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RMMG / PG Service	Jan Wallden, Lillemor Rapp, Laxminarayan Daund	Henrik Ryegard	Confidential	

Instruction manual
for
ABB MACHsense-R
MSR1600

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Approved by:
Henrik Ryegard

Document no.: 1MZB100400
Revision A

Contents

1 Introduction

1.1 General information

This instruction manual contains information on the installation, operation, and maintenance of the ABB MACHsense-R MSR1600. Also referred to MACHsense-R in this manual. MACHsense-R package consists of Data Acquisition Unit (DAU), vibration sensors, mounting pads for sensors, 10 meters cables for connecting sensors, and Installation guidelines for MACHsense-R - MSR1600.

Careful study of the contents of this manual and other related documentation before any actions are taken is necessary to ensure proper functionality and a long lifetime.

Actions shown in this manual are only to be performed by trained personnel with previous experience in similar tasks, and authorized by the owner of the equipment.

This document and parts thereof must not be reproduced or copied without the express written permission of ABB, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose. ABB constantly strives to improve the quality of the information provided in this instruction manual, and will welcome any improvement suggestions. For support, contact the closest ABB Local Service Centre LSC or ABB-Certified Service Centre.

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the DAU. It should be brought to the attention of anyone who installs, operates or maintains this equipment. Ignoring the instruction invalidates the warranty.

1.2 Standards

The MACHsense-R is designed and certified to fulfil the following standards and directives:

- CE
- LVD
- RED
- RoHS
- WEEE

	The MACHsense-R unit is also IP 65 certified.

1.3 Important note

The information in this document may sometimes be of a general nature and applicable to various products produced by ABB. Where a conflict exists between the contents herein and the actual product supplied, the user must either make an informed engineering judgement as to a course of action or, if any doubt exists, contact ABB.

Safety is dependent on the awareness, concern and prudence of all those who operate and service machines. While it is important that all safety procedures be observed, care near machinery is essential - always be on your guard.

To avoid accidents, safety measures and devices required at the installation site must be in accordance with the instructions and regulations stipulated for safety at work. This applies to general safety regulations of the country in question, specific agreements made for each work site and safety instructions included in this manual and separate safety instructions delivered with the machine.

1.4 Limitation of liability

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

The warranty issued covers manufacturing and material defects. The warranty does not cover any damage caused to the DAU, personnel or third party by improper storage, incorrect installation or operating of the machine. The warranty conditions are in more detail defined according to Orgalime S2000 terms and conditions.

The warranty issued is not valid, if the operation conditions of the DAU are changed or any changes in the construction of the MACHsense-R, or repair work to the MACHsense-R have been made without prior written approval from the ABB factory.

Local ABB sales offices may hold different warranty details, which are specified in the sales terms, conditions or warranty terms.

2 Recycling and scrapping

	This product cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling return this product to your supplier or a designated collection point as per your municipal rules.

2.1.1 General

The manufacturing process of the machine is carried out in accordance with the Environmental Management System ISO 14001.

This instruction concerns the disposal and recycling of ABB MACHsense-R. The equipment is designed in a way that it is easy to separate the different components and types of material from each other, making it easier to recycle.

	The methods are described in a very general way. All instructions are to be performed by personnel which is trained and skilled for the procedure.

2.1.2 Dismantling the equipment

	Risk of personal injury when dismantling the machine. Use proper PPE when dismantling.

- Only skilled and trained personnel should carry out the dismantling.
- Dismantling the machine is done by simply separating all the components of the equipment.
- When the equipment has been dismantled into its different components, the different components has to be separated and grouped together dependent upon the different types of material.

2.1.3 Separation of different types of material

Stainless steel – SS-304

- Enclosure
- Cable tray
- Screws, Standoff, Nuts

Aluminum

- Heat Sink
- Power module Tray
- Power Supply Cover

Polyurethane soft foam (FrenchFoam A-7-146-VP4)

- Gasket
  - Cable gland plate
  - Top cover plate

Copper: Different types of wires/cables used in DAU

Polycarbonate sheet: Transparent sheet to shield

- PCB:
  - Main Board
  - A/C input board
  - PoE board

Carbon Steel

Not used

Special high quality steel

Not used

Mixed metallic material

Not used

Electronic waste

The below items should be disposed and recycled as “electronic waste” as per WEEE directive:

- Cables
- PCB
- Power supply unit
- WiFi module
- GPRS module
- Ethernet module
- Any part of the DAU

Hazardous waste

Not used.

If there is some questions of environmental matters not considered in this instruction, please get in contact with the Environmental Coordinator of the ABB Machine Division.

3 Safety Instructions

3.1 Safety precautions

These instructions are for all personnel who work on the motor. Personnel performing maintenance on electrical equipment and installations must be certified. The personnel must be trained in, and familiar with, the specific maintenance procedures and tests required for rotating electrical machines.

Motor repair and maintenance should be performed following the motors own instruction and safety manuals. If a variable frequency drive (VFD)[1] unit is included in the motor setup, please follow also the VSD unit's additional safety and instruction manuals.

Before working on any electrical equipment, general electrical safety precautions must be taken into account, and local regulations must be respected in order to prevent personnel injury. This must be made according to instructions issued by the security personnel.

Personnel performing maintenance on electrical equipment and installations must be certified. The personnel must be trained in, and familiar with, the specific maintenance procedures and tests required for rotating electrical machines. Please read this section before you familiarize yourself with the MACHsense-R, initial product setup, and registration process.

3.2 General safety during MACHsense-R installation

- Handle the MACHsense-R carefully and must not be dropped.
- Use safety shoes with metal toe cap during installation to avoid foot injury.
- Don't install or perform maintenance on the DAU on a running motor.
- Make sure that the motor has cooled enough for the installation or maintenance of MACHsense-R.
- Make sure to use safe platforms to access the motor. Do not use ladders.
- When drilling be aware of hot cutting chips. Always wear safety goggles and adequate safety equipment.

3.3 Electrical safety during MACHsense-R installation

Installing the MACHsense-R will require wiring, so do not try to install when motor or connected drive is energized. Do not work on the MACHsense-R while VSD unit, motor cable, motor, control cables or control circuits are energized.

General points to be observed when working around the motor:

- Do not step on the motor.
- Be careful since the temperature of the outer casing of the motor will be high during normal operation and especially after shut-down.
- Observe rotating parts of the motor and take care during installation.
- Do not open terminal boxes while energized.

	Emergency stop controls must be equipped with restart lockouts. After emergency stop, a new start command can take effect only after the restart lockout has been intentionally reset.

[1] Also known as variable speed drive (VSD) unit

4 Important instructions

	As per Radio Equipment Directive (2014/53/EU minimum separation distance of 20 cm between the user and radiating antenna on MACHsense-R shall be maintained when it is switched on – either in installed or in troubleshooting status.

	Hazardous voltages and rotating parts can cause shock, burns or other injuries, including death.

4.1 USA & Canada compliance

Caution: FCC and IC RF Radiation Exposure Statement

FCC 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.

FCC Caution statements

1. Any changes or modifications not expressly approved by the party Responsible for compliance could void the user's authority to operate this Equipment.
2. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Attention: FCC et IC Déclaration d'exposition aux radiations RF

Déclarations ISDE

Cet appareil est conforme aux normes RSS exemptes de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquer d'interférences nuisibles, et

(2) Cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

Déclarations de mise en garde d'ISDE

Tout changement ou modification non expressément approuvé par la partie responsable de la conformité pourrait annuler le droit de l'utilisateur à utiliser cet équipement.

2. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps.

REMARQUE: Cet équipement a été testé et jugé conforme aux limites d'un appareil numérique de classe A, conformément à la section 8.4 de RSS Gen. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles lorsque l'équipement est utilisé dans un environnement commercial. Cet équipement génère, utilise et peut émettre de l'énergie de radiofréquence et, s'il n'est pas installé et utilisé conformément au manuel d'instructions, peut provoquer des interférences nuisibles aux communications radio. Le fonctionnement de cet équipement dans une zone résidentielle est susceptible de provoquer des interférences nuisibles, auquel cas l'utilisateur devra corriger les interférences à ses frais

Note :
The device integrates Cellular GPRS Modem HE910-D from Telit having FCC ID RI7HE910 and Wireless Transmitter module WF111-E from Silicon Labs having FCC ID QOQWF111 for radio communication. The modules are integrated to this product as per the module integration rule.

4.2 Europe compliance

Caution: RoHS and REACH Confirmatory Statement

The documentation for this device complies with technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances as per EN 50581:2012.

- Failure to observe and follow the instructions provided with the equipment and accompanying manuals could cause permanent damage to the equipment and could lead to property damage, personal injury and/or death.
- Before attempting to use the equipment, you should review this instruction manual in its entirety, including all caution and danger indicators.
- If the equipment is used in a manner not specified by the manufacturer or functions abnormally, proceed with caution. Otherwise, the protection provided by the equipment may be impaired and could result in improper operation and injury.
- Installation and service personnel must be familiar with general device test practices, electrical awareness and must take proper safety precautions when installing and/or servicing the equipment.
- Before performing installation, inspections, tests or maintenance on this device or associated circuits, all live circuits and sources of electric power to said device and circuits must be isolated or disconnected.
- Failure to shut off equipment prior to removing power connections could expose you to dangerous voltages that could cause injury or death.
- All electrical equipment should be properly grounded and must have a reliable and uncompromised grounding path. Equipment grounds should be properly bonded and connected to the facility's primary ground system for primary power.
- At all times, equipment must be properly grounded during device operation, maintenance and service.
- All electrical connections and grounds must comply with all applicable laws, regulations and electrical codes.
- Personal Protection Equipment shall be used to avoid injury. Safety shoes, safety hard hat, protective goggles, ear protectors, gloves are recommended.
- When working with chemicals, you should get the safety data sheet from the supplier's web page.

For more information regarding MACHsense-R, please visit www.abb.com

For answers not found in the support centre website or for product assistance, please contact support.machsense@abb.com or the ABB Local Service Centre or ABB Contact Centre.

5 Get started

5.1 Quick summary of the MACHsense-R

- MACHsense-R kit consists of a package of Data Acquisition Unit (DAU) vibration sensors, mounting pads, sensor cables, and installation manual.
- A web portal is used for showing data. For web address, please contact ABB.
- Wired or wireless sensors are connected on motors and MACHsense-R DAU is programmed to pick up signals relating to the motor's health and operating parameters. The collected data is then transferred via GPRS to MACHsense-R secure ABB-designated server.
- The data will be processed by algorithms, developed by ABB, and turned into meaningful information for the user to view and manage in the portal.
- The DAU is an IP56 certified device; housed in painted stainless-steel casing.

MACHsense-R is meant for condition monitoring and not for protection purposes.

5.2 The requirements for the use of MACHsense-R

- MACHsense-R portal access
- Internet connectivity for the DAU

  Expected data upload volume from MACHsense-R to the ABB secure cloud is about 1 GB per motor per month
- Motors

  Both ABB and non-ABB motors can be monitored

Note the motor specifications supported by MACHsense-R:

- Standard 3 phase induction motor >355 frame size
- Cast iron or rib cooled frame
- S1 operation

5.3 Preparations for installation

5.3.1 General

Adequate planning and preparation results in correct installation, assures safe running conditions and maximum accessibility.

During installation, general as well as local safety instructions must be followed.

5.3.2 Power supply

- MACHsense-R requires external power supply 110-240 V AC
- Recommended fuse is 10 A
- Recommended cable area is 1.5 mm^2
- Installation should be made by certified electrician according to local regulations and applicable standards.

5.3.3 Tools and materials

Suitable materials for set-up as well as other auxiliary tools for installation are normally not included in the ABB delivery. Auxiliary tools for installation are to be supplied by the customer.

6 Installing DAU

6.1 Installation kit

The MACHsense-R kit contains the following:

Item description
DAU
Accelerometers (four)
Mounting pad (four)
Cable (four, 10 m each)
Installation guidelines

The recommended way of installing vibration sensors is to glue the mounting pads into their correct position on the motor.

- Recommended glue: Loctite AA326
- Recommended Activator: Loctite SF7649
- Recommended cleaner Loctite 7061

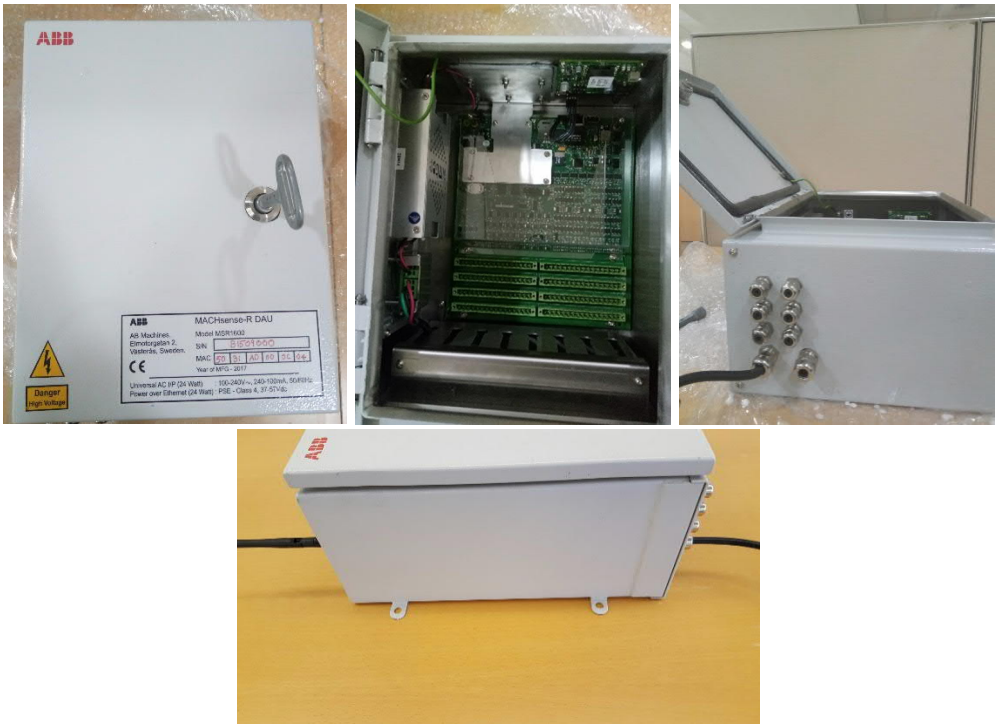
Note: Mounting glue is not included in the MACHsense-R package.

Safety Data sheet are available at the Loctite website http://www.henkel-adhesives.com.

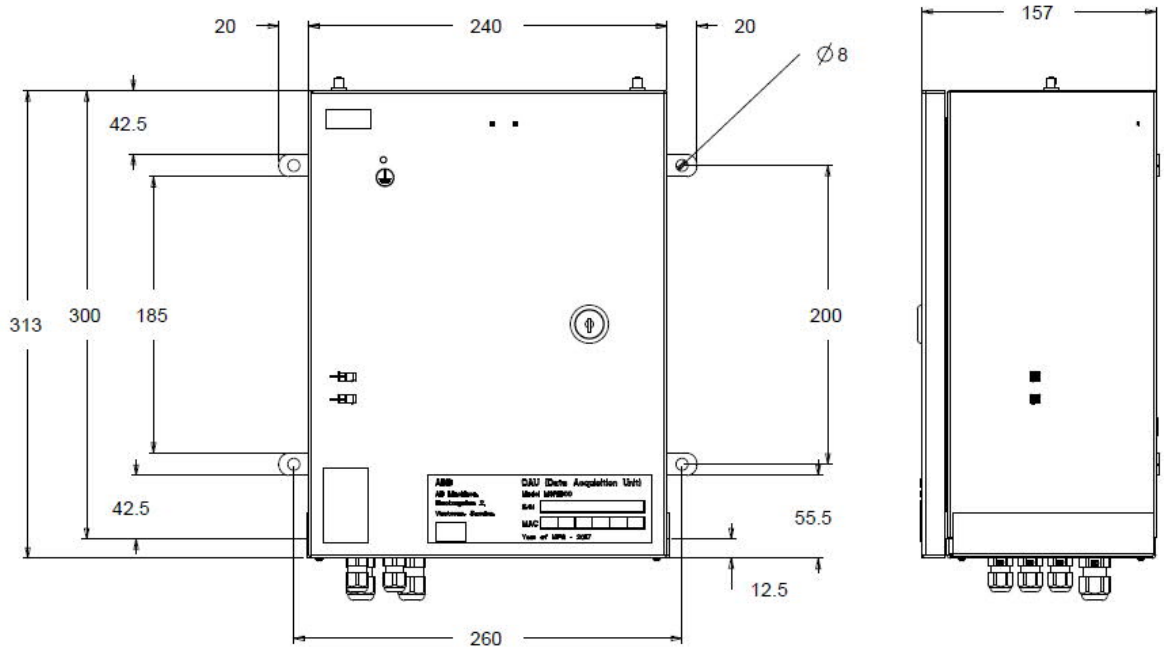
	Always have the Safety Data sheet available and follow the instructions carefully.

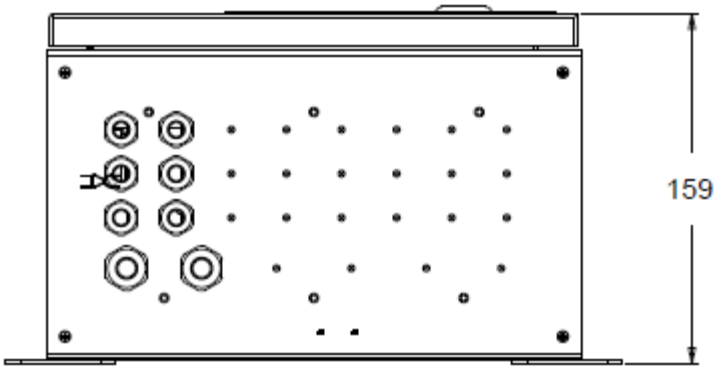
6.2 Mounting DAU

Monitoring device can be mounted on the motor or on neighbouring wall or steel structure depending on the feasibility of the condition. Drilling machine can be used for drilling mounting holes and fixing DAU using suitable bolts.



MACHsense-R pictures





DAU Mounting Holes and Space Requirements

	Small clamp to be welded to the base with 20 mm projection from left and right sides, horizontal hole pitch is 260 mm. Vertical hole pitch is 200 mm when the clamps are aligned 42.5 mm from the top and bottom sides of the baseplate. L bracket to be welded to the base with 12.5 mm projection from the edge.

Following precautions have to be taken into account while mounting DAU:

- Select mounting location which is a non-hazardous areas and free of shock forces, excessive dust, close proximity to electrical appliances, etc.
- Selected mounting location and subsequent mounting of DAU should allow trouble free cabling.
- The DAU should be mounted where it is easy accessible for service technician to connect laptop into the LAN connector inside the DAU.
- Sufficient reserve should be provided for connectors.
- Ensure correct fastening of mounting bolts to prevent any sudden unfastening due to external forces.
- Ensure proper laying of cables. Use cable ties and fasteners to secure the cables.
- Mounting directly on motor should be avoided. For further instructions please consult Motor manufacturer for mounting instructions.

6.3 Communications

The DAU communicates with the specific server over a *General Packet Radio Services* (GPRS) connection. A SIM card is required for the GPRS or 3G connection.

In addition to GPRS it will be enabled to use *Wireless Local Area Network* (WLAN) or Ethernet.

6.4 Example of Installation

- The DAU can be mounted on assembly plate of the motor. Drilling and tapping of holes will be required for this. Motor manufacturer should be consulted.

- The DAU can also be mounted on the same side as auxiliary terminal box to reduce the cable length for RTD, BTD.

	- For non-Ex- applications: Cable length up to 500 ft. (150 m) can accurately transmit data from sensors (datasheet) - For Ex- applications: Cable length up to 1600 ft. (480 m) can accurately transmit data from sensors (datasheet) – FUTURE RELEASE

Examples of Mounting DAU on a Machine

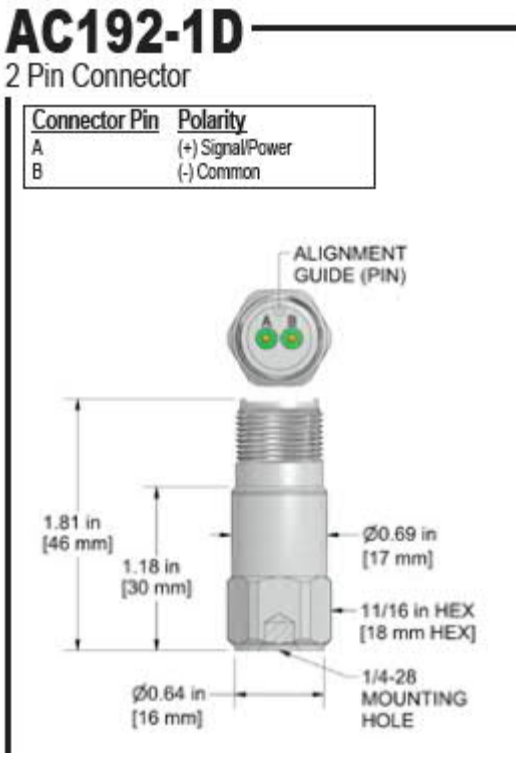
7 Installation of Accelerometers (Vibration Measurement)

7.1 Accelerometers Location

Accelerometer mounting locations are as follows:

- Channel 0 is DS horizontal direction
- Channel 1 is NDS horizontal direction
- Channel 2 is DE Axial direction
- Channel 3 is DS vertical direction

When mounting accelerometers, it is important to locate the best positions on the motor. The accelerometer is single axis and measures only in one direction.



Accelerometer diagram and technical specs

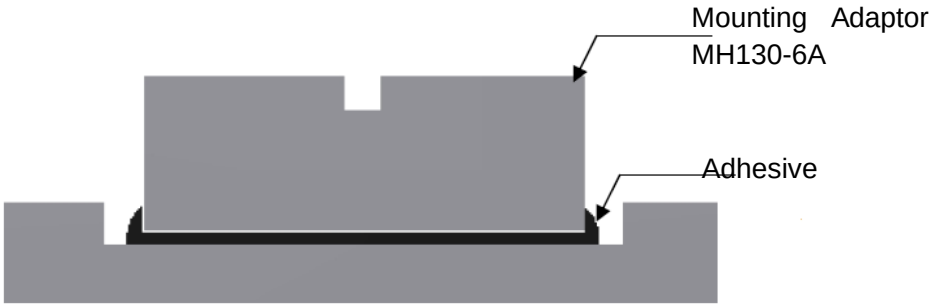
Channel 0: Motor Drive End horizontal direction. Find a position on the side of the motor. This position should be pointing directly in towards the bearing.

Channel 1: Motor Non-Drive End horizontal direction. Find a position on the side of the motor. This position should be pointing directly in towards the bearing.

Channel 2: Motor Drive End Axial direction: Find a position on the side of the motor. This position should be pointing in the direction of the shaft.

Channel 3: Motor Drive end vertical direction. Find a position on top of the motor. This position should be pointing directly in towards the bearing. This sensor should be mounted 90 degrees to the DE Horizontal direction sensor.

7.2 Mounting of pads



Procedure for gluing the pads:

1. All paint must be removed from the surface. Make sure all paint is grinded and the pad is glued directly on the metal on the motor.
2. Clean the surface with recommended cleaner Loctite 7061.
3. After the cleaner has dried, apply glue Loctite AA326 on the mounting pad. Make sure you put glue on the side where the threaded mounting hole is not positioned.
4. Spray some activator Loctite SF7649 on the glue and on the surface on the motor. Immediately attach the pad in correct position and keep steady for 15 minutes.

Mounting pad diagram and technical specs

	LOCTITE AA 326 is a yellow to amber, no-mix, medium viscosity (thixotropic) structural and magnet bonder which is suited to magnet bonding and resistant to temperature up to +120°C; LOCTITE 326 is activated with LOCTITE SF 7649.

LOCTITE SF 7649 (known as LOCTITE 7649)

Surface Preparation – activator that is solvent-based with low temperature curing. LOCTITE SF 7649 is designed to promote the curing speed of LOCTITE anaerobic adhesives and sealants without any significant loss of joint strength.

	Ensure to understand and follow the instructions and information of adhesive and cleaning products for safe and correct use. Make sure to use personal safety equipment and make sure the area is well ventilated.

7.3 Mounting of sensors

Mount the accelerometers in the mounting pads by screwing the sensor into the pad.

Mounting torque: 2.7 to 6.8 Nm

7.4 Additional information on mounting

There are alternative mounting techniques for mounting sensors, if it is not possible to use these glued mounting pads. Please consult ABB for alternative recommendations for mounting.

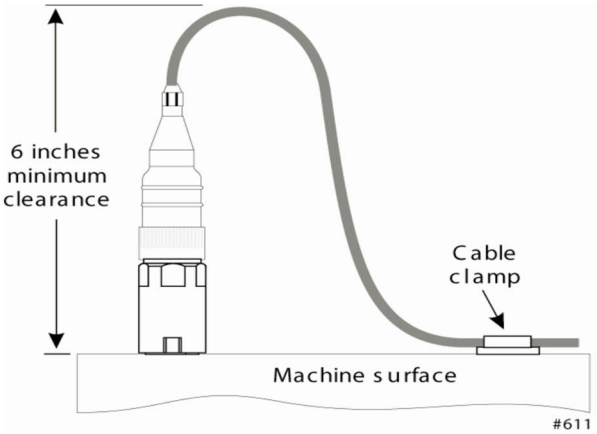
The point of measurement is chosen so that point of measurement and sensor are mechanically as close as possible to each other. The sensor should be mounted as close as possible to the bearing and pointing towards the shaft centreline.

- High-frequency oscillation loses some of its energy in the face of the interface. Therefore, the measuring point has to be chosen in such a way that the point of measurement and the sensor have minimal interfaces.
- Vibration of rotating equipment is transferred to the bearings through the body. So, the measurement points should be selected as close as possible.
- The sensor mounting point has to be chosen correctly so that the space available allows for the sensor installation and replacement.

7.5 Wiring and connection of sensors

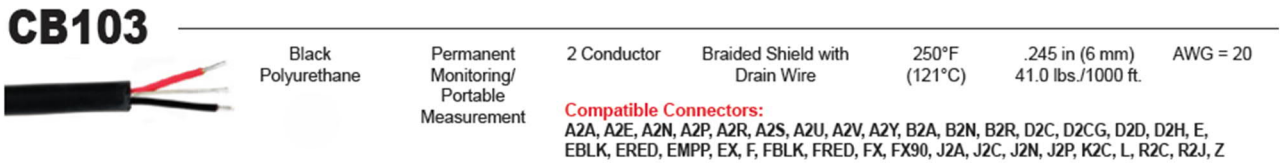
Quick connector

1. Connect the quick connector to each sensor and put the cable to the DAU.
2. After mounting the sensor, the cable should be anchored to reduce stress at the cable ends and to prevent false signals due to cable vibration and slapping. Cables that are allowed to have excessive motion will eventually result in cable metal and insulation fatigue. The fatigue causes wire strand breakage, insulation failure, and results in noisy or broken connections.
3. Use cable ties or clamps to secure cables without being left hanging loose. When securing the cable, leave enough slack cable to allow free movement of the accelerometer on the vibrating machinery. These techniques for cable anchoring are extremely important for machinery with high displacement amplitudes.



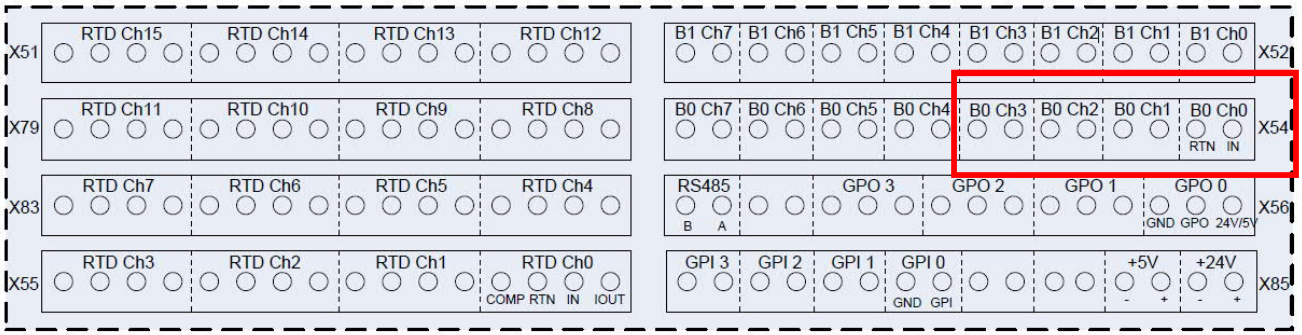
Cable anchoring (Clearance: 6 inches or 150 mm)

4. Use proper conduit and trays wherever required to help cables withstand the operating environment. The sensor cables should be laid away from high voltage cables by distance of at least 250 mm.
5. Connect the shield of the cable to the cable gland for proper ESD protection.
6. Locate X54 Connector on the DAU Board. Refer below Terminal Layout for reference



Cable diagram and technical specs

Terminal layout in DAU:



The accelerometers connections must be in the following order

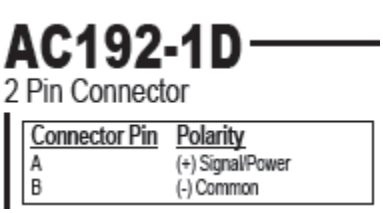
X54 B0 Ch0 - Channel 0 - DE Horizontal

X54 B0 Ch1 - Channel 1 - NDE Horizontal

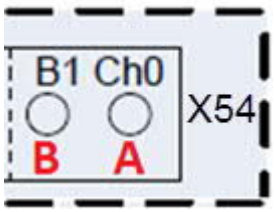
X54 B0 Ch2 - Channel 2 - DE Axial

X54 B0 Ch3 - Channel 3 - DE Vertical

7. Ensure proper polarity while connecting the sensor to the DAU



Connector Pin polarity



DAU Board Connection

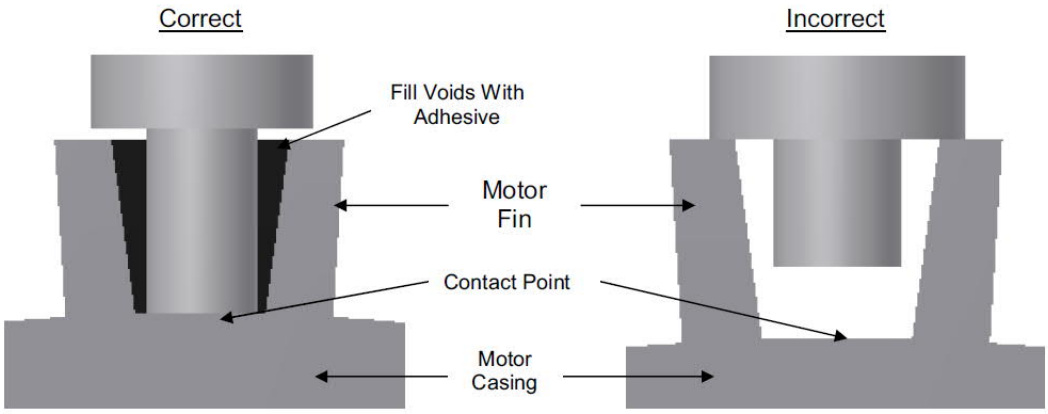
	Sensor protection and wiring must be carried out reliably and in accordance with good engineering practice. The sensor must not be allowed subject to a greater acceleration, or temperature. The sensor location should not hinder other operational and maintenance measures. Proper installation of mounting hardware or sensors on an application maximizes frequency response and data quality, and ensures long- term adhesion.

8 Installation in Motors with Fins

In some types of motors it might be useful to use other types of mounting pads. One example is motors with cooling fins. Please consult ABB for using these types of pads.

One example of pad for motors with cooling fins:

1. Prepare the cooling fins on motor for mounting by scraping or grinding any paint or debris between cooling fins.
2. Apply glue to the sides and bottom of the probe portion of the motor fin mount pad.
3. Place the motor fin mount pad between the motor fins at the desired location.
    a. Correct motor fin mount selection is important.
    b. The probe must fit in between the motor fins and the bottom of the probe must contact the motor casing.
4. Firmly press the motor fin mount pad into place, ensuring the bottom of the motor fin mount pad is touching the motor casing (this is the contact area where the vibration is transferred from the motor to the sensor).
    a. The tip of the motor fin mount pad should be as flat against the motor casing as possible.
    b. The motor fin mount pad should not be resting on the top of the fins. If it does, then the bottom of the probe may not be in direct contact with the motor casing.



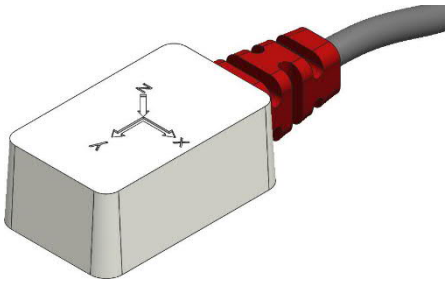
Placing of Motor Fin Mount Pad

	The motor fin mount pads are not provided as part of standard supply. This has to be procured separately by LSC, if customer needs it. Kindly ensure proper inspection of site conditions to include fin mount pad before submitting offer.

9 Installation of Magnetic Field Sensor (MFS)

9.1 MFS Location

The MFS is 3-axis sensor and measures axial, radial and tangential directions. When mounting Magnetic Field Sensor (MFS), it is important to locate the best positions on the motor. Install the MFS sensor with Y as Axial direction i.e. parallel to motor shaft and closer to drive end side of motor.



9.2 Mounting of MFS Sensor

Mount the MFS sensor by gluing the sensor enclosure directly on the motor. The enclosure is made from plastic material. Use of Loctite® 407™ is recommended.

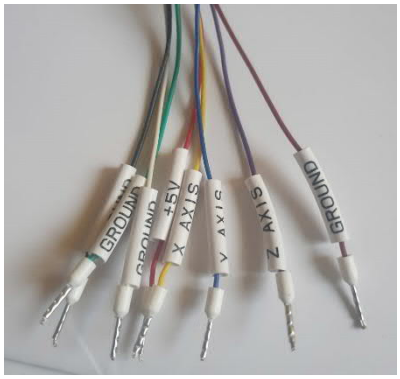
Procedure for gluing the enclosure:

1. All paint must be removed from the surface. Make sure all paint is grinded and the Sensor is glued directly on the metal on the motor.
2. Apply glue Loctite® 407™ on the motor surface.
3. Stick the plastic enclosure and put the cable to the DAU.
4. After gluing the sensor, the cable should be anchored to reduce stress at the cable ends. Cables if allowed to have excessive motion will eventually result in cable metal and adhesive fatigue. The fatigue causes wire strand breakage, adhesive failure, and results in noisy or broken connections.
5. Use cable ties or clamps to secure cables without being left hanging loose. When securing the cable, leave enough slack cable to reduce stress on the Magnetic Flux sensor enclosure on the vibrating machinery. These techniques for cable anchoring are extremely important for machinery with high displacement amplitudes

9.3 Wiring and Connection of Sensor

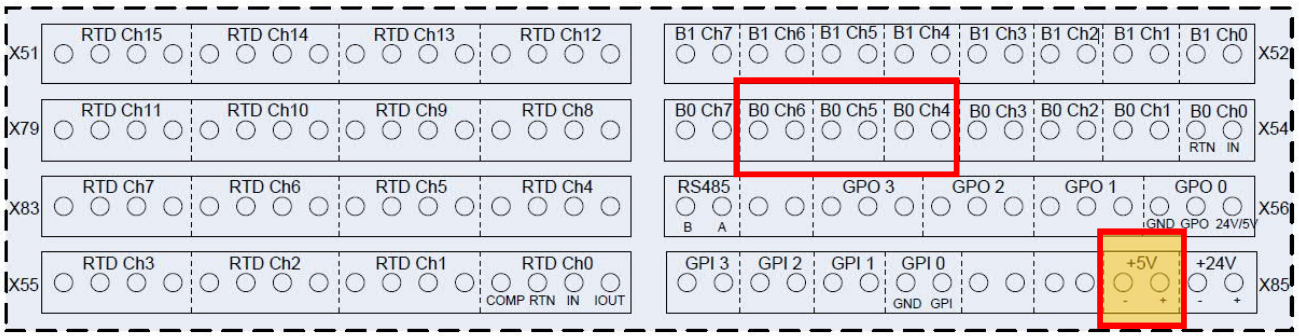
The sensor cable has 4 connection pairs as below

- V_{supply} (+5V) & Com
- X – Axis & GND
- Y – Axis & GND
- Z – Axis & GND



Locate Connector X54 on the DAU Board and refer following illustration for identifying the MFS Connections.

Terminal layout in DAU:

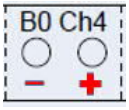


The MFS connections must be in the following order

X54 B0 Ch4 - Channel 4 – X - Axis

X54 B0 Ch5 - Channel 5 – Y - Axis

X54 B0 Ch6 - Channel 6 – Z - Axis

Note the polarity 

while connecting the sensor inside DAU.

Locate connector X85 on the DAU board and connect the V_{supply}, identified as +5V & Ground to the Supply connector as indicated in Terminal Layout above.

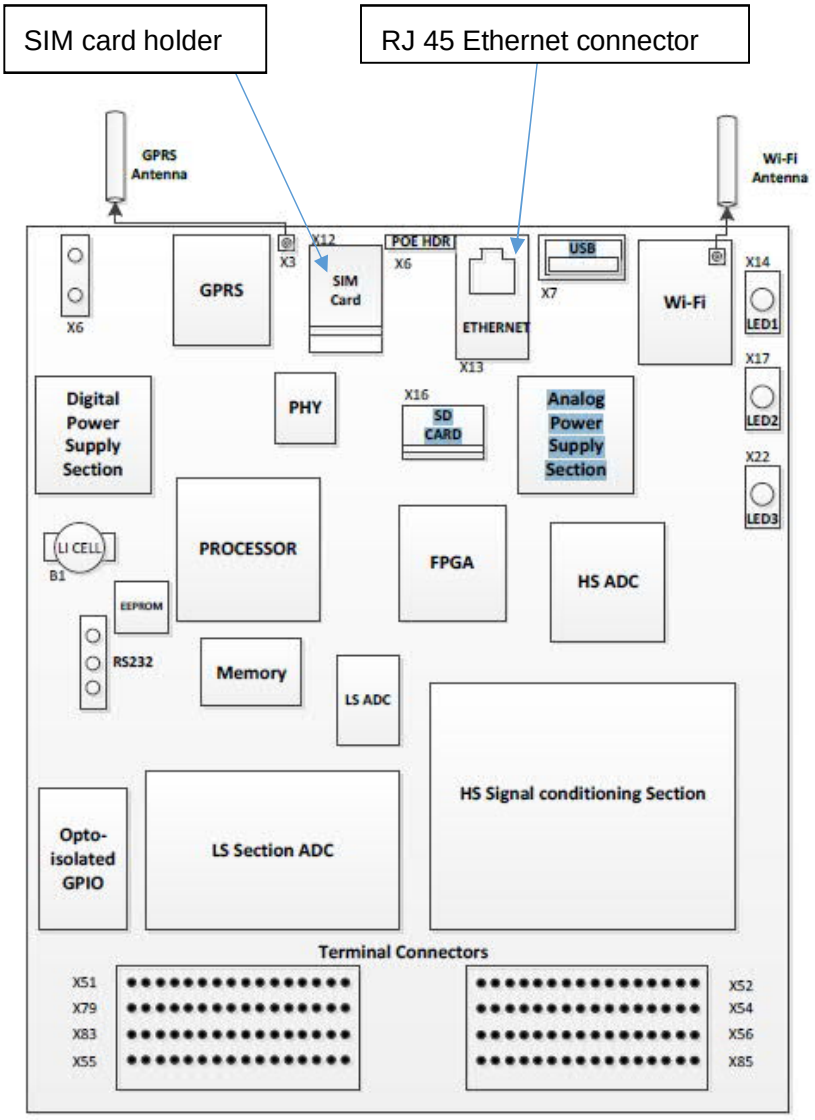
10 Configuration

10.1 Preparation

After installation have been done the MACHsense-R unit needs to be configured:

	Make sure that the power is switched off before putting in the SIM card.

	• Only micro SIM cards can be inserted in the provided hatch. • PIN code of the SIM card needs to be disabled.



1. First step is to insert SIM card in the SIM card holder.
2. Open the hatch, put in SIM card in correct position and close the hatch.
3. Next step is to connect a computer by using a network cable to connect between Laptop and MACHsense-R RJ45 connector.

In order to have all necessary information make sure that the following information about customer and the machine is collected:

	MACHsense R Installation information	ABB
Company name		MACHsense Serial No:
Plant name		MACHsense R MAC-address:
Drivetrain name		
Machine name		
	The above filled in information will be used for naming the machine in web portal.	

Manufacturer		Machine Serial Number	
Machine Type	☐ *Motor* ☐ *Generator*	Number of rotor bars (if known)	
Connection Type	☐ *Star* ☐ *Delta* ☐ *N/A*	Starting	☐ *Direct-online* ☐ *Variable Speed Drive*
Rated Power	*kW*		
Rated Voltage (Stator)	*V*		
Rated Current (Stator)	*A*		
Frequency	*Hz*		
Speed at Rated Output	*RPM*		
DE Bearing			
NDE Bearing			
If the machine has a Variable speed drive, please fill in the actual running speed or of the speed varies, fill in the running speed span.			
Actual Running Speed Max			
Actual Running Speed Min			

Sim card operator (company)			
Customer Contact persons:			
Name	Email	Mobile Phone Number (for SMS notifications)	

Please provide photos of motor nameplate and all machine including driven object and foundation.

10.2 Commissioning

Digitally connect MACHsense-R using the ABB Ability™ MACHsense-R Android app. Log on using your credentials and follow prompts to connect.

11 Terms for using ABB MACHsense-R – MSR1600 product/service

By registering and using the MACHsense-R portal, you are confirming that ABB will own the collected data and that this data can be used for future product development and that you will comply with all ABB website terms and conditions of use, as well as its Cookies and Privacy Policies.

By downloading, installing, activating, accessing or otherwise using the MACHsense-R Portal you have accepted the EULA (connect to EULA on our www.abb.com).

All data collected by the MACHsense-R is regarded as ABB property and will be shared with the user as described in the EULA.