STRYDE

NEST RACK

INSTRUCTIONS FOR USE

Revision: draft 0.2

Date: 26th June 2020

STRYDE document number: 0000000013

INTELLECTUAL PROPERTY

Table of Contents

1. Safety Information 4
2. Certifications 4
3. Introduction 5
4. Product Overview 5
5. Technical Specifications 5
6. Operation 5
7. Installation 6
8. Storage and Maintenance 6
9. Transportation 6
10. Faults and repair 7
11. End of Life 7
12. Safety Symbols 7
13. Regulatory Markings 8
14. Compliance Statement 8
15. IC (Canadian Industry) Notice 9

Table of Tables

No table of figures entries found.

Table of Figures

No table of figures entries found.

1. Safety Information

The following general safety precautions must be observed during all phases of operation of this product.

WARNING	**Do not use the device if it appears damaged or defective** **Do not perform any unauthorized modification or change to the device** **Do not expose to excessive heat or flames**
CAUTION	Dropping the device and other mechanical abuse may cause damage to the electronics and mechanical parts The device shall only be serviced by trained personnel who are familiar with the STRYDE system.

Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. STRYDE assumes no liability for the customer's failure to comply with these requirements.

For further information on safety, please refer to the STRYDE Operation Support Product File.

2. Certifications

This product is designed for use in compliance with, and is certified according to, the following certification rules:

FCC Part 18.305

FCC Part 15.209

General Requirements for Intentional Radiators

ETSI EN 303 417 V1.1.1 (2017-09)

ETSI EN 303 446-1:V1.2.0 (draft – 2019-03)

FCC KDB 680106 D01 RF Exposure Wireless Charging Apps v02

FCC Part 1.1310 Radiofrequency radiation exposure limits

EN 301 489-01:V2.2.0

EN 301 489-03:V2.1.1

EN 303 446-1:V1.2.0 (draft)

EN 61000-6-2:2005

EN 61000-6-3:2007 + A1:2011

IEC 61010-1:2010, AMD1:2016

3. Introduction

This manual describes the necessary safety precautions and gives a brief overview of the functionality of the Nest Rack. The STRYDE system is a seismic acquisition system for professional use, and the Nest Rack is used to recharge the batteries of the Nodes in this system. For operation and detailed description of the entire system, please refer to the STRYDE Operation Support Product File.

4. Product Overview

The Nest Rack is a charging and data harvesting device that is used to charge up to 540 Nodes simultaneously. A total of six Nest Racks can be fitted in the STRYDE MLDU container. The rack is powered by a single-phase supply.

Recharging of the Node battery and harvesting of the seismic data is performed by loading each of the six Nest Rack Shelves with a magazine of 90 Nodes. The Nodes are then charged wirelessly using the QI charging standard. The rate of charge is regulated by an Integrated Circuit on the Node and will automatically cease once the battery charge reaches a pre-determined level.

Data harvesting is performed by a bespoke optical communication link, which is initiated by the rack-mounted touch screen, the harvested data is sent over ethernet via a series of ethernet switches, where finally it is output to downstream products via 10GbE-over-fiber.

The Nest Racks are not available for consumers to purchase and are only sold to limited number of industrial customers who will have to sign confidentiality agreements before gaining access to the product and documents.

5. Technical Specifications

Dimensions (height, width, depth)	1910x680x800mm
Weight	<300Kg (estimated)
Operating temperature	0 to 60°C
Power supply input	Nominal 230V, max 32A, 50 to 60Hz (based on the Eaton supply)
Power supply output	48V
Charging positions	540, 90 per shelf

6. Operation

Operation of the Nest Rack shall be carried out by trained personnel that are familiar with the STRYDE system.

The Nest Rack is fitted in a bespoke container known as the Harvesting Container (or MLDU), a maximum of six Nest Racks can be populated in the MLDU depending on customer requirements. The MLDU (and hence the Nest Rack) is located at the local operations hub for the duration of a seismic survey. The ambient temperature in the MLDU is regulated by a HVAC system to maintain a suitable temperature for operating the Nest Rack.

The primary purpose of the Nest Rack is to harvest data from and recharge the lithium ion batteries in the Nodes that are used for the seismic survey. The Nest Rack shall only be used to recharge and harvest data from: Nodes that have been inspected for damage; and are clean and dry. Damaged Nodes shall not be used with the Nest Rack and instead they should be decommissioned when returned to the local operations hub. The Nest Rack can recharge and harvest data from up to 540 Nodes simultaneously, accepting six magazines of 90 Nodes. The Nodes are placed into the magazine with the optical port facing upwards and the magazine are placed on to a Shelf and raised into the charging position by pushing down the level of the scissor lift. The rack mounted touchscreen is then used to monitor the state of charge and view diagnostics for each optical link. Recharging of the Nodes is done using the wireless QI standard, with each Node having its own battery management circuit that is used to regulate the rate of charge and terminating charging once the battery reaches a pre-determined level. The data harvesting is performed using a bespoke bi-directional optical link, the data from the Node is then packetized by the Nest board and send over ethernet. The charging and harvesting time will take no more than 4 hours.

There are 540 Nest boards (corresponding to 540 Nodes), each with its own 100Mb ethernet link, these are routed to several switches where they are combined, first into 1Gb ethernet and then to 10GbE which are output over optical fiber.

The Nest Rack shall be powered by a single-phase mains supply, the Nest Rack contains a power distribution rack which distributes power to the other modules in the rack.

Charging shall be done away from flammable materials, and a fire extinguisher shall be within reach for emergency use.

7. Installation

The Nest Rack shall only be installed in the MLDU container by authorized STRYDE service personnel or by trained personnel working at approved MLDU manufacturing facilities.

8. Storage and Maintenance

When placed into long term storage, Nest Racks kits that have not yet been fitted in a MLDU shall be stored in suitable protective crates and stored in a temperature and humidity-controlled environment. Note that unfitted Nest Racks are stored in kit form as they cannot be fully assembled until they are installed in the MLDU.

Regular maintenance of the Nest Rack kits in storage is not necessary.

9. Transportation

When transported, Nest Racks that have not yet been fitted to an MLDU shall be shipped in suitable protective crates with protective packing material to prevent damage in transit.

10. Faults and repair

Fault finding and repairs to the Nest Rack shall only be performed by trained personnel who are familiar with the STRYDE system.

11. End of Life

This product shall be safely disposed of as electronic waste. The owner of the system is responsible for disposal in accordance with local laws and regulations at the time it is disposed of. The unit contains recyclable materials and they should be recycled where facilities are available. Ultimate disposal of this product should be handled according to all national laws and official regulations. For detailed instructions for end of life disassembly, please refer to the STRYDE Operation Support Product File.

Recycling of materials helps to conserving natural resources. By proper waste handling of this product the user ensures it has no negative consequences for the environment and human health, which could otherwise be caused if this product is disposed of as general waste.

12. Safety Symbols

	Caution, risk of danger (refer to this manual for specific Warning or Caution information)

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

13. Regulatory Markings

CE	The CE mark is a registered trademark of the European Community. This CE mark shows that the product complies with all the relevant European Legal Directives.
ICES/NMB-003(B)	This product complies with the Canadian ICES-003(B). Cet appareil est conformer a la norme NMB-003(B) du Canada.
c N us 61010-1	This product is tested and certified by Nemko and complies with IEC/EN 61010-1, UL 61010-1 and CSA C22.2 No. 61010-1
	This product complies with the WEEE Directive (2012/19/EU) marking requirement. This product label indicates that you must not discard this electrical or electronic product in general waste.

14. Compliance Statement

14.1. Compliance statement

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.

14.2. Interference statement

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 STRYDE for help

14.3. Exposure statement

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

14.4. Modification statement

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

15. IC (Canadian Industry) Notice

This Class B digital apparatus complies with Canadian ICES-003.

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.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.