

Quick Start Guide



Nexto Xpress Compact PLC

SUEN00395 - High-speed datalogging



1 Function and area of use

This document provides guidelines when working with

2 About this Startup document

This Startup document should not be considered as a complete manual. It is an aid to be able to Startup a normal application quickly and easily.

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Use the following hardware, software, drivers and utilities in order to obtain a stable application:

In this document we have used following software and hardware

- BCS Tools 3.30
- Nexto Xpress

For further information refer to

- Nexto Xpress CPU User's manual ([Click here to download](#))
- [Beijer Electronics knowledge database, HelpOnline](#)

This document and other Startup documents can be obtained from our homepage. Please use the address support.europe@beijerelectronics.com for feedback about our Quick Start documents.

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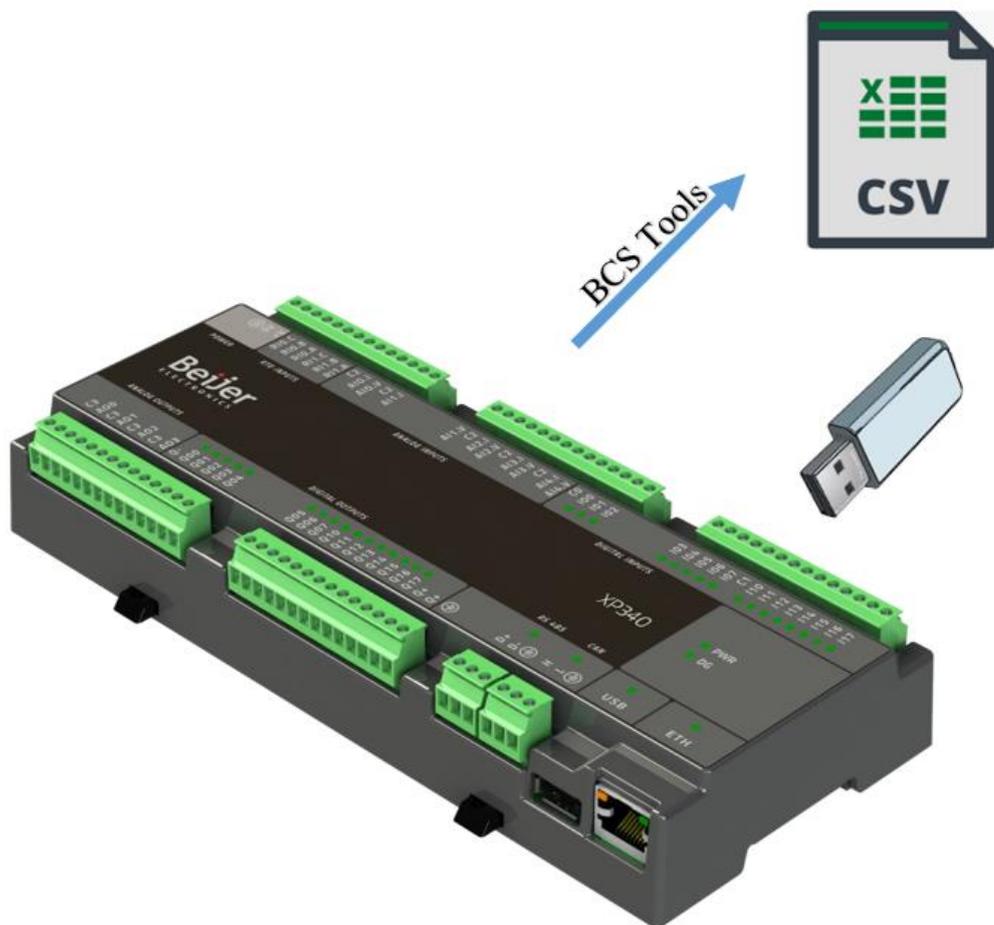
4 Introduction

The Nexto XPress series from Beijer Electronics includes a library (LibDatalogger) for logging high-speed data to local files in CSV format. The files are stored in persistent memory for later analysis in a spreadsheet (eg Excel®). The minimum logging frequency is 10ms in triggered mode and 100ms in continuous mode.

The generated CSV files can be stored as follows:

- Internal FLASH memory (retrieved with BCS Tools)
- USB memory

The code can easily be adapted to the larger PLC system in the Nexto series as well as the Xform RTU.

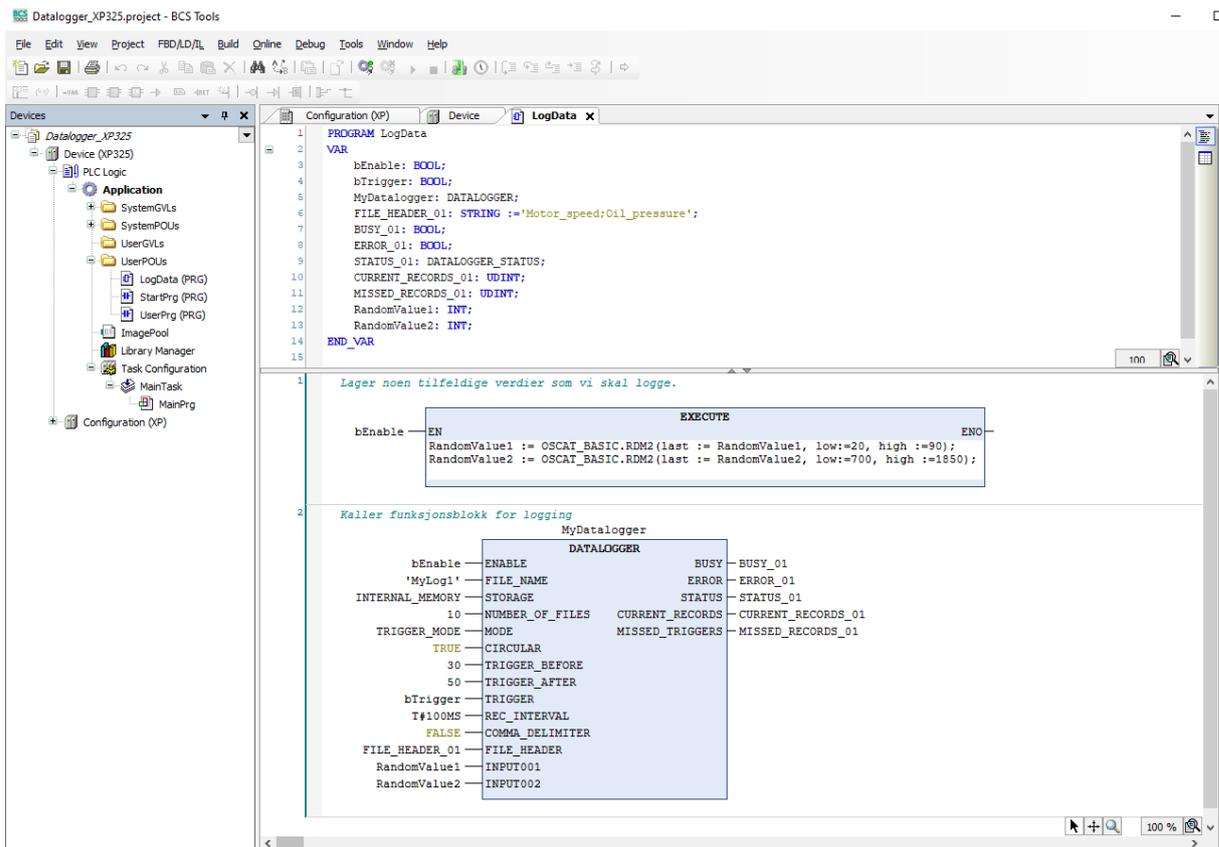


4.1 Add datalogging to the project

Start BCS Tools and open the project where you want to add data logging. In my example, I use the 'HelloWorld' project from the basic get started document (SUEN00393).

The datalog functionality is in the library 'LibDatalogger'. Add this library via 'Add Library' to 'Library Manager'. Here you find the function block, 'DATALOGGER' and associated object structure.

In my example, I have added 'DATALOGGER', and associated object structure and settings in the 'LogData' program.

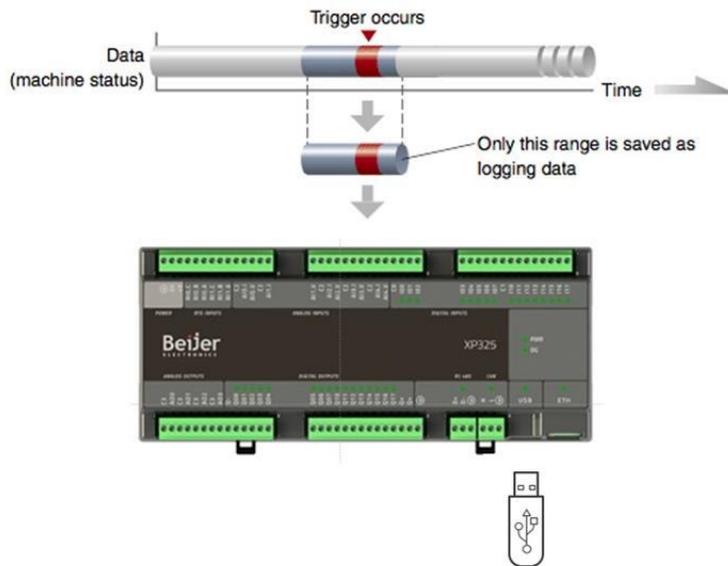


I use the RDM2 function in the OSCAT library to generate random values for the log. They are called as ST code in an 'EXECUTE' function. See the SUEN00393 document for details on how to add the OSCAT library.

The data logger client is controlled by several parameters. I have only configured what is needed to log 2 values every 100ms to internal memory on a trigger-signal. It is possible to log up to 255 values for each instance. The complete data logger manual (MU214604) contains a list of all possibilities

4.2 Trigger based logging

I have chosen trigger-based logging. When the data logger enables, it continuously stores the variables we have configured to an internal buffer. This is to remember the number of values we have configured before the trigger ("TRIGGER_BEFORE"). When the trigger signal becomes active, the number of values we have configured ("TRIGGER_AFTER") is logged. Once logged, the internal buffer is transferred to the log file the timestamp.

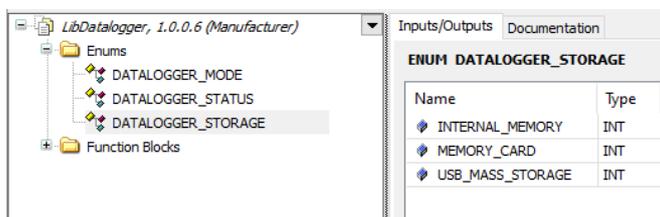


‘FILE_NAME’:

Text variable containing a unique file name for the log. In my example I have defined this as 'MyLog1'.

‘STORAGE’:

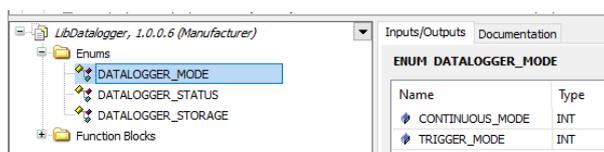
Parameter for specifying where to save the log files. In my example of internal memory.



Memory cards can only be used for the rack-based Nexto systems in the NX series as well as Xterm.

‘MODE’:

Parameter for selecting log method. In my example it is set to 'TRIGGER_MODE'



‘TRIGGER_MODE’

The logging is controlled by a trigger event, defined by the 'TRIGGER' parameter as described above.

‘CONTINUOUS_MODE’

The logging runs continuously when the data logger is enabled. The CSV file is saved when the maximum number of rows is entered in the log. This is controlled by parameter 'FILE_RECORDS'.

'NUMBER_OF_FILES':

Maximum number of CSV files stored. What happens when the maximum number is reached is controlled by the overwriting parameter. If 'CIRCULAR' is set to 'TRUE', the oldest file will be overwritten. If set to 'FALSE', the data logger will stop and provide error code 'ERROR_NUMBER_OF_FILES_REACHED'. In my example, the oldest file is overwritten when 10 files are saved.

'COMMA_DELIMITER':

Parameter that determines whether the CSV file should use comma ('TRUE') or semicolon ('FALSE') as a delimiter. In my example I use semicolon.

'FILE_HEADER':

Text variable containing column name for log if you want. In my example, I log two variables and call them 'Motor_speed; Oil_pressure '



It is possible to run multiple instances of 'DATALOGS' at the same time but remember to use different filenames.

4.3 Test of function

Then my datalogger is configured and I can download and start the Nexto project. I start the logger with 'bEnable' and trigger saving a new log file with 'bTrigger'. Each trigger creates a file with 81 rows. These are the values at the time of the trigger (Record 0), as well as 30 logs before the trigger and 50 after the trigger as configured.

The screenshot shows the 'Datalogger_XP325' project in the 'BCS Tools' environment. The left pane shows the project tree with 'Application [run]' selected. The main window is divided into two parts: a configuration table and a ladder logic diagram.

Expression	Type	Value	Prepared value	Address	Comment
bEnable	BOOL	TRUE			
bTrigger	BOOL	TRUE			
MyDatalogger	DATALOGGER				
FILE_HEADER_01	STRING	'Motor_speedOil...			
BUSY_01	BOOL	FALSE			
ERROR_01	BOOL	FALSE			
STATUS_01	DATALOGGER_STATUS	NO_ERROR			
CURRENT_RECORDS_01	UDINT	81			
MISSED_RECORDS_01	UDINT	0			
RandomValue1	INT	62			
RandomValue2	INT	1650			

The ladder logic diagram shows two rungs. Rung 1 is labeled 'Lager noen tilfeldige verdier som vi skal logge.' and contains an 'EXECUTE' block with the following code:

```

bEnable TRUE --(EN) EXECUTE
RandomValue1 := OSCAL_BASIC.RDM2(last := RandomValue1, low:=20, high :=90);
RandomValue2 := OSCAL_BASIC.RDM2(last := RandomValue2, low:=700, high :=1850);
--(ENO)
    
```

Rung 2 is labeled 'Kaller funksjonsblokk for logging' and contains a 'MyDatalogger' block. The block's inputs and outputs are as follows:

- Inputs: bEnable (TRUE), TRIGGER_MODE (1), bTrigger (TRUE), FILE_HEADER_01 ('Motor speed'), RandomValue1 (62), RandomValue2 (1650).
- Outputs: BUSY_01 (FALSE), ERROR_01 (FALSE), STATUS_01 (NO_ERROR), CURRENT_RECORDS_01 (81), MISSED_RECORDS_01 (0).

I save the files to internal memory in this example and they can be moved to my PC using the browser under Device / Files in BCS Tools.

The screenshot displays the BCS Tools software interface. On the left, a tree view shows the 'Device [connected] (XP325)' configuration, with 'LogData' selected. The main window is split into 'Host' and 'Runtime' panes. The 'Host' pane shows a file browser for 'MyLog1_00001.csv' (3.12 KB) located at 'C:\Beijer Documents\Kornigang'. The 'Runtime' pane shows the same file located at 'InternalMemory/Datalogger'. A red arrow points from the 'Files' section in the 'Host' pane to the 'MyLog1_00001.csv' file in the 'Runtime' pane. Below this, an Excel spreadsheet titled 'MyLog1_00001 - Excel' is open, displaying the following data:

RECORD	DATE	TIME	Motor_speed	Oil_pressure	
20	-12	10.06.2020	13:21:36,1	35	702
21	-11	10.06.2020	13:21:36,2	70	1765
22	-10	10.06.2020	13:21:36,3	33	1579
23	-9	10.06.2020	13:21:36,4	60	728
24	-8	10.06.2020	13:21:36,5	70	1046
25	-7	10.06.2020	13:21:36,6	31	1433
26	-6	10.06.2020	13:21:36,7	47	1766
27	-5	10.06.2020	13:21:36,8	72	817
28	-4	10.06.2020	13:21:36,9	47	1393
29	-3	10.06.2020	13:21:37,0	39	1003
30	-2	10.06.2020	13:21:37,1	28	905
31	-1	10.06.2020	13:21:37,2	53	1502
32	0	10.06.2020	13:21:37,3	86	773
33	1	10.06.2020	13:21:37,3	47	1850
34	2	10.06.2020	13:21:37,4	20	1014
35	3	10.06.2020	13:21:37,5	56	1272
36	4	10.06.2020	13:21:37,6	59	1164
37	5	10.06.2020	13:21:37,7	34	827
38	6	10.06.2020	13:21:37,8	58	1613
39	7	10.06.2020	13:21:37,9	28	746
40	8	10.06.2020	13:21:38,0	79	1530
41	9	10.06.2020	13:21:38,1	38	1091
42	10	10.06.2020	13:21:38,2	42	1698
43	11	10.06.2020	13:21:38,3	87	1023
44	12	10.06.2020	13:21:38,4	37	900
45	13	10.06.2020	13:21:38,5	69	1324
46	14	10.06.2020	13:21:38,6	40	700

At the bottom of the Excel window, summary statistics are shown: Average: 8970,311336, Count: 5, Sum: 44851,55668.

5 About Beijer Electronics

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