Project Number:	Document Type:	
20011	**Quick Reference**	
Date:	Product Name:	Revision:
03-Mar-2022	**Service FW-Update Builder**	**C**

HISTORY

Rev	Date	Comment	Author
A	29-Apr-2021	Initial	Thomas Wiedebusch
B	27-Oct-2021	FW Update SW and configuration files are taken from DB	Thomas Wiedebusch
C	03-Mar-2022	Mentioned the Safe Upload	Thomas Wiedebusch

Copyright © 2021..2022 by
SENSUS GmbH
CONFIDENTIAL

REVIEWS

Rev	Date	Reviewer	Department

Copyright ©2021..2022 by SENSUS GmbH

CONFIDENTIAL

LIST OF CONTENTS

1. Introduction 6
1.1 Content 6
2. Prerequisites 6
2.1 Hardware Requirements 6
2.2 Software Requirements 7
3. Installation 7
4. Security 7
5. Confidence Notice 8
6. Operating Instructions 9
6.1 Order-Position and Validation Date 9
6.2 Customer Selection 11
6.4 Cordonel Selection 12
6.5 FW-Package Selection 13
6.6 Update Operator 14
6.7 Update Capability Check – Manual Verification 15
6.8 Build Update Safe 18
6.9 Upload Safe 20
7. Trouble Shooting 21
7.1 Data Base Not Connected 21
7.2 Build Update Safe - Failure 22
8. Contacts 23
9. References 23

LIST OF TABLES

Table 1.1 Abbreviations 5
Table 8.1 Contacts 23

LIST OF FIGURES

Figure 1.1 FW-Update Builder Operation 6
Figure 4.1 Message Window – Expired License 7
Figure 4.2 Registration Window – Account Active 7
Figure 6.1 FW-Update Order-Position 9
Figure 6.2 FW-Update Validation Date 10

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

Figure 6.3 Customer Selection 11
Figure 6.4 Cordonel Selection 12
Figure 6.5 FW-Package Selection 13
Figure 6.6 Update Operator 14
Figure 6.7 Pre Build Summary – Update Capability Verification 15
Figure 6.8 Pre Build Summary – Assign FW Package 16
Figure 6.9 Pre Build Summary – Verification Completed 17
Figure 6.10 Build FW-Update Safe – Success 18
Figure 6.11 Build FW-Update Safe Success Message 18
Figure 6.12 Build FW-Update Safe – Success – One Cordonel Missing 19
Figure 7.1 Data Base Not Connected 21
Figure 7.2 Build FW-Update Safe – SW Collection Failure Message 22
Figure 7.3 Build FW-Update Safe - Failure 22
Figure 7.4 Build FW-Update Safe – Failure Message 22

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

ABBREVIATIONS

Builder Operator	Operator of the "FW-Update Builder" assembling the "FW-Update Safe"
DB	Data Base
DLL	Dynamic Link Library
EMEA	Identifier used for European, Middle East and Africa
FW	Firmware, hardware depending software
FW-Package	A combination of applications which work together and have to be installed as set
FW-Update Builder	Builder of the "FW-Update Safe", tool to select all needed components and to encrypt the "FW-Update Safe"
FW-Update Loader	Software for decryption of the "FW-Update Safe" and hast for the "FW-Update Software"
FW-Update Process	The process of installing the firmware
FW-Update Safe	Encrypted container of all components needed for the "FW-Update Process" during offline operation
FW-Update SW	Software executing the "FW-Update Process"
Genesis	Legacy Name of Cordonel
HW	Hardware
NA	Identifier used for North America
Offline Operation	Without connection to the Xylem-Network
Online Operation	Directly or via VPN connected to the Xylem-Network
PCB ID	Printed Circuit Bord Identifier, unique identification number of the Cordonel HW
SW	Software
Update Opertor	Operator executing the "FW-Update Process"
VPN	Virtual Private Network

Table 1.1 Abbreviations

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

1. Introduction

A general introduction of the “FW-Update package” is referenced by [FWU_PK].

1.1 Content

This document gives a brief overview of the “FW-Update Builder”. The software serves as an user interface to collect all data needed to update a series of Cordonels in the field. It is going to verify the selected update packages. If the combination passes all verification steps or the user acknowledges the “FW-Packages” as a valid package to install to specific device, the “FW-Update Safe” can be build.

The “FW-Update Safe” will be encrypted using the selected Update-Operator information.

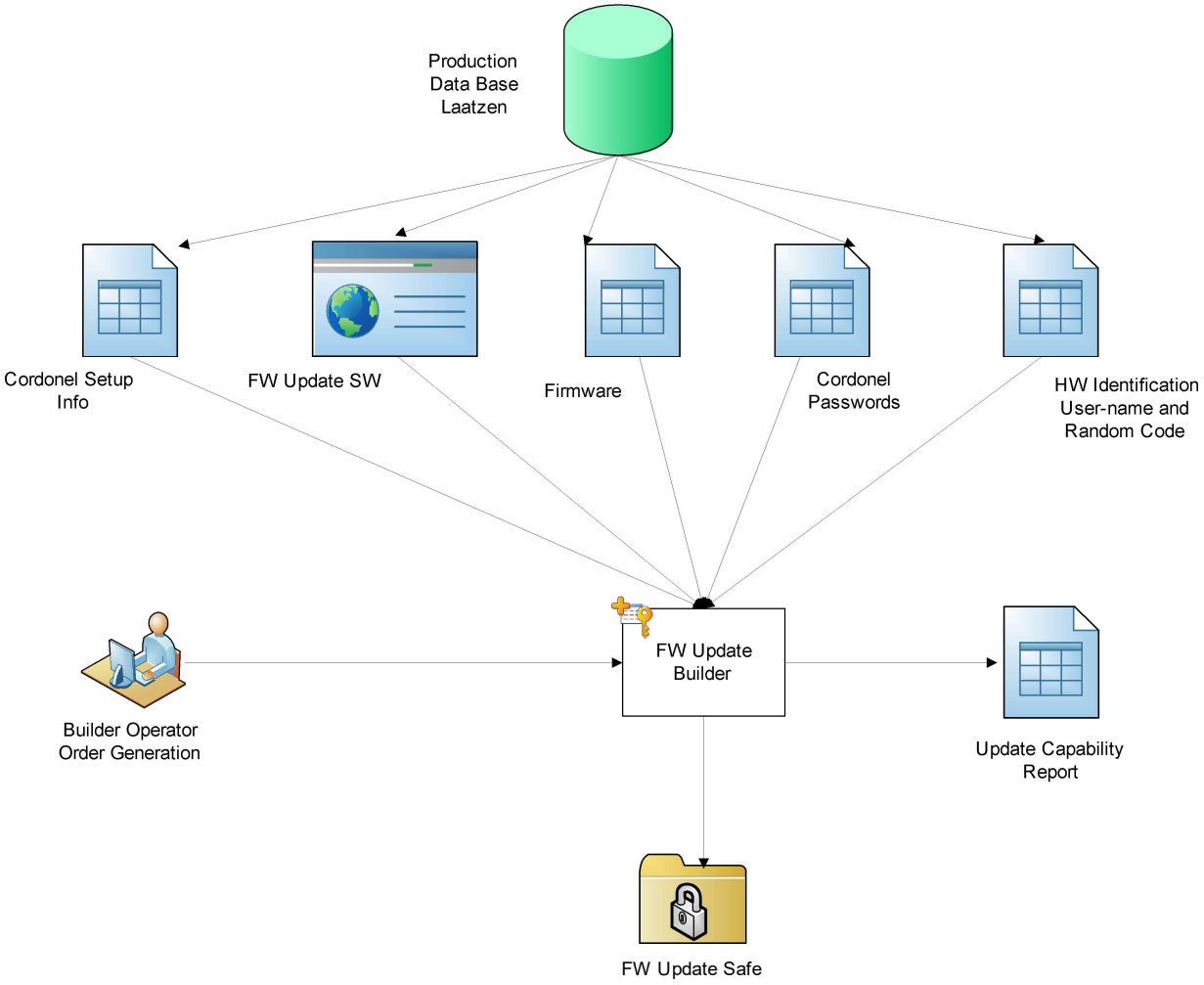


Figure 1.1 FW-Update Builder Operation

2. Prerequisites

2.1 Hardware Requirements

PC with MS-Windows™ 10 Operating system.

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

2.2 Software Requirements

Microsoft™ .NET framework 4.7.2.

3. Installation

An installation is not required, just copy the software including all sub-directories to a preferred location.

4. Security

The software is protected by a license for a specific version and licensed to a specific user. This license can be used on unlimited amount of PCs.

Key Values:

- License control by the Laatzen production data base – exit SW immediately if not licensed,
- User registration and activation control in DB, user specified by domain, log-in name and full name,
- Lock user control if user is not activated, only menu items are active, Builder operator cannot access the data base contents, neither read nor write,
- Using Web-Interfaces to access the DB contents.

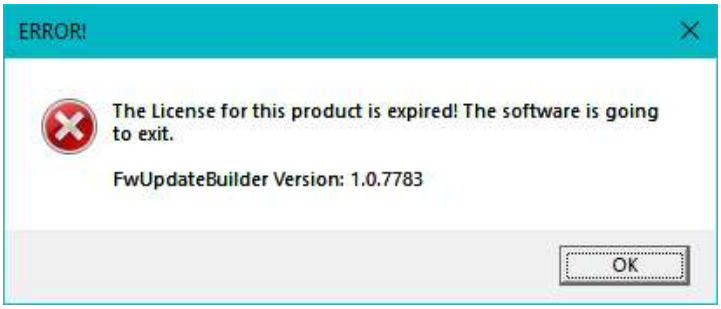


Figure 4.1 Message Window – Expired License

To check the “Builder Operator” validation select from the main menu:

Help->Info



Figure 4.2 Registration Window – Account Active

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

If the “Builder Operator” is not registered, only the Domain and Login fields will show a value. These have to be send to the administrator of the production data base. The full name has to be reported. As soon as the data base administrator has added this account, all information is going to be displayed here.

5. Confidence Notice

The Builder Operator can assign wrong “FW-Update Packages” to a Cordonel due to the lack of information nowadays. But finally, there is nothing which can be made wrong at all, as the “FW-Update Software” takes the responsibility for the late update capability check.

Even if the update cannot be performed, the Cordonel™ will remain fully functional.

But assigning an un-installable “FW-Update Package” may put a lot of stress to the Update Operator, as he cannot perform the update at all. Unfortunately, he can check the update capability only at the time of connection to the Cordonel.

Copyright ©2021..2022 by SENSUS GmbH

CONFIDENTIAL

6. Operating Instructions

To operate the “FW-Update Builder” at least the customer name, the customer specific Cordonel serial number and eventually the name of the required “FW-Package” are demanded. The software is almost intuitive to use. Behind the user views, a lot of checks and validation will protect against wrong selections.

6.1 Order-Position and Validation Date

The start screen shows in red all needed information before a “FW-Update Safe” can be created. Input an order number and position for the FW-Update order and select the validation date. Beyond the validation date, the “FW-Update Safe” will be useless.

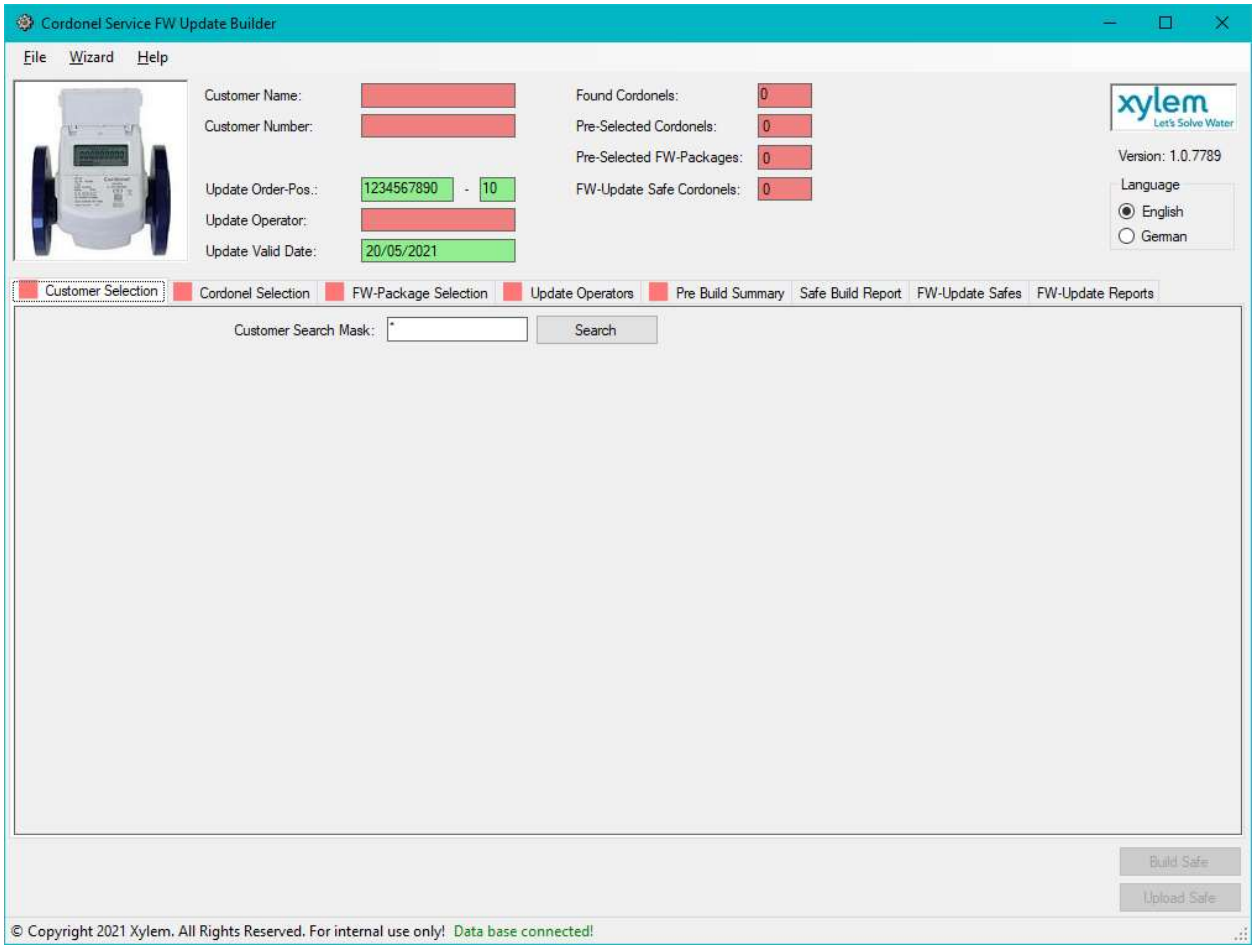


Figure 6.1 FW-Update Order-Position

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

IMPORTANT NOTICE:

The order number displayed here is a default number which has to be overwritten by the Builder Operator !

A safe has to have a unique name before uploading it to the data base. The need of several safes can be accomplished with an identical order number just increasing the position number. Before the upload, the safe can be overwritten as often as required until it fulfils the builder operator demands.

Only the latest created safe can be uploaded to the data base. Do not forget to upload this safe after generation!

Clicking on the validation date will open a “Date Time Picker”. This date states the last day, on which the generated “FW-Update Safe” can be used. Beyond this day (midnight) the “FW-Update Software” will exit itself.

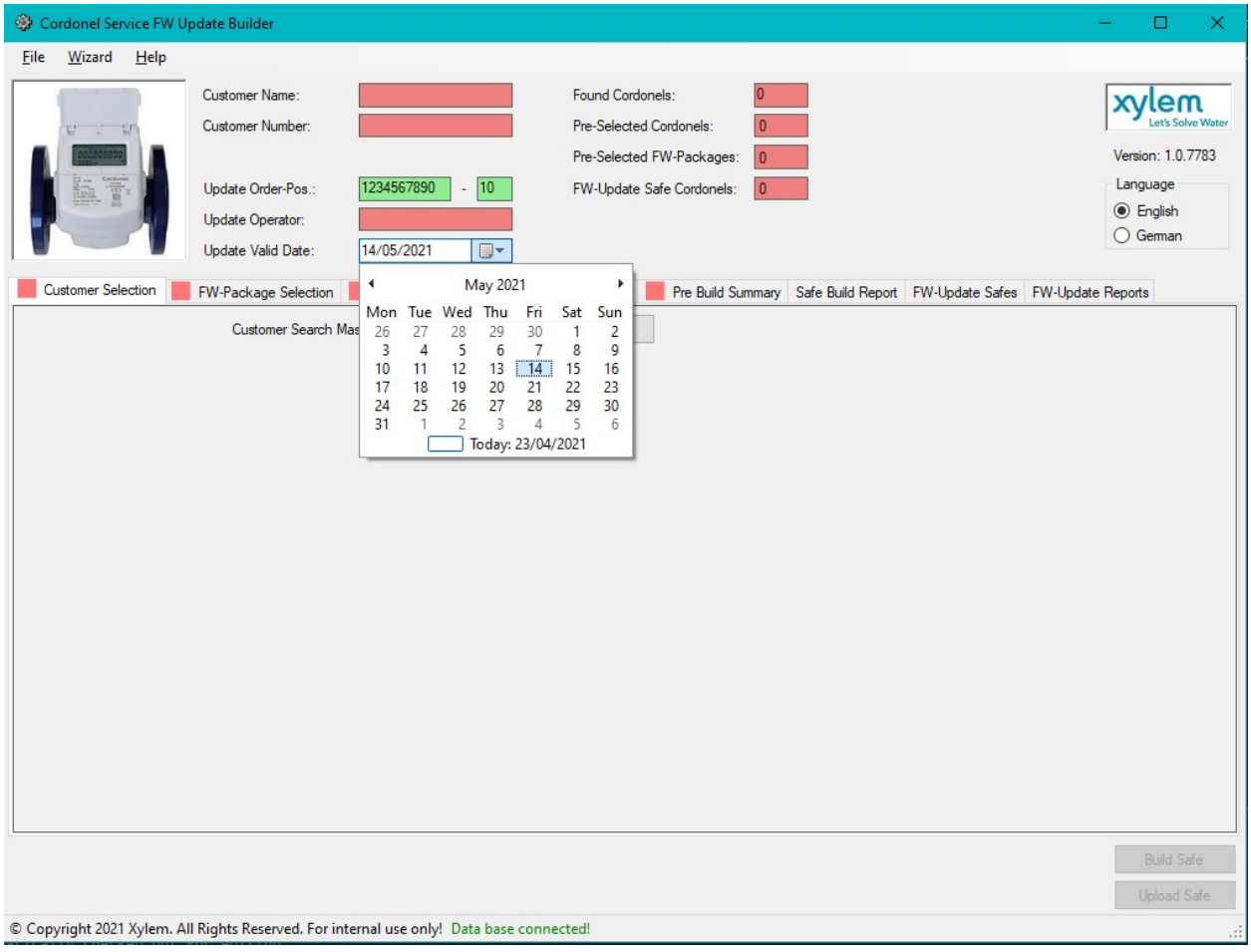


Figure 6.2 FW-Update Validation Date

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.2 Customer Selection

Select the Customer:

- This is the base for all further operations as the a “FW-Update Safe” is always for one customer,
- Changing the customer will remove all Cordonels from the selections, as these are strongly connected to each other.

A search mask can be used like “*Sen*” to preselect a customer subset, the star behind the search-string is mandatory:

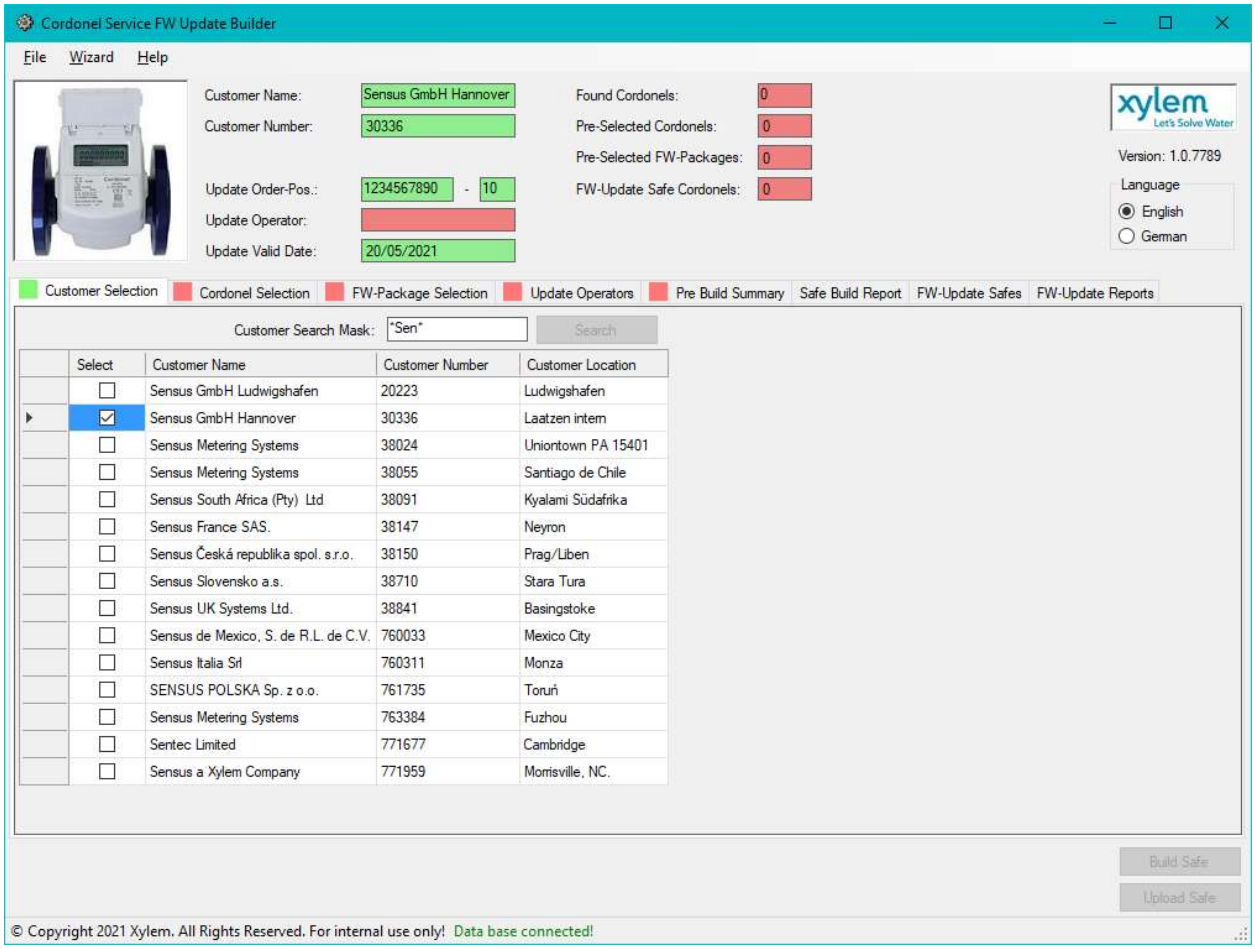


Figure 6.3 Customer Selection

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.4 Cordonel Selection

Select all Cordonels for the “FW-Update”. The amount of Cordonels, which can be selected, is unlimited. A suggested range is one to twenty devices, as it might be better to generate a second or third “FW-Update Safe”.

Again two search mask can be used to preselect and mask out uninterested devices. Knowing the original production number and position is always a good choice, but it is not necessary.

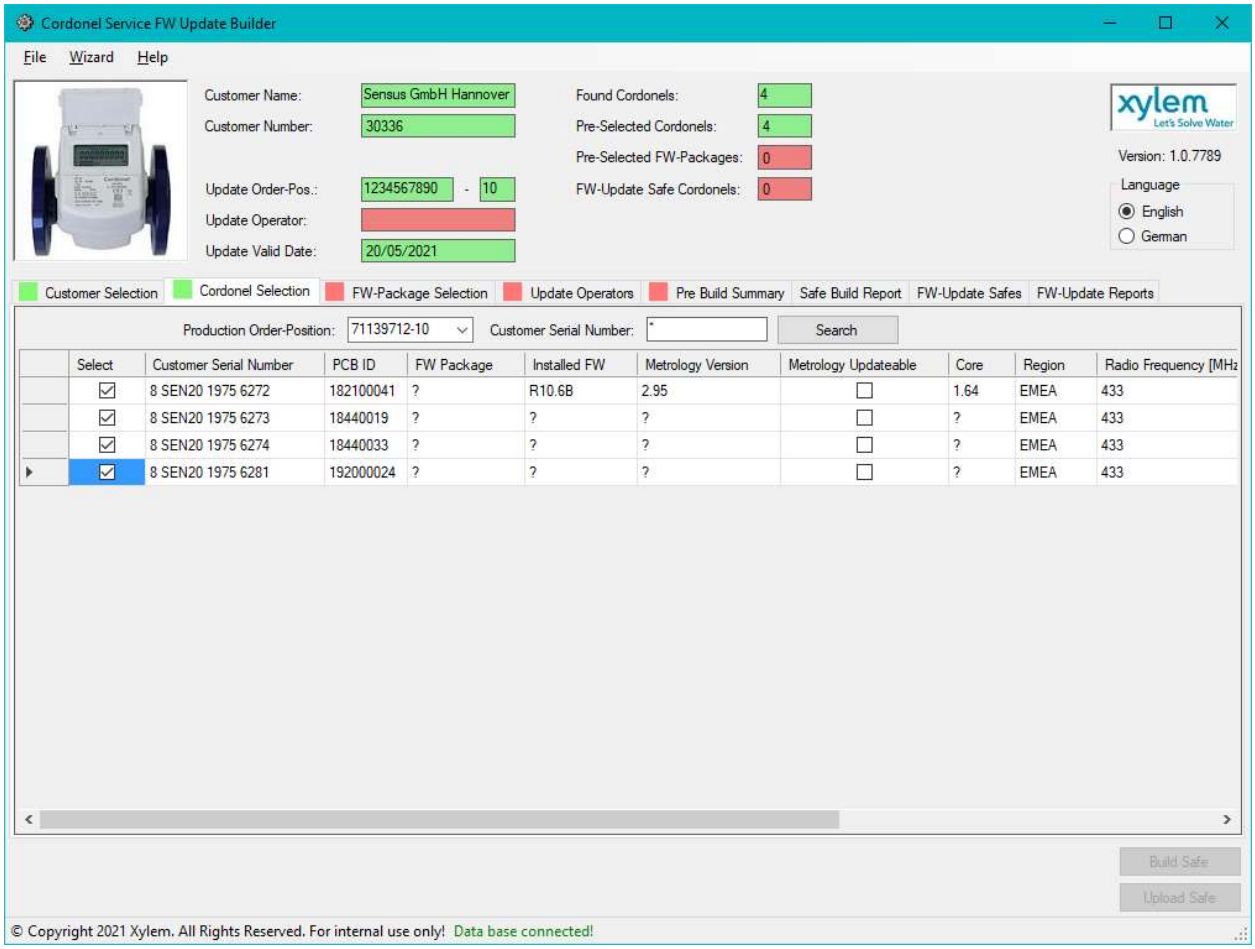


Figure 6.4 Cordonel Selection

It is support to search and assign Cordonels from different “Production-Orders”. The number of Cordonels, which can be selected, is unlimited. A recommendation is to select that many Cordonels and put it to a safe as can be updated in one working day. It is possible to generate an unlimited number of safes. These have to be assigned either to a different FW-Update Order-Position or can be used with the identical order, just changing the Position (e.g 1234567890-10, 1234567890-20, 1234567890-30 a.s.o.).

Identical Update Order-Pos numbers will overwrite the safe generated before this one.

The pre-selected FW-Packages can be assigned here or even later in the “Pre-Build Summary” page, where the final update capability check is going to be performed.

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.5 FW-Package Selection

The FW package has to be pre-selected, before it can be assigned to a specific device. The search masks will be filled with the information of the selected Cordonels to simplify the pre-selection of valid update packages.

Due to the lack of information nowadays, this has to be selected with the maximum rigor. Nevertheless, if it cannot be installed, an late update capability check in the "FW-Update SW" will avoid an accidentally installation to an unsupported device.

Again search masks can be used to find a specific package.

Important:

- The region (NA or EMEA) and radio frequency (433 MHz, 868 MHz or not available on NA versions) match
- The Metrology version
- The diameter,
- The core version.

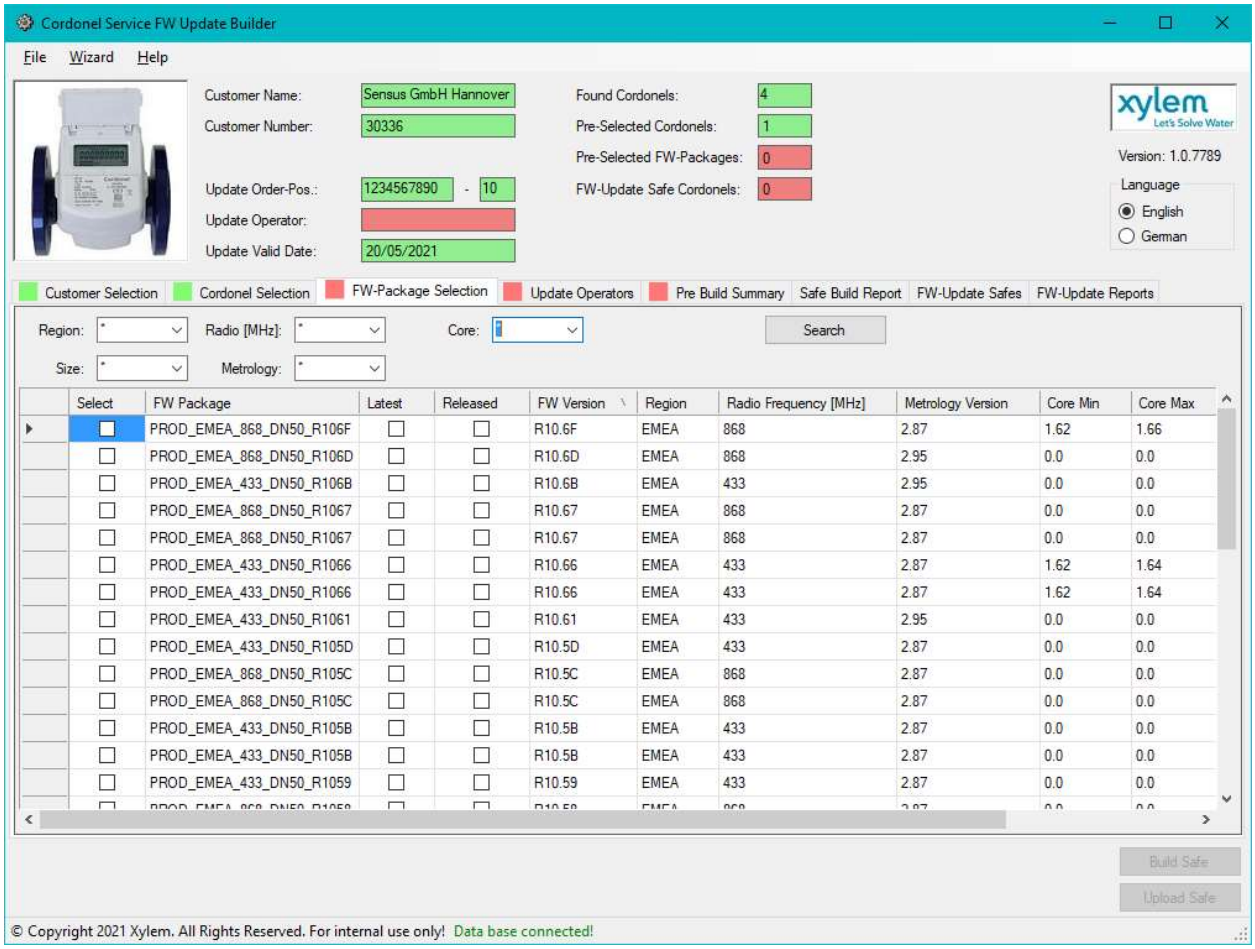


Figure 6.5 FW-Package Selection

The core min and max versions for a specific "FW-Update Package" are going to be taken from the *MeterFwUpdateRuler.json* file. If these are showing 0.0, the FW package is not in listed in this file. An update of this file may fix this, please contact the Firmware developer group!

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.6 Update Operator

A registered update operator has to be assigned. The “FW-Update Safe” will be encrypted with the information of the update operator and his PC. The “FW-Update Safe” can be decoded explicitly by this operator on his registered PC. Therefore only one update operator can be selected for one safe.

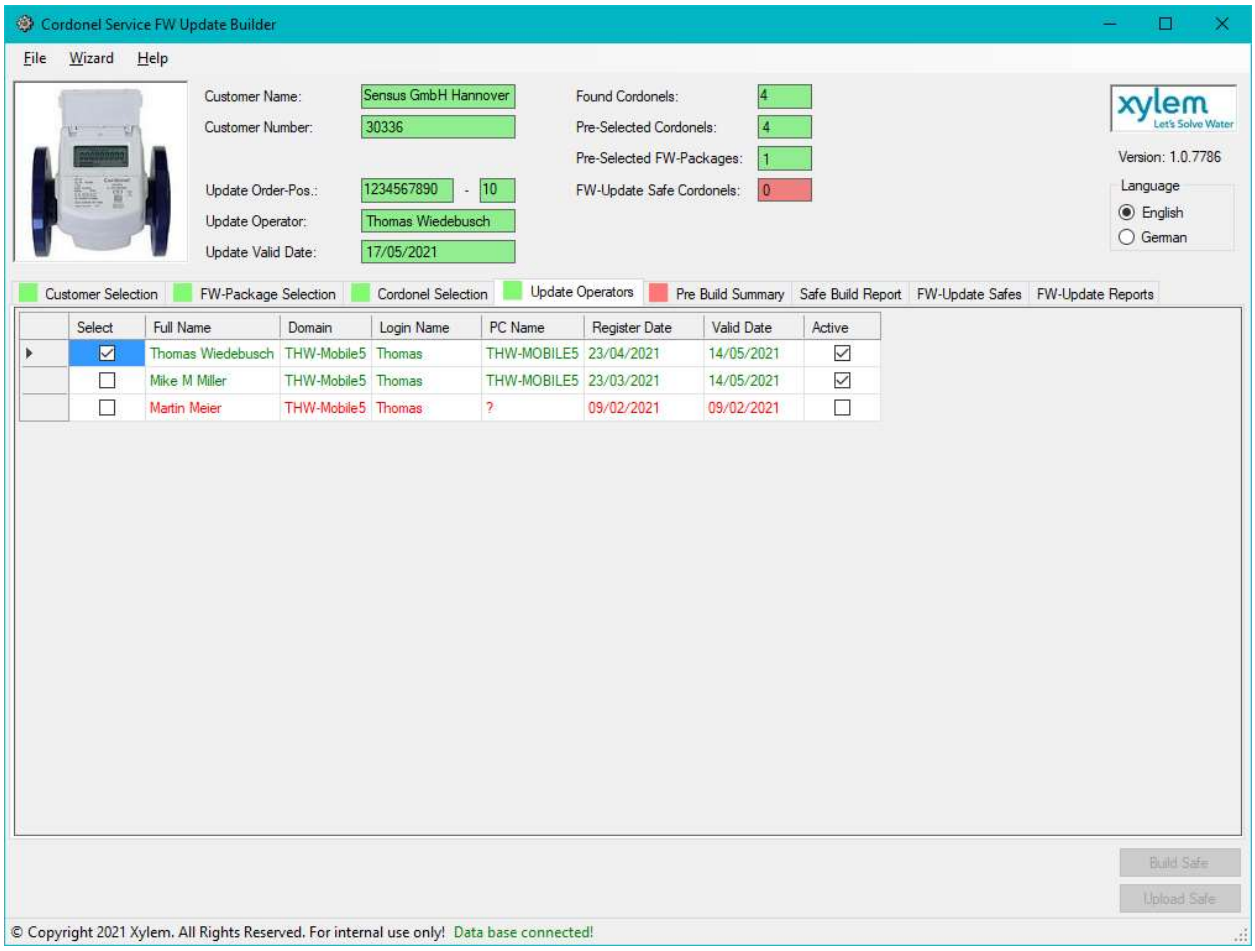


Figure 6.6 Update Operator

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.7 Update Capability Check – Manual Verification

The final step before the FW-Update Safe can be build, indicated by an overall “green” and the enabled [Build Safe] button, is the update capability check at the “Pre Build Summary” page.

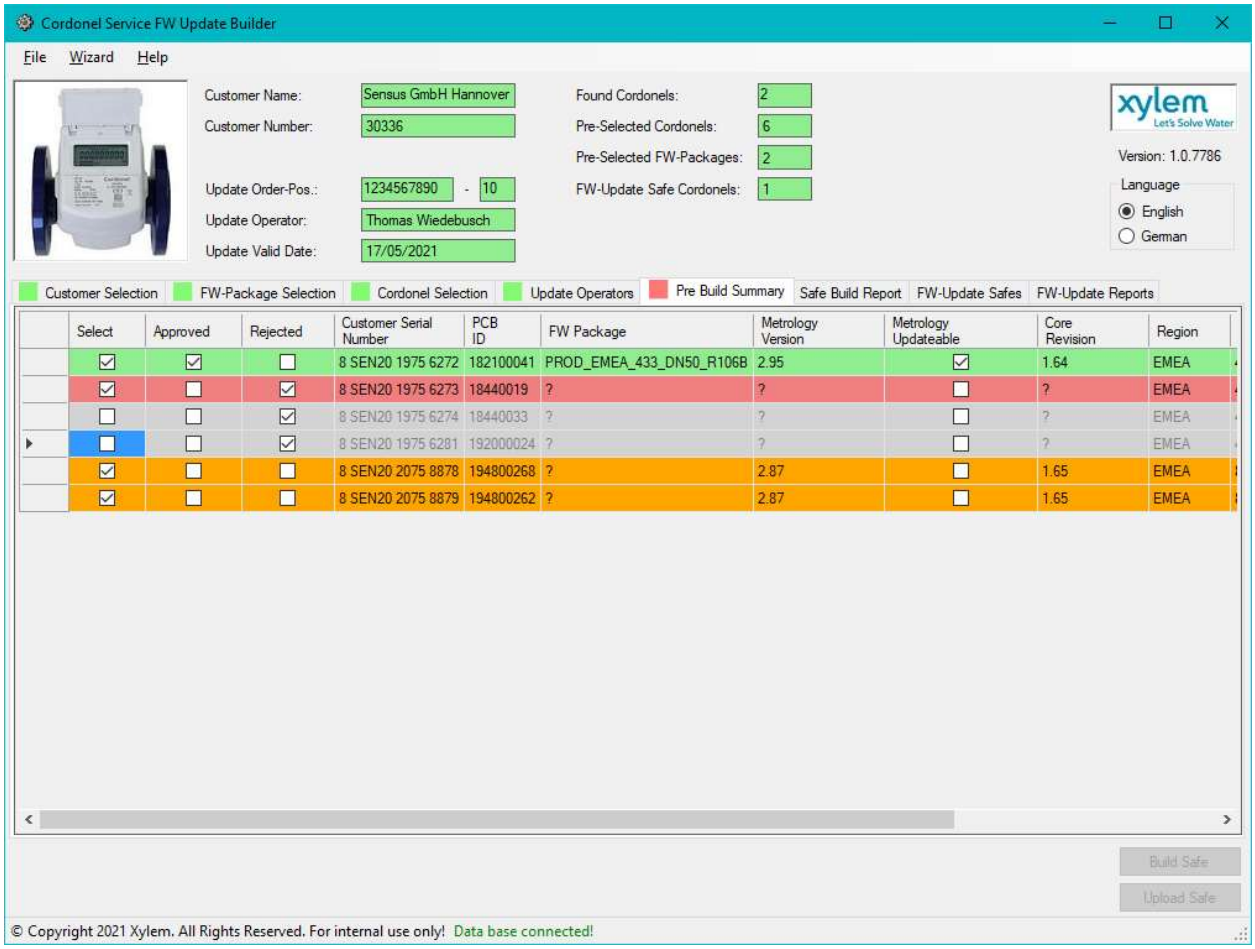


Figure 6.7 Pre Build Summary – Update Capability Verification

The update capability verification, here the manual approval, has to be done by the user. Green lines are acknowledged, red lines are rejected and have to be unselected to grey the line out and remove this device from the safe. Orange lines still missing an input, here the FW Package.

IMPORTANT NOTICE:

The assignment of a wrong “FW-Update Package” to a specific Cordonel will not harm the device, as at least the “FW-Update Software” will perform a strong update capability check. But this will put a lot of inconvenience to the update operator in the filed if the updat will be denied after connecting to the Cordonel.

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

To select the “FW Package”, a click to the questionmark in the FW Package column at the specific row will open a drop down list of the “Pre-Selected FW-Packages”.

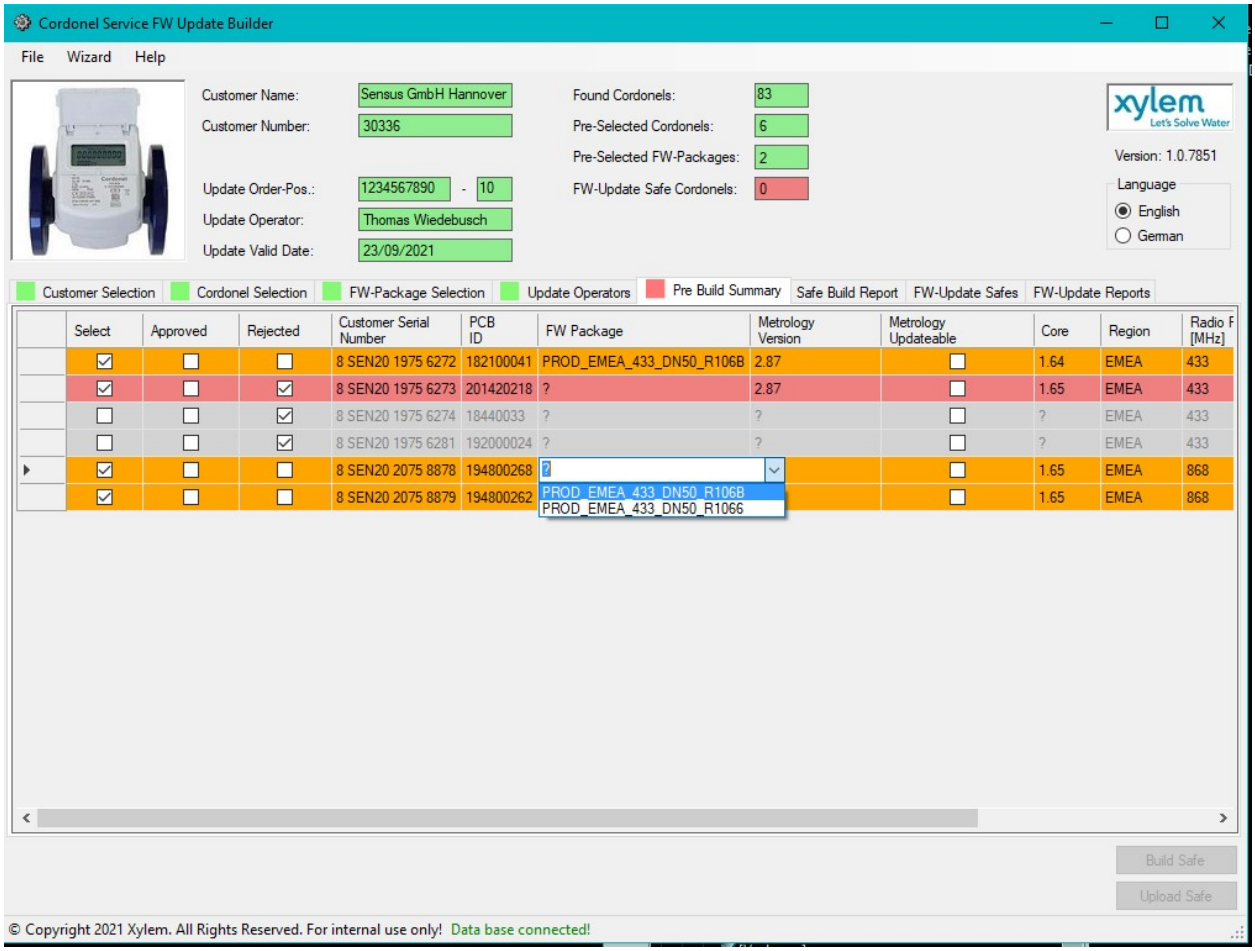


Figure 6.8 Pre Build Summary – Assign FW Package

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

Ready to [Build Safe] as all information needed has been filled. The green lines are showing the Cordonels which will be put into the safe.

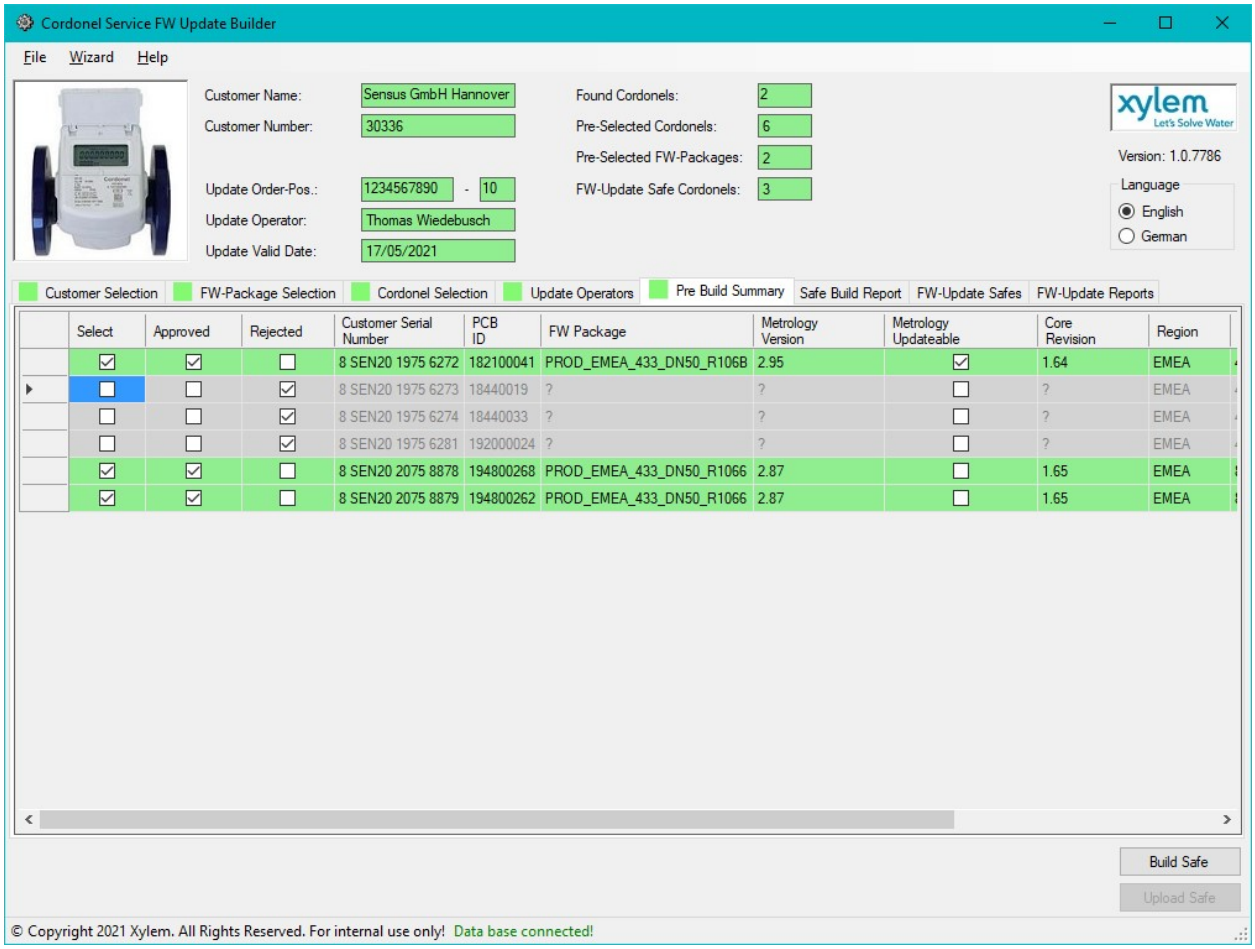


Figure 6.9 Pre Build Summary – Verification Completed

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.8 Build Update Safe

Finally the update safe build operation will take place by pressing the [Build Safe] button.

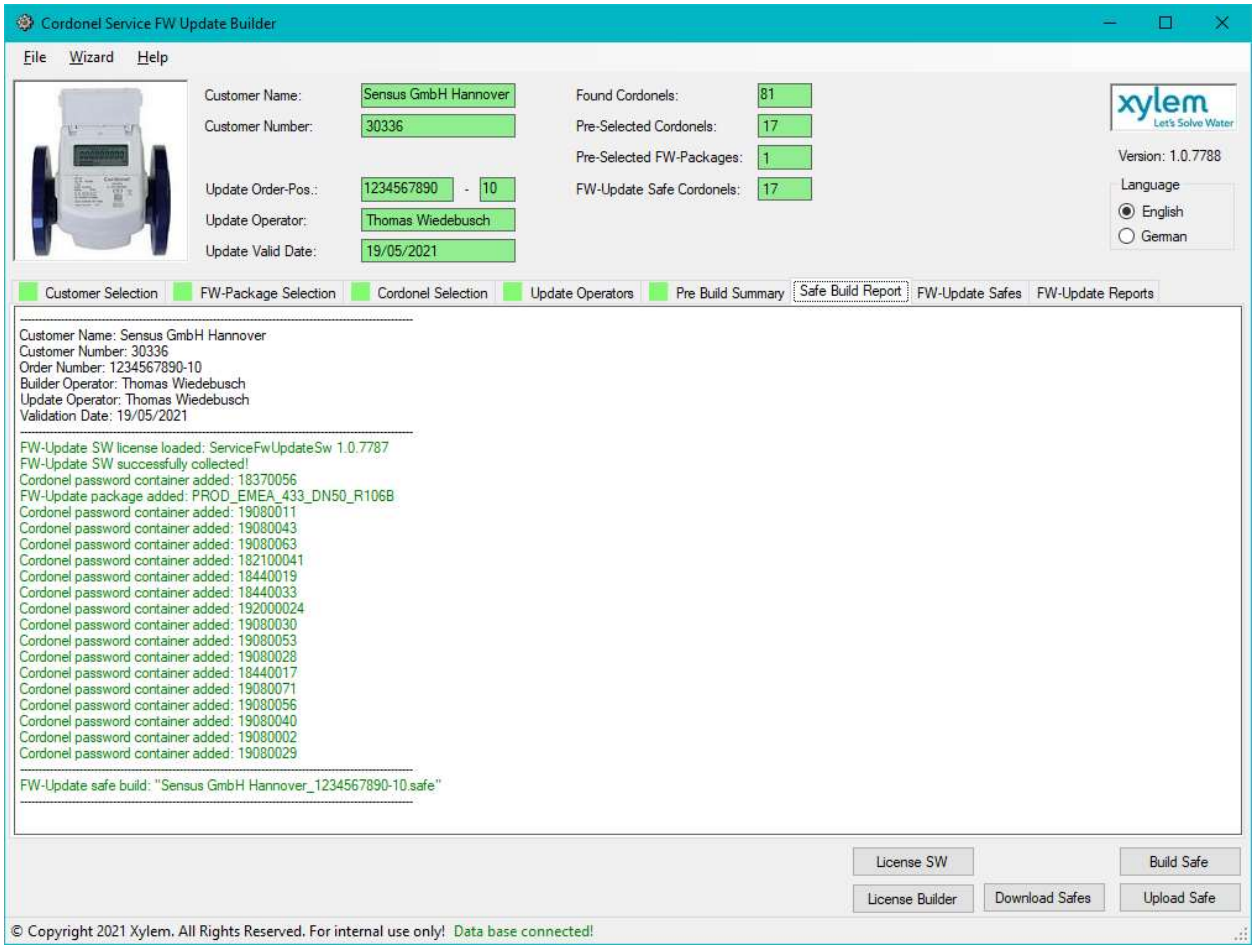


Figure 6.10 Build FW-Update Safe – Success

The message window will show all information and shall be copied by the builder operator for his report.

All Cordonels displayed in green with the message of the “Cordonel password container added” will be contained in the safe. Be aware, a missing “FW-Update package” will disable the update capability for this Cordonel. Any error, which needs a user interaction, will be displayed in red! A “FW-Package” being used for a few Cordonels will only be attached once.

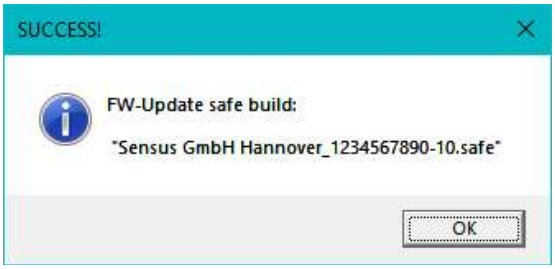


Figure 6.11 Build FW-Update Safe Success Message

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

If at least one Cordonel is approved and all information for an update are collected, a safe is going to be build. If some Cordonels cannot be attached, this is displayed in red. A rebuild can be initiated or the critical device can be removed from the list (in Pre Build Summary) to keep the “Safe Build Report” error free. A newly generated “FW-Update Safe” with an identical name is going to overwrite the actual safe.

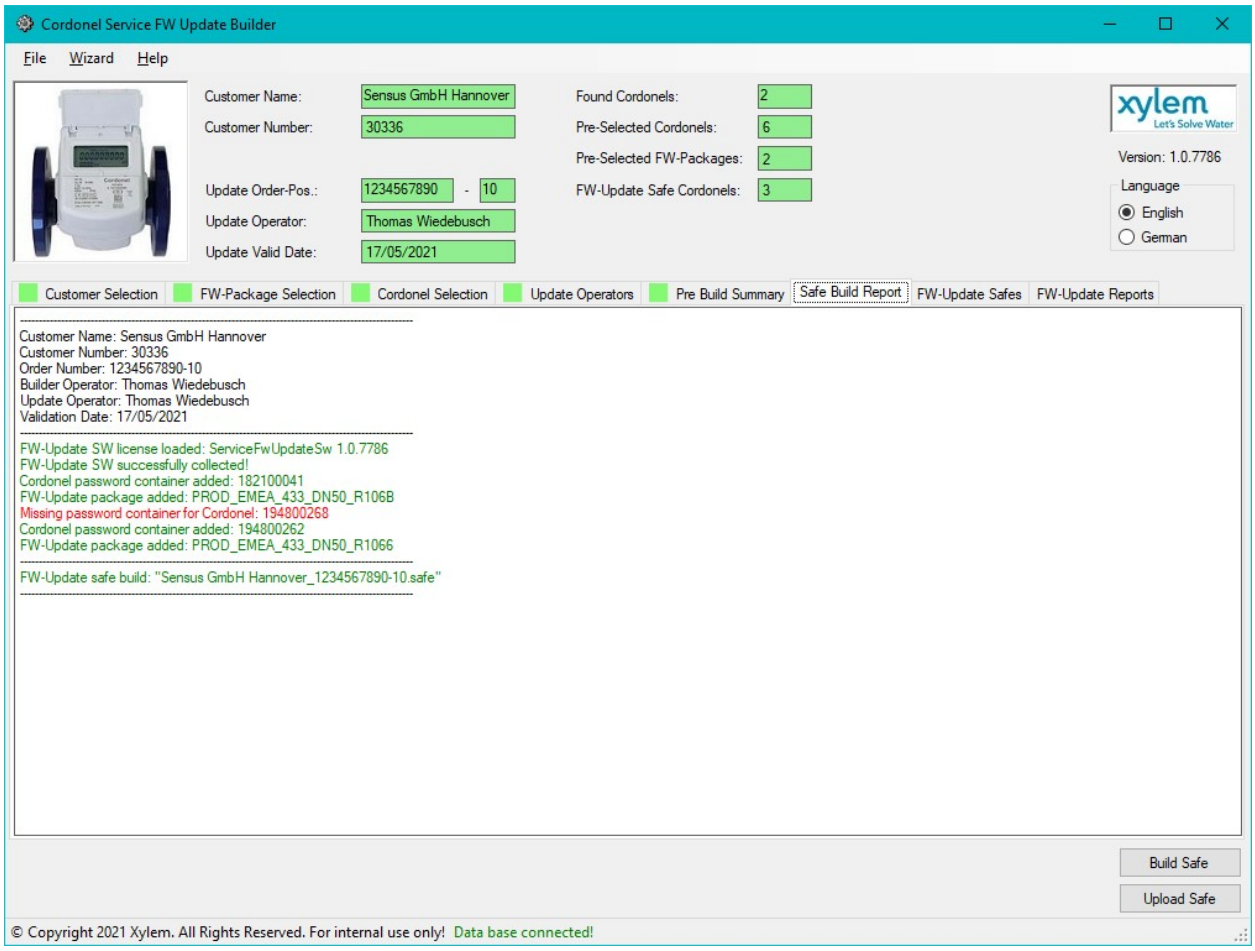


Figure 6.12 Build FW-Update Safe – Success – One Cordonel Missing

This safe can still be delivered to the Update Operator and used to update the attached Cordonels. All generated “FW-Update Safes” are stored in the

C:\[User name]\Downloads\FwUpdateSafe

folder.

ATTENTION: Make the decision, if the builder operator and update operator is identically and runs the builder and the loader on the identical machine. If NOT, do not forget to upload the safe to the data base after built with the lower right [Upload Safe] button! Exclusively the last generated safe can be uploaded to the data base directly after the build process! If this is not done, the safes are only locally stored on the PC where the builder is running. Alternatively all safes can be delivered via SharePoint storage or other channels (USB-stick).

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

6.9 Upload Safe

IMPORTANT NOTICE:

A safe has to have a unique name before uploading it to the data base. The need of several safes can be accomplished with an identical order number just increasing the position number. Before the upload, the safe can be overwritten as often as required until it fulfils the builder operator demands.

Only the latest created safe can be uploaded to the data base. Do not forget to upload this safe after generation!

Copyright ©2021..2022 by SENSUS GmbH

CONFIDENTIAL

7. Trouble Shooting

7.1 Data Base Not Connected

The “FW-Update Builder” needs a data base connection for license and operational issues. If it this connection cannot be established, the user interface is locked for further operation.

The missing data base connection can be observed in the status bar at the bottom of the main screen. A connection retry will be executed cyclically every 6 seconds.

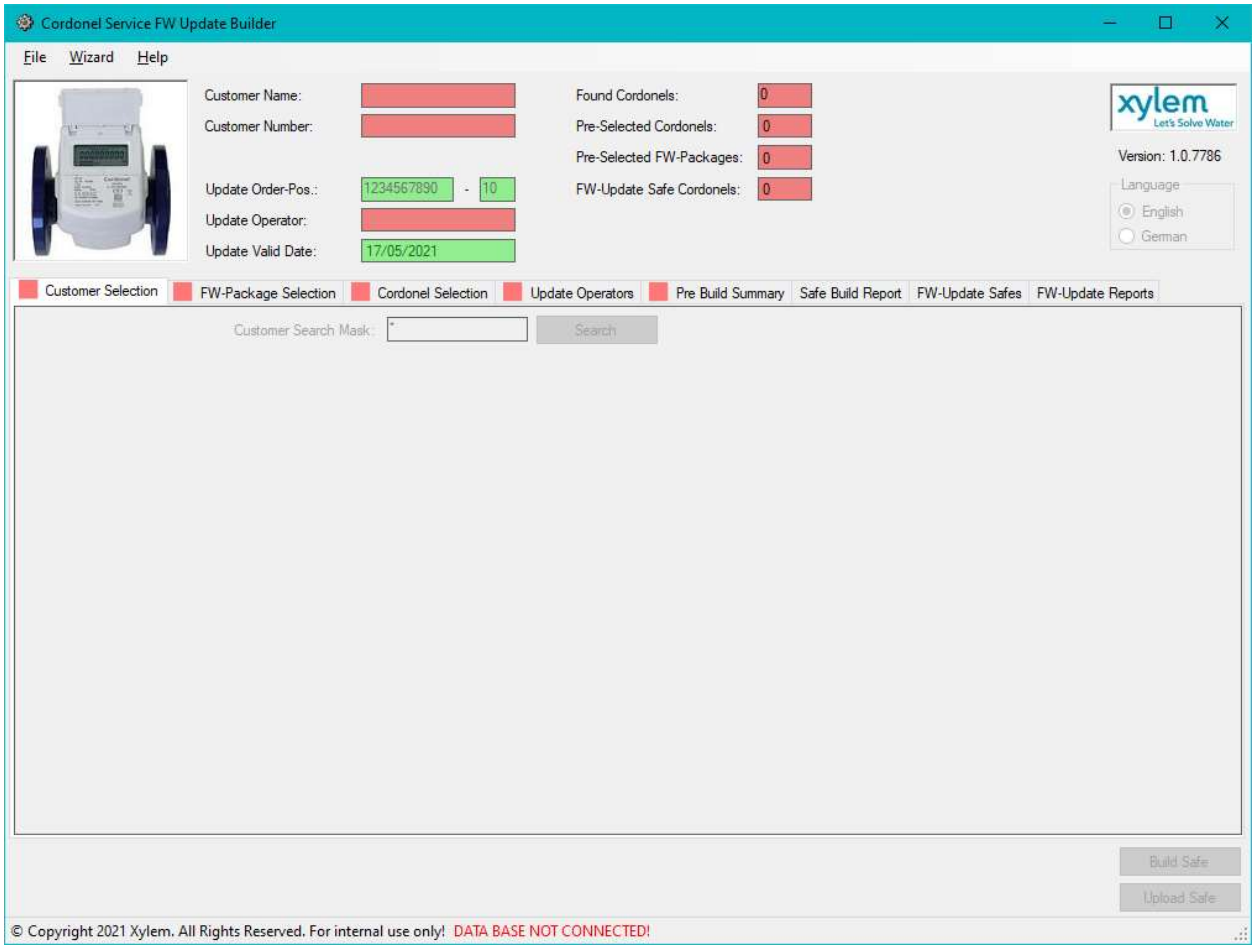


Figure 7.1 Data Base Not Connected

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

7.2 Build Update Safe - Failure

If the “FW-Update Safe” cannot be build, messages are going to show the reason for that.

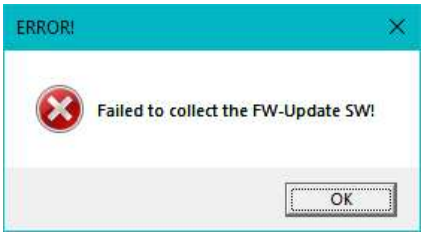


Figure 7.2 Build FW-Update Safe – SW Collection Failure Message

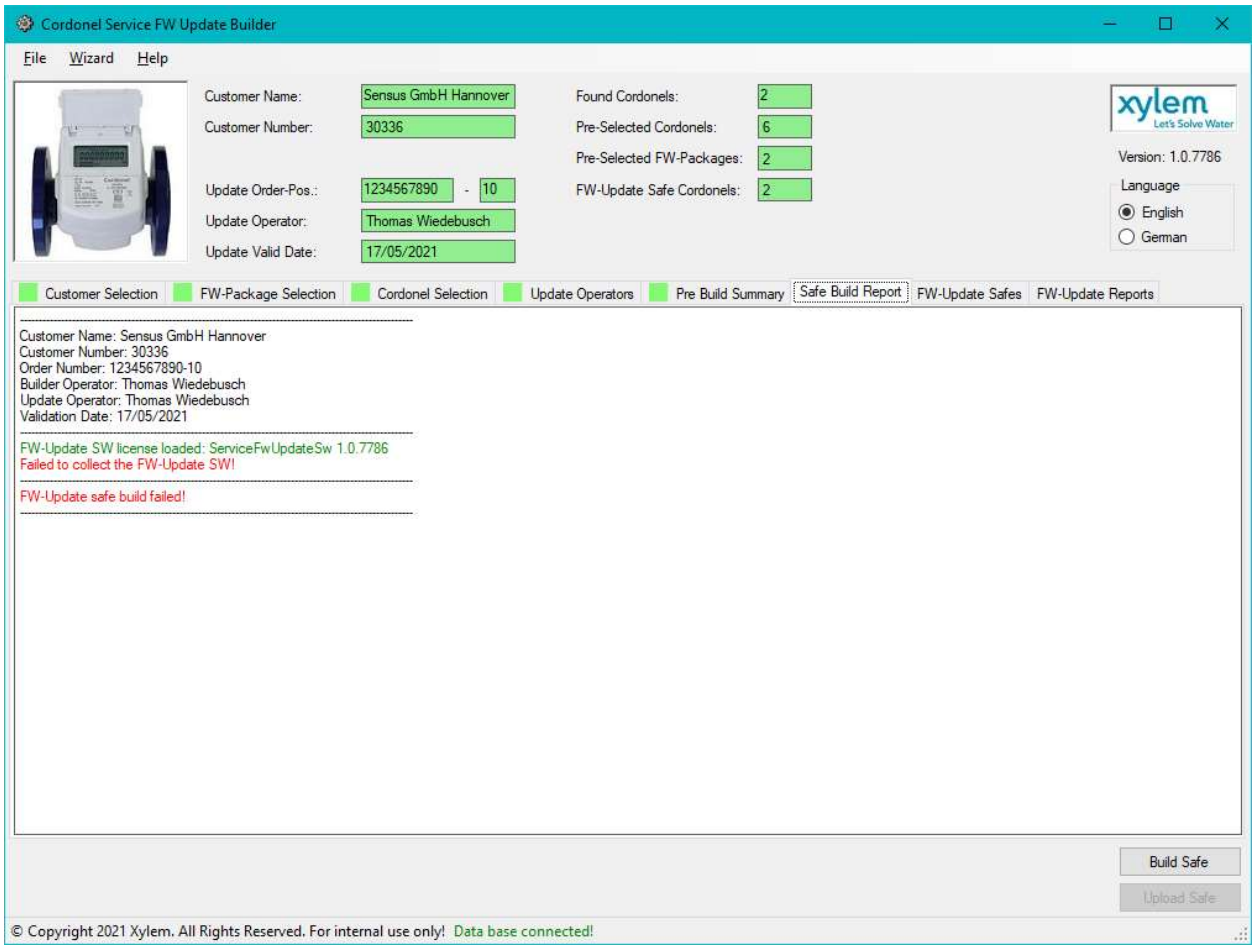


Figure 7.3 Build FW-Update Safe - Failure

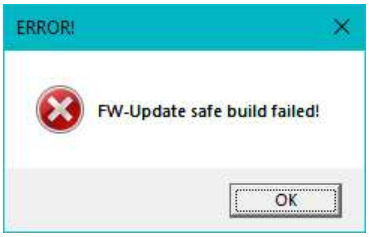


Figure 7.4 Build FW-Update Safe – Failure Message

Copyright ©2021..2022 by SENSUS GmbH
CONFIDENTIAL

8. Contacts

Name	Function	Mail

Table 8.1 Contacts

9. References

[FWU_MRD] **Cordonel Service FW-Update Process MRD**; *Published: SENSUS GmbH*; Author: Thomas Wiedebusch; Edition: September 2020 - Revision B

[FWU_SW] **Quick Reference Cordonel Service FW-Update Software**; *Published: SENSUS GmbH*; Author: Thomas Wiedebusch; Edition: April 2021 - Revision A

[FWU_LDR] **Quick Reference Cordonel Service FW-Update Loader**; *Published: SENSUS GmbH*; Author: Thomas Wiedebusch; Edition: April 2021 - Revision A

[FWU_PK] **Quick Reference Cordonel Service FW-Update Packet**; *Published: SENSUS GmbH*; Author: Thomas Wiedebusch; Edition: April 2021 - Revision A

Copyright ©2021..2022 by SENSUS GmbH

CONFIDENTIAL