# SKF E-SMS-C

## EXTERNAL SMS CONTROL FOR REMOTE MONITORING AND OPERATION OF LUBRICATION SYSTEMS

This manual includes the operating instructions for the SKF-E-SMS-C lubrication remote control and describes its operation.


E-SMS-C 1A

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# Legal disclosure

### Manufacturer

Oy SKF Ab
Teollisuustie 6
40951 Muurame
Finland
Telephone: +358 (0) 20 7400 800
Fax: +358 (0) 20 7400 899

Email: skf-lube@skf.com
www.skf.com/lubrication

### Training courses

In order to provide a maximum of safety and economic viability, SKF provides detailed training courses. Attending the training courses is recommended. For further information, please contact the provided SKF Service address.

### Copyright



### Notes related to the operating instructions

These operating instructions do not include information on the product warranty. The warranty terms are described in the general terms of use. The instructions are part of the described products and must be kept in an accessible location for further use.

### Disclaimer

The manufacturer shall not accept any liability for damages caused by the following actions by the customer:

- accidents, negligent or inappropriate use, assembly, operation, configuration, maintenance or repairs,
- improper or late response to malfunctions,
- unauthorised modifications to the product,
- intent or negligence, and
- the use of non-original (non-SKF) spare parts.

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price.

Liability for consequential damages of any kind is excluded.

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# Explanation of symbols, signs and abbreviations

The following symbols are used in the safety instructions included in these operating instructions to highlight conditions which are potentially harmful to people, materials or the environment.

Please follow the instructions provided especially in the highlighted conditions. Also, relate the safety instructions to other operators.

| | | | |
|---|---|---|---|
|  | General warning |  | Risk of electric shock |
|  | Risk of slipping |  | Hot surface |
|  | Fire hazard |   | Device protected from danger of explosion |
|  | Danger of crushing |  | ESD protected device |
|  | General note |  | Use protective goggles |
|  | Disposal, recycling |  | Disposal of waste electrical and electronic equipment |

| | Warning level | Consequence | Probability |
|---|---|---|---|
|  | DANGER | Death, serious injury | imminent |
|  | WARNING | Death, serious injury | possible |
|  | CAUTION | Minor injury | possible |
| | NOTICE | Property damage | possible |

| Symbol | Meaning |
|---|---|
| ● | Instruction step |
| ○ | List item |
| ✓ | Conditions which must be met before the activities described in the title clause can be completed |
| ☞ | Related factors, causes or consequences |

| Abbreviations | | | | | |
|---|---|---|---|---|---|
| ap-prox. | approximately | °C | degrees Celsius | °F | degrees Fahrenheit |
| i.e. | that is | K | Kelvin | Oz. | ounce |
| etc. | et cetera | N | Newton | fl. oz. | fluid ounce |
| poss. | possibly | h | hour | in. | inch |
| incl. | including | s | second | psi | pounds per square inch |
| min. | minimum | d | day | sq.in. | square inch |
| max. | maximum | Nm | Newton metre | cu. in. | cubic inch |
| min | minute | ml | millilitre | mph | miles per hour |
| etc. | et cetera | ml/d | millilitre per day | rpm | revolutions per minute |
| e.g. | for example | cc | cubic centimetre | gal. | gallon |
| kW | kilowatt | mm | millimetre | lb. | pound |
| U | voltage | l | litre | hp | horse power |
| R | resistance | dB (A) | sound pressure level | kp | kilopond |
| I | current | > | greater than | fpsec | feet per second |
| V | volt | < | less than | | |
| W | watt | ± | plus/minus | | |
| AC | alternating current | Ø | diameter | | |
| DC | direct current | kg | kilogram | | |
| A | ampere | rh | relative humidity | | |
| Ah | ampere hour | ≈ | approximately | | |
| Hz | frequency [Hertz] | = | equal to | | |
| NC | normally closed | % | per cent | | |
| NO | normally open | ‰ | per mille | | |
| | | ≥ | equal to or greater than | | |
| | | ≤ | equal to or less than | | |
| | | $mm^2$ | square millimetre | | |

| Conversion factors | |
|---|---|
| length | 1 mm = 0.03937 in. |
| area | 1 cm² = 0.155 sq.in |
| volume | 1 ml = 0.0352 fl.oz. |
| | 1 l = 2.11416 pints (US) |
| mass | 1 kg = 2.205 lbs |
| | 1 g = 0.03527 oz. |
| density | 1 kg/cc = 8.3454 lb./gal (US) |
| | 1 kg/cc = 0.03613 lb./cu.in. |
| force | 1 N = 0.10197 kp |
| pressure | 1 bar = 14.5 psi |
| temperature | °C = (°F–32) x 5/9 |
| output | 1 kW = 1.34109 hp |
| acceleration | 1 m/s² = 3.28084 ft./s² |
| speed | 1 m/s = 3.28084 fpsec. |
| | 1 m/s = 2.23694 mph |

# 1 Safety instructions

**Warning** Read and follow the operating instructions and operation description of this product. Failure to follow these instructions may result in serious injury or damage to the lubrication system or the lubricated equipment.

## 1.1 General safety instructions

- These safety instructions should be read and followed by any persons entrusted with working on the product and those who supervise or instruct the group of persons mentioned above. In addition, the owner must ensure that the relevant personnel are fully familiar with the contents of the instructions and have understood them. It is prohibited to commission or operate the product prior to reading the instructions.
- These instructions must be kept for further use.
- The described products have been manufactured according to the state of the art. However, if the products are used for other than their intended purpose, there may be risks which may result in personal injury or property damage.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these instructions, general statutory regulations for accident prevention and environmental protection must be observed.

## 1.2 General behaviour when handling the product

- Please follow these instructions whenever you use the product. If the product is not in proper technical condition or you are unaware of the potential hazards, do not use the product.
- Familiarise yourself with the functions and operation of the product. All specified assembly and operating steps must be competed in the indicated order.
- Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.
- Prevent unauthorised access.
- Always wear personal protective equipment.
- Take the proper precautions and follow the instructions concerning the relevant task. Responsibilities for different activities must be clearly defined and observed. Uncertainty is a major risk factor for safety.
- Safeguards and other protective and emergency equipment must not be removed, modified, disconnected or otherwise disabled. Their completeness and function must also be checked at regular intervals.
- If a safeguard or other protective equipment has to be detached, it must be reattached and tested immediately after the work is complete.
- Remedy any faults included in your area of responsibility. If the fault is beyond your competence, notify your supervisor immediately of the fault.
- Never use parts of the centralised lubrication system or of the machine as standing or climbing aids.

## 1.3 Intended use

SKF external SMS control modem (E-SMS-C) is used for various lubrication systems operation and monitoring in accordance with the specifications, technical data and limits stated in these instructions:

Usage is allowed exclusively for professional users in the frame of commercial and economic activities.

## 1.4 Foreseeable misuse

Any use differing from that stated in these instructions is strictly prohibited, particularly the following:

- use outside the indicated temperature range, see 3 Technical specifications,
- use in areas with aggressive or corrosive materials (e.g. high ozone pollution),
- use in areas with harmful radiation (e. g. ionising radiation),
- feeding, forwarding, or storing hazardous substances and mixtures described in Annex I part 2–5 of the CLP regulation (EG 1272/2008) and marked with warnings GHS01–GHS06 and GHS08,
- feeding, forwarding or storing gases, liquefied gases, dissolved gases, vapours or fluids whose vapour pressure exceeds normal atmospheric pressure (1,013 mbar) by more than 0.5 bar at the maximum permissible operating temperature, and
- use in an explosion protection zone.

## 1.5 Modifications to the product

Unauthorised conversions or modifications may have unforeseeable effects on product safety and functionality. Therefore, any unauthorised conversions or modifications are expressly prohibited.

## 1.6 Forbidden measures

Performing the following functions is allowed only for the manufacturer's experts or for the manufacturer's authorised persons due to statutory regulations and/or to avoid possible errors.

- Removal of protections against contact.

# 1.7 Other applicable documents

In addition to these instructions, the following documents must be observed by the respective target group:

- operational instructions and approval rules
- safety data sheet (SDS) of the lubricant used.

Where appropriate:

- project planning documents
- instructions provided by the suppliers of purchased parts
- any documents of other components required to set up the centralised lubrication system
- other documents relevant for the integration of the product into the machine or system.

# 1.8 Rating plate

Rating plate contains important information, such as the product code, date of manufacture, etc.

The following information must be recorded in the operating instructions in order to avoid the loss of product information in case the rating plate is lost or otherwise damaged during use.

Code No._____

Serial No._____

Model _____

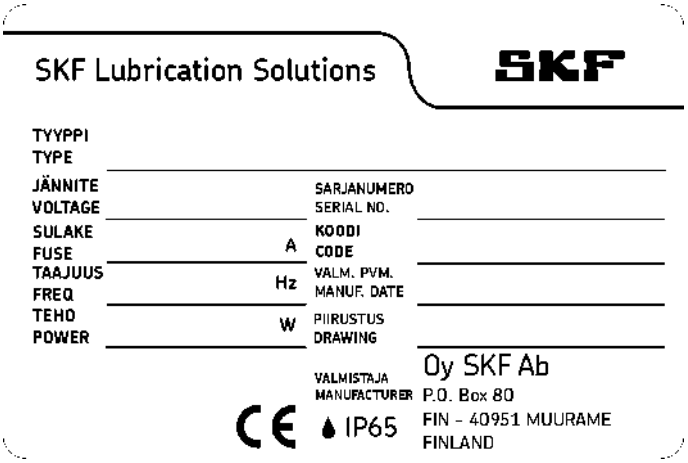



*Figure 1. Rating plate example.*

# 1.9 Information on the CE conformity marking

CE conformity marking is based to all the essential requirements set in the following directives:

- 2014/53/EU Radio Equipment Directive

# 1.10 Persons authorized to operate the device

## 1.10.1 Operator

An operator is a person who is qualified to carry out the functions and activities related to normal operation based on his or her training, knowledge and experience. This includes avoiding possible hazards that may arise during operation.

## 1.10.2 Mechanical specialist

A mechanical specialist is a person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, commissioning, operation, maintenance, repair and disassembly.

## 1.10.3 Electrician

An electrician is a person with appropriate professional education, knowledge and experience to detect and avoid electrical hazards.

## 1.10.4 Providing briefing for external technicians

Prior to commencing any activities, external technicians must be informed by the end-user of its safety provisions, applicable accident prevention procedures and the functions of the superordinate machine and its protective devices.

## 1.10.5 Provision of personal protective equipment

The end-user must provide suitable personal protective equipment for the respective location of operation and the purpose of operation.

# 1.11 Operation

The following must be observed during commissioning and operation:

- any information within this manual and the information within the referenced documents, and
- all laws and regulations that the end-user must observe.

## 1.11.1 Transport, installation, maintenance, malfunctions, repairs, shut down and disposal

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary operational measures and work instructions.
- Transport the products with suitable transportation and hoisting equipment using suitable work methods.
- Before conducting any work, depressurise the product or machine into which the product will be integrated and secure it against unauthorised activation.
- Ensure through suitable measures that movable or detached parts are immobilised during the work and that no limbs can be caught in between if there are inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Be careful not to damage other units in the machine or vehicle or impair their function during installation.
- Dry or cover wet, slippery surfaces accordingly.
- Cover hot or cold surfaces accordingly.
- Work on electrical components must be carried out by electrical specialists only. Observe any waiting periods for discharging, if necessary. Carry out work on electrical components using voltage insulated tools only.
- Make electrical connections only according to the information in the valid wiring diagram and taking the relevant regulations and the local connection conditions into account.
- Do not touch cables or electrical components with wet or damp hands.
- Do not bypass any fuses. Replace fuses with same type and rating only.
- Do not drill holes to critical, load-bearing parts. Use existing boreholes whenever possible. Be careful not to damage lines and cables when drilling.
- Observe possible abrasion points. Protect the parts accordingly.
- All components used must be suitable for use in:
  - the system's maximum operating pressure, and
  - the system's minimum and maximum ambient temperature range.
- No parts of the centralised lubrication system may be subjected to torsion, shear or bending.
- Before using any parts, check them for contamination, clean if necessary.
- Lubricant lines should be primed with lubricant prior to installation. This makes it easier to bleed the system of air afterwards.
- Observe the specified tightening torques. Use a calibrated torque wrench.
- When working with heavy parts, use suitable lifting tools.
- Avoid mixing up or wrong assembly of dismantled parts. Mark these parts accordingly.

## 1.12 Commissioning and daily start-up

Ensure that:

- All safety devices are complete and work properly.
- All connections are correctly connected.
- All parts have been correctly installed.
- All warning labels on the machine are complete, highly visible and undamaged.
- Replace illegible or missing warning labels without delay.

## 1.13 Cleaning

- There is a risk of fire and explosion when using flammable cleaning agents. Use only non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Do not use steam jet or high pressure cleaners. Electrical components may be damaged. Observe the IP protection class.
- Cleaning work on energised components may be carried out by electrical specialists only.
- Mark damp areas accordingly.

## 1.14 Residual risks

*Table 1. Residual risks.*

| **Residual risk** | **Prevention/remedy** |
|---|---|
| **Lifecycle stage: Installation / start-up / operation / setting and retrofitting** | |
| Electrical shock caused by a faulty or incorrectly connected power cable | • Check the supply cable before connecting power supply to the device.<br>• Connect all wires correctly. |
| Torn/broken wires, when connected to moving devices of the machines | • Use flexible cable lines with cable clamps, when there are moving components in use. |
| **Lifecycle stage: Failure, troubleshooting, maintenance, repair / removing from service and disposal** | |
| Electrical shock from a faulty power cable that has been connected to electricity supply | • Check the condition of the power cable before starting up the device. |
| Electrical shock from an open and energised control center | • Switch off power with the main switch before any work on electrical components.<br>• Be always careful and cautious, when working on the product.<br>• Ensure that the protection against contact of the energised parts is intact and in place. |

# 2 General description / Intended use of the system

SKF external SMS control modem (E-SMS-C) enabling remote control of lubrication systems. It will bring well proven SMS message-based alarm and operation functionality to mobile phone.

Remote alarm messages are extremely useful with difficult to access locations, either due safety or great distance.

Lubrication system inspections are easy to carry out with remote creating time saving for maintenance personnel.

SKF's E-SMS-C can be used with single line, dual-line, progressive and spray systems while using compatible IF or ST control centers firmware versions.

- SKF ST1340/ST-1440
- SKF ST-1240-IF
- SKF Multilube IF-103
- SKF Maxilube IF-105

# 3 Technical specifications

*Table 2. Technical specifications.*

| **Technical specifications** | |
|---|---|
| Operating temperature | -30 °C to +85 °C (-22 °F to 185 °F) |
| Operating voltage range | 9 – 30 V DC |
| GSM Quad-Band | 850/900/1800/1900 |
| Cable connections | Terminals for 2.5 mm² wires |
| Casing | Rittal GA9113.210, Aluminium |
| (dimensions) | 260x160x90 mm |
| Protection class | IP66 |
| Weight | 3,6 kg |

# 4 Delivery, return & storage

## 4.1 Delivery

Inspect the product immediately after reception for any signs of damage during shipment and other defects by comparing the delivery to the shipping documents. Immediately report any damage suffered in transport to the forwarding agent. In case of damage during shipment or other defect, store the original product packaging, until all deviations have been corrected. Ensure the safe handling of the product in the internal transport in the location.

## 4.2 Return

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning the product or its parts. Protect the product from mechanical strain (dents, shocks). Returns can be made via land, sea, or air transport. Add the following symbols to the package of the product to be returned:

## 4.3 Storage

The products must be stored as follows:

- Store in a closed, dry, cool and vibration-free location.
- Ensure that there are no corrosive or aggressive materials at the place of storage (e. g. UV rays, ozone).
- Protect the product from pests and animals (insects, rodents, etc.).
- Can be stored in the original packaging.
- Protect the product from hot and cold.
- In case of significant temperature fluctuations and/or high air humidity, perform the necessary measures in order to prevent condensation (e.g., by using a heater).
- The product's acceptable storage temperature range is the same as its operating temperature.
- Do not store the product for more than 24 months.

| | |
|---|---|
|  | Before taking the product into use, inspect it for possible damages incurred during storage. This applies to parts made of plastic and rubber (embrittlement) as well as components primed with lubricant (ageing) in particular. |

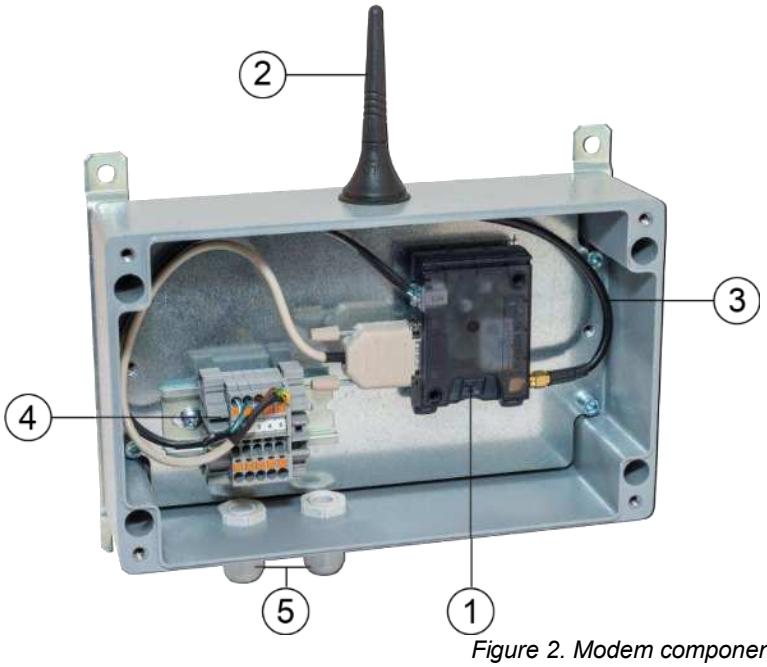
# 5 Structure

## 5.1 Enclosure


*Figure 1. SKF E-SMS-C remote SMS modem in robust casing.*

Casing material: aluminium. Colour similar to RAL7001.

## 5.2 Components




1. GSM - Modem
2. Antenna
3. Antenna Cable
4. Terminal blocks
5. Cable Glands

*Figure 2. Modem components.*

# 6 Installation

## 6.1 Installation of the machinery

| | |
|---|---|
| | WARNING |
| | Electrical connections must only be made by qualified electricians. Minimise the risk of electric shock by making sure that the control center is de-energized before making connections. Power must be turned off before work involving handling of conductive parts or opening any part of the system or product. |

### 6.1.1 E-SMS-C connection point dimensions

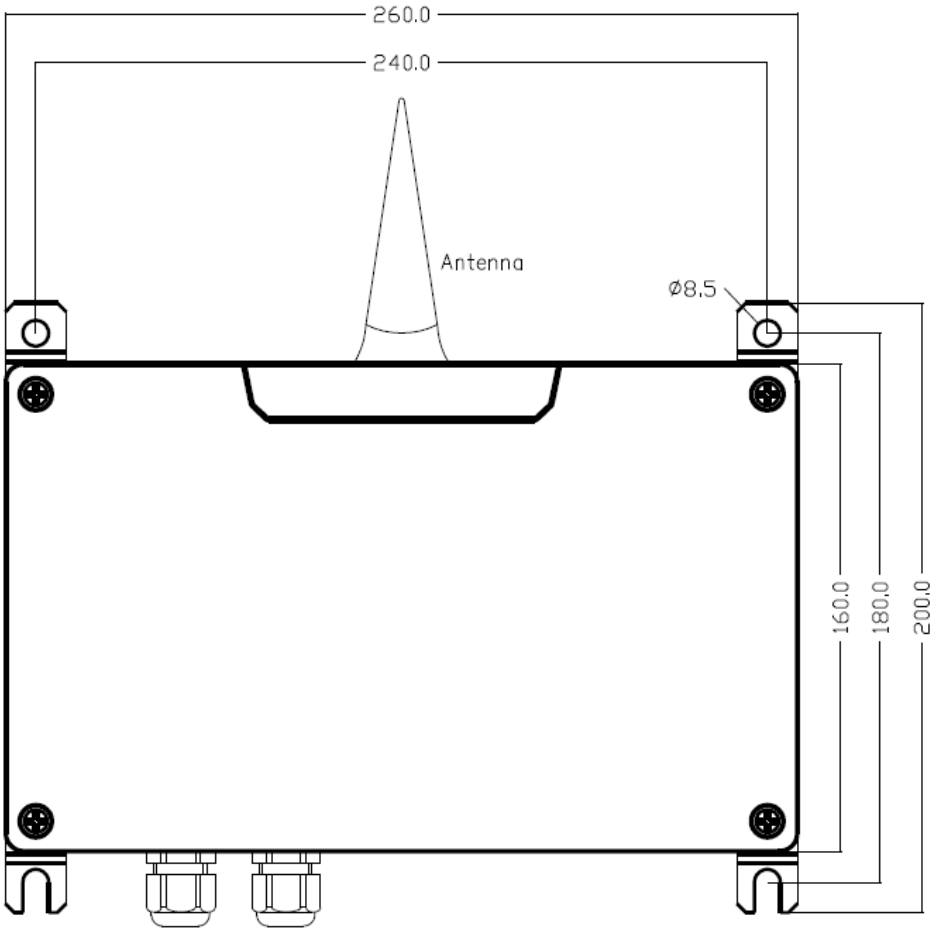



*Figure 3. Connection points of the SKF E-SMS-C modem.*

# 7 Operation

## 7.1 SKF E-SMS-C Lubrication system options

SKF's E-SMS-C can be used with single line, dual-line, progressive and spray systems while using compatible IF or ST control centers.

*Table 1. Compatible IF and ST control centers & firmware versions.*

| Control center | Firmware version |
|---|---|
| SKF ST1340/ST-1440 | 150519 |
| SKF ST-1240-IF | 2.46 |
| SKF Multilube IF-103 | ?? |
| SKF Maxilube IF-105 | 2.46 |

| **NOTE!** | E-SMS-C supports standard sim card size (15x25 mm). |
|---|---|

## 7.2 ST-1340/ST-1440 Control center and E-SMS-C

Text message connection is established between SKF ST1340/ST-1440 Control Center and a GSM-phone via SKF E-SMS-C.

The SKF ST-1340/ST-1440 sends a SMS message to the preset active telephone number when a lubrication alarm occurs.

User can initiate lubrications by sending SMS messages.

### 7.2.1 Preparing the SIM card

If the modem has been delivered without SIM-card, it must be inserted in the SIM slot in the modem.

The PIN code query must be set OFF in the SIM. It can be done by setting the SIM-card in a GSM phone and use the user's interface of the GSM phone for setting.

### 7.2.2 Setting phone number on a SIM-card

SKF ST1340/ST-1440 accepts communication with a GSM-phone only if the phone number has been saved in the phone book of the modem's SIM-card.
The easiest way to save a phone number on a SIM-card is to use the phone book settings of a GSM-phone.

- Remove SIM-card from modem. The card is released by pressing the SIM card in the slot.
- Place the SIM-card in a GSM-phone. PIN-code request is not in use.
- Remove all unnecessarily numbers from the SIM-card (e.g. teleoperator numbers)
- Add the number/numbers of the GSM-phones that are allowed to communicate with ST1340/ST-1440. Use international format. E.g. number of a Finnish GSM-phone in format +358…

Place the SIM-card back to the modem.

| **NOTE!** | Max. 9 phone numbers can be saved in the phone book. |
|---|---|

### 7.2.3 Activation of automatic alarm messages

Send a message **K0A** or **K0a.** (K zero A)
If the phone number of the sender is saved on the SIM-card of the modem, SKF ST1340/ST-1440 Control Center sets it as the active number. After that SKF ST-1440 sends a message to this number whenever an alarm occurs.

After the SKF ST1340/ST-1440 receives the message, it acknowledges this immediately with message:

| *ST1340* | *ST-1440* |
|---|---|
| *Name of the control center* | *Name of the control center* |
| *Alarm state (or No alarms)* | *Alarm state (or No alarms)* |

The alarm activation message can be used also for checking if there are active alarms in ST1340/ST-1440.

After this no alarm messages are transmitted to the previous active GSM-number.

If the number was not found on the SIM card of the modem, ST1340/ST-1440 sends a message:

| *ST1340* | *ST-1440* |
|---|---|
| *Name of the control center* | *Name of the control center* |
| *Access denied* | *Access denied* |

*Sending of alarms can be prevented by sending message:*

***K0X or K0x***

*After that alarms will be sent only after reactivating with message:*

K0A.

## 7.2.4 Alarm messages to active GSM-number

SKF ST1340/ST-1440 sends an alarm message to the active number immediately when an alarm occurs:

- Example 1:

| | |
|---|---|
| *ST1340* | *ST1440* |
| *Wood room* | *Wood room* |
| *Channel 2: Conveyer 1* | *Channel 2: Conveyer 1* |
| *Low level alarm* | *Low level alarm* |

- Example 2:

| | |
|---|---|
| *ST1340* | *ST1440* |
| *Wood room* | *Wood room* |
| *Channel 2: Conveyer 1* | *Channel 2: Conveyer 1* |
| *Pressure alarm, line 1* | *Pressure alarm, line 1* |

- Example 3:

| | |
|---|---|
| *ST1340* | *ST1440* |
| *Wood room* | *Wood room* |
| *Monitor alarm* | *Monitor alarm* |

Monitor alarm means alarm from SKF Doser monitor or from Lubemon monitoring units. The message doesn't show the lube point information. Monitor alarm message is sent only, if monitoring alarms are connected to common alarm relay in the configuration of the control center.

## 7.2.5 Acknowledge of an alarm

See chapter Lubrication commands.

## 7.2.6 Repetition of the alarm message

ST1340/ST-1440 sends an alarm message after an alarm occurs. The alarm message (same as the response to message K0x) is sent also once a day, if there are active alarms in ST-1340/ST-1440. The message is sent at 9:00AM based on the time of the real time clock in ST-1340/ST-1440.

## 7.2.7 Lubrication commands

SMS messages can be used for starting lubrication
Command format:

**KnLm** or **KnLm**

*K stands for "Channel"*

*n is the channel number*

*L stands for "Line"*

*m is the line number*

*when m=1, line 1 will be lubricated*

*when m=2, line 2 will be lubricated ( only for a DuoFlex channel)*

*when m=0, the line that is the line in turn to be lubricated*

*Example*

*K6L0 starts lubrication in channel number 6, line in turn.*

| | |
|---|---|
| **NOTE!** | If the channel is in alarm state, the alarm is acknowledged and the alarming line is lubricated independent on the line number in the message. |

| | |
|---|---|
| **NOTE!** | Monitor alarms can not be acknowledged by SMS messages |

*When ST-1340/ST-1440 gets a lubrication command, it starts the lubrication with the same conditions as if the extra lubrication button is pressed on the user's interface of ST1340/ST-1440.*

- *Waits until no other channel is pressuring.*
- *Waits until pressure is discharged after previous pressurization.*

*When ST-1340/ST-1440 starts pressuring, it sends a message:*

- *Example*

| | |
|---|---|
| *ST1340* | *ST1440* |
| *Wood room* | *Wood room* |
| *Pressuring* | *Pressuring* |
| *Channel 2: Conveyer 1* | *Channel 2: Conveyer 1* |
| *Line 2* | *Line 2* |
| *L1: 000bar* | *L1: 000bar* |
| *L2: 000bar* | *L2: 000bar* |

*When pressuring is finished, a message is sent:*

- *Example*

| | |
|---|---|
| *ST1340* | *ST1440* |
| *Wood room* | *Wood room* |
| *Pressured* | *Pressured* |
| *Channel 2: Conveyer 1* | *Channel 2: Conveyer 1* |
| *Line 2* | *Line 2* |
| *Elapsed 20s* | *Elapsed 20s* |
| *L1: 010 bar* | *L1: 010 bar* |
| *L2: 153 bar* | *L2: 153 bar* |
| *OK (or Alarm type)* | *OK (or Alarm type)* |

*Pressuring can be interrupted with command*

***KnX or Knx***

*n is the channel number.*

# 7.3 ST-1240-IF Control center and E-SMS-C

SKF ST-1240-IF is compatible with SKF E-SMS-C. In this case the SKF ST-1240-IF control center can be controlled with SMS-messages in addition to the IF-105 user interface. SMS-message connection is established between a GSM-modem and a GSM-phone.

## 7.3.1 Startup

The GSM-modem communicates only with the GSM-numbers which have been saved in the memory of the modems SIM-card. Phone number has to be saved with the country code (e.g. +358…). The PIN-code request has to be turned off.

The SIM-card is inserted in a GSM-phone. Save the phone numbers and turn off the PIN-code request with the help of the GSM-phone.

| | |
|---|---|
| **NOTE!** | The SKF ST-1240-IF control center has to be turned off when removing and inserting the SIM-card in the modem. |

## 7.3.2 Operation functions

The user sends an SMS-message to the GSM-modem of the control center in the following situations:

- request for set values
- request for operation mode
- changing set values
- performing functions

The GSM-modem of the control center sends an SMS-message to the user in the following situations:

- alarms
- set values when requested
- operation mode when requested

### 7.3.3 Set values: requesting, changing and confirming

Set values are requested by sending an SMS-message to the GSM-modem of the control center:

**A1?** or **A2?** 1 or 2 is the number of the requested channel

The GSM-modem of the control center replies with SMS-message:

**SKF ST-1240-IF**

**Channel (1) SG2** **(1)** is the channel number and **SG2** is the lubrication system type of the channel in question

**(Channel name)**

**Lub. cycle**

**(130 min)**

**Press. time**

**(700 s)**

**Low press. limit**

**(50 bar)**

**High press. limit**

**(120 bar)**

Set values are changed by sending the received SMS-message back to the GSM-modem of the control center with new values. The modem sends another SMS-message when the values have been saved. The SMS-message is in the same form as when the modem is replying to a set value request.

| | |
|---|---|
| **NOTE!** | The values have to be marked with brackets **( )**. |

| | |
|---|---|
| **NOTE!** | All information in brackets can be changed. |

### 7.3.4 Requesting operation mode and performing functions

Operation mode is requested by sending an SMS-message to the GSM-modem of the control center:

**T1?** or **T2?** **1** or **2** is the number of the requested channel

The GSM-modem of the control center replies with an SMS-message, e.g. when channel 1 is in pressure alarm mode:

**SKF ST-1240-IF**

**Channel (1) SG2**

**(Channel name)**

**Pressure alarm ALP L2**

**998 min** (duration of the current operation mode)

**L1 130 bar**

**L2 120 bar**

**Lubrication counter 12**

**Acknowledge alarm?**

The SMS-message shows the current operation mode of the channel in question, its duration, pressure values of the lines and the lubrication cycle counter reading.

In the last line of the SMS-message is the function which can be performed. Possible functions are alarm acknowledgement, start of extra lubrication during interval and interrupting the pressurization.

The function is started by sending the received SMS-message back to the GSM-modem of the pumping center.

The GSM-modem of the control center replies with an SMS-message when the function is started, e.g. when an alarm is acknowledged:

**SKF ST-1240-IF**

**Channel (1) SG2**

**(Channel name)**

**Pressuring 0001 min**

**L1 30 bar**

**L2 50 bar**

**Lubrication counter 12**

**Interrupt?** (Interrupt pressurization?)

### 7.3.5 Alarms

The GSM-modem of the control center sends an SMS-message when an alarm occurs. The SMS-message is sent to the phone number in the SIM-card memory which has communicated with the modem last. The SMS-message is in the same form as when the modem is replying to an operation mode request.

The alarm is acknowledged by sending the received SMS-message back to the GSM-modem of control center.

### 7.3.6 Alarm messages to additional GSM-numbers

The GSM-modem of the control center can be activated to send a message as in chapter 7.3.5 also to other numbers that have been saved on the SIM-card. Alarm messages are activated to desired number by sending an SMS-message **K0a** or **K0A** from the number in question. The GSM-modem of the control center replies with SMS-message: “Alarms will be sent to you”.

Alarm messages can be cancelled with command **K0x** or **K0X**. The GSM-modem of the control center replies with SMS-message: “Alarms will not be sent to you”.

| | |
|---|---|
| **NOTE!** | The activating or cancelling of alarm messages does not affect the actual sending of alarm messages or the number to which the messages are sent. Set the number at start-up with commands **T1?** or **A1?** before using the **K0**-commands. |

## 7.4 Multilube IF-103 and E-SMS-C

User interface IF-103 of SKF Multilube MLP pumping unit can be replaced with SKF E-SMS-C modem, which is compatible with the pumping unit. In this case the SKF Multilube MLP pumping unit can be controlled with SMS-messages. SMS-message connection is established between E-SMS-C modem and a GSM-phone.

### 7.4.1 Startup

The GSM-modem and IF-103 user interface use the same connector on the ST-103 circuit board. The modem and the user interface can not be in use simultaneously.

The GSM-modem communicates only with the GSM-numbers which have been saved in the memory of the modems SIM-card. Phone number has to be saved with the country code (e.g. +358…). The PIN-code request has to be turned off.

The SIM-card is inserted in a GSM-phone. Save the phone numbers and turn off the PIN-code request with the help of the GSM-phone.

| | |
|---|---|
| **NOTE!** | The MLP pumping unit has to be turned off when removing and inserting the SIM-card in the modem. |

## 7.4.2 Operation functions

The user sends an SMS-message to the GSM-modem of the pumping unit in the following situations:

- request for set values
- request for operation mode
- changing set values
- performing functions

The GSM-modem of the pumping unit sends an SMS-message to the user in the following situations:

- alarms
- set values when requested
- operation mode when requested

## 7.4.3 Set values: requesting, changing and confirming

Set values are requested by sending an SMS-message to the GSM-modem of the pumping unit:
**A?**

The GSM-modem of the pumping unit replies with SMS-message:

| In DuoFlex systems | In ProFlex systems |
|---|---|
| **SKF Multilube**<br>**Lub. cycle**<br>**(130 min)**<br>**Press. time**<br>**(700 s)**<br>**Low press. limit**<br>**(050 bar)**<br>**High press. limit**<br>**(120 bar)** | **SKF Multilube**<br>**Lub. cycle**<br>**(130 min)**<br>**Press. time**<br>**(700 s)**<br>**Set pulses P1**<br>**(020)**<br>**Set pulses P2** (only in mode P2)<br>**(010)** (only in mode P2) |

Set values are changed by sending the received SMS-message back to the GSM-modem of the pumping unit with new values. The modem sends another SMS-message when the values have been saved.

| | |
|---|---|
| **NOTE!** | The values have to be marked with brackets ( ). |

| | |
|---|---|
| **NOTE!** | All information in brackets can be changed. |

## 7.4.4 Requesting operation mode and performing functions

Operation mode is requested by sending an SMS-message to the GSM-modem of the pumping unit:
**T?**

The GSM-modem of the pumping unit replies with SMS-message, e.g. in pressure alarm mode:

| In DuoFlex systems | In ProFlex systems |
|---|---|
| **SKF Multilube**<br>**Pressure alarm ALP L2**<br>**998 min**<br>**L1 130 bar**<br>**L2 120 bar**<br>**Lubrication counter 12**<br>**Acknowledge alarm?** | **SKF Multilube**<br>**Pulse alarm ALP L1**<br>**998 min**<br>**L1 001 puls**<br>**L2 000 puls** (only in mode P2)<br>**Lubrication counter 12**<br>**Acknowledge alarm?** |

The SMS-message shows the current operation mode of the pumping unit, its duration, pressure values of the lines and the lubrication cycle counter reading.

In the last line of the SMS-message is the function which can be performed. Possible functions are alarm acknowledgement, start of extra lubrication during interval and interrupting the pressurization.

The function is started by sending the received SMS-message back to the GSM-modem of the pumping unit.
The GSM-modem of the pumping unit replies with an SMS-message when the function is started, e.g. when an alarm is acknowledged:

| In DuoFlex systems | In ProFlex systems |
|---|---|
| **SKF Multilube**<br>**Pressuring 0001 min**<br>**L1 30 bar**<br>**L2 50 bar**<br>**Lubrication counter 12**<br>**Interrupt?** (Interrupt pressurization?) | **SKF Multilube**<br>**Pressuring 0001 min**<br>**L1 001 puls**<br>**L2 000 puls** (only in mode P2)<br>**Lubrication counter 12**<br>**Interrupt?** (Interrupt pressurization?) |

### 7.4.5 Alarms

The GSM-modem of the pumping unit sends an SMS-message when an alarm occurs. The SMS-message is sent to the phone number in the SIM-card memory which has communicated with the modem last.

The SMS-message is in the same form as when the modem is replying to an operation mode request.

The alarm is acknowledged by sending the received SMS-message back to the GSM-modem of the pumping unit.

## 7.5 Maxilube IF-105 and E-SMS-C

SKF Maxilube is compatible with SKF E-SMS-C. In this case the SKF Maxilube pumping center can be controlled with SMS-messages in addition to the IF-105 user interface.

SMS-message connection is established between a GSM-modem and a GSM-phone.

### 7.5.1 Startup

The GSM-modem communicates only with the GSM-numbers which have been saved in the memory of the modems SIM-card. Phone number has to be saved with the country code (e.g. +358…). The PIN-code request has to be turned off.

The SIM-card is inserted in a GSM-phone. Save the phone numbers and turn off the PIN-code request with the help of the GSM-phone.

| | |
|---|---|
| **NOTE!** | The SKF Maxilube pumping center has to be turned off when removing and inserting the SIM-card in the modem. |

## 7.5.2 Operation functions

The user sends an SMS-message to the GSM-modem of the pumping center in the following situations:

- request for set values
- request for operation mode
- changing set values
- performing functions

The GSM-modem of the pumping center sends an SMS-message to the user in the following situations:

- alarms
- set values when requested
- operation mode when requested

## 7.5.3 Set values: requesting, changing and confirming

Set values are requested by sending an SMS-message to the GSM-modem of the pumping center:

**A1?** or **A2?** 1 or 2 is the number of the requested channel

The GSM-modem of the pumping center replies with SMS-message:

**SKF Maxilube**

**Channel (1) SG2** **(1)** is the channel number and **SG2** is the lubrication system type of the channel in question

**(Channel name)**

**Lub. cycle**

**(130 min)**

**Press. time**

**(700 s)**

**Low press. limit**

**(50 bar)**

**High press. limit**

**(120 bar)**

Set values are changed by sending the received SMS-message back to the GSM-modem of the pumping center with new values. The modem sends another SMS-message when the values have been saved. The SMS-message is in the same form as when the modem is replying to a set value request.

| | |
|---|---|
| **NOTE!** | The values have to be marked with brackets **( )**. |

| | |
|---|---|
| **NOTE!** | All information in brackets can be changed. |

### 7.5.4 Requesting operation mode and performing functions

Operation mode is requested by sending an SMS-message to the GSM-modem of the pumping center:

**T1?** or **T2?** **1** or **2** is the number of the requested channel

The GSM-modem of the pumping center replies with an SMS-message, e.g. when channel 1 is in pressure alarm mode:

**SKF Maxilube**

**Channel (1) SG2**

**(Channel name)**

**Pressure alarm ALP L2**

**998 min** (duration of the current operation mode)

**L1 130 bar**

**L2 120 bar**

**Lubrication counter 12**

**Acknowledge alarm?**

The SMS-message shows the current operation mode of the channel in question, its duration, pressure values of the lines and the lubrication cycle counter reading.

In the last line of the SMS-message is the function which can be performed. Possible functions are alarm acknowledgement, start of extra lubrication during interval and interrupting the pressurization.

The function is started by sending the received SMS-message back to the GSM-modem of the pumping center.

The GSM-modem of the pumping center replies with an SMS-message when the function is started, e.g. when an alarm is acknowledged:

**SKF Maxilube**

**Channel (1) SG2**

**(Channel name)**

**Pressuring 0001 min**

**L1 30 bar**

**L2 50 bar**

**Lubrication counter 12**

**Interrupt?** (Interrupt pressurization?)

### 7.5.5 Alarms

The GSM-modem of the pumping center sends an SMS-message when an alarm occurs. The SMS-message is sent to the phone number in the SIM-card memory which has communicated with the modem last. The SMS-message is in the same form as when the modem is replying to an operation mode request.

The alarm is acknowledged by sending the received SMS-message back to the GSM-modem of the pumping center.

### 7.5.6 Alarm messages to additional GSM-numbers

The GSM-modem of the pumping center can be activated to send a message as in chapter 4.1.3 also to other numbers that have been saved on the SIM-card. Alarm messages are activated to desired number by sending an SMS-message **K0a** or **K0A** from the number in question. The GSM-modem of the pumping center replies with SMS-message: “Alarms will be sent to you”.

Alarm messages can be cancelled with command **K0x** or **K0X**. The GSM-modem of the pumping center replies with SMS-message: “Alarms will not be sent to you”.

| | |
|---|---|
| **NOTE!** | The activating or cancelling of alarm messages does not affect the actual sending of alarm messages or the number to which the messages are sent. Set the number at start-up with commands **T1?** or **A1?** before using the **K0**-commands. |

# 8 User interface

Command user interface of SMS message can vary.

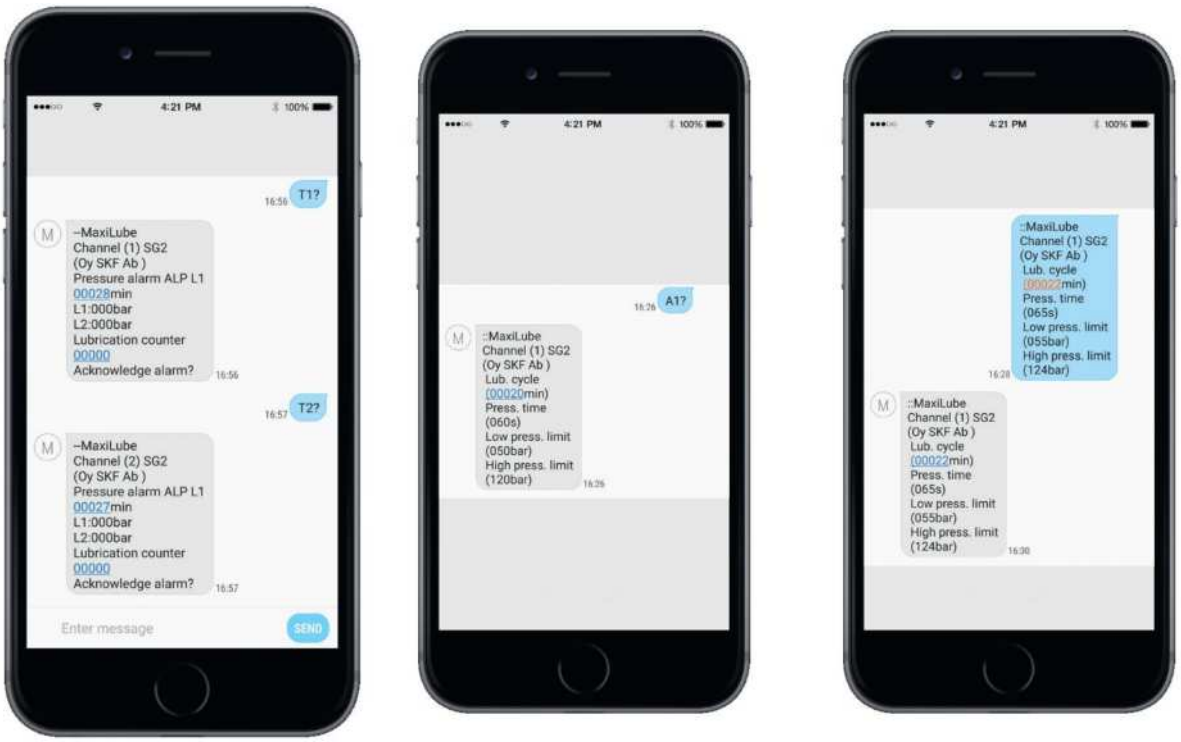



*Figure 2. Examples of request status and values & set values from Maxilube pumping channels.*

# 9 Electrical connections

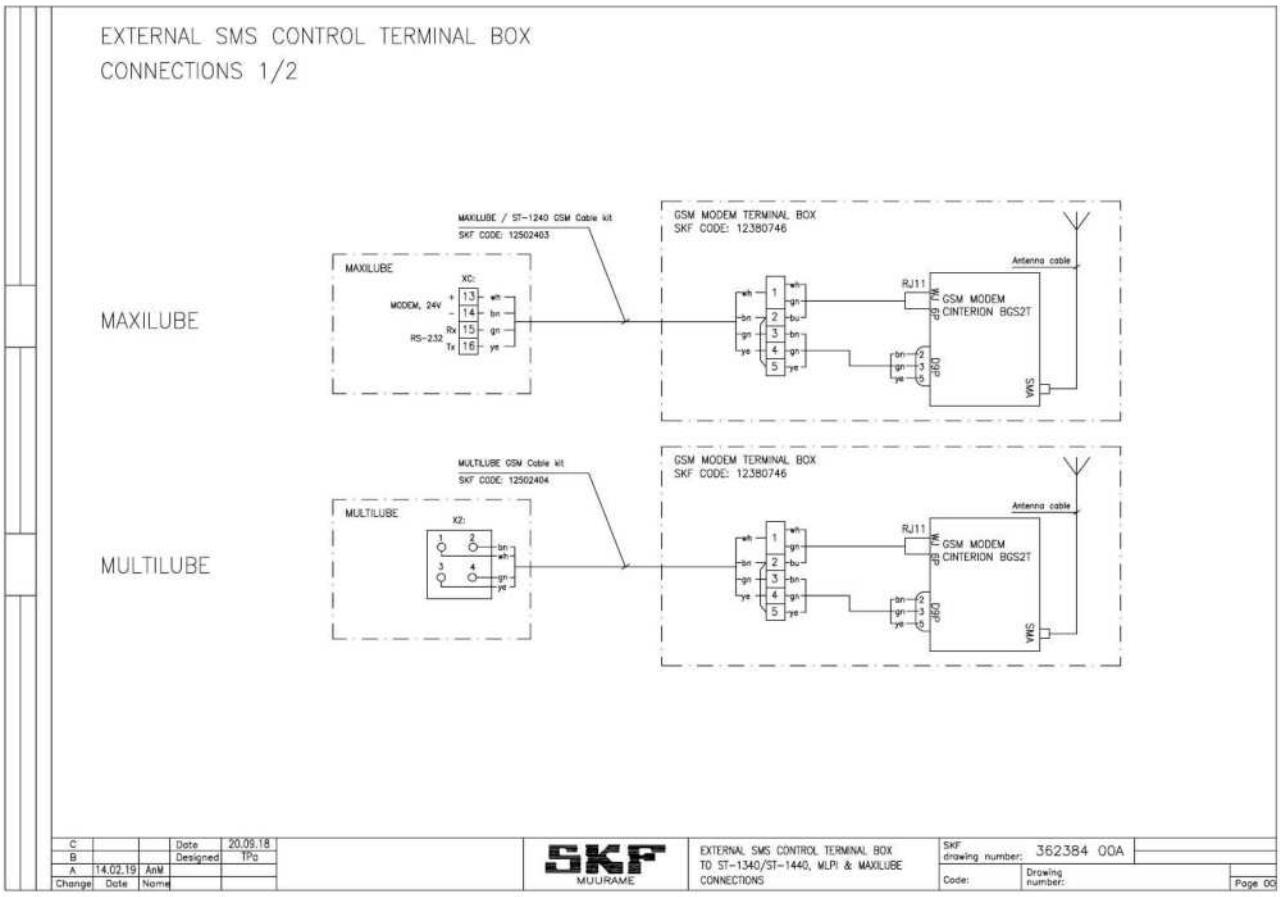



*Figure 3. Diagram of E-SMS-C modem alternative connection options for pumping centers.*

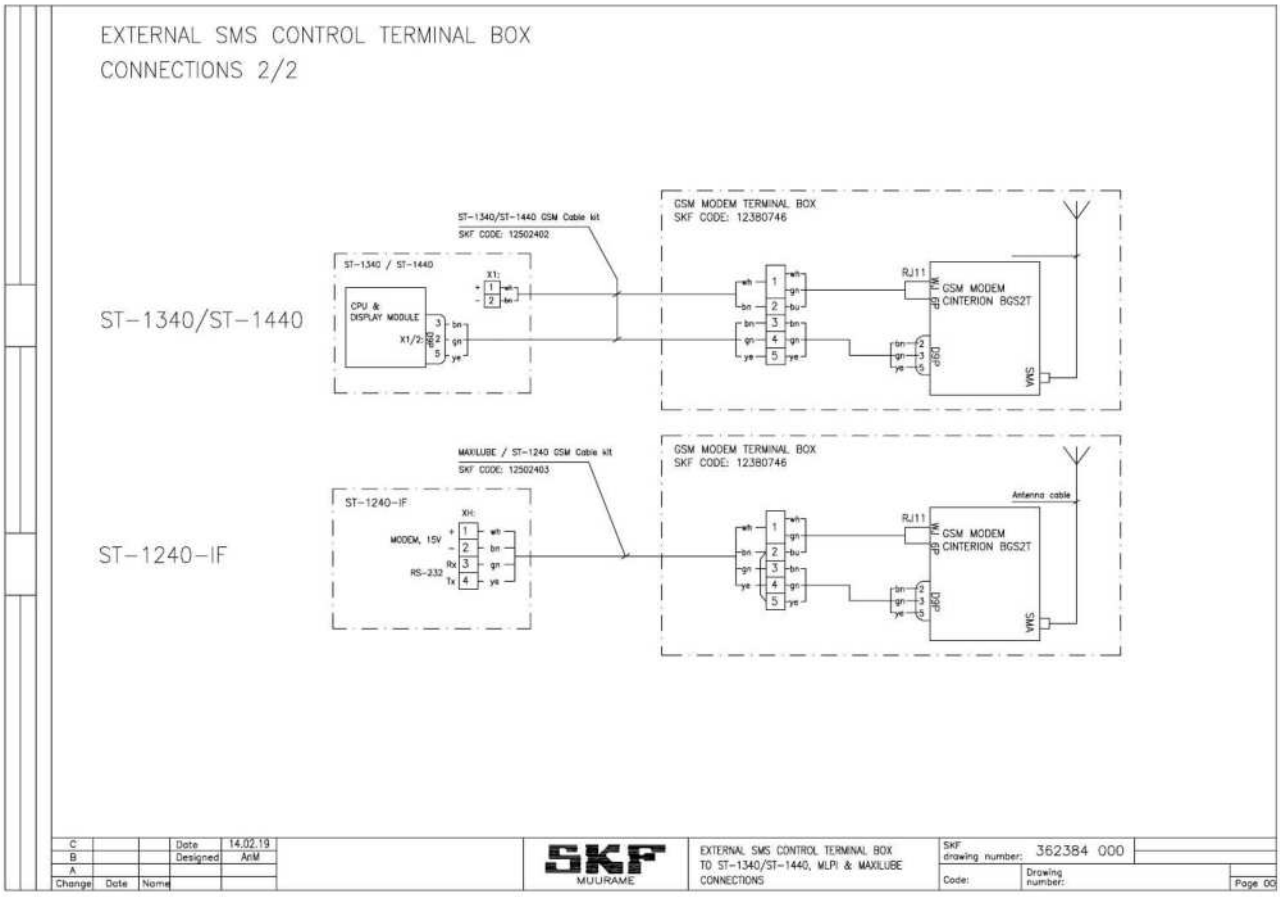



*Figure 4. Diagram of E-SMS-C modem alternative connection options for control centers.*

# 10 Spare parts

*See*

Figure 2. Modem components.

*Table 3.* SKF E-SMS-C *spare part list.*

| Part | Identifier | Code | Type |
|---|---|---|---|
| 1 | Modem BGS2T / RS232 | 12500301 | Cinterion Modem BGS2T / RS232 |
| 2 | Antenna | 12500315 | DynaFlex Part No. 573 |
| 3 | Antenna Cable | 12500324 | FME N / SMA U 0,2M RG58 |

# 11 Maintenance and troubleshooting

Following information will help with modem maintenance and troubleshooting communication issues.

First check your pumping center or control center firmware is compatible with E-SMS-C modem. Compatible Table 1. Compatible IF and ST control centers & firmware versions.

E-SMS-C modem have two LEDs (see Figure 5.) which informs to the user the operating status of the modem.

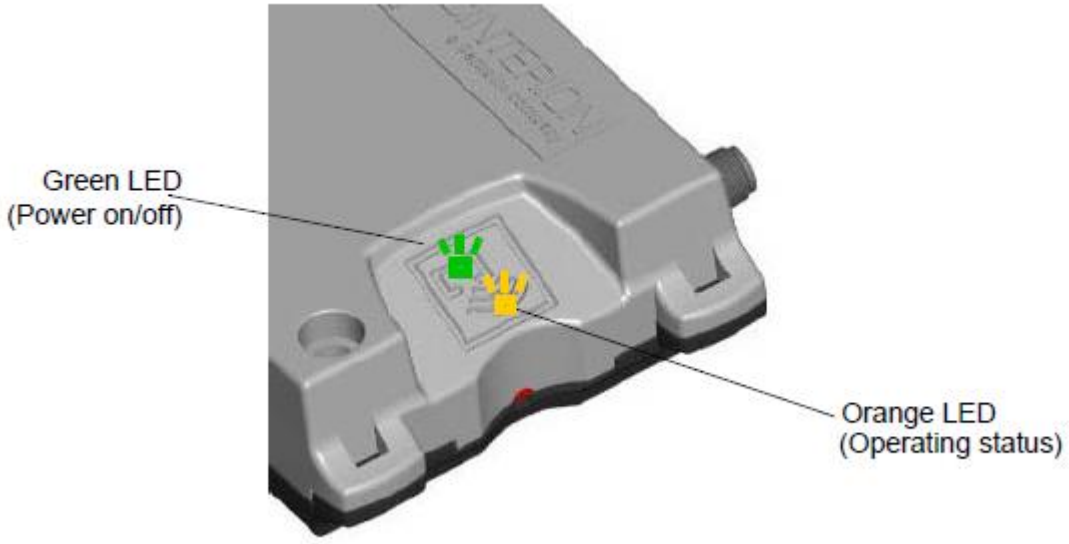



*Figure 5. E-SMS-C modem status LEDs.*

*Table 2. Modem operating status – orange LED.*

| **Modem operating status** | **Operating status – Orange LED** | |
|---|---|---|
| Modem power down mode | Permanently off | |
| Limited Network Service: No SIM card inserted or no PIN entered, or network search in progress, or ongoing user authentication, or network login in progress. | 600 ms on | 600 ms off |
| IDLE mode: The mobile is logged to the network (monitoring control channels<br>and user interactions). No call in progress. | 75 ms on | 3 s off |
| Connected to remote party or exchange of parameters while setting up or disconnecting a call. | Permanently on | |

# 12 Removing from service

## 12.1 Temporary shutdown

The system can be temporarily shut down by disconnecting it from electrical and/or hydraulic supply. If you wish to shut down the product temporarily, see also section 6.3 *Storage.* For further information, please refer to relevant component's operating and service manuals in Section *General description*. When recommissioning the equipment, please refer to sections *Commissioning* and *Technical specification* in the relevant components' operating and service manuals.

## 12.2 Final decommissioning

Used equipment filled with lubricant must be decommissioned and disposed of in accordance with national legislation and the procedures indicated in this operating and service manual.

| | |
|---|---|
|  | Observe any local laws and regulations concerning disposal and recycling. |

You can also return the product to Oy SKF Ab for disposal. Oy SKF Ab reserves the right to recover any costs arising from the disposal.

# 13 Contact information

Oy SKF Ab
P.O. Box 80 (Teollisuustie 6)
FI-40951 MUURAME
FINLAND
Tel. +358 (0) 207 400 800
Fax +358 (0) 207 400 899
www.skf.com

# 14 EU DECLARATION OF CONFORMITY

**(Declaration of conformity according to Radio Equipment Directive 2014/53/EU)**

## DECLARATION OF CONFORMITY

We, Gemalto M2M GmbH
Werinherstrasse 81
81541 München
Germany

Declare under our sole responsibility that the Cinterion Wireless Terminal:

| Model | SW | HW |
|---|---|---|
| BGS2T (RS232/RS485) | Rev. 01.301 | B2.2 |

to which this declaration relates, is in conformity with the following standards and/or other normative documents, by specific reference to the essential requirements of Radio Equipment Directive 2014/53/EU:

| | |
|---|---|
| **Health and Safety:** | **EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013**<br>**EN 62311:2008** |
| **EMC:** | **Draft EN 301 489-1:v2.2.0; draft EN 301 489-52:v1.1.0** |
| **RF spectrum efficiency:** | **EN 301 511:v12.5.1** |

We herby declare that all essential radio test suites have been carried out and that the above named product is in conformity to all the essential requirements of Radio Equipment Directive 2014/53/EU.

Follow notified body assessment has been applied:

**CETECOM GmbH**
**Im Teelbruch 116**
**45219 Essen**
**Germany**

Certificate Registration No.: **M17-0192-01-TEC**

The technical documentation relevant to the above equipment will be held at:

Gemalto M2M GmbH
Portfolio Development
Siemensdamm 50
13629 Berlin
Germany

Stephanie Reimert
Head of Portfolio Development

Berlin, 17 May 2017