Thank you for downloading "MG-801Pro".

Software name:	MG-801Pro Communication software for Tesla meter MG-801
Version:	1.0A
Copyright owner:	MAGNA Co., Ltd.
Operating environment:	Operation confirmed on Windows XP/7/8/10 (32/64 bits), Excel 2007 and later version, USB 2.0
Others:	USB cable (A male – mini B male) to be provided by the user

> This software cannot be used with MG-701/601.
> Connection of a Tesla meter to equipment other than a PC is not supported.
> The number of Tesla meters that can be connected to one PC is one unit.

1. Features
① Data acquired by a Tesla meter can be sent to a PC and saved in the CSV format.
② Measured values can be judged OK or NG.
③ Two modes; trigger measurement and automatic measurement are available.
④ Since the Tesla meter is powered via the USB port of the PC, there is no need to worry about the battery.

2. Installation and Uninstallation

(1)Windows10

<Installation>
Log on by the administrator authority to start installation. Prior to starting installation, check to see if the USB driver and MG-801Pro have been installed. If so, uninstall them. Do not connect MG-801.

① Unzip "mg801pro_v100a.zip" in a suitable folder.
   "Manual" and "mg801pro" folders will be created in the "mg801pro_v100a" folder.
② Unzip "CP210x_Universal_Windows_Driver.zip" in the "mg801pro¥usb driver¥win10" folder.
③ Execute the following files in the "mg801pro¥usb driver¥win10¥ CP210x_Universal_Windows_Driver" folder and install the USB driver:
   CP210xVCPInstaller_x64.exe (64-bit version)
   CP210xVCPInstaller_x86.exe (32-bit version)
   Proceed with installation as guided.
④ After installing the USB driver, select "setup.exe" in the "mg801pro" folder by double clicking the left mouse button and install it as guided.

When "MG-801pro" has been displayed in "Control Panel" – "Add or Remove Programs" (Programs and Features), the installation has been completed.

<Uninstallation>
Select "MG-801pro" and "Windows Driver Package - Silicon Laboratories Inc. (silabser) ports" in "Add or Remove Programs" (Programs and Features) and uninstall them.
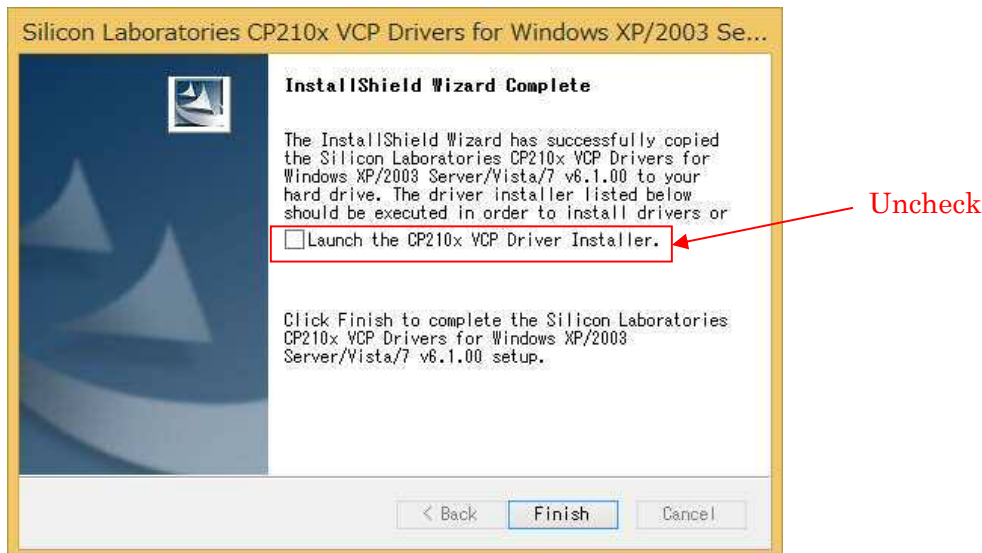
(2)WindowsXP/7/8

<Installation>
Log on by the administrator authority to start installation. Prior to starting installation, check to see if the USB driver and MG-801Pro have been installed. If so, uninstall them. Do not connect MG-801.

① Unzip "mg801pro_v100a.zip" in a suitable folder.
   "Manual" and "mg801pro" folders will be created in the "mg801pro_v100a" folder.

② Select "cp210x_vcp_win_xp_ s2k3_vista_7.exe " in the "mg801pro¥usb driver¥win8" folder by double clicking the left mouse button to install the USB driver.

Proceed with installation as guided. If during installation, "Do you want to allow the following program from an unknown publisher to make changes to this computer?" is shown, select "Yes".

Uncheck "Launch the CP210x VCP Driver Installer" and click [Finish] to finish the installation.
When "Silicon Laboratories CP210x VCP Drivers for Windows XP/ 2003 Server/Vista/7" in "Control Panel" – "Add or Remove Programs" (Programs and Features) has been displayed, the installation has been completed.

Note:
If the installation is finished without unchecking "Launch the CP210x VCP Driver Installer", next installation will be started. Then, click [Cancel] to finish the installation.
When the installation has been executed to the end, "Silicon Laboratories CP210x USB to UART Bridge" will be installed. It can be checked in "Control Panel" – "Add or Remove Programs" (Programs and Features). If it is not needed, uninstall it. If it is left installed, it causes no problem in operation.

③ After installing the USB driver, select "setup.exe" in the "mg801pro" folder by double clicking the left mouse button and install it as guided.
When "MG-801Pro" has been displayed in "Control Panel" – "Add or Remove Programs" (Programs and Features), the installation has been completed.

<Uninstallation>
Select "MG-801Pro" and "Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7" in "Add or Remove Programs" (Programs and Features) and uninstall them.
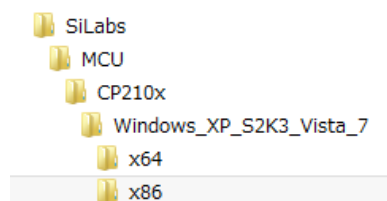
3. Flow of Measurement
① Connect cable → ② Start software → ③ Power ON Tesla meter →
④ Set loading → ⑤ Start loading → ⑥ Stop loading →
⑦ Power OFF Tesla meter → ⑧ Shutdown software

① Power "OFF" the Tesla meter and connect the USB cable to the digital output USB port of the Tesla meter and the USB port of the PC.
When this step is performed for the first time, MG-801 will be recognized automatically. If it is not recognized, follow the guide to select the folder where the USB driver has been saved.
Select "x64" in the case of the 64-bit PC and "x86" in the case of the 32-bit PC.

Caution: It must be inserted fully. Otherwise, communications may be disabled.

② Start the software.
Select "MG-801Pro.exe" by double clicking the left mouse button to start the software.

③ Power ON the Tesla meter.
Press the [ON/OFF] switch on the Tesla meter to power it on. When the auto power off cancel icon "◎" on the Tesla meter has lit up, communications have been enabled. In the communication mode, the auto power off function is disabled.

④ Set loading.
Load the value shown on the Tesla meter by the [TRIGGER] or [REC START] button. Set loading conditions in "REC Cycle", "Trig Only" and "Judg.".

⑤ Start loading.
Click the [REC START] button.

⑥ Stop loading.
When the [REC START] button is clicked again, loading will be stopped and data will be saved in the CSV format in a fixed folder. When the [Open Data] button is clicked, the folder where CSV data has been saved will be opened. The file name of CSV data is the date and time when the data was saved.

⑦ Power OFF the Tesla meter.
To power off the Tesla meter, press the [ON/OFF] switch on the Tesla meter.

⑧ Shut down the software.
To shut down the software, click the [×] button in the upper right corner of the screen.

4. Names and Functions

A-1: [POWER] button
    Turns on and off the power of the Tesla meter.

A-2: [REAL/HOLD] button
    Same function as the [REAL/HOLD] switch on the Tesla meter. The Tesla meter
    can be operated from the screen. For details, please see the Tesla meter instruc-
    tion manual.

A-3: [DC / AC MODE] button
    Same function as the [MODE] switch on the Tesla meter. The Tesla meter can be
    operated from the screen. For details, please see the Tesla meter instruction
    manual.

A-4: [ZERO /RESET] button
    Same function as the [ZERO /RESET] switch on the Tesla meter. The Tesla meter
    can be operated from the screen. For details, please see the Tesla meter instruc-
    tion manual.

B-1: [TRIGGER] button

A select button to perform trigger measurement. During trigger measurement, the button blinks in yellow and red alternately. When the [TRIGGER] button is pressed again, the trigger measurement mode is canceled.

A measured value is shown in the display field of "TRIGGER" (D-1) on the screen only when the "right-side button of the mouse" is clicked once or the "right arrow" cursor key is pressed at any timing. This can be used for both recording and judgment. To use the "right-side button of the mouse", be sure to move the cursor to within the frame. Trigger is not possible outside the frame.

B-2: [REC START] button

A select button to perform recording of measured values. During recording, the white part of the button changes to the red color. When the [REC START] button is pressed again, the recording mode is canceled.

Measured values are saved in a fixed folder in the CSV format automatically at the sampling intervals set in "REC Cycle".

This can be used for both trigger measurement and judgment setting.

> Caution:
> If during recording, the setting is changed or the power is turned on/off, the measured values may not be recorded correctly. To change the setting, be sure to stop recording in advance.

B-3: [Open Data] button

Opens the folder of CSV data saved during automatic measurement. The file name of CSV data is the date and time when the data was saved.

C-1: "Measure" display

A value measured by the Tesla meter is shown here. For details, please see the Tesla meter instruction manual.
　・"N/S": Show the polarity of a measured value.
　・"HOLD/REAL": Show the setting of "HOLD" and "REAL" of the Tesla meter.
　・"DC/DC*10/AC": Show a measurement range of the Tesla meter.
　・"Err1": Shown when "Err1" is shown on the Tesla meter.
　・"Err2": Shown when "Err2" is shown on the Tesla meter.
　・"−": Shown when "overflow" is shown on the Tesla meter.

D-1: "TRIGGER" display

This is shown only in the trigger measurement mode. A measured value is shown only when the "right-side button of the mouse" is clicked once or the "right arrow" cursor key is pressed at any timing.

・"N/S": Show the polarity of a measured value.

・"OK/NG": When judgment has been set in the trigger measurement mode and the measured value is within the judgment range, "OK" is shown in blue and when it is outside the judgment range, "NG" is shown in red.

E-1: "File Name" display

Shows the file name of data to be saved in the CSV format.

E-2: "REC Cycle" entry

Set cycle time to record data automatically.

The cycle time can be set in increments of 0.1 second in a range of 0.1 to 60 seconds.

E-3: "Trig Only" check

Check "Trig Only" when you want to record data only at the trigger timing in the trigger measurement mode. In this case, the cycle time set in "REC Cycle" is invalid.

E-4: "dCount" display

Shows the number of measured values recorded. When trigger measurement is performed during recording at the cycle time, the number of trigger measurements is also added.

F-1: "Judg." check

Check "Judg." to make judgment of measured values.

Enter a range of OK within the setting values below:

"DC" mode: (-)3000.0 to 3000.0   "DC*10" mode: (-)300.00 to 300.00

"AC" mode: 0.00 to 1500.00

To replace the N/S of measured values with the signs of plus/minus, click "+(N), -(S)". To disregard the polarity, click "None". The "AC" mode is limited to "None". The same values may be entered. (-0.50 ≦ -0.50mT → Judgment: Only "-0.50mT" is OK.) Overflow judgment results are NG. (See the examples of judgment on the next page.)

> Caution:
> To assign the plus/minus signs to the N/S of measured values, be sure to check "Judg."

<Examples of judgment> (mT)

+(N), −(S)				None			
Set value	Indicated value	Recorded value	Judgment	Set value	Indicated value	Recorded value	Judgment
−20.0 ≦ 200.0	S300.0	−300.0	NG	20.0 ≦ 200.0	S300.0	300.0	NG
	S100.0	−100.0	NG		S100.0	100.0	OK
	S15.0	−15.0	OK		S15.0	15.0	NG
	0.0	0.0	OK		0.0	0.0	NG
	N15.0	15.0	OK		N15.0	15.0	NG
	N100.0	100.0	OK		N100.0	100.0	OK
	N300.0	300.0	NG		N300.0	300.0	NG
	− − −	− − −	NG		− − −	− − −	NG

Indicated value: Tesla meter indication   Recorded value: CSV data value

− − −: Overflow

5. Measurement Method

① To check the Tesla meter indication

The same data as that of the Tesla meter is shown in "Measure" on the screen.

② To check the Tesla meter indication at desired timing

To make judgment of measured values, check "Judg." and set judgment values and polarity. Click the [TRIGGER] button to set the trigger measurement mode. Click the "right-side button of the mouse" or press the "right arrow" cursor key at desired timing. Then the measured value at that time will be shown in "TRIGGER".

③ To record the Tesla meter indication at desired timing

To make judgment of measured values, check "Judg." and set judgment values and polarity. The judgment result is recorded together with the measured value. Click the [TRIGGER] button to set the trigger measurement mode and check "Trig Only". When ready, click the [REC START] button to start recording. Click the "right-side button of the mouse" or press the "right arrow" cursor key at desired timing. Then the measured value at that time will be saved in the CSV format and also shown in "TRIGGER". When the [REC START] button is clicked again, recording will be stopped. Click the [Open Data] button to open the folder of CSV data saved during automatic measurement. The file name of CSV data is the date and time when the data was saved.

④ To record the Tesla meter indication at certain intervals

To make judgment of measured values, check "Judg." and set judgment values and

polarity. The judgment result is recorded together with the measured value. Enter cycle time to automatically record data to "REC Cycle" in a range of 0.1 to 60 seconds. When ready, click the [REC START] button to start recording. The measured value at that time will be saved in the CSV format. When the [REC START] button is clicked again, recording will be stopped. Click the [Open Data] button to open the folder of CSV data saved during automatic measurement. The file name of CSV data is the date and time when the data was saved.

6. USB Communication
① Communication system: Full-duplex asynchronous, serial communication,
                                    binary form
② PC side setting: Transmission rate 19200 bps, 8 bits, 1 stop, no parity
③ Silicon Laboratories Inc. CP2102 used
Caution: Connection of a Tesla meter to equipment other than a PC is not supported.

Send (PC→MG)

STX	TxCMD	CSUM
0x02	0xC1：POWER ON/OFF	
	0xC2：REAL/HOLD	
	0xC3：RESET/ZERO	
	0xC4：DC AC MODE	

Receive (MG→PC)

STX	rxCMD	rSTATE	Error	CSUM
0x02	0xA1		0x01：Err.1 (MG probe error)	

rSTATE

7	6	5	4	3	2	1	0bit
00：DC		0	Auto power	Over range	Initialize	1：HOLD	POWER
01：DC*10			off	(Err.2)	1: Startup	0：REAL	1：ON
10：AC			1：Stop	1：Occur	wait		0：OFF
11：AC*10			0：Run	0：Normal	0：None		

STX	rxCMD	Measurement data	CSUM
0x02	0xA2	Positive number with polarity sent in 2 bytes (signed short-2Byte)	

"CSUM" is a sum of bytes of transmission data including STX.

0xFF is subjected to X-OR to "CSUM". ("X-OR" is theoretical operation.)

Compared against the received CSUM and verified.

7. Precautions

This is free software and can be used and distributed freely. When using/ distributing the software, however, be sure to follow the precautions below:

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④ Please note that questions about software installation procedures or usage and requests for modification or improvement are not accepted.

⑤ The software may be updated without notice. Please note that program disclosure and on-site services are not supported.