy, that informs user remotely if Bapberry PF 5 CC UPS & Power Management HAT are running properly, and syste protected (based on various internal system triggers) User/Programmer Interface - Optional Direct Raspberry PF 3 Sutton via Spring Loaded Pogo P Programmable Watch-Dog Hardware feature (Still Alive Time) - Support for 4 different users selectable I ² C addresses sets: - Programmable Watch-Dog Hardware feature (Still Alive Time) - DEFAULT: Dx68, Dx68, Dx62, Dx50, Dx52, Dx57, Dx52, Dx57, Dx52, Dx54, Dx48, Dx44,	/IP, EPR (optionally
User/Programmer Interface User/Programmer Interface System Protection . PC PLoc AP Interface for Control and Monitoring, with over 50 programming registers System Protection . Support for 4 different users selectable I ^C addresses sets: System Protection DEFAULT: No.86, bb6, bb6, bb6, bb6, bb6, bb6, bb6, b	
User/Programmer Interface protected (based on various internal system triggers) User/Programmer Interface System Protection - PC PIG API Interface for Control and Monitoring, with over 50 programming registers System Protected (based on various internal system triggers) - Support for 4 different uses selectable I ^C addresses sets: Programmable Watch-Dog Hardware feature (Still Alive Timer) - DEFAULT: 0.469, 0.669, 0.669, 0.660, 0.667, 0.669, 0.656 - - ALTERNATES: 0.689, 0.689, 0.650, 0.650, 0.656 - - ALTERNATES: 0.689, 0.689, 0.640, 0.640, 0.440, 0.446, 0.447 - - 1 User Programmable button - externally accessed - Outer-Temperature protection - 1 User Programmable button - externally accessed - Internally accessed - 1 User Programmable button - externally accessed - Intound/Outboard Voltage sensors: - 1 User Programmable button - externally accessed - Intound/Outboard Voltage sensors: - 1 User Programmable button - externally accessed - Intound/Outboard Voltage sensors: - 1 User Programmable button - externally accessed - Intound/Outboard Voltage sensors: - - - - - - Additional Backed up User Applications like System Schedule	
User/Programmer Interface - PCPto API Interface for Control and Monitoring, with over 50 programming registers - Optimal Direct Raspberry PI* 5 Button via Spring Loaded Poge P - Support for 4 different users selectable I ² C addresses sets: - Optimal Direct Raspberry PI* 5 Button via Spring Loaded Poge P - DEFAULT: 0x68, 0x69, 0x66, 0x66, 0x66, 0x66 - - - ND_RTC: 0x69, 0x69, 0x64, 0x66, 0x66, 0x66 - - - ATTERNATE: 0x68, 0x69, 0x64, 0x48, 0x46,	ystem is power
 P^C P(2 P(x AP) Interface for Control and Monitoring, with over 50 programming registers Support for 4 different users selectable P^C addresses sets: DEFAULT: 0x68, 0x69, 0x64, 0x60, 0x60, 0x65, 0x65 ALTERNATE2: 0x68, 0x59, 0x54, 0x50, 0x50, 0x55, 0x55 ALTERNATE2: 0x68, 0x69, 0x64, 0x60, 0x60, 0x65, 0x56 Tuser Programmable tuston - externally accessed 1 User Programmable tuston - externally accessed 2 Additional Rs2a2 3V3 for user applications Powering Sources 3V3 and SVO Additional Rs2a2 3V3 for user applications the system Schedule System File Safe Shutdown/Sattrup button with additional calic connectivity to external button (similar/alternative to Raspberry PI* S tout with ultra-low current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry PI* S tout with outper thermal Pipe S for Control external button (similar/alternative to Raspberry PI* S tout Supply) PCB Construction Case Compatibility Case Compatibility Declicated Casle Powering/Loss (UPS), Battery Losy and cooling M2 (NGFP) M-Key Interface Supports 220, 2242 and 2280 M2 (NGFP) M-Key Interface Supports 220, 2242 and 22	
 registers Support for 4 different users selectable i¹C addresses sets: DEFAULT: 0x68, 0x69, 0x64, 0x66, 0x60, 0x6F, 0x6F NO, RTC: 0x69, 0x63 ALTERNATEJ: 0x58, 0x59, 0x54, 0x50, 0x52, 0x57 ALTERNATEJ: 0x58, 0x59, 0x54, 0x64, 0x46, 0x4F Current protection PPTC, ESABSW and the set of the set	
Support for 4 different users selectable I/C addresses sets: DEFAULT: DEFAULT: DefAULT: Dotage Default: DefAULT:	
 DEFAULT: Ox68, Ox69, Ox64, Ox66, Ox67, Ox69, O	ier)
 NO, RTC: 0x69, 0x68 ALTERNATE1: 0x68, 0x59, 0x54, 0x58, 0x50, 0x50, 0x5F, 0x5F ALTERNATE1: 0x68, 0x59, 0x54, 0x68, 0x40, 0x40, 0x4F, 0x4F Over-Current protection PPTC, ESD, Reverse Polarity on EPR and PPOE powering inputs Embedded Peripherals and Interfaces I User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed I User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed I User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional Backed up User Applications Nee system Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspherry PI^o 5 NTC) Dedicated Cable for the Raspherry PI^o 5 NTC buttery Supply RTC Support and System Scheduler Brite Stoudown and start-up system based on various internal/external events, time stang, Cable Powering(Loss (UFS), Battery Supply) Case Compatibility Case Compatibility Dedicated Cable for the Raspherry PI^o 5 NTC battery Supply and cooling G mils track/G mils gap technology 4 layers PCB Case Compatibility Designe and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer Designe and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer Designe and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer Dustrate Finishing – immersion Gold Multi-layer COpper Thermal Pleps for increased System Thermal Response and better passive cooling Multi-layer COpper Thermal Pleps for increas	
ALTERNATE:: 058, 0x59, 0x50, 0x50, 0x50, 0x50, 0x50, 0x50, 0x50, 0x50, 0x40, 0x46, 0x4F - Over-Temperature protection ALTERNATE:: 0x48, 0x49, 0x40, 0x48, 0x40, 0x40, 0x40, 0x40, 0x40, 0x40, 0x40, 0x40, 0x40, 0x40 - Over-Temperature protection Embedded Peripherals and Interfaces - Embedded Sensors - 1 User Programmable button - externally accessed - Inbound/Outbound High-side bi-directional hardware current/or monitor with power calculation on 5V supply - 2 12bit 200Kps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed - Inbound/Outbound High-side bi-directional hardware current/or monitor with power calculation on 5V supply - Additional Backed up User Applications Powering Sources 3V3 and SV0 - Backed up User Applications Powering Sources 3V3 and SV0 - System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry Pi ^a 5 but with <u>ultra-low</u> current consumption) - Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi ^a 5 BTC battery Supply RTC Support and System Scheduler - Dedicated Cable for the Raspberry Pi ^a 5 RTC battery Supply and cooling - 7 20 corper PCB manufactured for proper high current supply and cooling - Ouesigned and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer - NCB Supface Finishing = Immersion Gold - Mit-Actr LED - Withi-Byer Coper Thermal Pipes for increased System Thermal Response and better passive cooling - M2 Actr LED - Supports	
ALTERNATE2: 0x48, 0x49, 0x4A, 0x4B, 0x4C, 0x4D, 0x4E, 0x4F - Over-Current protection - Over-Current protection Embedded Peripherals and Interfaces - PPTC, ESD, Reverse Polarity on EPR and PPoE powering inputs - 1 User Programmable LEDs (with mapping capability of the system behavior LEDs)- externally accessed - Inbound/Outbound High-side bi-directional hardware current/ monitor with power calculation on 5V supply - 2 LDit 200Kps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed - Onboard Voltage sensors: - Additional Backed up User Applications Powering Sources 3V3 and SV0 - Onboard Voltage - Xdditional R5223 2V3 for user applications like System Schedule - Onboard additional Temperature Sensor - Network inder the Raspberry PI* 5 NTC bedicated Cable for the Raspberry PI* 5 NTC bedicated Cable for the Raspberry PI* 5 NTC battery Supply - Onboard additional Temperature Sensor RTC Support and System Scheduler - Case Compatibility - RTC Support and System Scheduler - Dedicated Cable for the Raspberry PI* 5 NTC battery Supply and cooling - 6 mits track/6 mils gas technology 4 layers PCB - System Design - PCB Construction - Over Support Thermal Pipes for increased System Thermal Response and better passive cooling System Indicators - Supports 2230, 2242 and 2280 - Multi-layer Coper Thermal Pipes for increased System Thermal Response and better passive cooling - M.2 ACT LED - Implemented SUSCUX 32, 768 MHz - M.2 Actr LED - M.2	
Embedded Peripherals and Interfaces 1 User Programmable button - externally accessed 1 User Programmable LDDs (with mapping capability of the system behavior LEDs)- externally accessed 12bit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed Additional Backed up User Applications Powering Sources 3V3 and SV0 Additional RS222 3V3 for user applications like System Schedule Additional RS22 3V3 for user applications like System Schedule accessed Additional RS22 3V3 for user applications like System Schedule System File Safe Shutdown/Star-up button with additional cable connectivity to external button (similar/alternative to Raspberry PI*5 but with ultra-low current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry PI*5 STC Dedicated Cable for the Raspberry PI*5 STC battery Supply RTC Support and System Scheduler Case Compatibility	
Embedded Peripherals and Interfaces Embedded Sensors 1 User Programmable button - externally accessed - Inbound/Outbound High-side bi-directional hardware current/A monitor with power calculation on SV supply - - 1 User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed - Inbound/Outbound High-side bi-directional hardware current/A monitor with power calculation on SV supply - - - 12bit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed -	itc.
 J ver Programmable button - externally accessed 1 User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed 12bit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional R5232 3V3 for user applications like System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry PI® 5 RTC Dedicated Cable for the Raspberry PI® 5 RTC Case Compatibility KTC Scheduler Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction Q zo copper PCB manufactured for proper high current supply and cooling G mils track/6 mils gap technology 4 layers PCB PCB Suntrace Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Supptive Mit Battery Backup Undpendent 3A Power Supply with Battery Backup User LED 	115
I User Programmable button - externally accessed I User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed I2bit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional R5232 3V3 for user applications ike System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry PI® F S RTC Dedicated Cable for the Raspberry PI® F S RTC Dedicated Cable for the Raspberry PI® F S RTC Dedicated Cable for the Raspberry PI® F S RTC battery Supply RTC Support and System Scheduler Case Compatibility Casoper PCB manufactured for proper high current supply and cooling	
 1 User Programmable LEDs (with mapping capability of the system behavior LEDs) - externally accessed 1 Uzhit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional R5232 3V3 for user applications like System Schedule Additional R5232 3V3 for user applications like System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry PI* 5 but with <u>ultra-low</u> current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Supply RTC Scheduler Dedicated Cable for the Raspberry PI* 5 RTC battery Supply Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current external buttin designeer 2 zo copper PCB manufactured for proper high current supply and cooling G mills track/6 mills gap technology 1 Jayers PCB PCB Sonstruction Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Mupernented SUSCKI 32.768 kHz Independent 3	ant/voltage consing
 externally accessed 12bit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional R5232 3V3 for user applications like System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry Pi⁺ 5 but with <u>ultra-low</u> current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi⁺ 5 RTC Dedicated Cable for the Raspberry Pi⁺ 5 RTC battery Supply RTC Scheduler Enhanced shutdow and start-up system based on various internal/external events: Time stamp. Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction 2 oz copper PCB manufactured for proper high current supply and cooling 6 mils track/6 mils gap technology 4 layers PCB PCB Surface Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Supports 2230, 2242 and 2280 Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper The	sitty voltage sensing
 12bit 200Ksps A/D with voltage follower pre scaled to 0-5V0 and 0-25V0 - externally accessed Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional R5232 3V3 for user applications like System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry Pi ^o 5 but with ultra-low current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi^o 5 RTC Dedicated Cable for the Raspberry Pi^o 5 RTC Dedicated Cable for the Raspberry Pi^o 5 RTC RTC Scheduler RTC Scheduler RTC Scheduler Z oz copper PCB manufactured for proper high current supply and cooling G mils track/6 mils gap technology 4 layers PCB Multi-layer Copper Themal Pipes for increased System Thermal Response and better passive cooling Multi-layer Copper Themal Pipes for increased System Thermal Response and better passive cooling Supports 2230, 2242 and 2280 Multi-layer Cupper Supply with Battery Backup Independent 3A Power Supply with Battery Backup Independent 3A Power Supply with Battery Backup 	
accessed Raspberry Pi GPIO 5V level Voltage Additional Backed up User Applications Powering Sources 3V3 and 5V0 EPR 5V0-32V0 level Voltage Additional RS232 3V3 for user applications like System Schedule EPR 5V0-32V0 level Voltage System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry Pi* 5 but with <u>ultra-low</u> current consumption) onboard additional Temperature Sensor Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi* 5 RTC onboard additional Temperature Sensor Dedicated Cable for the Raspberry Pi* 5 RTC battery Supply Case Compatibility onboard additional Case Coming soon RTC Support and System Scheduler Case Compatibility onboard additional Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer e PCB Construction System Design dand Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer - PCB Surface Finishing – Immersion Gold Design Based on Microchip 16-bit 16 MIPS micro controller - Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling System Indicators M.2 (NGFF) M-Key Interface System Indicators Multi-layer Stops System Step Step Stap Step Stap Step Step Step Step Stap Step Step Step St	
 Additional Backed up User Applications Powering Sources 3V3 and 5V0 Additional R5232 3V3 for user applications like System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry Pi* 5 but with <u>ultra-low</u> current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi* 5 RTC Dedicated Cable for the Raspberry Pi* 5 RTC battery Supply RTC Support and System Scheduler RTC Scheduler Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction G mils track/6 mils gap technology 4 layers PCB PCB Surface Finishing – Immersion Gold Multi-layer Copper TCB manufactured for proper high current supply and cooling better passive cooling Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling System Indicators System Indicators System Indicators Independent 3A Power Supply with Battery Backup Undependent 3A Power Supply with Battery Backup User LED 	
 Additional RS232 3V3 for user applications like System Schedule System File Safe Shutdown/Start-up button with additional cable connectivity to external button (similar/alternative to Raspberry Pi® 5 but with <u>ultra-low</u> current consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi® 5 RTC Dedicated Cable for the Raspberry Pi® 5 RTC battery Supply RTC Support and System Scheduler Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction 2 oz copper PCB manufactured for proper high current supply and cooling 6 mils track/6 mils gap technology 4 layers PCB PCB Sunface Finishing – Immersion Gold Multi-layer Cooper Multi-layer Cooper Multi-layer Cooper Multi-layer Cooper Multi-layer Cooper System Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Cooper Supports 2230, 2242 and 2280 Implemented SUSCLK 32.768 KHz Independent 3A Power Supply with Battery Backup 	
external button (similar/alternative to Raspberry Pi® 5 but with <u>ultra-low</u> current consumption) . . Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi® 5 RTC . Dedicated Cable for the Raspberry Pi® 5 RTC battery Supply RTC Support and System Scheduler Case Compatibility . RTC Scheduler . Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction System Design . Cable Powering/Loss (UPS), Battery PCB . 6 mils track/6 mils gap technology 4 layers PCB . PCB Surface Finishing – Immersion Gold . Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling M.2 (NGFF) M-Key Interface System Indicators . Supports 2230, 2242 and 2280 . M.2 Cower gLED . M.2 Powering LED	
consumption) Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry Pi® 5 RTC Case Compatibility Dedicated Cable for the Raspberry Pi® 5 RTC battery Supply Case Compatibility Dedicated Case Coming soon RTC Support and System Scheduler Case Compatibility Dedicated Case Coming soon - Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. System Design PCB Construction 2 oz copper PCB manufactured for proper high current supply and cooling Designed and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer - PCB Surface Finishing – Immersion Gold Design Based on Microchip 16-bit 16 MIPS micro controller - Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Industrial Originated M.2 (NGFF) McKey Interface System Indicators - Supports 2230, 2242 and 2280 M.2 Convering LED - Implemented SUSCLK 32.768 Hzlz M.2 Powering LED - Independent 3A Power Supply with Battery Backup -	
 Integrated Hardware Real Time Clock (RTC) with Battery Back-Up in addition and independent (synchronized) to Raspberry PI[®] 5 RTC Dedicated Cable for the Raspberry PI[®] 5 RTC battery Supply RTC Support and System Scheduler RTC Scheduler Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction G mils track/6 mils gap technology 4 layers PCB G mils track/6 mils gap technology 4 layers PCB PCB Surdsce Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Supports 2230, 2242 and 2280 Supports 2230, 2242 and 2280 Implemented SUSCLK 32.768 KHz Independent 3A Power Supply with Battery Backup 	
independent (synchronized) to Raspberry PI* S RTC Dedicated Cable for the Raspberry PI* S RTC battery Supply RTC Support and System Scheduler Case Compatibility - RTC Scheduler Dedicated Case Coming soon - Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. Dedicated Case Coming soon PCB Construction System Design - 6 mils track/6 mils gap technology 4 layers PCB Designed and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer - PCB Surface Finishing – Immersion Gold Design Based on Microchip 16-bit 16 MIPS micro controller - Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Industrial Originated M.2 (NGFF) M-Key Interface System Indicators M.2 Couport 120 - Supports 2230, 2242 and 2280 M.2 Powering LED M.2 Powering LED - Independent 3A Power Supply with Battery Backup - User LED	
Dedicated Cable for the Raspberry PI® S RTC battery Supply Case Compatibility RTC Support and System Scheduler Case Compatibility RTC Scheduler Dedicated Case Coming soon Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. Dedicated Case Coming soon PCB Construction System Design 6 mils track/6 mils gap technology 4 layers PCB Designed and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer • PCB Surface Finishing – Immersion Gold Design Based on Microchip 16-bit 16 MIPS micro controller • Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Industrial Originated M.2 (NGFF) M-Key Interface System Indicators • Supports 2230, 2242 and 2280 M.2 Powering LED • Independent 3A Power Supply with Battery Backup User LED	
RTC Support and System Scheduler Case Compatibility - RTC Scheduler - Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. Dedicated Case Coming soon PCB Construction - System Design - 2 oz copper PCB manufactured for proper high current supply and cooling - Designed and Simulated with PDA Analyzer with one of the most CAD/CAM Tools - Altium Designer - PCB Surface Finishing - Immersion Gold - Design Based on Microchip 16-bit 16 MIPS micro controller - Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling - System Indicators - Supports 2230, 2242 and 2280 - M.2 Child Case - - Implemented SUSCLK 32.768 KHz - M.2 Child Case - Independent 3A Power Supply with Battery Backup - User LED	
 RTC Scheduler Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction 2 oz copper PCB manufactured for proper high current supply and cooling 6 mils track/6 mils gap technology 4 layers PCB 9 CB Surface Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling M.2 (NGFF) M-Key Interface System Indicators Supports 2230, 2242 and 2280 Implemented SUSCLK 32.768 KHz Independent 3A Power Supply with Battery Backup User LED 	
Enhanced shutdown and start-up system based on various internal/external events: Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. PCB Construction 2 oz copper PCB manufactured for proper high current supply and cooling - 6 mils track/6 mils gap technology 4 layers PCB - 9 PCB Surface Finishing – Immersion Gold - PCB Surface Finishing – Immersion Gold - 0Esign Based on Microchip 16-bit 16 MIPS micro controller - 1ndustrial Originated - 10 - 10000 - 100000 - 1000000 - 10000000 - 0000000 - 00000000	
Time stamp, Cable Powering/Loss (UPS), Battery Level, Serial Port data, current etc. System Design PCB Construction System Design - 2 oz opper PCB manufactured for proper high current supply and cooling Designed and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer - 6 mils track/6 mils gap technology 4 layers PCB CAD/CAM Tools – Altium Designer - PCB Surface Finishing – Immersion Gold Design Based on Microchip 16-bit 16 MIPS micro controller - Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Industrial Originated M.2 (NGFF) M-Key Interface System Indicators Industrial Originated - Supports 2230, 2242 and 2280 M.2 ACT LED - Implemented SUSCLK 32.768 kHz M.2 Powering LED - Independent 3A Power Supply with Battery Backup User LED	
PCB Construction System Design - 2 oz copper PCB manufactured for proper high current supply and cooling - Designed and Simulated with PDA Analyzer with one of the most CAD/CAM Tools – Altium Designer - PCB Surface Finishing – Immersion Gold - Design Based on Microchip 16-bit 16 MIPS micro controller - Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling - System Indicators - Supports 2230, 2242 and 2280 - M.2 CIL B2 - Independent 3A Power Supply with Battery Backup - M.2 Powering LED	
 2 oz copper PCB manufactured for proper high current supply and cooling 6 mils track/6 mils gap technology 4 layers PCB PCB Surface Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling M.2 (NGFF) M-Key Interface Supports 2230, 2242 and 2280 Implemented SUSCLK 32.768 KHz Independent 3A Power Supply with Battery Backup User LED 	
 6 mils track/6 mils gap technology 4 layers PCB PCB Surface Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling Multi-layer Support 2230, 2242 and 2280 Supports 2230, 2242 and 2280 Imdemented SUSCLK 32.768 KHz Independent 3A Power Supply with Battery Backup User LED 	
 PCB Surface Finishing – Immersion Gold Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling M.2 (NGFF) M-Key Interface Supports 2230, 2242 and 2280 Implemented SUSCIK 32.768 kHz Independent 3A Power Supply with Battery Backup User LED 	nost advanced
Multi-layer Copper Thermal Pipes for increased System Thermal Response and better passive cooling M.2 (NGFF) M-Key Interface Supports 2230, 2242 and 2280 Implemented SUSCLK 32.768 KHz Implemented SUSCLK 32.768 KHz Independent 3A Power Supply with Battery Backup User LED	
better passive cooling Supports 2230, 2242 and 2280 System Indicators - Supports 2230, 2242 and 2280 - M.2 ACT LED - Implemented SUSCLK 32.768 kHz - M.2 Powering LED - Independent 3A Power Supply with Battery Backup - User LED	
M.2 (NGFF) M-Key Interface System Indicators - Supports 2230, 2242 and 2280 - M.2 ACT LED - Implemented SUSCLK 32.768 kHz - M.2 Powering LED - Independent 3A Power Supply with Battery Backup - User LED	
 Supports 2230, 2242 and 2280 Implemented SUSCLK 32.768 kHz Independent 3A Power Supply with Battery Backup User LED 	
 Implemented SUSCLK 32.768 kHz Independent 3A Power Supply with Battery Backup User LED 	
- Independent 3A Power Supply with Battery Backup - User LED	
- Low Battery LED	
- Active Battery Charger LED	
- System Timer LED	
- Raspberry Pi 5 Fan Status LED	
- Raspberry Pi 5 Temperature LED	
- System EPR or PPoE Powering Status LED	





