

# **RF Scientific GPIB logger v1.0** <u>User's manual v.1</u>

(C) RF Scientific

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#### 1. General information

RF Scientific GPIB logger v1.0 is a freeware application for gathering data from devices equipped with GPIB interface (there is a need to use Prologix GPIB to USB converter). The software can be used for data acquisition from up to 10 devices at the same time.

#### 2. Features

- freeware software working with Prologix 6.0 GPIB-USB converter
- provides data acquisition interface for equipment supporting GPIB bus
- supports readout for up to 10 devices simultaneously
- adjustable measurements interval
- user-friendly interface
- automatically generates log files, suitable for hassle-free import to MS Excel/Open Office Calc

Note: Freeware version **does not** support Group Executive Trigger (BUS Triggering)

#### **3. System requirements**

-operating system: Windows XP or newer

-40MB of free disk space for installation

#### 4. Getting started

#### 4.1 Drivers and configuration

Install USB driver as described in manual of Prologix converter:

' 1. Download drivers for FT245R chip from FTDI website (www.ftdichip.com)

2. Connect Prologix GPIB-USB controller to a computer using USB A-B cable

*3. Install drivers according to instructions in www.ftdichip.com/Documents/In-stallGuides.htm* 

4. Plug controller directly, or using a GPIB cable, to the GPIB connector on the instrument '

The link to driver is available also on prologix website: <u>http://prologix.biz/</u>

To ensure error-free operation during long periods of acquisition configure port properties as follows:

- 1. enter: My Computer->Properties->Device manager->Ports (COM 7 LPT)
- 2. enter properties of the port that Prologix is using
- 3. set port parameters as shown on Illustration 1
- 4. enter advanced port settings
- 5. change "bm options" and "timeouts" to be consistent with Illustration 2

Właściwo	ości: USB Serial Port (COM11)
Ogólne	Ustawienia portu Sterownik Szczegóły
	Liczba bitów na sekundę: 115200  Bity danych: 7 Parzystość: Brak Bity stopu: 1 Sterowanie przepływem: Xon / Xoff
	Zaawansowane Przywróć domyślne (advanced)
	OK Anuluj

Illustration 1: Port's parameters

Zaawansowane ustawienia dla: COM11	? ×
Numer portu COM: Wielkość transferów USB Ustaw mniejszą wartość aby poprawić problemy z wydajność Ustaw wiekszą wartość aby zwiększyć wydajność. Odbioru (Bajty): 4096 • Transmisji (Bajty): 4096 •	ОК       ją przy małych prędkościach.       Domyślne
Opcje BM Ustaw mniejsza wartość aby porawić problemy odpowiedzi.	Opcje Serial Enumerator
Czas opóźnienia (msek): 1 Timeouty Minimalny Timeout odczytu (msek): 100 Minimalny Timeout zapisu (msek): 100	Drukarka szeregowa   Anuluj jeżeli wyłączanie zasilania   Zdażenie przy nieoczekiwanym odłączeniu   Ustaw RTS przy wyjściu   Zablokuj kontrole modemu przy starcie   Enable Selective Suspend   Selective Suspend Idle Timeout (secs):

Illustration 2: BM options and timeouts

Now the system is ready to run RF Scientific GPIB logger application.

Click on downloaded file "rf\_scientific\_setup.exe" and follow installation messages.

Default destination folder is "C:\Program Files (x86)\RFScientific Data Logger".

Inside there are folders:

"configuration" - stores configurations of measurement systems

"logs"- stores acquired data as text files

"settings"- stores sets of commands used to configure the device to perform selected function and to trigger measurement.

#### 4.2 Main window overview

M12  Rescan Connect Disconnect	Log Window		Date	Time	HP34401A_DC10V_1G_10PLC	HP34401A_DC10V_1G_10PLC	HP3456A_DCV_	AUTO	Clear
n of devices 3	Addr: 24. Command: 6STG	<b>^</b>	1 02.07.2014	20:55:33	+1.24691200E-01	+2.31795000E-01	+06.70209E+0		
rval [s] 10	02.07.2014 20:55:17 >	:	2 02.07.2014	20:55:43	+1.46356400E-01	+3.30295000E-01	+06.73377E+0		settir
y [ms] 1000 文	Addr: 24. Command: 10STI		3 02.07.2014	20:55:53	+2.16595600E-01	+4.02827400E-01	+06.76116E+0		Save con settir
START Reading STOP Reading	02.07.2014 20:55:17 > Addr: 24. Command: E181M0T3		4 02.07.2014	20:56:03	+2.84880800E-01	+4.69943000E-01	+06.78564E+0		Ab
logix	02.07.2014.20.55.47.		5 02.07.2014	20:56:13	+3.50797400E-01	+5.33660400E-01	+06.80819E+0		
+mode 1 +auto 0 +read tmo ms 1000	Data acquisition started	-	6 02.07.2014	20:56:23	+4.14758100E-01	+5.94993900E-01	+06.82925E+0		
++ifc Prologix	< Ⅲ → Send		7 02.07.2014	20:56:33	+4.76738500E-01	+6.54376600E-01	+06.84906E+0		
ev 1: HP34401A_DC10V_1G_10PLC	Dev 2: HP34401A_DC10V_1G_10PLC		Dev 3:	HP3456A_	DCV_AUTO	Device 4		Device 5	
DDR 20	ADDR 21		ADDR	24	4	ADDR		ADDR	
nfiguration ++dr *CLS CONF:VOLT:DC 10, MAX UCIT:DC:NPLC 10 INP:IMP:AUTO ON ~	++dr *CLS Configuration CONF:VOLT:DC 10, MIN VOLT:DC:NPLC 10 INP:IMP:AUTO ON	-	Configu	ration 1( F:	+tdr STG 0STI IR IM0T3	Configuration		Configuration	
mmand READ?	Command READ?		Comma	nd T3	3	Command		Command	
Conf Execute Save Load	Conf Execute Save	Load	Con	f Exe	ecute Save Load	Conf Execute Sa	ve Load	Conf Execute	Save
vice 6	Device 7		Device	з		Device 9		Device 10	
DR	ADDR		ADDR			ADDR		ADDR	
nfiguration	Configuration		Configu	iration		Configuration		Configuration	
mmand	Command		Comma	nd		Command		Command	

Illustration 3: Application at work (3 devices active; acquisition mode) / high resolution image/

#### 4.3 How to connect with Prologix

After a startup, application will automatically find COM port(s) with Prologix converter(s). If startup search fails, user can use "Rescan" button to repeat scanning.

"Connect" and "Disconnect" buttons open and close selected serial port (respectively).



Illustration 4: Available ports list

#### 4.4 How to setup acquisition parameters

- Num of devices number of devices to communicate with (max. 10)
- Interval interval in seconds between consecutive measurements
- *Delay* time in *milliseconds* between sending polling command to a device and reading the data from Prologix internal buffer
- Start reading starts data acquisition with established settings (num of devices, interval, delay)
- Stop reading stops data acquisition

Num of devices	3	-
Interval [s]	10	-
Delay [ms]	1000	*
START Reading	STOP Reading	

Illustration 5: Acquisition parameters setup

#### 4.5 How to configure Prologix

There are two ways to provide prologix setup/commands:

- 1. entering commands separated with newline character (see example on Illustration 6: Prologix setup)
- 2. loading configuration file containing prologix commands

"Configure Prologix" buttons configures Prologix with current set of commands. Configuration is done automatically after pressing "START Reading" button.

++mode 1 ++auto 0 ++read_tmo_ms 1000 ++ifc	Configure Prologix
---	-----------------------

Illustration 6: Prologix setup

#### 4.6 How to configure a device

In order to establish communication with a device following parameters shall be provided:

- address: the unique GPIB address of the connected instrument (0...30)
- configuration: a sequence of commands which sets proper function and range (preparation for measurement)
- command: a command which triggers the measurement and puts the result into the output buffer

",Conf" button configures device with current set of commands,

",Execute" - executes command provided in "Command" field ("++read eoi" is sent after command provided).

#### 4.7 How to send commands and read answers

Serial port communication interface. "Send" button sends command provided and displays answer (if applicable).

#### 4.8 How to save / load system configuration

- Clear table/Create new log file self explanatory button clears table (removes all rows)
- Load configuration settings... loads selected configuration file
- Save configuration settings... saves current settings to a file
- About useful information about the application



Illustration 7: Buttons

#### 4.9 Configuration file format (example)

Prologix ++mode 1 ++auto 0 ++read\_tmo\_ms 1000 ++ifc Num of devices 1 Interval 10 Delay 2000 Device name HP34401A\_DC10V\_1G\_10PLC Address 21 Configuration ++clr \*CLS CONF: VOLT: DC 10, MAX VOLT: DC: NPLC 10 **INP:IMP:AUTO ON** Command READ?

#### 5. Results

The results are also stored in a text file named after date and hour of quitting acquisition eg. "Data\_Logger\_2014.10.05 11.41.03.txt".

The file has simple structure and can be viewed using Notepad.

It can also be imported to MS Excel or Open Office Calc to create charts from collected data.

#### 5.1 Table of results

	Date	Time	HP34401A_DC10V_1G_10PLC	HP34401A_DC10V_1G_10PLC	HP3456A_DCV_AUTO
1	02.07.2014	20:55:33	+1.24691200E-01	+2.31795000E-01	+06.70209E+0
2	02.07.2014	20:55:43	+1.46356400E-01	+3.30295000E-01	+06.73377E+0
3	02.07.2014	20:55:53	+2.16595600E-01	+4.02827400E-01	+06.76116E+0
4	02.07.2014	20:56:03	+2.84880800E-01	+4.69943000E-01	+06.78564E+0
5	02.07.2014	20:56:13	+3.50797400E-01	+5.33660400E-01	+06.80819E+0
6	02.07.2014	20:56:23	+4.14758100E-01	+5.94993900E-01	+06.82925E+0
7	02.07.2014	20:56:33	+4.76738500E-01	+6.54376600E-01	+06.84906E+0

Illustration 8: Table with data

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#### 5.2 How to import the log file (Open Office example)

It is important to set text separator to "|" when importing to spreadsheet program.

Sometimes it might be necessary to use option "find and change" to change dots into commas or to convert result format into numbers.

Import tekstu - [Data_Log	gger_2014.07.02%2020.55.17.txt]		×
Importuj			
Zestaw znaków	Unicode (UTF-8)	•	ОК
			Anuluj
<u>J</u> ęzyk	Domyślnie - Polski		
Od <u>w</u> iersza	1		Po <u>m</u> oc
Opcje separatora —			
Stała szerokość			
Rozdzielony			
T-huldter	D		
<u>l</u> abulator	<u>P</u> rzecinek	<u>✓</u> <u>I</u> nne	
🔲 Śre <u>d</u> nik	Spacja		-
Scal <u>s</u> eparator	ry S	eparator te <u>k</u> stu	
Inne opcje			
Pole w cudzysłow	vie jako tekst		
🔲 Identyfikui liczby	specialne		
in raciny incluy	specjanie		
Pola			
T <u>y</u> p kolumny			
Standardowe St	tandardowStandardowe	Standardowe 🔺	
1 Date T:	ime HP34401A_DC10V_1G_10PI	C HP34401A_DC10V_1G_10PLC	
2	Addr:20	Addr:21	
3 02.07.2014 20	0:55:33 +1.24691200E-01	+2.31795000E-01	
4 02.07.2014 20	0:55:43 +1.46356400E-01	+3.30295000E-01	
5 02.07.2014 20	0:55:53 +2.16595600E-01	+4.02827400E-01	
6 02.07.2014 20	0:56:03 +2.84880800E-01	+4.69943000E-01	
7 02.07.2014 20	0:56:13 +3.50797400E-01	+5.33660400E-01 +	
1		•	

Illustration 9: Open Office data import (use separator: |)

#### 5.3 Imported file

	A	В	C	D	E
	1 Date	Time	HP34401A_DC10V_1G_10PLC	HP34401A_DC10V_1G_10PLC	HP3456A_DCV_AUTO
Γ	2		Addr.20	Addr.21	Addr.24
	3 02.07.2014	20:55:33	0,1246912	0,2317950	6,7020900
	4 02.07.2014	20:55:43	0,1463564	0,3302950	6,7337700
	5 02.07.2014	20:55:53	0,2165956	0,4028274	6,7611600
	6 02.07.2014	20:56:03	0,2848808	0,4699430	6,7856400
	7 02.07.2014	20:56:13	0,3507974	0,5336604	6,8081900
	8 02.07.2014	20:56:23	0,4147581	0,5949939	6,8292500
	9 02.07.2014	20:56:33	0,4767385	0,6543766	6,8490600
Γ	10 02.07.2014	20:56:43	0,5370128	0,7123040	6,8678400
	11 02.07.2014	20:56:53	0,5953620	0,7688891	6,8857100
	12 02.07.2014	20:57:03	0,6519161	0,8245586	6,9028100
	13 02.07.2014	20:57:13	0,7063237	0,8791644	6,9192300
	14 02.07.2014	20:57:23	0,7587125	0,9329825	6,9350300

Illustration 10: Imported data example (measurement results converted into numbers)

#### 5.4 Displaying results

Use spreadsheet's "create chart" function to display the data.



Illustration 11: Plotted data

#### 6. Example for HP 34401A owners

-proceed all tasks described in chapter 4.1 Drivers and configuration
-now the software is installed and the PC is properly configured
-connect Prologix converter to the multimeter and to the PC via USB
-run the *RF Scientific GPIB logger* software
-click *Connect* button
-click *Load configuration settings...*-select file *34401A\_example\_configuration\_setup.txt*-click *START Reading*

From that moment, the logger will perform measurement every 10s. The results will be displayed in the main window and also to the file typically located in C:\Program Files (x86)\RFScientific Data Logger\logs

#### 7. Sharing setup files

The users are encouraged to share configuration files created for various devices. (<u>info@rfscientific.eu</u>).

Files can be found at: <u>http://rfscientific.eu/rf-scientific-gpib-logger-v10</u>

#### 8. Disclaimer

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#### 9. Donations

RF Scientific GPIB logger is a FREE software, but if you feel that you would like to support this project here you can find the details to do so:

PAYPAL:

user: <u>bartlomiej-radzik@wp.pl</u> identifier: 4KR7KKZMVZCBA

Data for Bank transfer: RF Scientific Bartlomiej Radzik ul. Rydygiera 15A lok.83 01-793 Warsaw, Poland IBAN NO: PL 82 1140 2004 0000 3802 7257 7225 BIC code: BREXPLPWMBK Bank : BRE Bank S.A.



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