DRANETZ®
GMC-INSTRUMENTS GROUP

DRANXPERT®

User 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 70-2023) 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-2024) of USA and any additional workplace safety requirements applicable to your installation.

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.

La conexión de este instrumento a un sistema eléctrico se debe realizar en conformidad con el Código Eléctrico Nacional (ANSI/NFPA 70-2023) de los E.E.U.U., además de cualquier otra norma de seguridad correspondiente a su establecimiento.

La instalación, operación y mantenimiento de este instrumento debe ser realizada por personal calificado solamente. El Código Eléctrico Nacional define a una persona calificada como "una que esté familiarizada con la construcción y operación del equipo y con los riesgos involucrados."

El personal cualificado que trabaja encendido o acerca a los conductores eléctricos energizados expuestos debe seguir prácticas y procedimientos relacionados seguridad aplicable del trabajo incluyendo el equipo protector personal apropiado en conformidad con el estándar para los requisitos de seguridad eléctricos para los lugares de trabajo del empleado (ANSI/NFPA

70E-2024) de los E.E.U.U. y cualquier requisito de seguridad adicional del lugar de trabajo aplicable a su instalación.

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.

Cet instrument doit être connecté conformément au National Electrical Code (ANSI/NFPA 70-2023) des Etats-Unis et à toutes les exigences de sécurité applicables à votre installation.

Cet instrument doit être installé, utilisé et entretenu uniquement par un personnel qualifié. Selon le National Electrical Code, une personne est qualifiée si "elle connaît bien la construction et l'utilisation de l'équipement, ainsi que les dangers que cela implique".

Le personnel qualifié qui travaillent dessus ou s'approchent des conducteurs électriques activés exposés doit suivre des pratiques en matière et des procédures reliées par sûreté applicable de travail comprenant le matériel de protection personnel approprié conformément à la norme pour des conditions de sûreté électriques pour les lieux de travail des employés (ANSI/NFPA 70E-2024) des Etats-Unis et toutes les conditions de sûreté additionnelles de lieu de travail applicables à votre installation.

Safety Summary

Read and follow these instructions carefully and completely in order to ensure safe and proper use.

The instructions must be made available to all persons who use the instrument.
Keep for future reference.

If the equipment is used in a manner not specified in this user guide, the protection provided by the equipment may be impaired. These safety precautions are repeated where appropriate throughout this manual.

General

- Installation, operation, and maintenance of this instrument must be performed by qualified personnel only and has received safety training on the hazards involved.
- Observe and comply with all safety regulations which are applicable to your work environment.
- Wear suitable and appropriate personal protective equipment (PPE) whenever working with the instrument.
- The functioning of active medical devices (for example pacemakers, defibrillators) and passive medical devices may be affected by voltages, currents and electromagnetic fields generated by the tester and the health of their users may be impaired. Implement corresponding protective measures in consultation with the manufacturer of the medical device and your physician. If any potential risk cannot be ruled out, do not use the instrument.

Accessories

- Use only the specified accessories (included in the scope of delivery or listed as options) with the instrument.
- Carefully and completely read and adhere to the product documentation for optional accessories. Retain these documents for future reference.

Handling

- Before each use, inspect the instrument and all cables for breaks or cracks in the insulation. Replace immediately if defective.
- Use the accessories and all cables in undamaged condition only. Inspect accessories and all cables before use. Pay particular attention to damage, interrupted insulation or kinked cables.
- If the instrument or its accessories don't function flawlessly, permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- If the instrument or accessories are damaged during use, for example if they're dropped, permanently remove the

instrument/accessories from operation and secure them against inadvertent use.

- If there are any signs of interior damage to the instrument or accessories (e.g. loose parts in the housing), permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- The instrument and the accessories may only be used for the tests/measurements described in the documentation for the instrument.
- The instruments and accessories of Dranetz are designed such as to ensure optimum compatibility with Dranetz products that are expressly provided for them. Unless otherwise expressly confirmed in writing by Dranetz, they are not intended and suited for use with other products.
- Route cables in an orderly fashion. Loose, disorderly cables result in unnecessary danger of tripping and falling.

Operating Conditions

- Do not use the instrument and its accessories after long periods of storage under unfavorable conditions (e.g. humidity, dust or extreme temperature).
- Do not use the instrument and its accessories after extraordinary stressing due to transport.
- Do not expose the instrument to direct sunlight.
- Only use the instrument and its accessories within the limits of the specified technical data and conditions (ambient conditions, IP protection code, measuring category etc.).
- Do not use the instrument in potentially explosive atmospheres. Danger of explosion!
- Do not use the instrument in atmospheres subject to fire hazard. Danger of fire

Rechargeable or regular batteries

- Use batteries in undamaged condition only. Risk of explosion and fire in the case of damaged batteries! Inspect the batteries before use. Pay particular attention to leaky and damaged batteries.
- When using (rechargeable) batteries, the respective test/measuring instrument may only be used with inserted and secured battery compartment lid. Otherwise, dangerous voltages may occur at the battery contacts under certain circumstances.
- Only charge undamaged batteries. Risk of explosion and fire in the case of damaged rechargeable batteries! Inspect the batteries before use. Pay particular attention to leaky and damaged batteries.

Measurement Cables and Making Connections

- Plugging in the measurement cables must not necessitate any undue force.
- Never touch conductive ends.
- Fully unroll all measurement cables before starting a test/measurement. Never perform a test/measurement with the measurement cable rolled up.
- Connect the safety (earth) ground 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.
- 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.

Data Security

- Always create a backup copy of your measurement/test data.
- The device is equipped with a data memory to which personal and/or sensitive data can be stored. Observe and comply with the applicable national data protection regulations. Use the corresponding functions provided by the test instrument (such as access protection), as well as other appropriate measures to prevent unauthorized access to the data.
- Protect the device against unauthorized tampering. Use appropriate measures (e.g. restricting physical access to the instrument).

Definitions of Safety Statement Levels in this Document

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.

NOTE - Safety Related References:
The references below are examples only. Make sure to follow the local safety and work requirements in your country and environment.

- Qualified personnel: In the USA, 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."
- Safe work practices: 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 USA Standard for Electrical Safety Requirements for Employee Workplaces (ANSI/NFPA 70E-2024) of USA and any additional workplace safety requirements applicable to your installation

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Intended Use / Use for Intended Purpose

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 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.

Being an international product, DranXperT's web-based user interface is available in many languages including English, German, French, Spanish, Italian, Simplified & Traditional Chinese.

DranXperT data is fully compatible with Dran-View® Windows software.

Use for Other than Intended Purpose
Using the instrument for any purposes other than those described in this guide is contrary to use for intended purpose. Use for purposes other than those intended may result in unforeseeable damage!

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.

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.

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.

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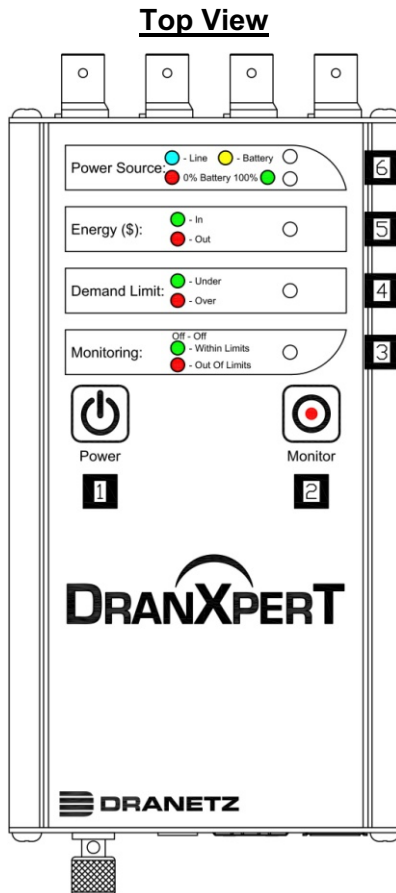
1 **Power Button** – press to turn the instrument power ON or OFF

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.
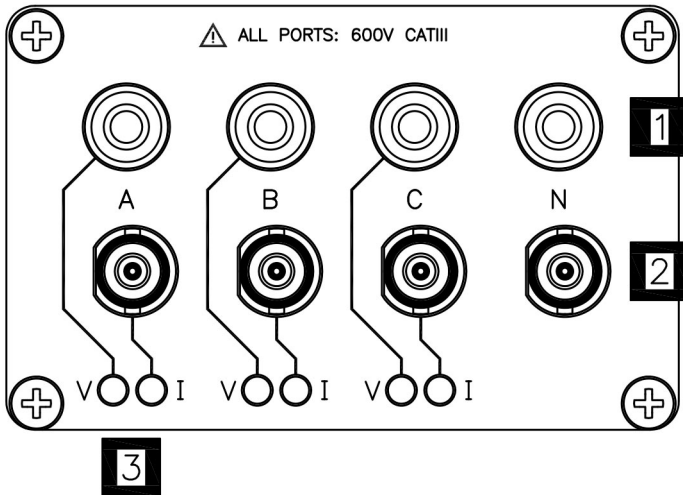
1 **Voltage Inputs** – use to connect the circuit voltage to the instrument channels A, B, C, and N using safety cables with banana connectors. See section Connecting the Voltage and Current Connectors for circuit connection details.

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**.**
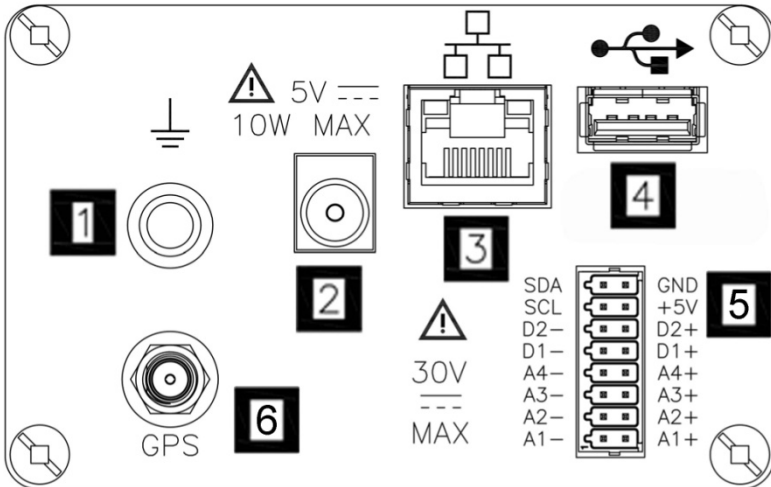
1	**Ground Terminal** – earth (ground) terminal reference connection to maintain accurate measurements.
2	**DC Power Input** –external AC adapter/battery charger input.
3	**Ethernet** – Wired Ethernet (RJ45) network connector. Depending on your computer, an Ethernet crossover cable (not included) may be required to connect directly to a computer when not using a network.
4	**USB** – use for data transfer to a USB drive.
5	**CSEB (Optional)** – **Common Sensor Expansion Board**. 4 Analog inputs, 2 Digital inputs, and an Extended Serial Bus (ESB) interface to a variety of common sensor types. See the Available Models section below for more information.
6	**GPS (Optional)** – input for GPS antenna for time sync.

CONNECTING TO DRANXPERT

A web browser is the only software needed to configure DranXperT for use and to download data for analysis and reporting by Dran-View. 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. Please contact Dranetz or your IT department for assistance.

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. Please contact Dranetz or your IT department for assistance.

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. Please contact Dranetz or your IT department for assistance.

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 your computer. Please contact your IT department or Dranetz Technical Support for assistance.
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: http://192.168.0.40.
6	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. Enter the default Username: **admin** Enter the default Password: **Dranetz** The username and password are case-sensitive and must be entered as shown.

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

Making Measurement Connections

WARNING

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

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.

Contact Dranetz for information on availability and pricing of current probes.

The following safety precautions apply to current probe connections.

Safety Precautions

• 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 elŽctrico. Utilizar transformadores de corriente completamente aislados alrededor de conductores sin aislamiento.

AVERTISSEMENT   N'EMPLOYEZ PAS les noyaux courants non-isolŽs de sonde autour d'un fil nonisolŽ. Des sondes de ce type sont concues pour l'usage autour des fils isolŽs seulement. L'utilisation seulement a complŽtement isolŽ des noyaux de sonde sans des secteurs conducteurs exposŽs du noyau autour des fils non-isolŽs.

WARNUNG   VERWENDEN Sie keine Stromzangen mit nicht isolierten Ferritkernen bei Messungen an nicht isolierten Leitungen. Stromzangen dieses Typs sind nur fŸr Messungen an isolierten Leitern geeignet. Bitte verwenden Sie zur Messung an nicht isolierten Leitungen Stromzangen mit vollstŠndig 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.
	Connect current probes with the instrument powered "OFF". After you have made the applicable connections for your installation, power "ON" the instrument. Next, select the applicable current probe settings, refer to "Survey Setup" section page 27.
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.

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.
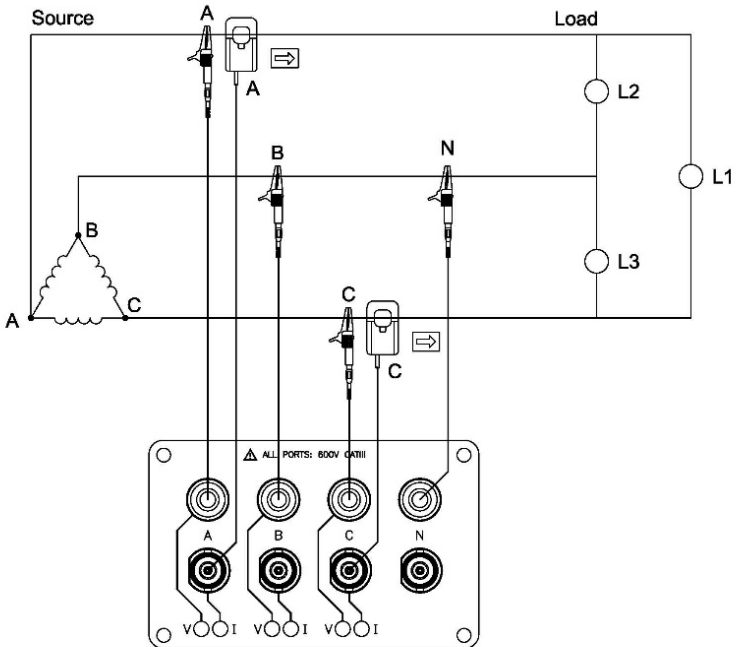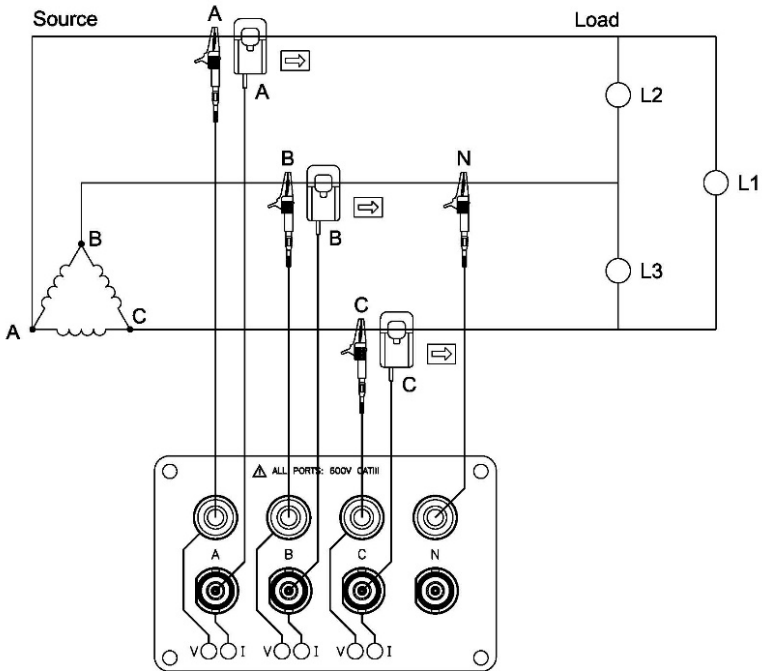

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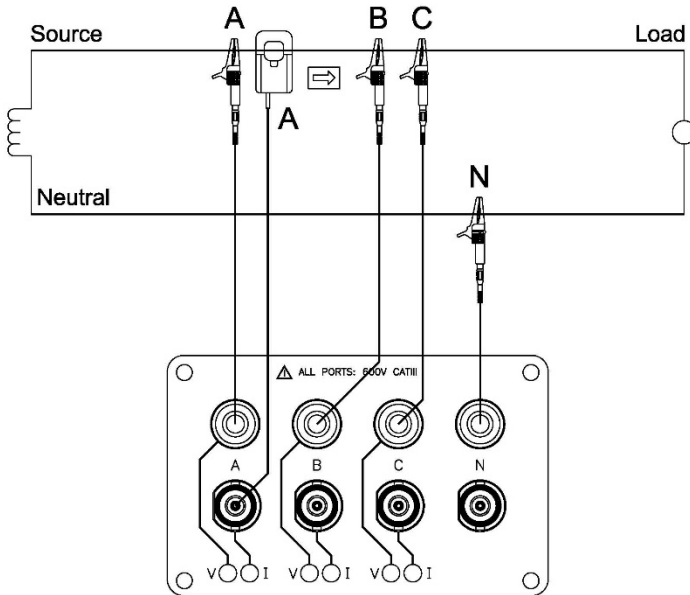
Split Phase

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.
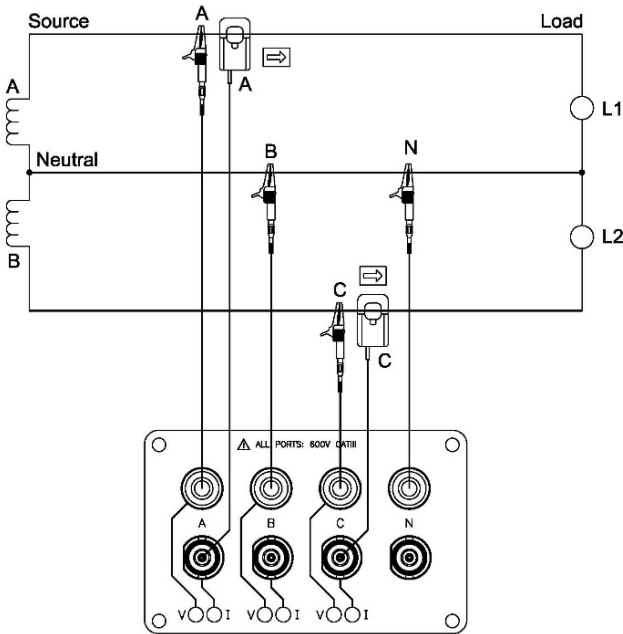
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3 Phase, Four Wire Wye

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.
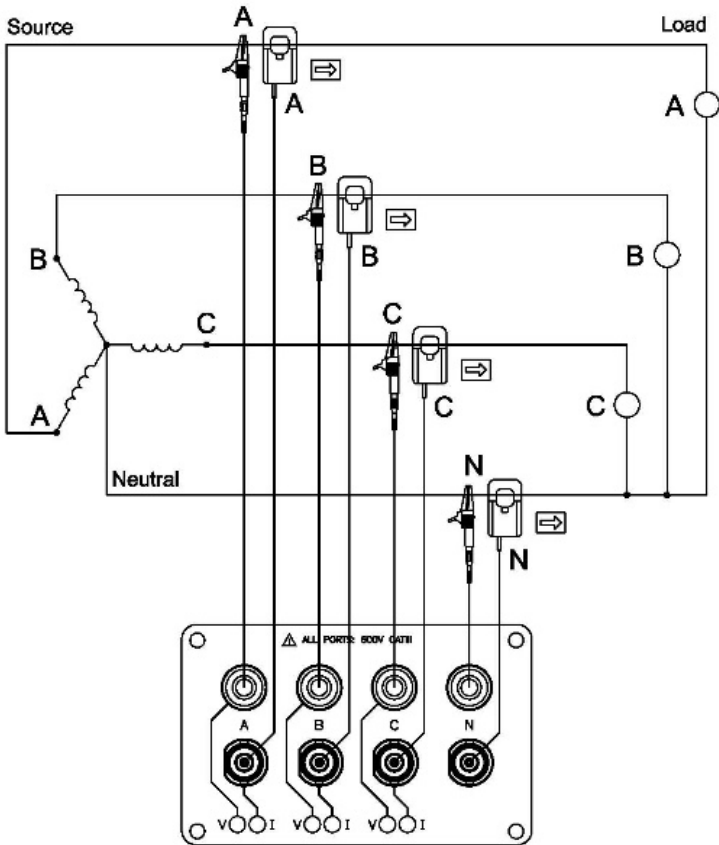
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3 Phase, 2 probe Delta

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.

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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.

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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.

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.

At the top right of every DranXperT web page is a pull down list to select the language of the web user interface. Available selections include English, German, French, Spanish, Italian, Simplified & Traditional Chinese. To change the language simply pull down the list and select the desired language. The web page will automatically refresh, and all pages will now appear in that language.

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".

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 IRMS.

Probe Type – Pull down list of available Flex & Hinged probe types. Select the probe used or Custom for probes not listed.

Current Probe Full Scale (IRMS) – Set only for the Custom probe type (above). Full scale of the CT's being used. Settable range is 1 – 10000. (0.333mVRMS = x 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 ≥1 second.

Snapshot Enable – Checkbox enable/disable.

Snapshot Interval Sec. – Snapshot interval in seconds. Value entered must be ≥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".

Ethernet

Please contact Dranetz or your IT department for network setting assistance.

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 .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 1502.

<u>Submit Changes</u>
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.

Date Time setup

Select Setup > Date Time setup to view/change the instruments time, date and time zone.

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 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.

Date Format - Select the data format to use in DranXperT's user interface. Selections are: YY/MM/DD, MM/DD/YY, DD/MM/YY

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

Time Zone Offset - Dropdown. Select the local time zone.

Expansion Setup (optionally available)

Select Setup > Expansion setup to enable and configure the optional analog and digital sensor inputs.
Note: The Expansion Setup menu will appear only if the DranXperT includes the optional CSEB board. See page 14

GPS

Enable – Check to enable the interval GPS

Match system time to GPS - Check to synchronize DranXperT's time to GPS time.

Journal Interval – Enter the GPS location journal recording interval in seconds. The settable range is 10 seconds – 86400 seconds.

Analog / Digital Input
The DranXperT CSEB board includes 4 analog and 2 digital inputs. The user can configure any combination of these inputs for their application.

Enable: Check to enable monitoring of the CSEB inputs

Journal Interval: Enter the journal interval for all CSEB input channels in seconds. The settable range is 15 – 3600 seconds.

Pre-Trigger Samples: Enter the number of samples to record for the pre-trigger when a trigger occurs. The settable range is 5 – 1000.

Post-Trigger Samples: Enter the number of samples to record for the post-trigger when a trigger occurs. The settable range is 5 – 3000.

Analog input settings
AnalogName: Enter a name for the analog input. The name usually relates to the sensor or device being monitored. The settable range is 31 characters.

Type: Pull down list to configure each analog channel. Selections are Off, 0-10 V and 4-20 ma. Note that the type should match the output sepcfications of the sensor being monitored.

SensorMin: Enter the minimal output of the sensor being measured. Ex: 0V.

SensorMax: Enter the maximim output of the sensor being measured. Ex: 24ma.

UnitsMin: Enter the minimum measurement of the sensor being measured in the units of measure of the sensor. Ex: 0 deg C.

UnitsMax: Enter the maximum measurement of the sensor being measured in the units of measure of the sensor. Ex: 100 deg C.

Units: Enter the units of measure for the sensor measured. Examples are deg F, PSI, W, etc. The settable range is 15 characters.

LimitEnable: Check to enable limit checking/recording.

HiLimit: A triggered event is generated when the High limit is exceeded. The recorded data includes the number pre/post trigger samples selected.

LoLimit: A triggered event is generated when the low limit is exceeded. The recorded data includes the number pre/post trigger samples selected

Digital Input Settings
DigitalName: Enter a name for the digital input. The name usually relates to the sensor or device being monitored. The settable range is 31 characters.

Type: Pull down list to configure each digital input. Selections are Off, Counter, Accumulator, Limit Trigger, Low Rate Change of State, High Rate Change of State.

> Counter: Each LOW-HIGH-LOW or HIGH-LOW-HIGH transition sequence is considered one count. The purpose of this mode is to count and log the number of transitions per journal interval. The count is cleared at the end of each journal interval.

> Accumulator: Provide a continuous counter. Each LOW-HIGH-LOW or HIGH-LOW-HIGH transition sequence is one count. The counters are NOT cleared at the end of each journal interval.

> Limit Trigger: Functions similarly to Counter mode, but the number of counts are checked against user entered limits. Each LOW-HIGH-LOW or HIGH-LOW-HIGH transition sequence is one count. The Limit Trigger (event) counter is used in triggering. It counts along with the journal counter until it is greater than the value set in the Limit field. At that point an event is recorded and the user specified pre- and post-trigger samples are captured and stored in the database.

> Low Rate Change of State (LRCOS)/High Rate Change of State (HRCOS): The Change-of-State (COS) modes count differently than all other modes. Each LOW-HIGH and HIGH-LOW transition increments the counters, effectively counting at twice the rate of all other modes. The difference between LRCOS & HRCOS is that LRCOS stores change-of-state journal records and event records in the database. HRCOS stores only change-of-state journal counts. A good rule of thumb is that if the system will likely change state more than once per minute then use HRCOS. The database can quickly fill up with event data if this is not properly managed. The choice is up to the user.

Enable: Check to enable the digital input channel.

Clear: Check this box to clear all digital counters when monitoring is enabled. If not checked, the counters from the previous monitoring session will be retained. An example of use (of not checked) is if instrument power is interrupted and the battery is depleted, a subsequent restart would result in continuing accumulation. If checked, the counters will be cleared upon reset.

Limit: Enter the value over which the event counter will cause a Digital Input trigger. Only applies to the Limit Trigger mode. Limit is set in counts and NOT in user units.

Units: Enter the units of measure for the digital inputs. The settable range is 15 characters.

PulsesPerUnit: Enter the number of counts per unit of measure. This is applicable when each count is scaled to a unit of measure, such has KWh when x number of counts equals 1KWh.

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 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.

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	VArhr	A, B, C
Apparent Energy	VAhr	A, B, C
True Energy (Fundamental)	Whr	A, B, C
Reactive Energy (Fundamental)	VArhr	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	VAr	A, B, C
Peak Apparent Demand	VA	A, B, C
Peak Demand (Fund.)	W	A, B, C
Peak Reactive Demand (Fund.)	VAr	A, B, C
Peak Apparent Demand (Fund.)	VA	A, B, C

Digital (if installed)		
Description	**Units**	**Channel**
Digital_1	Programmable	Count, State
Digital_2	Programmable	Count, State

Analog (if installed)		
Description	**Units**	**Channel (wiring dependent)**
Analog_1	Programmable	Value
Analog_2	Programmable	Value
Analog_3	Programmable	Value
Analog_4	Programmable	Value

GPS (if installed)		
Description	Units	Channel
Latitude	Degrees	Value
Longitude	Degrees	Value
Altitude	ft	Value
Speed	mph	Value
Satellites		Value

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, and to also delete files that are no longer needed.


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. Follow your web browser's instructions to save the file to your computer.

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.
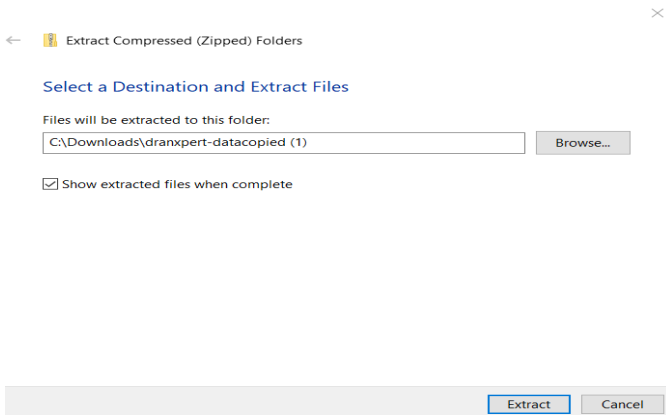
3) Click the *Browse* button to choose or create the folder where the extracted data files will be saved.

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. See the View Recorded Data section below.

<u>Deleting data files from DranXperT's memory</u>

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.

The firmware version of your instrument can be found on the Instrument Status page. Dranetz product firmware updates and information can be found here:

www.dranetz.com/technical-support-request/software-firmware-updates/

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.

<u>Firmware Updates</u>

Select Factory > Update Firmware to update DranXperT's main operational firmware module.

Select Factory > Update Expansion Firmware to update DranXperT's optional CSEB expansion module firmware. Note that this option will only appear if the CSEB module is installed in the meter.

Note that a DranXperT firmware update may include the main operational firmware module, CSEB module or both. The information provided with the new firmware will provide details of which modules to update, along with the update files. Regardless of module to install, the process is the same and as displayed below.

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. Please contact Dranetz for any assistance.

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.

Reset to Factory defaults (using the instrument top panel) - follow these steps to reset the instrument to factory defaults as described.

Step	Action
1	Verify that the instrument is off.
2	⊙ Monitor Press and hold the Monitor button, do not release.
3	⏻ Power Press and release the Power button, continue to hold Monitor button.
4	Wait about 35 seconds after the DranXperT starts operating, which is about 30 seconds after pressing the power button, and about 5 second after the instrument beeps three times. At the end of the third beep, settings will be restored to factory defaults for instrument settings and IP address. Release the monitor button if you only wanted the instrument settings and IP reset. or Continue to hold the Monitor button to delete data and passwords in the next step.
5	After holding the Monitor button an additional 10 seconds the instrument will beep four times. After the fourth beep all data will be deleted in the instrument. Release the monitor button if you wanted instrument settings including the IP and data deleted. or To delete passwords, continue to the next step.
6	After holding the Monitor button an additional 10 seconds the instrument will beep five times.

Step	Action
7	After the fifth beep all passwords will be restored to factory defaults and the system will restart.
8	Release the Monitor button and the instrument will be ready for to normal operation.

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.

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".

Information	Setup	Data	Factory		English ▼

Instrument Status

Instrument Status	
Model	DranXpert
Serial #	DRXP0QA062
Version	V 01.01.055
OS Information	Kernel 4.19.97-10-D-1.1.55-GB
Survey Name	Ross-cell-test-started-9-20-21
Monitoring Status	Off
Active Database File	DB_211011_114451_Ross-cell-test-started-9-20-21
Power Source	Line
Charging	Yes
Battery Level	100%
Language	English
Communication Status	
IP Address	192.168.2.13
MAC Address	b8:27:eb:fe:24:7c
Clock Status	
Current Time (Local)	21/10/11 14:02:10
Current Time (UTC)	21/10/11 18:02:10
Modules	
Measurement	PMU Device driver
UI	RGB User interface
Expansion	Analog / Digital Input (51) - 1.1.25 GPS

Turn On 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 software is used to view and analyze data recorded by DranXperT. 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 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 and then follow the instructions to open a data file.

Opening Data in Dran-View

To view data files in Dran-View:

1) Start Dran-View.

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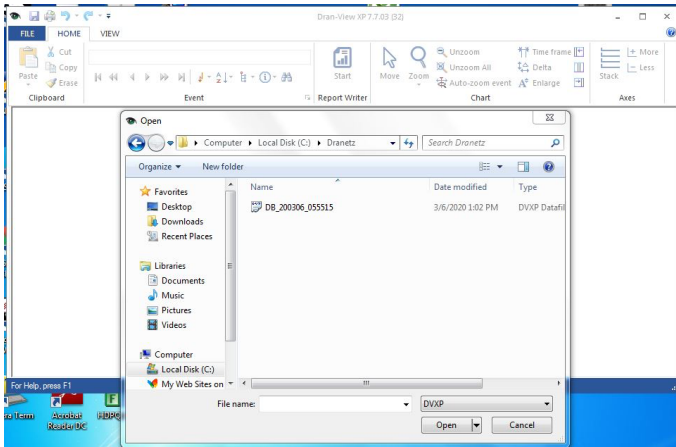
Once the data file is opened, Dran-View will display the data recorded by DranXperT. You can view Time Plots, Event details, and more for analysis and reporting.
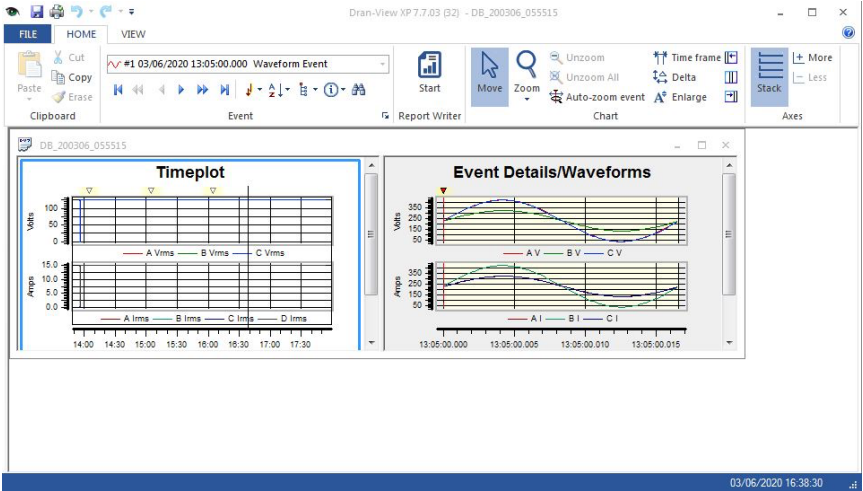
Storage and Transport

Attention

Improper storage.

Damage to the product and measuring error due to environmental influences.

Store the instrument in a protected location and only within the limits of permissible ambient conditions. The ambient conditions (temperature, humidity etc.) can be found on page **Fehler! Textmarke nicht definiert.**.

Attention

Improper transport.

Damage to the product and measuring error.

Transport the instrument only within the limits of permissible ambient conditions (temperature, humidity etc.), see page **Fehler! Textmarke nicht definiert.**.

Cleaning

Danger

Life endangering due to electric shock!

The instrument and its accessories are operated with electrical power, therefore there is a general risk of electric shock. This can be fatal or cause serious injuries.

- The instrument, the accessories and all connected conductors must be voltage-free before and during cleaning. Switch the instrument off and disconnect it from the mains power supply.
- Never immerse the instrument/accessories in water or other fluids.
- Never touch the instrument/accessories with wet or moist hands.

Attention

Unsuitable cleaning agents

Unsuitable cleaning agents such as aggressive or abrasive cleansers result in damage to the instrument/accessories.

- Use a cloth which has been slightly dampened with water for cleaning.
- Avoid the use of cleansers, abrasives or solvents.

Keep the outside surfaces of the instrument and any accessories clean.

Repair

If your instrument requires repair, please contact our service department. See page 66.

Note

Loss of warranty and guarantee claims:
Unauthorized modification of the instrument is prohibited. This also includes opening the instrument.
If it can be ascertained that the tester has been opened by unauthorized personnel, no guarantee claims can be honored by the manufacturer with regard to personal safety, measuring accuracy, compliance with applicable safety measures or any consequential damages.
If the guarantee seal is damaged or removed, all guarantee claims are rendered null and void.

- The device may only be repaired or opened by authorized, qualified personnel who are familiar with the associated dangers.
- Original replacement parts may only be installed by authorized, qualified personnel.
- The instrument may not be placed back into operation until troubleshooting and repair have been performed, and calibration and dielectric strength have been tested and approved at our factory, or at one of our authorized service centers.

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	118918-G1

Optional Accessories

The following table lists the optional accessories for DranXperT.

Description		Part Number
Current Probe Accessories		
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
Rogowski – Flexible Coil Current Probes. 1000V CAT III		
50A – 500A	4.17 in (106 mm) window size	FLEX-500A-16
	7.01 in (178 mm) window size	FLEX-500A-24
	10.67 in (271 mm) window size	FLEX-500A-36
150A – 1500A	4.17 in (106 mm) window size	FLEX-1500A-16
	7.01 in (178 mm) window size	FLEX-1500A-24
	10.67 in (271 mm) window size	FLEX-1500A-36
300A – 3000A	4.17 in (106 mm) window size	FLEX-3000A-16
	7.01 in (178 mm) window size	FLEX-3000A-24
	10.67 in (271 mm) window size	FLEX-3000A-36

Note:
DranXperT only supports current probes of the same type for all current input channels. When measuring current, the same probe type must be connected to each channel you are monitoring.

AVAILABLE MODELS

The following DranXperT models are available. Each is available in factory configured kits that include the available Flex or Hinged CT's.

Description	Model Designator
DranXperT – no sensor inputs	DXP
DranXperT with CSEB **sensor** board (4 Analog inputs, 2 Digital Inputs, ESB). Includes GPS receiver	DXP-S

CSEB (Common Sensor Expansion Board) (Optional)
The factory-installed Common Sensor Expansion Board provides 4 Analog inputs, 2 Digital inputs, and an Extended Serial Bus (ESB) I^2C interface to a variety of common sensor types. Additional available options are an onboard and an accelerometer and internal GPS with an SMA connector on the rear requiring connection to an antenna.

GPS (Optional)
The SMA type connector end of the DranXperT can be connected to a +3VDC GPS antenna.

Once enabled, the system uses the GPS as the system time source. The system records the time and location at journal intervals determined by the user.

When connecting a GPS antenna to the DranXperT follow these steps.

Step	Action
1	Verify that the instrument is off.
2	Connect the GPS antenna cable to the SMA connector located on the rear panel of the instrument.
3	Press the Power button to turn the instrument "ON"
4	Go to instrument menu Setup>Expansion Setup> and click the *Enable* checkbox in the GPS section. Check the *Match system time to GPS* checknox if you would like DranXperT's time to synchronize with GPS time. Set the journal interval value (settable from 10 - 86400 sec) and click on "Submit Changes" when done. This logs location information at the selected rate.
5	The GPS setting will take effect once the first programmed interval has elapsed.

Note: Antenna cable length is limited to 100 ft for proper operation.

<u>CSEB Measurement Input Connections</u>

CAUTION   The CSEB input terminals are rated 30VDC Max.
                 Do Not Exceed maximum ratings.

CAUTION   The +5VDC output terminal is rated 100 mA Max and
                 available to the user to source external ESB I^2C sensors.
                 Do Not Exceed maximum ratings.
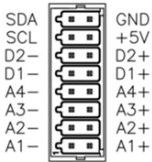
SDA ⬚ GND SCL ⬚ +5V D2− ⬚ D2+ D1− ⬚ D1+ A4− ⬚ A4+ A3− ⬚ A3+ A2− ⬚ A2+ A1− ⬚ A1+	Connections are made to the labeled terminals of the DranXperT for the applicable channel types as described in the following sections of these instructions. Refer to the user instructions provided with the external sensor being used for proper connections to the DranXperT.

<u>Analog / Digital Inputs, Extended Serial Bus (Optional)</u>
The Analog/Digital Inputs and Extended Serial Bus (I^2C) features are combined in one connector located on DranXperT's communications panel.

<u>Analog Inputs</u>
There are 4 analog inputs available. Each can be individually configured to measure voltage or a current loop.

Voltage Input:
If the voltage configuration is selected DranXperT will measure an external sensor device voltage signal from 0‑10 VDC.

Current Loop Input:
If the current configuration is selected, the instrument will measure a 4-20mA input (zero-max range). See below for a typical 4-20 mA sensor loop connected to analog input channel A1. Refer to the sensors user instructions for scaling and other information necessary for configuration with DranXperT.
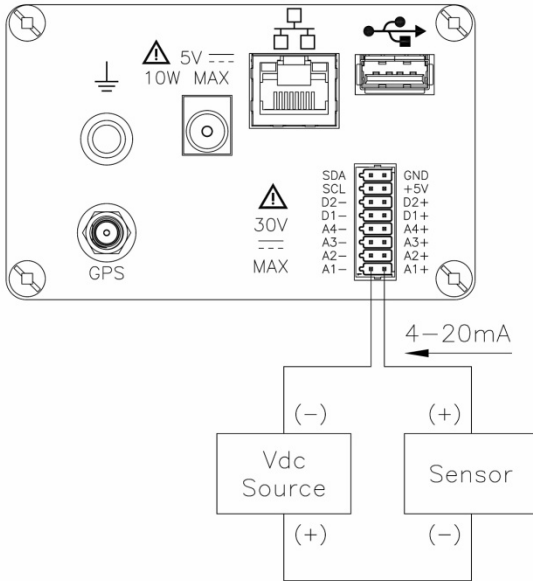
<u>Digital Inputs</u>
2 Digital inputs are available that are rated at 30VDC max for measuring logic state changes. The following modes are available:

- State of Change
- Pulse Counter
- Pulse Accumulation

The minimum measurable pulse width is 500 uSec.

The wiring diagram below shows a typical digital input connection to digital input channel D1. Refer to the user instructions of the digital sensor for scaling and other information needed to configure DranXperT.
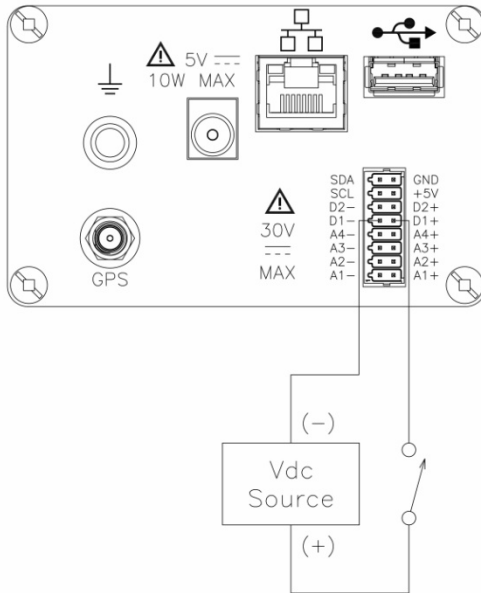
SPECIFICATIONS*

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 = ±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: ±0.1% + probe

Frequency
- Range: 50Hz = 45Hz to 55Hz, 60Hz = 55Hz to 65Hz
- Accuracy: 50/60Hz: ±0.001Hz

POWER QUALITY
- Sag/dip, swell trigger threshold resolution: 1-cycle
- Vthd: ±5% for V ≥ 10% Vnom
- Ithd: ±5% for I ≥ 10% Inom + 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): ±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 Mbps
- 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
Altitude
- 2000m (6560 ft) maximum
Installation Categories
- Mains Supply: 100-240V, CAT II, Pollution Degree 2
- Measurement: Inputs 600 VRMS, CAT III, Pollution Degree 2

OPTIONAL FEATURES *(Factory Installed)*

ANALOG INPUTS
- Selectable Input Voltage or Current Loop
- Voltage Input, 0-10 VDC
- Current Input, 4-20 mA

DIGITAL INPUTS
- 30VDC Maximum Input
- State of Change
- Pulse Counter
- Pulse Accumulation
- Minimum pulse width 500 uSec

GPS
- Time-sync update rate 60-90 sec (typical)
- SMA type connector input
- +3VDC output (120 mA Max)

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

Symbols on the Instrument and the Included Accessories

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:

Icon	Meaning
⚠	Warning concerning a point of danger (attention, observe documentation!)
⏻	Power switch
---	Direct current (DC) operation of the device.
CE	European conformity marking
♻	The instrument may not be disposed of with household trash. See page 66.

Statements and Notices

Statement of Warranty

All Dranetz engineered 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 repairs, 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 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.

CE Declaration

The instrument fulfills all requirements of applicable EU directives and national regulations. We confirm this with the CE mark.
The CE declaration is available upon request.

Notice Regarding Proprietary Rights

This publication contains information proprietary to Dranetz. By accepting and using this guide, you agree that the information contained herein will be used solely for the purpose of operating equipment of Dranetz.

Trademarks

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Disposal and Environmental Protection

Proper disposal makes an important contribution to the protection of our environment and the conservation of natural resources.

Attention

Environmental damage
Improper disposal results in environmental damage.
Follow the instructions concerning return and disposal included in this section.

The following comments refer specifically to the legal situation in the Federal Republic of Germany. Owners or end users who are subject to other regulations must comply with the respective local requirements and implement them correctly on site. Further information can be obtained, for example, from the responsible authorities or local distributors.

Waste Electrical Equipment, Electrical or Electronic Accessories and Waste Batteries (including rechargeable batteries)

Electrical equipment and batteries (including rechargeable batteries) contain valuable raw materials that can be recycled, as well as hazardous substances which can cause serious harm to human health and the environment, and they must be recycled and disposed of correctly.

 The symbol at the left depicting a crossed-out garbage can on wheels refers to the legal obligation of the owner or end user (German electrical and electronic equipment act ElektroG and German battery act BattG) not to dispose of used electrical equipment and batteries with unsorted municipal waste ("household trash"). Waste batteries must be removed from the old device (where possible) without destroying them and the old device and the waste batteries must be disposed of separately. The battery type and its chemical composition are indicated on the battery's labelling. If the abbreviations "Pb" for lead, "Cd" for cadmium or "Hg" for mercury are included, the battery exceeds the limit value for the respective metal.
Please observe the owner's or end user's responsibility with regard to deleting personal data, as well as any other sensitive data, from old devices before disposal.
Old devices, electrical or electronic accessories and waste batteries (including rechargeable batteries) used in Germany can be returned free

of charge to GMC-I Service GmbH or the service provider responsible for their disposal in compliance with applicable regulations, in particular laws concerning packaging and hazardous goods. Waste batteries must be returned in discharged state or with appropriate precautions against short circuiting. Further information regarding returns can be found on our website.

Packaging Materials
We recommend retaining the original packaging materials in case that you might require servicing or calibration in the future.

Warning
Danger of asphyxiation resulting from foils and other packaging materials Children and other vulnerable persons may suffocate if they wrap themselves in packaging materials, or their components or foils, or if they pull them over their heads or swallow them.
Keep packaging materials, as well as their components and foils, out of the reach of babies, children and other vulnerable persons.

In accordance with German packaging law (VerpackG), the user is obligated to correctly dispose of packaging and its components separately, and not together with unsorted municipal waste ("household trash").
Packaging which is not subject to so-called system participation is returned to the appointed service provider. Further information regarding returns can be found on our website.

DRANETZ ®
GMC-INSTRUMENTS GROUP

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