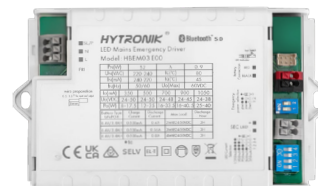


Product Description

HBEM03 ECO is a compact, dimmable Bluetooth LED driver with integrated emergency control, delivering a comprehensive solution for intelligent emergency lighting. It can be used as a built-in or standalone unit for flexible installation.



Properties

- Self - contained Emergency & LED drivers combination
- Non-maintained and maintained operations
- Mains & Emergency output (2W/3W/4W) selection via DIP switch
- It is dimmable via switch - dim or Koolmesh app in maintaining mode
- Active PFC design
- Abnormal protection for short-circuit, overload and open-circuit
- SELV classified (indicator LED, battery pack, test switch)
- Customized manual test switch (single press, long press)
- Battery Life Prediction and abnormal protection
- Wireless scheduling of monthly and annual EM tests via Koolmesh app
- Ideal for main lighting fixtures with emergency function requirements
- Provide insulating cover accessories for standalone installation
- 5 years guarantee

Emergency Features

 Emergency working mode:

- Normal emergency mode
- Rest mode
- Inhibit mode
- Extended emergency mode

 Monthly/Annually Automatic Testing with report generation

 Battery status check via Koolmesh app

 Automatic email notification when fault is detected

 Retrievable usage data and report history

Batteries

- LiFePO4 batteries (BPC83/BPC84)
- Battery safeguarded from overcharge, deep discharge, and overheating
- 5 year design life for battery (up to 30 °C ambient temperature)
- 2 years guarantee (For battery compatibility refer to the Battery specifications)

*<https://hytronik.com/emergency-led-drivers-inverters/bpc83>

*<https://hytronik.com/emergency-led-drivers-inverters/bpc84>

App Features

-  Emergency report generation and diagnosis
-  Quick setup mode & advanced setup mode
-  Web platform for project deployment & data analysis
-  Koolmesh Pro iPad for on-site configuration
-  Floorplan feature to simplify project planning
-  One-key device replacement
-  Device social relations check
-  Staircase function for quick setup
-  Remote control via Hytronik gateway
& touch screen HPAD-TSJASE1
-  Heat map
-  Grouping luminaires via mesh network
-  Scenes
-  Schedule
-  Astro timer (sunrise and sunset)
-  Power-on status (memory against power loss)
-  Offline commissioning
-  Bulk commissioning (copy and paste settings)
-  Different permission levels via authority management
-  Network sharing via QR code or keycode
-  Interoperability with Hytronik Bluetooth product portfolio
-  Internet-of-Things (IoT) featured
-  Device firmware update over-the-air (OTA)
-  Alert for excess lux / temperature
/ humidity via multi-meter HBLM01
-  Seamless integration with BMS via Hytronik BMS gateway
-  Test mesh network connection quality
-  Compatible with Shelly emergency metering
-  Continuous development in progress...

Koolmesh® - Operating Guide

Bluetooth® 5.0 SIG mesh



Smartphone (ios)



Smartphone (Android)



iPad



Web

*For additional information, including project and network, device, and scenes, please refer to: <http://faq.koolmesh.com/faq/en/index.html>

Bluetooth® Kinetic Switch



HBKS01

HBKS02

HBKS03

HBKS01D

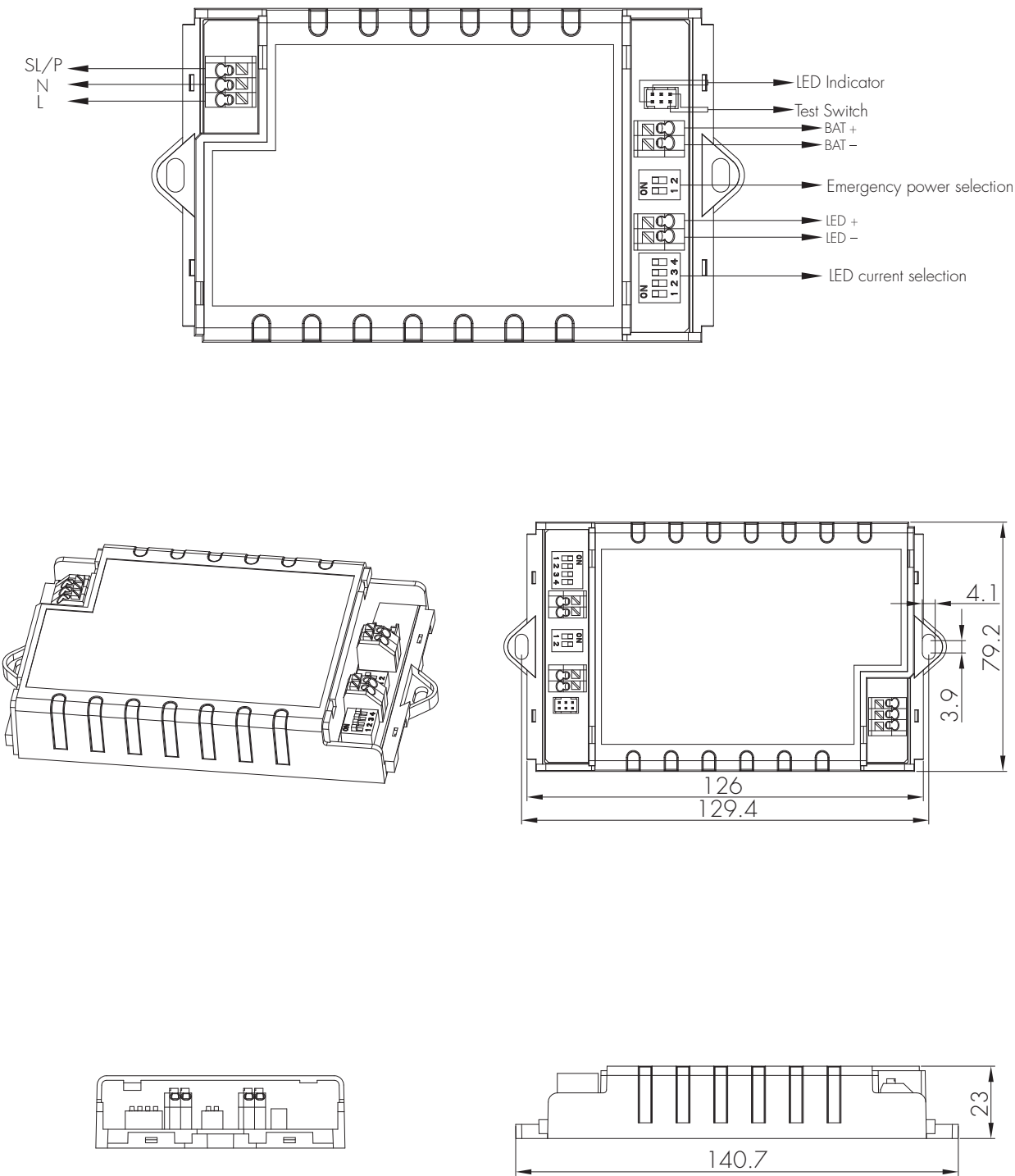
HBKS02D



EnOcean
Self-powered IoT

Fully support EnOcean self-powered switch module
PTM215B (HBES01/W & HBES01/B)

Mechanical Structure & Dimensions



Technical Specifications

Input & Output Characteristics	
Operating voltage	220~240VAC 50/60Hz
Input current	240~220mA
Max. Driver output power	40W
Max. emergency output power	4W
Efficiency	88%
Uout Max.	60V
Power factor	>0.9
Main output (Wattage/Current/Voltage)	8-17.5W / 350mA / 24-50V 12-25W / 500mA / 24-50V 16-33.5W / 700mA / 24-48V 16-40.5W / 900mA / 24-45V 25-40W / 1050mA / 24-38V
Emergency output (Wattage/Current/Voltage)	2W / 85-40mA / 24-50V 3W / 125-60mA / 24-50V 4W / 160-80mA / 24-50V
In-rush current (I _{max} .)	18A
Pulse time	80 μs

Bluetooth Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	4 dBm
Range (Typical indoor)	10~30m
Protocol	Bluetooth® 5.0 SIG Mesh

Environment	
Operation temperature	T _c : 0~+50°C
Storage temperature	T _c : -40~+70°C
Case temperature (Max.)	T _c : +85°C
IP rating	IP20

Safety & EMC	
EMC standard (EMC)	EN55015, EN61547, EN61000-3-2, EN61000-3-3, EN300328, EN301489-17
Safety standard (LVD)	EN61347-1, EN62493, EN61347-2-7, EN62034, IEC62133
Certification	CE, UKCA, RCM, ROHS

Circuit Breaker Information

Circuit breaker type	B16A	B10A	B13A	B20A
HBEM03 ECO	40 pcs	25 pcs	32 pcs	50 pcs

*Calculation uses typical values from ABB series S200 as a reference. E.g. Maximum amount = $16 / (P_n / 230)$. We recommend to use no more than 60% of the data as the actual max. number of drivers in real application. Actual values may differ due to used circuit breaker types and installation environment.

DIP Switch

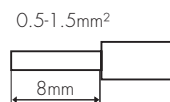
LED Current Selection

1050mA	● ● ● ●
900mA	● ● ● ○
700mA	● ● ○ ○
500mA	● ○ ○ ○
350mA	○ ○ ○ ○
	1 2 3 4

Emergency power Selection

4W	● ●
3W	● ○
2W	○ ○
	1 2

Wire Preparation

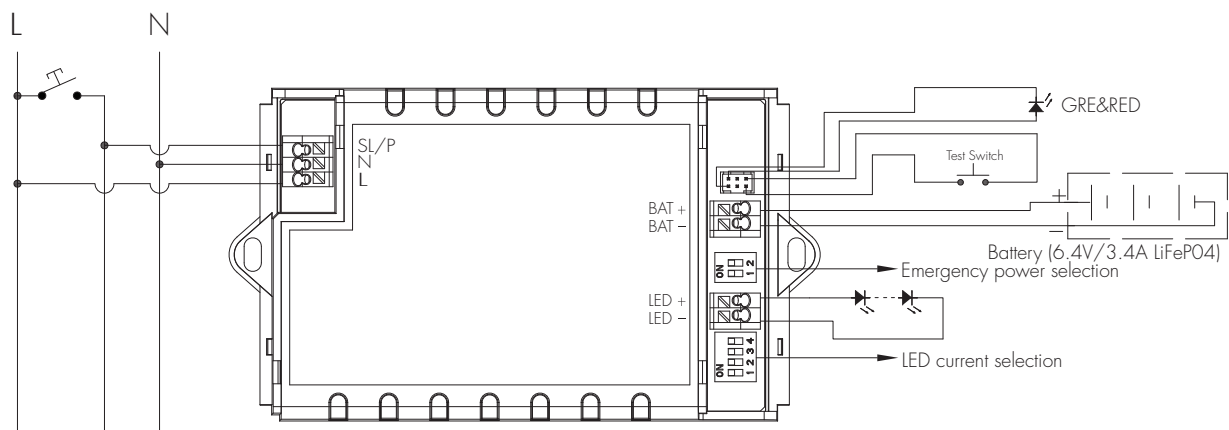


Solid or Stranded wire type 0.5 - 1.5mm²

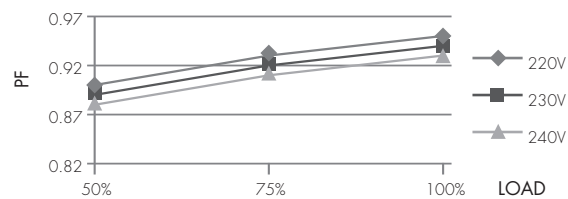
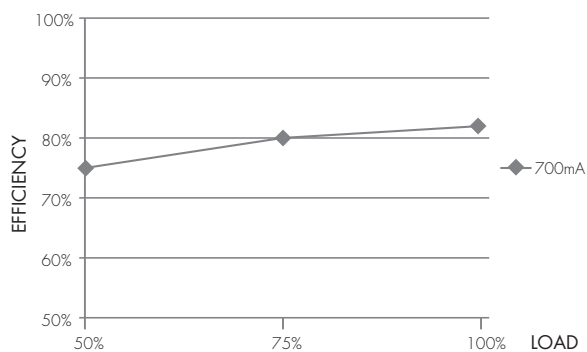
To make or release the wire from the terminal, use a screwdriver to push down the button.

Wiring Diagram

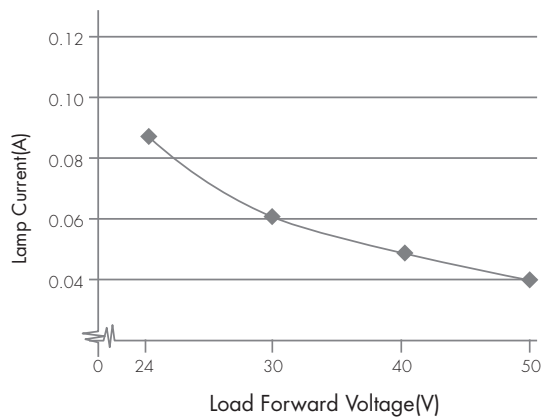
220-240Vac
50/60HZ



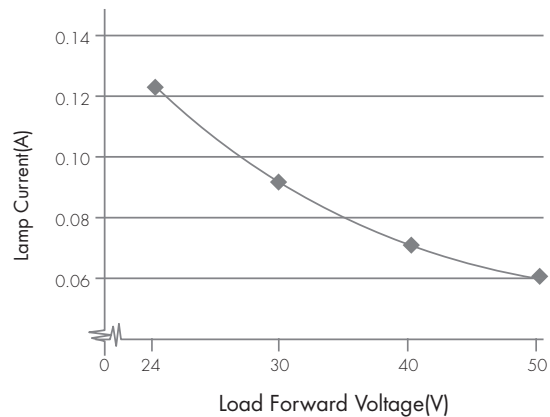
Performance Characteristics

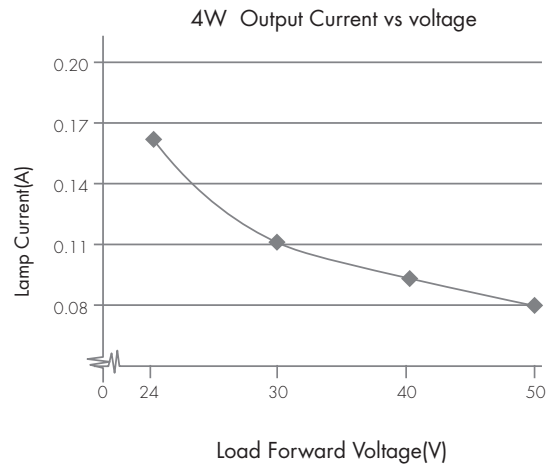


2W Output Current vs voltage

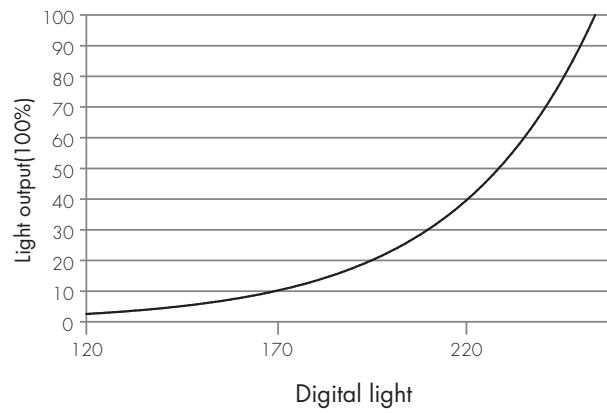


3W Output Current vs Voltage

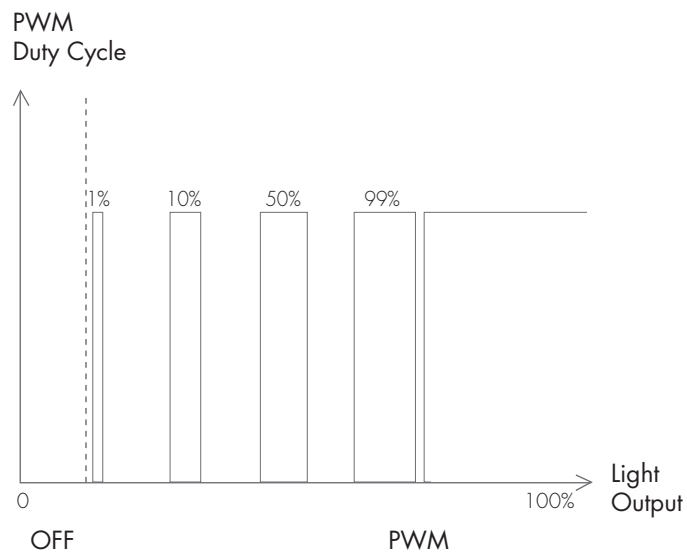




Dimming Characteristics



Dimming Profile



Dimming range	Dimming technique
0%	OFF
1-100%	PWM

Operating Modes & Self-Test Functions

Normal Mode

It is the mode in which mains supply is available, with the battery charged or charging. In this mode, HBEM03 ECO is a combined Bluetooth LED driver, with ability to create scenes and controllable by motion sensor, Push switch and app.

Emergency Mode

It is the mode in which mains supply has failed and whilst the control gear is powered by the battery until deep discharge point. In this mode, HBEM03 ECO is unable to be controlled by motion sensor, Push switch and app. However, some emergency parameters can still be configured via the app, such as time scheduled for self-test, duration for extended emergency mode etc.

Rest Mode

It is the mode in which the luminaire is intentionally off whilst the control gear is powered by the battery. To enter this mode, the prerequisite is that there is no mains supply. In this mode, the luminaire will be turned off automatically and HBEM03 ECO is powered by the battery. If the luminaire is forced to turn on in this mode, HBEM03 ECO will then be adjusted to emergency mode. When mains supply is recovered, HBEM03 ECO will return to normal mode.

Inhibit Mode

It is the mode in which HBEM03 ECO is powered from the mains but prevented from going into emergency mode in the event of mains failure. Please enter this mode only in special applications whereby emergency function is not needed, such as when electrician needs to cut off power supply when doing examination and maintenance work for HBEM03 ECO.

Extended Emergency Mode

It is the mode in which the control gear continues to operate the lamp in the same way as in emergency mode for the programmed prolong time after the restoration of the mains supply. When this mode is enabled, HBEM03 ECO will remain in emergency mode even when mains supply is recovered. In this mode, the user has to set the time extended for emergency mode; when the time extended elapses, HBEM03 ECO will then return to normal mode.

Self test (Monthly)

HBEM03 ECO carries out routine test on emergency lighting based on pre-programmed time via the app or after receiving manual commands from the app. During the self test process, tests for load connections (such as open circuit, short-circuit) and battery connections (such as open circuit, short-circuit, polarity reversal etc.) will be carried out.

Self test (Annually)

The test is carried out mainly to check the battery level. The user has to make sure that the battery for HBEM03 ECO is fully charged before HBEM03 ECO carries out annual test. Also, the battery lifetime statistics will be analysed and displayed on a chart basis.

Battery Installation and Protection

Battery Pack Options		
Picture		
LED indicator & Test switch		
Battery pack	BPC83	BPC84
Battery Type	LiFePO4	LiFePO4
Discharge current	6.4V, 3.6AH	6.4V, 3.6AH
Size (mm)	105*53*27.5	174.8*26.5*29
Battery charge current	0 - 500mA	0 - 500mA
Max. load/ Discharge hour	0.4A, 2W@24 - 50V / 3H 0.56A, 3W@24 - 50V / 3H 0.8A, 4W@24-50V, 3H	0.4A, 2W@24 - 50V / 3H 0.56A, 3W@24 - 50V / 3H 0.8A, 4W@24-50V, 3H
Recharge Time	24H	24H

- Please kindly charge battery for 24 hours before using.
- Do not short-circuit the battery pack.
- Over-discharge can damage the battery. Please avoid deep discharge and recharge promptly after emergency use.
- Do not connect the battery before installing the product. Once the battery is connected, ensure the HBEM03 ECO product powers on and operates normally within 24 hours.
- For more details on battery precautions and usage, please visit the following link:
- <https://hytronik.com/service/downloads> (LiFePO4 Battery Precautions and Usage).

Battery-Powered Bluetooth Standby

(Only applicable to Bluetooth Emergency Drivers)

To support emergency system logging and monitoring, Bluetooth-enabled emergency drivers are designed to allow the battery to directly power the Bluetooth module when mains power is not present.

During this state, the Bluetooth module typically draws ~20mA from the battery.

Please take this standby consumption into account when assessing battery life in long-term mains-disconnected scenarios.

Installation Warning for Unstable Mains Supply

(Important for on-site building installations)

During building installations, mains supply may not be available on a continuous 24-hour basis. If the battery is connected under such conditions, it may lead to uncontrolled and excessive charge/discharge cycles, which significantly shorten the design life of the battery.

To prevent premature battery wear, ensure the battery remains disconnected until a stable 24-hour mains power supply is available. Please refer to the corresponding emergency driver datasheets for behavior under intermittent power supply.

This warning must be clearly communicated to the installation staff and electricians to ensure proper commissioning practices on-site.

LED Diagnostics

Indicator Colour	Status	Meaning
GREEN SOLID	Device OK	All OK, AC power is present. Battery is connected & charging
GREEN FAST FLASH (0.1s ON, 0.1s OFF)	Monthly test/Functionality test	AC power is present. Monthly test in progress
GREEN VERY SLOW FLASH (1s ON, 1s OFF)	Annual test/Duration test	Annual test are being carried out
RED SOLID	Emergency LED fault	Emergency LED is open circuit, short circuit or has otherwise failed in some way,. Fault can indicate the live status or the result of a test
RED SLOW FLASH (1s ON, 1s OFF)	Battery fault	Battery failure (Battery failed the duration or functional test, battery appears to be defective, battery has incorrect voltage).
RED /GREEN OFF	No power available	AC power is lost, unit in emergency mode

*If you want to see the diagnostic report, please go to the APP or web platform to see the full report and analysis

Note: Before powering on, please plug in the sensor head and then plug in the battery, otherwise the sensor is disabled.

Remedy: Only after the APP is reset and re-connected to the network can the sensor head be re-identified.

Additional Information / Documents

1. To learn more about detailed product features/functions, please kindly refer to
https://hytronik.com/product/hbem03_eco
2. Regarding precautions for Bluetooth product installation and operation, please kindly refer to
<https://hytronik.com/service/downloads> (Bluetooth Products Precautions for Product linstallation and Operation)
3. Regarding precautions for Emergency LifePO4 Batteries, please kindly refer to
<https://hytronik.com/service/downloads> (LiFePO4 Battery Precautions and Usage)
4. Data sheet is subject to change without notice. Please always refer to the most recent release on
<https://hytronik.com/products/emergency-led-drivers-inverters>
5. Regarding Hytronik standard guarantee policy, please kindly refer to
<https://hytronik.com/service/downloads> (Guarantee Conditions document)