SKF IMx-S32-UPG-LMU Installation

Part No. 32289800
Revision A

Installation Manual

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1 Introduction

This document is an installation manual which shall be used when upgrading LMU/CMU to IMx-S unit.

The upgrade / installation must be carried out according to the instructions and advice given in this manual. Any deviation from these directions can be made only after consulting with the SKF Condition Monitoring Center Luleå.

Installation errors can lead to a situation where the system does not work as intended and machinery faults go undetected. Therefore, contact the IMx-S application engineer at the slightest doubt during the installation.

In addition, it is the responsibility of the user to comply with local regulations especially with regard to safety.

Important - Installation errors which require the involvement of SKF Condition Monitoring Center Luleå personnel in order to rectify the start of the system, might be debited.

Important - Problems or equipment faults that result from failure to follow theses instruction will void the equipment warranty.

Note that IMx-S specific detail information are found in IMx-S User Manual.

2

Important Messages and Requirements

The following messages are important information which require special care in order to have a safe and reliable IMx-S system.


Important messages, instructions and information in this document must be carefully followed. Otherwise, harm might occur to equipment and/or personnel.


In order to fulfill fire enclosure requirements the following must be ensured:

- The cabinet must always be mounted using all the supplied mounting brackets.
- All unused cable ways must be closed with blind plugs.
- All cable glands and blind plugs must be made of material with fire protection V-1 or better.
- Must be installed in a metal enclosure cabinet, overall size 60 x 60 x 22 cm (23.6 x 23.6 x 8.7 in.) (size not including mounting brackets).


Important messages related to mains power (see Mains Power chapter as well):

- The electrical installation must be performed by a qualified electrician in order to connect an IMx-S32-UPG-LMU to the power grid.
- Make sure that the power is disconnected before the installation.
- Mains cable must be properly fixed with a cable gland to prevent the cord from strain, twist or move. See Cable Glands chapter as well.
- In order to prevent a hazardous event, mains cable neutral (N) and line (L1) wires must be secured together with a cable tie (for example, a nylon cable tie CV-100K) close to the mains power connector.
- For permanently connected IMx-S, an external all pole power switch must be installed in order to be able to disconnect the IMx-S from the mains power grid. The switch must be labeled "IMx-S" or similar. On/Off position must be clearly marked. The switch must be located close to the IMx-S, within operator's easy reach.


IMx-S unit contains circuit boards that are static sensitive. Therefore, use appropriate precautions to prevent ElectroStatic Discharge (ESD) when handling circuit boards.


Do NOT change DIP switch settings while the IMx-S unit is powered-up, as this may cause damage and void warranty.


Before powering up the IMx-S unit, make sure that DIP switch settings are properly set to match the recommendations for the connected sensors. Incorrect settings may cause permanent damage to the IMx-S unit.

In case there is a need for new holes in LMU/CMU cabinet:

- All holes must be made before IMx-S upgrade plate is installed to ensure no metall dust can enter the electronics.
- All holes must be controlled that there are no sharp edges.
- No open or unplugged holes are allowed.
- All cable glands and blind plugs must be of fire protection V-1 or better.

To ensure personal safety and EMC protection, it is only allowed to upgrade cabinets that have been approved by SKF (e.g. LMU and CMU cabinets).

During installation, be aware of sharp edges and handle the unit carefully to ensure that it is not dropped accidentally.

3
Safety Requirements

It is important to assess and evaluate the current site for safety instructions and stipulations.

During the installation work, make oneself acquainted with the valid safety stipulations for the specific machine. Different types of machines can have different safety hazards and safety instructions. In all cases, read the instructions carefully and act accordingly.

Important - In order to fulfill fire enclosure requirements, the cabinet must always be mounted using all the supplied mounting brackets.


IMx-S unit contains circuit boards that are static sensitive. Therefore, use appropriate precautions to prevent ElectroStatic Discharge (ESD) when handling circuit boards.

The following are some of the ways to prevent ESD:

- Use an ESD wrist strap when handling circuit boards
- Use a grounding mat when handling circuit boards
- Use correct packaging materials such as antistatic bags when transferring circuit boards

Important - IMx-S unit contains circuit boards that are static sensitive. Therefore, use appropriate precautions to prevent ElectroStatic Discharge (ESD) when handling circuit boards.

Mount the IMx-S unit and make sure that it is firmly attached at a location where it is not exposed to unnecessary radiant heat or strong magnetic fields.

The ambient temperature can be found in Environmental section under Technical Data.

4
Scenario

It is important to assess and evaluate the current site where the system is to be installed.

Before getting started, draw a plan on a piece of paper how you would like this installation to look like after it is completed, then consider if it is possible to achieve. Among other things, consider lengths of cables, where electrical power to the IMx-S units can be connected, where the @ptitude Observer Monitor or Analyst IMx Service should be installed and positioned and who should analyse the data measured. Good and thorough planning is the basis for a successful solution and installation.

Make a detailed layout of the equipment, the network, and distances between components. Include specifically the IMx-S units, the @ptitude Observer Monitor or Analyst IMx Service computer, the database server computer and all hubs/routers in the network. Specify network configuration of each components, such as IP addresses and subnet masks. SKF application engineers and service engineers need these information in order to assist.

Note that a CAT5/6 Twisted Pair (TP) Ethernet cable has maximum working distance of 100 m. If longer cable lengths are needed, fibre optic cables may be used along with needed converters such as converters for fibre optic to CAT5/6 (TP) Ethernet and vice versa.

When GPRS is used, the GPRS routers should be reconfigured as a part of the application to run a lifeline connection with the Observer Monitor or Analyst IMx Service computer.

Important - Failure of this communication path will force the GPRS router to reboot itself constantly, and can hamper the success of the application. This is especially valuable to consider when the GPRS forms a part of the customers internal IP network (VPN). In such case, SKF must be informed of this before ordering the GPRS, so that SKF can disable the lifeline functionality of the GPRS router.

5
Upgrade

Preparing for Upgrade

Proper planning and accessibility increase efficiency and minimize difficulty during the upgrade procedure.

The following is a list of critical steps in preparation.

- The installer must identify which mechanical units are to be upgraded.
- Ensure that the unit's mains power is turned off before the start of upgrade procedure.
- Ensure to read and understand the entire installation instruction before the start of upgrade procedure.
- Ensure to have tools needed ready for the upgrade procedure.
- To ensure a safe upgrade procedure and product reliability, it is recommended that the upgrade procedure is performed by trained personnel only.

Dismounting CMU/LMU Fastening Plate

Dismounting of LMU/CMU fastening plate is carried out according to the following steps.

1. Disconnect all cables from the LMU/CMU.
2. Remove the four (4) nuts in each corner of the LMU/CMU fastening plate.

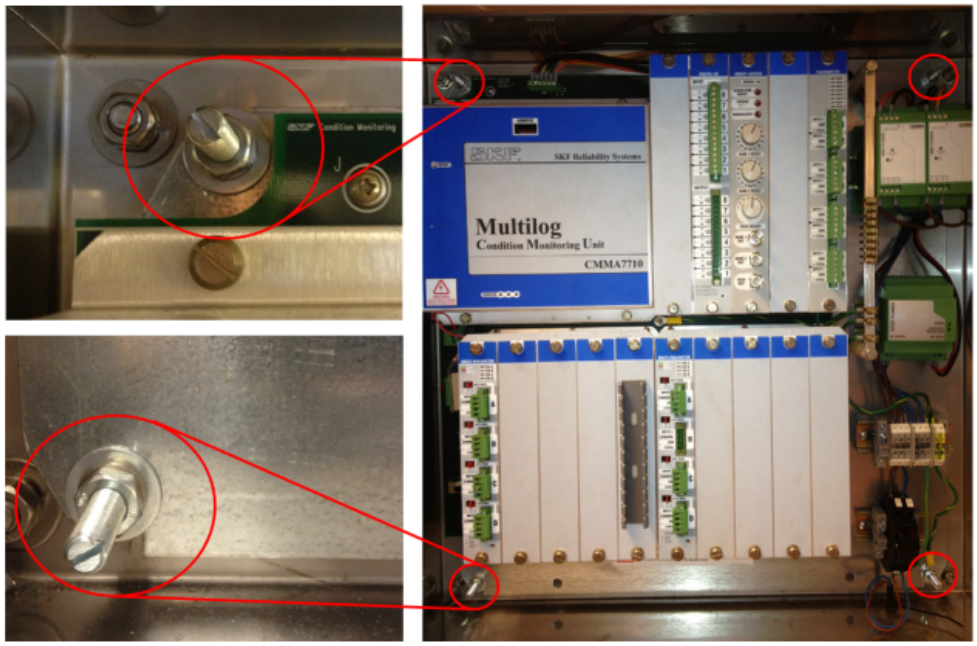

Figure 5-1: Locations of 4 nuts in each corner of LMU/CMU fastening plate

3. Remove the washers and save them for later use.
4. Remove the old LMU/CMU fastening plate.
5. Ensure to clean the cabinet carefully.

Replacing Gasket

The following steps are needed to replace an old gasket with an EMI gasket.

1. Remove the old gasket by using a small knife or equivalent.

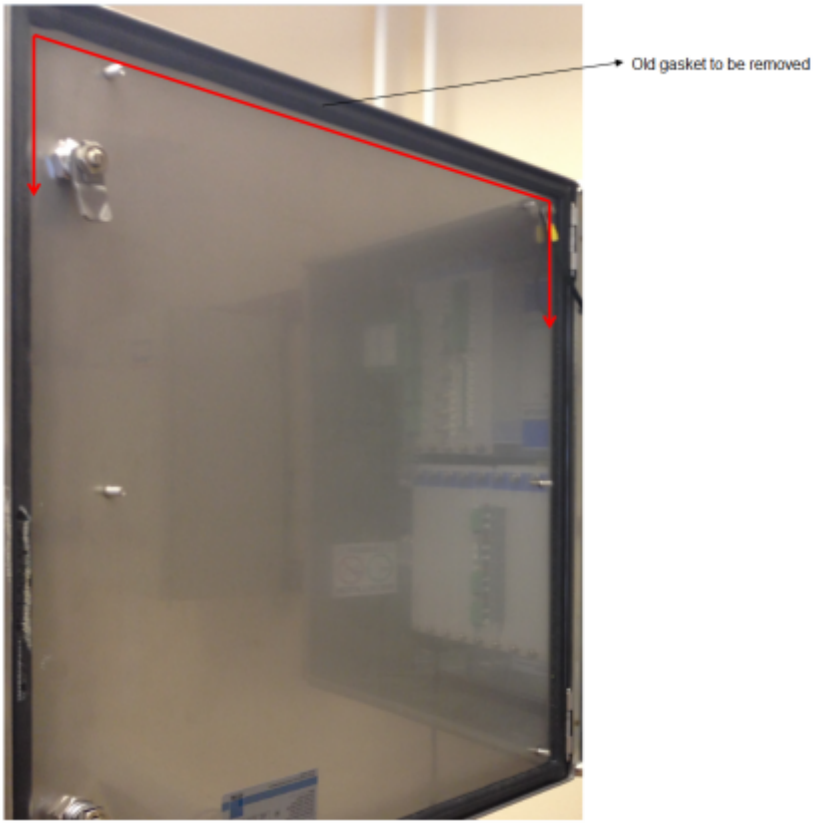

Figure 5-2: Old gasket to be removed

2. Ensure that all parts of the old gasket are removed.
3. Thoroughly clean the area where the new gasket should be fastened. Old glue leftovers must be completely removed.
4. Verify that there is no glue or parts left from the old gasket.
5. Try to fit the new EMI gasket in the position where the old gasket was located.
6. Remove the protection strip on the backside of the EMI gasket and fit the gasket in the same position where the old gasket was located. (there is tape on the backside of the EMI gasket).

Figure 5-3: Example of homogenous gasket

7. Do the same for all four gaskets to make one homogenous gasket all around the door.
8. Try to close the door and ensure that the gasket is positioned correctly.

Important - The EMI gasket is needed to fulfill EMC regulations. ***Note:*** *The change of gasket can affect IP classification.*

Mounting IMx-S Upgrade Plate

Mounting of IMx-S upgrade plate in LMU/CMU cabinet is carried out according to the following steps.

1. Make sure that there is one washer left on each fastening screw. This is to ensure that the new IMx-S upgrade plate is not mounted "directly on" to the cabinet wall.

   Note: A space of at least 5 mm is needed between the cabinet wall and the IMx-S upgrade plate.

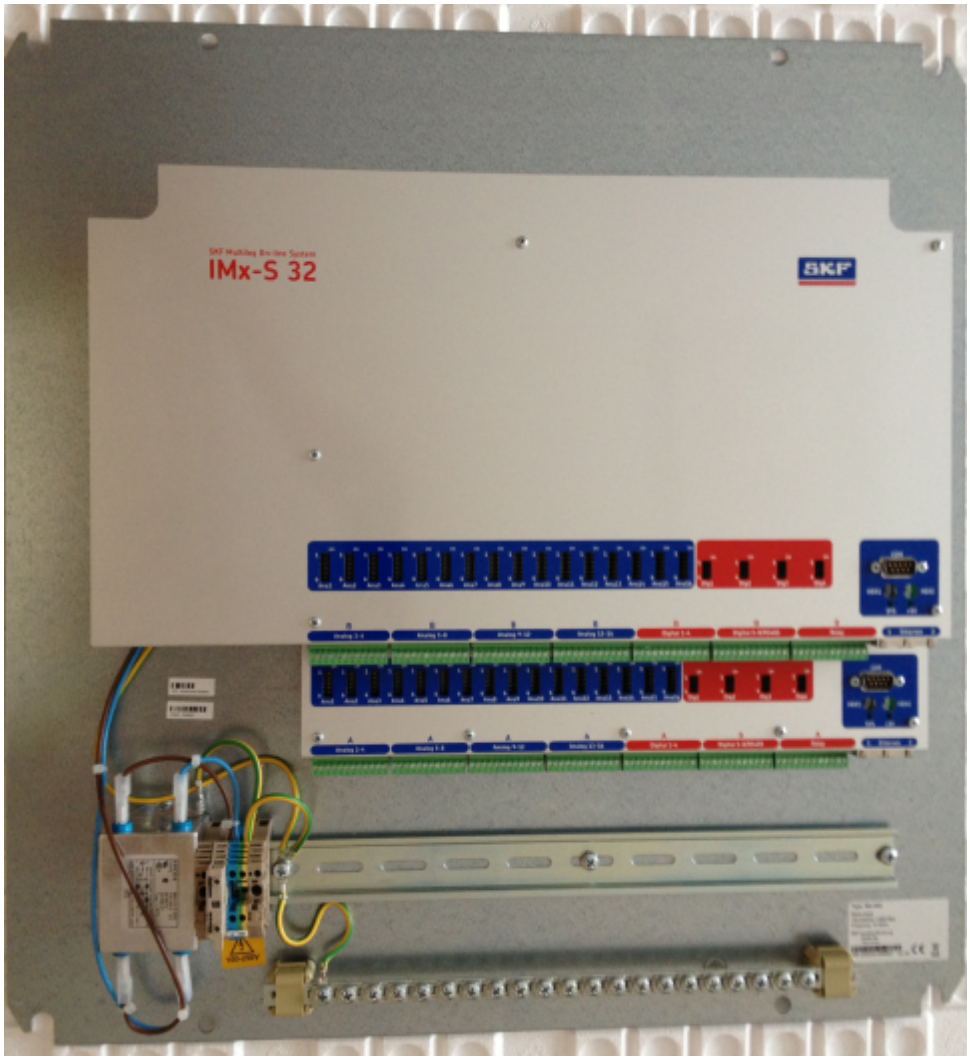

Figure 5-4: IMx-S 32 upgrade plate

2. Place the new IMx-S upgrade plate in its position.
3. Put back washers removed in step 3 of Dismounting CMU/LMU Fastening Plate.
4. Tighten the four nuts, one in each corner.

Sensor Cables

When routing a sensor cable, it is important that the cable is firmly fixed. The cable may never be allowed to vibrate or oscillate, since this effects the capacitance of the cable, and thereby the measurement result.

The sensor cable may not be routed or bundled together with supply cables since it generates strong magnetic fields.

Important - In general, all cables must be routed as far away as possible from the high voltage cables. If this cannot be done, care should be taken to use high quality shielded cables.

To connect IMx-S to sensors, the following sensor cable type is recommended:

- Shielded, twisted pair 2 × 2 × 0,5 mm^2 (FKAR-PG 2 × 2 × 0.50, DUE 4002 or corresponding)

Supply Cable

To connect IMx-S to 240 VAC or 120 VAC, the following is recommended:

- FKLK 3 × 1,5 mm^2 (*16 AWG*) or EKLK 3 × 1,5 mm^2 (*16 AWG*) or corresponding, with minimum voltage requirement 300 V and temperature range of –40 to +70 ºC (*–40 to +158 ºF*).

It is required that the IMx-S must be connected to protective ground/earth (PE). Refer to Mains Power for attaching power cable to the mains power/power grid.

Important - The cross section area of the PE wire must be equal or greater than the cross section area of the power wires. The PE wire should be color labeled green/yellow. However, in some countries, other cable requirements may apply.

Important - Mains cable must be properly fixed with a cable gland to prevent the cord from strain, twist or move. See Cable Glands section as well.

Cable Glands

If the sensor cable shields are to be grounded to IMx-S unit, then metallic EMC type cable glands with 360 degree shield connection are recommended for all cable lead-through except the mains and communication cable.

Important - All unused cable ways must be closed with blind plugs. All cable glands and blind plugs must be made of material with fire protection V-1 or better

Mains Power

In order to attach power cable to the mains power grid, follow the directions below.

1. First connect the green-yellow wire to the PE (protective earth) terminal.
2. Connect the blue wire to the N (neutral) terminal.
3. Connect the brown or black wire to the L1 (line) terminal.

Important - Make sure that the power is turned off before touching the power cable. Touching the leads of a powered cable can cause serious injuries.

Important - In some countries, you have to be certified in order to connect an IMx-S to the power grid.

Important - For permanently connected IMx-S an external all pole power switch must be installed in order to be able to disconnect the IMx-S from the mains power grid. The switch must be labeled "IMx-S" or similar. On/Off position must be clearly marked. The switch must be located close to the IMx-S, within operator's easy reach.

Important - Fuse holder can NOT be used as mains power disconnect device.

For power requirements refer to Power Supply in Technical Data section.

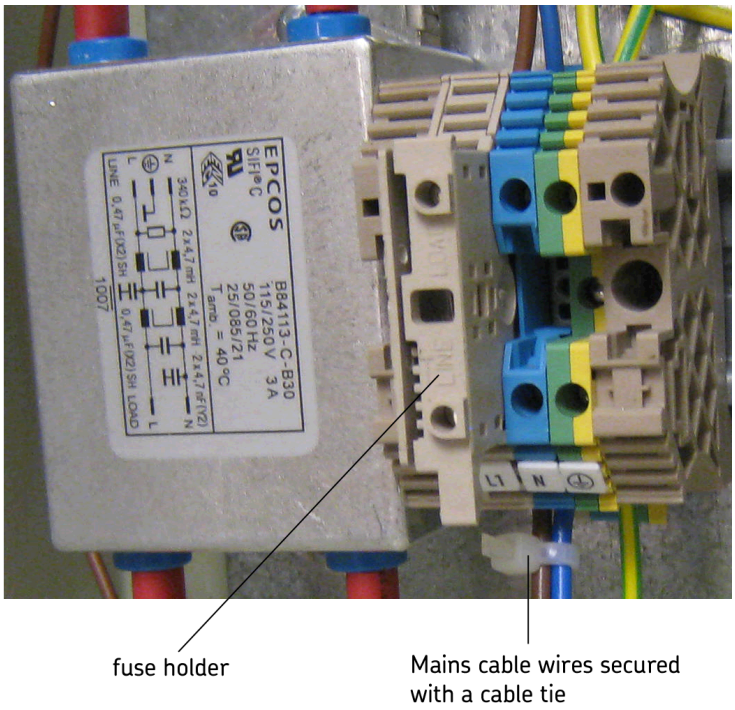

Figure 5-5: IMx-S mains power and fuse holder

As shown in the picture above, a fuse (slow blow T2A, 250 V, 5 x 20 mm) is mounted in the terminal power inlet.

Important - In order to prevent a hazardous event, mains cable neutral (N) and line (L1) wires must be secured together with a cable tie (for example, a nylon cable tie CV-100K) close to the mains power connector.

Communication Cable

For lengths up to 15 meters, it is recommended to use pre-fabricated Ethernet twisted pair cable FTP type, CAT5/6.

For longer cable lengths, it is recommended to use S-FTP (screened shielded twisted pair) Ethernet cable CAT5/6.

Data Communication

IMx-S unit data communications are compliant with the Ethernet standard 10/100 Mbit (half- and full-duplex).

IMx-S has two Ethernet ports which work like an internal network switch.

Ethernet Cable

The Ethernet TP cable on the IMx-S is connected at one of the standard Ethernet RJ45 connections. Both Ethernet ports have auto detection of crossover or straight through Ethernet cable connection. Basically, IMx-S has a built-in 2-port Ethernet switches. It is possible to connect several IMx-S units in a daisy chain with up to 8 units in a single cable layout.

There are two LEDs on RJ45 connector.

- Yellow LED is the Ethernet traffic indicator which flickers whenever there is traffic on the network.
- Green LED is the Ethernet link indicator which lights up when the system is correctly connected to another network device.

6
Configuration of IMx-S

After the LMU/CMU installation is completed, connect sensors and configure the IMx-S system.

Be ensure to read IMx-S User Manual in order to perform correct sensor connections and configuration.

7
Technical Data

Environmental

- Size (H × W× D):
  - Without mounting bracket: 60 × 60 × 22 cm (*23.6 x 23.6 x 8.7 in.*)
  - With mounting bracket: 60 × 65 × 22 cm (*23.6 x 25.6 x 8.7 in.*)
- Weight: 27 kg (*59.5 lb.*)
- Temperature range: –20 to +60 °C (*–4 to +140 °F*)
- Measurement category II
- Pollution degree 2
- Maximum altitude: 2 000 m (*6 561.7 ft.*)

Power Supply

- 100 to 240 VAC, 47 to 63 Hz
- Power consumption:
  - IMx-S 16: 30 W
  - IMx-S 32: 60 W

Analogue Inputs

- Analogue differential inputs:
  - IMx-S 16: 16
  - IMx-S 32: 32
- Individual 24 V power supply, maximum 35 mA per channel
- Selectable standard accelerometer power supply (4 mA)
- Input range: ±25 V
- Impedance: >100 kΩ

Digital Inputs

- Digital opto-isolated inputs:
  - IMx-S 16: 8
  - IMx-S 32: 16
- Individual 24 V power supply, maximum 30 mA per channel:
  - IMx-S 16: 4 channels
  - IMx-S 32: 8 channels

Outputs

- Relay driver outputs:
  - IMx-S 16: 4
  - IMx-S 32: 8
- System relay outputs:
  - IMx-S 16: 1
  - IMx-S 32: 2

Interface

- Ethernet: 100 Mbit RJ45, TCP/IP, switch functionality
- RS232 service interface
- 2-port Ethernet network switch (possible for daisy chaining)

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