

# DRANXPERT



## *Quick Reference Guide*

## **WARNING**

Death, serious injury, or fire hazard could result from improper connection of this instrument. Read and understand this manual before connecting this instrument. Follow all installation and operating Instructions while using this instrument.

Connection of this instrument must be performed in compliance with the National Electrical Code (ANSI/NFPA 70-2020) of USA 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 who has the skills and knowledge related to the construction and operation of the electrical equipment and installations, and who has received safety training on the hazards involved.”

Qualified personnel who work on or near exposed energized electrical conductors must follow applicable safety related work practices and procedures including appropriate personal protective equipment in compliance with the Standard for Electrical Safety Requirements for Employee Workplaces (ANSI/NFPA 70E-2018) of USA and any additional workplace safety requirements applicable to your installation.

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## **Safety Summary**

### **Definitions**

WARNING statements inform the user that certain conditions or practices could result in loss of life or physical harm.

CAUTION statements identify conditions or practices that could harm the instrument, its data, other equipment, or property.

NOTE statements call attention to specific information.

### **Symbols**

The following International Electrotechnical Commission (IEC) symbols are marked on the top and rear panel in the immediate vicinity of the referenced terminal or device:



Caution, refer to accompanying documents (this manual).



Alternating current (AC) operation of the terminal or device.



Direct current (DC) operation of the terminal or device.



Earth (ground) terminal



Power switch

## Safety Precautions

The following safety precautions must be followed whenever any type of voltage or current connection is being made to the instrument.

- Connect the earth (ground) terminal first, before making any other connections.
- When connecting to electric circuits or pulse initiating equipment, open their related breakers. DO NOT install any connection of the instrument on live power lines.
- Connections must be made to the instrument first, then connect to the circuit to be monitored.
- Wear proper personal protective equipment, including safety glasses and insulated gloves when making connections to power circuits.
- Hands, shoes, and floor must be dry when making any connection to a power line.
- Make sure the instrument is turned OFF before connecting probes to the rear panel.
- Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.
- If the equipment is used in a manner not specified in this reference guide, the protection provided by the equipment may be impaired. These safety precautions are repeated where appropriate throughout this manual.

## Table of Contents

INTRODUCTION .....	6
GETTING STARTED .....	7
Connecting To the Power Source.....	8
Controls, Indicators and Connectors .....	10
CONNECTING TO DRANXPERT .....	14
Connecting via Wired Ethernet Connection.....	15
Making Measurement Connections .....	17
Measurement Connectors for DranXperT.....	18
Connecting Voltage Measurement Cables .....	19
Connecting Current Probes .....	20
DranXperT USER INTERFACE .....	28
Home/Information Page.....	28
Instrument Settings .....	29
Real Time Measurements .....	36
Downloading and Managing Data .....	38
Factory Settings .....	41
START/STOP MONITORING .....	44
Start Monitoring .....	44
Stop Monitoring .....	45
VIEWING RECORDED DATA .....	46
Copying Data from DranXperT .....	46
Opening Data in Dran-View XP .....	46
Standard Accessories .....	48
Optional Accessories.....	49
SPECIFICATIONS .....	50
STATEMENTS AND NOTICES .....	52

## INTRODUCTION

DranXperT® is a very accurate three-phase power and energy logger. DranXperT not only meters, records, and trends what you expect from a power logger, but it also measures harmonics and detects voltage Sags/Dips, Swells, and Interruptions down to one cycle in duration. DranXperT has three voltage and four current channels, and can be used in single, two, and three phase monitoring applications. The fourth current channel can be used for monitoring the neutral or other current sources.

DranXperT can be used in a wide range of applications, including real-time metering, long-term power and energy studies, and basic power quality surveys. DranXperT can be used in portable, temporary, remote, or fixed installed applications.

All user interactions with DranXperT are performed using a web browser through a simple network connection, which can be local, via a direct connection to a computer, or remote by using a hub, switch, company network, or the Internet. Once connected to a network, any computing device with a web browser can be used to configure DranXperT, view real-time metering information, and copy recorded data from the instrument.

DranXperT data is fully compatible with Dran-View® XP Windows software, which is a free, unlicensed, 'lite' version of our popular Dran-View 7 PRO software. DranXperT data can also be viewed using the full versions of Dran-View 7 PRO or Enterprise.

## GETTING STARTED

### IMPORTANT NOTICE

- **Charge Battery Before Use**  
**Always charge the battery fully before using the instrument!**  
The instrument will fully charge its internal battery in approximately 15 hours.

The instrument will always operate on the AC power source (when available) and is designed to do so regardless of the state of charge of the battery.

## ***Connecting to the Power Source***

**Power Specifications** The DranXperT AC adapter can be powered by a 50/60 Hz, 15W, 90-264V AC power input source.

**CAUTION** Always set the power switch to the off position before connecting or disconnecting the input power cable.

Operation of the DranXperT from an AC voltage source other than the rated voltage input stated on the instrument nameplate can cause damage to the instrument.

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**PRECAUCION** Siempre fije el interruptor de encendido en la posición apagada antes de conectar o desconectar el cable de energía de entrada.

La operación del DranXperT desde una fuente de voltaje de ca que no sea la entrada de voltaje nominal indicada en la placa de identificación de la unidad puede causar daños a la unidad.

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**MISE EN GARDE** Mettez toujours l'interrupteur dans la position ouverte avant de connecter ou de déconnecter le câble d'alimentation primaire.

Le fonctionnement du DranXperT à partir d'une source de tension alternative autre que l'entrée de tension nominale indiquée sur la plaque signalétique de l'unité peut endommager l'unité.

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**VORSICHT** Vor dem Einstecken bzw. Ausstecken des Eingangsnetzkabels den Netzschalter immer in die Aus-Stellung bringen.

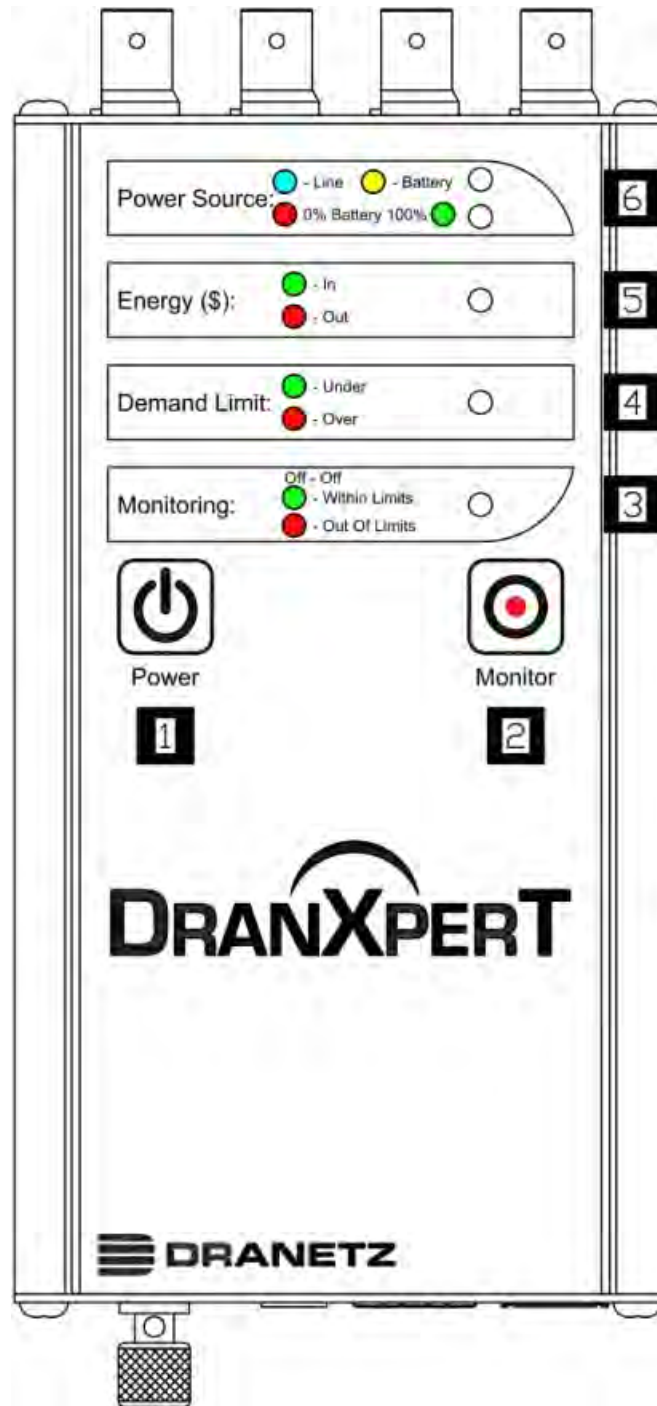
Der Betrieb des DranXperT von einer Wechselspannungsquelle, die nicht dem auf der Namensplatte der Einheit aufgeführten Nennspannungseingang entspricht, kann zur Beschädigung der Einheit führen.



Step	Action
1	Connect the AC adapter/battery charger plug to the DC input of the instrument
2	Connect the appropriate power cord for the voltage rating of the instrument to the AC adapter/battery charger.
3	Plug the AC adapter into an AC power source
4	Press the momentary On/Off power switch to turn the instrument on.

## Controls, Indicators and Connectors

### Top View



**1 Power Button** – press to turn the instrument power ON or OFF

**2 Monitoring Button** – press and hold for approximately 5 seconds until a single beep is heard to turn monitoring ON or OFF

**3 Monitoring Status** – LED status indicator

Monitoring Off: LED = OFF (No LED)

Monitoring Limits Within Trigger Limits: LED = GREEN

Monitoring Limits Out of Trigger Limits: LED = RED

**4 Demand Limit** – LED status indicator

Under Demand Limit: LED = GREEN

Over Demand Limit: LED = RED

**5 Energy (\$)** – LED status indicator

Exporting (producing) Energy: LED = GREEN

Importing (consuming) Energy: LED = RED

**6 Power Source** – LED status indicators

Top LED – Instrument power source:

Instrument powering up: LED = GREEN

Operating on external power source: LED = BLUE

Operating on internal battery: LED = YELLOW

Bottom LED – Battery status

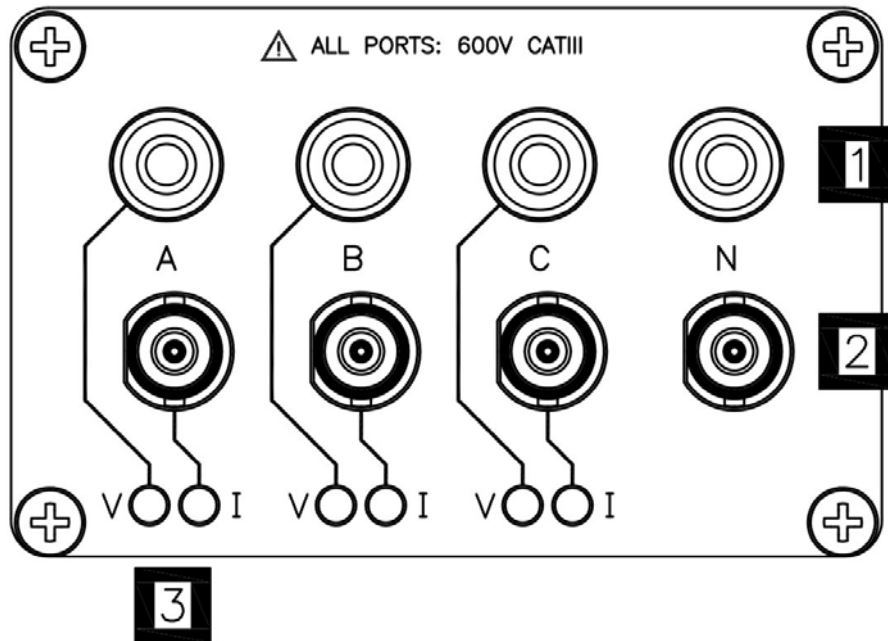
Depleted (0%): LED = RED

Charging/Discharging: LED = Shades of YELLOW from charged to discharged & vice versa

Fully charged (100%): LED = GREEN 100%

## Top End Panel View

This section describes the top end panel view of DranXperT.



- 1 Voltage Inputs** – use to connect the circuit voltage to the instrument channels A, B, C, and N using safety cables with banana connectors. See section Connecting the Voltage and Current Connectors for circuit connection details.
- 2 Current Inputs** – use to connect compatible current probes with an insulated BNC connector to the instrument channels A, B, C and N. See section Connecting the Voltage and Current Connectors for circuit connection details.
- 3 V and I Connection LEDs** – color coded to indicate the status of channels A, B, C for voltage and current.

### **LED Colors (colors can be changed in the instrument setups)**

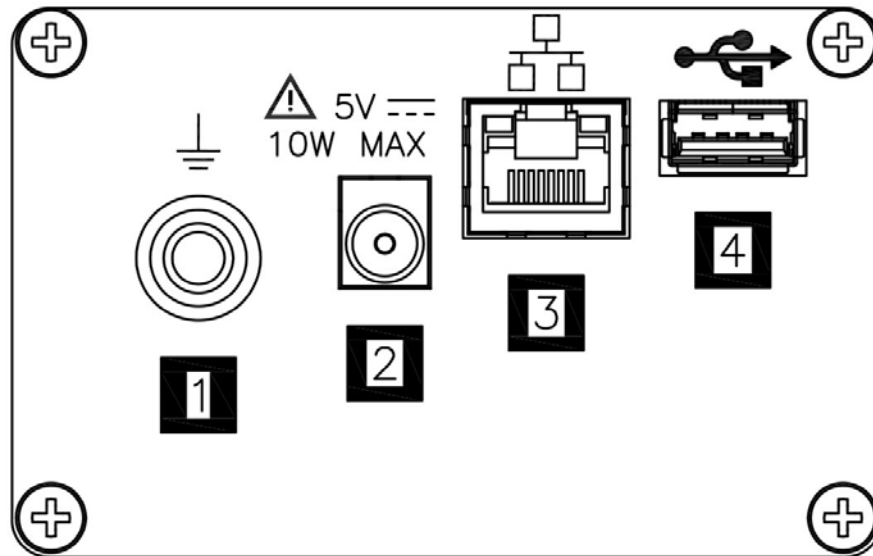
Channel A = RED  
Channel B = YELLOW  
Channel C = BLUE

### **LED Operation**

V or I applied: LED is solid in the channel color above  
No V or I applied: LED flashes in the channel color above  
V sequence error (if enabled): LED flashes RED if monitoring = ON

## Bottom End Panel View

This section describes the bottom end panel view of DranXperT.



- 1 Ground Terminal** – earth (ground) terminal reference connection to maintain accurate measurements.
- 2 DC Power Input** –external AC adapter/battery charger input.
- 3 Ethernet** – Wired Ethernet (RJ45) network connector. Depending on your computer, an Ethernet crossover cable (not included) may be required to connect directly to a computer when not using a network.
- 4 USB** – use for data transfer to a USB drive.

## CONNECTING TO DRANXPRT

A web browser is the only software needed to configure DranXperT for use and to download data for analysis and reporting by Dran-View XP. To connect to DranXperT, you must know its IP (network) address and password. Also, both the computer and the instrument must be properly configured for use on the intended networks. Once properly configured and connected to the network, simply launch a web browser on your computer, tablet, or smartphone and enter the instrument's IP address to communicate with DranXperT.

The factory default network settings are:

IP Address: 192.168.0.40

Username: **admin**

Password: **Dranetz**

### **Notes when using the default IP address:**

If you intend to use DranXperT directly connected to a computer, or on a small (un-routed) private network, it may be sufficient to use the default instrument IP address. Note that your computer must be configured for use on the same network (192.168.0.xxx) as DranXperT.

### **Notes when using DranXperT on a corporate, public, or other network:**


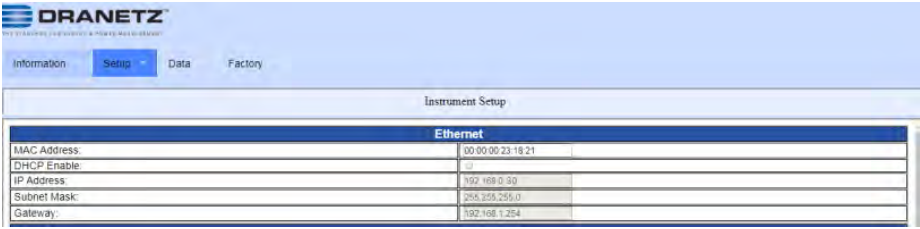
If you intend to use DranXperT on a routed, corporate, or other network, including the Internet, you may have to modify DranXperT's network settings for use on that network. To change the network settings, you must first establish a one-time connection to DranXperT using the default IP address to change the settings. PI

See the Instrument Settings section below to change the IP address of DranXperT.

## Connecting via Wired Ethernet Connection

The steps below show how to connect to DranXperT via a wired Ethernet connection.

Step	Action
1	Connect an Ethernet cable between your computer and the Ethernet port at the rear panel of the instrument. An Ethernet cross-over cable may be needed if the computer cannot auto-detect direct cabling.
2	Connect the power source at the rear panel of the instrument.
3	Power ON the computer, then press the DranXperT power button on the top panel to turn the instrument ON.
4	When using DranXperT for the first time, to complete the Ethernet connection, the computer's IP address needs to be changed to be on the same network as DranXperT's default IP address. This involves changing the IP address properties of
5	Once the computer's IP address has been properly configured, open a web browser and enter the following (default IP address) into the address bar: <a href="http://192.168.0.40">http://192.168.0.40</a> .
6	<p>If communications to the instrument are working properly, the login window below will be displayed, prompting you to enter the username and password. If you do not see the message below your computer's network settings may not be properly configured or an incorrect IP address is being used.</p> <p>Enter the default Username: <b>admin</b></p> <p>Enter the default Password: <b>Dranetz</b></p> <p>The username and password are case-sensitive and must be entered as shown.</p>

Step	Action
	 <p>When finished entering the username and password, click the <b>OK</b> button.</p>
7	<p>The DranXperT Home Page will then be displayed.</p> <p><u>Result:</u> The following screen is displayed.</p> 



## ***Making Measurement Connections***

### **WARNING**

Death, serious injury, or fire hazard could result from improper connection of this instrument. Read and understand the warnings in the beginning of this guide before connecting this instrument.

### **ADVERTENCIA**

Una conexión incorrecta de este instrumento puede producir la muerte, lesiones graves y riesgo de incendio. Lea y entienda este manual antes de conectar. Observe todas las instrucciones de instalación y operación durante el uso de este instrumento.

### **AVERTISSEMENT**

Si l'instrument est mal connecté, la mort, des blessures graves, ou un danger d'incendie peuvent s'en suivre. Lisez attentivement ce manuel avant de connecter l'instrument. Lorsque vous utilisez l'instrument, suivez toutes les instructions d'installation et de service.

### **WARNUNG**

Der falsche Anschluß dieses Gerätes kann Tod, schwere Verletzungen oder Feuer verursachen. Bevor Sie dieses Instrument anschließen, müssen Sie die Anleitung lesen und verstanden haben. Bei der Verwendung dieses Instruments müssen alle Installation-und Betriebsanweisungen beachtet werden.

## ***Measurement Connectors for DranXperT***

DranXperT has three (3) voltage and four (4) current channels which can be used to measure a wide variety of circuit types.

DranXperT comes with a voltage cable set for making voltage connections. Current measurements are made using the optional current probes available from Dranetz. Note that a variety of kits are available from Dranetz that include current probes.

Use only Dranetz voltage leads, current probes, and adapter cables for proper operation and safety. Do not exceed the marked maximum ratings.

### **Voltage Measurement Cables**

Voltage Measurement Cables: Voltage measurement cables and clips are provided as standard accessories.

### **Current Probes**

Current Probes (for Current Measurements): A variety of optional current probes are available. See the Optional Accessories section below.

## ***Connecting Voltage Measurement Cables***

### **Measurement cable set**

Description: Voltage measurement cables are used to connect to your circuit via safety banana jack connectors and alligator clips.

Voltage Rating: Direct connection of all voltage measurement inputs are rated at 600 VRMS max. When measuring voltages greater than 600 VRMS, potential transformers (PTs) or other transducers must be used.

Contents: A cable set consists of four (1 red, 1 yellow, 1 blue, 1 white) 6-foot voltage measurement cables, each with a detachable alligator jaw safety clip assembly (maximum jaw opening, 3/4 in (20 mm)). There are three (3) black and one (1) white safety clips.

## Connecting Current Probes

### Types of current probes

The instrument uses an insulated BNC type connector for connection of current probes to channels A, B, C and N.

#### WARNING

Use only probes that are rated 600V CAT III or higher. DO NOT use other probe types, including probes that use uninsulated connectors.

Probe positioning: The arrow marking on the current probe should be pointed in the direction of current flow and towards the load. To reduce measurement errors, it is always “best practice” to center the conductor in the probe. Correct position of the probe is necessary for correct power measurements, where in-phase voltage and current measurements are necessary.

### Safety Precautions

The following safety precautions apply to current probe connections.

- DO NOT attempt to measure current in any circuit in which the circuit to ground voltage exceeds the insulation rating of the current probe (example: 600 VRMS max).
- Make sure the current probes are tightly closed. Keep mating surfaces clean and free from foreign matter.

#### WARNING

DO NOT USE non-insulated current probe cores around a non-insulated wire. Probes of this type are designed for use around insulated wires only. Use only completely insulated probe cores with no exposed conductive areas of the core around non-insulated wires.

**ADVERTENCIA**

NO UTILIZAR transformadores de corriente sin material aislante al rededor de conductores sin material aislante. Los Transformadores de corriente de este tipo est n dise ados para ser utilizados solamente con conductores con aislamiento el ctrico. Utilizar transformadores de corriente completamente aislados alrededor de conductores sin aislamiento.

**AVERTISSEMENT**

N'EMPLOYEZ PAS les noyaux courants non-isol s de sonde autour d'un fil nonisol . Des sondes de ce type sont concues pour l'usage autour des fils isol s seulement. L'utilisation seulement a compl tement isol  des noyaux de sonde sans des secteurs conducteurs expos s du noyau autour des fils non-isol s.

**WARNUNG**

VERWENDEN Sie keine Stromzangen mit nicht isolierten Ferritkernen bei Messungen an nicht isolierten Leitungen. Stromzangen dieses Typs sind nur f r Messungen an isolierten Leitern geeignet. Bitte verwenden Sie zur Messung an nicht isolierten Leitungen Stromzangen mit vollst ndig isoliertem Kernmaterial

## Connection Guidelines

Refer to the appropriate connection diagram on the pages below for the desired circuit type.

### **Voltage and Current connections**

Voltage: As per the diagrams below, voltage probes are connected to the individual source or load lines and are referenced to the return (common).

Current: As per the diagrams below, current probes are connected to each line and positioned to measure currents with reference to the voltage probe.

Incorrectly positioned current probes may produce erroneous current and power measurement. Current probes are always oriented with the arrow pointing to the load.

### **WARNING**

To reduce the risk of fire, electric shock, or physical injury, it is strongly recommended that connections be made with all circuits de-energized and current carrying conductors fused. If it is necessary to make connections on energized circuits, these must be performed by Qualified Personnel ONLY with proper Personal Protective Equipment.

### **WARNING**

To avoid the risk of electric shock or burns, always connect the earth ground before making any other connections.

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DranXperT can monitor the following power configurations:

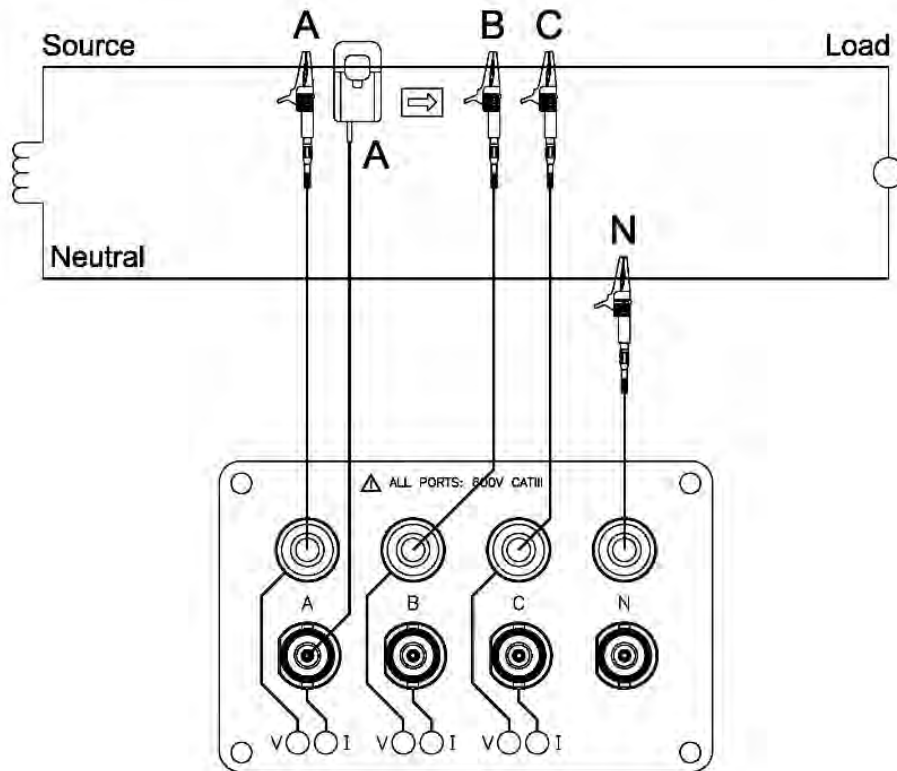
- Single Phase
- Split Phase
- 3 Phase, Four Wire Wye
- 3 Phase, Three Wire Delta (2 or 3 probe)

## Single Phase

When making single phase measurements, use channel A as shown below. The Neutral is chosen as the reference for measurement purposes. You may optionally measure the Neutral current by connecting a current probe to the Neutral conductor and to the N channel current input.

### NOTE

Be sure to connect the current probes with the arrow pointing towards the load or an erroneous power reading will result.



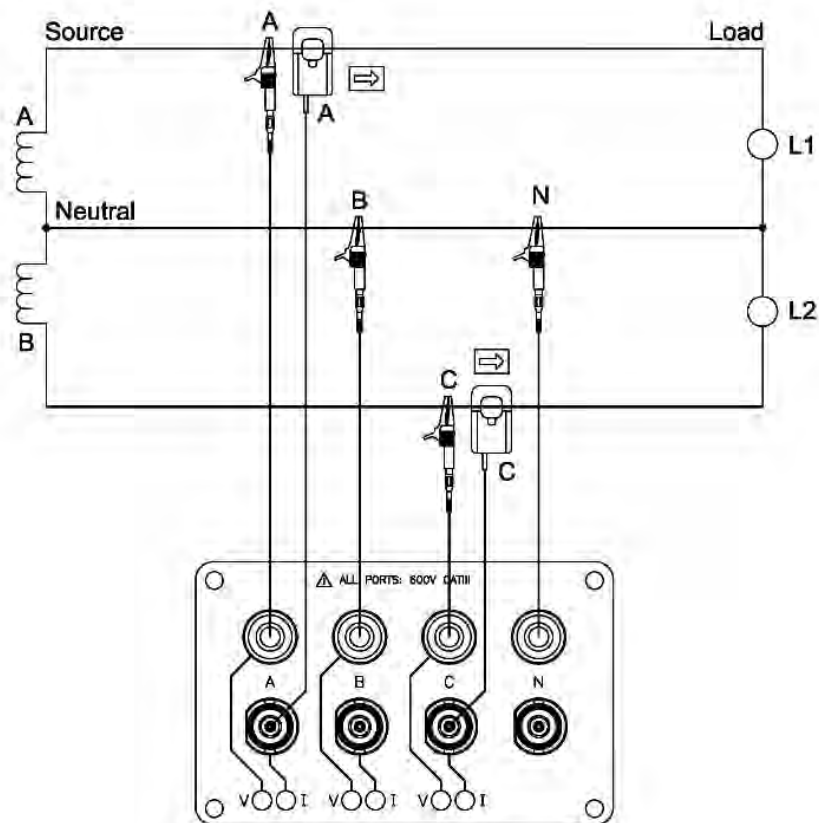
DRANXPRT-901

## Split Phase

When making split phase measurements, use both channels A and C for voltage and current connections. The Neutral is chosen as the reference for measurement purposes. You may optionally measure the Neutral current by connecting a current probe to the Neutral conductor and to the N channel current input.

### NOTE

Be sure to connect the current probes with the arrow pointing towards the load or an erroneous power reading will result.



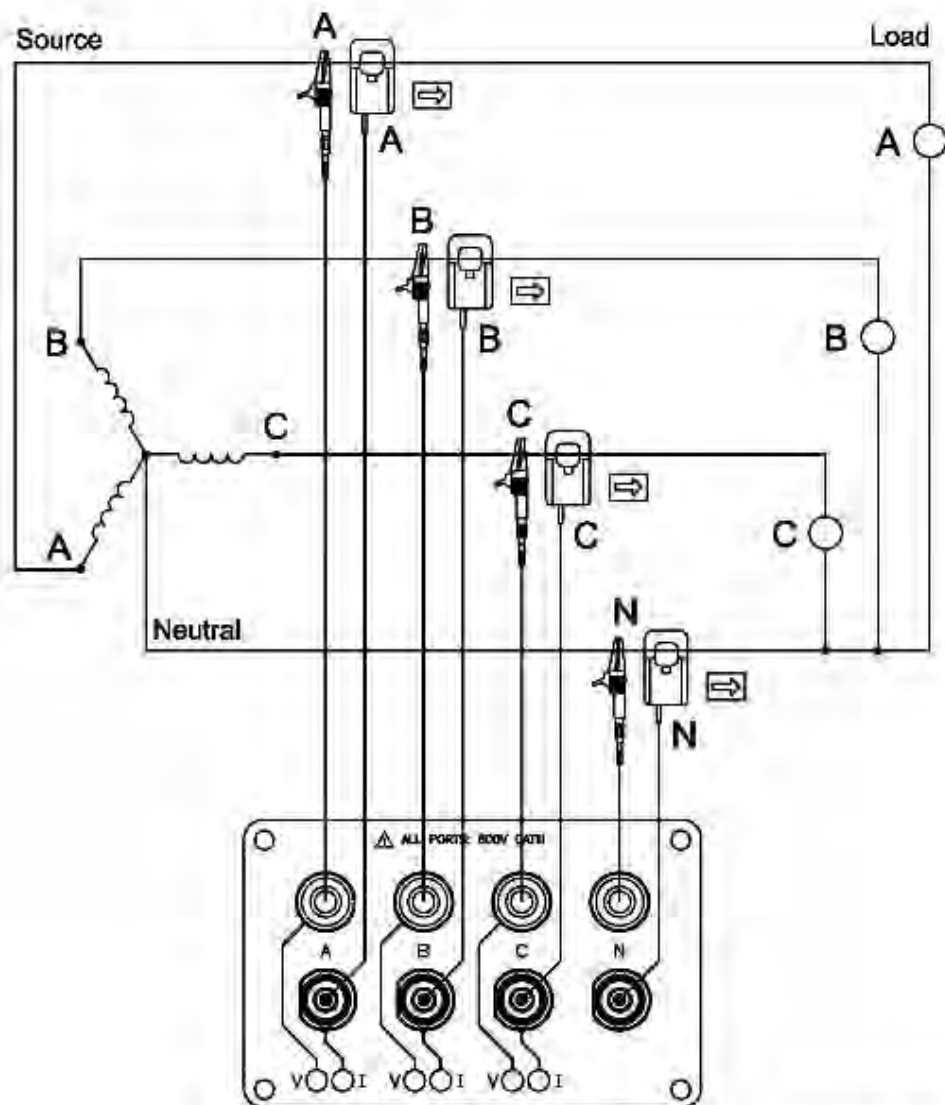
DRANXPRT-902



### 3 Phase, Four Wire Wye

Channels A, B, and C are connected to the voltage and current probes. The neutral is connected to common and is the reference for the three voltage channels. Note that the Neutral current measurement is optional.

**NOTE** Be sure to connect the current probes with the arrow pointing towards the load or an erroneous power reading will result.



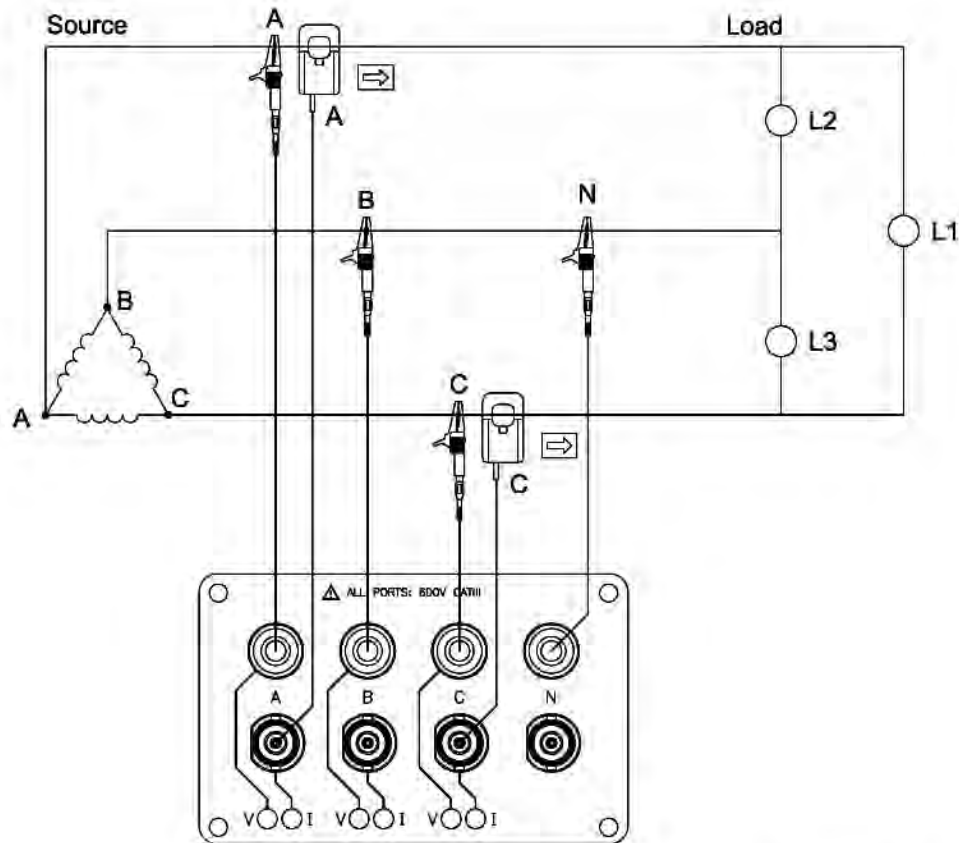
DRANXPRT-903

### 3 Phase, 2 probe Delta

The figure below shows the 3 Phase, 2 probe, 2 wattmeter delta connection using phase channels A-B-C. The N channel is connected to phase B as the reference for measurement purposes. Current probes are connected to measure line currents A and C.

#### NOTE

Be sure to connect the current probes with the arrow pointing towards the load or an erroneous power reading will result.

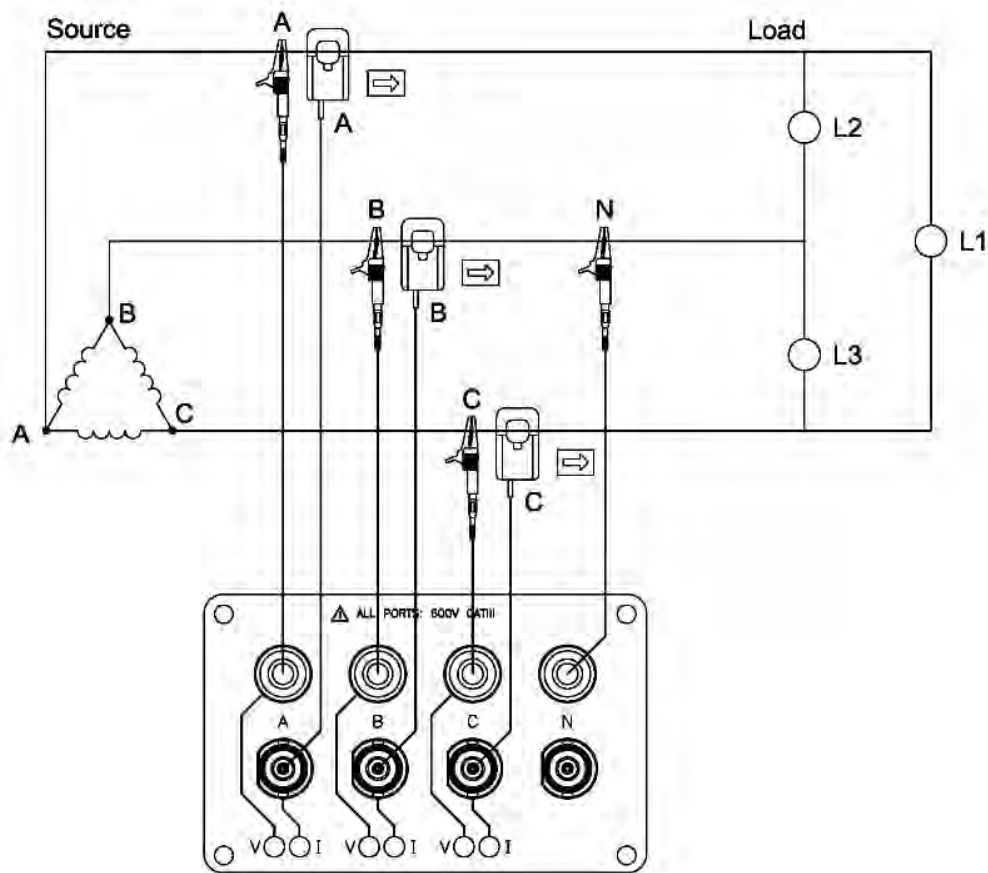


DRANXPRT-904

### 3 Phase, 3 probe Delta

The figure below shows the 3 Phase, 3 probe, 2 wattmeter delta connection using phase channels A-B-C. The N channel is chosen as the reference and is connected to phase B for measurement purposes. Current probes are connected to measure line currents A, B and C. Note that the B current probe is connected to measure the B phase current only and is not included as part of the power computations.

**NOTE** Be sure to connect the current probes with the arrow pointing towards the load or an erroneous power reading will result.



DRANXPERT-905

# DranXperT USER INTERFACE

## Home/Information Page

When first connecting to DranXperT, the Information page will be displayed. This page is also available by selecting Information > Status in the menu. See below.

Instrument Status	
Model	DranXpert
Serial #	DRXP0QA016
Version	V 01.01.009
OS Information	DaVinci-V0.4.3-BusterDesktop-8GB
Survey Name	4_EdSE_Wye_01_01_009_2_3
Monitoring Status	On
Active Database File	DB_201019_143011_4_EdSE_Wye_01_01_009_2_3
Power Source	Line
Charging	Yes
Battery Level	100%

Communication Status	
IP Address	172.20.20.118
MAC Address	b8:27:eb:48:f0:49

Clock Status	
Current Time (Local)	20/10/19 16:35:14
Current Time (UTC)	20/10/19 20:35:14

Modules	
Measurement	ADE9000 Device driver
UI	RGB User interface
Expansion	None

Turn Off Monitoring

The Information page provides instrument status information, such as the serial number, firmware version, monitoring state, power source/battery charge status, IP address, and current time.

At the bottom of the page, there is a button to turn monitoring ON or OFF. If monitoring is OFF, click this button to turn monitoring ON, and vice versa. This button serves the same purpose as the monitoring ON/OFF button located on the front panel. You can use either to control the state of the instrument monitoring.

Note that when monitoring is ON, the monitoring and instrument settings described below are “view only” and cannot be modified until monitoring is turned OFF.



## Instrument Settings

Once you have connected to DranXperT via a web browser, you can view and edit the instrument's settings as described below.

## Survey Setup

Select Setup > Survey Setup to view/change the current monitoring settings of the instrument.

Note that the survey settings can only be modified if monitoring is OFF. If monitoring is ON, you will receive a warning that the survey settings are “view only”.



Information **Setup** Data Factory

Survey Setup

General		
Survey Name:	Edition_SE_Vlge_3_Proce <small>(0-48 characters (Alpha, Numeric, - _))</small>	
Nominal Frequency:	60 Hz	
Wiring Configuration:	Three-Phase Wye	
Enable Monitor On Power Up:	<input type="checkbox"/>	
Pre-trigger Cycles:	10	< Total Trigger Cycles
Total Trigger Cycles:	50	0-500 Cycles

Voltage		
Nominal:	120	60 Vrms - 600 Vrms
PT Ratio Primary:	1	1-65535
PT Ratio Secondary:	1	1-65535
Sequence Error Enable:	<input type="checkbox"/>	
Enable V Limits:	<input type="checkbox"/>	
High Threshold %:	105	100% - 500%
Low Threshold %:	90	0% - 100%
Input Order:	A-B-C	

Current		
Nominal:	300	1 Arms - 65535 Arms
Current Probe Full Scale (Irms):	20	533 mVrms = 7 (1 - 3000)
CT Ratio Primary:	3000	1-65535
CT Ratio Secondary:	5	1-65535
Enable I Limits:	<input type="checkbox"/>	
High Threshold %:	300	100%+
Low Threshold %:	0	0% - 100%
Input Order:	A-B-C	
Current Probes:	3 Probes	

Energy		
Enable:	<input type="checkbox"/>	
Demand Interval Min.:	15	1 min - 1440 min
Demand Sub-Interval Min.:	5	1 min - 1440 min
Demand Limit:	0	

Journal / Snapshot		
Journal Enable:	<input type="checkbox"/>	
Journal Interval Sec.:	600	>= 1 sec
Snapshot Enable:	<input type="checkbox"/>	
Snapshot Interval Sec.:	600	>= 60 sec

## **General**

*Survey Name* - Enter a name (up to 48 characters) that describes your survey. This name will be included in the name of the data file recorded.

*Nominal Frequency* – Dropdown selection, either 50 Hz or 60 Hz.

*Wiring Configuration* – Dropdown selections are: Single Phase, Split Phase, Three-Phase Wye, Three-Phase Delta 2 probes, Three-Phase Delta 3 probes.

*Enable Monitor On Power Up* – Checkbox enable/disable. When checked, if the instrument resets, such as when power is restored after the battery has depleted, monitoring will be re-enabled upon restart if monitoring was previously ON.

*Pre-trigger Cycles* – Number of pre-trigger RMS points (in cycles) to record when exceeding the voltage or current trigger limits set below. Must be less than the Total Trigger Cycles.

*Total Trigger Cycles* – Total number of RMS points (in cycles) to record when exceeding the voltage or current trigger limits set below. Entry range is from 0 to 600 Cycles.

## **Voltage**

*Nominal* – Nominal voltage. Settable range is 90 – 600VRMS.

*PT Ratio Primary* – PT primary (if applicable). Settable range is 1 – 65535.

*PT Ratio Secondary* – PT secondary (if applicable). Settable range is 1 – 65535.

*Sequence Error Enable* – Checkbox enable/disable. Enables connection panel LED notification of a voltage sequence/connection error. The LEDs will flash RED if enabled and a voltage sequence error exists.

*High Threshold %* – Voltage high trigger limit. Settable range is 100 – 500% of the nominal voltage setting.

*Low Threshold %* – Voltage low trigger limit. Settable range is 0 – 100% of the nominal voltage setting.

*Input Order* – Dropdown selectable. Corrects for voltage wiring mistakes. Selections are: A-B-C (default), A-C-B, B-A-C, B-C-A, C-A-B, C-B-A.

## **Current**

*Nominal* – Nominal current for use with the current threshold settings below. Settable range is 1 – 65535 IRMSI.

*Current Probe Full Scale (IRMS)* – Full scale of the CT's being used. Settable range is 1 – 3000. ( $0.333\text{mVRMS} = x \text{ amps}$ , x is the full scale).

*CT Ratio Primary* – CT primary (if applicable). Settable range is 1 – 65535.

*CT Ratio Secondary* – CT secondary (if applicable). Settable range is 1 – 65535.

*High Threshold %* – Current high trigger limit. Settable range is 100 – 500% of the nominal current setting.

*Low Threshold %* – Current low trigger limit. Settable range is 0 – 100% of the nominal current setting.

*Input Order* – Dropdown selectable. Corrects for current wiring mistakes. Selections are: A-B-C (default), A-C-B, B-A-C, B-C-A, C-A-B, C-B-A.

## **Energy**

*Enable* – Checkbox enable/disable.

*Demand Interval Min* – Settable range is 1 minute - 1440 minutes.

*Demand Sub-Interval* – Settable range is 1 minute - 1440 minutes.

*Demand Limit* – When exceeded the Demand LED on the front panel will change to RED to indicate the programmed limit has been exceeded.

## **Journal/Snapshot**

*Journal Enable* – Checkbox enable/disable.

*Journal Interval Sec.* – Journal interval entered in seconds. Value entered must be  $\geq 1$  second.

*Snapshot Enable* – Checkbox enable/disable.

*Snapshot Interval Sec.* – Snapshot interval in seconds. Value entered must be  $\geq 60$  seconds.



## Submit Changes

When the Survey Setups have been completed, click the *Submit Changes* button to save the settings. Click the *Discard Changes* button to discard the settings.

## Instrument Setup

Select Setup > Instrument Setup to view/change the current instrument setup. These are miscellaneous instrument settings, such as the Ethernet settings, date/time, etc.

Note that the instrument settings can only be modified if monitoring is OFF. If monitoring is ON, you will receive a warning that the survey settings are “view only”.

The screenshot shows the 'Instrument Setup' page of the DRANXPRT web interface. The page has a header with the DRANETZ and DRANXPRT logos, and navigation tabs for Information, Setup (selected), Data, and Factory. The main content area is titled 'Instrument Setup' and contains several sections for configuring the instrument:

- Ethernet:** DHCP Enable (checked), IP Address (172.20.20.118), Subnet Mask (255.255.255.0), Gateway (192.168.0.255).
- Date and Time:** Date and Time (2020-10-19 16:36), DST Enable (checked), Time Zone Offset (UTC-05:00 United States - Eastern Time Zone).
- Input Channels:** Channel A Color (Red #FF0000), Channel B Color (Lime #00FF00), Channel C Color (Blue #0000FF).
- Database:** Max DB File Seconds (1 Day), Max DB Keep Minutes (2 Years).
- BACnet:** BACnet Enable (unchecked), BACnet DeviceID (0).
- Modbus TCP:** Modbus Enable (checked), Modbus Port (502).

At the bottom of the page, there are two buttons: 'Submit Changes' and 'Discard Changes'.



## Ethernet

*DHCP* – Checkbox enable/disable. If enabled, an IP address will be automatically assigned to the instrument by the network. The IP address assigned can be viewed in the Home/Instrument Status page.

*IP Address* – Instrument static IP address. The default static IP address is: 192.168.0.40. Enter a valid IP address for the network being used.

*Subnet Mask* – Network subnet mask. The default is 255.255.255.0. Enter a valid subnet mask for the network being used.

*Gateway* – Network gateway setting. Enter a valid gateway for the network being used.

## Date and Time

Note: The time and date of data stored in the DranXperT database is recorded in UTC time. By setting the local time zone offset (below), the data will appear in DranXperT and Dran-View XP in the local time zone.

*Date and Time* – Click in the date/time entry area to open up a dialog box to enter the local time and date. Click the *Change Date/Time* button when completed.

*DST Enable* – Checkbox enable/disable. Enable or disable Daylight Savings Time.

*Time Zone Offset* – Dropdown. Select the local time zone.

## Input Channels (LED colors)

You can change the color of the connector panel LEDs to match the circuit's wire colors.

*Channel A Color* – Dropdown list. Default channel A LED color is RED.

*Channel B Color* – Dropdown list. Default channel B LED color is YELLOW.

*Channel C Color* – Dropdown list. Default channel C LED color is BLUE.

## Database

*Max DB File Seconds* – Set the duration of the data file in hours, days, weeks, or months from a dropdown list. The default setting is 31 days. You can also enter a custom setting in seconds (<1hr). This setting is how long the instrument will record until a new data file is automatically created. A new data file will automatically be created when the duration is exceeded.

*Max DB Keep* – Set the duration of time that the data file will be retained in memory in days, weeks, months, or years from a dropdown list. You can also enter a custom setting in minutes. This setting is the length of time that the data file is retained in instrument memory before it is marked for deletion from the database automatically. Data files older than this setting will be automatically deleted to free up space for new recordings.

## BACnet

*BACnet Enable* – Checkbox enable/disable.

*BACnet Device ID* – Enter a valid BACnet Device ID for the instrument.

## Modbus TCP

*Modbus Enable* – Checkbox enable/disable.

*Modbus Port* – Enter a valid modbus port. The default Modbus port is 502.

## Submit Changes

When the Instrument Setups have been completed, click the *Submit Changes* button to save the settings. Click the *Discard Changes* button to discard the settings.

## Download Config

Select Setup > Download Config to download the instrument settings to your computer. This capability allows you to store a settings template for your surveys that can be uploaded back into the instrument for future use.

When selecting Download Config, two choices are available:

- CfgActive.json (instrument settings file)
- Cfg9000.json (for factory and advanced use)

Select the CfgActive.json option to download the current instrument settings to your computer via your web browser's file download feature. When prompted, select "Save" or "Save as" in your web browser. The file will be stored on your computer in the folder where your web browser saves downloaded files. The instrument settings file saved will be named "Survey Name.json", where Survey Name is the survey name that you programmed. Once saved to your computer, this file can be renamed.

## Upload Configuration

Select Setup > Upload Config to upload a settings file that was previously downloaded (see above).

It is recommended that before uploading a setup file, the default "CfgActive.json" file in the instrument should be saved in case of any errors encountered with the uploaded file.

The screenshot shows the DRANETZ DRANXPRT web interface. At the top, there are logos for DRANETZ and DRANXPRT. Below the logos are navigation tabs: Information, Setup (highlighted), Data, and Factory. The main heading is "Config Upload". Below this is a table titled "Update Configuration with File".

Step #	Name	Description	Status
1	File Selection	Select the configuration file to be uploaded to the instrument. It should be a file named CfgActive.json. Press the BROWSE button to locate the CfgActive.json file. <input type="text"/>	BROWSE
2	Upload	Send the selected file to the instrument. This will take several seconds. Press the UPLOAD button to the right when you are ready to begin.	UPLOAD
3	Update	Press the UPDATE button to the right to begin.	UPDATE
4	Complete	You're done with the Config Upload. You don't need to do anything else. From here you can continue on with normal interaction with this site. You can use the Information>Instrument Status menu item to confirm that the instrument is running the updated configuration.	

As shown in the image above, there are 4 steps to upload settings files to the instrument. Each step is highlighted in GREEN as you progress through the process:

- 1) *File Selection* – Click the *BROWSE* button to path to the configuration file to upload. Select the file and click *Open*.
- 2) *Upload* – Click the *UPLOAD* button to transfer the configuration file to the instrument.
- 3) *Update* – Click the *UPDATE* button to save the configuration information into the instrument.
- 4) *Complete* – When Complete is highlighted, uploading the configuration has been successfully completed.

### ***Real-Time Measurements***

Select Data > Meters to view the real-time metering information.

Real-time measurements are updated about every 5 seconds. The table as follows lists the real-time parameters displayed and their units.

Energy		
Description	Units	Channel (wiring dependent)
True Energy	Whr	A, B, C
Reactive Energy	VAhr	A, B, C
Apparent Energy	VAhr	A, B, C
True Energy (Fundamental)	Whr	A, B, C
Reactive Energy (Fundamental)	VAhr	A, B, C
Apparent Energy (Fundamental)	VAhr	A, B, C
Power		
Description	Units	Channel (wiring dependent)
Frequency	Hz	A, B, C
RMS Voltage	VRMS	A, B, C
RMS Current	IRMS	A, B, C
True Power	W	A, B, C
Apparent Power	VA	A, B, C
Reactive Power	VAr	A, B, C
Power Factor		A, B, C
Voltage THD	%	A, B, C
Current THD	%	A, B, C
RMS Voltage (Fundamental)	VRMS	A, B, C
RMS Current (Fundamental)	IRMS	A, B, C
True Power (Fundamental)	W	A, B, C
Apparent Power (Fundamental)	VA	A, B, C
Reactive Power (Fundamental)	VAr	A, B, C
RMS Voltage (1 sec avg)	VRMS	A, B, C
RMS Current (1 sec avg)	IRMS	A, B, C
RMS Voltage (10/12 cycle)	VRMS	A, B, C
RMS Current (10/12 cycle)	IRMS	A, B, C
Voltage Phase	Deg.	A, B, C
Current Phase	Deg.	A, B, C

Neutral		
Description	Units	Channel (wiring dependent)
Neutral RMS Current	IRMS	N
Neutral RMS Current (1 sec avg)	IRMS	N
Neutral RMS Current (10/12 cycle)	IRMS	N
Demand		
Description	Units	Channel (wiring dependent)
Peak Demand	W	A, B, C
Peak Reactive Demand	VA <sub>r</sub>	A, B, C
Peak Apparent Demand	VA	A, B, C
Peak Demand (Fund.)	W	A, B, C
Peak Reactive Demand (Fund.)	VA <sub>r</sub>	A, B, C
Peak Apparent Demand (Fund.)	VA	A, B, C

### ***Downloading and Managing Data***

Select Data > List Files to view the recorded data files in the instrument's memory. The List Files page allows you to download data recorded by DranXperT to your computer for analysis using Dran-View XP, and to also delete files that are no longer needed.

DRANETZ  
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DRANXPERT

Information Setup **Data** Factory

File Listing

No.	Select	Name	Type	Size (bytes)	Last Modified
1	<input type="checkbox"/>	DB_200828_194157_Survey.json	json	1699840	September 07 2020 11:31:58.
2	<input checked="" type="checkbox"/>	DB_200828_194157_Survey.json	json	1327783	September 02 2020 04:00:00.
3	<input checked="" type="checkbox"/>	DB_200828_112654_DranXpert_Kens_On_Rack.json	json	47427	August 28 2020 15:39:25.

Check All Zip and Download Selected Data Files Delete Selected Data Files

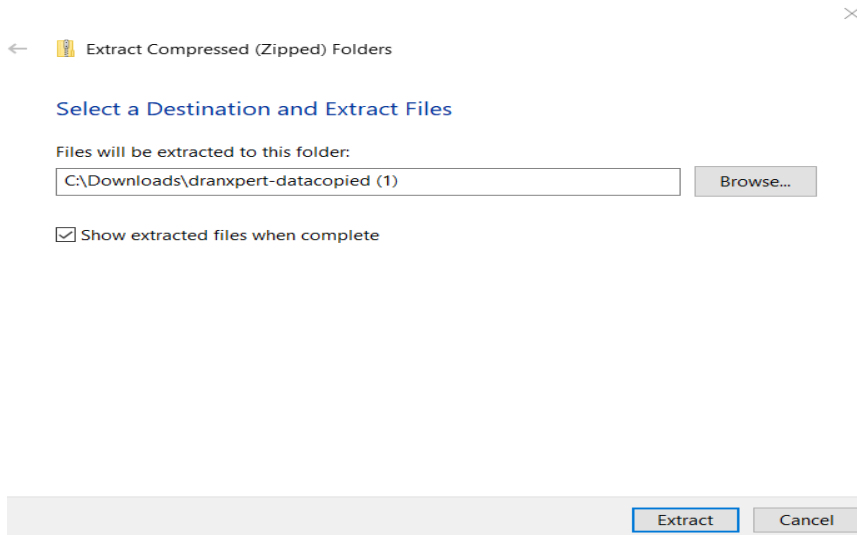
## Downloading data files

To download data files to your computer:

- 1) Check the file(s) to download or click the *Check All* button to select all data files.
- 2) Click the *Zip and Download Selected Data Files* button to download the selected files. The Zip feature will combine (zip and compress) multiple files into one file for downloading.
- 3) DranXperT will display a progress window, and when completed, your web browser will prompt you to open or save the zip file. Click *Save* (or *Save As*) to save the file to your web browser's Download folder (name and location are browser-dependant).
- 4) Once the zip file has been downloaded, you can then move the file to another location on your computer, network, or transfer via email or FTP to another computer.

To unzip data files using the Windows unzip function:

- 1) Locate the zip file downloaded above. This is usually in your web browser's Download folder.
- 2) Right-click on the file and select *Extract All*. The window below will be displayed.



- 3) Click the *Browse* button to choose or create the folder where the extracted data files will be saved.
- 4) Click *Extract* to save the DranXperT files to the location chosen in step #3. Note that DranXperT data files are of the file type “.json”.
- 5) When the above is completed, the DranXperT data is ready to be viewed by Dran-View XP. See the View Recorded Data section below.

#### Deleting data files from DranXperT’s memory

- 1) Check the file(s) to delete or click the *Check All* button to select all data files.
- 2) Click the *Delete Selected Data Files* button.
- 3) When prompted, click *OK* to delete the selected files or *Cancel* to abort.



## Factory Settings



### Instrument Firmware

Dranetz continually provides updates to our products to enhance their capabilities and to correct known issues. These updates are available for download on our website. It is always good practice to periodically check to make sure that your instrument is up to date.

If the firmware posted on our website is newer than what is installed in your instrument, please follow the online instructions to download the firmware update. Then, follow the firmware installation instructions below to update your instrument.

### Firmware Updates

Select Factory > Update Firmware to update DranXperT's firmware. The page shown below will be displayed.



Information Setup Data **Factory**

Firmware Update

Firmware Upload Procedure			
Step #	Name	Description	Status
1	Clear Uploaded Files	This table will walk you through the process of loading a firmware update into your DataNode. All steps are shown so that you can see where you are in the process and what to expect. The green, highlighted row is the current step. Only the buttons in that row will be active. As each step is completed the buttons for that step will be replaced by a check mark indicating no further action is required for that step.  Click on the CLEAR button to the right to clear all uploaded files.	<input type="button" value="CLEAR"/>
2	File Selection	Select the firmware file to upload to the instrument. It should be a file named davinci.deb. Press the BROWSE button to locate the davinci.deb file: <input type="text"/>	<input type="button" value="BROWSE"/>
3	Upload	Send the selected file to the instrument. This will take several seconds. Press the UPLOAD button to the right when you are ready to begin.	<input type="button" value="UPLOAD"/>
4	Install	Press the UPDATE button to the right to begin.  Press CANCEL to the right if you do not want to continue. If you've changed your mind and no longer wish to reprogram the instrument's firmware then you MUST cancel the firmware load process. Since you've reached this point failure to properly cancel the steps will cause the firmware to be reprogrammed on the next restart.	<input type="button" value="UPDATE"/> <input type="button" value="CANCEL"/>
5	Complete	You're done with the firmware upload. You don't need to do anything else. From here you can continue on with normal interaction with this site. You can use the Information>Instrument Status menu item to confirm that the instrument is running the updated firmware.	

Follow the steps below to upgrade DranXperT's firmware. The firmware update wizard will guide you through the process. The current step is highlighted in GREEN as shown in the picture above. Once a step is completed the next step will be highlighted.

- 1) Click the *Clear* button to clear previously updated firmware.
- 2) Click *Browse* to locate the firmware update file that you downloaded from the Dranetz website. Note that DranXperT firmware files have a '.deb' file extension. Select the firmware file and click *Open*.
- 3) Click the *Upload* button to upload the firmware update file to DranXperT.
- 4) Click the *Update* button to begin the firmware update process or click *Cancel* to abort.
- 5) When the firmware update process has completed, step #5 will be highlighted in GREEN.

Please check the Information > Status page to verify that the version displayed matches the new version installed.

## Restore Factory Defaults

There may come a time when you need to restore DranXperT's settings to its factory defaults. There are several options. Select the "Factory" tab, then choose the option below that best fits your needs:

- *Restore Factory Default (Keep IP)* – Restore the factory settings but keep the data and IP address settings as is (unchanged).
- *Restore Factory Default with Data Purge (Keep IP)* – Restore the factory settings and purge all data, but keep the IP address settings as is (unchanged).
- *Restore All Settings to Factory Default (incl. IP)* – Restore all factory settings including the IP address, and also purge the data.

**Note:** Depending on the option chosen above, instrument settings, recorded data, and/or the IP address will be deleted from the instrument.

After selecting one of the options described above, you will be prompted to confirm that you would like to proceed. Click the *OK* button to continue or click *Cancel* to abort.

## Restart

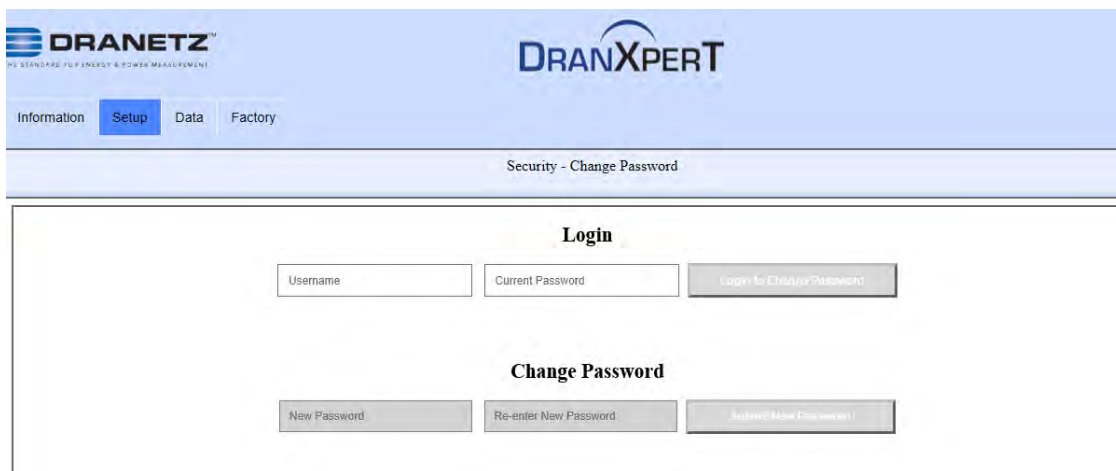
There may come a time when you need to restart the instrument. Restarting will reboot the instrument, and when completed, the instrument will resume monitoring if monitoring was previously turned on. No settings or data files are lost when restarting.

To restart the instrument, select Factory > Restart.

## Change Password

The default username and password for DranXperT are listed above in the Connecting to DranXperT section. The username cannot be changed, but the password can be changed.

To change the password, select Factory > Change Password. The page below will appear.



The screenshot shows the DranXperT web interface. At the top, there is a header with the DRANETZ logo on the left and the DRANXPERT logo on the right. Below the logos is a navigation bar with tabs: Information, Setup (highlighted in blue), Data, and Factory. Below the navigation bar is a sub-header that reads "Security - Change Password". The main content area is divided into two sections. The first section is titled "Login" and contains three input fields: "Username", "Current Password", and a button labeled "Login to Change Password". The second section is titled "Change Password" and contains three input fields: "New Password", "Re-enter New Password", and a button labeled "Submit New Password".

Enter the current username and password in the Login field and click *Login to Change Password*.

Enter the new password in the both the New Password and Password Confirmation fields and click *Submit New Password*.

## START/STOP MONITORING

Monitoring can be started or stopped by using either the membrane keypad or via a web browser.

### Start Monitoring

Once you have configured the DranXperT settings, the next step is to start monitoring. Please do one of the following to start monitoring:



#### Instrument Keypad

Press and hold the “Monitoring” button for approximately 5 seconds until a beep is heard to turn monitoring ON. The LED above the button will illuminate “GREEN” when monitoring has started and is ON.

#### Web Browser

Select the Information > Status page. At the bottom of the page, click *Turn On Monitoring*. When monitoring is ON, the button text will change to “Turn Off Monitoring”.

**DRANETZ**  
THE STANDARD FOR ENERGY & POWER MEASUREMENT

**DRANXPERT**

Information Setup Data Factory

Information

Instrument Status	
Model	DranXpert
Serial #	DRXP0QA016
Version	V 01.01.009
OS Information	DaVinci-V0.4.3-BusterDesktop-8GB
Survey Name	4_EdSE_Wye_01_01_009_2_3
Monitoring Status	On
Active Database File	DB_201019_143011_4_EdSE_Wye_01_01_009_2_3
Power Source	Line
Charging	Yes
Battery Level	100%

Communication Status	
IP Address	172.20.20.118
MAC Address	b8:27:eb:48:f0:49

Clock Status	
Current Time (Local)	20/10/19 16:35:14
Current Time (UTC)	20/10/19 20:35:14

Modules	
Measurement	ADE9000 Device driver
UI	RGB User interface
Expansion	None

Turn Off Monitoring

## ***Stop Monitoring***

Please do one of the following to stop monitoring.



### **Instrument Keypad**

Press and hold the “Monitoring” button for approximately 5 seconds until a beep is heard to turn monitoring OFF. The “Monitor” LED will turn OFF when monitoring is stopped.

### **Web Browser**

Select the Information > Status page. At the bottom of the page click *Turn OFF Monitoring*. When monitoring is OFF, the button text will change to “Turn On Monitoring”.

## **VIEWING RECORDED DATA**

DranXperT data files are stored in a json (JavaScript Object Notation) file format and have a “.json” file extension. Dran-View XP software is used to view and analyze data recorded by DranXperT. In order to do so, you must first copy the DranXperT data files to your computer. Please follow the steps below:

### ***Copying Data from DranXperT***

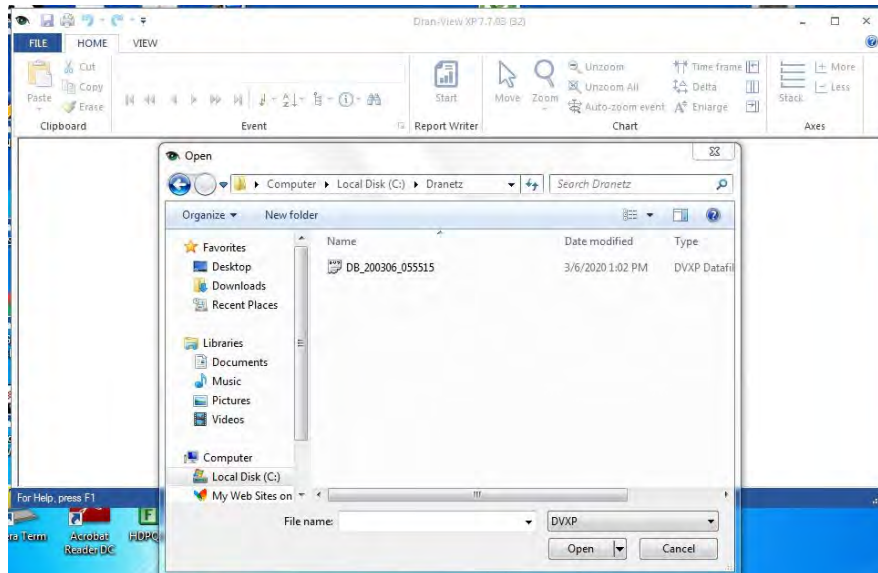
There are 2 ways to copy data to your computer for analysis using Dran-View XP software.

- 1) Download data to a computer using your web browser – see the *Downloading and Managing Data* section above.
- 2) USB drive – DranXperT data can be automatically copied to a USB drive by following the steps below:
  - a. Turn off monitoring – see the Start/Stop Monitoring section above. Data cannot be copied to a USB drive when monitoring is ON.
  - b. Insert a USB drive into the USB port.
  - c. DranXperT will automatically begin copying all data files to the USB drive. The 6 measurement input LEDs will blink GREEN while data is being transferred to the USB drive.
  - d. The data transfer has completed when the measurement input LEDs stop blinking GREEN.
  - e. When the transfer is complete, remove the USB drive from DranXperT.
  - f. Insert the USB drive into a USB port of the computer running Dran-View XP and then follow the instructions below to open a data file.

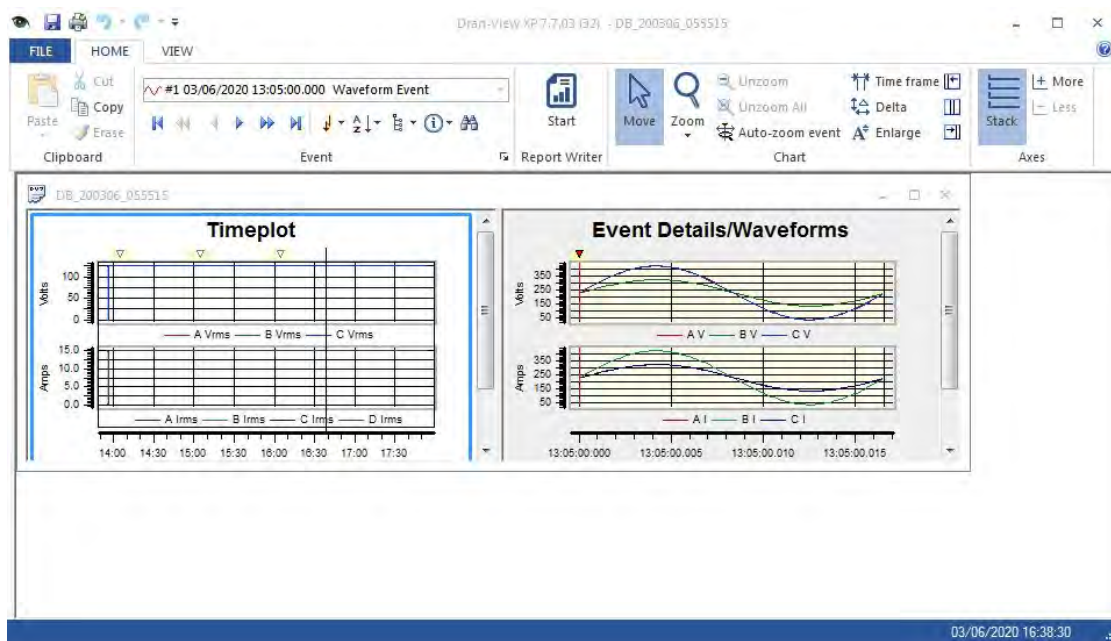
### ***Opening Data in Dran-View XP***

To view data files in Dran-View XP:

- 1) Start Dran-View XP.
- 2) Select “File” and then select “Open”.
- 3) Locate and select the data file of interest and select “Open”. The data file can be located on your computer, external USB drive, network folder, etc.



Once the data file is opened, Dran-View XP will display the data recorded by DranXperT. You can view Time Plots, Event details, and more for analysis and reporting.





## ACCESSORIES LIST

### ***Standard Accessories***

The following table lists the standard accessories for DranXperT.

Qty	Description	Part Number
1 (universal input power supply and choice of one power cord supplied with each instrument)	External Power Supply (+5V output) and US 115V power cord	DRANXPERT-PS-US
	External Power Supply (+5V output) and European Schuko 250V power cord	DRANXPERT-PS-EU
	External Power Supply (+5V output) and United Kingdom 250V power cord	DRANXPERT-PS-UK
	External Power Supply (+5V output) and Australian 250V power cord	DRANXPERT-PS-AU
1	Voltage Cable Set	118375-G1
1	DranXperT Quick Reference Guide	QR-DRANXPERT



## Optional Accessories

The following table lists the optional accessories for DranXperT.

Description		Part Number
<b>Current Probe Accessories</b>		
Hinged, Split - Core Current Probes. 600V CAT III		
5A	0.4 in (10 mm) window size	CT-H-5A
20A	0.4 in (10 mm) window size	CT-H-20A
50A	0.4 in (10 mm) window size	CT-H-50A
100A	1 in (25.4 mm) window size	CT-H-100A
600 A	1.38 in (35.1 mm) window size	CT-H-600A

# SPECIFICATIONS\*

## GENERAL

- Sampling Frequency: 32ksps (recorded and real-time meters), 128 samples per cycle (periodic waveform snapshots)
- Sag/dip, swell trigger resolution: 1-cycle (uses IEC 61000-4-30 Class S methods)
- Panel indicators: RGB LEDs for monitoring on/off, energy flow, PQ event indication, battery charging/status, wiring status
- Storage Capacity: 8GB
- UL, CE

## Voltage (3)

- Range: 90 to 600VRMS CATIII
- Accuracy: 90 VRMS to 600VRMS =  $\pm 0.1\%$ , <90 VRMS = 0.5%
- Connections: 4 safety banana voltage inputs – 3-phase voltage and 1 neutral/reference

## Current (4)

- Input: 0.333 VRMS full scale, Connections: BNC
- Accuracy:  $\pm 0.1\%$  + probe

## Frequency

- Range: 50Hz = 45Hz to 55Hz, 60Hz = 55Hz to 65Hz
- Accuracy: 50/60Hz:  $\pm 0.001\text{Hz}$

## POWER QUALITY

- Sag/dip, swell trigger threshold resolution: 1-cycle
- $V_{thd}$ :  $\pm 5\%$  for  $V \geq 10\% V_{nom}$
- $I_{thd}$ :  $\pm 5\%$  for  $I \geq 10\% I_{nom}$  + probe error

## ENERGY PARAMETERS *(probe dependent)*

- (True/Active) Energy (P): 0.1%
- Reactive Energy (Q): 0.1%
- Apparent Energy (S): 0.1%
- Fundamental Active Energy(P): 0.2%
- Fundamental Reactive Energy(Q): 0.2%
- Fundamental Apparent Energy (S): 0.2%
- Demand: 0.2%

## **POWER PARAMETERS** *(probe dependent)*

- (True/Active) Power (P): 0.2%
- Reactive Power (Q): 0.2%
- Apparent Power (S): 0.2%
- Fundamental Active Power(P): 0.2%
- Fundamental Reactive Power (Q): 0.2%
- Fundamental Apparent Power (S): 0.2%
- Power Factor (PF):  $\pm 0.001\%$

## **INSTRUMENT POWER**

### **Line Power Supply**

- Range: 90 to 264 VAC, 47 to 63Hz, Consumption: 15W max
- Line cords/plugs: Localized – US, EU, UK, Australia available

### **Internal Battery**

- Rechargeable lithium Ion battery pack (UL recognized)
- Run time: 7 hours (typical), Charge time: 15 hours (typical)

## **COMMUNICATION INTERFACES**

- Ethernet: 10
- USB: 2.0
- Protocols: Modbus, Bacnet

## **ENCLOSURE & MECHANICAL**

### **Mechanical**

- Weight: 1.4 lb. (0.64Kg)
- Dimensions: 3.5" W x 2.2" H x 7.4" L (6.4 cm x 8.9 cm x 18.8cm)
- IP50 (vertical position)

### **Environmental**

- Storage Temperature: 5 to 131 °F (-15 to +55 °C)
- Operating Temperature: 32 to 113 °F (0 to +45 °C)
- Humidity: 5% to 95% non-condensing

### **\* Notes:**

- Specifications are subject to change without notice
- Dranetz recommends annual calibration to maintain the specified accuracies

## **STATEMENTS AND NOTICES**

### **Statement of Warranty**

All Dranetz manufactured portable instruments and accessories are warranted to the original purchaser against defective material and workmanship for a period of three years from the date of invoice. User replaceable instrument batteries are warranted for a period of one year from the date of invoice. Certain Dranetz branded accessories, such as current transformers and other accessories not manufactured by Dranetz, are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of invoice. Warranties for products and accessories sold by, but not branded as Dranetz, are covered by their respective manufacturer's warranties, and are not warranted by Dranetz. Dranetz will repair or replace, at its option, all defective equipment that is returned, freight prepaid, during the warranty period. There will be no charge for repair, provided there is no evidence that the equipment has been mishandled or abused. This warranty shall not apply to any defects resulting from improper or inadequate maintenance, buyer-supplied hardware/software interfacing, unauthorized modification or misuse of the equipment, operation outside of environmental specifications, or improper site preparation or maintenance.

### **Statement of Reliability**

The information in this Quick Reference Guide has been reviewed and is believed to be entirely reliable. However, no responsibility is assumed for any inaccuracies. All material is for informational purposes only, and is subject to change without prior notice.

### **Notice Regarding FCC Compliance**

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

## **Statements and Notices (cont.)**

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