



User Guide

CentrePoint Data Hub

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Overview

CentrePoint Data Hub

The CentrePoint (CP) Data Hub from ActiGraph is a home-based communication gateway capable of transmitting both one-minute epoch level and raw data captured by ActiGraph GT9X Link activity monitors to the CentrePoint cloud software platform via LTE cellular network. The CP Data Hub also functions as a charging hub for ActiGraph Link activity monitors. This User Manual contains instructions on how to set up, operate, and manage your CentrePoint Data Hub.



Getting Started

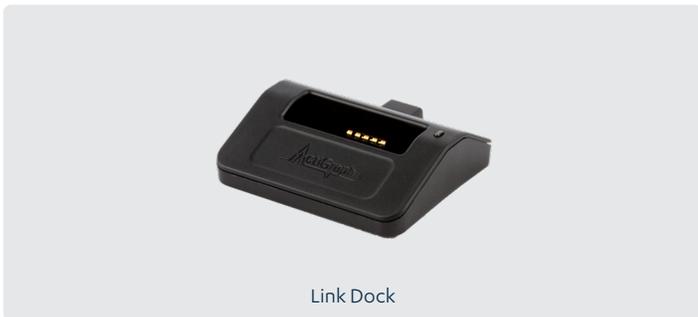
Your CP Data Hub package contains the items listed below. A CentrePoint user account and ActiGraph Link activity monitor are required to use the CentrePoint Data Hub and must be purchased separately.



CentrePoint Data Hub



Power Cable



Link Dock



USB Cable

You will also need:



ActiGraph Link and Accessories (Not Included)



CentrePoint Account (Not Included)

Assigning the CentrePoint Data Hub to a Subject

1

Pair the CP Data Hub with the ActiGraph Link

- 1 Follow the instructions in the [CentrePoint User Manual](#) or your custom Site Manual to assign the ActiGraph Link activity monitor to a new subject in CentrePoint. After the assignment is complete, remove the Link from the dock (connected to your PC).
- 2 Connect the adapter end of the power cable into the back of the CP Data Hub and plug the other end into a wall outlet, using the international adapter if necessary.
- 3 The blue LED status light on the back of the CP Data Hub will flash during startup. It may take up to 20 seconds for the LED to begin to flash. Once the CP Data Hub connects to the cellular network, the blue LED will stay on solid.



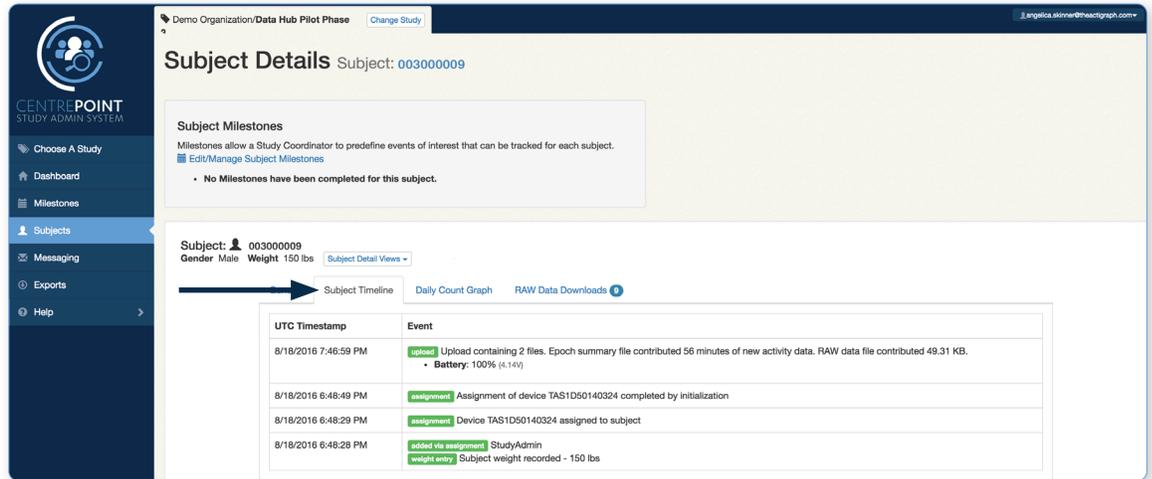
- 4 Connect the Link dock to the USB port on the CP Data Hub using the USB cable.
- 5 Insert the Link into the dock connected to the CP Data Hub. Once connected, a progress wheel will appear on the Link screen indicating that data upload has begun. A checkmark will appear on the Link screen when this is complete.



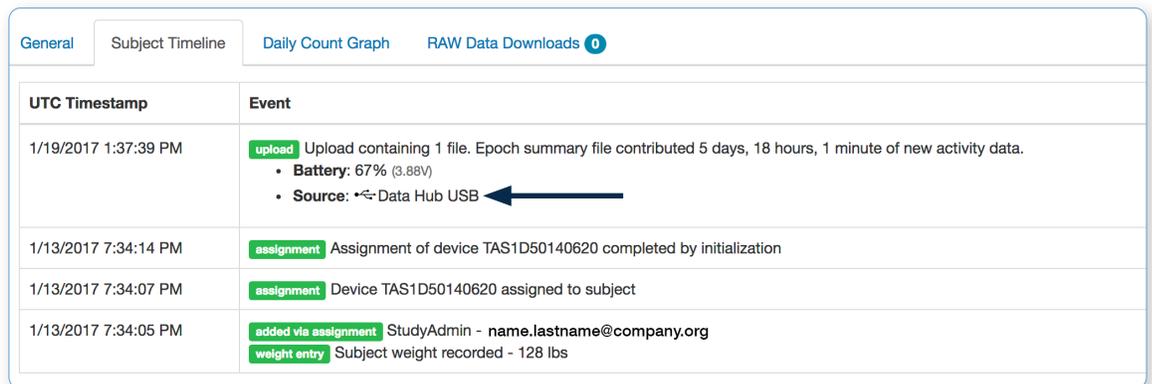
2

Verify connection and upload status in CentrePoint

- 1 On the CentrePoint website, go to the “Subject Details” page and select “Subject Timeline.”



- 2 Verify that an upload has occurred via Data Hub USB. The ActiGraph Link and the CP Data Hub are now paired.



- 3 Remove the ActiGraph Link from the dock. Give the activity monitor, CP Data Hub, dock, and cables to the subject and provide specific instructions for wearing, charging, and uploading data.

1

Setting up the CP Data Hub in the home (instructions for subjects)

- 1 The CP Data Hub should be placed in a location where the subject spends a lot of time.
- 2 Connect the adapter end of the power cable into the back of the CP Data Hub and plug the other end into a standard wall outlet, using the international adapter if necessary.
- 3 The blue LED status light on the back of the CP Data Hub will flash during startup. It may take up to 20 seconds for the LED to begin to flash. Once the CP Data Hub connects to the cellular network, the blue LED will stay on solid.
- 4 If the CP Data Hub cannot connect to the cellular network (or if it loses connection), the blue LED will continue to flash. If this continues for more than two minutes or occurs throughout the day, move the CP Data Hub to a new location.
- 5 Once the CP Data Hub is successfully connected, plug the Link dock into the USB port on the side of the CP Data Hub.

The CP Data Hub performs wireless uploads of summary data using Bluetooth®, and raw data is uploaded via USB connection. Please reference this Helpdesk article for more information about the difference between raw and summary data.

<https://actigraph.desk.com/customer/portal/articles/2830405-raw-and-summary-data-explained>

2

Wireless uploads (Bluetooth®)

If the CP Data Hub has been configured for wireless Bluetooth® uploads, it will periodically attempt to connect to the ActiGraph Link wirelessly when the activity monitor is within range, which is approximately 30 meters. Once connected, the CP Data Hub will download one-minute epoch summary data from the ActiGraph Link.

- 1 If a full day's worth of data is downloaded, it will be immediately transferred to the CentrePoint system via LTE cellular network.
- 2 If only a partial day is downloaded via Bluetooth®, the CP Data Hub will store that data until a full day is queued. The data will then be uploaded to CentrePoint.

Note: CentrePoint Data Hub default settings require a full day of data before an upload is initiated, however this can be configured for each study.

3

Raw data uploads (USB)

The CP Data Hub can be used to upload raw actigraphy data using the Link dock.

- 1 Insert the ActiGraph Link into the connected dock with the logo facing up. A progress wheel will appear on the ActiGraph Link screen once the upload begins.
- 2 When the upload is complete, a checkmark will appear on the screen. This can take several minutes to several hours, depending on how much data is on the device. The ActiGraph Link can now be removed from the dock.



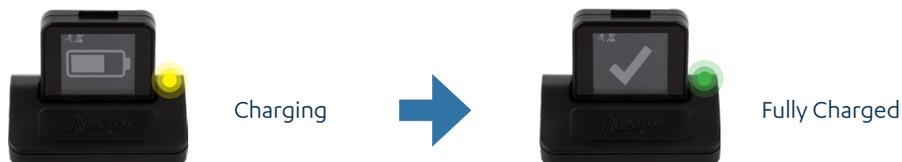
- 3 Summary one-minute epoch data and the raw data file (if applicable) are immediately available in CentrePoint. See "**Viewing uploaded data**" section below.

4

Charging the activity monitor

The CP Data Hub charges the ActiGraph Link battery anytime it is placed in the connected dock.

- 1 During charging, an animated battery icon will appear on the ActiGraph Link screen and the charging dock will display a yellow LED.
- 2 Charging is complete when the LED turns green.



- 3 If the dock displays a red LED, this indicates a charging problem. Remove and reinsert the activity monitor in the dock.
- 4 It takes approximately 2-3 hours to charge a fully depleted battery.

1

Viewing upload details

- 1 All CP Data Hub data uploads (wireless and raw data) are instantly logged in the “Activity Feed” on the “Study Home Dashboard” page.

The screenshot shows the 'Study Home Dashboard' for 'Demo Organization/Data Hub Pilot Phase 6'. The dashboard includes a navigation sidebar with options like 'Dashboard', 'Milestones', 'Subjects', 'Messaging', 'Exports', and 'Help'. The main content area features a 'Study Details' section with '1 Site' and '1 Subject', a 'User Guide' section, and a 'Quick Actions' section. The 'Activity Feed' section is highlighted with a blue arrow and contains a list of data uploads:

Date	Time	Status	Event
3/25/2017	about a month ago	upload	Uploaded data for Subject 111
3/25/2017	about a month ago	upload	Uploaded data for Subject 111
3/24/2017	about a month ago	upload	Uploaded data for Subject 111
3/24/2017	about a month ago	upload	Uploaded data for Subject 111
3/23/2017	about a month ago	upload	Uploaded data for Subject 111
3/23/2017	about a month ago	upload	Unloaded data for Subject 111

- 2 To view detailed upload information for a subject, go to the “Subject Details” page and select “Subject Timeline.” Each timestamped data upload is logged and the amount of new data, activity monitor battery level, and upload source (CP Data Hub Bluetooth® or USB) are provided.

The screenshot shows the 'Subject Details' page for 'Demo Organization/Demo Study'. The page includes a 'Subject Milestones' section, a 'Subject's activity monitor is collecting data...' notification showing '109 days, 00:35:15', and a 'Subject Timeline' section. The 'Subject Timeline' is highlighted with a blue arrow and contains a table of data uploads:

UTC Timestamp	Event
3/25/2017 5:49:46 PM	upload Upload containing 1 file. Epoch summary file contributed 11 minutes of new activity data. • Battery: 11% (3.66V) • Source: Data Hub Bluetooth
3/25/2017 5:39:02 PM	upload Upload containing 1 file. Epoch summary file contributed 23 hours, 51 minutes of new activity data. • Battery: 11% (3.66V) • Source: Data Hub USB
3/24/2017 5:47:31 PM	upload Upload containing 1 file. Epoch summary file contributed 11 minutes of new activity data. • Battery: 14% (3.67V) • Source: Data Hub Bluetooth
3/24/2017 5:36:38 PM	upload Upload containing 1 file. Epoch summary file contributed 23 hours, 52 minutes of new activity data. • Battery: 22% (3.7V) • Source: Data Hub USB

2

Viewing uploaded data

- 1 After the CP Data Hub performs a successful data upload (Bluetooth® or USB), the epoch summary data is immediately available to view.
- 2 From the “Subject Details” page, select “Subject Data Report” from the dropdown list to view daily wear compliance, calories, and steps. Select the date link to view minute by minute daily details.

Subject Details Subject: 111

Subject Milestones
View, Edit, Manage and Mark Subject Milestones
No Milestones have been completed for this subject.

Subject 111 [Edit Subject]
DOB 10/6/1977 Gender Female Weight 128 lbs Name 111 First Name Last Name

Activity Monitor
TAS1D50140620 Assigned: 1/13/2017
Wear Position Left Wrist
Collecting Data

Mobile Sync
View or Add Mobile Devices
0 devices active

Sleep
View or Add Sleep Periods
0 sleep periods

Subject Data Report (Selected)

Study Information
Organization Demo Organization
Study Data Hub Pilot Phase 6
Site [Link]
Timezone (UTC -6:00)

Day Summary
Total Data Days 59 of 72 days
First Day of Data 1/13/2017
Last Day of Data 3/25/2017

Subject Data Report

Subject 111
DOB 10/6/1977 Gender Female Weight 128 lbs Name 111 First Name Last Name

About This Report
This report provides an actigraphy data analysis and wear compliance summary for the subject. Data is summarized for each date range (e.g. visits, milestones) and also shown for each day. CentrePoint looks for patterns in the data captured by the activity monitor and classifies time periods of wear or non-wear. The non-wear periods are removed from analytical results (e.g. calories).
Study protocol:
• Wear compliance criteria for this report: Minimum daily wear = 12 hours
• Wear time validation algorithm: Troiano (2007)

Data Range Summary Data is summarized for each date range (e.g. visits, milestones)

Date Range	Wear Compliance	Calories	Steps
All Subject Data 1/13/2017 - 3/25/2017	29 of 71 compliant days	1,035 avg calories	4,092 avg steps

All Subject Data Date range: 1/13/2017 - 3/25/2017

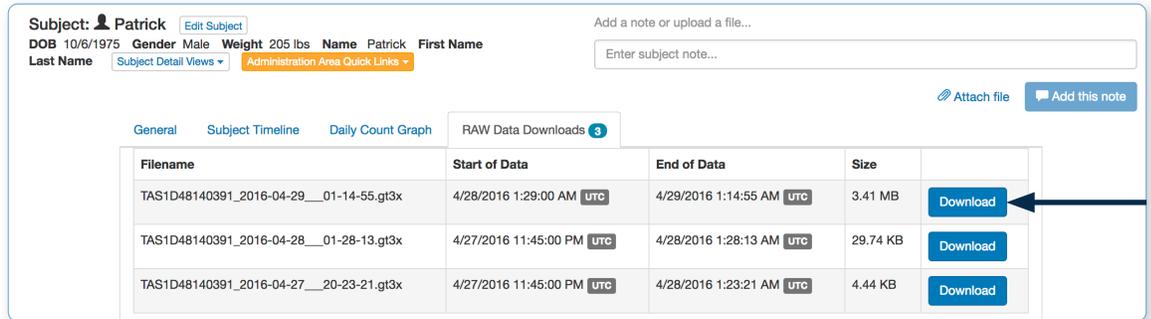
Wear %
This graph shows the percentage of time the activity monitor was worn each day. Study minimum daily wear represented in green. Calculated using Troiano (2007) Wear Algorithm.

Calories
This graph represents energy expenditure (kCal) for each day. Calculated using Freedson VMS Combination (2011).

Steps
This graph represents the total steps for each day.

Managing the CentrePoint Data Hub in CentrePoint (Continued)

- 3 If raw data has been uploaded via the CP Data Hub (USB), the file can be downloaded by going to the “Subject Details” page and selecting the “Raw Data Downloads” tab. Select the desired file(s) and click download. The raw data is stored in a .gt3x file, which can only be opened using the ActiLife desktop analysis software.



The screenshot shows the 'Subject Details' page for a subject named Patrick. The 'RAW Data Downloads' tab is active, displaying a table with three rows of data. Each row includes a filename, start and end dates with UTC indicators, and a file size. A 'Download' button is present for each file. An arrow points to the 'Download' button for the first file.

Filename	Start of Data	End of Data	Size	
TAS1D48140391_2016-04-29__01-14-55.gt3x	4/28/2016 1:29:00 AM UTC	4/29/2016 1:14:55 AM UTC	3.41 MB	Download
TAS1D48140391_2016-04-28__01-28-13.gt3x	4/27/2016 11:45:00 PM UTC	4/28/2016 1:28:13 AM UTC	29.74 KB	Download
TAS1D48140391_2016-04-27__20-23-21.gt3x	4/27/2016 11:45:00 PM UTC	4/28/2016 1:23:21 AM UTC	4.44 KB	Download

Note: CentrePoint is a role-based system and certain user types can be configured to view wear compliance data only.

1

The CentrePoint Data Hub (CP Data Hub) leverages several technologies to facilitate the reliable transfer of both raw and summary data collected by ActiGraph activity monitors and other connected health sensors.



Bluetooth®

Data transfer from peripheral devices to the CP Data Hub is supported by a dual-mode Bluetooth® Smart Ready (v.4.0) (Classic and Low Energy) chipset capable of data rates approaching 25 Mbit/s. This is sufficient for capturing continuous-time epoch level (1 sample/minute/axis) activity data throughout the day without the need for user interaction.



USB 2.0

Raw activity data (up to 100 activity samples/second/axis) is transferred to the CP Data Hub through a USB 2.0 high-speed connection (480 Mbit/s), which is capable of handling the large data payloads generated by ActiGraph's activity monitors while simultaneously charging the device battery.



Cellular

Data collected from in-home peripherals are transferred via cellular network into ActiGraph's secure CentrePoint study management system. The CentrePoint Data Hub leverages a global UMTS/HSPA/GSM LTE cellular radio capable of operating on a global scale with supported data-rates of 7.2 Mbit/s (down) and 5.76Mbit/s (up) in an extended operating range of -0 to +60 C. Fallback bands include GSM 850/1900 and 900/1800 MHz; GPRS Class 12 CS1-CS4 (up to 85.6 kbit/s); EDGE Class 12, MCS1-9 (up to 236.8 kb/s); CSD GSM (max 9.6 kb/s); and UMTS (max 64 kbit/s). Certifications and approvals include PTCRB, GCF, FCC, IC, R&TTE, RCM Anatel, and AT&T.



Ethernet

An optional 10/100 Base-TX ethernet connection is also available for non-cellular applications.



Microprocessor

The CentrePoint Data Hub core processor is a 32-Bit ARM® Cortex®-A8 RISC Microprocessor (IC Sitara™) supporting an embedded Linux OS.



Data Security

All protected health information (PHI) is encrypted and stored securely in the ActiGraph cloud database. Connections are made securely using PKCS #1 SHA-256 with RSA Encryption. No PII is transferred.



Power

The CentrePoint Data Hub has a power rating of 5V and 2.5A. V means DC voltage.



Temperature

The CentrePoint Data Hub has a temperature range of 0°C to 60°C.

2

Regulatory statements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation. Changes or modifications not expressly approved by ActiGraph, LLC will void the user's authority to operate the equipment under FCC regulations.

- *FCC Part 15.107 – AC Conducted Emissions*
- *FCC Part 15.109 – Radiated Emissions*
- *FCC Part 15.207 – Modular Transmitter AC Line Conducted Emissions*
- *FCC Part 15.249 – Radiated Emission Limits of Intentional Radiators*

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 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*

3

Regulatory symbols



CAUTION: Do not simultaneously wear and charge, service, or provide any maintenance on the product.

CAUTION: Transporting or operating this product outside of the temperature range of -20°C to 40°C could lead to dangerous conditions.

CAUTION: Modification to ActiGraph products are not permitted and will void all warranties if tampered and/or modified. Do not modify the product in any way.

CAUTION: Do not swallow any part of this product. If a piece has been swallowed, contact your local poison control hotline or seek medical attention as soon as possible.

NOTICE: No precautions need to be taken in the event of changes in the performance of the product.

NOTICE: Product does not have any contraindication(s)

NOTICE: Only ActiGraph approved accessories should be used with this product.



Emergo Europe
Prinsessegracht 20
2514 AP The Hague
The Netherlands

Authorized Representative in European Community

Indicates the authorized representative in the European Community.

AUSTRALIAN SPONSOR

Emergo Australia
Level 20, Tower II
Darling Park
201 Sussex Street
Sydney NSW 2000
Australia

ActiGraph's Australia Sponsor

Indicates ActiGraph's authorized Australian Sponsor.



Catalog Number

Indicates the manufacturer's catalogue number so that the medical device can be identified for reordering.



CE Symbol

By affixing the CE marking to a product, a manufacturer declares that the product meets all the legal requirements for CE marking and can be sold throughout the EEA. ActiGraph's products abide with the Medical Device Directive 93/42/EEC and Radio Equipment Directive 2014/53/EU.



Consult Instructions for Use

Indicates the need for the user to consult the instructions for use.



Serial Number

Indicates the manufacturer's serial number so that a specific medical device can be identified.



Manufacturer

ActiGraph is the medical device manufacturer and is located at 70 North Baylen Street, Suite 400, Pensacola, Florida 32502.



Temperature Limit

Indicates the temperature limits to which the medical device can be safely exposed.



Recycle: Electronic Equipment

Indicates the medical device should not be disposed of in the trash. Contact ActiGraph Customer Service regarding the disposal of these products.



Lithium Ion (EU)

Indicates the lithium ion battery within the device should not be disposed of in the trash. Contact ActiGraph Customer Service regarding the disposal of these batteries.

1 CP Data Hub LED behavior

- **Blinking blue light:** The CP Data Hub is attempting to connect to the cellular network. If the blinking blue light lasts more than several minutes or happens intermittently throughout the day, move the CP Data Hub to a different location in the home.
 - **Solid blue light:** The CP Data Hub is connected to the cellular network and working properly.
 - **Red light:** The CP Data Hub is not working. Contact your study/site team to report the problem.
- 2 If the CP Data Hub is disconnected from a power source, be sure to wait at least 10 seconds before plugging it back in.

Please contact support@theactigraph.com with questions and for technical assistance.



TheActiGraph.com

Please contact our Customer Support Team with any questions or for additional information about operating the CentrePoint Data Hub.

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U.S. federal law restricts this device to sale by or on the order of a physician.