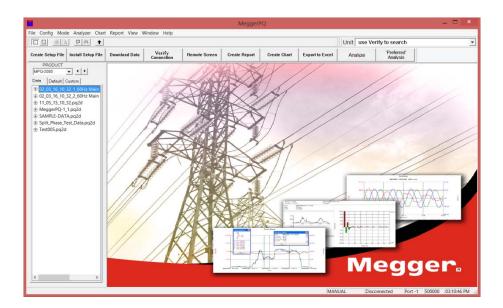
User Manual MEGGERPQ PQ Software



Megger.

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MEGGER PQ Software

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Introduction

The MEGGERPQ Power Quality Software has been designed with emphasis on reliability, simplicity and ease of use. It will provide you with the information you need to create configuration setup files for the MPQ Series of power quality analyzers. This software will also allow you to performed detailed analysis of the MPQ Series of data files.

Purpose of this manual

This document is the operator manual for the MEGGERPQ PC Software. It provides a description of the installation and operating instructions. Read this manual before using this software. Special emphasis should be placed on all safety discussions.

Audience

This manual is written for technical personnel who are familiar with the various measurements performed by power analyzers and have a general understanding of their use and operation. Such personnel should also be thoroughly familiar with the hazards associated with the use of this equipment and should have received proper safety training.

If you find any discrepancies in this software or have any comments, please send them to Megger via fax, e-mail or phone.

Megger 400 Opportunity Way Phoenixville, PA 19460Attn: Customer Service

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Overview of the PC Software

The MEGGERPQ Software is an IBM compatible interface for the Megger MPQ line of power quality analyzers. This software supports the following functionality.

Sor	ne of the Power Analyzer's features include:
1	Communications to the Megger line of MPQ Analyzers through a USB port.
2	Communications to the Megger line of MPQ Analyzers through Ethernet.
3	Ability to transfer MPQ configuration setup files to the MPQ unit via a USB stick or an SD Card.
4	Ability to import MPQ configuration setup files from the MPQ unit via a USB stick or an SD Card.
5	Ability to transfer MPQ configuration data files to the MPQ unit via a USB stick or an SD Card.
6	Ability to import MPQ configuration data files from the MPQ unit via a USB stick or an SD Card.
7	Create configuration setup files for the Megger line of MPQ Power Quality Analyzers.
8	Create automated reports from the recorded data files of the MPQ line of power quality instruments.
9	Create automated charts from the recorded data files of the MPQ line of power quality instruments.
10	Perform detailed harmonic analysis from the recorded data files of the MPQ line of power quality instruments.
11	Analyze recorded event data from the MPQ line of power quality analyzers.
12	Export data to Excel and Adobe
13	Print reports
14	Cascade and Tile charts and reports.

Applications

The features of the MEGGERPQ software make the software capable of performing various applications.

- EN50160 Analysis
- Power Quality Studies
- Energy Analysis and Audits

- Troubleshooting Analysis
- Motor Start Up
- Automated Data Analysis
- Reliability Studies

Definitions

Clock Hour Orientation	A setup feature in the PQ software that when selected will delay the start of the recording until the real time clock in the PQ Device reaches a time interval that is a multiple of the selected storage interval. This will keep each interval from having fractional time stamps.
CT Full Scale	The specified maximum RMS current range of the current clamp in use with the PQ Analyzer
Data File	An electronic file that contains the aggregated measurements of the PQ Analyzer.
Default Frequency	The user selectable frequency in the setup file that the PQ Analyzer defaults to if the phase lock loop is lost.
EFT	Extremely Fast Transient - Transients that have rise and fall times in the nanosecond region.
Flicker	An impression of unsteadiness of the visual sensation, induced by a light stimulus with a luminance fluctuates over time.
Harmonics	A sinusoidal component of a periodic wave or quantity having a frequency that is an integral multiple of the fundamental frequency.
Hysteresis	A user selectable value that sets a buffer between the trigger level that starts a sag or swell event and the trigger level that ends the event. This value is displayed as a percentage of the user programmed limit.
Imbalance	The ratio of the negative sequence component of a voltage or current to the positive sequence component of that voltage or current, typically expressed as a percentage.
Inter-Harmonics	A harmonic component of a periodic quantity that is not an integer multiple of the fundamental frequency that the supply system is operating.
Phase Angle	The delay between the zero crossing of the fundamental voltage signal and the fundamental current signal represented in degrees.
Post-Triggers	A user selectable value in the setup file that defines the number of cycles the unit will record after a cycle has occurred that has exceeded the user programmed event limits.
Power Factor	The ratio of the total power input, in watts, to the total volt-ampere input to the converter.

Pre-Triggers	A user selectable value in the setup file that defines the number of cycles the unit will record before a cycle has occurred that has exceeded the user programmed event limits.
Rapid Voltage Change	A variation of the rms or peak value of a voltage between two consecutive levels that is sustained for a given durations.
Ratio	A user selectable value in the setup file that defines a value that shall be used to multiply the recorded voltage and / or current values. This feature is used when recording secondary values of a PT or a CT and the operator wishes to record and view the primary value.
Response Interval	A user selectable value in the setup file that allows the user to define the aggregation length of each RMS calculation. Programmed in cycles.
RMS Current	The Root Mean Square value of the current , derived from the summation of the square root of the arithmetic mean (average) of the squares of the original current samples.
RMS Voltage	The Root Mean Square value of the voltage , derived from the summation of the square root of the arithmetic mean (average) of the squares of the original voltage samples.
Sag	An instantaneous or momentary decrease in the steady state RMS value.
Sample	The actual discrete instantaneous measurement the MPQ-MPQ Analyzer performs 256 times per cycle.
Scheduled Run	A recording mode in the setup file that will allow the user to select a date and time that the MPQ-MPQ Analyzer will start recording.
Setup File	An electronic file that contains the measurement configuration that shall be used by the PQ Analyzer during its recording.
Storage Interval	A selection in the MPQ-MPQ Analyzer setup file that allows the user to determine how often the unit saves the aggregated data.
Sub-cycle	A power quality event in which the duration is less than a cycle.
Swell	An instantaneous or momentary increase in the steady state RMS value.
TDD	Total Demand Distortion is a measurement of the current THD taking into account the average current load on the circuit during the recording interval.
THD	The ratio of the root-mean-square of the harmonic content to the root-mean-square value of the fundamental quantity, expressed as a percent of the fundamental.
Transient	A sudden non-power frequency change in the steady state condition of voltage or current.
Vars	A unit which is the imaginary counterpart of the watt. The relationship between a VAR and a watt in an alternating-current electrical system is determined by the power factor.

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Volt Amps	A measurement of apparent power.
Watts	A unit of energy equivalent to one joule per second.
Waveform Capture	A selection in the MPQ-MPQ Analyzer setup file that allows the unit to record waveforms based on timed intervals. NOTE: The unit will always capture waveforms when an out of limits event occurs.

Safety

Warnings and Safety Precautions



Installation of this instrument MUST be performed in compliance with the National Electric Code and any additional safety requirements applicable to your installation.

Installation, operation and maintenance of this instrument MUST be performed by qualified personnel only. The National Electrical Code defines a qualified person as one familiar with the construction and operation of the equipment and the hazards involved.

Safety Precautions

The following safety precautions MUST be taken whenever the Power Quality instrument is installed.

- Wear safety glasses and insulated gloves when making connections to power circuits
- Hands, shoes, floor/ground must be dry when making any connection to a power line
- These warnings and safety precautions are to be used where appropriate when following instructions in this manual.



CAUTION! The equipment could be impaired from improper use. Read the

complete manual before use.



WARNING!

The equipment should not be used if there is any visible damage to the case or if the hardware holding the unit together has been loosened.

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Installing the Software

Install the Power Quality software into an IBM compatible PC as follows.

- 1. Verify the PC meets or surpasses the minimum requirements of the software.
 - a. Operating System Windows 7, Windows 8 or Windows 10.
 - b. 1 GHz Processor minimum
 - c. 2 Gig RAM
 - d. 1000 Meg free hard drive disk space
 - e. USB port
- 2. Verify the PC is powered up and there are no open programs.
- 3. Insert the Megger PQ USB Stick into the PC.
- 4. Double Click on "MY COMPUTER".
- 5. Double Click on the USB Stick Drive.
- 6. Double Click on Megger PQ executable.
- 7. Follow the Software instructions displayed on the screen until the software is installed. The installation may take up to 2 minutes.
- 8. Execute the software once it is installed.
- 9. *After* the software opens plug in the MPQ-MPQ Analyzer unit to one of the computers USB ports, using the USB communications cable.
- 10. Once the driver has successfully been installed click on VERIFY CONNECTION in the software.

File Config Mode Analyzer Chart Report View Window Help Image:					M	eggerPQ					
Consta Schus Elle Install Schus Elle Deutstand Date Verify Demote Screen Consta Deard Consta Deard Events Deard Assister Preferred	ile Config Mode	e Analyzer Chart	Report View W	lindow Help							
								Unit use Verify	to search		1
	Create Setup File	Install Setup File	Download Data	Verify Connection	Remote Screen	Create Report	Create Chart	Export to Excel	Analyze	'Preferred' Analysis	

11. The software will automatically scroll through the COM ports until it locates the MPQ-MPQ Analyzer.

MPQ-SWG-EN-V06 Septembre 2022

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Software Operation

The following section describes the operation of the MPQ-MPQ Analyzer unit. This section will describe in a step by step manner how to setup, program, install and download data from the MPQ-MPQ Analyzer.

Setting Up Software Preferences

The software contains folders for both data files as well as setup files. The operator can select the desired path of both folders. In addition the operator can create multiple folders and configure the software to view the desired folder.

1. Select the MPQ instrument, using the PRODUCT drop down menu.

NOTE: The software will only display the data files and setup files for the model instrument selected.

1		
File Config Mod	le Analyzer	Chart
		1
Create Setup File	Install Setu	File
PRODUCT		
MPQ-2000	- + +	
MPQ-1000	aml	
MPQ-2000	om	

2. Click FILE, then PREFERENCES.

File	Config	Mode	Analyzer	Chart	Report
	New Eve	nt Log		Ctr	I+N
	Open Eve	ent Log		Ctr	1+0
	Save Eve	nt Log		Ct	rl+S
	Save Log	As			
	Edit			Ct	rl+E
	Informat	ion			
	Refresh				F5
	Import				
	Import/E	xport Se	etup File		
	Clear/Co	py SD C	ard		
	Print			Ct	rl+P
	Print Prev	view			
	Printer Se	etup			
	Recent Fi	le			
	Preference	tes			
	Exit				

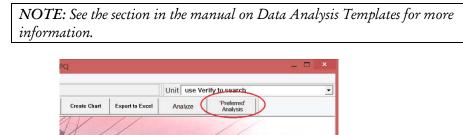
3. Click DISPLAY to set the Display Preferences.

	Preferences	x
Display	Reports Charts	
Select your prefe for use in the ap	erence for the following items plication.	
DIP / SAG	Sag 💌	
Voltage Label	V •	
Voltage Selection	120 💌	
Date Format	mm/dd/yy 💌	
Time Format (hours)	12 💌	
Analysis Shortcut	EN50160.tplt	
	Save Cancel	

From this screen you can set the local terminology. You can select, a reduction in voltage referred to as a dip or a sag. You can also select what symbol you would like to have the software use to represent voltage (V, U or L).

From this screen you can also choose the date and time format for your local

This screen also allows you to select the Default Data Analysis Template, in the *Analysis Shortcut* dropdown field. This will allow you to perform your desired (or most common) data analysis by simply clicking on the *Preferred Analysis* button.



4. Click REPORTS to set the *Report Preferences*.



From this screen you can disable or enable your desired reports. This way only the ones of interest are displayed.

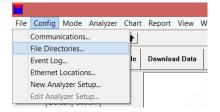
5. Click CHART to set the Chart Preferences.

Select your preference for which charts stad for viewing.
F Phase to Phase
P Demand
Vaveform
🖓 ANSI Unbelance
F IEC Unbalance (61000-4-27)
Frequency
F IEC Harmonics (61000-4-30)
THD VIE
TOD TO
If EC Flicker (61000-4-15)
🖓 Mains Signaling

From this screen you can disable or enable your desired charts. This way only the ones of interest are displayed.

Configuring File Directories

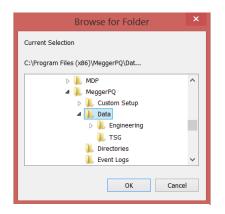
1. Click CONFIG then FILE DIRECTORIES.



a. Click BROWSE for either the *Data Files Location* or the *Setup Files Location*, which ever you wish to modify.

File Directories		×
Data Files Location: C:\Program Files (x86)\MeggerPQ\Data	Browse	
Setup Files Location: C:\Program Files (x86)\MeggerPQ\Custom Setur	Browse	
Directory Database Location: C:\Program Files (x86)\MeggerPQ\Directories	Browse	
OK Cancel	Help	

b. Select the desired path and then click OK to close the *Browse for Folder* window.

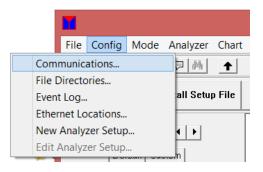


c. Click OK to close the *File Directory* window.

Configuring USB Communications

The communications needs to be configured in order to tell the PC whether to use USB communications or Ethernet communications. To configure the software for USB communications please perform the following procedure.

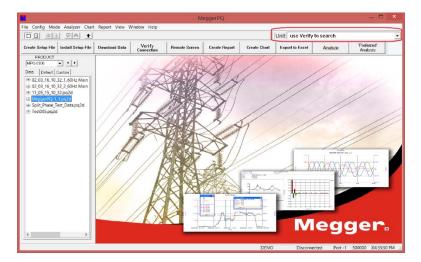
1. Click CONFIG then COMMUNICATIONS.



2. In the Communications window check USE COM PORT.

Communications	×
Port Information	
Ethernet Communications Use Network Communications TCP Port 30685	
OK Cancel Help	

The software will now display the active COM ports in the upper right hand corner.



- 3. Select the COM port in use.
- 4. With the MPQ unit powered up and plugged into the proper COM port click VERIFY CONNECTION button. The software should now connect to the unit.

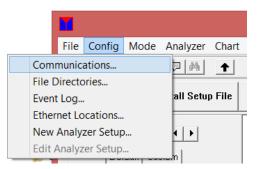
NOTE: The software will automatically scan all COM ports if it does not find a unit at the selected COM port.

The software will support up to 128 COM ports.

Configuring Ethernet Communications

The communications needs to be configured in order to tell the PC whether to use USB communications or Ethernet communications. To configure the software for Ethernet communications please perform the following procedure.

1. Click CONFIG then COMMUNICATIONS.



2. In the *Communications* window check USE NETWORK COMMUNICATIONS.

Comn	nunications	×
Port Information		
Ethernet Communications	ins	
TCP Port 30	685 💌	
ОК	Cancel Help	

3. Connect the MPQ unit to the network using the Ethernet connection. The Ethernet LED on the unit should illuminate, indicating communications with the network.



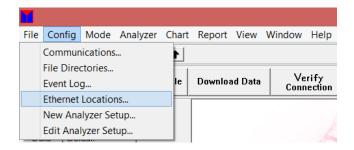
The unit will now be assigned an IP address. This can take up to 2 minutes. To view the address, go to the MPQ units help screen as follows.

4. Press the HELP button.



NOTE: This is a static screen that does not update. To refresh the screen you will need to exit the screen and re-open the help screen.

5. In the PC software click CONFIG then ETHERNET LOCATIONS.



a. An *Ethernet Directory Database* window will open. With the unit connected click SEARCH.

	Ethe	ernet Directory D	Database	
Name 00:04:A3:93:77:6D 00:04:A3:93:83:15 00:04:A3:93:F2:55	10.50.31.74 10.50.31.46 10.50.31.72	Address		Add Delete Modify Search
		(DK Cance	el Help

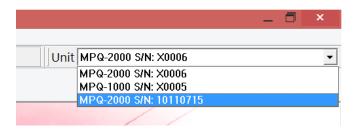
b. The software will search the network for all active MPQ units. They will be displayed in the *Ethernet Search* window. Select the desired unit and click ADD / MODIFY DATABASE. This will add the unit to the database.

Ether Search	×
Discovered Units	
MAC: 00:04:A3:E6:82:E0 at 169:254:219:157	Add/Modify database
	Cancel
, From: 169.254.111.215	

6. In the *Ethernet Directory Database* window, select the desired unit, then click OK.

	Ethernet Directory Database	
Name MPO S/N: SN	Address 10.50.31.67 Add Delete Modify Search	
	OK Cancel Help	

The software will now display the active Ethernet locations in the upper right hand corner. *Select the desired unit*.



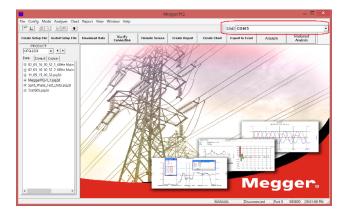
7. Click VERIFY CONNECTION. The software should not connect to the unit. The software should now connect to the unit.

Transfer a Setup File from the PC to the MPQ Analyzer

A setup file is used to program the unit to perform different types of recording. Multiple setup files can be installed into the unit. These setup files can be activated from the front panel of the unit or using the Megger PQ software.

Uploading a setup file from the PC using the Megger PQ software

- 1. Verify the batteries in the unit are fully charged or connect the unit to the AC adapter and plug it into an AC outlet.
 - a. Connect the unit to the PC via the USB cable.
 - b. Execute the Megger PQ software.
 - c. Select the COM Port in use.



- <complex-block>
- 2. Verify communication by clicking VERIFY CONNECTION.

3. Click INSTALL SETUP FILE in order to select a setup program for the unit.



- 4. Select the *type* of setup you would like to select.
 - a. Default: Pre-made setups in the unit.
 - b. Custom:



c. The setup folder window will open. Select the desired setup file and click OPEN. See the section on *Creating Setup Files*.

) () - 1 🖡 « MeagerPQ			4		D.C.A.L.Y.	
Image:			~ C	Search TEMP	DEFAULT	P
Organize • New folder					ie • 🔟	0
	^	Name	Date	modified	Туре	
Mar This PC		230V_DEMO_WYE.pq2s	9/30/	2016 9:42 AM	Megger PQ File	
E Desktop		230V_EN50160_WYE.pg2s		2016 11:35 A		
Documents		and farmer and the second seco				
la Downloads						
Music						
E Pictures						
Videos	1.0					
Sindows8_OS (C:)						
ID-WLU3 (E:)						
🛫 marketing (\\vf-fs3) (T:)	- 8					
	~	<				
File name:				✓ Files (*.p	(2sp	Ŷ
				Ope	n Cance	a

The software will now upload the setup file to the unit and activate that setup and sync the date and time of the unit to the PC date and time.

NOTE:	If the setup file is loaded from the PC to the MPQ analyzer via Ethernet or USB connection, the setup file is automatically activated but the scheduled run mode is NOT entered.
	The analyzer must be turned OFF then back ON to activate the scheduled run.
	Once the analyzer is powered back up the scheduled run mode is active. Do NOT push the record button on the analyzer. The analyzer will automatically start recording when the date and time is reached.
	If the 'Loading a setup file' is activated from the front panel of the analyzer then scheduled run mode is activated. There is no need to cycle the power of the analyzer. The analyzer will automatically start recording when the date and time is reached. Do NOT push the record button.

Transferring a Setup file from the PC to a USB stick

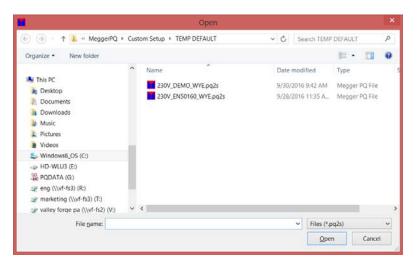
- 1. Open the Megger PQ Software.
 - a. Plug the USB stick into the USB port of the PC.
 - b. Execute the Megger PQ software.
 - c. Click on FILE then IMPORT / EXPORT SETUP FILE.
 - d. Click on EXPORT SETUP FILE.

	File	Config	Mode	Analyzer	Char	t I	Report	View	Window	/ Help
New	Event	Log		Ctrl+N						
Oper	n Even	t Log		Ctrl+O	F	1			1.	
Save	Event	Log		Ctrl+S	е	1	Downloa	nd Data	Cor	erify nection
Save	Log A	s			F	T				15/1
Edit				Ctrl+E						
Infor	matio	n								
Refre	sh			F5					14	A
Impo	ort				۰I			/	1	
Impo	rt/Exp	ort Setu	o File		•	1	mport S	Setup Fi	le	F
Clear	/Сору	SD Card				E	Export S	etup Fi	le	
Print.				Ctrl+P		Г	- / /		J.	
Print	Previe	w							/	
Printe	er Setu	q.				Ľ	/ ,	/ /	-61	XX
Recent Fil										
Prefe	rence	s					/ /	-	\Box	
Exit							/	A	1	

2. The *Export Setup File to Binary Format* window will open. Click BROWSE next to the *From* field, to search for desired setup file.

Export Setup file to Binary Format				
Enter File Na	ne			
	Use default file			
From:	C:\Program Files (x86)\MeggerPQ\Custom Setup\TEMP DEFAULT Browse			
To Drive:	G:\ Browse			
	Cverwrite existing file			
	OK Cancel			

3. The *Open* window will open. Select the desired setup file and then click OPEN.



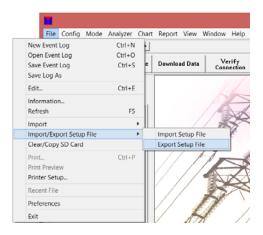
4. The *Export Setup File to Binary Format* window will open again with the selected setup file in the *From* field. Select the path to the USB stick in the *To Drive* field then click OK.

Export Setup file to Binary Format				
Enter File Name				
Use default file				
From: C:\Program Files (x86)\MeggerPO\Custom Setup\TEMP DEFA	C Browse			
To Drive: G:\	Browse			
☐ Overwrite existing file				
OK Cancel				
2000000000				

The setup file will now be written to the USB stick.

Transferring a Setup File from the PC to an SD Card

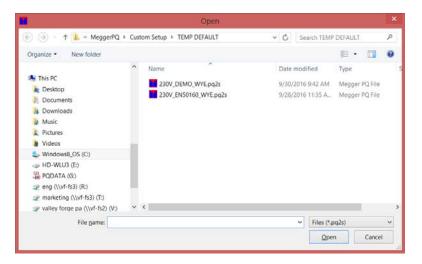
- 1. Open the Megger PQ Software.
 - a. Plug the SD Card into the SD Card port of the PC.
 - b. Execute the Megger PQ software.
 - c. Click on FILE then IMPORT / EXPORT SETUP FILE.
 - d. Click on EXPORT SETUP FILE.



2. The *Export Setup File to Binary Format* window will open. Click on BROWSE next to the *From* field, to search for desired setup file.

	Export Setup file to Binary Format	×
Enter File Na	ne	
	Use default file	
From:	C:\Program Files (x86)\MeggerPQ\Custom Setup\TEMP DEFAULT Browse	
To Drive:	G/, Browse	
	Cverwrite existing file	_
	OK	

3. The *Open*-window will open. Select the desired setup file and then click OPEN.



4. The *Export Setup File to Binary Format* window will open again with the selected setup file in the *From* field. Select the path to the SD Card in the *To Drive* field then click OK.

	Export Setup file to Binary Format	×
Enter File Nan	le	
	Use default file	
From:	C\Program Files (x86)\MeggerPO\Custom Setup\TEMP DEFAULT Browse	
To Drive:	G1 Browse	
	Cverwrite existing file	
	OK	

The setup file will now be written to the SD Card.

Transferring Data from the MPQ unit to the PC

The data from the MPQ Analyzer can be transferred to the PC in several different manners.

- The data can be transferred through the type B USB Port directly to the PC.
- The data can be transferred through the Ethernet Port directly to the PC.
- The data can be transferred to a USB stick plugged into the type A USB port.
- The data can be imported directly from the SD Card.

Transfer data to a PC using a USB or Ethernet port

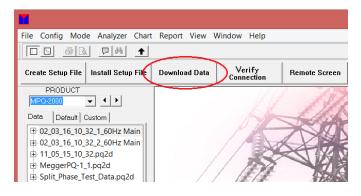
1. Power up the MPQ unit.

If communicating using the USB port perform the following steps.

- a. Connect the unit to a PC using the USB communications cable.
- b. Setup the USB communications as described in the "Configure USB Communications" section of this manual.

If communicating using the Ethernet perform the following steps

- a. Connect the unit to the network using the Ethernet communications cable.
- b. Setup the Ethernet communications as described in the "Configure Ethernet Communications" section of this manual.
- 2. Once communications is established click DOWNLOAD DATA.



The following Retrieve Data window will open.

		R	tetrieve	Data					
Cverwrite all existing file names							H	Help	
Filenome:	C3Ph	C Program Files (x88)MeggerP0(Data/Engineering Test)//					Ba	Browse	
	Duana	Overagine existing file							
	Cleor ALL dolo after refrevol						C	Cancel	
							Ro	tieve	
Test Name		StertTing		Dursi	ion	_			-
SAMPLE	-DATA	09/30/16 11:00		5 Days 01		-			-
File Informati Centomer/E								2	
Customer,								2	-
Customer,	operment							2	-
Customer/A Account/M	operment							2	
Customer/E Account/M Address:	Joperiment Her Number							2	
Customer/C Account/M Address: City:	Joperment der Number duce:							2	
Customer/C Account/M Address: City: State / Pro-	Joperment der Number duce:							2	
Cestomer/E Account/M Address: City: State / Prov Postel Cod	laperiment ater Number dace: e:							_	
Cestomer/E Account/M Address: City: State / Prov Postel Cod Country.	lapertmant star Number dece: a: loar							_	

3. Select the data files to be downloaded.

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- 4. Input the desired customer information or notes you like. This data will be saved in the data file.
- 5. Click on RETRIEVE.



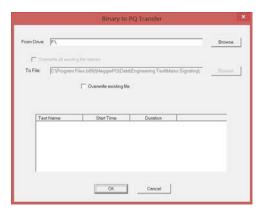
6. The data transfer shall now begin. Once the data download is complete *disconnect the unit*. The data file shall be displayed in the *Data File Bar*.

Transfer Data to a PC using a USB stick

- 1. Insert the USB stick containing the data into the PC USB stick port.
 - a. Open the Megger PQ software.
 - b. Click FILE then IMPORT then TRANSFER USB to PQ.

File	Config Mode Analyzer		ort View V	Vindow Help	_	
	New Event Log Open Event Log Save Event Log Save Log As	Ctrl+N Ctrl+O Ctrl+S	oad Data	Verify Connection		
	Edit	Ctrl+E				
	Information Refresh	F5		P	2	
	Import	•	SD card to PQ Transfer USB to PQ			
	Import/Export Setup File Clear/Copy SD Card	,				
	Print	Ctrl+P		11-12	E.	

2. The *Binary to PQ Transfer* window will open. Click on *From Drive* BROWSE to select USB path.



3. Select the *path* and the *Data File Folder*.

NOTE: The data file will reside in the following path on the USB stick. MEGGER / Datafile / MPQ.

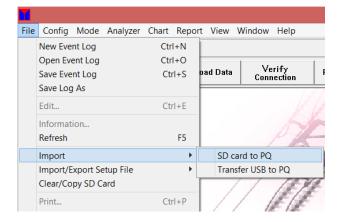
	Open			×
) () → ↑ 👢 « MeggerPQ → Cus	tom Setup 🔸 TEMP DEFAULT	✓ C Search TEMP	DEFAULT	٩
Organize - New folder			•	0
 This PC Desktop Documents Downloads Music Pictures Videos Windows8_OS (C:) HD-WLU3 (E:) PQDATA (G:) eng (\\vf-fs3) (R:) marketing (\\vf-fs3) (T:) 	Name 230V_DEMO_WYE.pq2s 230V_EN50160_WYE.pq2s	Date modified 9/30/2016 9:42 AM 9/28/2016 11:35 A	Type Megger PQ File Megger PQ File	S
☞ valley forge pa (\\vf-fs2) (V:) File name:	<	✓ Files (*.p		>

4. Select the desired data file to import then click OK.

Binary to PQ Transfer							
From Drive: F\Megger\DataFile\MPQ\TestData_10102016-12-52-31.binq Browse Browse Cverwrite all existing file names To File: C\Program Files (x86)\MeggerPQ\Data\Engineering Test\Mains Signaling\T Browse							
r	Cverwrite existing file						
TestName	Start Time	Duration					
SAMPLE-DATA	09/30/16 11:00:22 A	5 Days 01:17:21					
	OK	Cancel					

Transfer Data to a PC using an SD Card

- 1. Remove the SD CARD from the unit and place it in the SD Card reader slot of the PC.
 - a. Open the Megger PQ software.
 - b. Click FILE then IMPORT then SD CARD TO PQ.



2. The *Binary To PQ Transfer* window will open. Click *From* BROWSE to select path.

SD Card to PQ Transfer					
From Drive:	G\			Browse	
	enwrite all existing fi	le names			
To File:	C:\Program File	s (x86)\MeggerPQ\Data\	Engineering Test\Main	s Signaling\\} Browse	
	ſ	Overwrite existing file			
	it Name	Start Time	Duration		
₽s	AMPLE-DATA	09/28/16 11:45:37 A	0 Days 19:24:00		
		OK	Cancel		

3. Select the *data file* to be transferred, then click OK.

		SD Card to	PQ Transfer			×
From (Drive: G\				Browse	
Г	Overwrite all existing f	ile names				
To P	File: C:\Program File	es (x86)\MeggerPQ\Data	Engineering Test\Main	s Signaling\\}	Browse	
		Overwrite existing file				
	Test Name	Start Time	Duration			
	SAMPLE-DATA	09/28/16 11:45:37 A	0 Days 19:24:00			
		OK	Cancel			

Merging Multiple Data Files

This feature allows for multiple data file to be merged into a single data file. For data file to be merged they need to have the same aggregations rates. In addition the start time of the second file must be after the end time of the first file. The files are merged 2 at a time. There is no limit as to the total number of data files that can be merged together.

NOTE: Very large data files may cause the slower PC response rates during analysis.

1. Click on FILE then DATA FILE MERGE.

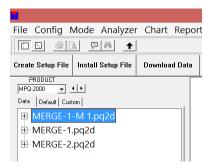
File	Config	Mode	Analyzer	Chart	Repo		
Ν	lew Ever	nt Log		Ctr	+N		
C	Open Eve	nt Log		Ctr	+0		
S	ave Ever	nt Log		Ctr	l+S		
S	Save Log As						
E	dit			Ctr	I+E		
l.	nformati	on					
F	Refresh				F5		
0	Data File Merge						
h	mport				•		
l	mport/Ex	port Se	tup File		•		
C	lear/Co	by SD C	ard				

2. This will open the Merge Dialog window.

	Merge Dialog	×	
Enterl	File Names to Merge:		
File 1:			
C:\Program Files (x86)\MeggerF	PQ\Data\TEST FILE	Browse	
File 2:			
C:\Program Files (x86)\Meggerf	Q\Data\TEST FILE	Browse	
Merged File			
C:\Program Files (x86)\MeggerPQ\Data\TEST FILE Browse			
IC.urrogram Files (xoo).weggerr			
nclude Data	Cverwrite exi	ating file	
nclude Data └──RMS └──All └──Demand └──Unbalance └─ Event	C Overwrite exis	-	
Include Data	C Overwrite exis	-	
nclude Data └──RMS └──All └──Demand └──Unbalance └─ Event	C Overwrite exis	-	
nclude Data TRMS TAll Demand Tunbalance Event THD THD THATMONIC	C Overwrite exis	-	
nclude Data RMS I All Demand Unbalance Event THD Harmonic Inter-Harmonic	C Overwrite exis	-	

- 3. Use the BROWSE buttons to select the two data files to be merged. FILE 1 will be the first file in chronological order and FILE 2 will be the second one in chronological order.
- 4. Use the BROWSE button next to the "Merged File" field to select the desired path of the resulting merged file and to name the file. If nothing is selected then the merged data file will default to the active data folder and will appear in the data file bar and it will be auto-named.
- 5. Select the desired fields to be merged.
- 6. Select OK

The data file will now be created. It will appear in the data file bar provided the data file path was not changed.



Renaming Data Files

This feature allows the data files displayed in the data file bar to be renamed.

- 1. Right click on the desired data file in the data file bar.
- 2. This will open the "File Name Change" window.

File Name Change	×
MERGE-1-M 1	

- 3. Enter the desired name then click on OK.
- 4. The name of the file will now be changed.

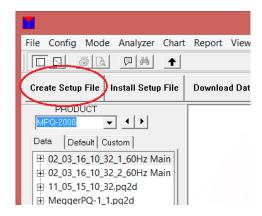
Megger.

7

Creating a Setup File

Creating a Basic Setup File

1. Click on CREATE SETUP FILE



The following screen shall be displayed.

DIRECTIONS for Basic PQ Setup Select Options Select Test Duration Select Type of Test	Save Select Configuration Select Frequency	Advanced C Single Ph C 50 Hz	nase O Delta • 60 Hz	(wy	e O Split	Phase	
A description shall be displayed below. Then SAVE the test so it can be loaded into a PQ. For more detailed setups, select "Advanced" button.	Event Configuration Select Declared Voltage Event Limits (Sags, Swells) Select CT Range		120 10% 6000		₹ 		
Type of Test EN50160 standards te	,		2	3		-	Use jumpers to jump neutrals together. 4th CT Optional

2. Select the desired parameters as described in Table 1.0.

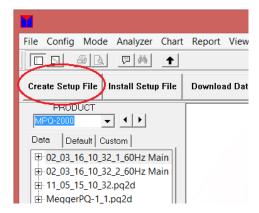
Table 1.0				
Select Configuration:	Select the wiring configuration that the unit will be connected. If the wiring configuration is not displayed then open the advanced setup screen, by clicking the ADVANCED button.			
Select Frequency:	Set the frequency of the fundamental voltage. The unit has a phase lock loop and will lock on the existing frequency. If there should be a power outage then the unit will default back to this selected default frequency.			
Event Configuration / Select Declared Voltage:	Select the nominal voltage that shall be on the network to be measured.			
Event Configuration / Event Limits (Sags and Swells):	This value sets the maximum allowable deviation from the nominal voltage that is permitted. Any RMS value beyond this point triggers an out of limits event.			
CT Range:	Select the full scale range of the CT to be used.			
Select Voltage Ratio (Multiplier):	Input the PT ratio, if a PT is being used.			
Type of Test:	Select the type of test to be performed from the list provided. A description of each test type is provided below this field. The software will analyze the selections and automatically create the optimized setup file.			

Creating an Advanced Setup File

The advanced setup file will allow the operator to configure every parameter in the analyzer setup file.

NOTE: The Megger PQ software has built in safeties to stop an operator from creating a setup file that will overdrive the processor. However there are so many possible combinations of settings that is may be possible to over-drive the processor when creating very aggressive setup files with short storage intervals.

1. Click on CREATE SETUP FILE.



The following screen shall be displayed.

DIRECTIONS for Basic PQ Setup Select Options Select Test Duration Select Type of Test	Save Select Configuration Select Frequency	Advanced C Single Ph C 50 Hz	nase (C (* 60		☞ Wye	C Split F	Phase		
A description shall be displayed below. Then SAVE the test so it can be loaded into a PQ. For more detailed setups, select "Advanced" button.	Event Configuration		120	•	PHA - PHB - PHC - N - G -			L (с
Type of Test	,			•				Use jumpe together. 4	

2. Click ADVANCED to view the configuration pages.

RMS Page

Save	
Program Criteria Phogram Criteria Waveform General Scheduled Run Image: Common Co	PHA PHB PHC N V V V Se jumpers to jump neutrals together. 4th CT Optional

If you want to record Demand Information, which includes KW, KVAR, KVA, PF and DPF the following setup is required. If you do not want to record demand information then de-select *Enable Power Calculations* and proceed to the next step.

Save		
Program Citeria PMS Waveform General Scheduled Run	Power Wiring Connection 4-Wire Wye 3-Watmeter ✓ Enable Power Calculations Demand Interval ✓ Fixed ✓ Stiding Storage Rate: ✓ Enable RMS Recording Record ✓ MIN Ø MAX ✓ RMS ✓ Enable IEC Unbalance Recording Event Configuration Select Declared Voltage Izo Event Limits (Sags, Swells)	PHA PHA PHC Image: Comparison of the state of the sta

Enable Power Calculations: If enabled the unit will record demand information. If disabled the unit will not record demand information.

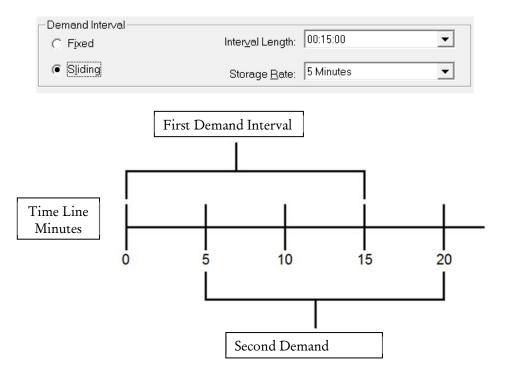
Power Wiring Connection: This needs to be selected if you have enabled power calculations. This selection must match the wiring setup of the unit to the circuit. In order to see selections available; click on the down arrow next to the Power Measurement Method. Then just click on the one you need.

Demand Interval Length: This is the time interval the unit uses to calculate the demand parameters. So if the demand interval length is set to 00:15:00, then the unit will calculate the demand parameters every 15 minutes.

Demand Storage Rate: This is time interval the unit waits until it stores the calculated demand information to the unit's non-volatile memory. So if the demand storage rate is set to "Demand Rate" then the unit will save the calculated demand information to memory every demand interval length.

Demand Interval: The user has a choice of selecting either a fixed window or a sliding window. If a fixed window is selected then at the end of each demand interval the power parameters will be calculated and stored. If a sliding window is selected then at the end of the first demand interval the demand parameters will be calculated. Then from there on, after at the end of each demand storage rate, the window will slide by the amount of time in the demand storage interval and the demand parameters will be calculated and stored again.

Example: With the following Sliding Demand settings this would be the Demand Interval window.



RMS Recording: If you want to record RMS data then the following setup is required. If you do not want to record RMS data then de-select "Enable RMS Recording" and proceed to the next step.

NOTE: If the recording of every RMS cycle is desired, as in a motor start up test then **disable** RMS recording and set the demand recording to 1 cycle.

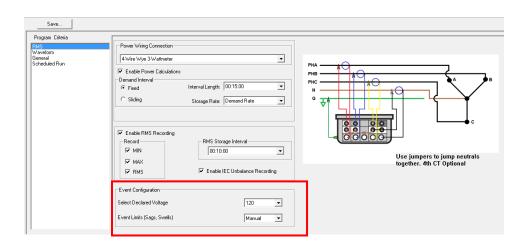
Save		
Program Criteria		
RMS Waveform	Power Wiring Connection	
General Scheduled Run	4-Wire Wye 3-Wattmeter	
	I Enable Power Calculations	РНА
	Demand Interval	
	C Sliding Storage Rate: Demand Rate	° ↓
	I Enable RMS Recording	
	RMS Storage Interval	
	✓ MIN 00:10:00 ▼	Use jumpers to jump neutrals
	MAX	together. 4th CT Optional
	RMS Rable IEC Unbalance Recording	
	- Event Contiguration	
	Select Declared Voltage 120 -	
	Event Limits (Sags, Swells) Manual 💌	
	,	

Enable RMS Recording: With this checked the unit will record RMS data. If this is not checked then the unit will not record RMS data.

RMS Storage Interval: If the RMS Storage Interval is set to time then the unit will save RMS data to memory at the end of the set storage interval. So if time is selected and the time is set to 0000:10:00 then the unit will save the RMS data to memory every 10 minutes. This can be set to 0.2 seconds, 3 seconds 10 minutes or 2 hours.

Record (Min, Max and RMS): At the end of each RMS storage interval the unit will save the minimum RMS value (MIN), the maximum RMS value (MAX) and the average RMS value (RMS) to memory for that interval if Min, Max and RMS are all checked. If any of them are not checked then that value will not be saved to memory.

Enable IEC Unbalance Recording: With this checked the unit will record the unbalance between the phases based on the IEC 61000-27 standards.



EVENT CONFIGURATION

Select Declared Voltage: Select the nominal voltage that shall be on the network to be measured.

Event Limits: This value sets the maximum allowable deviation from the nominal voltage that is permitted. Any RMS value beyond this point triggers an out of limits event.

Setting up the event limits: The user can select event limits, which if exceeded will cause an out of limits event to be recorded in the out of limit reports.

Ca	lculate	Maximum	Recording Ti	ime per 1 GByte:		85 Days	04:48:20					
	teresis Val centage of		2	▼ Ena		o-Cycle Event		Enable <u>P</u> hase E Enable RVC Eve		Rotation		
		· ·	J			075 10 1		_				
Label	Channel	Sag Limit	Swell Limit	SubCycle Limit	Ratio	CT Full Scale	Nom Angle	Angle Dev +/-	RVC Thresh (%)	RVC Hysteresis (%)	Fast Transient (Volts)	THD Limit %
🔽 Va	V1	☑ 108.000	132.000	240.0	1.000		0.00		3.00	10.00	210.000	5.00000
🗹 la	1	0.00000	☑ 6000.00	600.0	1.000	6000.00						5.00000
🔽 Vb	V2	☑ 108.000	132.000	240.0	1.000		120.00	2.00	3.00	10.00	210.000	5.00000
🔽 Ib	12	0.00000	✓ 6000.00	600.0	1.000	6000.00						5.00000
Vc 🔽	V3	☑ 108.000	✓ 132.000	240.0	1.000		240.00	2.00	3.00	10.00	210.000	5.00000
✓ Ic	13	0.00000	☑ 6000.00	600.0	1.000	6000.00						5.00000
🗖 Vn	V4	114.000	5.00000	12.00	1.000				3.00	10.00		5.00000
🗖 In	14	0.00000	6000.00	600.0	1.000	6000.00						5.00000

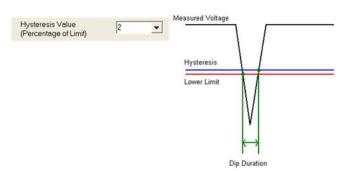
Label: This column allows the user to turn on and off individual channels. It also allows the user to rename the channel. If a channel is checked then it will record data. If a channel is not checked then it will not record data. To rename a channel just highlight the label and type in the new name.

Channel: This column is to let the user know what channel each row is related to. This column is not user adjustable.

Sag Limit: This column allows the user to turn on and off and set the lower limit of each channel. When the limit is checked and a value is set, if the measured RMS value goes below this setting, an out of limits event will occur. This event can be viewed in the out of limits report.

Swell Limit: This column allows the user to turn on and off and set the upper limit of each channel. When the limit is checked and a value is set, if the measured RMS value goes above this setting, an out of limits event will occur. This event can be viewed in the out of limits report.

Hysteresis: This feature allows the user to set a percentage difference between the trigger value that starts an event and the trigger value that ends an event. For example; if a voltage Sag limit is set to 100V this means that if the RMS value drops below 100V an out of limits event begins. If the hysteresis is set to 2 (2% of the limit 100V = 2V) then the event will not end until the RMS voltage rises above 102V instead of 100V. This feature greatly reduces the amount of multiple and false triggers that can be detected. The hysteresis value can be set from 0 to 20. This feature only applies to Sag and Swell events NOT sub-cycle or THD.



Sub-Cycle Limit: This allows the user to program the unit to capture events that last less than 1 cycle (sub-cycle events). In order for option to be active then the "Sub-Cycle Event Capture" must be checked in the setup file and the sag and swell limits must be checked for each channel the user wants to capture sub-cycle events on and a limit must be set. The unit will then compare each sample of each cycle to the corresponding sample of the previous cycle. If the difference is greater than the limit programmed in the setup file then an out of limits event occurs. This event can be viewed in the out of limits report.

Ce	lculate	Maximu	m Re	ecording Ti	me per	1 GByte:		85 Days	04:48:20					
	eresis Va			0	_ (o-Cycle Event		Enable <u>P</u> hase E		Rotation		
(Per	centage (of Limit)		2	•	Cap	iture			Enable <u>R</u> VC Eve	ents	C ABC @ AC	В	
Label	Channe	I Sag Limi	t Sv	well Limit	SubC	ycle Limit	Ratio	CT Full Scale	Nom Angle	Angle Dev +/-	RVC Thresh (%)	RVC Hysteresis (%)	Fast Transient (Volts)	THD Limit %
🔽 Va	V1 -	108.00		132.00	240.0	>	1.000		0.00		3.00	10.00	210.000	5.00000
🔽 la	- 11	0.0000	A C	6000.00	600.0		1.000	6000.00						5.00000
🗹 Vb	V2	☑ 108.00	N (132.000	240.0		1.000		120.00	2.00	3.00	10.00	210.000	5.00000
🗹 Ib	12	0.0000	V (6000.00	600.0		1.000	6000.00						5.00000
Vc 🔽	V3	☑ 108.00) 🔽	132.000	240.0		1.000		240.00	2.00	3.00	10.00	210.000	5.00000
🗹 Ic	13	0.0000) 🔽	6000.00	600.0		1.000	6000.00						5.00000
🗖 Vn	V4	114.00	ם נ	5.00000	12.00		1.000				3.00	10.00		5.00000
🗖 In	14	0.0000	ם ו	6000.00	600.0		1.000	6000.00						5.00000

Ratio: This value is used when the unit is measuring the secondary of a step down transformer. This value will be multiplied by the actual measured value the unit reads and recorded. This will allow the unit to record primary values.

CT Full Scale: This value should be set to the full scale value of the current probe being used. The current probes used with this unit actually output 0-1 volt to the unit. So if a 6000A CT is being used and the MPQ unit measures the input from the 6000A CT as 0.5V this value will then be multiplies by the CT full scale value. The MPQ unit will record the 0.5V output from the 600A CT as 3000.0 Amps.

Nom Angle: These fields allow the user to select the nominal voltage phase angles for phase B and C, as referenced to phase A. These angles are used for calculating the phase deviation when "Enable Phase Events" has been selected.

Angle Dev (+/-): These fields allow the user to select the phase shift trigger value. When the voltage phase angles for phase B or C exceed these limits a phase angle event will be triggered, when "Enable Phase Events" has been selected.

Rotation: This field allows the user to select the phase rotation that will be used to calculate phase events, when "Enable Phase Events" has been selected. Please note the unit must be connected in the same phase rotation as selected to insure the proper triggering of phase events.

RVC Threshold (%): This value is set to a percentage of the declared voltage. (The declared voltage is set on the General page of the advanced setup. The declared voltage represents the nominal voltage of the line under test. After a steady state condition has been achieved an RVC event will be triggered when a single Urms(1/2 cycle) interval deviates by more than the RVC Threshold from the declared voltage.

RVC Hysteresis (%): This value is set to the percent of the RVC threshold. The RVC event will end (in a 50Hz system) when 100 consecutive Urms(1/2 cycle) intervals do not deviate more that the RVC Event End Threshold from the RVC Interval. The RVC event will end (in a 60Hz system) when 120 consecutive Urms(1/2 cycle) intervals do not deviate more that the RVC Event End Threshold from the RVC Interval.

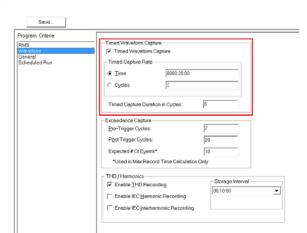
Fast Transient (Voltage): The high speed transient function will capture high speed transients from 1 to 64µsec. The high speed transient limit is a value that is set relative to 0V. When programmed this value must be higher than the standard sub-cycle limit. It is recommended to be at least 2x the peak voltage. The Megger PQ software will not allow the operator to set the High Speed transient limit to less than the 175% of the declared voltage. This will help ensure a low trigger does not trigger false transient events.

THD Limit: If this is checked and a limit is set it will allow the unit to record Total harmonic Distortion events. If the total harmonic distortion exceeds the user programmed percentage of the fundamental amplitude then a THD event will be recorded. This can be viewed in the out of limits report.

When the RMS page setup configurations are complete; click on *WAVEFORM* to proceed to the *Waveform Capture and Harmonic Setup* page.

Program Critoria		
PMS	Timed Waveform Capture	
Waveform	Timed Waveform Capture	
General Scheduled Run	- Timed Capture Rate	
	© <u>T</u> ime 0000:201	00
	C Ogeles 2	
	Timed Capture Duration in Cycles:	6
	Exceedance Capture	
	Ere-Trigger Cycles:	2
	Post Trigger Cycles:	20
	Expected # Of Events*:	10
	*Used in Max Record Time Calcu	lation Only
	THD/Harmonics	
	Enable IHD Recording	Storage Interval
	Enable IEC Harmonic Recording	00:10:00
	Enable IEC Interharmonic Record	ding
	Enable IEC Interharmonic Record	ding

Waveform Page



Timed Waveform Capture: When this feature is enabled the unit will record waveforms on all enabled channels periodically. If this feature is disabled the unit will still capture waveforms triggered by out of limit events.

Timed Capture Rate: This field instructs the unit how often to record waveforms. This can by time or by cycles.

Timed Capture Duration: This field defines how many cycles will be captured for each timed triggered waveform capture.

Exceedance capture: Allows the configuration of event triggered waveforms.

Program Critoria PMS Wönetform General Scheduled Pun	Timed Wevelom Capture Timed Vevelom Capture Timed Capture Rate C Time C Time C Time C Occles C C C Occles C C C C C C C C C C C C C C C C C C
	Timed Capture Duration in Cycles: 6
	- Exceedance Capture
	Pre-Trigger Cycles: 2
	Post Trigger Cycles: 20
	Expected # Of Events*.
	"Used in Max Record Time Calculation Only
	THD / Harmonics
	Enable IHD Recording 0010:00
	Enable IEC Harmonic Recording
	Enable IEC Interharmonic Recording

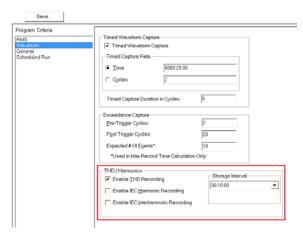
Pre-Trigger Cycles: If an "Exceedance Trigger Mode" is being used then the unit can be programmed to capture a pre-trigger cycle. This would be the cycle before the actual cycle that caused the exceedance event. The unit can capture up to 9 pre-trigger cycles per waveform capture.

Post Trigger Cycles: This will tell the unit how many cycles to capture after the first cycle. The unit can capture up to 99 post-trigger cycles per waveform capture.

Example: If the user programs in 1 pre-trigger cycle and 10-post trigger cycle, the unit will capture 12 cycles each time a waveform capture occurs.(i.e. 1 Pre-trigger, the actual cycle and 10 post trigger cycles)

Expected # Of Events: If waveform capture is set to exceedance mode then the number of waveforms captured will depend on how many times the inputs to the unit exceed their programmed limits. This means the software cannot accurately determine the "Maximum Recording Time" the unit can record. So the user can program in the expected number of events, then press the calculate button in the software. This will show the user how long the unit will record if that number of waveform captures occur (this is only an estimate). This does not affect the unit's programming at all; it is just a tool so the user can get an idea of how long the unit can record.

THD / Harmonics: Allows configuration of the aggregation rate of continuous THD and Harmonic recording.



Enable THD Recording: When this feature is enabled the unit will record Total Harmonic Distortion (THD) continuously for all enabled channels.

Enable IEC Harmonic Recording: When this feature is enabled the unit will record Harmonic continuously for all enabled channels. This is performed per IEC standards.

Enable IEC Interharmonic Recording: When this feature is enabled the unit will record Inter - Harmonic continuously for all enabled channels. This is performed per IEC standards.

Storage Interval: This field instructs the unit how often to aggregate and record the THD, Harmonic and Inter-harmonic data. This field can be set to 0.2 seconds, 3 seconds, 10 minutes or 2 hours.

When the Waveform page setup configurations are complete; click on GENERAL to proceed to the *General Setup* page.

General Page

RMS Waveform Gonoral Scheduled Run	C 50 Hertz			
	Analyzer Tag:	EN50160		
	Clock Hour Orientation	1	🔽 Enab	le Frequency Recording
	 Enable IEC Flicker Re 	Enable IEC Flicker Recording		
			*Not All	lowed (Harmonics Enabled
	- Mains Signaling			
	Enable Mains Signa	aling		
	Signaling Frequency 1 (H	2) 1300.0		
	Detection Threshold 1 (%	5.0		
	Signaling Frequency 2 (H	z) 700.0		
	Detection Threshold 2 (%	5.0		
	Interval (Seconds)	3	Ŧ	

Default Frequency: This sets the frequency the phase lock loop will default to should the measured frequency drop below 42.5 Hz.

Analyzer Tag: This field allows you test set a descriptor of the test for reference purposes. These descriptors will match the test types indicated in the basic set up screen

Clock Hour Orientation: If this is checked it will cause the unit to delay recording until the next synchronized storage interval. The unit divides an hour into whole number of storage intervals. When asked to record, it will delay recording until its real time clock reaches the beginning of one of these storage intervals.

Enable Frequency Recording: With this checked the unit will record the frequency of the phase A voltage input channel.

Enable IEC Flicker Recording: With this checked the unit will record IEC Flicker per the IEC61000-4-15 specification (Pst and Plt) on Phase A, B and C voltage channels.

Enable Instant Flicker Recording: With this checked the unit will record instantaneous flicker every 200ms on Phase A, B and C voltage channels. <u>When</u> <u>Instant Flicker Recording is enabled the unit cannot record harmonics or inter-</u><u>harmonics</u>.

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RMS Waveform Scheduled Run	Default Frequency O 50 Hertz 60 Hertz			
	Analyzer Tag:	EN50160		
	Clock Hour Orienta	tion	🔽 Ena	ble Frequency Recording
	 Enable IEC Flicker 	Recording	End	ble Instant Flicker Recording
			*NotA	llowed (Harmonics Enabled
	-Mains Signaling	gnaling		
	Signaling Frequency 1	(Hz) 1300.0)	
	Detection Threshold 1	(%) 5.0		
	Signaling Frequency 2	(Hz) 700.0		
	Detection Threshold 2	(%) 5.0		
	Interval (Seconds)	3	•	

Mains Signaling: Allows the configuration of the trigger points for the mains signaling events.

Enable Mains Signaling: The mains signaling function looks for two separate frequencies. One frequency (signal frequency 1, for example) could be the frequency to turn off an appliance while the other frequency (signal frequency 2, for example) is the frequency to turn on an appliance.

Signal Frequency 1 (Hz): Set this to the desired frequency in Hz. (70Hz - 3000Hz) A mains signaling frequency is a frequency between 70Hz & 3000Hz.

Detection Threshold 1 (%): This is the trigger that initiates the event detection. This is measured as a percentage of the declared voltage.

Signal Frequency 2 (Hz): Set this to the desired frequency in Hz. (70Hz - 3000Hz) A mains signaling frequency is a frequency between 70Hz & 3000Hz.

Detection Threshold 2 (%): This is the trigger that initiates the event detection. This is measured as a percentage of the declared voltage.

Scheduled Run Page

Scheduled Run: Allows the MPQ unit to be configuration to automatically start recording at a specific time and record for a specified duration.

Program Criteria			
RMS Waveform General Scheduled Run	Scheduled Run Enable Scheduled Run Date: Time:	09/29/16 11 AM	
	Length of Recording:	Days 100	Hours 0

Megger_a

Enable Scheduled Run: When this field is enabled the unit will start recording at the specified date and time, and stop recording after the programmed length.

Date: Enter the date you wish the unit to start recording.

Time: Select the time you wish the unit to start recording.

Length: Enter the length you want the unit to record for, in days and hours.

Save the Setup File

Saving a Setup File: After a setup file is created, it can be saved by clicking SAVE.

Save			
Program Criteria EMS Veveform Seneral Scheduled Run	Power Wiring Connection 4-Wire Wye 3-Wattmeter Fnable Power Calculation Demand Interval Fixed Sliding	ons Interval Length: 00.15.00 Storage Rate: Demand Rate	•
	Enable RMS Recording Record MIN F MIN F MAX F RMS Event Configuration Select Declared Voltage Event Limits (Sags, Swells)	PMS Storage Interval 00:10:00 Enable IEC Unbalance Recording 230	•

The software will then prompt the user to name the file. The file will then be saved in the setup folder. After the setup is saved the file can be viewed in the *Data File Bar* by clicking CUSTOM.

Window H	View	Report	Chart	Analyzer	ig Mode	File Conf
			1	P M	<i>8</i> d	
Verif Connec	d Data	Downloa	File	nstall Setuj	tup File	Create Se
] • •	DUCT	PR MPQ-20
				stom	Default Cu	Data
					_DEMO_W	
1				WYE.pq2s	_EN50160_	230V

8

Viewing Downloaded Data

The MPQ-MPQ Analyzer software allows the user to view recorded data as either text reports, or in chart format. The software also allows the user to export the recorded data to Excel, for further custom analysis. This section of the manual will describe the various software features available for charts and reports.

Charting Data

The software allows you to create the following type of charts.

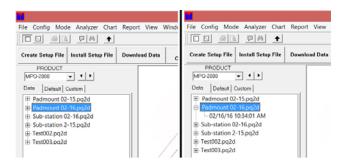
- RMS Data
- Imbalance
- Waveform
- Demand(KW, KWH, KVAR, KVARH, KVA, KVAH, DPF and TPF)
- THD / TDD
- Harmonics
- Flicker PST / PLT

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Creating a Chart

1. Highlight the data file you wish to review.

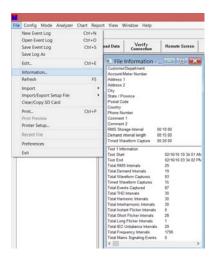
NOTE: Click the Plus (+) sign next to the data file to see the date and time of the start of the test.



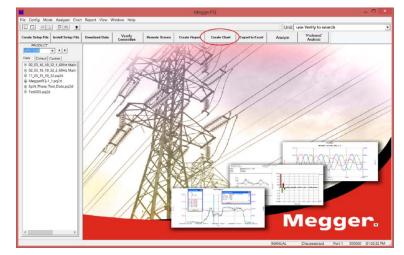
2. Viewing File Information. File information will allow the user to view any input customer information, the date the test started, the date the test ended, the total number of intervals in the test and the total number of waveform captures in the test.

To view this information, do the following.

- a. Highlight the desired data file in the Data File Bar.
- b. Click FILE.
- c. Click INFORMATION.



- 3. To create a chart, do the following.
 - a. Highlight the desired test in the data file bar.
 - b. Click CREATE CHART.



c. Select the desired chart type.

Chart types include the following, provided the data exists in the data file and the chart is enabled on the preferences screen.

Chart Types	Description
RMS	RMS values of all enabled voltage and current channels.
Phase to Phase	Phase to Phase RMS values in wye connected configurations.
Demand	Power, energy and power factor parameters.
Waveform	All recorded waveforms, both event triggered and time triggered.
ANSI Unbalance	ANSI voltage and current unbalance.
IEC Unbalance	Symmetrical components. Negative and zero sequence are actual RMS values. Negative and zero sequence factors are displayed as a percentage of the positive sequence. Per IEC61000-4-27.
Frequency	Frequency of Phase A voltage.
IEC Harmonics	Trended voltage and current harmonics and inter-harmonics per IEC61000-4-7. View as RMS or as percentage of fundamental.
тно	Trended Total Harmonic Distortion per IEC61000-4-7.

Chart Types	Description
TDD	Current Total Demand Distortion. Referenced to maximum average current during the test or a manual reference can be entered.
IEC Flicker	Phase A, B and C voltage flicker per IEC61000-4-15
Mains Signaling	Trend of mains signaling ripple frequency occurrences.
CBEMA	View dips, swells and sub-cycle events on a CBEMA curve. Clicking the event points on the graph will open the event.

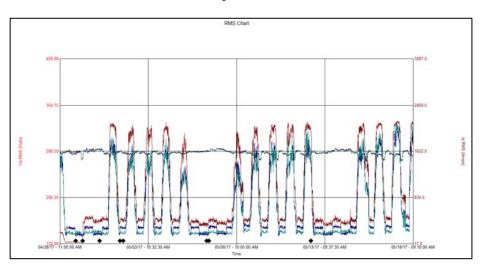
- d. Fill out the chart setup as desired.
- e. Then click CREATE.

File Config Mode Analyzer C	hart Report View	v Window Help					Link T	use Verify to sea	ech.	3.0
rate Setus File Install Setus File	Downland Data	Verify Connection	Remote Screen	Create Report	Create Chart	Expert to Excel	Analyze	Preferred	run	
PRODUCT	Overte Oner Type	Let Auto	high Keis	antine Innet		[Analysis		
Determine [Centermine] # Q2,03,15,03,21,50424 Main # Q2,03,15,10,32,1,50424 Main # 11,05,15,10,32,2,4042 Main # Megger/Q2-1,1xq2d # Spirt,Phase,Test,Data.pq2d # Test005,pq2d	Demand Weyelons AND Unbelance Frequency EC Hermonics (61) THD	205-4-30)	τα	11,23/15 et	(02.00.00 PM (06.30.00 AM	PO Event Wavefort Analysis	Advenced Date	Analysis or of limit events. Sort ev event waveforms	vents	
	TOD EC Picker (\$1000-415)		Major Tuck Mark Intervet 001152:30		the hermonic spe-		nitysis of waveforms. An c spectrum of periodic rom II to 129th order.	0 to 100th order.		
			[™] [DetSceling		[25% <u>v</u>]	Dement Angelons				
	Via MNI (Volta) Via RMS (Volta) Via RMS (Volta) Via MAX (Volta) Via MAX (Volta) Via RMS (Amps) Via RMS (Amps) Via MNX (Amps) Via MNX (Amps)	000000 F 000 1 000000 F 000	006 2008 Sol 009 2008 Sol 000 2008 Sol 000 2008 Sol 000 2008 Sol 000 2008 Sol 000 2008 Sol							
	Vo RMS (Volts) Vo RMS (Volts) Vo MAX (Volts) to MN (Amps) to RMS (Amps) P to MAX (Amps)	F 000000 F 000 F 000000 F 000 F 000000 F 000	000 Sol 000 Sol 000 Sol	ia ia						

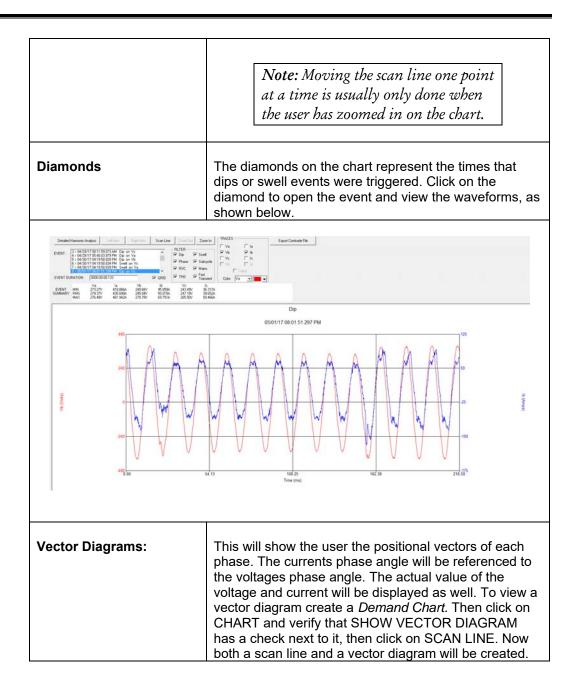
Chart Type:	Allows you to select the type of chart you wish to create. Highlight the chart type you wish to create by clicking on it once.
Chart Title:	In this location you can enter a label. This will appear on the chart and on the print out.
Time Axis:	This is the start and end time of the plot. This is user selectable.
Major Tick Interval:	Lets the user know the amount of time between the vertical grid lines in the generated chart. This is not user selectable; it is a function of the start and stop sign.
Show Grid Lines:	Allows the user to either display or not display the grid lines on the generated charts.
Flag Data during Sags or Swells:	Will display markers on the chart that indicate an out of limits event was occurring during that interval.

Chart Scaling:	This field provides a method of auto scaling. The chart scaling shall be set to a percentage above the peak value displayed in the chart trace. This field can be set to either 10%, 25%, 50%, 75% or 100%.
Trace:	Allows the user to plot specific channels. Just select the check box next to the desired trace title. If the check is present then that channel shall be plotted. If the check is not present then that trace shall not be plotted.
Y axis MIN - Y axis MAX:	This field enables the user to manually set the Y axis range of the chart. If a box is not checked then the software will auto scale that channel. If a box is checked then the software will use the user input value for the range.
Line Color:	Allows the user to select the line color of each trace.
Line Type:	Allows the user to select either a solid or a dashed line for each trace.

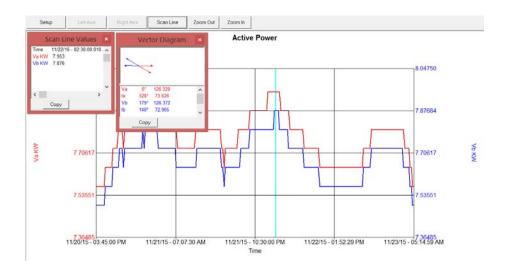
f. Once the chart is created there are various charting tools that can be utilized to help view the data.



Left Axis – Right Axis:	Allows the user to view the scale for various traces on the chart. Click the RIGHT AXIS or LEFT AXIS buttons. The <i>Label</i> and <i>Scale</i> on the right or left axis will then scroll showing the scale for the different traces.
Scan Line:	A scan line will tell the user the exact value of any point on the graph and the exact time this value occurred. To create a <i>Scan Line</i> first create a chart then click on SCAN LINE. To move the scan line, move the arrow on the screen using the mouse. Then right click on the location in which you want the scan line. If you wish to move the scan line one recorded point at a time then press the left or right arrow keys.



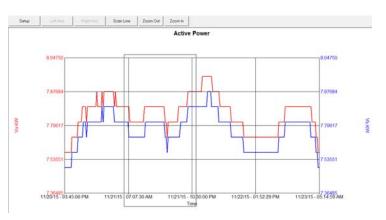
See picture below for examples of Scan Line and Vector Diagram.



Zoom:

To zoom in on portions of the chart using the mouse place the arrow on the chart. Then hold down the left key of the mouse and drag the mouse diagonally across the chart. A dotted line box should appear. When you release the left mouse key the chart will zoom into the area within the dotted line box. Or, just click on the ZOOM IN Button.

See below picture for example of ZOOM



Zoom Out:

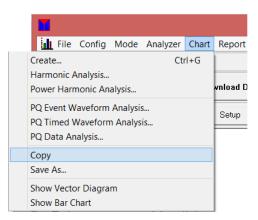
To Zoom Out just click on the ZOOM OUT button.

Event:

This feature allows the user to scroll through the waveform captures, by clicking on the up / down buttons. This feature applies to the Waveform Charts ONLY.

- 4. To copy a chart into Word, do the following.
 - a. Create the chart using Metrosoft for Windows software.

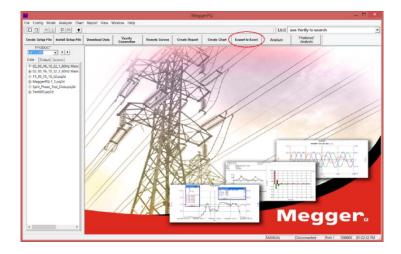
- b. Click CHART.
- c. Click COPY.



5. The chart is now in the computer clipboard. It can now be pasted into Word.

Exporting Data to Excel

1. Select the desired data file in the data file bar then click EXPORT TO EXCEL.



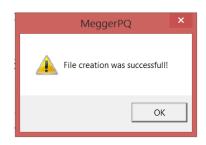
2. The following screen appears. Click on either RMS or DEMAND.

Export Data to Excel				
Input Data File C:\Program Files (x86)\MeggerPQ\Data\Engineering Test\Mains Signalin	Test Number			
Excel File Name C:\Program Files (x86)\MeggerPQ\Data\Engineering Test\Mains Signalin	Browse	J		
RMS Demand	Quit]		
Harmonics C Interharmonics				

a. The export shall now begin

	Export Data	to Excel	2
Input Data File C:\Program Files (x	86)\MeggerPQ\Data\Engineer	ing Test\Mains Signalin	Test Number
Excel File Name C:\Program Files (>	(86)\MeggerPQ\Data\Engineer	ring Test\Mains Signalin	Browse
RMS	Demand		Quit
	Harmonics	C Interharmonics	

b. The following message shall appear when the export is complete.

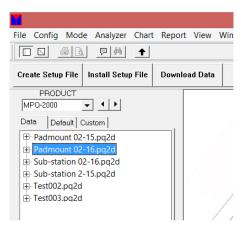


Detailed Harmonic Analysis

The MPQ-MPQ Analyzer software has the ability to create a detailed harmonic analysis of any captured waveform. This feature will analyze any single cycle through the 128th harmonic. The data will be presented as either text data or as a bar chart.

Creating a Detailed Harmonic Analysis

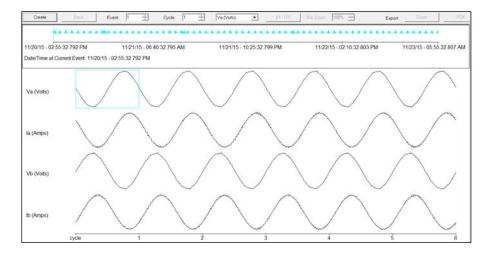
1. Select desired data file by highlighting data file in Data File Bar.



2. Click on CHART / HARMONIC ANALYSIS.

	File	Config	Mode	Analyzer	Chart	Report
Crea	te			Ctr	rl+G	
Harr	nonic A	Analysis				
Pow	er Harn	nonic An	alysis			Downlo
PQ Event Waveform Analysis PQ Timed Waveform Analysis PQ Data Analysis						
Copy Save As						
	w Vecto w Bar C	or Diagra hart	m			

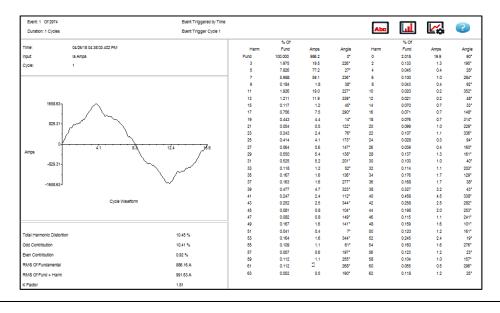
The following screen will open.



This screen shall support the following features.

Create:	When CREATE is clicked a detailed harmonic analysis shall be created for the cycle that is selected.
Event:	This feature allows the use to scroll through the various recorded waveforms.
Cycle:	This feature allows the user to place the select box over different cycles within the waveform capture.
Channel:	This feature allows the user to place the select box over cycles of different channels within the waveform capture.

- 3. Select the desired cycle to be analyzed, by clicking on it.
- 4. Click CREATE. The following detailed harmonic analysis shall be created.



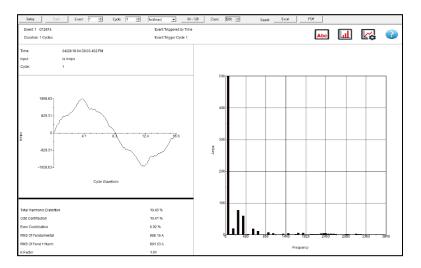
This screen shall display the amplitude of each harmonic, through the 128th as a percentage of fundamental. This screen will also display the Odd and Even contribution as well as displaying the RMS value of the fundamental without harmonics.

In order to select another cycle to be examined, click SETUP to back up one screen. Or, you can scroll through the channels and cycles using the EVENT and PHASE up / down keys.

5. **Creating a BAR CHART:** In order to display a bar chart, click on CHART icon. To view the text data, click on the TEXT icon.

		Abc		L?	?
Amps	Angle			Amps	Angle
986.2	0.	<u> </u>	2.018	19.9	90*
19.5	226*	2	0.133	1.3	195*
77.2	27*	4	0.045	0.4	28*
59.1	236*	6	0.100	1.0	284*
1.8	38"	8	0.043	0.4	92*
19.0	227*	10	0.020	0.2	352*
11.9	339*	12	0.021	0.2	48*
1.2	45*	14	0.070	0.7	33*
7.5	290*	16	0.071	0.7	148*

When selected, the following bar chart shall be displayed.



Click on the CHART SETTINGS icon to modify the chart axis.

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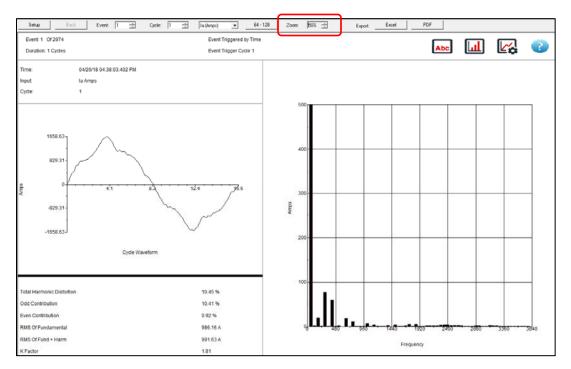
		Abc			2
			% Of	1 1	
Amps	Angle	Harm	Fund		Angle
986.2	0*	0	2.018	19.9	90*
19.5	226*	2	0.133	1.3	195*
77.2	27*	4	0.045	0.4	28"
59.1	236*	6	0.100	1.0	284*
1.8	38*	8	0.043	0.4	92*
19.0	227*	10	0.020	0.2	352*
11.9	339*	12	0.021	0.2	48*
1.2	45*	14	0.070	0.7	33*
7.5	290*	16	0.071	0.7	148*

The chart axis options screen.

Options	×
Chart © Value	0
 C Percentage Display G Frequency 	
C Order	ancel

The Y axis, or "Chart" axis, can display the harmonic amplitudes as either a percentage of the fundamental (ideal for AC analysis) or as actual voltage values (ideal for DC analysis)

The X axis, or "Display" axis, can display the harmonic frequency bands as either an actual frequency (ideal for DC analysis) or as a harmonic order (ideal for AC analysis).

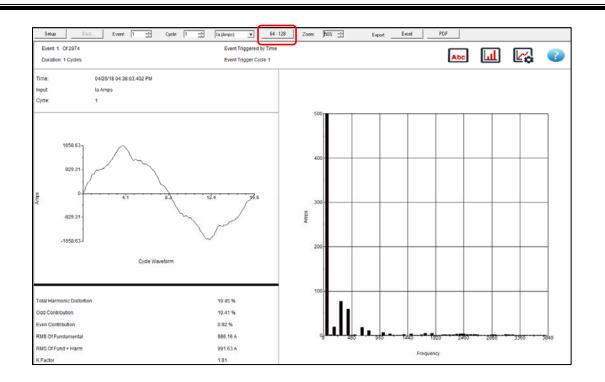


The scale of the harmonic bar chart can be adjusted using the *Bar Zoom* feature.

Viewing High Frequency Harmonics

The Megger PQ software allows you to view the harmonic up to the 128th order.

To view the 64th through 128 harmonic orders, click 64-128 button.

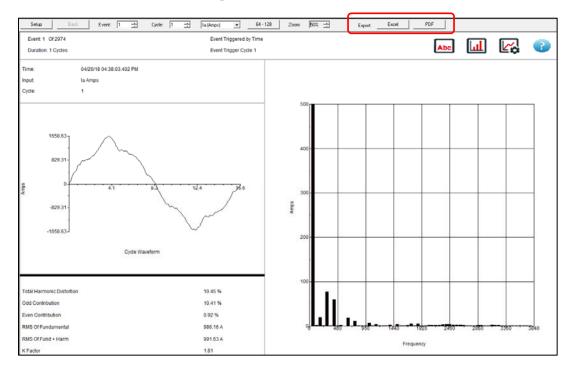


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Printing Harmonic Report

The Megger PQ software allows you to export the harmonic data as either Excel data or in a PDF report.

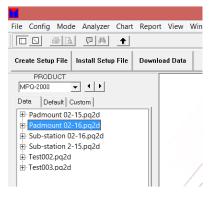
- a. To export the data to an excel file click EXCEL.
- b. To export the data to a PDF file click PDF.



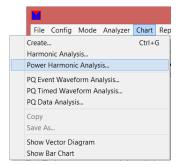
NOTE: If 0-63 is selected report will consist of only these orders. If 64-128 is selected report will consist of all orders.

Viewing Harmonic Direction

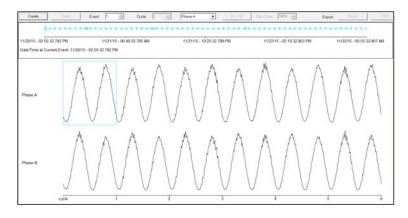
1. Select desired data file by highlighting the *data file* in *Data File Bar*.



2. Click on CHART / POWER HARMONIC ANALYSIS.



The following screen will open.



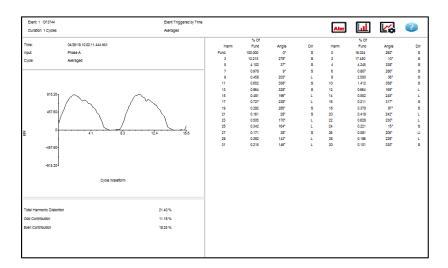
This screen shall support the following features.

Create: When this button is clicked a detailed harmonic analysis shall be created for the cycle that is selected.

NOTE: If a current cycle is <u>below</u> 10 amps then a detailed Harmonic analysis will not be available.

- **Event:** This feature allows the use to scroll through the various recorded waveforms.
- **Cycle:** This feature allows the user to place the select box over different cycles within the waveform capture.
- **Channel:** This feature allows the user to place the select box over cycles of different channels within the waveform capture.
 - 3. Select the desired cycle to be analyzed, by clicking on it.
 - 4. Click CREATE.

The following detailed power harmonic analysis shall be created, with harmonic directions.



S = Source, L = Load and U = Undefined (Too small to determine)

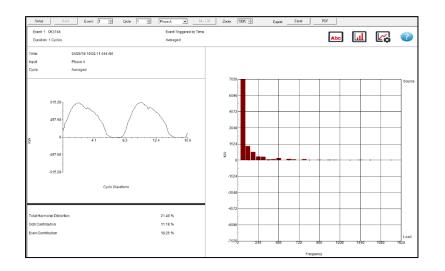
This screen shall display the amplitude of each harmonic, through the 31st as a percentage of fundamental. This screen shall also display the Odd and Even contribution as well as displaying the RMS value of the fundamental without harmonics.

In order to select another cycle to be examined, click on SETUP to back up one screen. Or you can scroll through the channels and cycles using the EVENT and PHASE up / down keys.

5. **Creating a BAR CHART:** In order to display a bar chart, click on CHART icon. To view the text data, click on the TEXT icon.

		Abc			?
Amps	Angle			Amps	Angle
986.2	0.		2.016	19.9	90"
19.5	226*	2	0.133	1.3	195*
77.2	27*	4	0.045	0.4	28*
59.1	236*	6	0.100	1.0	284*
1.8	38"	8	0.043	0.4	92*
19.0	227*	10	0.020	0.2	352*
11.9	339*	12	0.021	0.2	48*
1.2	45*	14	0.070	0.7	33*
7.5	290*	16	0.071	0.7	148*

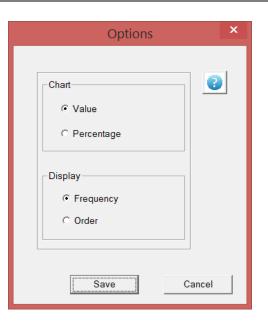
The following bar chart shall be displayed.



Click on the CHART SETTINGS icon to modify the chart axis.

		Abc	ш		?
			% Of		
Amps	Angle	Harm	Fund		Angle
986.2	0.	0	2.018	19.9	90"
19.5	226*	2	0.133	1.3	195*
77.2	27*	4	0.045	0.4	28"
59.1	236*	6	0.100	1.0	284"
1.8	38"	8	0.043	0.4	92*
19.0	227*	10	0.020	0.2	352*
11.9	339*	12	0.021	0.2	48"
1.2	45*	14	0.070	0.7	33*
7.5	290*	16	0.071	0.7	148*

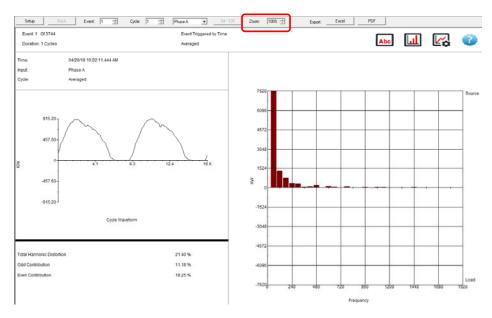
The chart axis options screen is on the following page.



The Y axis, or "Chart" axis, can display the harmonic amplitudes as either a percentage of the fundamental or as actual voltage values.

The X axis, or "Display" axis, can display the harmonic frequency bands as either an actual frequency values or as a harmonic order.

The scale of the harmonic bar chart can be adjusted using the Bar Zoom feature.



PQ Event Waveform Analysis Screen

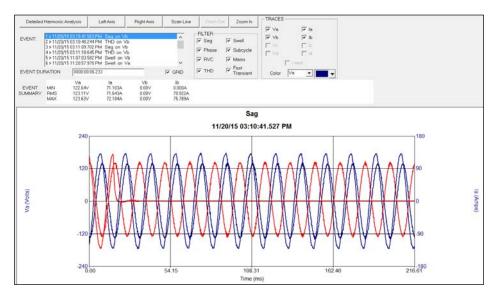
1. Select desired data file by highlighting *data file* in *Data File Bar* and then click CREATE CHART.



The following screen will open.

Create Setup File	Download Data	Votify Connection	Hemote Scre	en 🛛 Create Rep	ort Create Ch	art Expert to Excel	Analyze	"Preferred" Analysis	
PRODUCT	Create	Let.Avia	Agitara	Scalute 2	loon Die Zoon	in.			
Dote Defeats Custom	Cost Type		CroriTile	Панасные		_			
 B 02 03 16 10 32 1 60Hz Main B 02 03 16 10 32 2 80Hz Main B 11_05_15_10_32_280Hz Main B 11_05_15_10_32_pa2d B MeggerK2-1_1.pa2d B Split_Phase_Test_Data.pa2d B Test005.pa2d 	Evel Demand Wrwitnen ANSIUrbalance Prequency ECHarmonics (63 THD TID	1000000	Time Akis From To: Major Tick Mark (11,20,15 11,20,15 11,20,15	9 010000PM 9 063000AP	PO Even: Wavel Zonijski	and boolyze	ul of last avoats. Sort a event severiorms. a ysis of weiveforms. Au	
	EC Floker (61010	-+-(2)	IF ShowGridtung IF Registration	ig Bags or Swells	18%	PO Times Waterbarr Analy Demand Analy	es bevelorente	sbecham of periodic om 0 to 128th once over and one of	
		C00000 C C00000 C C00000 C C00000 C C00000 C	000000	Line Type Sold Sold Sold Sold Sold Sold					

2. Click on the PQ Event Waveform Analysis and the following screen shall open.



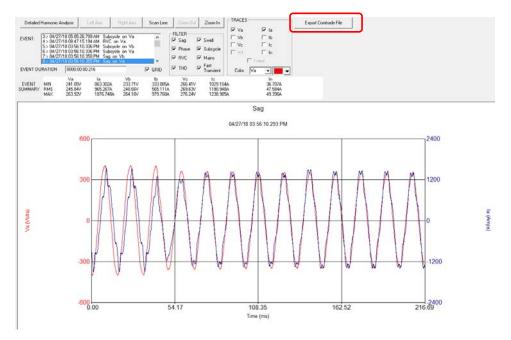
This screen shall support the following features.

Left Axis:	When this button is clicked the Y axis label and scaling, on the left side of the chart will cycle through the traces displayed on the chart.
Right Axis:	When this button is clicked the Y axis label and scaling, on the right side of the chart will cycle through the traces displayed on the chart
Scan Line:	This button will enable and disable the scan line on the chart.
Zoom Out:	This button will Zoom out of any Zoomed in views on the chart.
Zoom In:	This button will Zoom In on the traces of the chart.
Event:	This window will display all the events recorded in the test interval.
Filter:	The filter will allow to user to only view the selected event types in the Event Window.
Traces:	Allows the operator to select the desired channels that will be viewed in the advanced analysis chart.
Color:	Allows the operator to select the colors of the various traces in the advanced analysis chart.
Event Duration:	Displays the duration of the event selected in the Event Window.
Event Summary:	Displays the event data of the event selected in the Event Window.
Grid:	Allows the operator to turn on and off the grid lines in the advanced analysis chart.

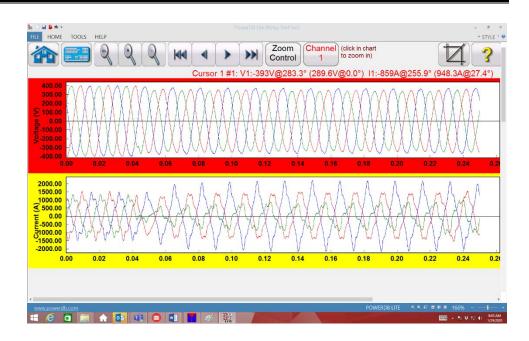
COMTRADE EXPORT

Any event recorded on the MPQ analyzer can be exported as a Comtrade file. These events include dips, swells, high speed transients, sub-cycle waveform distortions, THD, RVC, Mains Signaling Communications as well as phase shift deviation events. Any of these events will trigger waveform captures up to 10 seconds in duration on all channels simultaneously. These events can then be exported as Comtrade files and then played back on a Megger SMRT or equivalent.

To export an event as a Comtrade file, select the desired event then click on the EXPORT COMTRADE FILE button.



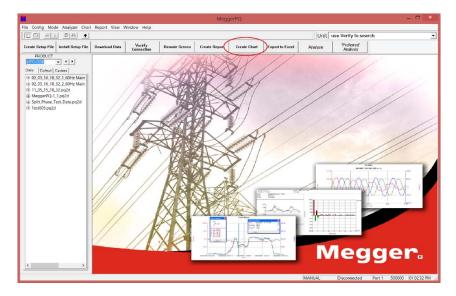
The Comtrade file can then be played back on a Megger SMRT or equivalent device.



Timed Waveform Analysis Screen

This feature allows the operator to analyze timed waveform captures. The software will average together the waveform cycles and then calculate the individual harmonic orders. This screen will trend the individual harmonic orders, display the raw waveforms and show a detailed harmonic bar chart of the selected waveform.

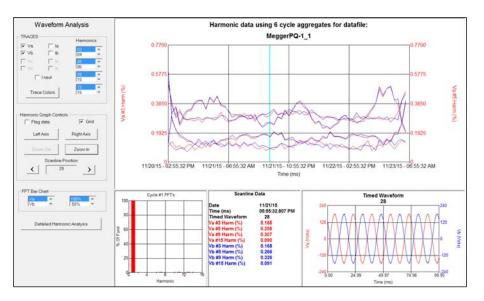
1. Select desired data file by highlighting *data file* in *Data File Bar* and then click CREATE CHART.



The following screen will open.

			Megg	erPQ - [Chart -]	MeggerPQ-1_	1.pq2dj				
File Config Mode Analyzer C	hart Report View	Window He	ip .				14			- 4
							Unit	use Verify to se	arch	
ate Setup File Install Setup File	Download Data	Verify Connection	Remote Screen	Create Report	Create Chart	Export to Excel	Analyze	"Preferred" Analysis		
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ta Defeuit Custom	Chart Type	-	Chart Title	PMS CHart		1			_	
02,03,16,10,32,1,60H2 Main 0,03,16,10,32,2,60H2 Main 11,05,15,10,32,p042 MeggerP0-1,1pq2d Spiti,Phare,Text,Datapq2d Test005,pq2d	Bucs Demand Wawitom ANSI Unbefonce Friequency IEC Hemonics (510 THD TED TED TED TED TEC Flicker (5100-	2.02	100 N	et.	[03.00.00 FM [06.30.00 AM [0015 52:30	PO Ever/Waveform Analysis PO Timed Waveform Analysis Cammid Analysis	Plamonic an Methomonic weveforms b	vrages at of limit events. Sort sevent weweltoms. alysis of waveforms. spectrum of periodic on 8 to 128th order.	Anelyze	
	Va MIN (Volta) Va RMS (Volta) Va RMS (Volta) Va RMS (Volta) Ta RMS (Mnps) fa RMS (Annps) fa RMS (Annps) for Ita MAX (Annps) for Ita MAX (Annps) for Vb MIN (Volta) for Vb MIN (Volta) for Vb MIN (Annps) for MIN (Annps)	000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00 000000 [] 00	0000 Soil 0000 Soil	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4						

2. Click PQ Timed Waveform Analysis and the following screen shall open.



This screen shall support the following features.

Left Axis:	When this button is clicked the Y axis label and scaling, on the left side of the chart will cycle through the traces displayed on the chart.
Right Axis:	When this button is clicked the Y axis label and scaling, on the right side of the chart will cycle through the traces displayed on the chart.
Scan Line:	This button will enable and disable the scan line on the chart.
Zoom Out:	This button will Zoom out of any Zoomed in views on the chart.
Zoom In:	This button will Zoom In on the traces of the chart.

Harmonics:	Allows the operator to select the harmonics to be viewed in the trended harmonic chart.
Waveform Event:	This window will display the waveform event being analyzed.
Traces:	Allows the operator to select the desired channels that will be viewed in the advanced analysis chart.
Color:	Allows the operator to select the colors of the various traces in the advanced analysis chart
FFT Bar Chart:	Allows the operator to select the channel to be viewed in the bar chart. In addition it allows the operator zoom in and out of the bar chart.
Detailed Harmonic Analysis:	Short cut key that allows the operator to view the waveform being analyzed in the detailed harmonic screen.
Grid:	Allows the operator to turn on and off the grid lines in the advanced analysis chart.
Trace Colors:	This selection allows the user to select the trace colors for each phase.

Megger.

9

Creating Reports

The MPQ-MPQ Analyzer software allows the user to view recorded data as either text reports, or in chart format. This section of the manual will describe the various software features available for reports.

Report Types

The software allows you to create the following type of charts, provided the data is available. (See Table 2.0 for descriptions)

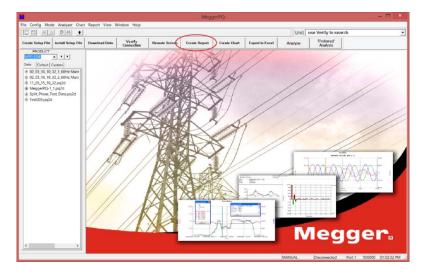
- Tabular: V/I Data (RMS Voltage and Currents)
- Phase to Phase Voltage
- Tabular Demand Data (KW, KVAR, KVA and PF)
- Out Of Limits: Brief
- Out Of Limits: Detailed
- Summary and Setup
- Exceedance: V/I Data
- Exceedance: Demand Report
- Weekly Energy
- Total Demand
- THD Waveform Analysis
- IEC Unbalance
- Total Harmonic Distortion
- EN50160
- Data Analysis

	Table 2.0
RMS Tabular Data	This report will display the values of each channel for every recorded interval.
Phase to Phase Voltage	When phase to neutral data is recorded the software will calculate and plot the phase to phase voltage based on the phase to neutral voltage.
Tabular Demand Data	This report will display the power values (KW, KVAR, KVA and PF) and energy values (KWH, KVARH and KVAH) for all phases.
	NOTE: In a 3 wire wye 2 wattmeter or 3 wire delta 2 wattmeter configuration there will be an option that allows the third phase voltage to be calculated even if it was not connected.
Total Demand Data	This report will display the power values (KW, KVAR, KVA and PF) for the total of all phases.
Out Of Limits: Brief	This report will display the out of limits or "event" data. Only the channel that triggered the out of limits event shall be displayed.
Out Of Limits: Detailed	This report will display the out of limits or "event" data. The state of all the channel at the time of the event shall be displayed.
Summary and Setup Report	This report will display the overall totals for the test. This report will also display the setup of the MPQ-MPQ Analyzer.
Exceedance: V/I Data	This report displays the values of each channel for every interval that is either higher or lower than the limits programmed in the report setup.
Exceedance: Demand Report	This report displays the power values of each phase of every interval that is either higher or lower than the limits programmed in the report setup.
Weekly Energy	This report breaks will display the selected energy parameter aggregated over 60 minute intervals for a period of 1 week.
Total Demand	This report will display the sum total of all the power and energy parameters recorded.
THD Waveform Analysis	This report will display the calculated Total Harmonic Distortion for the first cycle of each timed waveform captured.

IEC Unbalance	This report will display the unbalance between the channels based on the IEC61000-4-27 standards. To view ANSII unbalance open the "Tabular: V/I Data" report.
Total Harmonic Distortion	This report will display the recorded IEC Total Harmonic Distortion recorded over the test interval.
EN50160	This report will report if the recorded values passed or failed the EN50160 requirements. NOTE: If the recorded parameters are not configured for the proper aggregation as required by the EN50160 standard then this shall be indicated in the report.
Data Analysis Report	This report will compare the recorded data against the selected data analysis template and create an analysis report complete with bar charts. This report will display what data was within the tolerances and what data was outside the tolerances. This report can include both a CBEMA curve as well as a Mains Signaling graph, if these options are enabled.

Creating a Report

1. Select desired data file by highlighting *data file* in *Data File Bar* and then click CREATE REPORT.



2. The following window shall open. Select the desired report and any desired selections and then click CREATE.

					Unit use Verity	to search		_
Create Setup File Install Setup File Do	awninad Data Verify Connection	Remote Screen	Create Report	Create Chart	Export to Excel	Analyze	Preferred Analysis	
PRODUCT		Save As Text.	Section Sec	(01)>> >> >> >>				
To 20, 20, 16, 10, 22, 16, 12, Main third 20, 23, 16, 10, 22, 16, 12, Main third 20, 23, 16, 10, 32, 2, 60Hz Main third 20, 23, 16, 10, 32, 24, 60Hz third 20, 23, 16, 10, 32, 24, 60Hz third 20, 24, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10	otalor V/ Dolo S	La Provincia Sombino Parada	Timeli ⊛ Mi ⊂ Se Date D ⊛ Ki	er: CODEDE PM te: CODEDE PM te: CEDEDE ANNO DE 2010 AN te: DE 2010 AN te:	x Sketts			

From – To:	Allows the user to select the start date and time and the end date and time of the report.
Spread Sheet Style:	Displays the data in a spread sheet format
Time Interval Precision:	Allows the user to set the precision of the time of each interval to either seconds or milliseconds.
Display Data Notation:	Allows the user to select whether the data should be viewed in Kilo Notation or Scientific Notation.
Combine Periods:	This feature allows the user to average together multiple intervals in order to create a smaller report.

Exceedance Reports

There are two types of Exceedance Reports that can be selected, using the MPQ-MPQ Analyzer software, Exceedance: V/I Data *or* Exceedance: Demand Data. Both of these reports allow the user to input limits. Only the intervals that exceed these limits shall be displayed.

Exceedance: V/I Data

Create Font	Save As Text << Se	ection Section >> >>>
Report Type	Report Properties	Lower Upper
Tabular: V/I Data	Start / Stop times	VOLTS 00000 00000
Tabular : Demand Data	Data Exceedance Limits	AMPS 00000 00000
Out Of Limits : Brief		· · · · · · · · · · · · · · · · · · ·
Out Of Limits : Detailed		
Summary and Setup		
Exceedance: V/I Data		
Exceedance : Demand Data Weekly Energy		

- **Sag:** If the Sag box next to a desired channel is selected and a limit input then the software will only display intervals below this limit, in the report.
- **Swell:** If the Swell box next to a desired channel is selected and a limit input then the software will only display intervals above this limit, in the report.

Exceedance: Demand Data

Create Font	Save As Text << Section	on Section >> >>>>
Report Type	Report Properties	Check Exceedance Limits By:
Tabular: V/I Data Tabular : Demand Data Out Of Limits : Brief Out Of Limits : Detailed Summary and Setup Exceedance: V/I Data	Start/Stop times Exceedance Limits By Exceedance Limits	© Phase C Total
Exceedance: VII Data Exceedance : Demand Data Weekly Energy		

Check Exceedance Limit By:

This feature allows the user to compare lower and / or upper limits to either the power measurements of each individual phase or the power measurements of the total of all phases.

Save As Text << Se	ection	Section >>	>> >>
Report Properties		Lower	Upper
	Volts	00000	00000
Exceedance Limits By	Amps	00000	D 00000
Exceedance Limits	KW	00000	□ 00000
	KVA	00000	□ 00000
	KVAR	00000	□ 00000
	PF	00000	D 00000
	DPF	00000	D 00000
	KWH	00000	D 00000
	KVAH	00000	□ 00000
	KVARH	00000	□ 00000
	Report Properties Start / Stop times Exceedance Limits By	Report Properties Start / Stop times Volts Exceedance Limits By Amps Exceedance Limits KW KVA KVA KVR PF DPF KWH KVAH KVAH	Report Properties Lower Start / Stop times 00000 Exceedance Limits By Amps 00000 KW 00000 KVA 00000 KVAR 00000 KVAR 00000 PF 00000 KVAR 00000 KVAR 00000 KVAR 00000 KVAR 00000 KVAR 00000 KWH 00000 KWH 00000

- **Sag:** If the Sag box next to a desired measurement is selected and a limit input then the software will only display intervals below this limit, in the report.
- **Swell:** If the Swell box next to a desired measurement is selected and a limit input then the software will only display intervals above this limit, in the report.

Report Options

After a report is created the user has several options for viewing and saving the data.

Setup Font.	Save As Text. (4 Section	Section >> >> >> >> >> >> >> >> >>>>>>>>>>>>	section 1 of 2					
					Tabula	r: V/I Data		
Note: Test Number Combined Periods Total Displayed Perio	1	Indicate END of	Interval Pe	eriod				
Date / Time	Va Volts MIN	la Vb Amps Volts MIN MIN	lb Amps MIN	Va Volts RMS	la Amps RMS	Vb Volts RMS		
11/20/15 03: 10: 00.044 11/20/15 03: 20: 00.104 11/20/15 03: 30: 00.133 11/20/15 03: 40: 00.193 11/20/15 03: 50: 00.044 11/20/15 04: 00: 00.122 11/20/15 04: 10: 00.147 11/20/15 04: 30: 00.067	IPM 122.332 7 IPM 122.591 7 IPM 123.368 7 IPM 123.316 7 IPM 123.212 7 IPM 123.2161 7 IPM 123.2161 7 IPM 123.264 7	1.373 122.125 1.193 0.000 1.103 122.746 1.553 123.523 1.463 123.471 1.373 123.368 1.373 123.316 1.463 123.420 1.553 123.420	70.382 70.111 70.382 70.472 70.472 70.382 70.652	123.471 123.368 123.575 123.679 123.730 123.679 123.523 123.575 123.627	71.733 71.733 71.733 71.733 71.643 71.553 71.643	123.420 121.814 123.730 123.834 123.834 123.834 123.679 123.730 123.782		
Setup:	By clicking SI new report.	ETUP the	user c	an bao	ck up	one scr	een to c	reate a
Font:	This option al report.	lows the ι	iser to	chang	ge the	font typ	be and s	ize of each
Save as Text:	This option al	lows the u	iser to	save	the re	port as	a text fil	e.
>>Section:	Each report is forward to the			ions. T	⁻his b	utton all	ows you	u to move
Section <<:	Each report is backwards to				his b	utton all	ows you	ı to move
>>>>:	Each report is forward to the				his b	utton all	ows you	u to move

PQ Data Analysis Screen

This software will compare the recorded data file to a set of predefined limits. The results will then be display in a bar chart format.

The software allows the operator to create a series of Data Analysis Templates.

These *Data Analysis Templates* can be used to analyze the data in the Megger PQ software or they can be uploaded to the MPQ unit.

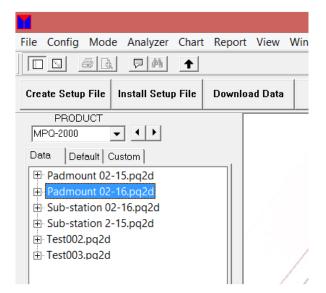
If the data analysis is uploaded to the MPQ unit then the data analysis can be performed on the unit.

The data analysis operates by comparing each interval of data to a set of predefined limits. That data interval is either within or outside the limits. A running tally is maintained. At the end of the analysis the software determines the percentage of time the data intervals were within the user defined limits and reports this. The operator can set two sets of limits. One set of limits defines a narrow band of time while the other set of limits defines a wide band of time.

For example, one could analyze the voltage by saying it must be within 5% of nominal for 95% of the time and must be within 10% of nominal for 100% of the time.

Selecting a Template

1. Select the desired data file by highlighting *data file* in *Data File Bar*.



2. Click on the ANLAYZE button.

•				Meg	gerPQ				_ 🗆 ×
File Config Mode Analyze	er Chart Repor	t View Windo	w Help						
	·						Unit	se Verify to search	2
Create Setup File Install Setup File	Download Data	Verify Connection	Remote Screen	Create Report	Create Chart	Export to Excel	Analyze	'Preferred' Analysis	
PRODUCT MP0-2000 V V Data Default Custom		L	10		XX	//		/	

3. Select the desired template from the drop down menu in the *Default Configurations* field.

fault Configuratio	ins		Save - Name and save t Delete - Delete a saved Harmonic Limits - Select	the desired harmonic ana	re use.	e.
Delete Configuration	Save Configuration	Load Selecte Configuratio	d Nominal Voltage	Nominal Frequency	Narrow Limit	Wide Limit
IEEE519_1159 AL	лто.tplt	-	Automatic	Automatic	95.00 %	100.00 9
Def_IEEE519_115 EN50160.tplt IEEE519_1159 AU			init Tolerance Negative %	6 10.00	Positive % 10.00	
EN50160.tplt	ПО.tplt		hit Tolerance Negative 9 hit Tolerance Negative 9 Flicker		Positive % 10.00 Positive % 15.00 THD	
ENSÖ 160. tplt IEEE 519 1159 AL Unbala	ПО.tplt		nit Tolerance Negative 9		Positive % 15.00	% 8.00
EN50160.tplt IEEE519_1159 AU Unbala Narrow Limit T	nce	wide B	hit Tolerance Negative %	6 15.00	Positive % 15.00	
EN50160.tplt IEEE519_1159 AU Unbala Narrow Limit T	nce olerance +/- %	2.00	Regative 9 ht Tolerance Negative 9 Flicker Narrow Limit Tolerance Pt Wide Limit Tolerance Pt Frequency	 ↓ 15.00 ↓ 1.00 ↓ 0.80 	Positive % 15.00 THD Narrow Limit Tolerance +/- ¹ Wide Limit Tolerance +/-	% 10.00
EN50160.tplt IEEE519_1159 AU Unbala Narrow Limit T	nce olerance +/- %	2.00	Flicker Narrow Limit Tolerance	 ↓ 15.00 ↓ 1.00 ↓ 0.80 	Positive % 15.00 THD Narrow Limit Tolerance +/- 1	% 10.00

4. Click LOAD SELECTED CONFIGURATION.

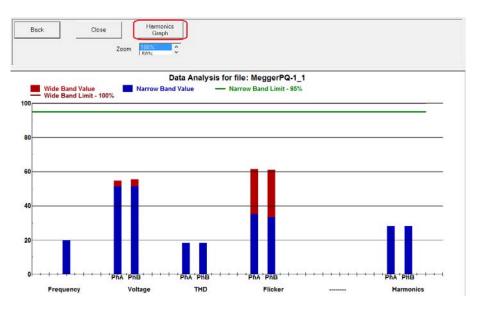
Performing a Data Analysis on the PC

1. Once the desired template is selected click CREATE. The main data analysis shall now commence.

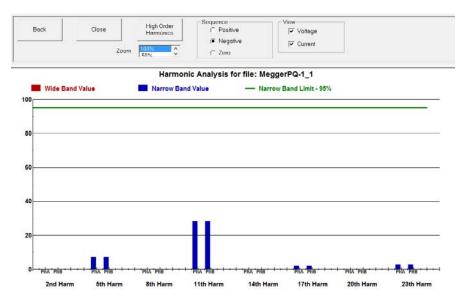
Close Create Upload Default Configurations Configuration Configuration Configuration IEEEE 19_1159 AUTO.tplt		alysis parameters. selected from the drop down box.
Voltage Limits	Limit Tolerance Negative % 10.00	Positive % 10.00 Positive % 15.00
Unbalance Narrow Limit Tolerance +/- % 2.00 Wide Limit Tolerance +/- % 3.00	Flicker Narrow Limit Tolerance Dat 1.00 Wide Limit Tolerance Reference 0.80	THD Narrow Limit Tolerance +/- % 8.00 Wide Limit Tolerance +/- % 10.00
Harmonic Limits	Frequency Tolerance 99,5% Negative % Tolerance 100.0% Negative %	1.00 Positive % 1.00 2.00 Positive % 2.00

2. To view a harmonic data analysis click HARMONIC GRAPH. This graph will allow you to view *Positive Sequence Harmonics*, *Negative Sequence Harmonics* as well as *Zero Sequence Harmonics*.

Megger_a

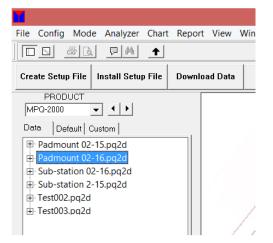


3. To perform a data analysis on the higher order harmonics click HIGH ORDER HARMONICS.



Creating a New Template

1. Select the desired data file by highlighting data file in Data File Bar.



2. Click CHART then PQ DATA ANALYSIS to open *Data Analysis* screen.

	File Config I	Mode	Analyzer	Chart	Report
	Create Harmonic Analysis Power Harmonic Ana	lysis	Ct	rl+G	Downloa
	PQ Event Waveform A PQ Timed Waveform PQ Data Analysis				
	Copy Save As				
•	Show Vector Diagram Show Bar Chart	n			/

3. Make the desired selection in each field of the data analysis template, as defined in Table 3.0.

Table 3.0		
Nominal Voltage	Enter the nominal voltage. This value shall be used as a reference for the data analysis calculations.	
	Optionally select "Automatic". The software will then automatically calculate the nominal voltage in the data file.	
Nominal Frequency	Enter the nominal frequency. This value shall be used as a reference for the data analysis calculations.	
	Optionally select "Automatic" The software will then automatically	

	calculate the nominal frequency in the data file.
Narrow Limit	Enter the percentage of time (0 to 100%) that the recorded data must remain within the user defined narrow tolerance limits.
Wide Limit	Enter the percentage of time (0 to 100%) that the recorded data must remain within the user defined wide tolerance limits.
Voltage Limits: Narrow Limit: Negative	Enter the negative voltage limit to be used for the narrow tolerance.
Voltage Limits: Narrow Limit: Positive	Enter the positive voltage limit to be used for the narrow tolerance.
Voltage Limits: Wide Limit: Negative	Enter the negative voltage limit to be used for the wide tolerance.
Voltage Limits: Wide Limit: Positive	Enter the positive voltage limit to be used for the wide tolerance.
Unbalance: Narrow Limit Tolerance	Enter the unbalance limit to be used for the narrow tolerance.
Unbalance: Wide Limit Tolerance	Enter the unbalance limit to be used for the wide tolerance.
Flicker: Narrow Limit Tolerance	Enter the flicker limit to be used for the narrow tolerance.
Flicker: Wide Limit Tolerance	Enter the flicker limit to be used for the wide tolerance.
THD: Narrow Limit Tolerance	Enter the THD limit to be used for the narrow tolerance.
THD: Wide Limit Tolerance	Enter the THD limit to be used for the wide tolerance.
Frequency: Tolerance 99.5%: Negative	Enter the negative frequency limit to be used for the 99.5% tolerance.
Frequency: Tolerance 99.5%: Positive	Enter the positive frequency limit to be used for the 99.5% tolerance.
Frequency: Tolerance 100%: Negative	Enter the negative frequency limit to be used for the 100% tolerance.
Frequency: Tolerance 100%: Positive	Enter the positive frequency limit to be used for the 100% tolerance.
Note: To disable a field s	set the value to zero.

4. To set harmonic limits click HARMONIC LIMITS.

5. Make the desired selection in each field of the harmonic limits template, as defined in Table 4.0. When complete click OK to return to the *Main Template* page.

	Table 4.0
Voltage Analysis	Click the box to enable the voltage harmonic analysis.
Current Analysis	Click the box to enable the current harmonic analysis.
High Frequency Harmonics	Click the box to enable the high frequency harmonic analysis above the 25th order.
HF Limit	Enter the limit for the harmonic above the 25th order. This is set as a percentage of the fundamental.
Must be in tolerance for below percentage of time.	Enter the percentage of time that the harmonics must be within their defined limits.
Voltage Harmonic Limit	Enter the limit for the voltage harmonic orders. This is set as a percentage of the fundamental.
Current Harmonic Limit	Enter the limit for the current harmonic orders. This is set as a percentage of the fundamental.

6. Save the template by clicking SAVE CONFIGURATION. A *Save As* window will open.

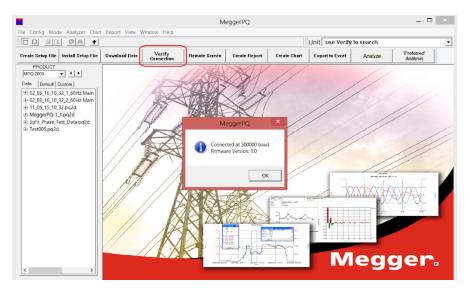
Close Create Upload Default Configurations Delete Configuration Delete Configuration Delete Configuration Delete Configuration Configuration TEEES19_1159 AUTO.tpit		ire use. alysis parameters. selected from the drop down box.
Voltage Limits	Limit Tolerance Negative % 10.00	Positive % 10.00 Positive % 15.00
Unbalance	Flicker	THD
Narrow Limit Tolerance +/- % 2.00	Narrow Limit Tolerance	Narrow Limit Tolerance +/- % 8.00
Wide Limit Tolerance +/- % 3.00	Wide Limit Tolerance	Wide Limit Tolerance +/- % 10.00
Harmonic Limits	Frequency Tolerance 99,5% Negative % Tolerance 100.0% Negative %	1.00 Positive % 1.00 2.00 Positive % 2.00

7. Input the desired template name and the click SAVE. The template will now appear in the drop down menu in the *Default Configurations* field.

🖻 🕘 - 🛧 📕 « Pro	ogram Files (x86) + MeggerPQ + Directories	~ C	Search Directories	۶
Organize • New folde	er			E · (
^	Name	Date modified	Туре	Size
This PC Desktop Documents Documents Nusic Pictures Videos Windows8_OS (C: HD-V/LU3 (E:) Pictures Nusic C:	120V Test.tpit Padmount.tpit Padmount_2.tpit Wind Farm.tpit CFLLpit EEEE1159.tpit Sample.tpit	6/9/2015 1:52 PM 4/6/2016 4:52 PM 4/6/2016 4:55 PM 4/14/2016 9:58 AM 7/11/2016 9:58 PM 5/2/2016 1:205 PM 7/11/2016 3:41 PM 8/20/2015 8:58 AM 8/20/2015 8:47 AM	TPLT File TPLT File TPLT File TPLT File TPLT File TPLT File TPLT File TPLT File	1 KB 1 KS 1 KB 1 KB 1 KB 1 KB 1 KB
File name: Save as type: Files	(*.tplt)			

Uploading a Template to the MPQ Unit

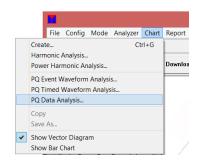
- 1. Connect the MPQ unit to the PC.
 - a. Set the COM port.
 - b. Verify communications with the MPQ unit, by clicking on the VERIFY CONNECTION.



2. Click on any data file by highlighting *data file* in *Data File Bar*. This enables the data analysis screen.

File Co	onfig	Mode	Analyzer	Chart	Report	View	Win
		# B.	P M	+			
Create	Setup	File I	nstall Setu	File	Downlo	ad Data	
F	PROD						
MPQ-	2000	•	• •				
Data	De	fault Cu	stom				
⊞ Pa	dmo	unt 02-1	5.pq2d				
⊞. Pa	admo	unt 02-1	6.pq2d				
🕀 Su	ıb-sta	tion 02-	16.pq2d				
🕀 Su	ıb-sta	tion 2-1	5.pq2d				
⊞ Te	st002	.pq2d					
± Te	st003	.pq2d					/
							/ ,
						1	

3. Click CHART then PQ DATA ANALYSIS to open *Data Analysis* screen.



4. Select the desired template from the drop down menu in the *Default Configurations* field.

			Save - Name and save t	rs or a saved configuration he configuration for futur			
fault Configuratio	ons			the desired harmonic anal			
Delete	Save Configuration	Load Selecte Configuration	d	ata after a file has been s	elected from the drop dow	vn box.	
configuration	Corniguration	Configuration	Nominal Voltage	Nominal Frequency	Narrow Limit	N	/ide Limit
EEE519_1159 AU	JTO.tplt	•			95.00	% 1	00.00
ef_EN50160			120.0	60.00			
ef IEEE519 115	59						
			imit Tolerance		and a second		
N50160.tplt EEE519 1159 AL			imit Tolerance Negative %	10.00	Positive % 10.	00	
N50160.tplt			Negative %	10.00	Positive % 10.	00	
N50160.tplt			in Tolerance Negative % nit Tolerance Negative %		Positive % 10.		
N50160.tplt	лто.tplt		Negative %				
N50160.tplt EEE519_1159 AU Unbala	лто.tplt		nit Tolerance Negative %		Positive % 15.	00	8.00
N50160.tplt EEE519_1159 AU Unbala	ло.tplt	Wide Lin	nit Tolerance Negative % Flicker Narrow Limit Tolerance	15.00	Positive % 15.1 THD Narrow Limit Tolerance	00 2 +/- %	
N50 160. tplt EEE519_1159 AU Unbala Narrow Limit T	ло.tplt	Wide Lin	nit Tolerance Negative % Flicker	15.00	Positive % 15.	00 2 +/- %	8.00
N50 160. tplt EEE519 1159 AL Unbala Narrow Limit T	nce	Wide Lin	Negative % nit Tolerance Negative % Flicker Narrow Limit Tolerance	\$ 15.00 \$ 1.00	Positive % 15.1 THD Narrow Limit Tolerance	00 2 +/- %	
N50 160. tplt EEE519 1159 AL Unbala Narrow Limit T	nce	Wide Lin	Negative % Flicker Narrow Limit Tolerance Wide Limit Tolerance	↓ 15.00 ↓ 1.00 ↓ 0.80	Positive % 15. THD Narrow Limit Tolerance Wide Limit Tolerance	00 2 +/- %	

Close Create Upload		ire use. alysis parameters. selected from the drop down box.
Voltage Limits	imit Tolerance Negative % 10.00 mit Tolerance Negative % 15.00	Positive % 10.00 Positive % 15.00
Unbalance Narrow Limit Tolerance +/- % 2.00 Wide Limit Tolerance +/- % 3.00	Flicker Narrow Limit Tolerance Pst Wide Limit Tolerance Pit 0.80	THD Narrow Limit Tolerance +/- % 8.00 Wide Limit Tolerance +/- % 10.00
Harmonic Limits	Frequency Tolerance 99.5% Negative % Tolerance 100.0% Negative %	1.00 Positive % 1.00 2.00 Positive % 2.00

5. Click on LOAD SELECTED CONFIGURATION.

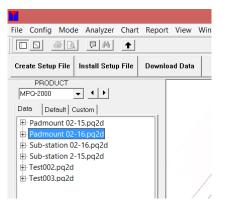
6. Click UPLOAD. The template will now upload to the unit.

Close Create Upload Default Configurations Delete Configuration Configuration IEEE519_1159 AUTO.tplt Narrow	Nominal Voltage Automatic 230.00 60.00	alysis parameters. selected from the drop down box.
Voltage Limits	Negative % 10.00	Positive % 10.00
Wide I	imit Tolerance Negative % 15.00	Positive % 15.00
Unbalance	Flicker	THD
Narrow Limit Tolerance +/- % 2.00	Narrow Limit Tolerance	Narrow Limit Tolerance +/- % 8.00
Wide Limit Tolerance +/- % 3.00	Wide Limit Tolerance	Wide Limit Tolerance +/- % 10.00
	Frequency Tolerance 99.5% Negative %	1.00 Positive % 1.00
Harmonic Limits	Tolerance 100.0% Negative %	2.00 Positive % 2.00

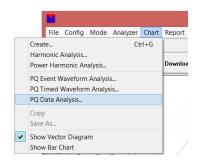
7. When complete disconnect unit from PC.

Deleting a Template

1. Select the desired data file by highlighting the data file in Data File Bar.



2. Click on CHART then on PQ DATA ANALYSIS to open *Data Analysis* screen.



3. Select the desired template from the drop down menu in the *Default Configurations* field.

efault Configuratio	Save	Load Selecte	d	lesired parameters or a Name and save the conf Delete a saved configu ic Limits - Select the de elected - inputs data afte	iguration for future ration. sired harmonic ana	use.	vn box.	
Configuration	Configuration	Configuration	n	Nominal Voltage	Nominal Frequen	cy Narrow Limit	Wide Limit	e)
120V Test.tplt		-		120.0	60.00	95.00	% 100.00	- 9
Padmount_2.tplt Wind Farm.tplt CFL.tplt		ž	iit Tolerance Flid	ingene inf	10.00	Positive % 10.00	0	
Unbalar Narrow Limit Tol	STORE AND ADDRESS OF THE	2.00	Narrow Limit T	125	1.00	THD Narrow Limit Tolerance	+/- % 8.00	-
Wide Limit Tol	lerance +/- %	3.00	Wide Limit To	plerance Pt 0	0.80	Wide Limit Tolerance	+/- % 0.00	_
			10000	Frequency rance 99,5% No	gative % 1.0	00 Positiv	ve % 1.00	_
	Harmonic Limits		10000				(C.C.)	

Close Create Upload Default Configurations Delete Save Configuration Configuration Def_ENS0160		future use. ic analysis parameters. een selected from the drop down box. equency Narrow Limit Wide Limit
	Limit Tolerance Negative % 10.00	Positive % 10.00 Positive % 10.00
Unbalance Narrow Limit Tolerance +/- % 2.00 Wide Limit Tolerance +/- % 3.00	Flicker Narrow Limit Tolerance Pet 🗘 1.00 Wide Limit Tolerance Pit 🗘 0.80	THD Narrow Limit Tolerance +/- % 8.00 Wide Limit Tolerance +/- % 0.00
Harmonic Limits	Frequency Tolerance 99.5% Negative % Tolerance 100.0% Negative %	1.00 Positive % 1.00 6.00 Positive % 4.00

4. Click DELETE CONFIGURATION. The template will now be deleted.

10

Remote Control

The MPQ can be controlled remotely using the Metrosoft PQ PC software. Establish communications with the MPQ (See "Configuring Ethernet Communications").

Once connected to the MPQ, open the Remote screen by clicking on the REMOTE SCREEN button.

					MeggerPQ		
File Config Mode Analyzer Chart Report View Window Help							
Create Setup File Install Setup File Download	I Data Verify Connection	Remote Screen	reate Report	Create Chart	Export to Excel	Analyze	'Preferred' Analysis
PRODUCT MPO-2000 • • • Data Default Custom		Remote		ARA	X	X/	//
1		the Antonio	1 1 1 1 1			1 /	/

The remote screen will now open.

			Rem	ote Control		_ 🗖	×
Recording Contro	Stop	Ana S/N		MPQ-2000 1016E9	Hardware Version: Firmware Version:	4.20022 1.0	
Analyzer Data							
Date/Time:	04/22/20 10:37:1	4 AM R	ecording Status:	Not Recording	Storage Interval:	Complete	_
Elapsed Time:	, 0 D ays 00:02:30	D	ata Status:	Data Recorded	Demand Interval:	Not Complete	_
Active Setup:	Stops When Full w	ith RMS			Real Time Freq:	60	_
0% Battery: 13.5 Rms Der	i Volts mand Events	Battery	100% OK		Software Versions	Close	1
Source	Voltage (V)	Current (A)	Power (W)	Secondary Voltage (V)			
Phase A	115	1	10	115			
Phase B	116	2	20	116			
Phase C Neutral	117 0.18	3	30	117 0.180			
Ground	0.18	4		0.180			
Totals		5	60.00				

In the remote screen, you can view real time RMS data, Demand data and an event summary by clicking on the appropriate tab.

View the recording status.

View the date and time. 🔍

View the amount of time the analyzer has been recording.

View the active setup file.

View the remaining memory and battery status.

NOTE provided the analyzer's firmware version is 1.407 or above, the analyzer will automatically restart recording a new data file once the 100M file size if reached. No data in the existing files will be overwritten.

Using the remote screen, you can start and stop the recording.

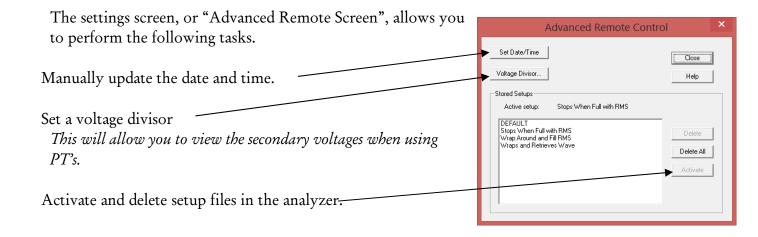
Clear the recorded data in the analyzer.

Click on the SETTINGS button to open the analyzer's setup screen.

Recording Contro	I	Ana	alyzer:	MPQ-2000	Hardware Version:	4.20022
Start	Stop	S/N	ł:	1016E9	Firmware Version:	1.0
Analyzer Data						
Date/Time:	04/22/20 10:37:	14 AM	ecording Status:	Not Recording	Storage Interval:	Complete
Elapsed Time:	0 D ays 00:02:30	[Data Status:	Data Recorded	Demand Interval:	Not Complete
Active Setup:	Stops When Full w	vith RMS			Real Time Freq:	60
Memory: 0.012	2Gb 6	7 % Remainin	g	Clear	. Settings	Help
0%			100%			
			100%			
	Volts	Batter	y OK			
Battery: 13.5	Volts	Batter	y OK		Software Versions	Close
Battery: 13.5		Batter	y OK		Software Versions	Close
Battery: 13.5	Volts nand Events	Batter	y OK			Close
Battery: 13.5		Batter	y OK Power (W)	Secondary Voltage (V)		Close
Battery: 13.5 Rms Dem Source Phase A	nand Events Voltage (V)	Current (A)	Power (W)	115		Close
Battery: 13.5 Rms Dem Source Phase A Phase B	nand Events Voltage (V) Voltage (V) 115 116	Current (A) 1 2	Power (W) 10 20			Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3	Power (W)	115 116 1 7 7	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral	nand Events Voltage (V) Voltage (V) 115 116	Current (A) 1 2 3 4	Power (W) 10 20	115	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral Ground	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3	Power (W) 10 20 30	115 116 1 7 7	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3 4	Power (W) 10 20	115 116 1 7 7	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral Ground	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3 4	Power (W) 10 20 30	115 116 1 7 7	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral Ground	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3 4	Power (W) 10 20 30	115 116 1 7 7	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral Ground	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3 4	Power (W) 10 20 30	115 116 1 7 7	Versions	Close
Battery: 13.5 Rms Dem Source Phase A Phase B Phase C Neutral Ground	nand Events Voltage (V) 115 116 117	Current (A) 1 2 3 4	Power (W) 10 20 30	115 116 1 7 7	Versions	Close

To see the analyzer version, click on the Software Version button

		R	emote Control		_ 🗖
	Recording Control	Analyzer:	MPQ-2000	Hardware Version:	4.20022
	Start St	op S/N:	1016E9	Firmware Version:	1.0
\neg	Analyzer Data				
	Date/Time: 04/22/20	10:37:14 AM Recording S	tatus: Not Recording	Storage Interval:	Complete
	Elapsed Time: 0 D ays 00:	D2:30 Data Status:	Data Recorded	Demand Interval:	Not Complete
u	Active Setup: Stops Whe	n Full with RMS		Real Time Freq:	60
	Memory: 0.012 Gb	67 % Remaining	Clear	Settings	. Help
	0%		00%		
	Battery: 13.5 Volts	Battery OK		Software Vereins	Close
1e	Rms Demand Event	s			
	Source Voltag				
_	Phase A Phase B		0 11		
_	Phase C	117 3 3	80 11	7	
_	Neutral Ground	0.18 4 5	0.18	30	
,	Totals	60.0	0		
's					

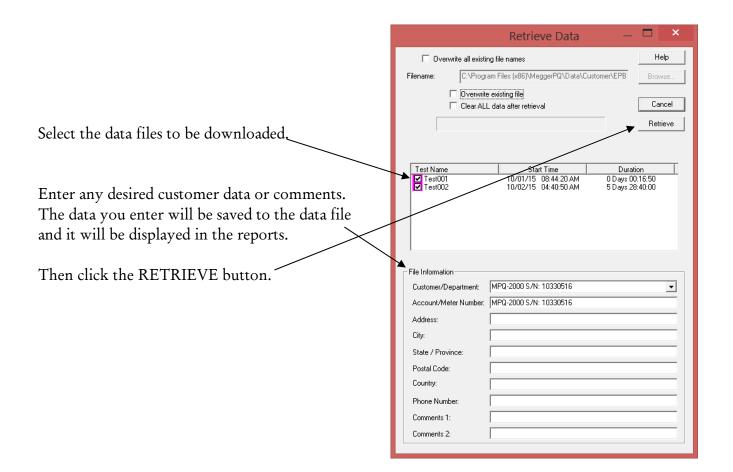


To download data manually from the MPQ analyzer: Close the remote screen. Open a log file by clicking on: FILE / NEW EVENT LOG This will allow you to view the progress of the download

Click on the DOWNLOAD DATA button. This will open the download window.

File	e Config	Mode	Analyzer	Chart	Repo	rt View	Windo
	New Ever	nt Log		Ctr	+N		
	Open Eve	nt Log		Ctr	+0	Veri	fy
	Save Ever	nt Log		Ctr	1+S	Conne	ction
	Save Log	As					
	Edit			Ctr	1+E		

🗒 File Config Mode Analyzer Cl	hart Report View Wind
	~
Create Setup File Install Setup File Downl	oad Data Verify Connection
PRODUCT	Display Events of type(s) :
Data Default Custom	
1108 Hendricks Weatherhead	
H-Chat Pump VED pg2d	



Optional Selections:

You can change the file names by enabling "Overwrite all existing file names".	Retrieve Data 🛛 🗖 🗙
0	Uverwrite all existing file names
Then click the BROWSE button.	Filename: C:\Program Files (x86)\MeggerPQ\Data\Customer\EPB Browse
	Overwrite existing file Clear & L data after retrieval Cancel
You can now change the data download path and rename the data files.	Clear ALL data after retrieval Cancel Retrieve

Note: You can also change the name of the file after it is downloaded by right clicking on the data file name in the data file bar.

	Retrieve Data —	×
Overwrite existing file	Overwrite all existing file names Filename: C:\Program Files (x86)\MeggerPQ\Data\Customer\EPB	Help Browse
This option allows you to overwrite existing files you already downloaded that have the same name.	Clear ALL data after retrieval	Cancel Retrieve
Clear all data after retrieva.l	Test Name Start Time Dural ☑ Test001 10/01/15 08:44:20 AM 0 Days 00 ☑ Test002 10/02/15 04:40:50 AM 5 Days 20	0:16:50
This option allows you to clear the data in the analyzer after retrieval is complete.		
	File Information Customer/Department: MPQ-2000 S/N: 10330516 Account/Meter Number: MPQ-2000 S/N: 10330516 Address:	

Remote Time Sync

The MPQ software can be configured to automatically sync the remote MPQ to the network time periodically. This saves the expense of a GPS and removes the possibility of losing the GPS signal.

Establish communications with the MPQ (See the "Remote Operations" application note.)

Once connected to the MPQ, open the ethernet locations window by clicking on CONFIG/ETHERNET LOCATIONS.

Fi	le	Config	Mode	Analyzer	Chart	Report	View
	C	Commun	ications				
	F	ile Direc	tories		ownios	nd Data	Ver
	E	vent Log	J				Conne
	E	thernet	Locatio	าร			
	Ν	lew Ana	lyzer Se	tup			
	E	dit Anal	yzer Set	up	d		

The Ethernet Directory Database window will open. Select the desired analyzer then click on the MODIFY button.

	Ethernet Dire	ectory Database
Name Keith Damboise MPG-2000 5/N: MPG-2000 5/N:		Add Delete Modify Search
		OK Cancel Help

The "Add Modify Directory Entry" window will now open.

Enable the Time Sync

ustomer/Analyzer Inform	ation	Schedule Information	
Customer/Department:	MPQ-2000 S/N 10330516	Schedule Date: 3/ 5/2020	-
Account/Meter Number:	MPQ-2000 S/N: 10320516	Schedule Time: 10:56:21 AM	-
Address:		Schedule Interval: 0 + Da	ays
City:		Enable scheduling	
State / Province:		Clear All_data after retrieval	
Postal Code:			
Country:			
Internet Address:	10.50.30.127		
MAC Address:	54:10:EC:F3:16:D4	Time Sync	6
Phone Number:			
Analyzer Password:	NER	Interval: 30.Minutes	ĉ
Comments 1:			
Comments 2:		OK Cancel	нер

Set the desired time sync interval by clicking on the UP / DOWN keys.

Click the OK button to save the settings.

The analyzer will now automatically be timed synced with the network based on the selected sync interval.

NOTE: A PC must be dedicated to the remote monitoring and be kept running for this function.

NOTE: Verify the analyzer's firmware is 1.407 minimum and the Metrosoft PC Software is version 2.6.2.1 minimum.

Megger.