SANDVIK

RDY

REMOTE MONITORING DEVICES

REMOTE MONITORING DEVICE

1 FOREWORD

Read all safety warnings, instructions, illustrations and specifications provided with this monitoring device. Failure to follow all instructions of this document may result to safety hazards, serious injury or incorrect operation of the device

Warnings alert persons to hazards that occur when handling or using the product. Following symbol is used in this document.

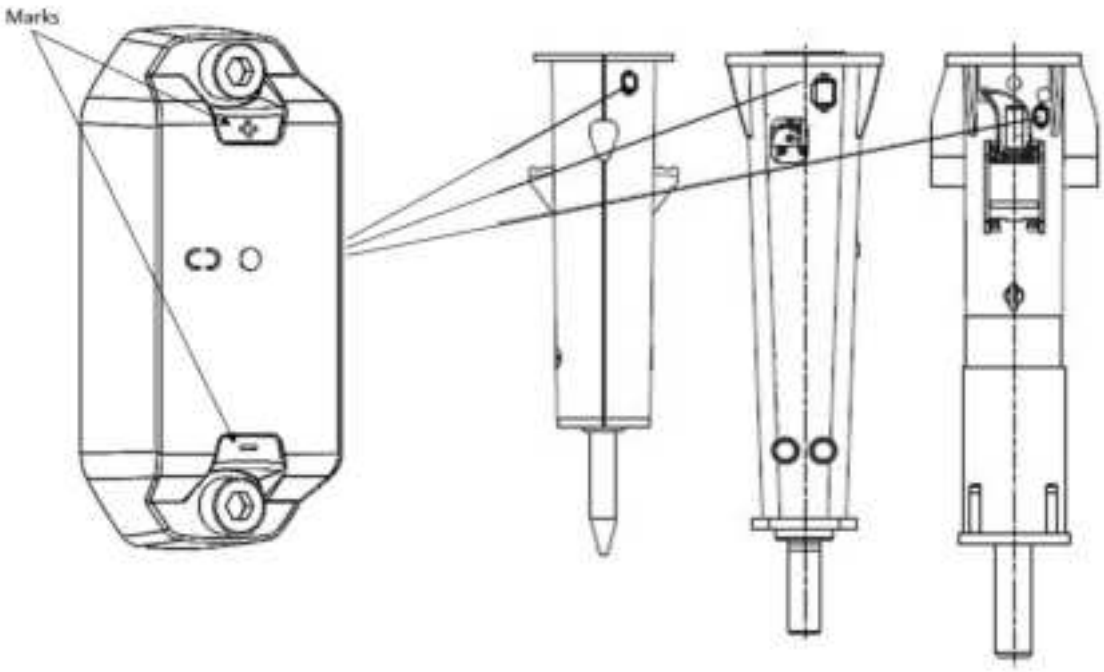
Warning symbol *draws attention to a potential threat of danger that can lead to serious injury or fatality*

2 RDY REMOTE MONITORING DEVICE

2.1 OVERVIEW

RDY is a hammer-mounted device that enables remote monitoring of hammer units. During hammer operation, RDY collects and transmits operating and location information. This information is available through an online service and can be used, for example, to view hammer work history, manage service schedules, optimize hammer performance, plan operator training and conduct fleet management.

Following picture shows RDY device and typical installations to different hammer models.



Note: Hereby Sandvik declares that the radio equipment type, remote monitoring device RDY is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0053

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2.2 TECHNICAL SPECIFICATIONS

Item	Specification
Battery type	Primary, lithium, built-in, encapsulated
Supply voltage (internal)	3.6 V
Max rated current (Note1)	350 mA
Temperature, operating	-25...80 °C (-13...176 °F)
Temperature, storage Humidity, storage	-25...80 °C (-13...176 °F) Max. 100%
Altitude	3000 m
Enclosure ingress protection	IP67 Type 4
Pollution degree	4
Strength of magnet for activation and forced reporting	Minimum pull force 2 kg
Lithium content	< 2 grams

RDY device is designed for outdoor use and can be used in wet locations, but not under water.

RDY device can be used in environments according to pollution degree 4, where device can be exposed to conductive dust, rain, or other wet conditions.

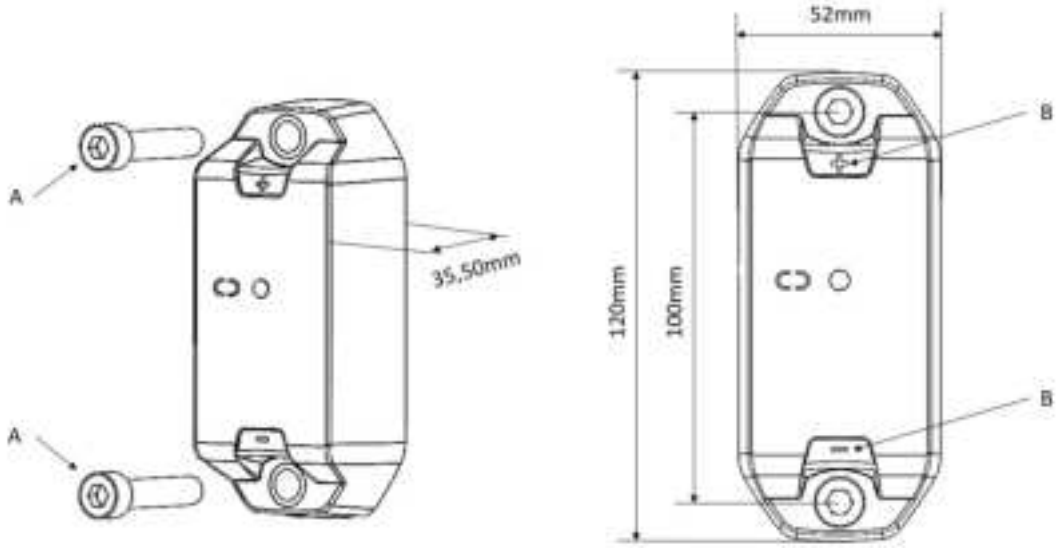
NOTE1: Maximum rated current is the average maximum current consumption during cellular communication and data transmission.

WORKSHOP

3 DISASSEMBLY AND ASSEMBLY

3.1 RDY REMOTE MONITORING DEVICE

MOUNTING DIMENSIONS



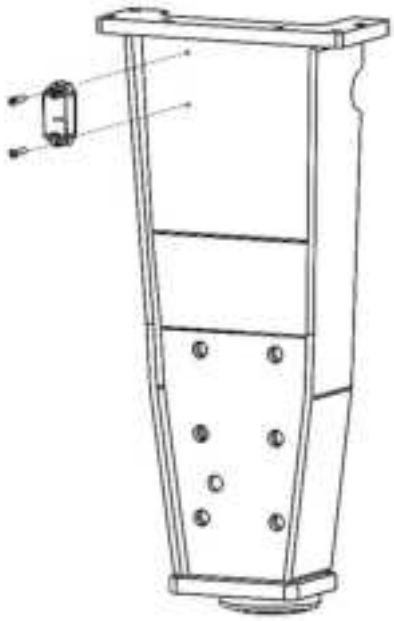
Item	Tightening torques
Mounting screws M8 (A)	24 Nm (18 lb-ft)
Orientation marks (B)	“+” points upward when hammer is in upright posture “-” points downward when hammer is in upright posture
⊂ ⊃ mark	Position of the magnet switch for forced activation

Item	Adhesive
Mounting screws	Locking fluid, medium strength locking force (e.g., Loctite 243)

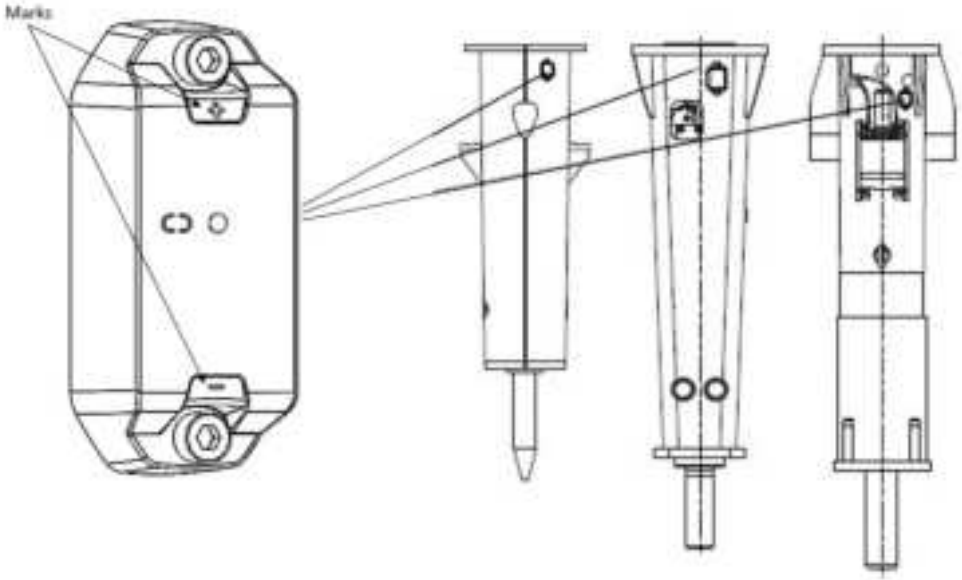
3.2 ORIENTATION

The “+” and “-“ marks (B) on the remote monitoring device are orientation marks. These marks indicate the upright position of the device. The “+” sign must point towards the mounting flange and “–“ sign towards the impact direction of the hammer, when installing the device.

Depending on the hammer model the device can be mounted on the side of the hammer housing i.e., perpendicular to the boom plane or towards the operator cabin i.e., parallel to the boom plane.



3.3 INSTALLING THE SURFACE-MOUNTED RDY



Warning! The hammer must be secured from falling down in any direction when handling it.

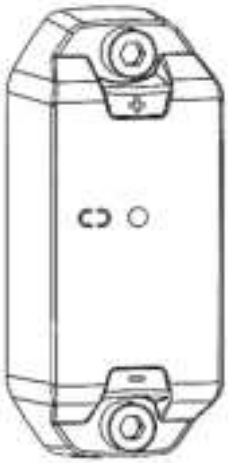
1. If you are replacing an existing RD3, RD3X or RDY device, remove the old device. See "Removing device".
2. If this is the first RDY installation on your hammer or you must reposition the RDY device, prepare the mounting threads for mounting the RDY:
   - Choose a flat surface where it will be protected from flying debris, sudden impact or collisions.
   - Mark the places for the mounting screw threads. Note: Use the RDY device as a template. Remember to orient the device with the orientation marks.
   - Drill the holes for the threads perpendicular to the surface of the hammer.
   - Prepare the threads with a threading tool, using lubricant.
   - Clean the threads carefully.
3. Apply the recommended locking fluid to the mounting screws.
4. Position the RDY device on the hammer, in line with the mounting holes and ensure correct mounting according to the orientation marks.
5. Attach RDY to the hammer with the Nord-Lock washers and mounting screws. Tighten the screws to the specified torque.
6. To activate RDY, see “Activating an RDY device".

3.4 REMOVING AN RDY DEVICE

Follow these instructions to remove an existing RDY device.

Warning! The hammer must be secured from falling down in any direction when handling it.

1. Unscrew the mounting screws.



2. Remove the remote monitoring device.
3. The mounting screws are secured with locking fluid. Clean the threads carefully if mounting a replacement device.

4 ACTIVATION AND USE

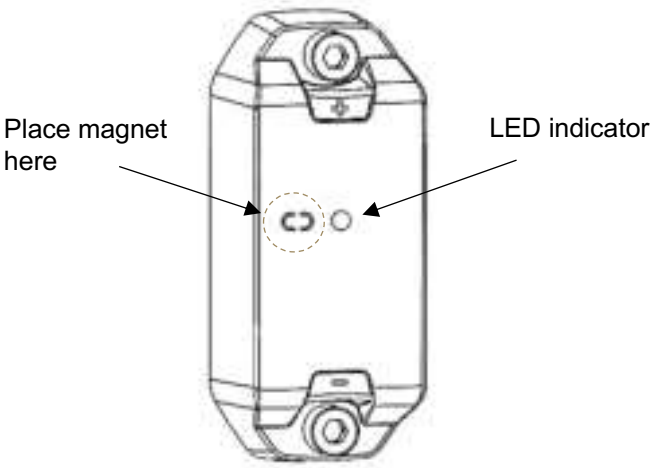
4.1 ACTIVATING AN RDY DEVICE

Follow these instructions to activate an existing RDY device.

Warning! Big magnets have a very strong attractive force. Unsafe handling could cause contusions, bruises, or bone fractures.

Warning! Magnets could affect the proper functioning of pacemakers and implanted heart defibrillators. If you or others nearby wear one of these devices, maintain a safe distance from magnets.

1. Place the magnet on top of RDY as shown. Warning! Large magnets can have high adhesive force. Keep a safe distance from metal objects!



2. Wait minimum of 5 seconds to start activation of the device.

The RDY device has an indicator LED to acknowledge successful activation and communication. See table for the LED indications.

When activated, the RDY device sends an acknowledgement message to the cloud service and starts to operate as configured in the cloud service.

4.2 FORCED CONNECTIVITY OF THE RDY DEVICE

RDY device connects automatically according to a set schedule to the cloud service. User can trigger instant connectivity and reporting at any time after device has been activated.

1. Place magnet on top of the magnet symbol for minimum of 5 seconds
2. Indicator blinks once GREEN when communication has been initiated
3. Magnet can be removed after 1st blink
4. Observe indicator LED lights to follow progress of the communication.

LED indications

LED indication	Status
Multi color blinking	Device activated
BLUE blinking	Connecting to cloud service
GREEN blinking	Connection successful to cloud service
RED blinking	Connection failed
AMBER blinking	Battery low / unable to communicate

Device activation is successful when LED sequence ends with GREEN blinks.

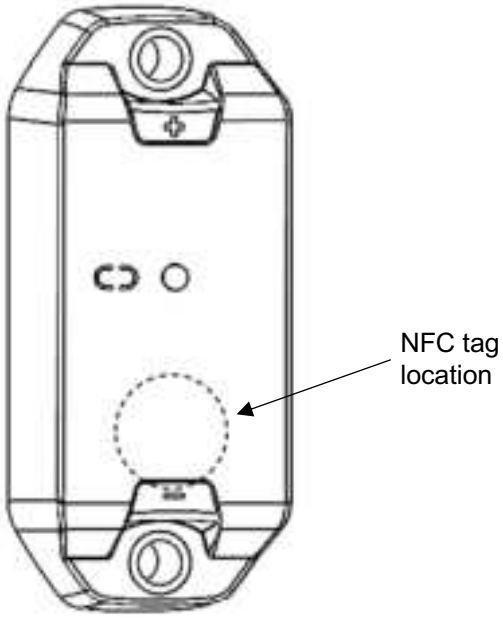
Device communication was not successful, if the sequence ends with RED blinks. This can be due to limited or no cellular network access or failure in communication to cloud service. Please check if mobile network is available and try the activation again.

Device battery is low, if LED starts to blink with AMBER color after placing the magnet. Note that device can still possibly continue to record hammer operation, but it can't communicate to cloud service. Battery can indicate low level momentarily, if device has been reporting with short interval. Device needs to be replaced to new unit if the problem persists.

4.3 READING INFORMATION FROM NFC TAG

RDY device has a NFC tag that contains product serial number.

1. Acquire proper device to read NFC tag content. For example, NFC capable smartphone can be used.
2. Place NFC capable device over the NFC tag. The tag is placed inside the device cover, see correct reading location for picture below.



4.4 CLEANING OF RDY DEVICE

The device should be cleaned during weekly maintenance checks of the hammer to ensure its performance and operation.

Device can be cleaned using clean cloth, water and alkaline or hydrocarbon based industrial cleaner to remove any dirt and debris from the surface of the device. Device must be rinsed with water after using industrial cleaner.

5 PRECAUTIONS

The device must be set to flight mode via the cloud service if it is transported via air freight. It contains an encased lithium-ion battery which is regulated for air transport. Consult your forwarder about any restrictions for air freight.

Disposal of the device into fire or a hot oven, or mechanically crushing or cutting the device open, can result in an explosion.

The device subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

Do not try to open the device in any way. The device electronics and power components are potted in polyurethane resin.

The internal Lithium Thionyl Chloride Battery has hermetically sealed structure, so it is not hazardous when device is used in the recommended way, Risk of exposure is only in case of abuse (mechanical, thermal, electrical) which leads to the rupture of the battery container. Electrolyte is toxic and corrosive and causes irritation, skin burn, lung injuries, asthma and other respiratory disorders

List of substances and related information

Substance	*CAS No.*	*Approximate weight*	*Hazard Symbol*	*R-phrases*
Lithium Metal	*7439-93-2*	*0,7 – 1.2 g*	*F, C*	*14/15-34*
Thionyl Chloride	*7719-09-7*	*7,9 -10,8 g*	*C*	*14-34-37*
AluminumChloride	*7446-70-0 2-5*			
Lithium Chloride	*7447-41-8 1-2*			
Carbon	*1333-86-4 3-5*			

Hazard Symbols:
C Corrosive
F Highly flammable

R-Phrases:
R 14 Reacts violently with water
R 14/15 Reacts violently with water liberating extremely flammable gases
R 34 Causes burns
R 37 Irritating to respiratory system

5 LEGAL NOTICES

Hereby, Sandvik Mining and Construction Oy declares that the radio equipment type RDY is in compliance with Directive 2014/53/EU.

RDY operates at Bluetooth® 2.4 GHz, at GSM 850/900/1800/1900 MHz and LTE M1/NB2 at 689 – 2200 Mhz frequencies. The maximum radio-frequency powers transmitted are 4 dBm for Bluetooth®, 33 dBm for GSM and 23 dBm for LTE.

Manufacturer name and address:

Sandvik Mining and Construction Oy
Taivalkatu 8
15101 Lahti
Finland

RECYCLING

Check the local regulations for proper disposal of electronic products. The Directive on Waste Electrical and Electronic Equipment (WEEE), which entered into force as European law on 13th February 2003, resulted in a major change in the treatment of electrical equipment at end-of-life. The purpose of this Directive is, as a first priority, the prevention of WEEE, and in addition, to promote the reuse, re-cycling and other forms of recovery of such wastes so as to reduce disposal.

The crossed-out wheelie-bin symbol on your product, battery, literature, or packaging reminds you that all electrical and electronics products and batteries must be taken to separate collection at the end of their working life. Do not dispose of these products as unsorted municipal waste: take them for recycling. For info on your nearest recycling point, check with your local waste authority.

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FCC REQUIREMENTS FOR OPERATION IN THE UNITED STATES

FCC Information for the User

This product does not contain any user serviceable components and is to be used with approved, internal antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals.

FCC Guidelines for Human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communications Commission Statement

This device complies with Part 15 Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Radio Frequency Interference Warnings & Instructions

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 uses and can radiate radio frequency 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 methods:

- Increase the separation between the equipment and the receiver
- Consult the dealer or an experienced radio/TV technician for help
- Reorient or relocate the receiving antenna

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate this equipment.

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Innovation, Science and Economic Development Canada (ISED) regulatory information

This device complies with RSS-247 of the Innovation, Science and Economic Development Canada (ISED) 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.

Ce dispositif est conforme à la nor me RSS-247 d'Innovation, Sciences et Développent économique Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement

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

NOTE IMPORTANTE: Déclaration d'exposition aux radiations

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé avec une distance minimale de 20 cm entre le radiateur et votre corps.

FCC ID: 2BD5URDY

IC: 31800-RDY

Contains FCC ID: XPYUBX20VA01

Contains IC: 8595A-UBX20VA01