

RUNMODE S7 DBtoCSV

DATABLOCK TO CSV

DATA FILES CREATOR

Communication utility suitable for

- Siemens S7-300/-400 CPUs
- Siemens TIA 1200/1500 CPUs

ETHERNET INTERFACE ONLY
PROFIBUS MPI/DP IS NOT SUPPORTED

Documentation last update: August 22, 2017

Copyright Luca Gallina
RUNMODE
Industrial Automation Software
Via C. B. Cavour, 7
31040 Volpago del Montello (TV)
ITALY
www.runmode.com

1 CONTENTS

2	RUNMODE S7 DBTOCSV FEATURES	3
3	CONNECTING TO THE PLC	4
3.1	CONNECTING TO AN S7-300/-400 CPU.....	4
3.2	CONNECTING TO A TIA S7-1200/-1500 CPU.....	5
3.2.1	<i>Step 1, remove the “optimized” property</i>	<i>5</i>
3.2.2	<i>Step 2, allow data to be read from the CPU</i>	<i>6</i>
3.2.3	<i>Step 3, allow GET/PUT communication with other partners</i>	<i>7</i>
4	RUNNING THE S7 DBTOCSV UTILITY	8
4.1	DATA CREATION IN PLC MEMORY.....	8
4.2	DATA READING AND CSV FILE CREATION	8
5	ANALYZING AND PLOTTING THE DATA.....	11
6	CREDITS	12
7	LEGAL NOTES	13
7.1	LICENSE.....	13
7.2	DISCLAIMER	13

2 RUNMODE S7 DBtoCSV FEATURES

The RUNMODE S7 DBtoCSV utility is a software tool that reads selected datablocks from the PLC memory and creates a single CSV data file complete of variable names and value index columns.

Up to 4 different datablocks can be uploaded.

The CSV values separator character can be selected by a predefined list (e.g. comma, tab, semicolon, etc.) or can be freely assigned by the user.

Once the datablocks have been read, the data is automatically parsed and a CSV data file is saved on the computer hard disk.

When saved, the CSV file is automatically named upon the current date and time using the YYYYMMDD_HHMMSS format (e.g.: a file created on July 19, 2017 at 2:35PM will be named 20170719_143500.CSV).

3 CONNECTING TO THE PLC

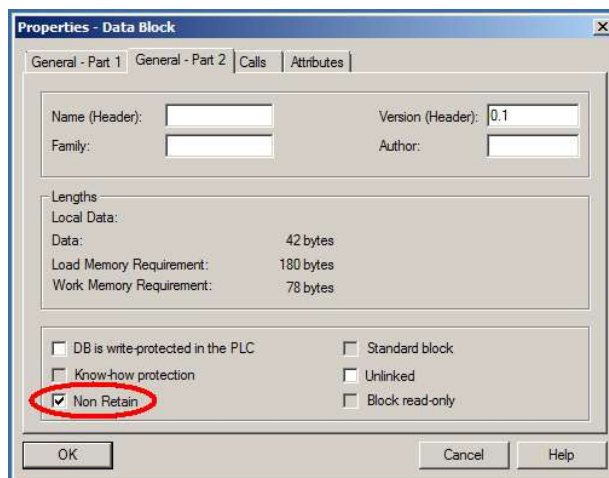
The RUNMODE S7 DBtoCSV utility works with Ethernet/Profinet connections only.

Communication based on Profibus MPI / DP is not supported.

3.1 CONNECTING TO AN S7-300/-400 CPU

The connection to S7 -300/-400 CPUs does not need any action, just create the necessary datablocks in the PLC memory.

Hint: In case of large datablocks, you might select the “non retain” option in the datablock properties to save retentive memory space.



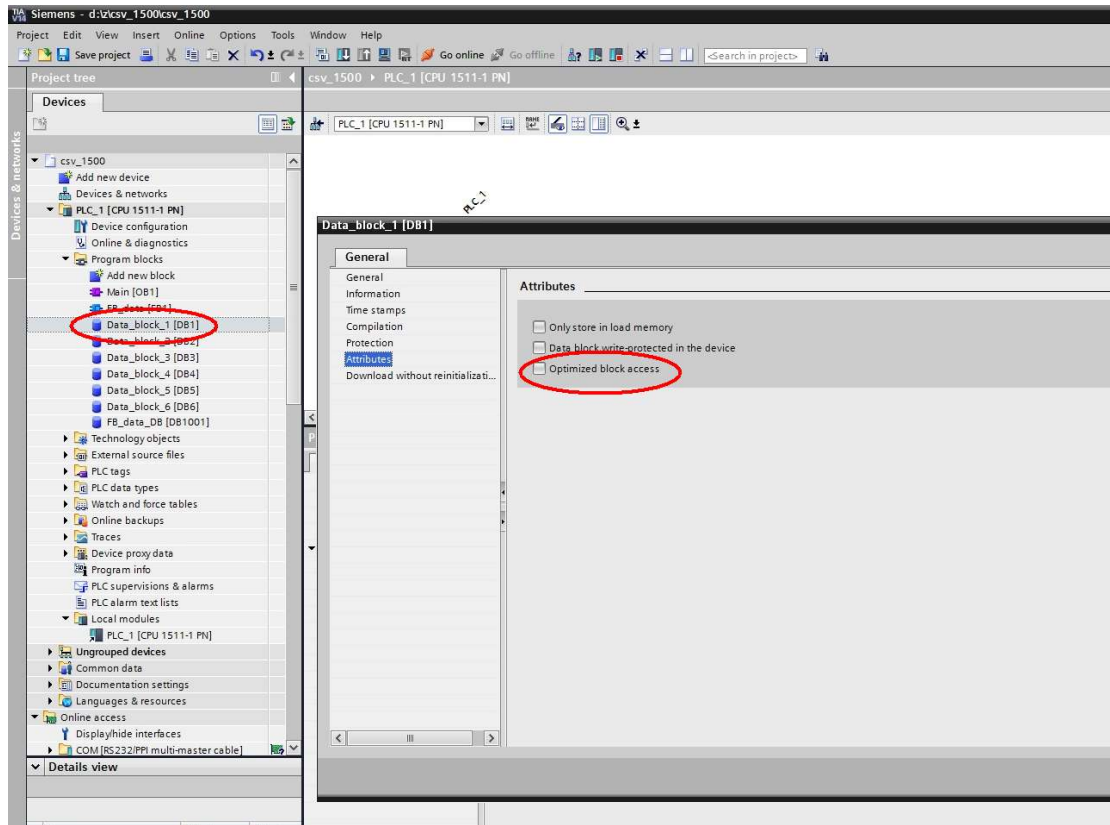
3.2 CONNECTING TO A TIA S7-1200/-1500 CPU

Connecting the “RUNMODE S7 DBtoCSV” to TIA S7-1200/-1500 need some actions both on the datablocks and the CPU itself. Without these actions the communication with a 1200/1500 PLC will not work.

3.2.1 Step 1, remove the “optimized” property

Due to the memory model, which differs from traditional Step7 -300/-400 CPUs, in TIA 1200/1500 CPUs the datablocks hosting the variables to be converted into CSV values must be set as “not optimized”. In this way, all the datablock variables will be stored side by side within the PLC memory.

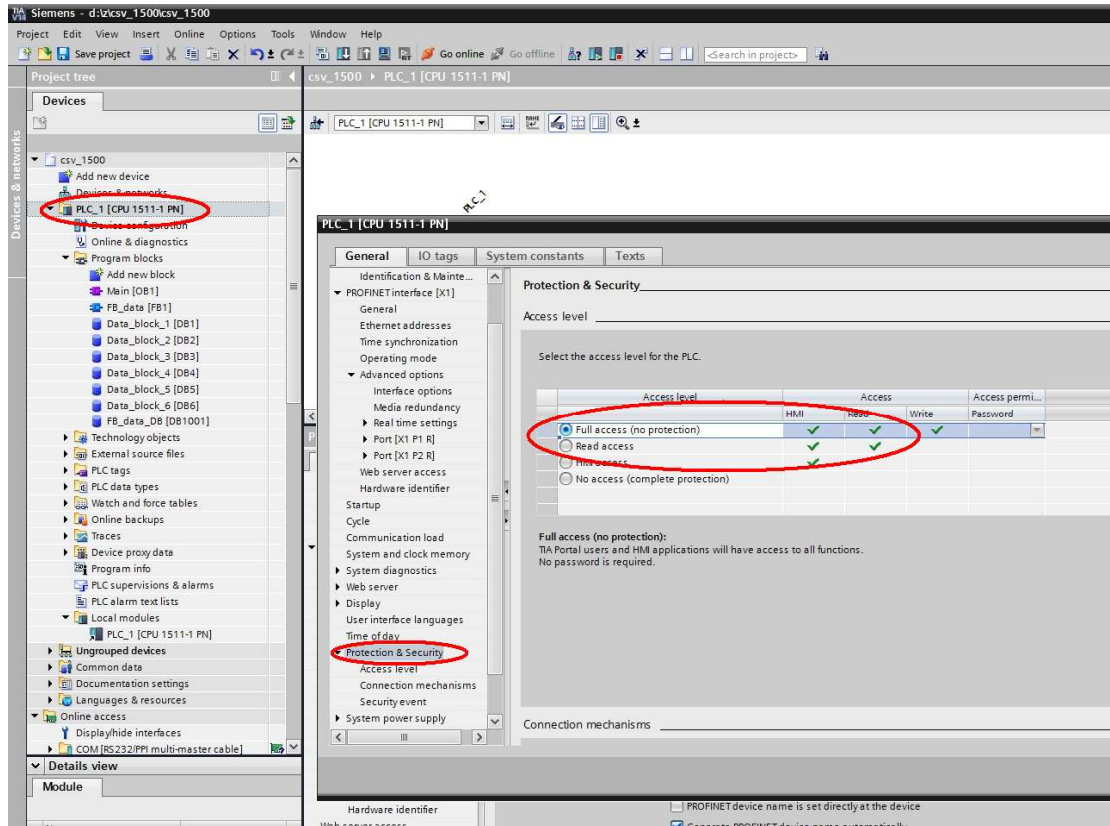
Ensure to remove the “optimized block access” from all the DBs that will be accessed by the “RUNMODE S7 DBtoCSV” utility.



Hint: To save “work memory” space you may select the also “only store to load memory” option.

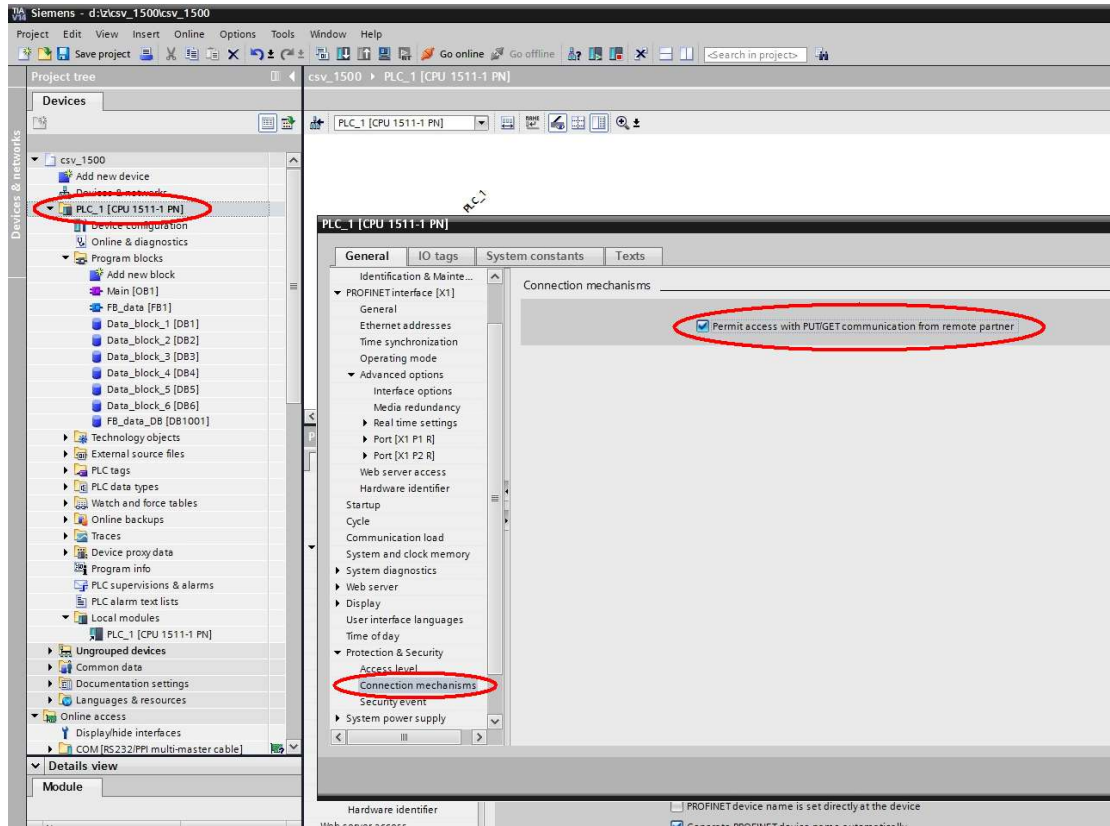
3.2.2 Step 2, allow data to be read from the CPU

In the CPU properties you must grant READ data access



3.2.3 Step 3, allow GET/PUT communication with other partners

You must also grant GET/PUT memory access



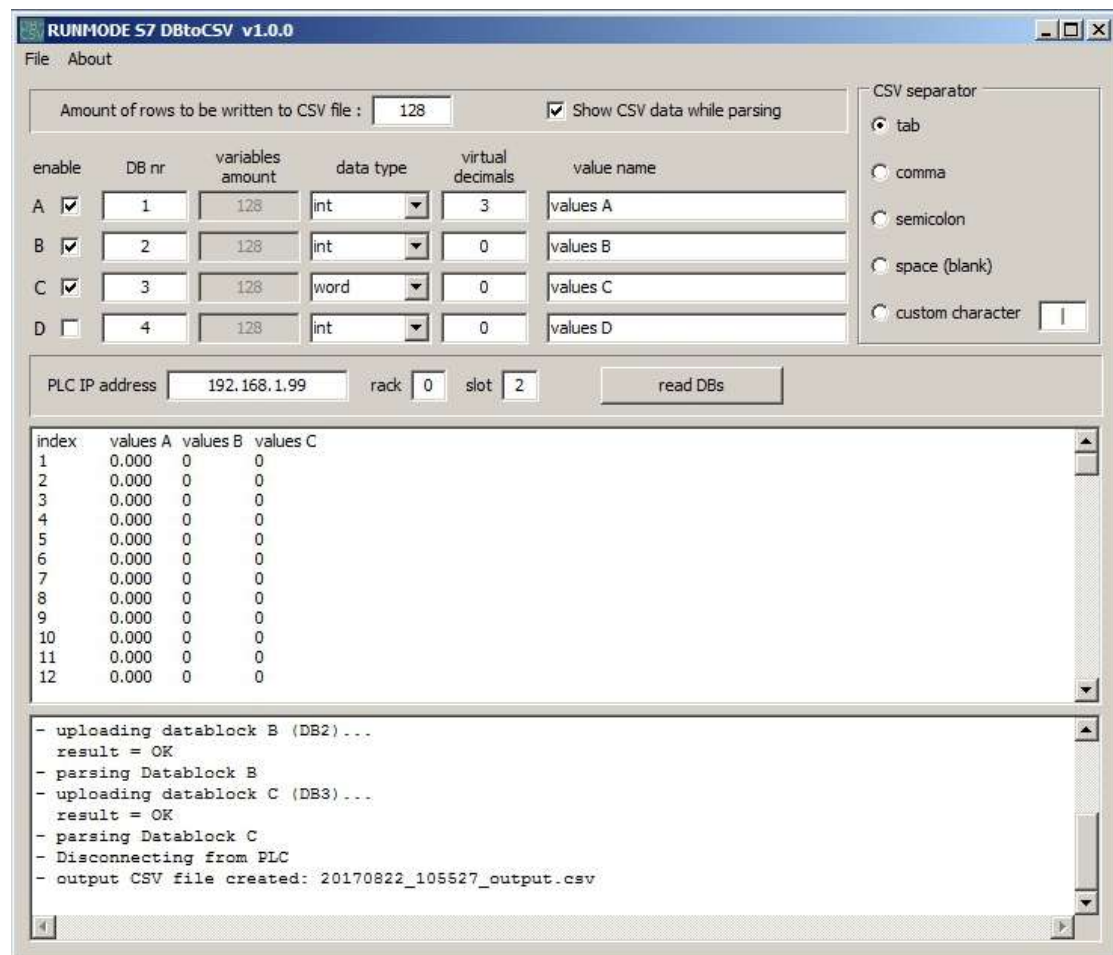
4 RUNNING THE S7 DBtoCSV UTILITY

4.1 DATA CREATION IN PLC MEMORY

Prior to running the utility, you must create in the PLC a set of datablocks and write some code in the PLC to fill the datablocks with proper data.

While datablocks will be made of a specific variable type (e.g. array of bytes, array of integers, array of floats, etc.) according to the PLC programming, the S7DBtoCSV will read the data in raw mode; therefore it is not important whether the data type declared in the datablocks is the same defined in S7DBtoCSV.

4.2 DATA READING AND CSV FILE CREATION



Set here the amount of rows to be included in the CSV file, in other words the amount of values to be read from the PLC. The datablocks in the PLC memory must be obviously large enough to contain the indicated amount of values.

Amount of rows to be written to CSV file :

Set here which datablocks (A, B, C, D) you want to read and parse.

- “Enable” option will quickly include or exclude the DB from the reading procedure.
- “DB nr” is the number of the datablock to be read
- “variables amount” corresponds to the amount of lines to be included in the CSV file
- “data type” instructs the utility on the nature and size of the variables to be read. Allowed types are BYTE, INT, WORD, DINT, DWORD, REAL.
- “virtual decimals” allows to add a decimal point to the output value (e.g. integer value 12345 can be printed as 12.345 if “virtual decimals” is set to 3).
- “value name” is the name you want to be printed in the CSV file as value identifier (e.g. “speed”, “torque”, “position”, etc.).

enable	DB nr	variables amount	data type	virtual decimals	value name
A <input checked="" type="checkbox"/>	<input type="text" value="1"/>	<input type="text" value="128"/>	<input type="text" value="int"/>	<input type="text" value="3"/>	<input type="text" value="values A"/>
B <input checked="" type="checkbox"/>	<input type="text" value="2"/>	<input type="text" value="128"/>	<input type="text" value="int"/>	<input type="text" value="0"/>	<input type="text" value="values B"/>
C <input checked="" type="checkbox"/>	<input type="text" value="3"/>	<input type="text" value="128"/>	<input type="text" value="word"/>	<input type="text" value="0"/>	<input type="text" value="values C"/>
D <input type="checkbox"/>	<input type="text" value="4"/>	<input type="text" value="128"/>	<input type="text" value="int"/>	<input type="text" value="0"/>	<input type="text" value="values D"/>

The “CSV separator” allows you to select the values separator in the output CSV file.

CSV separator

tab

comma

semicolon

space (blank)

custom character

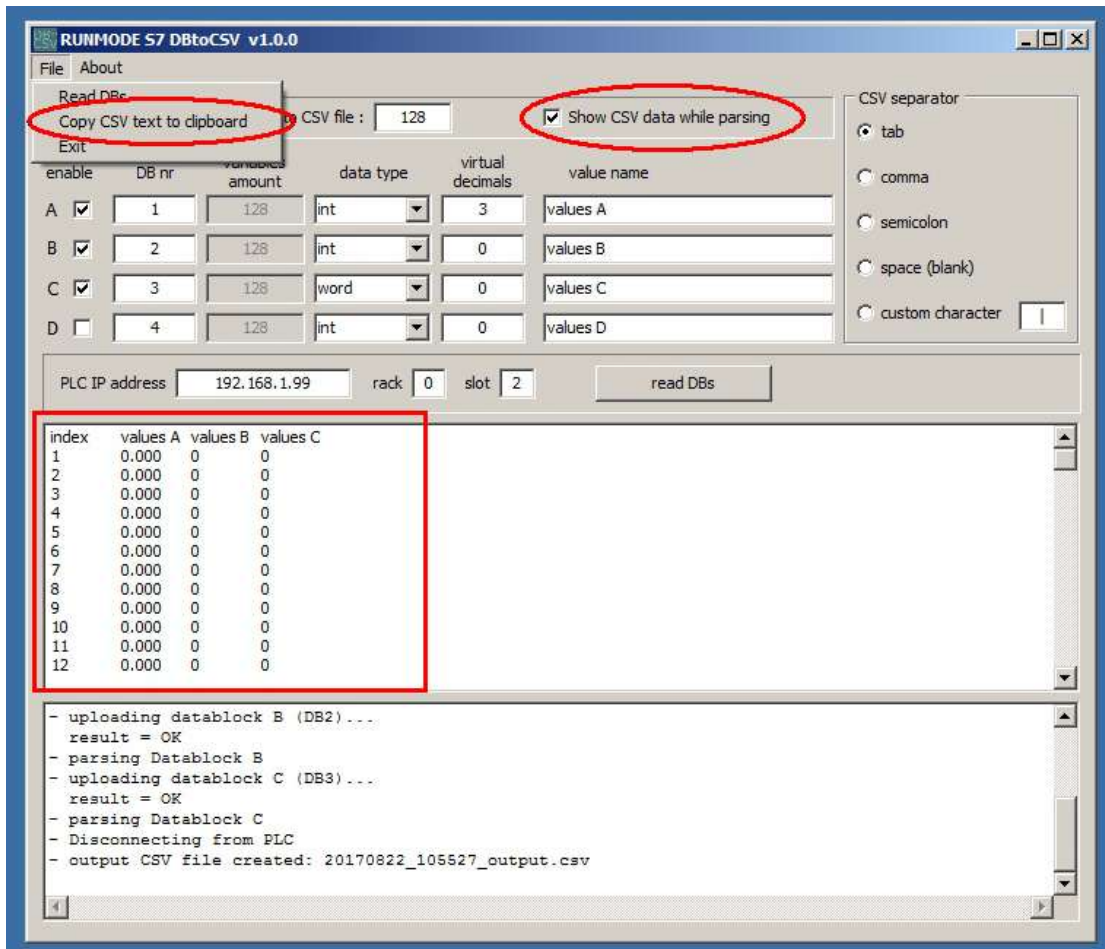
Set here the IP address of the PLC, along with rack and slot indication. The “read DBs” butto will start the reading and parsing process.

PLC IP address rack slot

If “Show CSV data while parsing” option is selected, the CSV data is displayed on screen during the parsing process and the “copy to clipboard” function is enabled.

If “Show CSV data while parsing” is not selected, no data is displayed on screen and the parsing process is much faster.

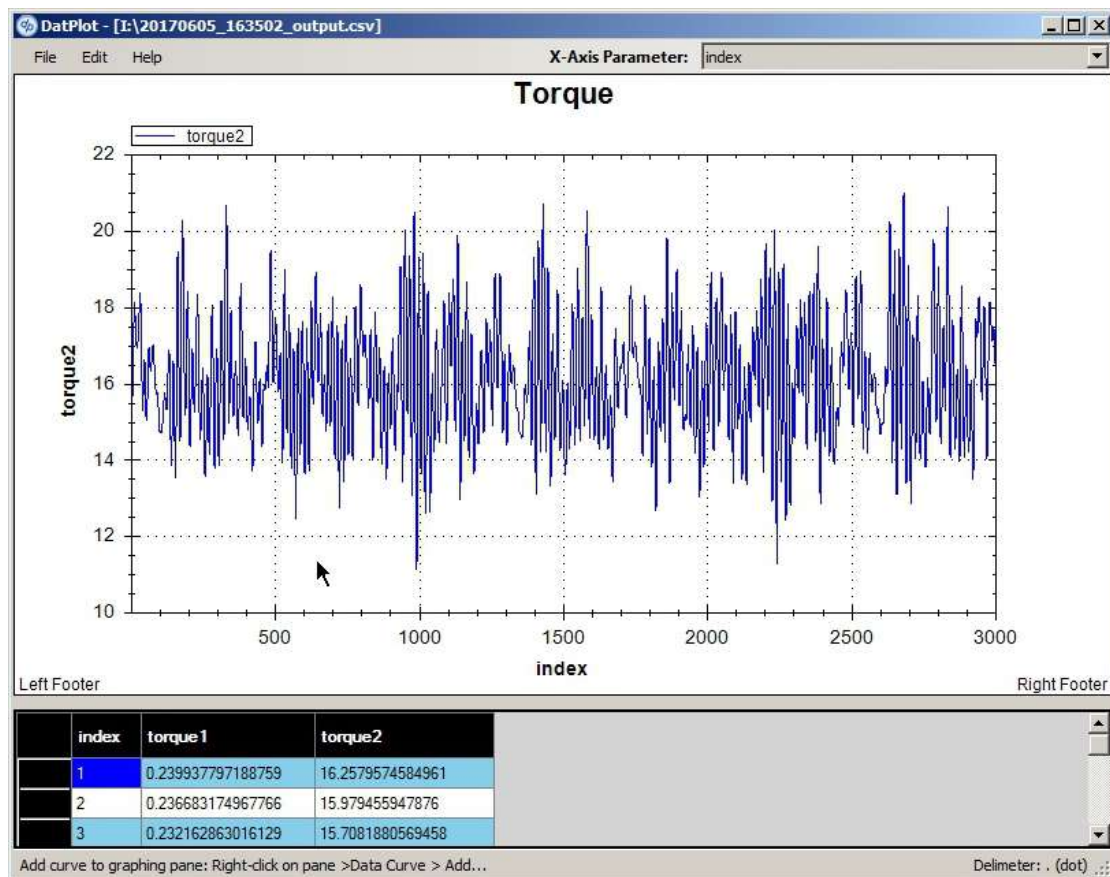
NOTE: the “index” column in the CSV file is generated automatically.



5 ANALYZING AND PLOTTING THE DATA

The generated CSV files can be imported and analyzed with any suitable software applications. While it is quite common to plot data by using Microsoft Excel, I suggest you to evaluate the freeware “DatPlot” application developed by Michael Vogt and available at the following link <http://www.datplot.com/>

Do not miss the video presentation at <http://www.datplot.com/features/>



6 CREDITS

This application uses SNAP7 communication library developed by Davide Nardella, who also edited a beautiful documentation on Siemens Step-7 native communication.

Check <http://snap7.sourceforge.net/>

7 LEGAL NOTES

The enclosed computer program (“Software”) is licensed, not sold, to you by the author for use only under the terms of this License. You own the media on which the Software is recorded or fixed, but the author retain ownership of the Software itself.

The Software is registered to each user by means of a unique license file. Illegal copies can therefore be tracked. Free distribution and upload to Internet is strictly forbidden.

7.1 LICENSE

This License allows you to:

- Use one copy of the Software on a single computer at a time. To “use” the Software means that the Software is either loaded in the temporary memory (i.e., RAM) of a computer and/or installed on the permanent memory of a computer (i.e., hard disk, etc.).

7.2 DISCLAIMER

The author is not liable for any use of the Software and takes no responsibilities for damages of any kind.