

User Manual

PDS-C4



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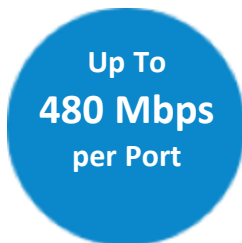
2. Your PDS-C4 at a glance

The PDS-C4 has been designed primarily for desktop use, being highly compact and quiet. It provides 60W of charging power to each of its 4 x USB 2.0 Type-C ports, allowing mobile devices to be charged quickly, safely and reliably. All ports can be controlled using Cambrionix software to allow charging and/or data transfer while monitoring important port and device information.

The PDS-C4 can charge attached USB devices without using a local computer and our intelligent charging algorithm allows almost any device to be charged at its optimum rate (up to 3A). The firmware can be up-dated to allow new charging profiles to be added, ensuring the PDS-C4 can charge the latest devices. It is ready to charge out-of-the-box and to sync devices when attached to a host computer.

When a local (host) computer is attached, the host can control operation of the ports using freely available software. Device charging and synchronisation can be monitored through Cambrionix’s LiveViewer App, the Application Programming Interface (API) or Command Line Interface (CLI). Cambrionix’s free monitoring and control software can be downloaded from www.cambrionix.com/software

2.1. Key Features



Transfer Data Seamlessly

Each high speed port can transfer data up to 480 Mbps



Power

Each port can charge devices up to 3A (60W)





Scalability

Up to 16 devices can be connected at once using multiple hubs

3.Safety


This user manual is for informational purposes only, it contains information for start-up and operation of this product. Note: the contents and the product described are subject to change without notice. To avoid injuries and damage observe the safety instructions of the user manual.

Understanding and observing the instructions in this user manual are prerequisites for hazard-free use and safety during operation. This user manual cannot cover all conceivable applications. If you would like additional information or if problems arise that are not sufficiently addressed in this manual please ask your distributor or contact us directly using the means preferred which are located on the back cover of this manual.

| | |
|---|---|
|  |  CAUTION |
| | <p>Personal Injury and Damage to the product</p> <ul style="list-style-type: none"> • Observe the safety instructions in this user manual |

3.1.Signal word panel

Depending on the probability of serious consequences, potential dangers are identified with a signal word, the corresponding safety colour, and if appropriate, the safety alert symbol.

| |
|--|
|  CAUTION |
| <p>Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor (reversible) injury.</p> |

| |
|--|
| CAUTION |
| <p>Indicates a potentially hazardous situation which, if not avoided, may result in damage to the product and/ or its functions or of a property in its proximity.</p> |

3.2.Safety alert symbol



Use of the safety alert symbol indicates a risk of injury.

Observe all measures that are marked with the safety alert symbol in order to avoid injury


3.3.Pictograms


| Warning Signs | |
|---------------------------------|--------------------------|
| Electrical hazard | Fire Hazard |
| Mandatory action signs | |
| Read operating instructions | Mandatory regulation |

3.4.Product modification

Cambrionix products are designed and manufactured to meet the requirements of UK and International safety regulations. Modifications to the product could affect safety and render the product non-compliant to relevant safety standards, which could result in injury or damage to the product.


| | |
|--|--|
| | CAUTION |
| | <p>Electric shock or personal injury may occur</p> <ul style="list-style-type: none"> • Do not modify the product in any way • Do not dismantle the product |


| | |
|---|--|
|  | CAUTION |
| | <p style="text-align: center;">Fire or personal injury may occur</p> <ul style="list-style-type: none"> • Do not obstruct air vents on the product • Do not cover the product in combustible material |

| | |
|---|--|
|  | CAUTION |
| | <p style="text-align: center;">Damage to your product may occur</p> <ul style="list-style-type: none"> • Do not bend or compress any part of the product |

3.5. Power supply


This section describes safety precautions you must follow when using the power supply.


| | |
|---|---|
|  | CAUTION |
| | <p style="text-align: center;">Electric shock or personal injury may occur</p> <ul style="list-style-type: none"> • Do not use a damaged power cord or plug, or a loose power socket • Do not touch the power plug with wet hands • Do not allow liquids to come into contact with the unit or power supply |


| | |
|---|---|
|  | CAUTION |
| | <p style="text-align: center;">Damage to your product may occur</p> <ul style="list-style-type: none"> • Do not short circuit the Power Supply Unit (PSU) supplied with your product • Do not disconnect the power cord while the product is being used • Do not bend or pull the power cord with excessive force |

3.6.Storage and Installation

This section describes safety precautions you must follow when installing and storing your PDS-C4.

| | |
|---|--|
|  | ⚠ CAUTION |
| | <p style="text-align: center;">Electric shock or personal injury may occur</p> <ul style="list-style-type: none"> • Do not place the power cord near heat sources • Connect the plug to an earthed socket |

| | |
|--|--|
|  | CAUTION |
| | <p style="text-align: center;">Damage to your Cambrionix product may occur</p> <ul style="list-style-type: none"> • Operate the product only in an environment where the ambient temperature is inside the operating temperature range • Operate the product only in an environment where the relative humidity is inside the operating range • Be careful not to leave the power cord underneath a heavy object |

| | |
|---|---|
|  | ⚠ CAUTION |
| | <p style="text-align: center;">Overheated power sockets may cause a fire</p> <ul style="list-style-type: none"> • Do not overload the power socket that your hub is connected to • Insert the power plug all the way into the socket so that it is not loose |

4. Getting Started

4.1. What's Included

- 2m Mains power cable (Country specified on order)
- 0.8m USB 2.0 Type-C Updater Cable
- PDS-C4 Hub
- Power Supply Unit

4.2. Connecting to the mains

Connect the Power Supply Unit (PSU) to the hub using the 4-pin DIN plug. Connect the power cable to the PSU. Making sure you adhere to local safety regulations, connect the power cable to the 100 – 250 VAC mains power outlet and switch the hub on using the small power switch located adjacent to the power input connector on the hub. When the device is switched on, a red LED will be illuminated. The hub is now ready to charge attached devices.

4.3. Previous versions of Windows

If you are using a version of Microsoft Windows™ Windows prior to Windows 10 you will need to install

Cambrionix CDC drivers for enabling the full functionality of the hub. To install the drivers please detach the hub from the PC before executing the downloaded installer. The installer will prompt you for permission to install drivers signed by Cambrionix, please agree to this.

Once the installer has completed the installation of the drivers you may attach your hub.

Download the file at: <https://www.cambrionix.com/software-archive>

4.4. Registration

You may register your product at www.cambrionix.com to download LiveViewer and our API.

4.5. Help and Support

FAQs and help can be found on the Help page here

- www.cambrionix.com/help_pages/help.

You can raise a support ticket for more in depth support here

- www.cambrionix.atlassian.net/servicedesk/customer/portals

You can also download any of our manuals and keep up to date at the link here

- www.cambrionix.com/product-user-guides

5. Using your PDS-C4

5.1. Using without connecting to a host computer

When the Hub is switched on and is not connected to a local host computer it is automatically configured to charge devices using its intelligent charging algorithm. Simply connect the devices to be charged to any of the available ports (not the Host Port) using USB - compliant cables.

Once the devices are connected, the algorithm will detect the highest charge rate allowable for each attached device. Charging at the optimum rate (up to 3A) specified by the manufacturer will commence once profiling is complete. Depending on the state of charge of the device attached, this may take tens of seconds.

5.2. Using when connected to a host computer

5.2.1 Charging

When the Host Port is connected to a local computer, the hub defaults to Sync mode and charge currents are determined according to USB Implementers Forum (USBIF) Super-Speed USB3.0 specifications. If the attached device complies with USB-IF Battery Charging specification BC1.2 and supports Charging Downstream Port (CDP), the hub can provide high-speed charging at up to 3A. If the connected device does not comply with BC1.2, the charge current will be limited to 500 mA in compliance with USB specifications.

5.3. Data Transfer

If you wish to transfer data, change applications, restore or update your mobile device, a data connection to a local host computer is required. The hub works independently to the Operating System (OS) and data transfer can be performed to all common mobile operating systems, such as iOS™, Android™, Chromebook™ and Microsoft Windows™. In order to transfer data, connect the host port to your local (host) computer using a Type-A to Type-A USB2.0 (or higher) compliant cable. Any devices connected to the hub will now appear as if they were connected to the host computer's USB port. The hub is fully compliant with High Speed USB2.0 and

supports data transfer at speeds up to 480Mbps. The red power LED may flicker when the hub is syncing.

You can now use the programme of your choice to transfer data to and from your device. Please note that USB specifications require a minimum 100 mA charge current to be delivered during data transfer. As indicated in above, if the attached device has a BC1.2 compliant CDP port, the device can draw up to 3A while transferring data.

5.4. Scalability

If you wish to synchronise more devices, multiple hubs can be connected together to allow more devices to be managed from a single host computer simultaneously.

In order to daisy-chain multiple hubs, each hub needs to be connected to mains power individually and the first hub in the chain should be connected to the local computer through the hubs' "host port". The Host port of the next hub in the daisychain is then connected to any of the first hubs downstream USB ports. More hubs are added in the same way.



5.5. Manage Ports & Your PDS-C4

Each port on your PDS-C4 can be managed either individually or all together. You can turn the ports off and on, change the port mode or change the charging profiles. This can be done either through LiveViewer or by connecting to the hub via the API.

5.5.1 Port Modes

| | |
|---------|--|
| Charge | Turn specific ports or the whole hub to charge only mode |
| Sync | Turn specific ports or the whole hub to sync mode |
| Biassed | Detect the presence of a device but it will not sync or charge it. |
| Off | Turn specific ports on or off or switch the whole hub on or off. |

5.5.2 Charging Profiles

To ensure attached devices charge at their optimum rate, our smart USB hubs come with the below intelligent charging profiles built in:

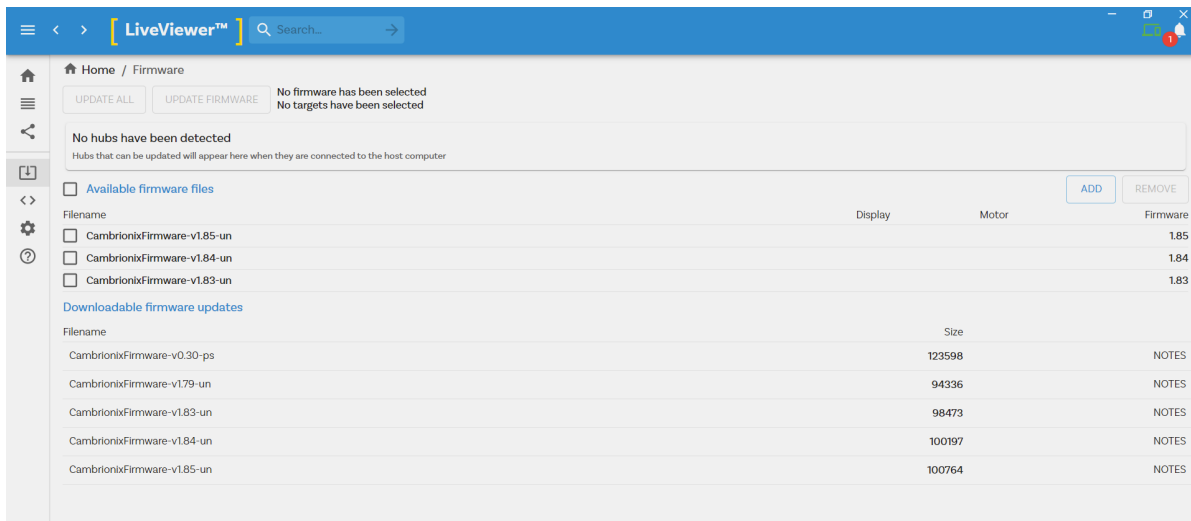
| | |
|---|-----|
| 1 | 15W |
| 2 | 27W |
| 3 | 45W |
| 4 | 60W |

5.5.3 Firmware


The firmware can be kept up to date using our LiveViewer software. As part of delivering an easy user experience our LiveViewer application is now a set-and-forget solution. The LiveViewer application will find out what firmware your USB hub has and present an update for you, ready to just hit install.

To update the firmware first go to the firmware updater section of LiveViewer. Here you can see the available Firmware versions available to download and install to the hub. To download a firmware file click on the version under the "downloadable firmware updates" section. once downloaded it will appear in the "Available firmware files" section.

The current firmware version on the hub is displayed in the firmware updater section alongside the hubs name. This will appear red if a newer version is available or green if it is the most up to date.



To install the firmware onto the hub simply click the hub/ hubs connected that you want to update and then select the firmware version you want to upgrade to. Once selected press the update button at the top and the update will commence.

| | |
|---|---|
|  | CAUTION |
| | <p>Your Cambrionix Firmware may get corrupted</p> <ul style="list-style-type: none"> • Do not interrupt the Firmware update process |

5.6. Software

More productivity, saving you time. Cambrionix provides three interfaces by which the Hub can be monitored and managed:

- LiveViewer
- Cambrionix API
- Command Line Instructions

5.6.1 LiveViewer

LiveViewer is an Application that can be downloaded from www.cambrionix.com/products/liveviewer . Once downloaded and installed on the host computer, LiveViewer allows you to switch the ports on and off, set the port to charge only, or to sync mode. LiveViewer’s home page shows the following information about all the ports:

- Status (attached/disconnected)
- Mode (Charge/Sync/Off)
- Profile (Charging profile)
- Duration (how long the device has been attached)
- End time (time the battery reaches a threshold (full) level)
- Current (instantaneous charge current in mA)
- Energy (present energy rate)

Tick boxes adjacent to each port symbol allow that port mode to be changed. When the port is in Sync mode, only instantaneous current can be monitored through LiveViewer. When the port is in Charge mode, the charge profile, instantaneous current, energy rate, duration of charge and end time are displayed. In addition to individual port information and control, LiveViewer displays the hub rail voltages, time since switched on, total instantaneous current and power, and temperature. Further information on LiveViewer is available on our website.

5.6.2 Cambrionix API

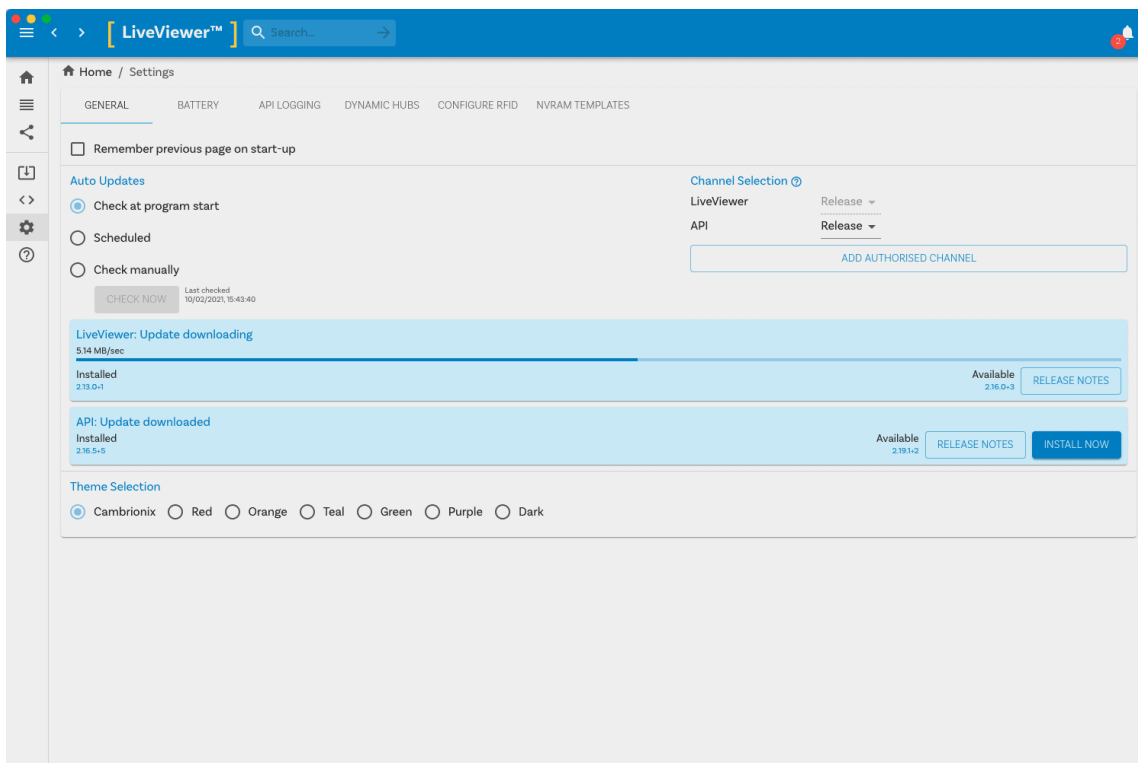
Cambrionix API allows you to monitor and control each port in more detail and to integrate these functions into your own workflow processes. The API comprises a daemon that can be downloaded from www.cambrionix.com/products/api and installed on the host machine. Port information and control can be provided through the API using JavaScript Object Notation (JSON) Remote Procedure Calls (RPC) over TCP. JSON-RPC calls send a request to the API to “Get” port, device or Hub information, or “Set” port functions (such as mode). A library of

sample Python code can be obtained from www.cambrionix.com/products/api to help you integrate many of these functions into your process workflow alongside the full User Guide.

5.6.3 Updating Software

By using LiveViewer you will be able to automatically download and install the most up to date software (LiveViewer and the Cambrionix API)

By going into the settings section on the left hand side of LiveViewer you can navigate to the general tab and under this can see the options for keeping both LiveViewer and the API up to date.



You can select when you would like the automatic software checks to take place or if you prefer can change to a manual update selection. You can also select which version of the software you would like to use between the options of Alpha, Beta or Release.

When you have some software updates available you can select install now to begin the installation process, a progress bar will appear to show the installation status. From this bar you can also view the release notes for the version of the software you are looking at.

5.6.4 Command Line Instructions (CLI)

Command Line Instructions can also be used to control and monitor the functions of the hub and attached devices over a VCP (Virtual COM Port). In order to use the command line interface a serial terminal emulator must be installed on the host computer. Examples include Serial, ZTerm, PuTTY, and Minicom. If you would like more information please look at our more in depth information here www.cambrionix.com/cli

Once you have installed your preferred terminal emulator, please connect to the hub's COM port using 115,200 baud, 8 data bits, No Parity, 1 Stop Bit. Once you get a command prompt, type “help” for a list of commands and their usage, as shown below:



| Command | Action |
|-----------------------|--|
| mode <m> [p] | Set mode <m> for port [p] or all ports |
| mode c <p> [cp] | Set charge mode for a port <p> with optional profile [cp] to enter immediately |
| state [p] | Show state for port [p] or all ports |
| system | Show hardware and firmware information |
| health | Show voltages, temperatures, errors and boot flag |
| cef | Clear error flags |
| sef [flags] ... | Set error flags |
| crf | Clear rebooted flag |
| limits | Show voltage and temperature limits |
| list_profiles | List all profiles on system |
| en_profile <i> <1 0> | Enable (1) or disable (0) profile <i> |
| set_profiles <p> [l] | Set profiles <l> associated with port <p> |
| sec [arm disarm] | Set or reveal security mode |
| host [auto manual] | Show if USB host is present, and set mode change |
| id | Show id string |
| bd | Board description |
| logc <s> | Report mA for each port every <s> seconds |
| loge [s] | Report state for all ports every [s] seconds and events as they occur |
| | Live view (periodically updated screen showing system state) |
| remote [exit kexit] | Enter or exit mode where console is controlled by terminal |

| Command | Action |
|-----------------------------------|---|
| ledb <p> <row> <ptn> | Set individual LED on row <row>, port <p> to flash bit pattern <ptn> |
| leds <row> [ptnstr] | Set flash pattern of a string of LEDs on row <row> to string <ptnstr> |
| keys | Read key click event flags |
| lcd <row> <col> <str> | Write string <s> to LCD at row <row>, column <col> |
| clcd | Clear LCD |
| beep [ms] | Make console beep for [ms] milliseconds |
| cls | Clear terminal screen |
| reboot [watchdog] | Reboot (optionally by using watchdog timeout) |
| serial_speed [test fast slow] | Change serial interface speed |
| set_delays | Change internal delays |
| host [auto/manual/charge/sync/off | Show if USB host is present, and set mode change |

| Notes | |
|------------------------------|--|
| [p] is port number | Range 1....16. Omit for 'all' |
| <m> is port mode | c=Charge, s=Sync, o=Off, b=Biassed |
| < > is a list of profile IDs | Blank to use all profiles |
| <i> is a single profile ID | |
| Parameters | Optional parameters are shown in [] Compulsory in < > |
| Tab key | Re-runs previous command |
| Cursor up | recalls last command |

5.7.Cleaning your PDS-C4

Cleaning the product is generally not required, although in some instances it may be necessary if excess dirt/ dust/ hair has accumulated, or if minor liquid spillages have occurred on the module during operation or storage.

| | |
|---|--|
|  |  CAUTION |
| | <p>Electric shock or personal injury may occur</p> <ul style="list-style-type: none"> • If there is a dirt/ spillage over a ventilation slot, external data/ power connector or product aperture, please remove power from the unit without touching the liquid and contact Cambrionix immediately |

- Ensure that the product is switched off and the power cord is removed from the product. Hold the power cable by the plug and do not touch either the plug or the power cord with wet or damp hands as an electrical shock may result
- Wipe the product with a clean, dry and soft cloth. Do not use detergents which contain alcohol, solvent or surface-active agents. Do not spray water or detergent directly onto the product
- Wet a soft and dry cloth in water and wring thoroughly to clean the product as required
- Dry the product thoroughly once the cleaning has finished
- Reconnect the power cord and use your product as advised once cleaning and drying is complete

6. Product Specifications

6.1. Input Power

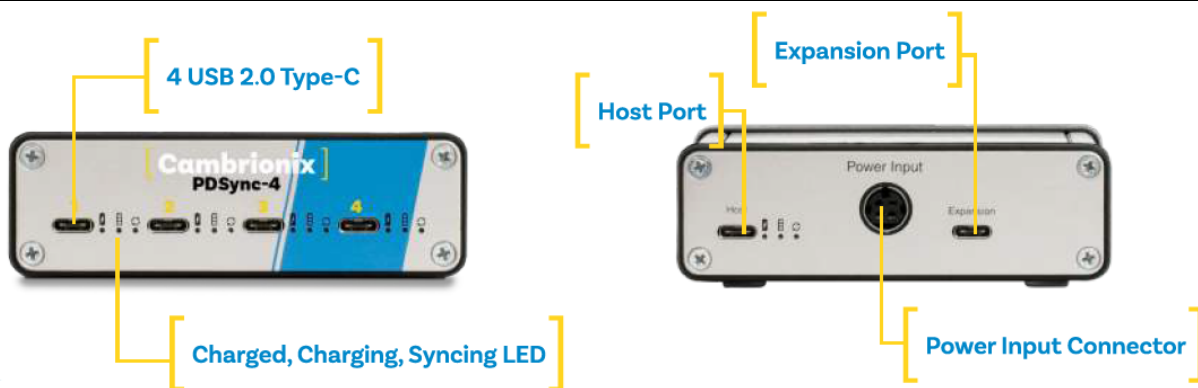
| | |
|------------------|-----------|
| Input Voltage | 24Vdc |
| Input Current | 15A |
| Input Connection | 4-pin DIN |

6.2. Output Power

| | |
|-------------------------------|-------------|
| Output Voltage | 21V Maximum |
| Output Current (Max per Port) | 3A |
| Output Power (Max per Port) | 60W |
| Output Power (Total) | 200W |

6.3. Physical specifications

| | |
|-------------------------------------|--|
| Input Connectors | 1x USB 2.0 Type-C + 1 x USB2.0 Type-C Expansion port |
| Output Connectors | 4 x USB 2.0 Type-C |
| Maximum Data Speed | 480 Mbps |
| Ambient Operating Temperature range | 0-35 °C |
| Relative humidity | 5% to 95% non-condensing |
| Dimensions | 132 x 106 x 34mm |
| Weight | 1.6kg |



6.4. Power Supply Specifications

| | |
|------------------|---------------|
| Input Voltage | 100-250Vdc |
| Input Current | 2.5A @ 115VAC |
| Input Frequency | 50-60Hz |
| Input Connector | C14 |
| Output Voltage | 24V |
| Output Current | 8.5A |
| Output Power | 200W |
| Output Connector | 4-pin DIN |

7. Compliance and Standards

- CB Certificate
- CE Tested and marked
- China CCC Certification
- FCC Part 15 Tested and marked
- Housed within a UL94-VO specification fire enclosure
- Japanese PSE certification (pending)
- RoHS Compliant
- Independently safety tested by the Underwriters Laboratory (UL) under file #E346549

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