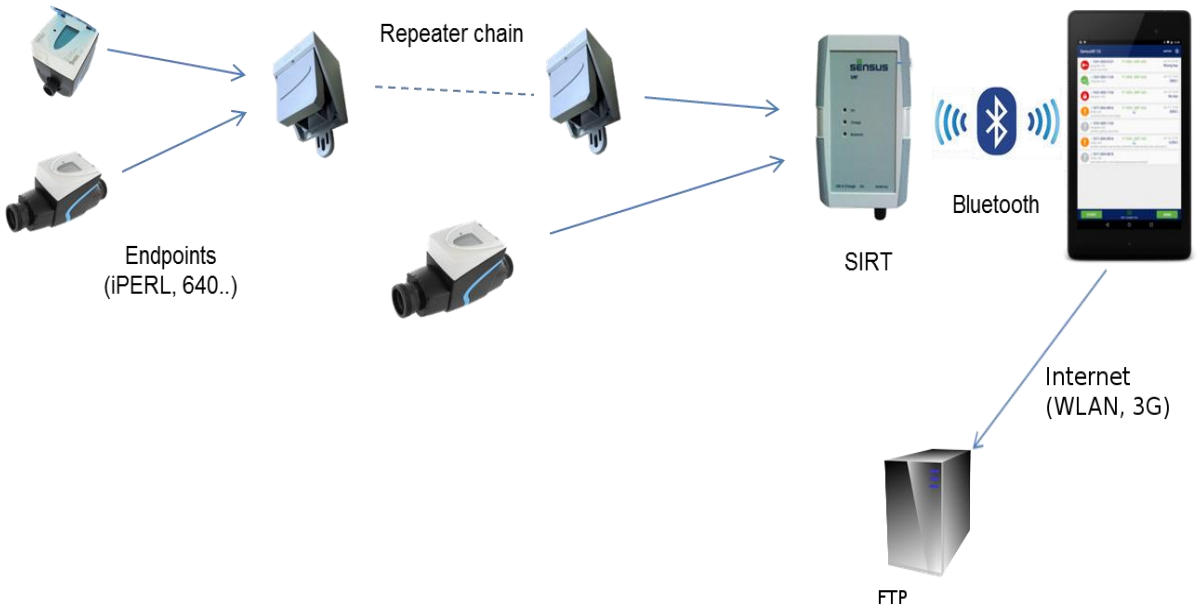
SensusRF Finder



User Guide

MS 7050 | SensusRF Finder user Manual

SensusRF Finder Software User's Guide

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Revision 0.1	**November 22, 2015**	Draft versions	Michael André
Revision 1.0	**January 23, 2016**	Final version	Ján Janeka
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SENSUSRF FINDER

User guide

1 Purpose

This document describes what *SensusRF Finder* is and guide users how to use it.

2 Overview

SensusRF Finder is an Android platform application whose purpose is to detect and read endpoints with SensusRF radio technology and wMbus which are in the range of the Radio transceiver SIRT (Sensus Interface Radio Tool) in a simple way.

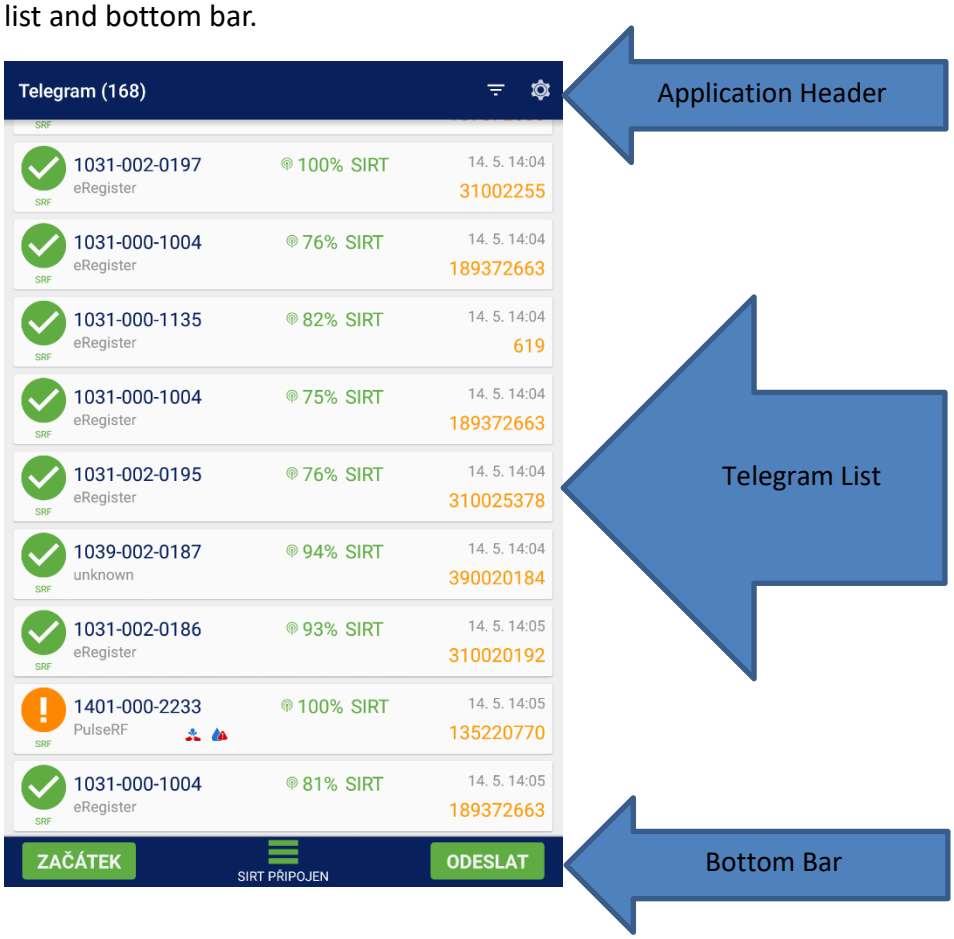
The application runs on an Android device – a smart-phone or a tablet and communicates with the SIRT.

3 Requirements

- Android device with:
    - Android version 4.2 and higher.
    - Bluetooth support
    - WiFi or mobile network access
- SIRT
- Accessible FTP server (to send collected readings) (optional)
- Android device with a data SIM card (in case a mobile network will be used for sending files to the FTP server) (optional)

4 User interface

The user interface of the application consists of the three parts, the application header, Telegram list and bottom bar.



4.1 Application header

Application header contains the number of telegrams that is in the list and two buttons. Filter button that opens filter dialog that can be used to filter content of list and button for settings access. There can be a direct Settings button or a menu entry, it depends on the screen size of the used Android device. The settings button/settings menu entry shows the settings screen. Its content is described in a separate section below.

4.2 Telegram list

Telegram list shows collected telegrams (wM-bus and SensusRF) and their information. List can be filter through filter dialog according to several settings. List updates every time there is a new telegram. For every displayed telegram, the following information is shown.

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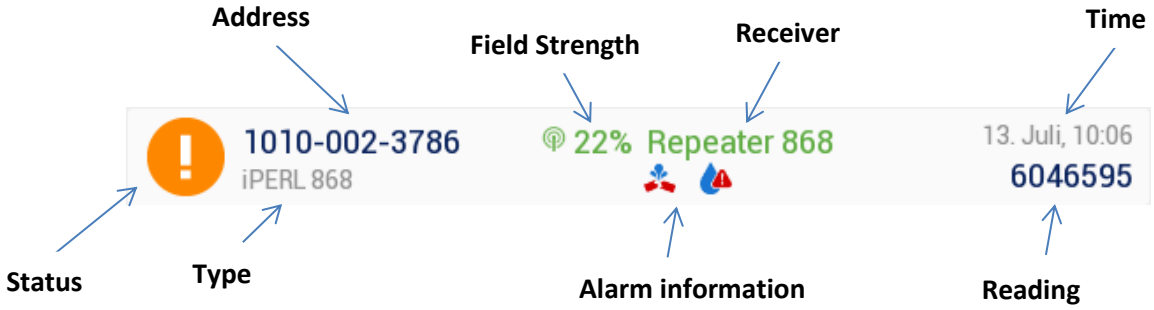
The list shows:



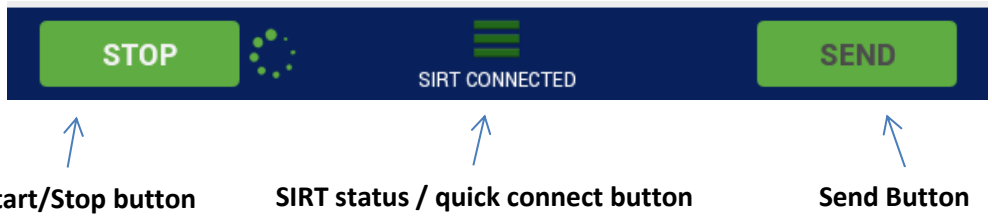
- **Status icon** – Icon representing status of read endpoint :
  - (Encryption key is valid, There are no alarms indicated in BUP telegram)
  - (Encryption key is valid, There is some alarm indicated in BUP telegram)
  - (Wrong encryption key)

- **Address** – radio address of the meter that sent the telegram
- **Protocol** – protocol of received telegram (wM-bus or SensusRF)
- **Type** – type of the endpoint
- **Receiver** – the device that received the BUP (SIRT or repeater)
- **Field strength** – strength of the signal based on the RSSI value of SIRT or repeater that collected the telegram
- **Reading** – the reading value of the endpoint, available only if the telegram was decrypted successfully, otherwise a short message "Wrong key" is displayed. Value is interpreted to match meter unit if the unit is known for the meter type. Otherwise raw orange readout value is shown.
- **Alarm information** – list of the alarms reported by the meter, available only if the telegram was decrypted successfully
  - SensusRF Alarms are represented by following icons :
    - (Backflow), (Leakage), (Broken pipe), (Low Battery)
    - (Medium Absent), (Magnetic tampering)

- (Metrology Unavailable), (Specific Error),
  - wMbus alarms (status word) is shown in decimal format.

- **Time** – receiving time of the telegram; it is either the local time of the Android device in case the telegram was directly received by SIRT or the time when the BUP was received by a repeater

4.3 Bottom bar



The *bottom bar* contains the *Start/Stop* and *Send* buttons together with *SIRT status/quick connect* button.

The *Start button* allows to start a new telegram collection and after a collection started it changes to Stop button which allows to stop the current running collection process.

While collection is in progress a status message is shown in the Android notification bar. Clicking on this notification brings the SensusRF Finder application to foreground.

The *SIRT status/quick connect* button shows the current status of the SIRT connection (SIRT connected/ not connected). Clicking on it causes:

- auto-connection to the SIRT in case the SIRT is not connected and SIRT connection parameters are set in the Settings
- opening of the SIRT Settings screen in case SIRT is already connected
- opening of the SIRT Settings screen in case the auto-connection is not successful

The *Send button* performs export of readings to destination set in the settings. The options are SMTP, FTP ad Local storage.

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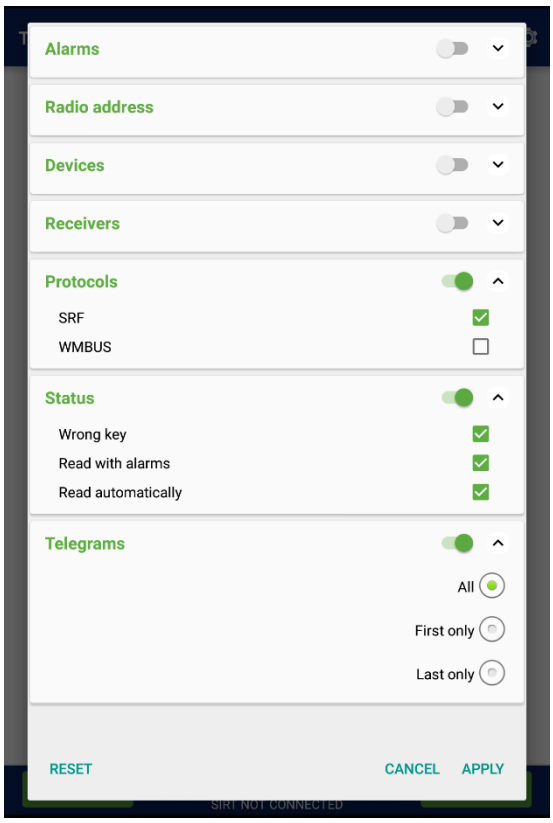
5 Filter dialog

Filter is used to filter content of telegram list. There are 7 filter options that can be used.



1. Alarms – Check what alarms telegram should contain
2. Radio address – finds any match in the radio address of telegram
3. Devices – Check what devices telegram should contain
4. Receivers – Check what receivers telegram should contain
5. Protocols – Check what protocols telegram should contain
6. Status – Check what readout status telegram should have
7. Telegrams – What telegrams should be shown in the list (All, First only, Last only)

6 Collection process

Collection process is used mainly to see what meters are readable from the current location of the device. An application store all received telegrams and actively discovers repeaters (up to 7 hops) and meters behind them. It does not start any active collection on queried repeaters. Received telegrams are displayed in the user interface (see section 4.2) of the application and stored to a file, depending on the storing configuration (see Settings section 6.1.2). For more information on the information displayed in the user interface see the section 4.2.

7 Settings

The Settings screen consists of several sections with options that are described in following sections. On tablets the section screen and the settings option screen can be displayed side by side depending on the screen size.

7.1 SIRT

Contains settings for configuration of SIRT together with the current state of SIRT connection.

- **Bluetooth settings** – opens Bluetooth settings of the system and shows current Bluetooth state; inside the settings the Bluetooth radio can be switched on and off, SIRT device can be discovered and paired with the Android device
- **SIRT to use** – lists paired SIRT devices and allows to select one of them
- **SIRT connection state** – allows to establish and close connection with SIRT; shows state of current connection
- **SIRT protocols -** option to enable different protocols on SIRT. Currently wMbus and SensusRF or both.
- **Use external antenna** – option for enabling/disabling usage of external antenna by the SIRT
- **SIRT status -** section shows information about SIRT when SIRT is connected. The status information consists of the hardware version, firmware version, frequency and remaining battery capacity.

7.2 Store

Allows to change whether all received BUP telegrams are stored in the output file or only the first received telegram for each meter.

- **All BUPs** - all received BUP telegrams are stored in the output file
- **First BUPs only** - only first telegram that was received for each meter is stored

7.3 Encryption key

Allows to change the encryption key used for telegram decryption. The application uses the default encryption key by default and user can always go back to using the default key after changing it.

This option is not available in the trial version of the application.

7.4 Encryption key import

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Allows to import encryption keys from file. Only .csv,.json and .xml files formats are allowed. The application uses the default encryption key by default and user can always go back to using the default key after changing it.

For wM-bus meters the address has to be in specific format MANUFACTURER + ADDRESS.

For example SEN00000001

This option is not available in the trial version of the application.

7.5 Application language

Allows to change the language used by the application and shows current state. The user can use either System default setting or select one of the provided languages. The latter uses the selected language regardless of the system language. The former uses the system language if there is a translation provided for that language and defaults to English if it is not.

7.6 License

The section provides user information about the license that is being used by the application and also the means to request the license key from Sensus and apply the received key.

- **Device serial ID** - unique device ID used for license generation
- **Request license** - opens a pre-filled email that can be sent to Sensus in order to receive a license key
- **License key** - here can be inserted the received license key from Sensus

7.7 Import and export settings

7.7.1 Import and export

Import and export options can be configured on the screen shown on Figure 1.

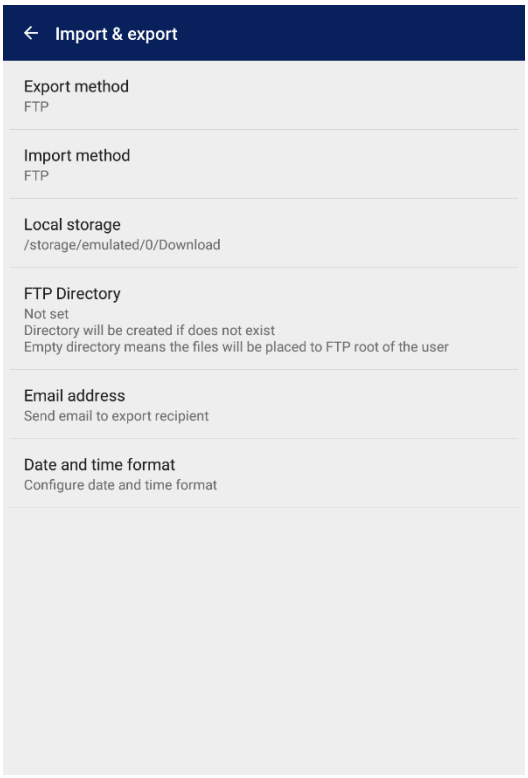

FIGURE 1 – EXPORT ANDIMPORT SETTINGS

- **Export method** - allows to choose FTP, Email or Local storage export methods.**Import method** - allows to choose FTP or Local storage import methods. User can pick file from local storage of device when Local storage is chosen.
- **Local storage** - Path to the directory that is used as main root during import or export.
- **FTP Directory** - directory on the FTP server where the files will be uploaded. If not set, the FTP root directory for given user is used. The directory is created if it does not exist.
- **Email address** - Recipient Email address
- **Date and time format** - The format of the date and/or time for exports

7.7.1.1 Date and time format

In this dialog, the user can configure the format of date and time. This date and time format is used in the date time fields of exported files. Initially the format is set to android system date time format, but the users can change the date and/or time format based on their needs. The user can select format from some predefined formats or he can define his own format.

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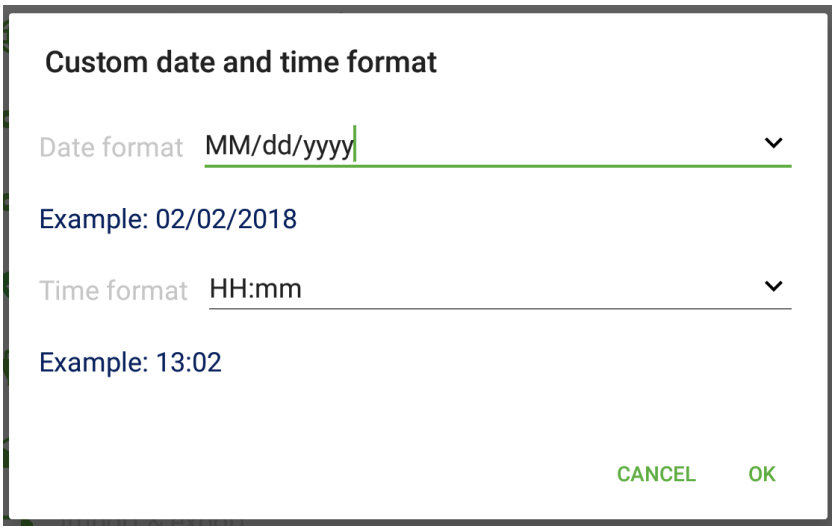

FIGURE 5: CUSTOM DATE AND TIME SETTINGS

Symbols	Meaning	Examples
y, yyyy	Year	18; 2018
M, MM, MMM, MMMM	Month	2, 02, Feb, February
d, dd	Day of month	9, 09
c	Day of week	Fri
h, hh	Hour (0-12)	1, 01
H, HH	Hour (0 – 23)	4, 13
m, mm	Minute of hour	8,08
s, ss	Second of minute	5, 54
a	am or pm	AM
, / . :_	delimiters	, / . :

7.7.2 FTP settings

FTP server connection can be configured on the screen shown on Figure 2. If the communication with FTP server is not successful then error dialog containing according message is shown to the user.

- **FTP protocol** – allows to choose Unsecured FTP connection option or one of the secure options FTPS or SFTP.
- **Server address** – IP address or network name of the FTP server to use
- **Port** – allows to specify the port the FTP connection uses. This value is reset to default value for each protocol when FTP protocol option is changed.

- **Login** – user name used for connection with the FTP server. Leave it blank for an anonymous connection.
- **Password** – password to be used when the Login option is set.**Directory** – directory on the FTP server where the files will be uploaded. If not set, the FTP root directory for given user is used. The directory is created if it does not exist.

7.7.3 SMTP

SMTP conguration for export can be configured on the screen shown on Figure 2.

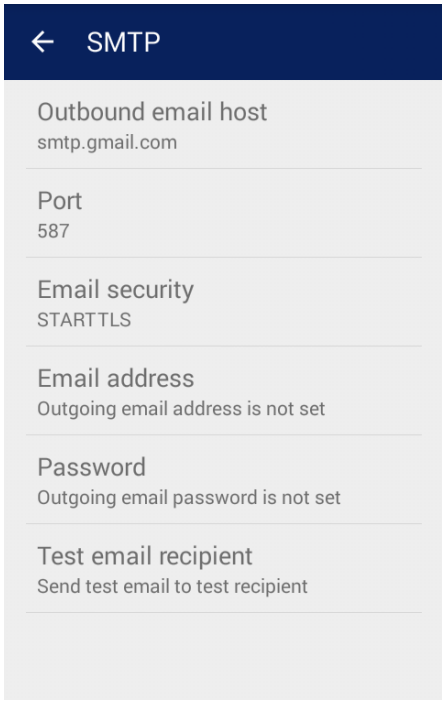

Figure 2: SMTP settings

- **Outbound email host** - host-name or IP address of the SMTP server to use for sending emails
- **Port** - the port the SMTP server uses
- **Email security** - security option to use (None, SSL, STARTTLS)
- **Email address** - sender email address; the SMTP server must allow sending email from this user
- **Password** - password belonging to the sender email address; needed only if the SMTP server requires it
- **Test email recipient** - Test the correct configuration of SMTP by sending test email to this email address by using the Save and test button in this dialog

8 Licensing & Registration

When the SensusRF Finder application is started first time there is a message shown on the screen that application is running in the trial mode with limited features. Information about the license status is displayed in the License screen of the Finder Settings in the Summary section.

In order to get valid license key it is necessary to send request for the license by email. License key is unique for each android device because it is generated according unique Device serial ID.

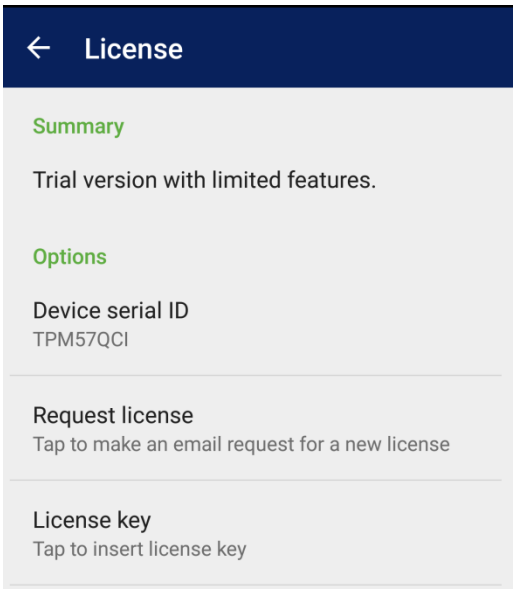

FIGURE 2 – LICENSE SUMMARY, TRIAL VERSION

8.1 Sending request for a license key

After taping on *Request license* button a new email will be opened. Reciepent of the email and License request text will be filled out automatically in the email client on android device.

For successful receiving of license key you need to add following information :

- License ID (provided by Sensus)
- Name of the person using the Finder application
- Phone number

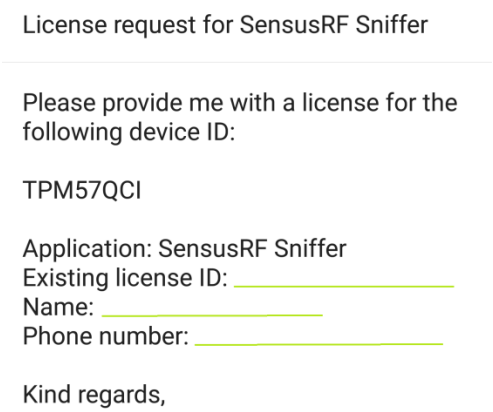

FIGURE 3 – LICENSE REQUEST

Sensus team will check your request for a license and will send back license key . To insert license key tap on the *License key* button and insert license key provided by Sensus. The text in the Summary section will be changed to "License is valid." and application has full functionality.

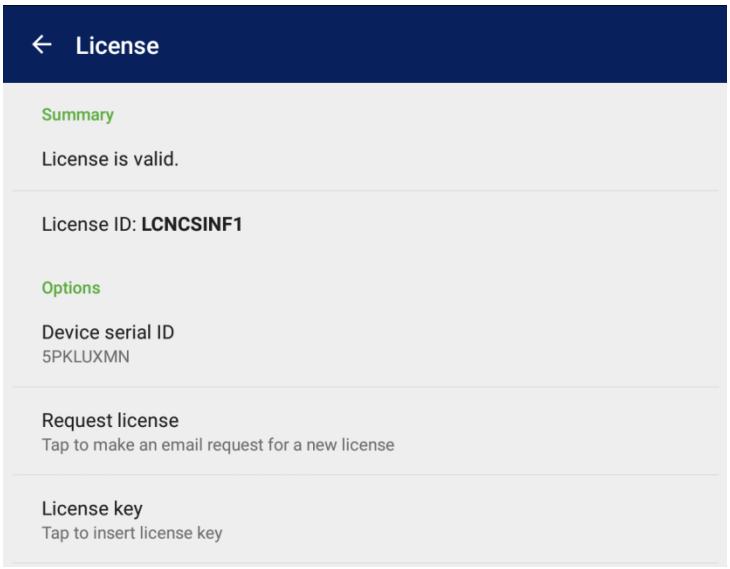

FIGURE 4 – LICENSE SUMMARY / VALID LICENSE

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9 Appendix A – BUP file

The following table describes structure of the BUP file which can be sent to FTP server after successful reading.

Tabular view

Receive time	Meter address	Meter type	Value	Alarm flags	Field strength	Original receiver	Telegram bytes
1/15/16 10:40:25	1012-005-4806	unknown	3510	2	20%	SIRT 868	11a3590727e4160d00830727e41600000db6026936
1/15/16 10:40:25	1010-001-8680	iPERL 868	0	0	94%	SIRT 868	11a3be05f629f80d01c005f629f80000000000280a
1/15/16 10:40:25	1010-002-8897	iPERL 868	0	0	98%	SIRT 868	11a2c305f651e10d004105f651e100000000006da0
1/15/16 10:40:25	1010-000-6744	iPERL 868	131509	0	12%	SIRT 868	11a54e05f5fb580d00f305f5fb58000201b500d30f
1/15/16 10:40:25	1010-000-1062	iPERL 868	17478	0	60%	SIRT 868	11a28f05f5e5260d00d105f5e52600004446004e64
1/15/16 10:40:25	1000-000-0051	unknown	0	89	78%	SIRT 868	11a3a8000000330d00f60000003300000000059db7e

9.1 Resulting BUP file format

The following part describes the format of the resulting CSV file which contains the collected BUPs and is created automatically by the application.

column 1: ***BUP receive time* of the original receiver**

It is time of the Android device (tablet) if the BUP is caught directly. In case it comes from the repeater the time is computed from the device time and the Actuality from the FEP.

e.g.: 12/8/14 2:21:31 PM

column 2 ***meter SRF address in format s XXXX-XXX-XXXX or XXXXXXXXXXX***

e.g.: 1031-000-0026

10310000026

column 3: ***meter type***

e.g.: eRegister 433

column 4: ***value* – readout of the meter**

This value represents the original raw reading from the meter.

e.g.: 547

column 5: ***alarm flags***

This decimal value represents the alarm byte from the BUP. It is equal to zero if there is no alarm in the meter. To interpret wich alarms are active , the decimal value has to be converted to binary format as following

Alarm Byte Format

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Low Battery	Leak	Magnetic Tamper	Metro-Com broken	Backflow	Broken Pipe	Empty Pipe	Not used

e.g.: 2 (decimal) = 00000010 = Empty pipe

column 6: ***field strength***

This integer represents the strength of the signal in percents calculated from the RSSI value.

RSSI comes from the BUP if it is received directly or from FEP if it comes from the repeater.

e.g.: 32%

column 7: ***original receiver***

This field contains the type of the device that originally received the BUP telegram.

e.g.: Repeater 433

SIRT 433

column 8: ***telegram bytes***

The complete string of the BUP telegram in hexadecimal form.

e.g.: 110053127a399a0d0100127a399a0000022300f6fc

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9.2 BUP file name format

The name of this file is auto-generated and follows this format:

MOB_<SIRT name>_<collection date (yyyymmdd)>_<collection time (hhmmss)>.csv

e.g.: MOB_SIRT_00989736_20150210_122611.csv

The SIRT name is the default SIRT name and consists of the “SIRT_” prefix and its radio address in the hexadecimal format.