Configuration Instructions

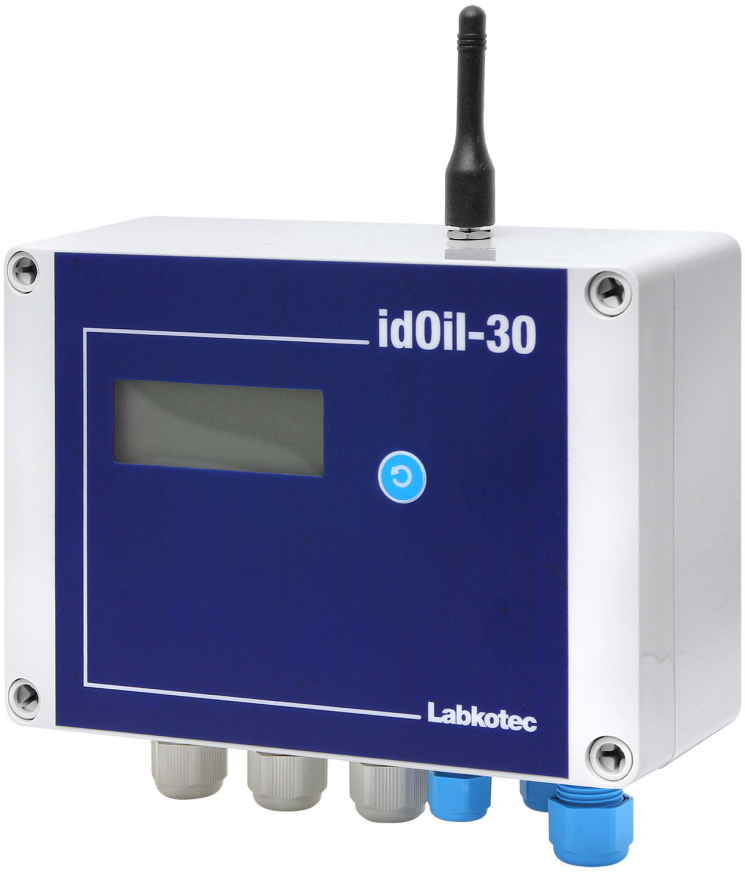
EN

idOil®-30 3G

idOil®-30 Battery 3G

Oil Separator Alarm Device

SMS-messages - Commissioning and use



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1. General information about the manual

This manual is an integral part of the product.

- Please read the manual before using the product.
- Keep the manual available for the entire duration of the product's life span.
- Provide the manual to the next owner or user of the product.
- Please report any errors or discrepancies related to this manual before commissioning the device.

1.1. Markings and symbols used in this document

The following markings and symbols are used in this document.

- The "<>" symbol signifies the setting parameter of a function. The user or device replaces this symbol with the desired value. The angle brackets "<>" often contain a short description of the setting in question.
- *Italicised* and indented text is used to present messages entered by the user or sent by the device.

Informative markings and symbols

This marking highlights essential information.

▶ This marking refers to a user measure.

Tables

The structure of the setting and response messages is depicted in the form of tables where the first column indicates the command in question and its parameters on separate rows. The second column features a more specific description of the command in question and its setting parameters.

Field legend	
TEL	Telephone number setting command
<no1>…<no5>	End user numbers in international space-delimited format.

2. Introduction

This manual describes how to operate the idOil-30 3G and idOil-30 Battery 3G units by means of text messages.

Matters related to aspects such as the installation, connection, commissioning and electrical safety of the device are described in the actual installation and user instructions.

2.1. Product operation

The device contains a 3G modem, which enables text messages to be sent over the cellular network between the user and the device. The following functions are possible.

- The user can change the unit settings.
- The user can request information on the settings, measurements and alarms from the device.
- The device sends the measurement and alarm data to either the users or the LabkoNet® server at times specified by the user.

The text messages and their more specific structure are described later in this manual.

Figure 1. Messages between the user and the idOil unit

One message sent by the idOil unit can contain a maximum of 160 characters. If a message exceeds the 160 character limit, idOil will send it in multiple parts. The beginning of each message indicates how many messages are impending and which one of them the current message is. For example 1/2 (first message) and 2/2 (second message).

2.2. idOil and LabkoNet

The idOil unit can be connected to the web-based LabkoNet® monitoring system. In comparison to a cellular connection, the benefits of the LabkoNet® system include continuous connection monitoring, storage of alarm data and visual representation.

The device sends the alarm or measurement data received from the measurement point to the LabkoNet® server. The server receives the data and stores them in a database from which they can later be accessed for reporting purposes, for example.

At the same time, the server examines data sent by each sensor as well as any possible instances of upper or lower alarm limits being triggered. If it detects any violations, it sends the alarm data to the predefined email addresses as email messages and to mobile numbers as text messages.

Numerical and graphical representations of all the information on the target can be viewed online at https://www.labkonet.com with the end user's credentials via a regular web browser.

In order to activate the LabkoNet® service, please contact Labkotec Oy's customer service at info@labkotec.fi.

3. Commissioning

The unit's text message feature can be enabled by installing a SIM card.

▶ Install the SIM as described in the installation and user instructions of the idOil-30 3G or idOil-30 Battery 3G device.

▶ Connect power to the control unit.

Once a signal strength bar appears at the top right corner of the local display (see the figure below), the idOil unit is connected to the cellular network. The idOil unit is ready to send and receive messages when the recipient telephone numbers have been set.

Figure 2. Signal strength bar shown in the idOil unit's local display.

The idOil unit functions with cellular connections provided by the most common operators.

4. Settings

The settings of the idOil unit can be changed with the text message commands described in the following paragraphs.

4.1. Mobile numbers

Up to five telephone numbers can be programmed in the device, to which the unit can then send alarm messages and from which it can receive settings and alarm status queries.

This setting can also be entered via the idOil unit's browser user interface.

4.1.1. Setting telephone numbers and telephone number queries (TEL)

A total maximum of five numbers can be set 1–5 numbers at a time. The number is always saved in the first free memory slot.

The format of the telephone number setting command is:

TEL <no1> <no2> <no3> <no4> <no5>

Field legend	
TEL	Telephone number setting command
<no1> <no2> <no3> <no4> <no5>	End user telephone numbers in international format delineated with spaces.

The device responds with a message including the name of the device (if set), the set telephone numbers and the corresponding memory slots in the device memory.

TEL <device name if specified>
1: <memory slot 1 telephone no>
.
.
5: <memory slot 5 telephone no>

Example:

If the device name has not been defined, no numbers have been set and the entered command is

TEL +35840111111 +35840222222 +35840333333

the response is:

TEL
1: +35840111111
2: +35840222222
3: +35840333333

If, after this, the command

TEL +35840444444

is entered, the response is:

TEL
1: +35840111111
2: +35840222222
3: +35840333333
4: +35840444444

4.1.2. Deleting a telephone number (DELTEL)

1–5 telephone numbers can be deleted at a time.

The telephone number deletion command is in the format:

DELTEL 1 2 3 4 5

Field legend	
DELTEL	Telephone number deletion command
1 2 3 4 5	Memory slot numbers (one or more) for deletion – space-delimited.

The unit's response to this message is the same as with the TEL command, i.e. the unit outputs the remaining memory slots and their telephone numbers.

TEL <device name if specified>
1: <memory slot 1 telephone no>
2: <memory slot 2 telephone no>
3: <memory slot 3 telephone no>
4: <memory slot 4 telephone no>
5: <memory slot 5 telephone no>

The response contains nothing more than the text *TEL* if no numbers remain in the device memory.

Example

If numbers have been stored in all memory slots but a new device name is yet to be specified and the command

DELTEL 2

is entered, the response is:

TEL
1: +35840111111
3: +35840333333
4: +35840444444
5: +35840555555

When the command

DELTEL 1 3 5

is entered, the response is:

TEL
4: +35840444444

Only memory slot 4 contains an end user number. The other memory slots are empty.

4.2. Basic settings after commissioning

4.2.1. Name of the device or location (NAME)

This setting can also be entered via the idOil unit's browser user interface.

It is a good idea to set a unique name for the device or location so that alarm messages, for example, show which device the message is coming from.

The format of the setting command is:

NAME <name of the device/location>

Field legend	
NAME	Name setting command
<name of the device/location>	Name freely selected by the user – up to 60 characters. The name can also contain spaces.

Example:

▶ Send the following message to the idOil device:

NAME Pirkkala Myllyhaantie

The unit responds:

NAME Pirkkala Myllyhaantie

4.2.2. Sensor input settings (DI)

Descriptive names can be set for the sensors connected to the idOil unit to improve the legibility of the alarm messages.

This setting can also be entered via the idOil unit's browser user interface.

The names of the sensor inputs include fixed portions that cannot be changed. The idOil unit identifies the sensor type automatically and names each sensor input based on this. If three different sensors are connected to the idOil control unit, the sensor names are as follows: 1: Oil sensor, 2: High liquid sensor and 3: Sludge sensor.

The format of the setting command for sensor input names is as follows:

DI <x>: <sensor x name>. <y>: <sensor y name>. <z>: <sensor z name>

Field legend	
DI	Sensor input settings command (and query)
<x, y or z>:	Sensor input number 1, 2 or 3
<sensor x, y or z>.	The name specified for a sensor input can include up to 55 characters. Can include spaces.

Please note that there must be points and spaces between the sensor names to separate them.

A name can also be set for one or two inputs only, if there is a need to change the name of a specific sensor input afterwards, for example.

Example 1

Do the following to set unique names for sensors.

▶ Send the following text message command to the idOil unit's phone number:

DI 1: Separator 1. 2: Separator 1. 3: Separator 1.

The unit's response includes the names of the device and the sensor inputs. Please note the fixed portion of the sensor input names.

DI <device name>
1: Separator 1 / Oil level sensor
2: Separator 1 / High liquid sensor
3: Separator 1 / Sludge level sensor

Example 2:

▶ Enter the following command to rename sensor input 2.

DI 2: Separator 1 Pirkkala

Device response:

DI <device name>
1: Separator 1 / Oil level sensor
2: Separator 1 Pirkkala / High liquid sensor
3: Separator 1 / Sludge level sensor

4.2.3. Time (CLOCK)

The time setting is needed if you wish to save log information with actual time stamps or if you want the device to send timed messages to the end user or the LabkoNet server.

This setting can also be entered via the idOil unit's browser user interface.

The format of the time setting command is:

CLOCK <yyyy-mm-dd> <hh:mm>

Field legend	
CLOCK	Time setting command and query
<yyyy-mm-dd>	Year (yyyy), month (mm) and date (dd) separated with a hyphen.
<hh:mm>	Hours (hh) and minutes (mm) separated with a colon.

Example

Do the following to set the time.

▶ Send the following message to the idOil device:

CLOCK 2018-10-23 15:30

The device responds as follows:

CLOCK <device name> 2018-10-23 15:30

In addition to the time, the response includes a possible name set for the device in question.

4.3. Alarm settings

4.3.1. Timed message interval (TXD)

The idOil unit can be timed to send information on system status and possible alarms to the recipients' phone numbers. The user can define interval in days and the specific time of the message.

The timed alarm information message is described in the section "*Alarm status query*".

This setting can also be entered via the idOil unit's browser user interface.

The command format for setting the timed message interval is as follows:

TXD <nnn> <hh:mm>

Field legend	
TXD	Timed message interval command.
<nnn>	The timed message interval in days.
<hh:mm>	The time of the message – hours (hh) and minutes (mm) – separated with a colon.

The factory default for the interval and time is 0 00:00. When the interval is set to 0, the timed message is not in use.

Example 1

▶ Send the following message to the idOil device:

TXD 1 12:00

Device response:

TXD <device name> 1 12:00

The device sends a timed message every day at 12:00.

Example 2

Switching off the timed message

▶ Send the following message to the idOil device:

TXD 0 00:00

Device response:

TXD <device name> 0

4.3.2. Service alarm interval (SI)

This setting can also be entered via the idOil unit's browser user interface.

The format of the service alarm interval is as follows:

SI <interval>

Field legend	
SI	Service alarm interval command.
<interval>	Service alarm interval in months. Accepted values: 0, 1, 3, 6 and 12. 0 means that the function is off.

Example

To set the device to provide service interval alarm every six months, follow the steps below.

▶ Send the following text message to the idOil unit:

SI 6

The unit's reply message format is as follows:

SI <device name> 6

4.4. Settings for battery-operated devices

4.4.1. Measurement interval (MI)

An interval can be set for the device, according to which it will wake up from power saving mode, perform sensor measurements and, if necessary, activate the 3G modem to forward the alarm data. After this, the device returns to power saving mode.

ⓘ The factory default for the measurement intervals is 10 (minutes).

ⓘ This setting can also be entered via the idOil unit's browser user interface.

The format of the measurement interval setting command is as follows:

MI <nnn>

Field legend	
MI	Command
<nnnn>	Measurement interval in minutes. Permitted values: 10, 30, 60, 120, 180, 240, 360, 480, 600, 720, 1440

Example:

If Pirkkala Myllyhaantie has been set as the device name and the command

MI 60

is sent, the response is:

MI Pirkkala Myllyhaantie 60

With this setting, the device wakes up to perform sensor measurements every 60 minutes and sends alarm data to the set telephone numbers, if necessary.

4.4.2. Listening interval (LI)

A listening interval can be set for the device, according to which it will wake up from power saving mode, activate the 3G modem and read any possible setting messages and queries that have been sent to it. The device performs any possible setting commands and responds to any possible queries. After this, the device returns to power saving mode.

The factory default for the listening interval is 12 hours. The listening takes plays every 12 hours from device activation.

This setting can also be entered via the idOil unit's browser user interface.

The format of the listening interval setting is as follows:

LI <nn>

Field legend	
LI	Command
<nn>	Listening interval in hours. Permitted values 12, 24, 36, 48.

Example:

If Pirkkala Myllyhaantie has been set as the device name and the command

LI 24

is sent, the response is:

LI Pirkkala Myllyhaantie 24

4.4.3. Operating voltage alarm limit setting (VLIM)

The idOil-30 Battery 3G unit monitors the level of its operating voltage. The device sends an alarm when the voltage drops below the alarm limit setting specified for the operating voltage.

The factory default for the alarm limit is 11.4 V.

This setting can also be entered via the idOil unit's browser user interface.

The setting command for the operating voltage alarm limit is formatted as follows:

VLIM <xx.x>

Field legend	
VLIM	Setting command for the operating voltage alarm limit
<xx.x>	The desired voltage in volts with one decimal. The integer and decimal are separated with a point. Permitted values: 0 (setting off), 10.5–99.9

A 0.2 V hysteresis has been set for alarm removal. In other words, the alarm removal limit is 0.2 V higher than the setpoint. The hysteresis value cannot be changed.

Example:

If the device name has been set as *Pirkkala Myllyhaantie* and the command is:

VLIM 11.8

The response is:

VLIM Pirkkala Myllyhaantie 11.8 V

5. Information requested from the unit

5.1. Alarm information query (M)

To request alarm information from the device,

▶ send the following message to the idOil device:

M

The device responds as described below by sending the device name, sensor names and alarm or fault information. The information of each sensor input is on a separate row of the message.

STATUS <device name>
<sensor input 1 name> / <sensor input 1 alarm or fault status> <yyyy-mm-dd> <hh:mm>
<sensor input 2 name> / <sensor input 2 alarm or fault status> <yyyy-mm-dd> <hh:mm>
<sensor input 3 name> / <sensor input 3 alarm or fault status> <yyyy-mm-dd> <hh:mm>

The field legends are listed in the following tables.

Field legend	
STATUS	Heading of command M
<device name>	If a name has been set for the device, it is indicated at the beginning of the message.
<sensor input name> /	The possible descriptive name set by the user for the sensor input and the character "/".
<alarm text> <yyyy-mm-dd> <hh:mm>	Alarm text (standard, cannot be changed, depends on the type of sensor connected to the input): *Oil level alarm* *Sludge level alarm* *High liquid alarm* Alarm time.
<fault alarm text> <yyyy-mm-dd> <hh:mm>	Alarm text regarding the fault (standard, cannot be changed, depends on the type of sensor connected to the input): *Oil level fault* *Sludge level fault* *High liquid fault* Alarm time.

Example 1:

STATUS Pirkkala Myllyhaantie
Oil level alarm 2018-05-31 13:05

Example 2:

If there are no alarms active in the device, it responds with a SYSTEM OK message:

STATUS Pirkkala Myllyhaantie
SYSTEM OK 2018-05-31 13:05

5.2. Cellular signal strength query (CSQ)

The device can also be requested to indicate the 3G modem's signal strength. The signal strength can vary between 0 and 31.

If the value is less than 11, the connection may not be sufficiently strong for sending messages.

To check the signal strength of the cellular network,

▶ send the following message to the idOil device:

CSQ

The unit's response includes the device name and the field strength as a value between 0 and 31.

CSQ <device name> value>

Example:

If the device name has been set as *Pirkkala Myllyhaantie* and the signal strength is requested with the command

CSQ

the device response can be as follows:

CSQ *Pirkkala Myllyhaantie 25*

5.3. Battery voltage query (BATVOLT)

To request the battery voltage value from the idOil unit,

▶ send the following text message to the idOil unit:

BATVOLT

The device response includes the device name (if set) and the battery voltage value in volts with one decimal.

BATVOLT <device name> <value> V

Example

If Pirkkala Myllyhaantie has been set as the device name and the command

BATVOLT

is sent, the response is:

BATVOLT Pirkkala Myllyhaantie 12.9 V

5.4. Software version query (VER)

A software version query can be sent to the idOil-30 3G and idOil-30 Battery 3G units in a text message. The version information helps Labkotec Oy's maintenance department to resolve any possible problems.

▶ Send the following text message to the idOil unit:

VER

The unit's response contains the device name (if set) and the software version:

VER <device name> <x.xx>

Example

"Pirkkala Myllyhaantie" has been set as the device name and the software version is 1.00. When the command

VER

is entered, the response is:

VER Pirkkala Myllyhaantie 1.00

6. Messages sent to the end user by the unit

The idOil-30 3G and idOil-30 Battery 3G devices send alarm messages to the recipient's telephone number either when the alarm or fault status changes or as a response to an alarm query.

6.1. Alarm message

The device sends the alarm immediately upon detection to the telephone numbers set with the TEL command and/or to the LabkoNet® service.

The alarm message contains the following space-delimited information:

<device name> <sensor input name> <alarm text or fault alarm text> <alarm time>

Field legend	
<device name>	If a name has been set for the device, it is indicated at the beginning of the message.
<sensor input name> /	The possible descriptive name set by the user for the sensor input and the character "/".
<alarm text>	Alarm text (standard, cannot be changed, depends on the type of sensor connected to the input): *Oil level alarm on (* or *off),* *Sludge level alarm on (* or *off),* *High liquid alarm on (* or *off).*
<yyyy-mm-dd> <hh:mm>	Alarm time.
<fault alarm text>	Alarm text regarding the fault (standard, cannot be changed, depends on the type of sensor connected to the input): *Oil level fault on (* or *off*) *Sludge level fault on (* or *off*) *High liquid fault on (* or *off*).
<yyyy-mm-dd> <hh:mm>	Alarm time.

The message contains the information of commissioned sensor inputs only.

6.2. Timed message

If the timed message function has been activated with the TXD command (see chapter *"Timed message interval"*), the device sends a message in the same format as the response to the command M, i.e. the alarm message query (see chapter "*Alarm information query*").

6.3. Test alarm

To receive the test alarm, hold down the reset and test button on the cover of the device for more than three seconds and then release the button.

The unit's local display shows the text *Test alarm* and the unit sends a text message in the following format:

<device name> Test alarm <test alarm time>

6.4. Low operating voltage alarm

If the unit's operating voltage falls below the set alarm limit, (see chapter "*Setting the operating voltage alarm limit*"), the device sends the following message:

<device name> Battery voltage low on <alarm time>

If the operating voltage then increases above the alarm removal limit, the unit sends the following message:

<device name> Battery voltage low off <alarm removal time>

6.5. Power outage alarm

The device can detect power outages and save their start and end times in its memory.

Once power supply is restored, the device sends the following message:

<device name> Power down after<power outage start time>
Power up <power outage end time>

Examples:

idOil-30 Battery 3G
Power down after 2018-10-03 11:30
Power up 2018-10-03 12:10

idOil-30 3G
Power down 2018-10-03 11:30
Power up 2018-10-03 12:10

In other words, the power outage has started on 3 October 2018 at 11:30 am and the power has been restored on 3 October 2018 at 12:10 pm.

7. Troubleshooting

7.1. Device responses in error situations

The idOil-30 3G and idOil-30 Battery 3G units send a text message response to any commands they receive. At times, the text message command sent by the user may be erroneous, in which case the unit responds with an error message to the user's mobile phone.

Possible reasons for error messages are listed below.

Error state/message	Possible cause
No response	The 3G modem is not connected to the network. The signal strength bar must be visible on the local display. If this is not the case, it is possible that the signal is too weak or the SIM card's PIN code is incorrect.
COMMAND ERROR	The command was entered incorrectly.
COMMAND SYNTAX ERROR	The command is correct, but there was an error in the parameter entry. The reasons for the errors vary between commands. Possible causes include the following: • the point is missing from between the numbers • there are too many numbers for the free memory slots • too many characters • the point or colon is missing • the sensor input number is not 1...3 • the separator characters are missing or are incorrect • the date/time entered is invalid • the entered value deviates from the allowed values

Solution: Enter a new text message command and check before sending that it has been entered correctly.

7.2. Resetting the message counter (RSTC)

The total number of messages sent by the device within 24 hours is limited to 50. If the device is not sending any messages, it is possible that the message counter has reached its limit.

To reset the counter and resume message traffic with the device,

▶ send the following text message to the idOil unit:

RSTC