TUTORIAL KREO HMI
Database connection and data exchange

Tutorial dedicated to the setting and data exchange with an external database via ODBC protocol

Connect
Ideas.
Shape
solutions.

Introduction

Using KREO, you can connect to databases based on the relational model (RDBMS).

It means that the data exchanged between KREO RUNTIME and PLC can be exported to the DATABASE tables.

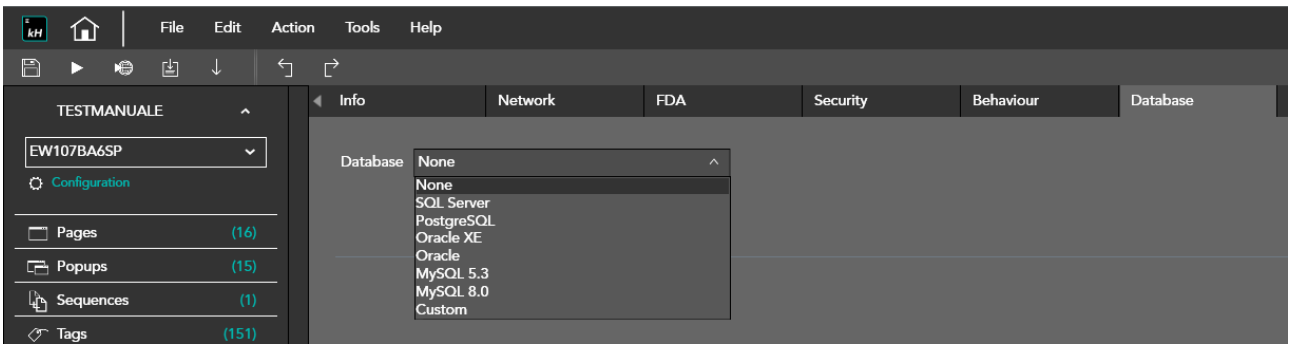
The key factors are:

- The database exists. The RUNTIME will take care of creating the related project SQL tables (tags, alarms, datalogs,recipes, FDA-table,...)
- the odbc driver that is installed to connect to the sql db is a 32-bit type application
- The ESA CONNECT application must be installed in the same PC where the database is running.

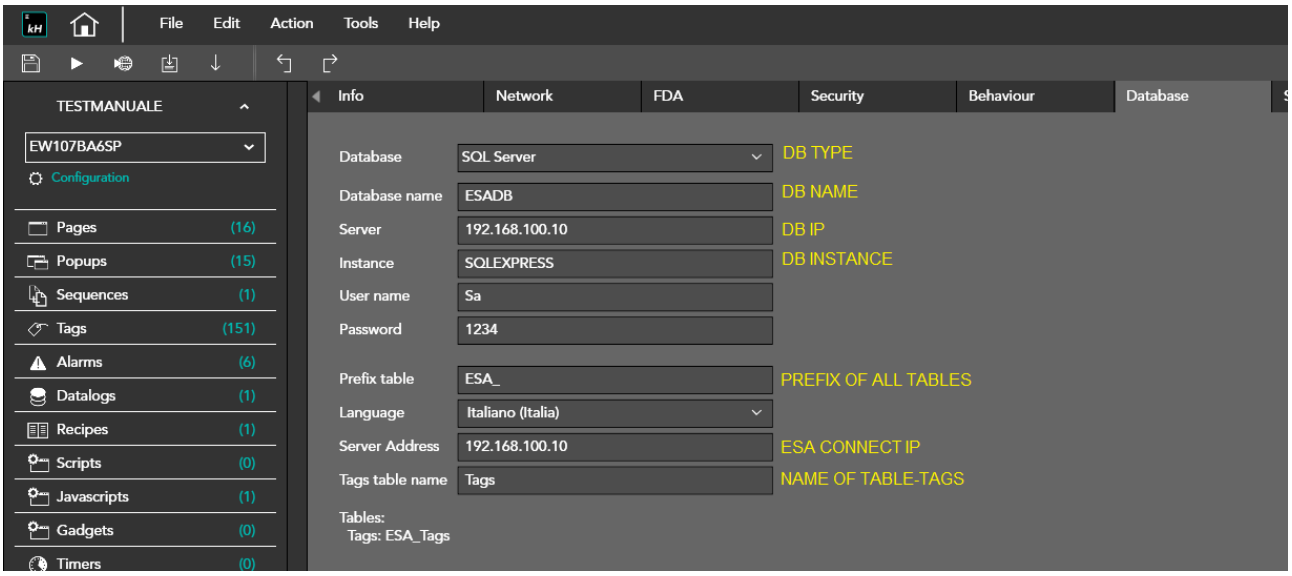
The supported connections are odbc connections.
The data is written in sql language

How to do:

1. Suppose a simple project with 3 tags, 3 alarms, 1 datalog with 3 tags, 1 recipe with 3 tags.
   You want to export this data to SQL DB
2. You then prepare the project. In addition to the project data, you must configure the connection parameters to the SQL DB setting menù

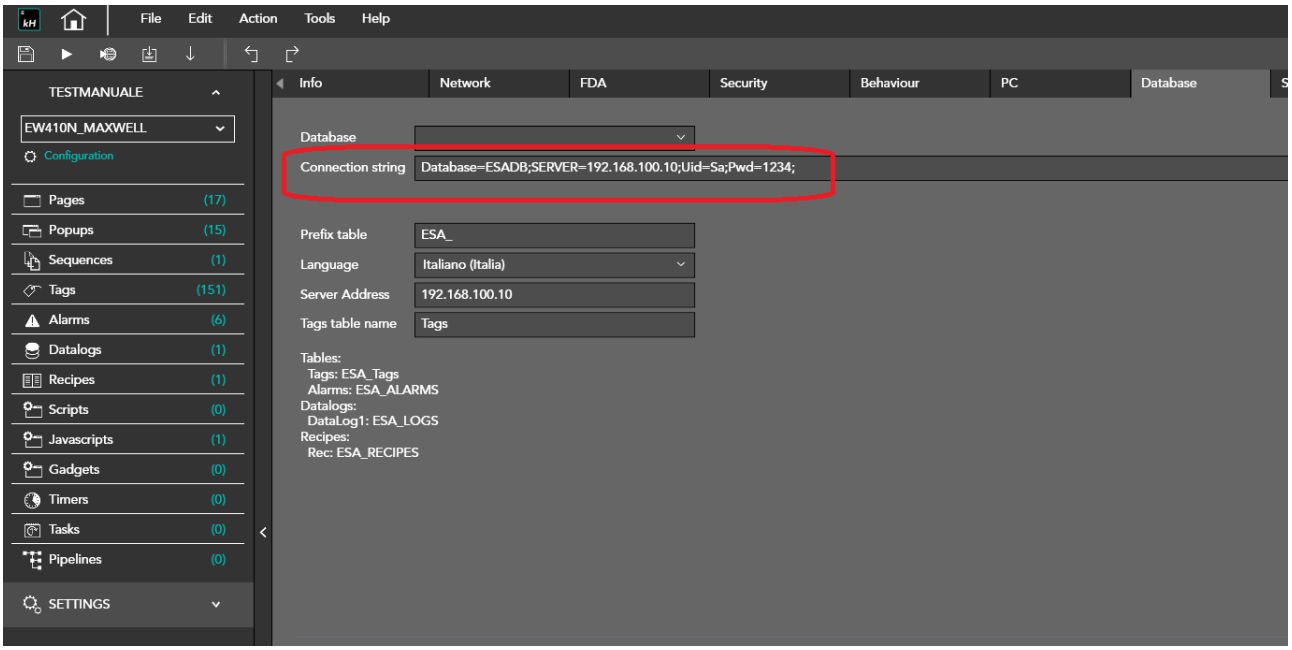


3. KREO HMI allows you to define different types of DB (see figure above) but also write directly via a custom CONNECTION STRING
4. Here is an example of SQL SERVER parameterization with some descriptions of the meaning:

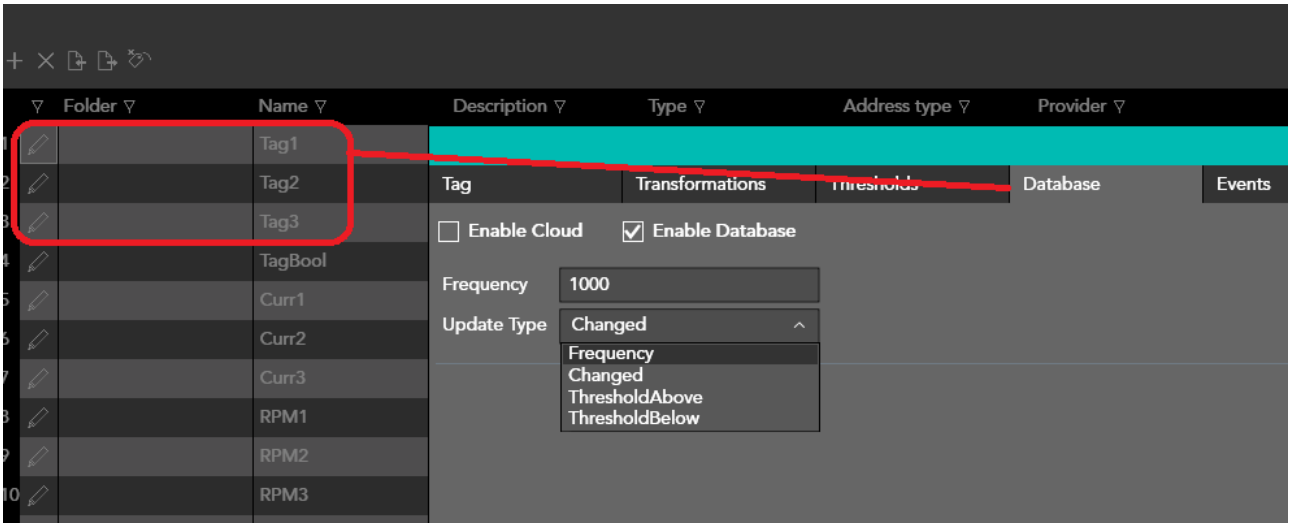


NOTE: Do not confuse SERVER with SERVER ADDRESS.
SERVER is the address/name of the PC where the SQL DB is installed.
SERVER ADDRESS is the address/name of the PC where ESA CONNECT is installed.

5. You can define manually the same CONNECTION STRING with the CUSTOM configuration:

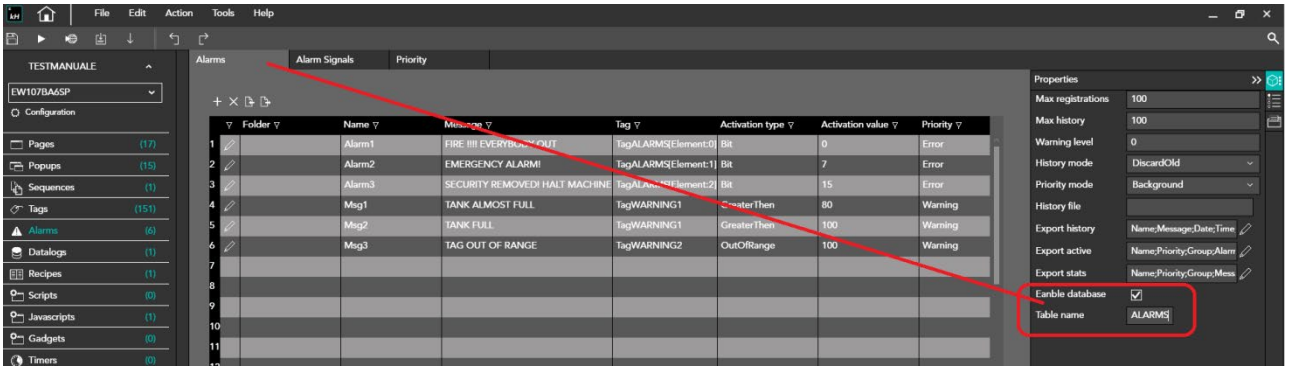


6. Define wich Tags have to be exported to the SQL table and the export trigger. (frequency, change, on higher / lower threshold values).



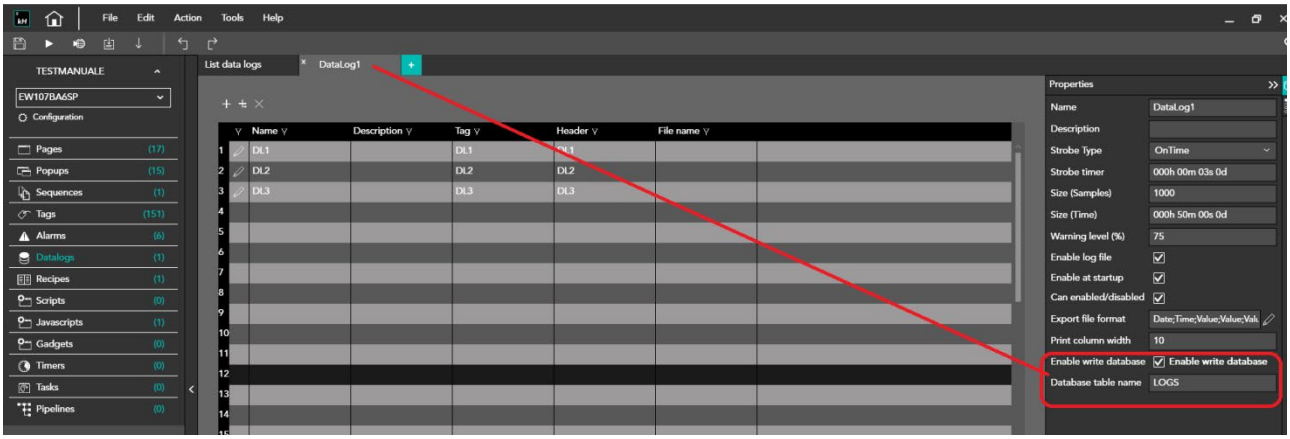
7. The other tables-data will be optionally enabled and named with prefix ESA_ (editable in sql db connection parameters)

ALARMS

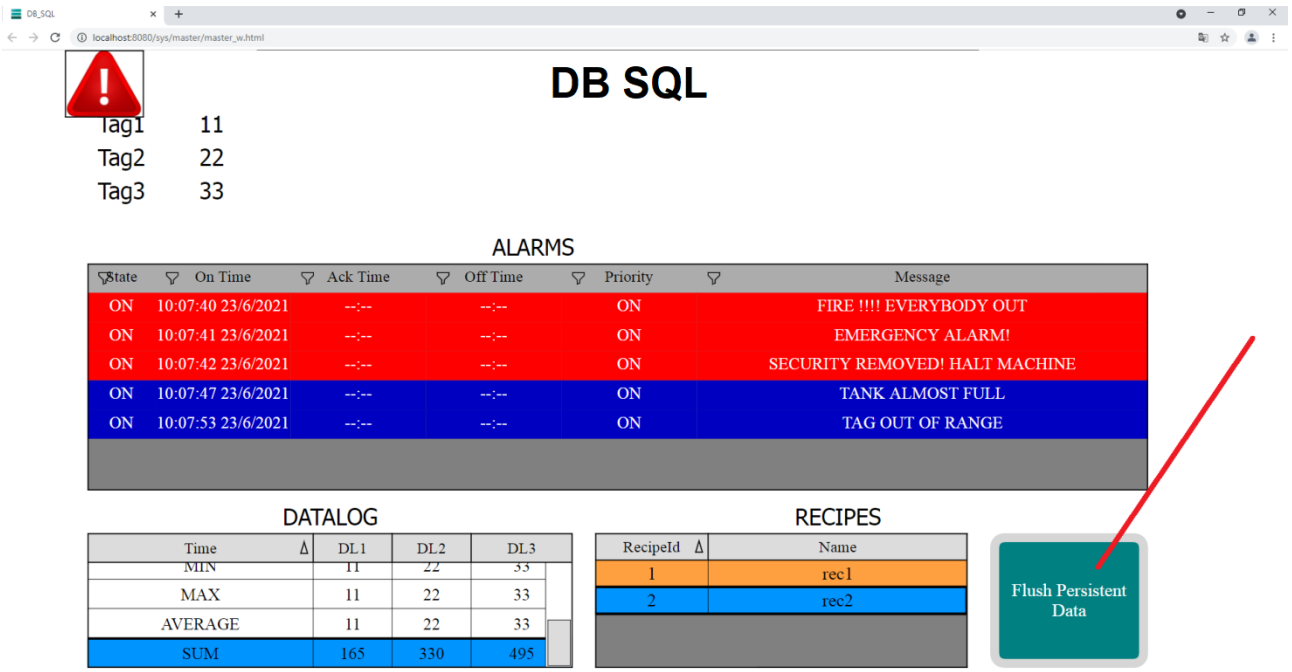


RECIPES

LOGS

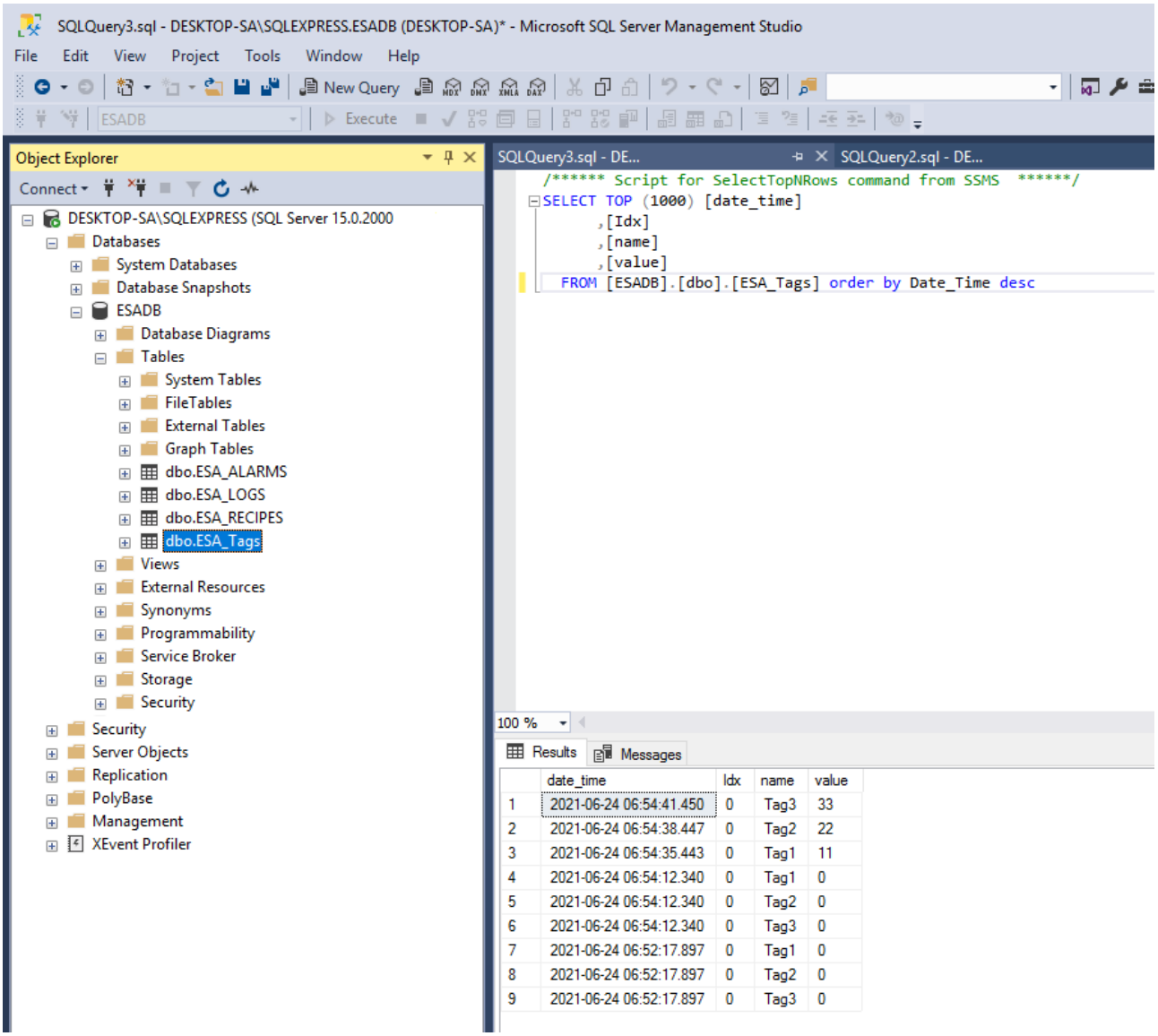


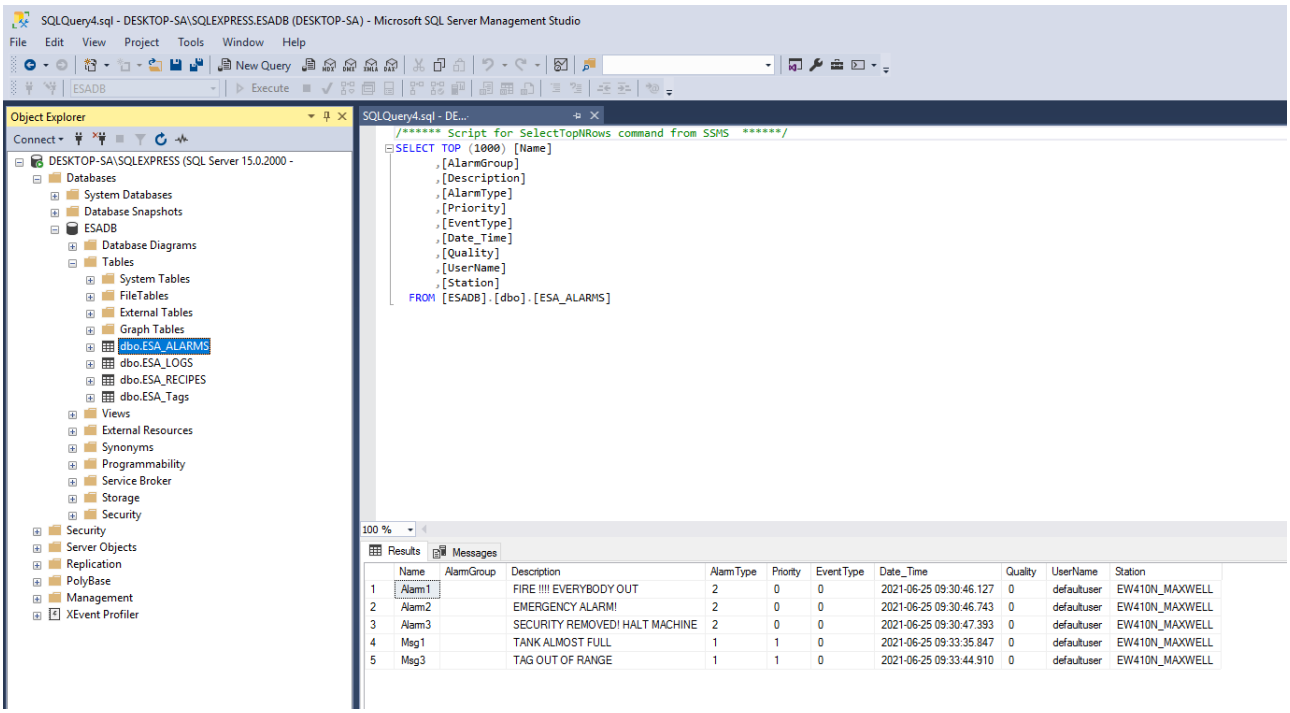
8. At RUNTIME, the PLC-data can be displayed in the specific objects on the page.
   This data is exported as SQL tables on the expected DB via several built in functions.
   For example, the FLUSH PERSISTENT DATA function (LOGS and ALARMS) or RECIPE EXPORT DB (RECIPES).
   Of course these are only 2 of the SQL export functions.
   We will see all the details later.



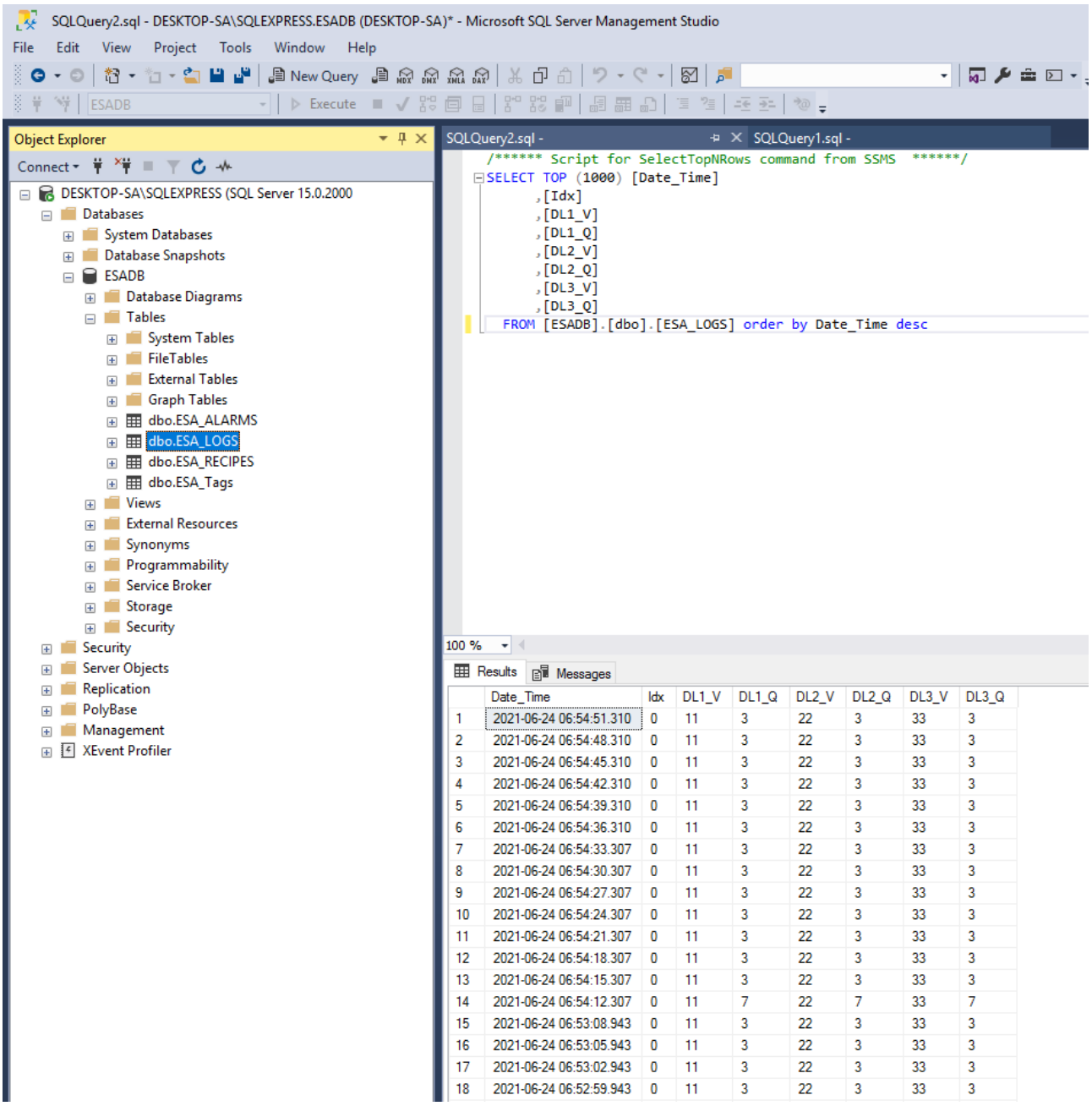
9. KREO RUNTIME and the SQL DATABASE exchange the data via the ESA CONNECT software.
   ESA CONNECT has simply to be started in the server PC.
   The connection via the ODBC driver starts automatically and export the data following the KREO PLC programming

10. In the DATABASE the different data tables are created and refreshed automatically (below examples TAGS / ALARMS / LOGS with queries).





	Name	AlarmGroup	Description	AlarmType	Priority	EventType	Date_Time	Quality	UserName	Station
1	Alarm1		FIRE !!!! EVERYBODY OUT	2	0	0	2021-06-25 09:30:46.127	0	defaultuser	EW410N_MAXWELL
2	Alarm2		EMERGENCY ALARM!	2	0	0	2021-06-25 09:30:46.743	0	defaultuser	EW410N_MAXWELL
3	Alarm3		SECURITY REMOVED! HALT MACHINE	2	0	0	2021-06-25 09:30:47.393	0	defaultuser	EW410N_MAXWELL
4	Msg1		TANK ALMOST FULL	1	1	0	2021-06-25 09:33:35.847	0	defaultuser	EW410N_MAXWELL
5	Msg3		TAG OUT OF RANGE	1	1	0	2021-06-25 09:33:44.910	0	defaultuser	EW410N_MAXWELL



	Date_Time	Idx	DL1_V	DL1_Q	DL2_V	DL2_Q	DL3_V	DL3_Q
1	2021-06-24 06:54:51.310	0	11	3	22	3	33	3
2	2021-06-24 06:54:48.310	0	11	3	22	3	33	3
3	2021-06-24 06:54:45.310	0	11	3	22	3	33	3
4	2021-06-24 06:54:42.310	0	11	3	22	3	33	3
5	2021-06-24 06:54:39.310	0	11	3	22	3	33	3
6	2021-06-24 06:54:36.310	0	11	3	22	3	33	3
7	2021-06-24 06:54:33.307	0	11	3	22	3	33	3
8	2021-06-24 06:54:30.307	0	11	3	22	3	33	3
9	2021-06-24 06:54:27.307	0	11	3	22	3	33	3
10	2021-06-24 06:54:24.307	0	11	3	22	3	33	3
11	2021-06-24 06:54:21.307	0	11	3	22	3	33	3
12	2021-06-24 06:54:18.307	0	11	3	22	3	33	3
13	2021-06-24 06:54:15.307	0	11	3	22	3	33	3
14	2021-06-24 06:54:12.307	0	11	7	22	7	33	7
15	2021-06-24 06:53:08.943	0	11	3	22	3	33	3
16	2021-06-24 06:53:05.943	0	11	3	22	3	33	3
17	2021-06-24 06:53:02.943	0	11	3	22	3	33	3
18	2021-06-24 06:52:59.943	0	11	3	22	3	33	3

In the LOGS table you can also see the READING-QUALITY data of the data:

- 7=OK before reading the LOG (at startup, after a start/stop LOG,...)
- 3=OK next readings

In the ALARMS tables we will find more information:

- alarmtype: 1(simpleevent), 2 (ISAalarm)
- event type: 0 (ON) , 1(OFF) , 2(ACK)

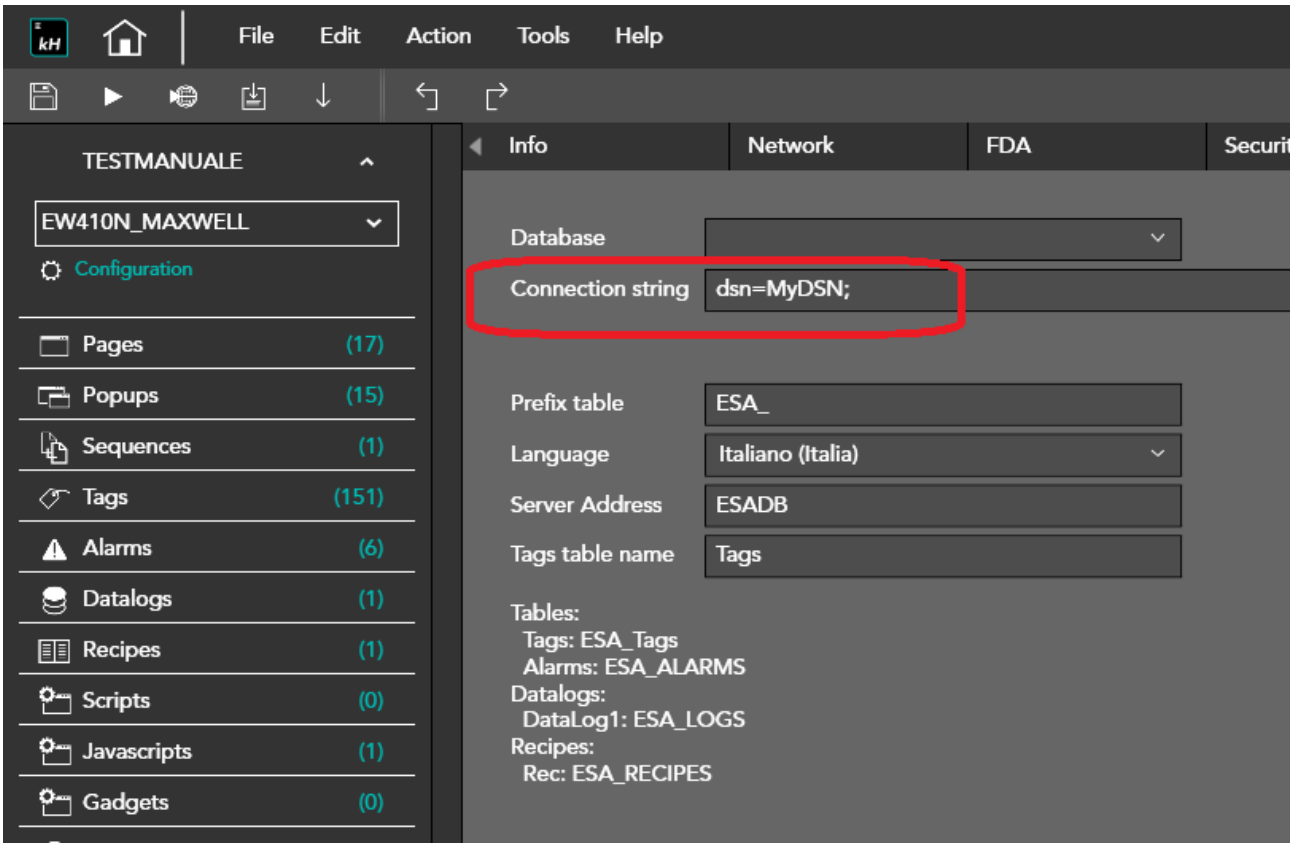
- quality: 0 (OK), 1 (the value saved is not consistent due to communication error).

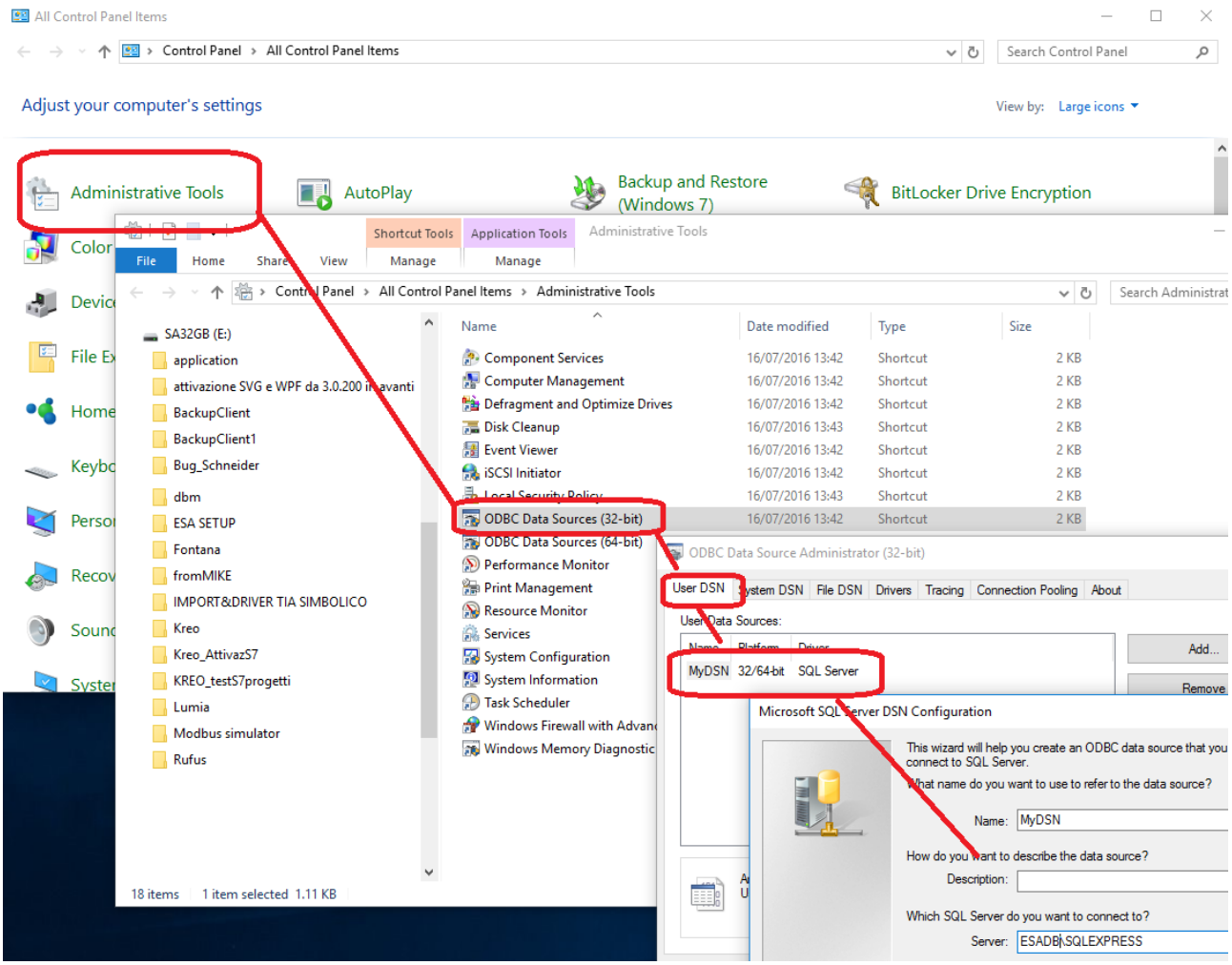
General notes

NOTE1: The data exchanged between the KREO runtime and the SQL database are exchanged in UT mode.
It is possible, via a specific parameter, display both UTC and TIMEZONE data.

NOTE2: The CONNECTION-STRING setting must be defined according to the SQL DB.
For example:
DRIVER={SQL Server};Database=ESADB; SERVER=192.168.100.10\SQLEXPRESS; Uid=Sa; Pwd=1234;

If the credentials for the SQL DB connection are coming via the WINDOWS NT AUTHENTICATION and not via the SQL SERVER AUTHENTICATION it is necessary to define the DSN connection string as displayed below.





ESA CONNECT will still use ODBC driver and it will connect to the SQL DB via that DSN.

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