

# Nayax



## Onyx

Compact, eye-catching, contactless payment and  
telemetry device

# Onyx User Manual

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For more information contact us at [support@nayax.com](mailto:support@nayax.com)

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Revision History			
ECO #	Revision	Change Description	Owner
NX-ECO-0831	A02-000	Change of applicable regulatory information <ol style="list-style-type: none"> <li>Added appendix 2 and 3</li> <li>Added CE DoC</li> <li>Added Cellular Bands and power transmission</li> <li>Added IK information</li> <li>Added WEEE information for disposable</li> <li>Added FCC information</li> <li>Changed Power supply requirement</li> <li>Changed Flammability rating</li> </ol>	Nayax
NX-ECO-1144	A03-000	Update to CE RED regulatory requirements - Cybersecurity	Nayax

## WARNING

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## General Information

This section explains the classification of the manual and the purpose for which it is intended.

### Organization of the Manual

The user manual consists of six sections namely General Information, Device Overview, Getting Started, Appendix 1 – Tests Prior to Repair and Safety & Handling Instructions.

General Information section explains the purpose for which the manual is intended.

Device Overview section provides an overview of the device. The summary outlines the uses of the hardware and software requirements, device configuration, and device behavior in case of any contingencies.

Getting Started section explains the first steps to start using the device.

Appendix 1 – Tests Prior to Repair section describes how to resolve the most frequent issues experienced prior to sending the device to the Nayax Laboratory.

Lastly, the Safety and Handling section provides guidelines on how to clean and maintain the device.

#### **Regulatory instruction of usage**

- Before using the terminal, please check has it been disassembled, modified, or showed an abnormal situation. If yes, please do not use it.
- Please stay away from strong electromagnetic waves. (Example) Microwave ovens, magnets, shoplifting prevention devices, high-voltage wires, automatic doors, communication antennas, etc.
- Condensation can occur when moving from a cold place to a warm place. If condensation occurs, do not use the unit until the connected water droplets evaporate.
- Static electricity may occur in some places (such as where you use a carpet).
- Please do not leave it exposed to direct sun for a long time.
- Please operate the unit carefully as it is a precision instrument. Do not apply impact, drop, or heavy objects on top of the unit.
- Do not attach dust, oil, etc. to a part of the power terminal. Also, please do not scratch.

## Device Overview

The device overview section provides an overview of the device, feature highlights, device specifications and much more.

### Device Summary

A complete M2M telemetry and contactless payment solution ideally suited for the unattended machine in various applications. This contactless device accepts all modes of cashless payments and processing methods in real-time:

- Debit and credit cards
- Mobile and NFC payments
- Prepaid cards and closed environment solutions

### Feature Highlights

- Encryption algorithms and protocols supported: AES/DES/RSA/SHA-1/SSL
- Anti-Vandal with Dragontrail glass
- Decorative round lighting
- ARM Technology – 2x Cortex, 32 bit, 180/216MHz

## Device Specifications

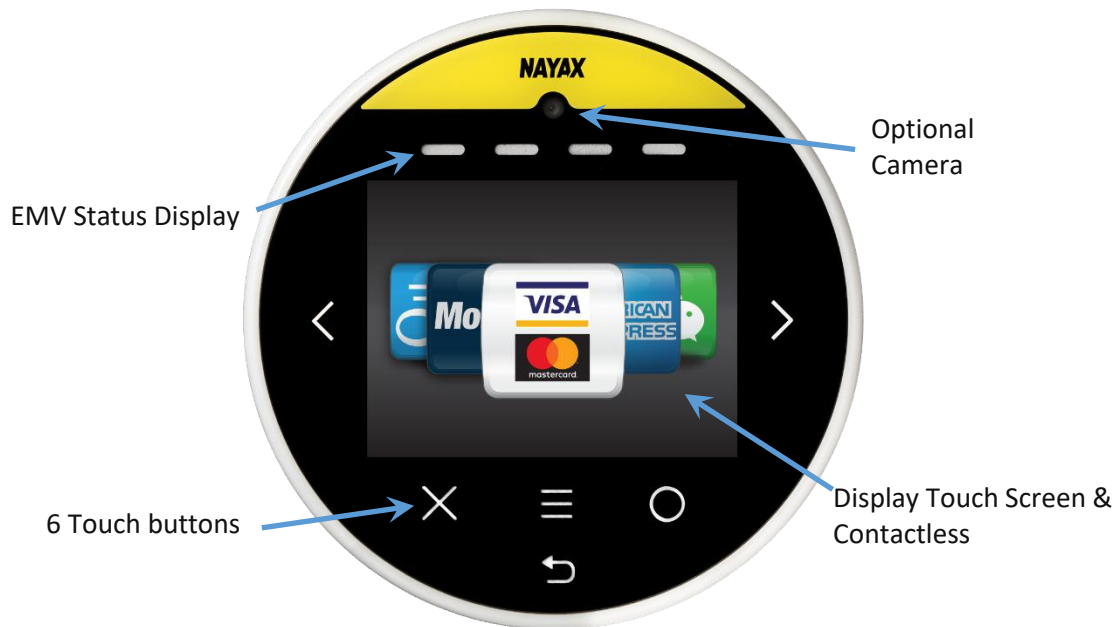
Installation Environment		
Operating Temperature	-20 °C to +55 °C	-4°F to +131°F
Storage Temperature	-40 °C to +85 °C	-40°F to +185°F
Humidity	25% to 95% (non-condensing)	
Dust & Water Resistance	IP 55	
Flammability	UL94-V2	
Regulatory Compliance	CE, FCC, RoHS	
Physical Dimensions		
Diameter	85 mm	3.3 inch
Depth	28 mm	1.1 inch
Main Features		
Display Screen	High quality color Touch LCD Display 2.4 inch IPS, 400nits 320 x 240 pixels + 4 LEDs + 6 Touch buttons	
Architectutre	ARM Technology – 2xCortex, 32 bit, 180/216MHz	
Audio	Speaker + Buzzer	
Localization	Multi language support - LCD text & voice audio instructions	
Security	Support DES, 3DES, AES, RSA, ECC, SHA1 algorithms, Random Number Generator	
Power Supply	12-42V DC, 12-24V AC; 5 Watts	
Power Consumption	Recommended External Power Supply: 24V DC / 2Amp.	
Anti-Vandal	Dragontrail glass	
IK Shock Protection	IK06	
Power-loss protection	Super capacitors for safe shutdown mechanism	

Communication & Interfaces	
<b>External Interface</b>	Ethernet, 2 X RS232 (RS232 or TTL level through SW), USB Device, External reader
<b>Contactless</b>	13.56 MHz : NFC, MIFARE, ISO 14443 Type A and B, ISO 15693
<b>Pulse Input/Output</b>	6 pulse input/output interfaces + 1 Inhibit input
<b>External Sensors support</b>	1 Door open & 1 Temperature
<b>Communication</b>	3G/4G/Ethernet/NFC
<b>Machine Protocols</b>	MDB / DEX / DDCMP / Pulse / VCCS / ccTalk / JVMA
Payment	
<b>Contactless</b>	EMV Level 1
	Level 2: Visa payWave, MasterCard PayPass, UnionPay qPBOC, AMEX ExpressPay, JCB J/Speedy, Discover D-PAS, CUP QuickPass

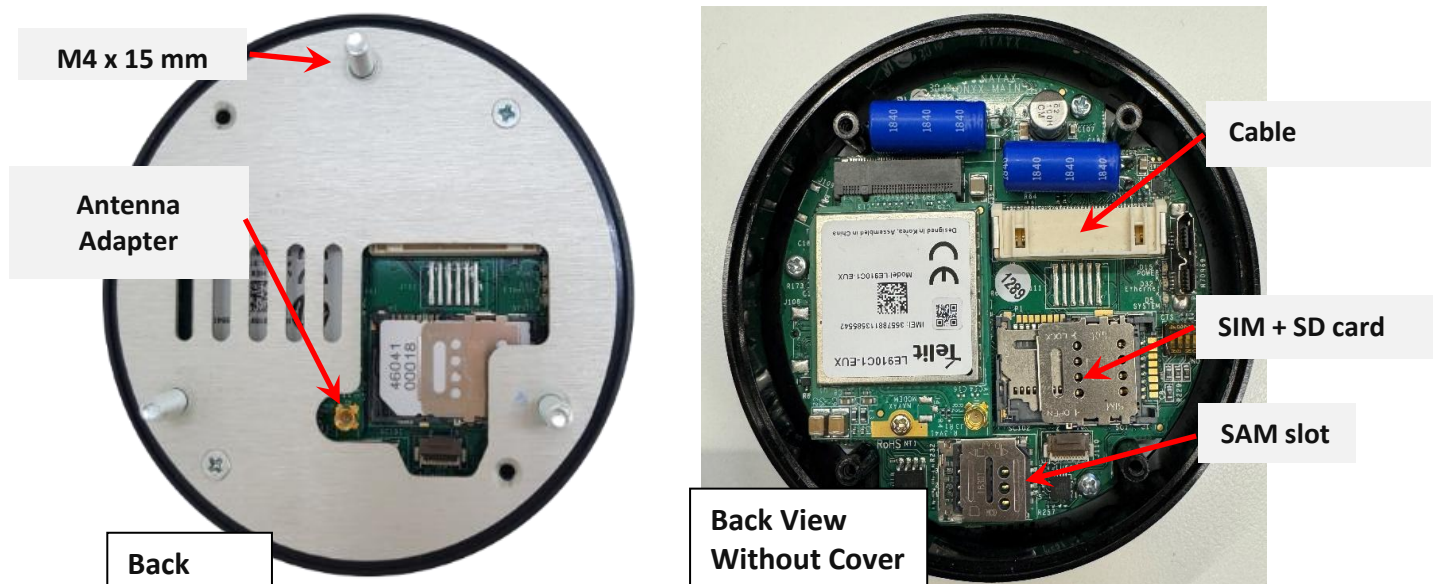
## Device Components

### Front Panel

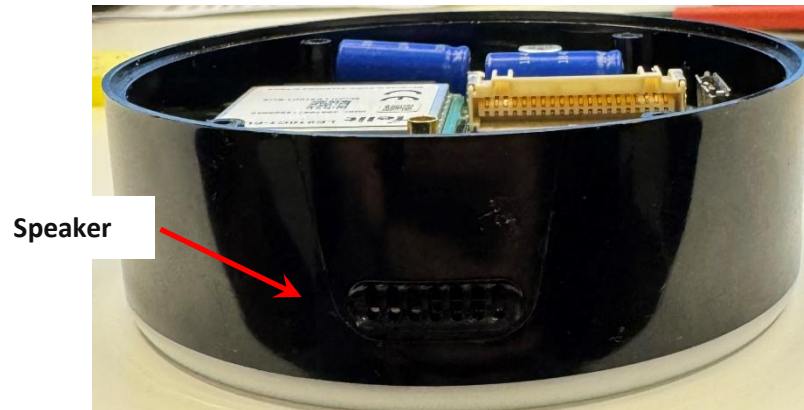
Front Panel Color - Yellow / Black



### Rear Side







## Device 2D Scheme



NYX PARTS 05 (Block) ASSY

## Touch Button








The Onyx employs six touch buttons:

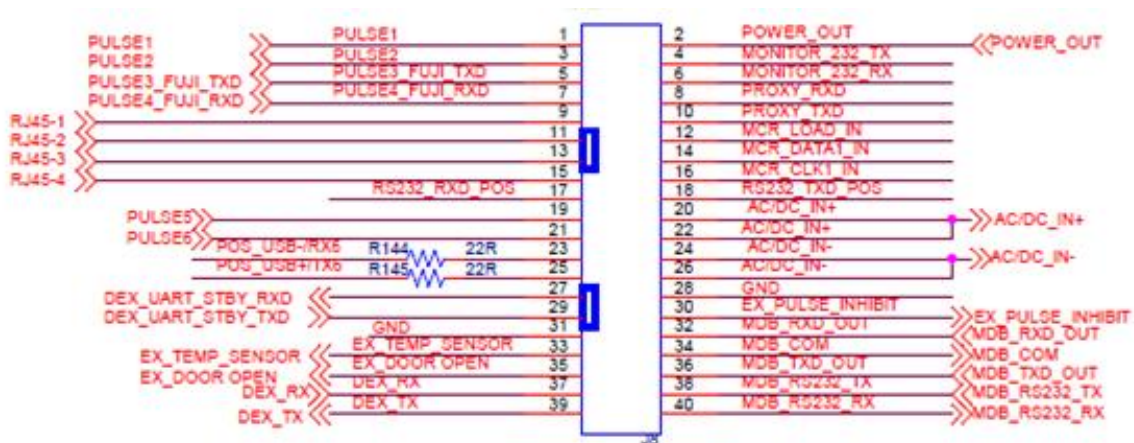
- Right and left arrows allow you to move between the different views or menus.
- Menu – go into different parameters, technician mode, language, terminal info, etc.
- Cancel button – Cancel of transaction or close sub menu.
- Select – select item from menu.
- Back – return to previous menu.

## Device Cables

Nayax provides different configuration cables to suit different machines. The below table refers to each cable and its configuration.

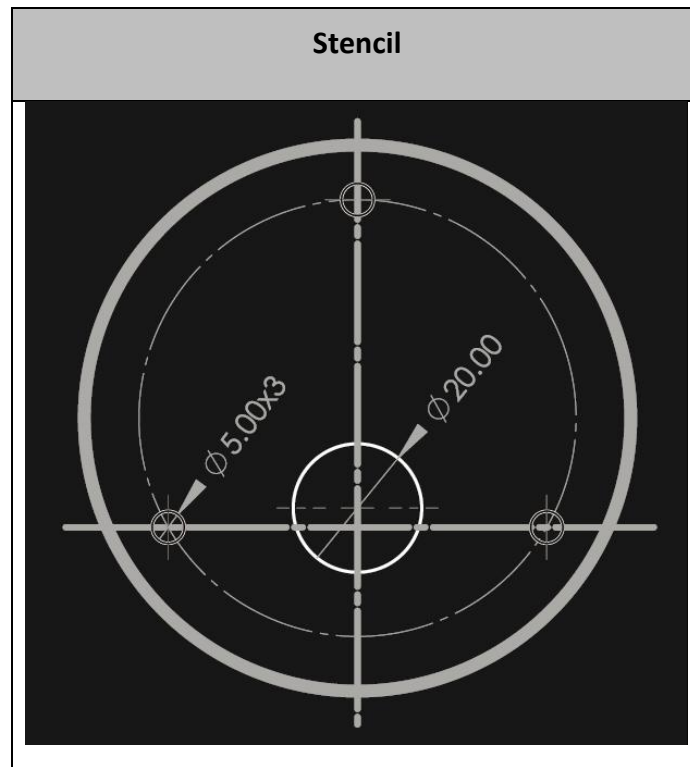
Image	Connector	Connect to
	MDB	MDB at vending machines
	DEX	DEX
	RS232 DB9 Female Output	Serial
	Device 40-pin	Nayax Onyx
	LAN	LAN cable

## Device Connector Scheme (40-Pin)

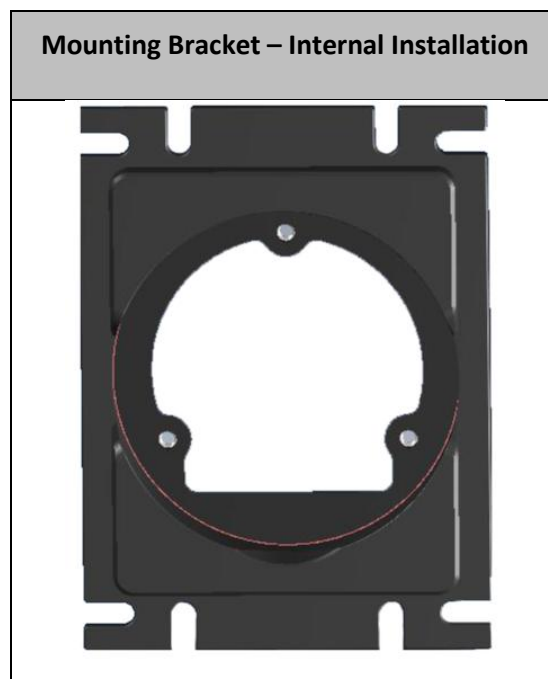


PIN	Name	Type	Description
1	PULSE1	Bidirectional	20V
2	POWER_OUT	Supply	5V/1A Out
3	PULSE2	Bidirectional	20V
4	MONITOR_232_TX	Data	RS232 Rx
5	PULSE3_FUJI_TXD	Bidirectional	20V
6	MONITOR_232_RX	Data	RS232 Rx
7	PULSE4_FUJI_TXD	Bidirectional	20V
8	PROXY_RXD	Data	Proximity Rx 5V
9	RJ45-1	Data	Ethernet Tx+
10	PROXY_TXD	Data	Proximity Tx 5V
11	RJ45-2	Data	Ethernet Tx-
12	MCR_LOAD_IN	Input	TTL
13	RJ45-3	Data	Ethernet Rx+
14	MCR_DATA1_IN	Input	TTL
15	RJ45-4	Data	Ethernet Rx-
16	MCR_CLK1_IN	Input	TTL
17	RS232_RXD_POS	Data	RS232 Rx
18	RS232_TXD_POS	Data	RS232 Tx
19	PULSE5	Bidirectional	20V
20	AC/DC_IN+	Supply	Power Input
21	PULSE6	Bidirectional	20V
22	AC/DC_IN+	Supply	Power Input
23	POS_USB-/RX6	Bidirectional	USB2.0 - 5V
24	AC/DC_IN	Supply	Power Input
25	POS_USB+/TX6	Bidirectional	USB2.0 + 5V
26	AC/DC_IN	Supply	Power Input
27	DEX_UART_STBY_RXD	Data	DEX RS232 Rx
28	GND	Supply	Ground
29	DEX_UART_STBY_TXD	Data	DEX RS232 Tx
30	EX_PULSE_INHIBIT	Input	5V
31	GND	Supply	Ground
32	MDB_RXD_OUT	Data	MDB UART Rx
33	EX_TEMP_SENSOR	Input	0-5V
34	MDB_COM	MDB Supply	MDB Common
35	EX_DOOR_OPEN	Input	5V
36	MDB_TXD_OUT	Data	MDB UART Tx
37	DEX_RX	Data	DEX RS232 Rx
38	MDB_RS232_TX	Data	MDB RS232 Tx
39	DEX_TX	Data	DEX RS232 Tx
40	MDB_RS232_RX	Data	MDB RS232 Rx

## Additional Accessories (Included in Box)



## Additional Accessories (Optional)



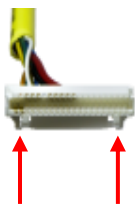
## Getting Started

The Getting Started section briefly explains how to install the device on the machine, the operating and testing process and the different screens.

## Installation

The latest Installation Guide version is currently available and can also be downloaded from NayaxVend. The Onyx Quick Guide has been included in your box for your quick reference.

## Device Dismantling



To unplug the Onyx connector, you must press both sides of the releasing bridge at the same time to avoid damaging the releasing bridge.

## Operating and Testing

### **Pro Tip**

*Before performing any checks, make sure that the machine is loaded with products and that the prices are updated in the system.*

1. Turn on the machine.
2. Once the Onyx is powered-up, a Self-Test is automatically initiated that performs a SIM card and Server Connectivity check.



**Note:** *If the device is not installed correctly, you may see an error message*

3. Once the Onyx is fully initialized, carry out the following trial purchases.
  - a. Cash /Credit Purchase
  - b. E-money (E.g. A prepaid card transaction)
  - c. Canceled transaction to confirm that credit is not retained.

**Once all purchases are successfully completed, the unit is fully installed and ready for use!**

### **Pro Tip**

*In case you need to send your device to the Nayax Laboratory for review, refer to the **Error! Reference source not found. Error! Reference source not found.** Prior to Repair.*

## Configure Onyx Settings in NayaxVend

- Refer to the below attributes used to configure the Onyx device in the NayaxVend system.
- Payment Methods - Controls the type of payments that are displayed on the Welcome screen (VISA, Mastercard, Apple Pay, Samsung Pay, etc.)
- Support WEB - Displays the website that is visible under the Menu - Contact Us function.
- Support Phone Number - Displays the phone number that is visible under the Menu - Contact Us function.
- Technician Code - Controls the pin code to access the Technician mode screen.
- Menu Timeout - Controls the timeframe (in seconds) for the unit to return to the Welcome screen after the menu button is pressed.
- Menu Functions - Controls the options to be displayed when the Menu button is pressed. It is possible to disable the Menu button entirely or display only the selected features such as:
  - I. Technician Mode
  - II. Report a Problem
  - III. Contact Us
  - IV. Device Info
  - V. Nutrition Facts
  - VI. Languages

## EMV Indication LEDs

The Onyx includes 4 green led indications for EMV transaction.

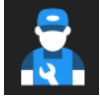
Appearance from left to right:

1. Green led lite if device is ready for transaction.
2. Green led lite once payment card is presented.
3. Green led light once transaction is being processed.
4. Green led lite once transaction is approved.





## Technician Mode



To enter the **Technician Mode** either present the Technician Card in the Idle mode or click the **Triple Bar** from the Menu. Click the **Technician Mode** button and then enter the **technician code** and click the green **OK** button.

### Technician Mode Commands

Under the technician mode, three different screens are visible.

The first screen consists of two buttons that are configured by logging into the Management Suite – NayaxVend DCS.

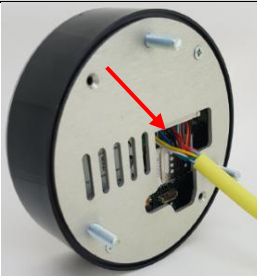


The next two screens consist of a pre-defined collection of options that are listed below:

Icon	Icon Name	Description
	Cash Collection	Indicates to the server that cash was collected
	Poll	Initiates Keep Alive communication with the server
	Reboot	Checks for updated device version in the boot server
	Inventory Fill	Indicates to the server that the machine inventory was filled
	Fee	Defines the extra charge (convenience fee) for various payment methods
	Reset	Restarts the Onyx firmware
	Read Audit File	Initiates DEX read from the machine and sends it to the server
	Advanced Settings	Configure additional Nayax device parameters
	Modem Info	Displays modem details, version info, reception level, and so on
	View Audit	Displays DEX file on screen
	Volume	Adjust the audio volume level
	Language Settings	Set the audio and text languages

## Appendix 1 – Tests Prior to Repair

The below procedure needs to be carried out by the Operator before sending the device to be fixed at the Nayax laboratory.

1. Connect the Onyx **Cable Connector** to get power from the machine – Refer to below Image 1.
2. Once the device starts to load, the following initiation messages are displayed:
  - I. **FW OK**
  - II. **Init mdm**
  - III. **RSSI 99** - In this case there are three options to proceed:
    - a. **RSSI 99** - Check the **External Antenna Adapter** connected to the board  
- Refer to Image 2
    - b. **(SIM) / RST** – This could refer to a SIM issue. In that case, confirm that the Sim socket is closed securely and if required, try to replace the SIM card - Refer to Image 3
    - c. **RSSI => 10** – This is normal, and you can proceed to the next step.
  - IV. **Mobile operator**
  - V. **Init GPRS**
  - VI. **TCPIP OK**
  - VII. **Gloader Test** – In case you need to install a new Firmware Version it will run:
    - a. **Gloader x.x.x TCPIP OK**
    - b. **Running FW ... TCPIP OK**
  - VIII. **Nayax**
  - IX. **Ready**

Image No.	Title	Image	Description
1.	Onyx Connector		Onyx cable connector (same connector for both MDB and Pulse cables).  <b>Note:</b> To disconnect the connector, press the latch (indicated with an arrow) before pulling out the cable.
2.	External Antenna Adapter		The External Antenna adapter connects to the board and to the external antenna that is provided by Nayax.
3.	Sim Socket		The SIM socket is opened by pulling up and closed by pulling down the socket.

3. Test payment for contactless cards. In case of an error, send it the Nayax Laboratory for further tests.

## Appendix 2 - FCC & IC Compliance Statement

This device complies with part 15 of the FCC Rules. The 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.

**i** **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.

**i** **Note:** *The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. such modifications could void the user's authority to operate this equipment*

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

This device complies with Industry Canada RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) il ne doit pas produire de brouillage et

(2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter, except tested built-in radios.

Cet appareil et son antenne ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, exception faites des radios intégrées qui ont été testées.

### **Radiation Exposure Statement**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body.

### **Déclaration d'exposition aux radiations**

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

The Onyx IDs are:

- FCC ID: 2AK6L- ONYX
- IC: 10840A- ONYX

The Onyx is available with one of the listed below cellular modules:

1. Contain FCC ID: RI7ME910G1WW, Contains IC: 5131A-ME910G1WW
2. Contain FCC ID: RI7ME910C1NA, Contains IC: 5131A-ME910C1NA

## Appendix 3 – Declaration of Conformity

Manufacturer's Name: NAYAX Ltd.  
 Manufacturer's Address: 3 Arik Einstein St., 1st Floor, Herzliya, 4659071, Israel  
**declare, under its sole responsibility that the product**  
 Product Description: Cashless & Telemetry System  
 Product Model: Onyx  
 Brand Name or Trademark: NAYAX


**is in conformity with the relevant Union harmonization legislation:**

Article	Standards	Description
3.1a Health	EN 62311:2008	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0Hz - 300 GHz)
3.1a Safety	EN 62368-1:2014+A11:2017	Audio/video, information and communication technology equipment - Part 1: Safety requirements
3.1b EMC	EN 301 489-1 V2.1.1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
	EN 301 489-3 V2.1.1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
	EN 301 489-52 V1.1.0	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication User Equipment (UE) radio and ancillary equipment
3.2 Radio Spectrum	EN 300 330 V2.1.1	Short Range Devices (SRD); Radio equipment in the frequency range 9kHz to 25 MHz and inductive loop systems in the frequency range 9kHz to 30 MHz
	EN 301 908-1 V15.1.1	IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements Release 15
3.3 (d), (e), (f) Cybersecurity Requirements	EN 18031-1: 2024 EN 18031-2: 2024 EN 18031-3: 2024	Common security requirements for radio equipment Part 1: Internet connected radio equipment Part 2: Radio equipment processing data, namely Internet connected radio equipment Part 3: Internet connected radio equipment processing virtual money or monetary value

### RoHS:

- EN 62321-3-1:2014 Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry

The product herewith complies with the requirements of the Radio Equipment Directive 2014/53/EU,

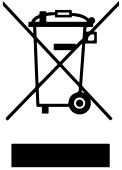
the RoHS Directive 2011/65/EU and carries the  marking accordingly.

### Additional Information:

- Once this module has been incorporated into an end product, that end product must be re-assessed for compliance with the requirements of the Radio Equipment Directive 2014/53/EU.

## Environment (WEEE, batteries and packaging)

This product is labelled in accordance with European Directives 2012/19/EU concerning Waste Electrical and Electronic Equipment (WEEE) and 2006/66/EC concerning Batteries and Accumulators. Those provisions require producers and manufacturers to become liable for take-back, treatment and recycling upon end of life of equipment and batteries.



The associated symbol means that WEEE and waste batteries must not be thrown away but collected separately and recycled.

## Cellular bands and transmission power

Market	Europe, Middle East and Africa  LE910C1-EUX	North America (Cat 1)  ME910C1-NA	Worldwide (Cat-M)  ME910G1-WW
Frequencies 4G Bands	B1, B3, B7, B8, B20, B28A	B2, B4, B12, B13	B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B27, B28, B66, B71, B85
Frequencies 3G Bands	B1, B3, B8	B1, B2, B4, B5, B8	N/A
Frequencies 2G Bands	B3, B8	B2, B3, B5, B8,	B2, B3, B5, B8
Max Power Transmission (LTE/4G)	+25dbm	+23dbm +/-2db	+25dbm
Max Power Transmission (3G)	+25dbm	+23dbm +/-2db	N/A
Max Power Transmission (2G-GSM)	+33.5 dBm (E-GSM 900);  +30.5 dBm (DCS 1800)	+33dbm +/-2db (GSM 900)  +30dbm +/-2db (DCS 1800)	GSM/GPRS: 900 band: +34 dBm,  1800 band: +31 dBm

NFC – Frequency of 13.56Mhz with modulation of ASK, max power 30.41dbm



## Safety and Handling Instructions

It is advised to read the manual carefully before attempting to use the device.

### Environmental Outdoor Guidelines

It is recommended to avoid installing the device in direct sunlight to prevent any risk of burnouts. Make sure not to expose the product to any corrosive gas or liquid. It is important to deploy the device in non-condensing conditions.

### External connection and power supply

All external circuits connected to the Onyx must be SELV (Safety Extra Low Voltage) and LPS (limited power source) within the meaning of section 2.2 and 2.5 of the standard IEC60950-1:2005+/A1:2010 and IEC/EN62368-1:2014 ES1 section 5 and LPS according to Annex Q.

### Warranty and Liability

Thank you for choosing Nayax. Read the Nayax 24 months Limited Warranty Terms and Limitations included in your contract. In the unlikely event that your device needs repair service or for additional information, please contact us at [support@nayax.com](mailto:support@nayax.com).

Your warranty shall be void in case the device is damaged due to vandalism and/or any corrosion issues.

### Cleaning Instructions

You can use soft, dry cloth for cleaning purposes. In case your device is extremely dirty, use a small amount of alcohol. Make sure not to use organic solvents such as thinner and benzene.