Manual for Electronic Labels and Radio Modules

Read all documents and system instructions carefully to minimize the risk of injuring persons and to avoid damage to the system or damage to the environment. Always keep all documents and guidance accessible.

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An electronic label is a device that shows digital information on its display. In comparison to printed paper the information is automatically updated if object data changes. The PDi Digital electronic label family offers high-quality display options, operating with a replaceable battery, thus working without any external power supply.

The PDi Digital electronic label family can change all pixels to black, white or red/yellow – dependent on the available colors for the selected product. The current line-up has display sizes from 1.6 inch to 12.2 inch with the technologies of 2.4 GHz, NB-IoT and NFC in different combinations. They may be used in landscape and portrait mode and can be configured in terms of radio, theft protection, display protection and LED flash.

Next to the PDi Digital electronic label family, a radio module is available in order to give third parties access to the existing SES Imagotag + PDi Digital 2.4GHz infrastructure. The module is acting similar to an electronic label but has no display.

General Key Features 2.4 GHz products:

- 2.4 GHz proprietary radio protocol
- BLE Beaconing for locationing
- Radio coverage: up to 25 meters
- Bi-directional communication
- 11 available communication channels
- Ultra-low power consumption
- Customer-replaceable battery
- Full graphical e-Ink display with paper-like readability
- e-ink displays are available (Black/White, Black/White/Red, Black/White/Yellow)
- Different configurations available (theft protection, display protection, LED flash)
- Label versions for deep-freezing environments
- Super wide viewing angle (nearly 180 degrees)
- Flexible mounting options available
- May be used in landscape and portrait mode
- Fast response time
- 128-bit AES encryption with secure key exchange
- Multiple pages support with preloading and fast page switching
- Integrated Passive NFC tag

General Key Features NB-IoT products:

- NB IoT/LTE CAT M1 communication
- BLE Beaconing for locationing
- Bi-directional communication
- Low power consumption
- USB rechargeable battery
- Full graphical e-Ink display with paper-like readability
- e-ink displays are available (Black/White)
- Different configurations available (theft protection, display protection, LED flash)
- Different versions for different environmental conditions (temperature range)
- Super wide viewing angle (nearly 180 degrees)
- Flexible mounting options available
- May be used in landscape and portrait mode
- Fast response time
- 128-bit AES encryption with secure key exchange
- Multiple pages support with preloading and fast page switching
- Integrated Passive NFC tag

General Key Features NFC products:

- Passive NFC device
- Data and energy transfer via NFC Reader device or Smart Phone
- No battery
- Full graphical e-Ink display with paper-like readability
- e-ink displays are available (Black/White)
- Super wide viewing angle (nearly 180 degrees)
- Flexible mounting options available
- May be used in landscape and portrait mode

The installation instructions are intended for trained electricians who can exhibit the following qualifications:

- Knowledge of the use of tools and work instructions.
- Knowledge of the usable conditions of the tool.
- Knowledge of the electrical safety instructions.
- Knowledge of the electrical building regulations.
- Knowledge of the relevant standards.
- Knowledge of the assembly schedule.

The power supply are cell-button batteries. The following table will give you a short overview about all kinds of labels and their batteries.

Caption	Main Communication Technology	Model	Display Resolution	Active Display Area (mm)	Display colors	Usable pages	Battery Type	Operating Voltage	Nominal capacity	Wake up (seconds)	Battery lifetime 5 years with N updates per day
2.4 GHz products											
sepioo D2.6	HF	ED03-0260-A/B	296x152	60.1 x 30.7	b/w/r	12	2xCR2450	3V	1100 mAh	15	2
Bossard SmartLabel 2.6	HF	ED03-0260-A	296x152	60.1 x 30.7	b/w/r	12	2xCR2450	3V	1100 mAh	15	2
sepioo D2.7	HF	ED03-0270-A/B	264x176	57.3 x 38.2	b/w	12	2xCR2450	3V	1100 mAh	15	2
Würth iDisplay 2.7	HF	ED03-0270-A	264x176	57.3 x 38.2	b/w	12	2xCR2450	3V	1100 mAh	15	2
RECA iDisplay 2.7	HF	ED03-0270-A	264x176	57.3 x 38.2	b/w	12	2xCR2450	3V	1100 mAh	15	2
sepioo D4.2 B	HF	ED03-0420-A	400x300	84.8 x 63.6	b/w	12	3xCR2450	3V	1650 mAh	15	2
sepioo S1	HF	RMG3-RCOM-A/B	-	-	-	-	external supply	3V	external supply	15	external supply
NB-IoT products											
sepioo D12.2 B NB-IoT Indoor	NB IoT/LTE CAT M1	PDNBT001B	960 x 768	190.1 x 237.6	b/w	8	TLH 3664180	3V	5200 mAh	Customizable	Rechargable
sepioo D12.2 B NB-IoT Outdoor	NB IoT/LTE CAT M1	PDNBT001B / PDNB-1220-A/C/C2	960 x 768	190.1 x 237.6	b/w	8	ICR18650	3V	6000 mAh		
NFC products											
sepioo D2.6 NFC	NFC	PDNF-0260-A	152×296	30.7 x 60.1	b/w	1	-	3V	-	-	-

Note: battery lifetime can vary depending on the operating conditions of the labels (temperature, radio usage, reception, etc...).

General remarks

The sepioo labels must be installed according to the mounting instructions of the producer. In rare cases it may occur that the usage of wireless appliances is restricted by the building owner (e.g. Airport or Hospital). Please contact the appropriate authorities before installing the PDi Digital sepioo labels.

Environmental

General

E-Paper displays are moisture and UV sensitive. The absolute rating operating environments describes the boundary conditions for updating the display while the absolute rating storage environment (see Storage and warehousing) describes the boundary conditions for a display not updating.

	BW (2.4 GHz)	BW (NB IoT)	BW (Wide temp/Freezer)	BWR
Operating temperature	0° C to +45° C	-15° C to +60°C	-25° C to +30° C	10° C to +40° C
Operating temperature for maximum lifetime	21° C	21° C	21° C	21° C
Operating humidity	30% - 80%	30% - 90%	30% - 80%	35% - 70%

Cleaning Instructions

Clean the electronic label with the help of a damp cloth. Use only common household cleaners.
Do not clean the label with alcohol, solvents and / or abrasive cleaning products.
Note: Do not use liquid or aerosol cleaners and keep it away from water.

Temperature and Humidity Conditions

High humidity combined with low temperature are not recommended.
Low temperature will reduce the battery lifetime.

Storage and warehousing

While displays are rated to perform according to specification for the warranty period at the absolute specified operating environment, the better the storage condition, the better the E-Paper displays will perform. Like other moisture and UV sensitive components, we recommend that our labels are stored in temperature and humidity-controlled environments, and whenever possible, under below defined Optimal Storage Conditions, away from sunlight, to optimize their performance.
It is strongly recommended to observe the following points to ensure the best operation, functioning and battery lifetime:

Storage temperature and humidity

	BW	BW (NB IoT Outdoor/Indoor)	BW (Wide temp/Freezer)	BWR
Storage temperature	-20° C to +50° C	-20/-10 ° C to +60/45° C	-20° C to +50° C	-20° C to +50° C
Storage humidity	30% - 80%	45% - 85%	30% - 80%	40% - 70%
Optimal storage temperature	15° C to +35° C	15° C to +35° C	15° C to +35° C	15° C to +35° C
Optimal storage humidity (non-condensing)	40% - 60%	40% - 60%	40% - 60%	40% - 60%

- Do not operate any ESL Infrastructure (e.g. SES-imagotag AP-2010 or MAP 2014T/Lancom L-151E, …) in warehouse storing labels or where the radio coverage will activate stored labels.
    - The label will permanently try to connect to the access point, leading to less usable battery lifetime.
- The maximum storage time of labels should not exceed 0.5-1 year

If these listed limits are not complied, the specified battery lifetime can vary, and display quality can be influenced negatively.

Intended Use

All Devices need to be installed to provide a separation distance of at least 20 cm from all persons.

PDi Digital's 2.4 GHz electronic label family is exclusively designed to connect to Access Points of the company SES-imagotag or acknowledged partners via radio.
The NB-IoT product family communicates via NB-IoT or LTE CAT M1 technology where a dedicated SIM card in nano format needs to be inserted and the configuration for the device needs to be setup accordingly (APN, bands, …).
The NFC product family communicates via NFC – for this an active NFC reader device or SmartPhone is required to enable the data and energy transfer to the device.

The device may only be used in areas where the environmental fulfill the requirements described in the chapter **"Environmental"**. The products are not intended for permanent outdoor usage.

Improper use

PDi Digital is not responsible and does not assume liability for damage or injury to persons, property, environment and the PDi Digital electronic label family itself caused by improper installation or improper handling.
The operator assumes liability for any damage that results from improper use.

The following usage is not allowed:

- Don't drop electronic labels.
- Keep electronic labels away from water except they are meant to be waterproof.
- Don’t use electronic labels with defective parts.
- Don’t use electronic labels with spare parts and accessories which are not examined and approved by PDi Digital.
- Unauthorized changes or modifications to electronic labels and their components without the consent of PDi Digital are strictly forbidden.
- PDi Digital’s electronic labels do not contain parts, except batteries, that are allowed to be maintained by the user.
- PDi Digital’s electronic labels must NOT be dismantled. For necessary maintenance or repair works always contact the manufacturer.
- Don't throw electronic labels into the dustbin. Deposit electronic labels at a reprocessing company.

- Contact PDi Digital for more details about the removal process.
- Please do not use any liquid or spray cleaners directly on the surface of the electronic labels.

- PDi Digital takes no responsibility for stolen electronic labels without encryption.
- KEEP BATTERIES OUT OF REACH OF CHILDREN
- Swallowing batteries may lead to serious injury in as little as 2 hours or death, due to chemical burns and potential perforation of the esophagus.
- If you suspect your child has swallowed or inserted a button battery immediately call local Poisons Information Authority, with contact information available online.
- Don't heat, recharge or bend the battery.
- Examine devices and make sure the battery compartment is correctly secured, e.g. that the screw or other mechanical fastener is tightened. Do not use if the compartment is not secure.
- Dispose used button batteries immediately and safely. Empty batteries can still cause harm.
- Tell others about the risk associated with button batteries and how to keep their children safe.

Certificates

Hereby, PDi Digital GmbH declares that the products sepioo D2.6, sepioo D2.7, sepioo D4.2, sepioo S1 and sepioo D12.2 NB IoT are in compliance with Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at the following internet address: https://www.pdi-digital.com.com/sepioo-declaration-of-conformity

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.

CAUTION TO USERS
Changes or modifications not expressly approved by the party responsible for compliance could void the user`s authority to operate the equipment.

FCC rules apply to the following products: sepioo D2.6, Bossard SmartLabel 2.6, Würth iDisplay 2.7, RECA iDisplay 2.7, sepioo D2.7, sepioo D4.2 and sepioo S1, sepioo D12.2 B NB-IoT Outdoor

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
L'émetteur/récepteur exempt de licence contenu dans le présent appareil estconforme aux CNR d'Innovation, Sciences et Développement économique Canadaapplicables aux appareils radio exempts de licence. L'exploitation est autoriséeaux deux conditions suivantes:
1) L'appareil ne doit pas produire de brouillage;
2) L'appareil doit accepter tout brouillage radioélectrique subi, même si lebrouillage est susceptible d'en compromettre le fonctionnement.

IC standards apply to the following products: sepioo D2.6, sepioo D2.7, sepioo D4.2 and sepioo S1

NCC rules apply to the following products: sepioo D2.6, sepioo D2.7 and sepioo S1, Bossard SmartLabel 2.6 (Note: Smart Label 2.6 Bossard ED03-0260-A and sepioo D2.6 B ED03-0260-B do not support NB IoT/LTE CAT M1technology in Taiwan region)

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R-R-BOK-ED03-0260-A

Additional statement for Class A Equipment (industrial use) only:
이 기기는 업무용(A급) 전자파적합기기로서 판 매자 또는 사용자는 이 점을 주의하시기 바라 며, 가정외의 지역에서 사용하는 것을 목적으 로 합니다.

Translation: This equipment has been evaluated for its suitability for use in a commercial environment. If used in a domestic environment, there is a risk of radio interference.

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음

Translation: This wireless device may have electronic interference, it cannot be used for life-saving related services

Japan

This device is granted pursuant to the Japanese Radio Law under the grant ID n° :
219 - 230001 (Model: ED3-0270-A)

This device should not be modified (otherwise the granted designation number will become invalid)

本製品は、電波法に基づく特定無線設備の技術基準適合証明などを受けております。認証番号:
219 - 230001 (Model: ED3-0270-A)

本製品の改造は禁止されています。（適合証明番号などが無効となります。）

Complies with IMDA Standards DA105282

Singapore

The following products comply with the IMDA Standards: sepioo D2.6 B (ED03-0260-B), sepioo D2.7 B (ED03-0270-B) and sepioo D4.2 B (ED03-0420-A)