DRANETZ BMI

Power Platform® PP1 & PP1E TASKCard® Flicker *User's Guide*

Dranetz-BMI • 1000 New Durham Road • Edison, New Jersey 08818-4019
Telephone 1-800-372-6832 or 732-287-3680
Fax 732-248-1834 • www.dranetz-bmi.com

Power Platform® PP1 & PP1E TASKCard® Flicker
User's 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 70-1996) 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 familiar with the construction and operation of the equipment and the hazards involved."

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P/N OM-PP1-TASK-FLKR Rev. A

Safety Summary

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 debe ser hecha de acuerdo con las normas del Código Eléctrico Nacional (ANSI/NFPA 70-1996) de EE. UU., 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."

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 70-1996) 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."

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.

Der Anschluß dieses Instruments muß in Übereinstimmung mit den nationalen Bestimmungen für Elektrizität (ANSI/NFPA 70-1996) der Vereinigten Staaten, sowie allen weiteren, in Ihrem Fall anwendbaren Sicherheitsbestimmungen, vorgenommen werden.

Installation, Betrieb und Wartung dieses Instruments dürfen nur von Fachpersonal durchgeführt werden. In dem nationalen Bestimmungen für Elektrizität wird ein Fachmann als eine Person bezeichnet, welche "mit der Bauweise und dem Betrieb des Gerätes sowie den dazugehörigen Gefahren vertraut ist."

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 Power Platform, its data, other equipment, or property.

NOTE statements call attention to specific information.

Symbols

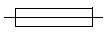
The following International Electrotechnical Commission (IEC) symbols are marked on the top and rear panel in the immediate vicinity of the referenced terminal or device:


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.

T
Symbol preceding a fuse rating indicates the fuse is a time delay (slow-blow) type. Example: T10A = time-delay, 10 Ampere fuse.


Fuse WARNING notice.


Protective conductor terminal.


Power Switch.

Definiciones

Las ADVERTENCIAS informan al usuario de ciertas condiciones o prácticas que podrían producir lesiones mortales o daño físico.

Las PRECAUCIONES identifican condiciones o prácticas que podrían dañar la Power Platform, sus datos, otros equipos o propiedad.

Las NOTAS llaman la atención hacia la información específica.

Símbolos

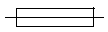
Los siguientes símbolos de la Comisión Internacional Electrotécnica (IEC) aparecen marcados en el panel superior y el posterior inmediatos al terminal o dispositivo en referencia:

Precaución, consulte los documentos adjuntos (este manual).

Operación de corriente alterna (ca) del terminal o dispositivo.

Operación de corriente continua (CC) del terminal o dispositivo.

T — El símbolo que precede la capacidad nominal de un fusible indica que se trata de un fusible con retardo de tiempo (fundido lento). Ejemplo: T10A = fusible con retardo de tiempo, 10 Amperios.



ADVERTENCIA de fusible.

Terminal de protección del conductor.

Interruptor de encendido.

Définitions

Les messages d'AVERTISSEMENT préviennent l'utilisateur que certaines conditions ou pratiques pourraient entraîner la mort ou des lésions corporelles.

Les messages de MISE EN GARDE signalent des conditions ou pratiques susceptibles d'endommager "Power Platform", ses données, d'autres équipements ou biens matériels.

Les messages NOTA attirent l'attention sur certains renseignements spécifiques.

Symboles

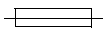
Les symboles suivants de la Commission électrotechnique internationale (CEI) figurent sur le panneau arrière supérieur situé à proximité du terminal ou de l'unité cité:


Mise en garde, consultez les documents d'accompagnement (ce manual).


Fonctionnement du terminal ou du dispositif sur le courant alternatif (c.a.).


Fonctionnement du terminal ou de l'unité en courant continu (CC).

T — Symbole précédant la valeur nominale d'un fusible et indiquant que le fusible est du type à temporisation (fusible à action retardée). Exemple : T10A = fusible de 10 ampères à temporisation.


AVERTISSEMENT sur les fusibles.


Borne conductrice de protection.


Interrupteur de tension

Definitionen

WARNUNGEN informieren den Benutzer darüber, daß bestimmte Bedingungen oder Vorgehensweisen körperliche oder tödliche Verletzungen zur Folge haben können.

VORSICHTSHINWEISE kennzeichnen Bedingungen oder Vorgehensweisen, die zu einer Beschädigung von Power Platform, seiner Daten oder anderer Geräte bzw. von Eigentum führen können.

HINWEISE machen auf bestimmte Informationen aufmerksam.

Symbole

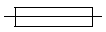
Die folgenden Symbole der Internationalen Elektrotechnischen Kommission (International Electrotechnical Commission; IEC) befinden sich auf der Abdeck- und Seitenplatte unmittelbar am betreffenden Terminal oder Gerät.

Vorsichtshinweis, siehe Begleitdokumente (dieses Handbuch).

Wechselstrombetrieb des Terminals bzw. Geräts.

Gleichstrombetrieb im Terminal oder Gerät.

T — Dieses Symbol vor einem Sicherungswert weist darauf hin, daß es sich um eine Sicherung mit Zeitverzögerung (Trägsicherung) handelt. Beispiel: T10A = Trägsicherung mit 10 Ampere.



WARNHINWEIS Sicherung.

Terminal-Schutzleiter.

Netzschalter.

Safety precautions

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

- Connect the green 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.
- Wear 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 unit 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.

Medidas de seguridad

Las medidas de seguridad siguientes deberán observarse cuando se realice cualquier tipo de conexión al instrumento.

- Antes de hacer cualquier conexión, deberá enchufarse el conector de seguridad verde a tierra.
- Cuando se haga conexiones a circuitos eléctricos o a equipo de activación por pulso, deberá abrirse sus respectivas cajas de seguridad. NO deberá hacerse ninguna conexión del instrumento en líneas eléctricas bajo tensión.
- Las conexiones deberán hacerse primero al instrumento y, luego, al circuito a ser monitorizado.
- Al hacer conexiones a circuitos eléctricos, deberá utilizar anteojos y guantes protectores.
- Sus manos, zapatos y el piso deberán estar secos en todo momento en que se haga una conexión a un cable eléctrico.
- Verifique que la unidad esté DESACTIVADA antes de conectar sondas en el panel posterior.
- Previo a cada uso, deberá verificarse que los cables no estén rotos y que el material aislante no tenga rajaduras. Reemplace de inmediato cualquier parte defectuosa.

Mesures de Sécurité

Les mesures de sécurité suivantes doivent être prises chaque fois qu'un type de connexion quelconque est effectué sur l'instrument.

- Connecter d'abord la prise de terre de sécurité verte (terre) avant d'effectuer toute autre connexion.
- Ouvrir les disjoncteurs correspondants lors d'une connexion à des circuits électriques ou à des équipement de génération d'impulsions. NE PAS effectuer de connexion d'instrument sur des lignes électriques sous tension.
- Une fois toutes les connexions de l'instrument effectuées, connecter au circuit à contrôler.
- Porter des lunettes de protection et des gants isolants pour effectuer des connexions aux circuits électriques.
- S'assurer que les mains, les chaussures et le sol soient secs lors de connexions à une ligne électrique.
- S'assurer que l'unité est ÉTEINTE avant de connecter les sondes au panneau arrière.
- Inspecter tous les câbles, avant chaque utilisation, pour s'assurer que les isolants ne sont pas coupés ou fendus. Remplacer immédiatement tous les équipements défectueux.

Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen sind immer dann zu befolgen, wenn eine Verbindung zum Instrument hergestellt wird.

- Schließen Sie zuerst die grüne Sicherheits-/Erdleitung an, bevor Sie eine andere Verbindung herstellen.
- Öffnen Sie beim Anschluß an elektrische Stromkreise oder Impulsauslösungseinrichtungen die entsprechenden Unterbrecher. Es dürfen KEINE Anschlüsse an das Instrument unter stromführenden Spannungsleitungen montiert werden.
- Die Verbindungen müssen zuerst am Instrument und danach an der zu überwachenden Schaltung hergestellt werden.
- Tragen Sie Schutzbrillen und Isolierhandschuhe, wenn Sie Anschlüsse an den Stromkreisen vornehmen.
- Hände, Schuhe und Fußboden müssen trocken sein, wenn Sie Anschlüsse an den Stromkreisen durchführen.
- Stellen Sie sicher, daß das Gerät AUSgeschaltet ist, bevor Sie an der rückwärtigen Konsole Meßfühler anschließen.
- Prüfen Sie vor jedem Gebrauch alle Kabel auf Bruchstellen und Risse in der Isolierung. Wechseln Sie schadhafte Kabel sofort aus.

Statements and Notices

FCC Statement

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.

Statement of reliability

The information in this manual 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 proprietary rights

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

Trademarks

Power Platform, TASKCard, and Scope Mode are registered trademarks of Dranetz-BMI.

Warranty

Dranetz-BMI warrants that the Power Platform PP1 will be free from defects in workmanship and materials for a period of one year from the date of purchase. Dranetz-BMI will, without charge, replace or repair, at its option, any warranted product returned to the Dranetz-BMI factory service department.

Dranetz-BMI shall not be held liable for any consequential damages, including without limitation, damages resulting from loss of use, or damages resulting from the use or misuse of this product. Some states do not allow limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may also have rights which vary from state to state.

Exclusions: *This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized repairs or alterations.*

How to Contact Dranetz-BMI

Regardless of your location, Dranetz-BMI sales and product support are within easy reach through an established network of representatives and distributors worldwide.

For Sales, Technical Support, or the name of a Dranetz-BMI Sales Representative in your area, call:

1-800-372-6832 or 732-287-3680
Fax: 732-248-1834
Web site: www.dranetz-bmi.com

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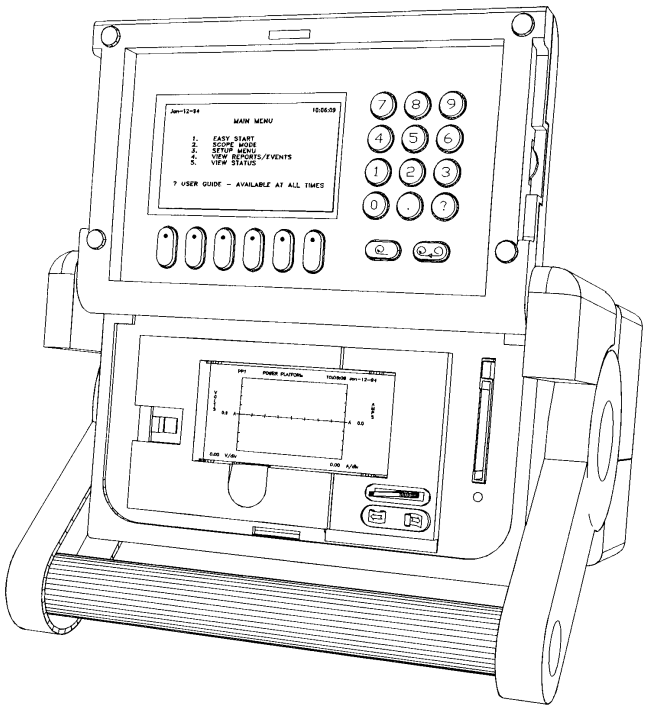
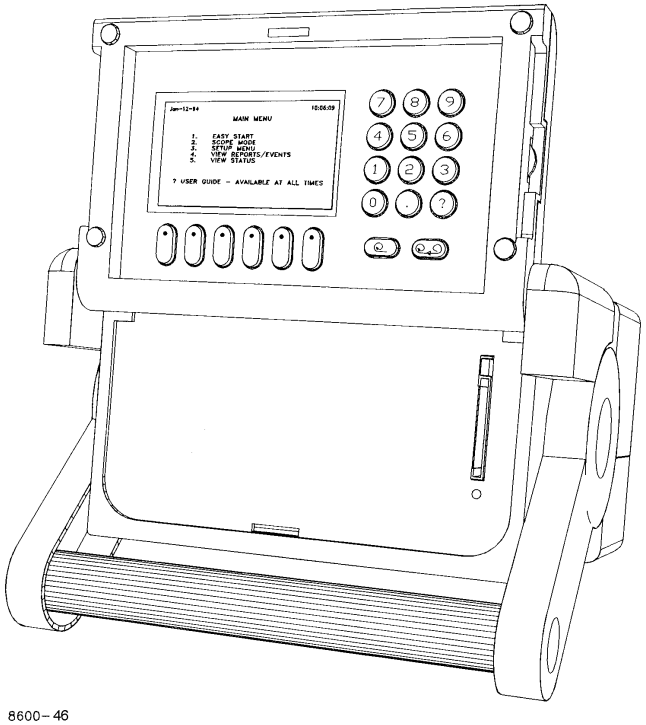


Dranetz-BMI Power Platform, Models PP1 & PP1E.



Dranetz-BMI Power Platform, Models PP1 & PP1E, without printer.

Chapter 1

Introduction

Overview

Power Platform description

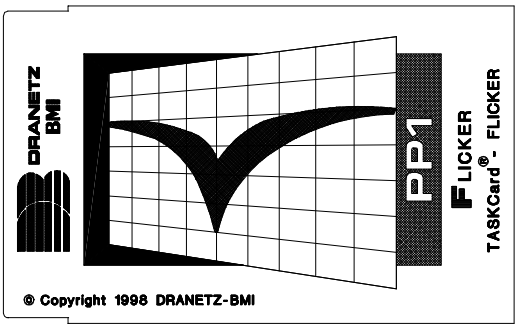
The Dranetz-BMI Power Platform allows you to change the type of monitoring the unit does by changing the TASKCard. Models PP1 & PP1E are shown with and without printer on the facing page.

TASKCard definition

The TASKCard is a removable memory card that is installed in the rear panel of the Power Platform and contains an operating system that is designed for a specific application (task).

Flicker TASKCard

Flicker is the perceived variation in light intensity from a lamp as a result of the modulation or fluctuation in amplitude of the voltage at low frequencies. The details of how this measurement is accomplished are too involved to be discussed fully here and the reader is referred to the standard contained in the IEC 1000-4-15 (formerly IEC 868) document. These measurements represent the response of the human brain to the light output of a 60 W coiled coil filament gas filled bulb at 240 V/50 Hz or 120 V/60 Hz. The principles of measuring flicker, however, apply to other bulbs as well. The result of the measurement is an overall indication of the severity of the fluctuations over an interval of time. Different types of measurements are used for different intervals, with each one being based on a mathematical manipulation of the previous smaller intervals. Definitions are provided in the *Operational Description* at the end of this chapter.



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Available TASKCards

Each available TASKCard provides the Power Platform with different capabilities. For a description of available TASKCards, refer to Appendix A, *Optional Accessories*.

This manual

This manual contains instructions for operating the Dranetz-BMI Power Platform, Model PP1 with or without the printer, with the Flicker TASKCard installed.

Throughout this manual reference to the Power Platform will be made when hardware or other generic functions are being described. Where software functions are being referenced, the term PP1-Flicker will be used.

Index

An Index is provided at the rear of this manual to assist you in quickly finding related subject information.

Easy Start

Chapter 2 provides you with the information needed to quickly and easily set up the Power Platform for monitoring.

In this chapter

The following topics are covered in this chapter.

Unpacking The Power Platform

Introduction

Open the carton carefully. Check the carton inventory and inspect the contents for possible shipping damage.

Unpacking

Unpack the Power Platform as follows:

1. Remove all literature inside the carton.

2. Carefully remove the Power Platform from the carton.

3. Remove all accessories from the carton. Check that the standard accessories (See next page) are included.

4. Save the carton and packing materials in case you have to return the Power Platform to Dranetz-BMI for maintenance, repair, or calibration.

Shipping damage inspection

Visually inspect the Power Platform for possible shipping damage. If any damage exists, first notify and file an insurance claim with your carrier or underwriter or both. Then notify Dranetz-BMI Customer Service Department of your intentions to return the unit. DO NOT return the Power Platform without prior instructions from Dranetz-BMI Customer Service Department, telephone (732) 287-3680 or 1-800-372-6832.

Repacking for return shipment

If you have to return the Power Platform to Dranetz-BMI Customer Service Department, repack it in its original packing materials. Refer to the repacking instructions in the Appendix.

Physical Description

Dimensions

The Dranetz-BMI Power Platform is a self-contained, portable instrument weighing less than 21 pounds and measuring 10" deep by 13" wide by 7" high.

Front panel

The front panel, including screen, keypad, printer, and memory card is protected by a locking, flip-top type display housing. The padded bail handle can be used as a carrying handle or as a means to position the unit. See Chapter 3 for description of the front panel controls and indicators and how to position the Power Platform.

Rear panel

The rear panel contains the input and output connectors including the slot for the TASKCard. See Chapter 3 for rear panel controls, indicators, and connectors.

Standard accessories

The following table lists the Power Platform's standard accessories.

Part Number	Description
OM-PP1-TASK-FLKR	User’s Guide
TASKCard-FLICKER	Flicker TASKCard (contains four languages)
115815-G1*	Measurement Cable Set (Domestic)
115815-G2*	Measurement Cable Set (Euro)
115815-G3*	Measurement Cable Set (UK)
115323-G1	Thermal Paper (4 rolls)
113218-G3	Terminal Block, 6 pin
113218-G4	Terminal Block, 8 pin
107506	Connector Plug, Battery
115520-G1	Wire Marker Kit
115240-G1	Shipping Carton
115818-G1	TASKCard Cover
107539-G13	TASKCard Cover Screw, Phillips Head, 4-40 x 1/4” long. Two used.
* User specified, one standard only.	

Optional accessories

The optional accessories are described in Appendix A.

Physical Description, Continued

Batteries	For battery specifications and replacement procedures, refer to Appendix C.
Fuses	For fuse specifications and replacement procedures, refer to Appendix D.
Replaceable Parts	For a list of operator replaceable parts, refer to Appendix E.

Operational Description

Monitoring Capacity

The Dranetz-BMI PP1 with TASKCard Flicker can monitor any of the following power configurations:

- Single phase, 2 wire
- Split phase, 3 wire
- 3 phase, 3 wire (delta)
- 3 phase, 4 wire (wye)

While monitoring any of the above configurations, the Power Platform can also be wired to monitor neutral to ground voltage and neutral current, but these are not included in the flicker calculations.

Specifications

Specifications for the PP1-Flicker, measured parameters, computed parameters, current probes, and isolated current transformers, are listed in Appendix F.

Easy Start™

The Easy Start function prompts you for information about the circuit you want to monitor and then automatically sets up the Power Platform for monitoring and reporting. See next chapter.

Meter Mode™

In addition to monitoring for power disturbances, the PP1-Flicker is a true RMS voltmeter and true RMS clamp-on ammeter. Voltage and current measurements, along with all other calculated parameters, are displayed on the Meter Mode screens. The PP1-Flicker also functions as a phase angle meter and a wattmeter.

Available Parameters: The following table lists all the parameters and their abbreviations as displayed on the Power Platform's screens.

Parameter	Abbreviation
Volts	V
Amps	I
Watts	W

Continued on next page

Meter Mode (continued)

Phase angle meter: The PP1-Flicker can display voltage and current phasors for all of the channels. Functioning as a phase angle meter, the Power Platform can display system imbalance conditions. The phase angle display can also verify that monitoring connections have been made correctly.

Meter mode operation does not interfere with any of the analyzer's other monitoring or recording functions. The meter mode is not effected by the configuration of the PP1-Flicker. Turning monitoring off or individual channels off does not effect meter readings.

Scope Mode®

When in Scope Mode, the PP1-Flicker is an oscilloscope, displaying real-time waveforms of voltage and current for all channels.

Continued on next page

Help

Help is available by pressing the question mark (?) key on the numeric keypad. A help screen is a description of the screen (function) presently displayed.

Calibration

The recommended calibration interval for this unit is once every 12 months.

We recommend that you return the unit to the factory for calibration. If you decide to do so, first contact the Dranetz-BMI Customer Service Department to obtain a Return Authorization Number.

Telephone: (732) 287-3680
Fax:(732) 248-9240

Connecting to an external power source

Connecting the Power Platform to an external DC power source is described in Appendix G.

Menu structure

The PP1-Flicker menu structure is shown in Appendix H.

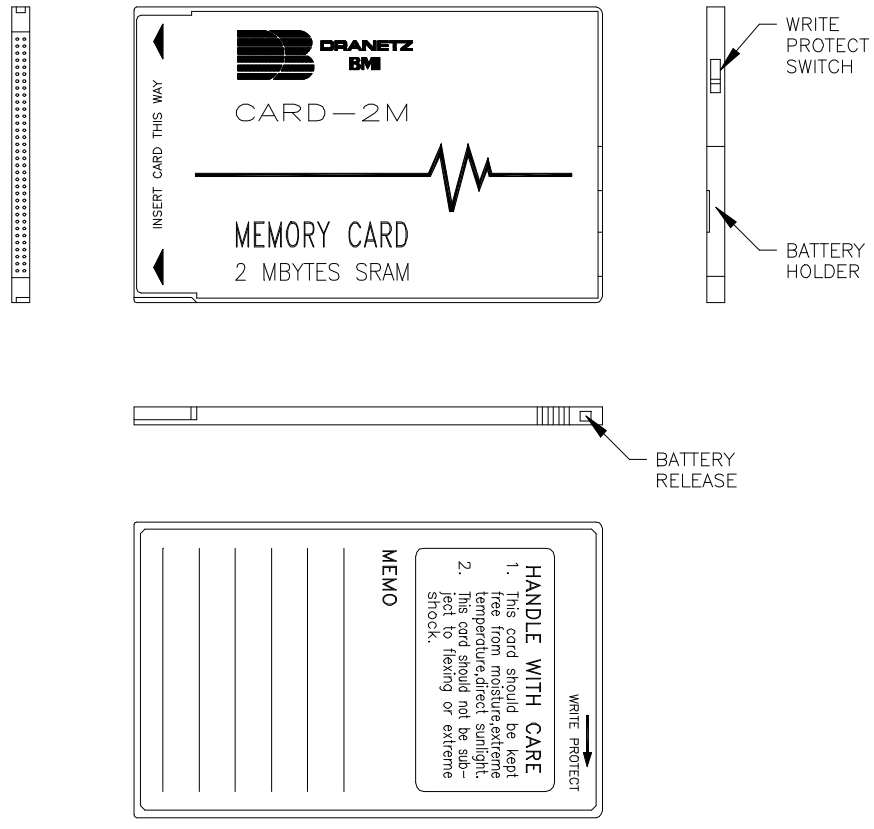
Continued on next page

Memory Card

A memory (data) card is used with the Power Platform to provide a removable, rugged, compact, solid state mass storage device. A memory card, shown below, uses low power, has an internal battery for data retention, and is available as an optional accessory in sizes from 512 Kbytes to 2 Mbytes. (1 Mbyte or larger recommended).

For information about the battery, refer to Appendix C.

The PP1-Flicker treats the memory card like a floppy disk storing files in a DOS format. In the PP1-Flicker, the memory cards are used to store events and setups.



Continued on next page

Printing options

TASKCard Flicker supports the following printing operations:

- PP1 with internal printer

Pressing either the period key [**.**] or the PRINT function key, when displayed, will produce a normal printing function to occur on the internal printer.

Definitions

The following is a summary of the terms and measurements used for flicker:

Pinst: The instantaneous flicker sensation. This represents the maximum Eye-Lamp-Brain response measured during (approximately) a one-second window. (The window is 0.64 sec at 50 Hz and 0.533 sec at 60 Hz).

Pst: The 'short term' flicker severity measured over an interval of 10 minutes, typically. This is a statistical weighting of all the Pinst values during that interval which results in a single number. Since the distribution is NOT a typical “Bell Shaped Gaussian Distribution,” the weighting is more complex, being done over 15 partitions of the cumulative probability of the Pinst; each partition has its own weighting factor. The user specifies the interval prior to beginning monitoring. The default is 10 minutes.

Plt: The 'long term' flicker severity measured over an interval of a few hours, based on the Pst values. A cubic law smoothing function is used as this gives good consideration to both short and longer disturbances. This interval can be specified after the data is taken because the Pst values are saved. The default is two hours.

Presentation of RMS Data

In order to understand the nature and significance of the flicker, or to determine if any other phenomena (for example, a severe dropout) has occurred, it is necessary to have information other than the Pinst, Pst, or Plt. Along with these, there is also a measurement of the RMS voltage and current variations during the Pst measurement interval. Although flicker is only measured on voltage channels A, B, and C, the current values are included as additional diagnostic information.

Chapter 2

Easy Start

Overview

Introduction

This chapter provides you with a quick and easy way to start monitoring if you are familiar with the setup and operation of similar power monitoring equipment. If you are not familiar with equipment of this type, proceed to Chapter 3 for a detailed description of the Power Platform.

Easy Start description

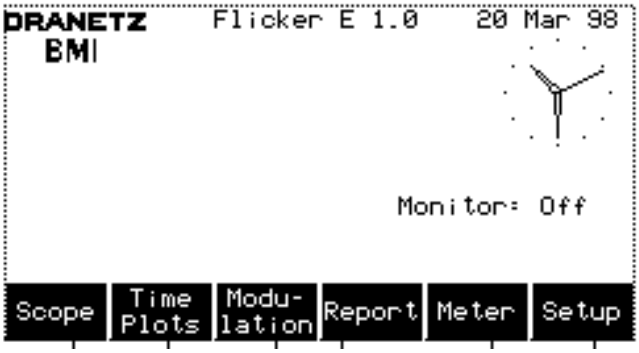
This chapter provides information for using the Easy Start function of the Power Platform-Flicker. Easy Start is a series of screens that prompts you for information about the circuit you will be monitoring. The PP1-Flicker then automatically turns on the correct channels, sets the monitoring thresholds, and chooses the types of reports that it will print out.

In this chapter

The following topics are covered in this chapter.

Turning On the Power Platform

Procedure Follow these steps to turn on the Power Platform.

Step	Action
1	Plug unit into an ac power source.
2	Verify that the Flicker TASKCard is inserted into the slot on the rear panel.
3	Turn on the unit. Result: If the TASKCard is inserted correctly, the unit will perform internal diagnostics, momentarily display the message "TASKCard Found, Loading Flicker Vxx", then display the scope mode screen shown below.  Note: If the TASKCard is not inserted correctly, or if the TASKCard is corrupted, an error message will be displayed indicating TASKCard or downloading failure. Refer to Chapter 4, *Turning the Unit On*, for a list of the error message types and what to do next.

Using Easy Start

Introduction

Refer to the tables on the following pages for the possible Easy Start combinations based on the information that you enter.

CAUTION

The Easy Start process will change previously programmed instrument settings and configurations. Monitoring is also shut down during Easy Start programming.

PRECAUCION

El proceso Inicio fácil cambiará los ajustes y configuraciones del instrumento programados anteriormente. Tambièn se detiene el monitoreo durante la programación de Inicio fácil.

MISE EN GARDE

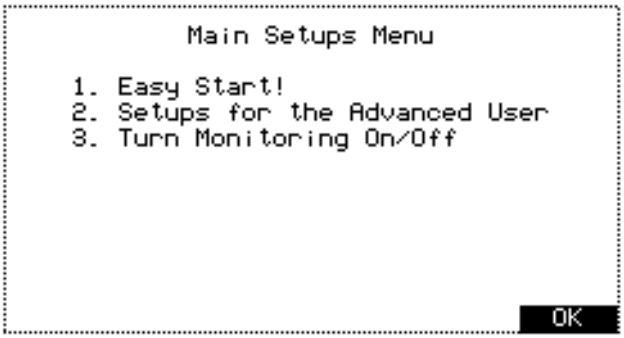
Le processus Easy Start modifiera les configurations et les réglages des instruments précédemment programmés. La fonction de contrôle est également éteinte pendant la programmation de Easy Start.

VORSICHT

Der Vorgang “Easy Start” (Einfacher Start) ändert vorher programmierte Instrumenteneinstellungen und -konfigurationen. Das Überwachen wird während des “Easy Start”-Programmierens ebenfalls ausgeschaltet.

Procedure

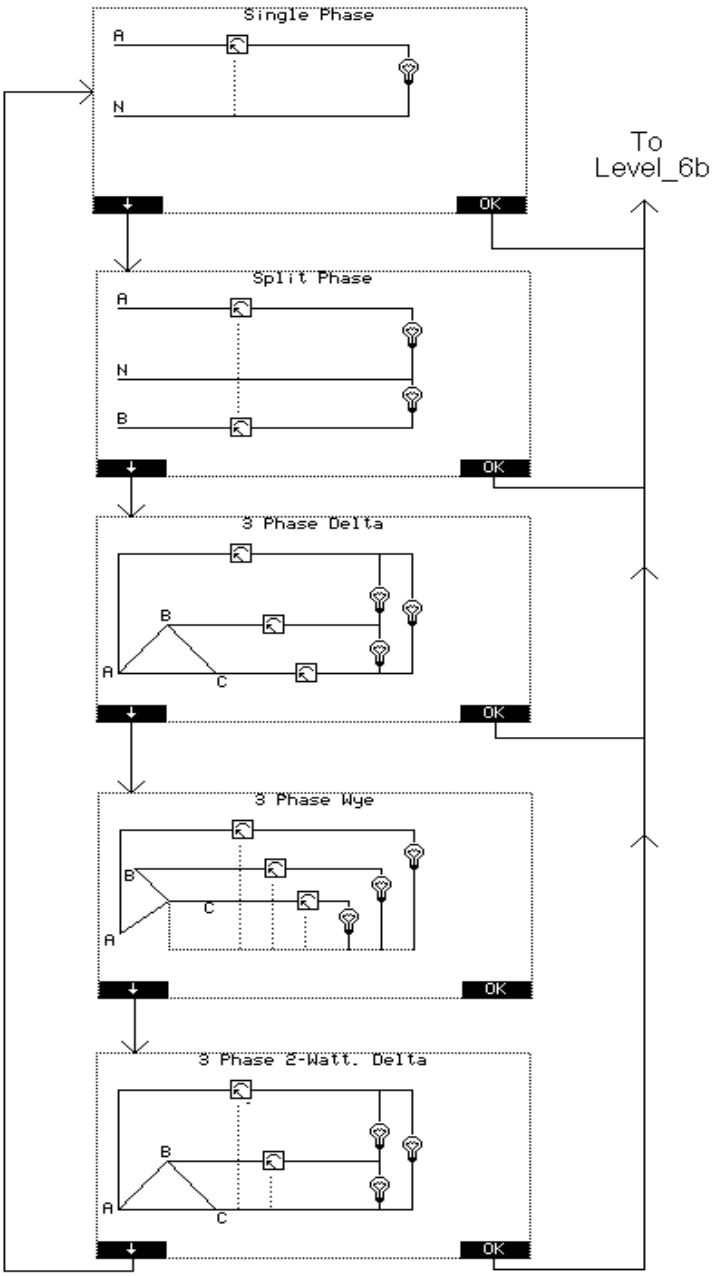
Follow these steps if you are using the Easy Start function of the PP1-Flicker.

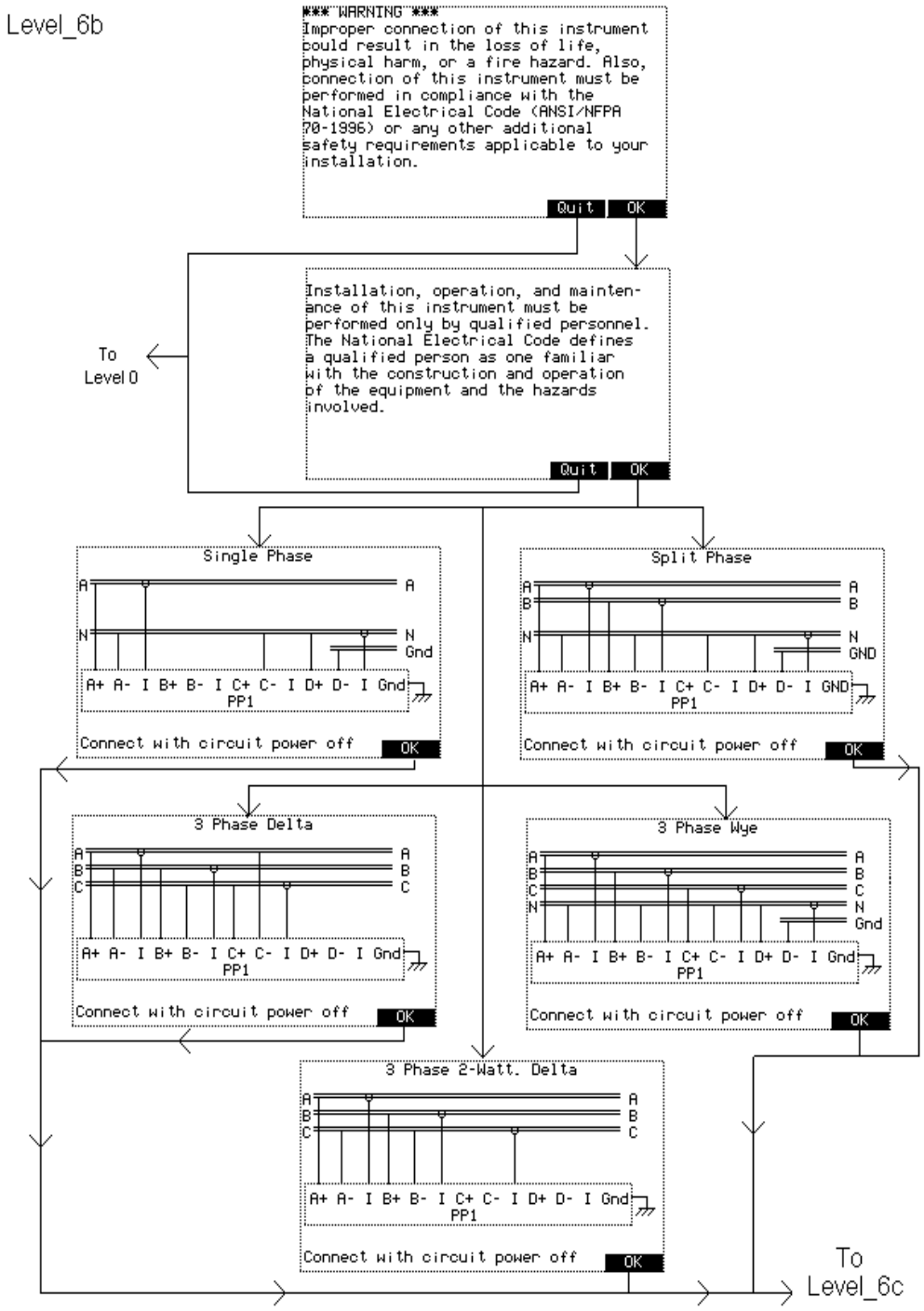
Step	Action
1	From the opening screen, press SETUP. Result: The following screen will appear. 
2	Select item 1, Easy Start.

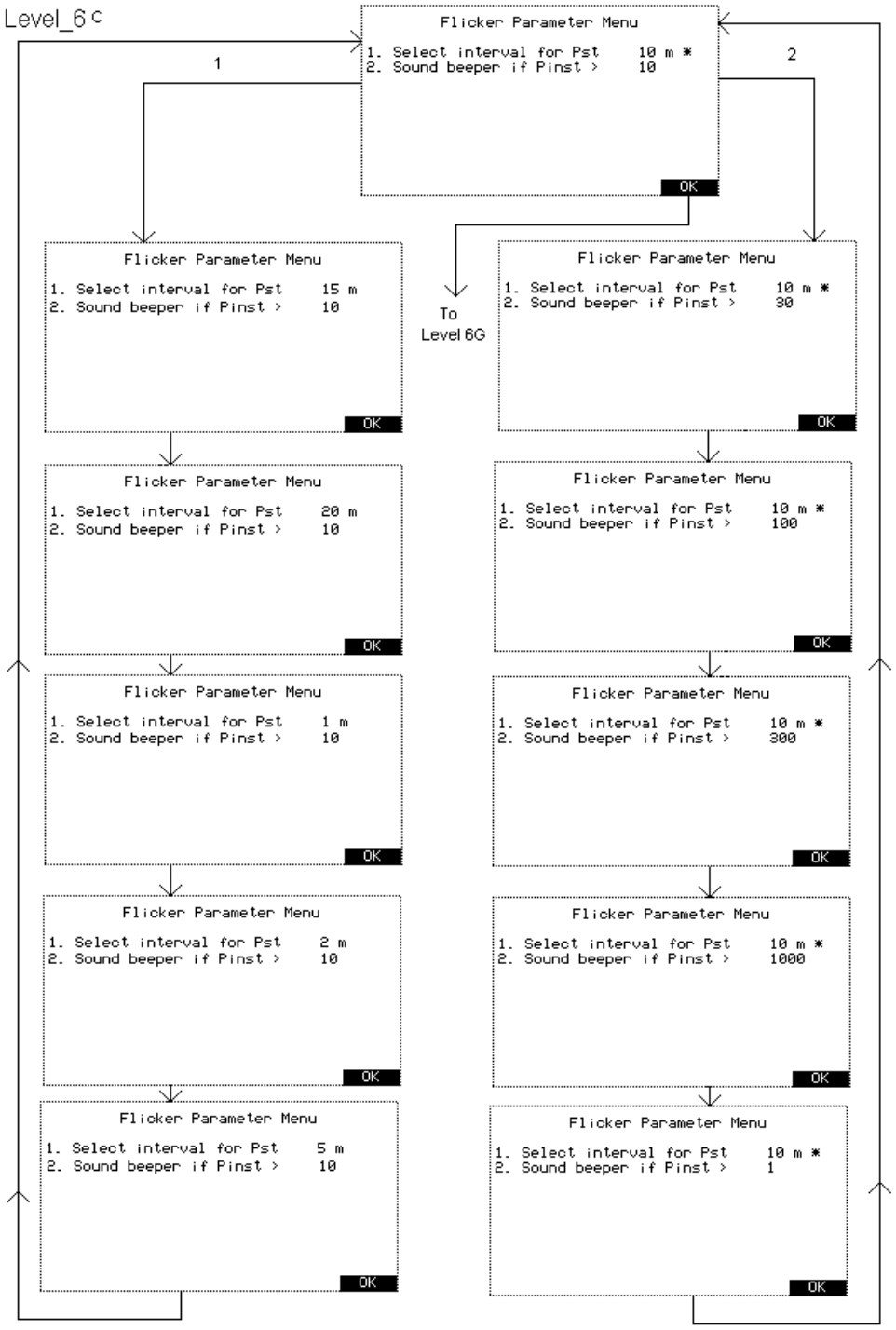
Continued on next page

Easy Start setup The first screen shown is the Circuit Select screen. Use the Down arrow key to find the circuit type being monitored. Press OK to select it. Warning screens will be displayed as shown. Read the warning screens and press OK to continue (press Quit to return to the Main Menu). A connection diagram for the circuit type selected will be displayed. Verify connections and press OK to continue. Select the monitoring interval for the flicker measurements. Select threshold for warning beeper. Press OK to exit Easy Start.

Level_6a




Level_6b
*** WARNING ***
Improper connection of this instrument could result in the loss of life, physical harm, or a fire hazard. Also, connection of this instrument must be performed in compliance with the National Electrical Code (ANSI/NFPA 70-1996) or any other additional safety requirements applicable to your installation.
Quit
OK
Installation, operation, and maintenance of this instrument must be performed only by qualified personnel. The National Electrical Code defines a qualified person as one familiar with the construction and operation of the equipment and the hazards involved.
Quit
OK
To Level 0
Single Phase
A
N
A
N
Gnd
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
Split Phase
A
B
N
A
B
N
GND
A+ A- I B+ B- I C+ C- I D+ D- I GND
PP1
Connect with circuit power off
OK
3 Phase Delta
A
B
C
A
B
C
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
3 Phase Wye
A
B
C
N
A
B
C
N
Gnd
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
3 Phase 2-Watt. Delta
A
B
C
A
B
C
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
To Level_6c


Level_6 c
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 10
OK
1
2
Flicker Parameter Menu
1. Select interval for Pst 15 m
2. Sound beeper if Pinst > 10
OK
To
Level 6G
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 30
OK
Flicker Parameter Menu
1. Select interval for Pst 20 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 100
OK
Flicker Parameter Menu
1. Select interval for Pst 1 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 300
OK
Flicker Parameter Menu
1. Select interval for Pst 2 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 1000
OK
Flicker Parameter Menu
1. Select interval for Pst 5 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 1
OK

Chapter 3

Controls, Indicators, and Connectors

Overview

Introduction

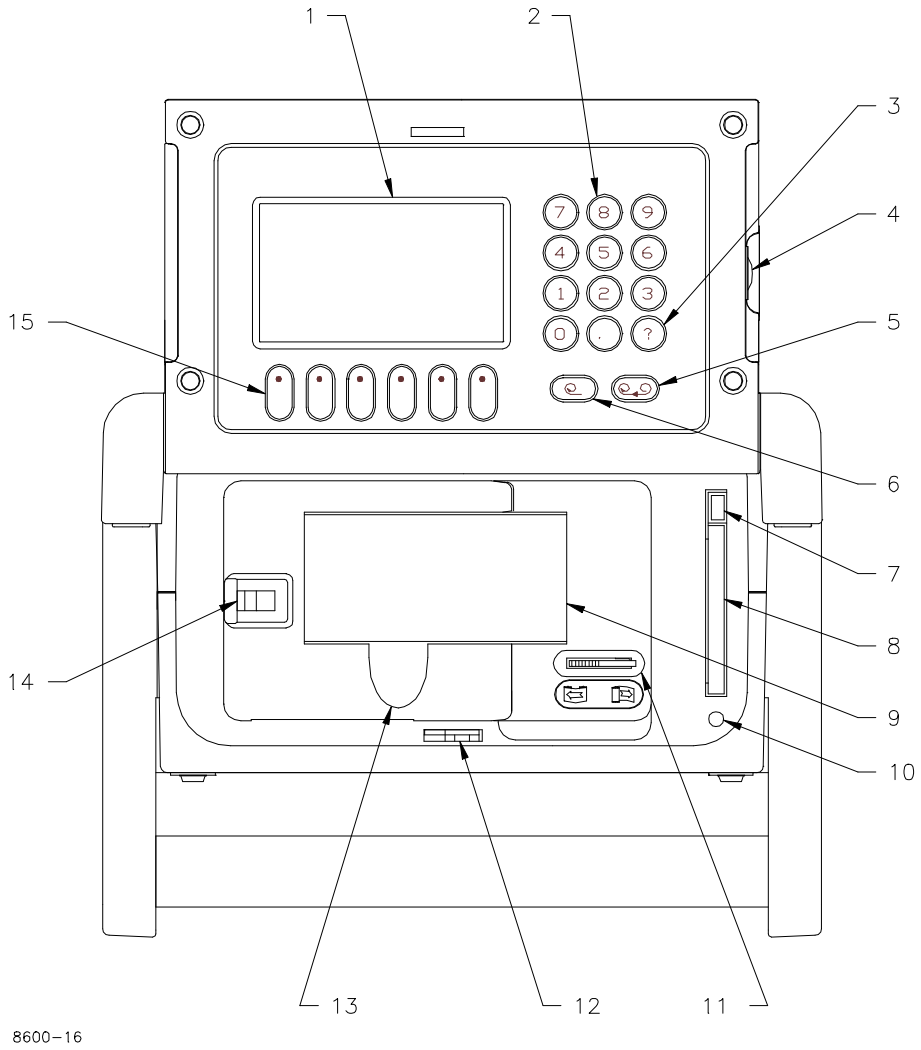
This chapter identifies and describes the controls, indicators, and connectors on the front and rear panels of the Power Platform. In addition, the methods of positioning the unit for carrying, operating, and securing the unit are discussed.

In this chapter

The following topics are covered in this chapter.

Front Panel

Diagram Models PP1 & PP1E



Continued on next page

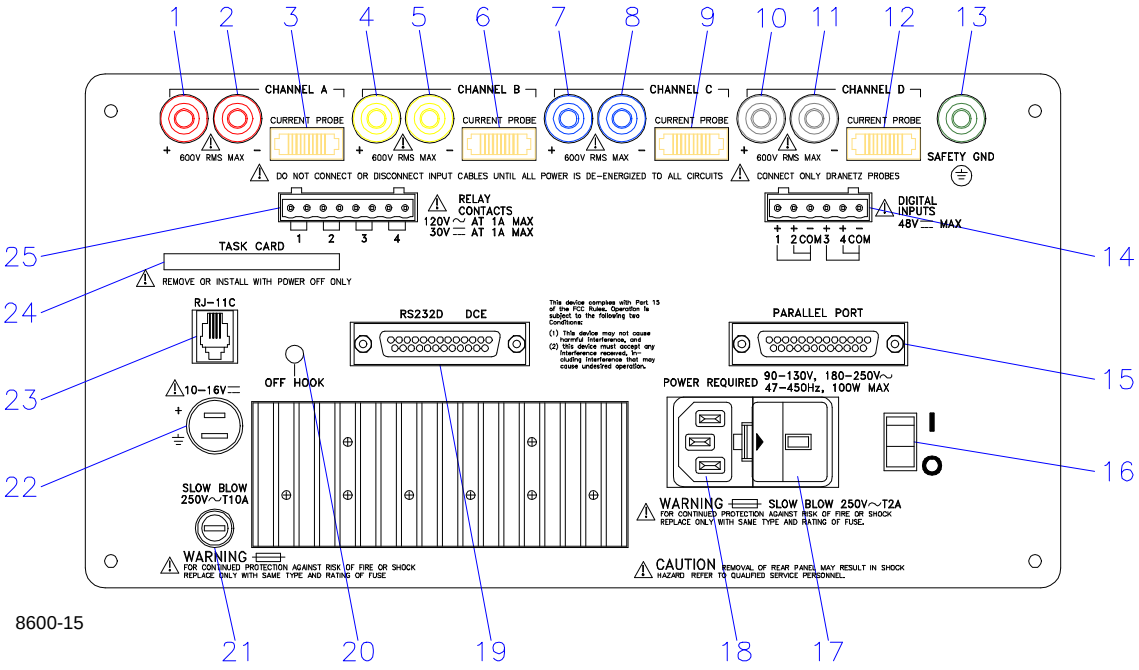
Front Panel, Continued

Parts Table

Part	Function
1	Liquid Crystal Display (LCD). Provides 2 3/4 x 4 1/2 inch (5 x 10 cm) display consisting of 240 by 128 pixels (dots) of text and graphic information. Has electroluminescent (EL) backlighting for low light level viewing.
2	Numeric keypad. Consists of keyboard keys 0 thru 9 and decimal point (.) Permits menu selection and numerical data entry.
3	Question Mark Key. Displays help screen with reference to screen displayed at any time.
4	Contrast Control. Provides contrast range control for LCD viewing.
5	Paper Feed. Controls paper feed and take up to advance the paper uniformly across window from right to left.
6	Paper Take-up. Controls paper slack.
7	Data Card Release. Ejects data (memory) card.
8	Data Card Holder. Holds and connects data (memory) card to internal circuitry.
9*	Thermal Paper Printout. High-resolution thermal print of real-time data and report information.
10	Data Card Busy LED. Yellow LED indicates data (memory) card is being accessed.
11*	Run/Load Printhead Control. Lever in left position for normal run operation. Lever in right position lifts printhead from paper for loading or paper pulling.
12	Keylock. Secures front panel in locked shut position.
13*	Finger Groove. Access to grasp and pull paper out for viewing. (Note: Printhead control must be in LOAD position before paper is pulled.)
14*	Printer Door Latch. Moves to right to unlock printer door.
15	Function Keys. Used to select options that appear on bottom of screen. Function selected varies with screen displayed.
*Part of PP1 with printer.	

Rear Panel

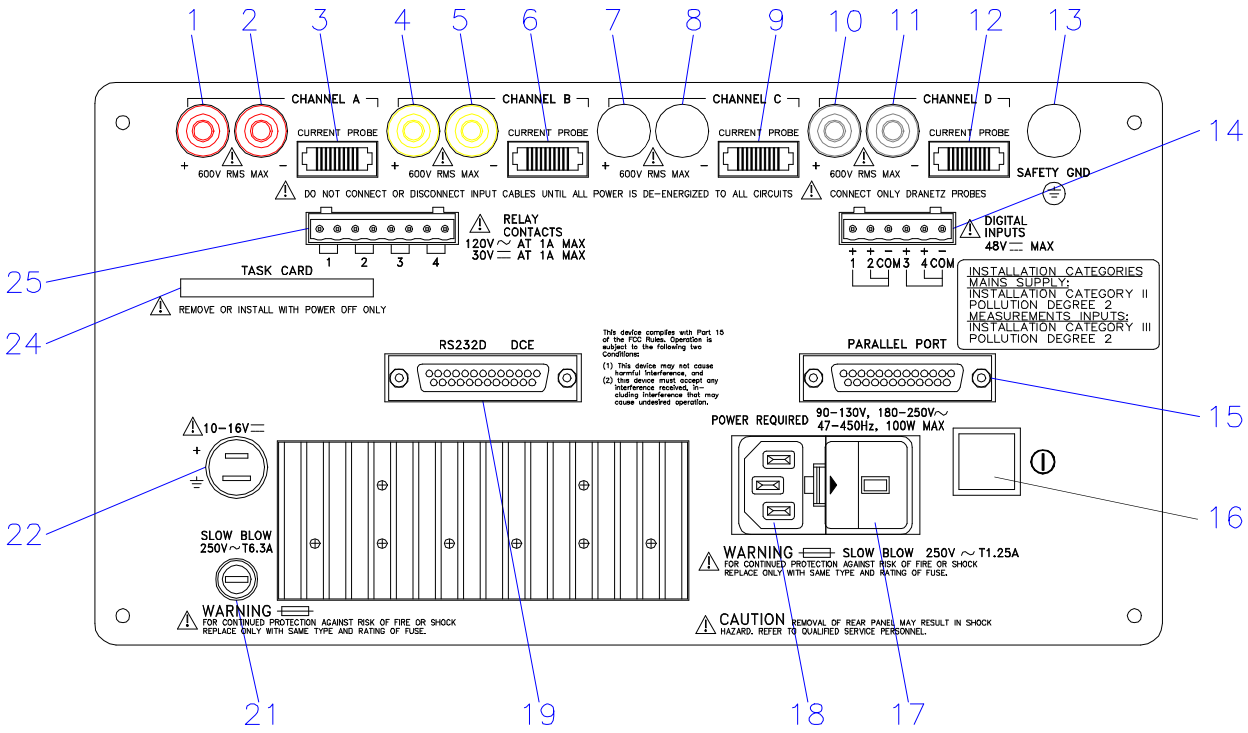
Diagram Model PP1



8600-15

Continued on next page

Diagram Model PP1E



Continued on next page

Parts Table Models PP1 &PP1E

Part	Description
1	CHANNEL A, + Differential Voltage Input Connector; color red.
2	CHANNEL A, - Differential Voltage Input Connector; color white.
3	CHANNEL A, CURRENT PROBE Input Connector.
4	CHANNEL B, + Differential Voltage Input Connector; color yellow.
5	CHANNEL B, - Differential Voltage Input Connector; color white.
6	CHANNEL B, CURRENT PROBE Input Connector.
7	CHANNEL C, + Differential Voltage Input Connector; color blue.
8	CHANNEL C, - Differential Voltage Input Connector; color white.
9	CHANNEL C, CURRENT PROBE Input Connector.
10	CHANNEL D, + Differential Voltage Input Connector; color grey.
11	CHANNEL D, - Differential Voltage Input Connector; color white.
12	CHANNEL D, CURRENT PROBE Input Connector.
13	SAFETY GROUND Connector; color green.
14	DIGITAL INPUTS, 12-48 VDC. Four channels of digital signal inputs.
15	PARALLEL PORT. *Discontinued*.
16	On/Off Switch. 1 = ON, 0 = OFF.
17*	PP1: SLOW BLOW 250 VAC T2A. Fuseholder. (Main Power) PP1E: SLOW BLOW 250 VAC T1.25A 5x20 mm Fuseholder (Main Power).
18	POWER REQUIRED, 90-130 VAC 180-250 VAC, 47-450 Hz, 100 W MAX. Input power plug.
19	RS232D DCE, Serial data port.
20	PP1: OFF HOOK indicator. When lit yellow indicates that the telephone line is active. *Not used with Flicker TASKCard.* PP1E: Not available
21*	PP1: SLOW BLOW, 250 VAC T10A. Internal/External battery fuse. PP1E: SLOW BLOW, 250 VAC T6.3A 5x20 mm Internal/ External battery fuse.

Continued on next page

Parts Table
(continued)

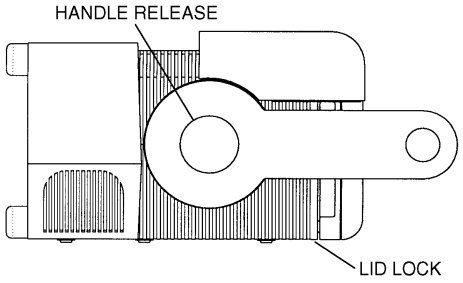
Part	Description
22	10-16VDC, External DC voltage source input.
23	PP1: RJ-11C. Telephone jack for internal 2400 baud modem connection. *Not used with Flicker TASKCard.* PP1E: Not available.
24	TASK CARD, connector slot. TASKCard Protective Cover, mounted with screws after TASKCard is installed. (Not shown.)
25	RELAY CONTACTS. *Not used with Flicker TASKCard.*
* Refer to Appendix D for Fuse Replacement	

Positioning the Unit

Handle release

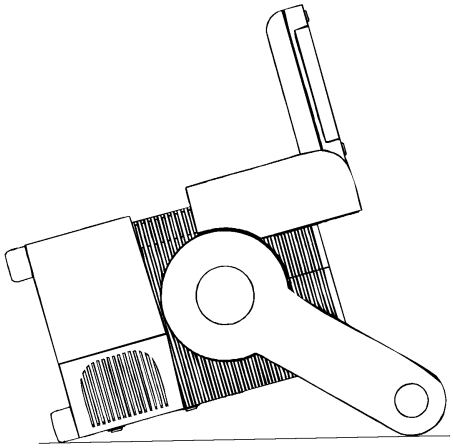
Handle releases, in the pivots of the handles, must be pressed inwards together to unlock the handles. Once released, the handles can be positioned in three positions: one for carrying the unit, and two for viewing the display at 15 or 45 degrees. At each position the handles will lock and must be released again to be repositioned.

Handle release location and carrying position

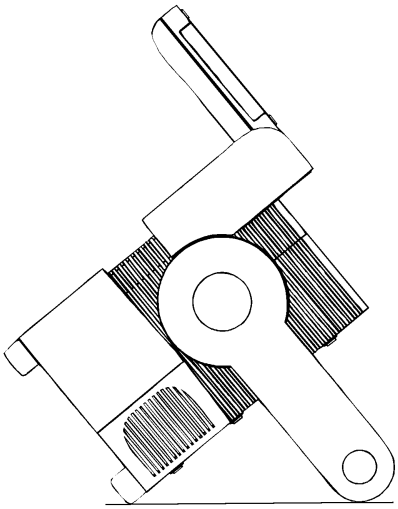


8600-53

Viewing positions



8600-54



8600-55

Chapter 4

Getting Started

Overview

Introduction

This chapter helps you get started in making the required connections to the circuit to be monitored, verify that your connections are made correctly, activate a monitoring setup so that the unit can begin gathering information, and view the basic displays of the parameters being monitored.

In this chapter

This chapter is divided into the following sections.

Section A

Turn On Procedures

Overview

Introduction

This section describes the procedures you need to perform before you turn the unit on and what you should see after it is on. Possible error conditions and the necessary corrective actions are also discussed.

In this section

The following topics are covered in this section.

Setting the Voltage Selector

Introduction

The Power Platform input voltage may be set to 115VAC or 230VAC by manually positioning a selector type switch. The selected operating voltage is indicated in a window of the fuse holder.

WARNING

The power to the Power Platform must be off when changing the voltage selector.

ADVERTEN-CIA

Se debe cortar la energía a la Plataforma de energía cuando se cambie el selector de voltaje.

AVERTISSE-MENT

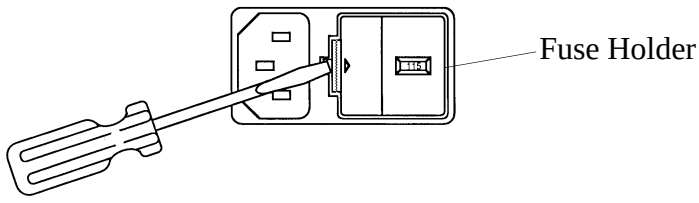
L'alimentation jusqu'à la plate-forme d'alimentation doit être coupée lors du changement de tension.

WARNUNG

Die Stromzufuhr zur "Power Platform" (Stromplattform) muß ausgeschaltet sein, wenn der Spannungswähler ausgewechselt wird.

Procedure

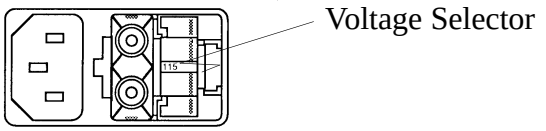
Follow these steps to set the voltage selector.

Step	Action
1	Turn power switch off and remove power cord, if connected.
2	Place screwdriver blade in fuse holder retaining slot and push to right to release fuse holder.  8600-56
3	Remove fuse holder.

Continued on next page

Setting the Voltage Selector, Continued

Procedure
(continued)

Step	Action
4	Grasp and pull out voltage selector from fuse holder body.  8600-57
5	Rotate voltage selector so that desired voltage marking is facing rear of panel.
6	Insert voltage selector into fuse holder slot and push firmly to seat.
7	Replace fuse holder.
8	Verify that voltage selector indicator displays the required voltage. If not, repeat steps 2 through 7.

Power Requirements

Introduction

The Power Platform can be operated from an AC or DC power source. Refer to Appendix I for information about connecting to an external DC power source.

Connecting to an AC power source

Follow these steps to connect to an AC power source.

Step	Action
1	Verify that the power switch is off. See rear panel, page 3-5, item 16.
2	Verify that the voltage selector on the rear panel is set to the operating voltage of your facility. If voltage selection is wrong, refer to page 4-3.
3	Connect female end of correct operating voltage power cord (listed below) to the AC power input receptacle on the rear panel. • 115 VAC power cord - Part No. 110893-G1 (Domestic) • 230 VAC power cord - Part No. 110726-G1 (Domestic) • 230 VAC power cord - Part No. 115369-G1 (Euro) • 230 VAC power cord - Part No. 115368-G2 (UK)
4	Connect male end of power cord to input power source.

Operating the PP1 using the internal battery

Follow these steps to run the Power Platform on the internal battery.

Step	Action
1	Turn the unit off.
2	Disconnect AC power cord.
3	Turn on power to the unit. Note: The unit will operate up to one hour without using printer. Using printer continuously will deplete the battery in approximately 15 minutes.

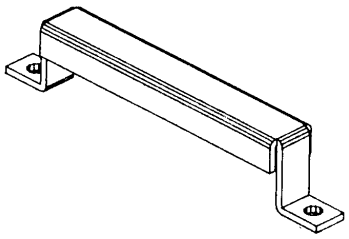
Installing a TASKCard

Procedure

Follow these steps to install a TASKCard.

Step	Action
1	Turn off power to the unit.
2	Remove TASKCard-Flicker from its protective holder and check that the plug end of card is clean and free of any obstruction. Note: If plug end of card is dirty, clean with static-free, dry, low pressure air to remove any foreign material causing obstruction of the plug holes.
3	Verify that the Write Protect switch (end opposite plug) is set to the Write Protect position. Use pencil point to move switch.
4	At the rear of the unit, position the TASKCard-Flicker with the label facing up and the plug end facing the TASK CARD slot.
5	Insert the card fully into the slot until resistance is felt, then press firmly until the card engagement is felt. Note: Do not force the card further into the slot if no card engagement is felt. Remove card and check that there is no foreign object on or in the plug end of the card. Remove any obstruction. Reinsert card and repeat card engagement. If card cannot be engaged, STOP all further action and call Dranetz-BMI Service for further instructions.
6	To prevent the inserted TASKCard from being removed during operation, install the TASKCard cover accessory (shown below) over the TASKCard and secure the cover with the two screws provided.
7	Go to next page for power turn on procedure.

TASKCard cover



Turning the Unit On

WARNING **Do not turn power on unless a secure safety ground, using the green safety wire, is connected to the green ground terminal on the rear panel.**

ADVERTEN-CIA **No encienda la energía a menos de que haya una conexión a tierra de seguridad, utilizando el alambre de seguridad verde, con el terminal de conexión a tierra verde en el panel posterior.**

AVERTISSE-MENT **Ne pas mettre sous tension sauf si une mise à la terre adéquate, en utilisant le câble vert de sécurité, est connectée à la borne de mise à la terre verte sur le panneau arrière.**

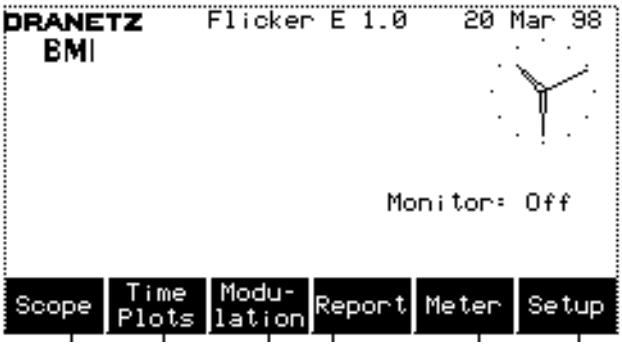
WARNUNG **Schalten Sie den Strom nicht ein, bevor Sie eine sichere Erdung mit dem grünen Erdungsdraht hergestellt haben, der an den grünen Erdungsterminal auf der Rückwand angeschlossen ist.**

Procedure Follow these steps when turning on the Power Platform.

Step	Action
1	Verify that the green grounding connector is attached to the Safety Gnd connector on the rear panel and that the other end is firmly attached to a secure ground.
2	Verify that all voltage probe connections at the source or load are secure and that voltage probes are connected securely to the rear panel. Refer to Section B in this chapter.
3	Verify that all current probe connections at the source or load are secure and that current probes are connected securely to the rear panel. (Current probes are not required to monitor for flicker.)
4	Verify that the Flicker TASKCard is installed in the rear panel.

Continued on next page

Procedure
(continued)

Step	Action
5	Turn on power to the unit. Result: If the TASKCard is inserted correctly, the unit will perform internal diagnostics, momentarily display the message "TASKCard Found, Loading Flicker Vxx", and display several diagnostic messages, such as "Sync acquired." Finally, the Scope Mode screen shown below will be displayed.  Note: If the TASKCard is not inserted correctly, or if the TASKCard is corrupted, an error message will be displayed indicating TASKCard or downloading failure. Refer to the error message table on next page for the error message types and what to do next.

TASKcard error messages

The following table describes the possible error messages when loading the TASKCard and the corrective action to take for each.

Error Message	What to Do Next
TASKCard Not Found. Booting From ROM.	TASKCard may not be installed or is installed incorrectly. Turn off power and recheck TASKCard installation. To boot from ROM see next page.

Continued on next page

TASKcard error messages (continued)

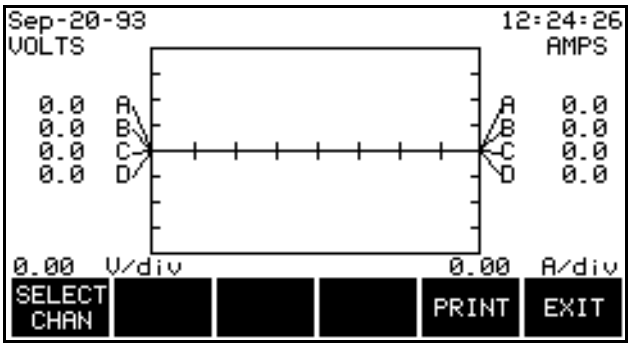
Error Message	What to Do Next
Corrupt TASKCard. Booting from ROM.	A TASKCard was found but it was not recognized as a valid TASKCard. Turn off power and recheck TASKCard. If the TASKCard is properly inserted, there may be a problem, notify Dranetz-BMI. To boot from ROM, see next page.
WARNING: The TASKCard found: (now installed) Is different than last used: (previous TASKCard) CHANGING TASKCARDS MAY ERASE MEMORY!	Press any key to continue or turn off the unit and reinstall the last TASKCard used.
ADVERTENCIA: La TASKCard que se encontró: (ahora instalada) Es diferente de la utilizada la última vez: (TASKCard anterior) ¡CAMBIAR LAS TASKCARDS PUEDE BORRAR LA MEMORIA!	Pulse cualquier tecla para continuar o apague la unidad y vuelva a instalar la última TASKCard utilizada.
AVERTISSEMENT: La TASKCard détectée : (actuellement installée) est différente de la dernière utilisée : (TASKCard précédente) LE CHANGEMENT DE TASKCARDS PEUT EFFACER LA MÉMOIRE !	Appuyez sur une touche pour continuer ou éteignez l'unité et réinstallez la dernière TASKCard utilisée.
WARNUNG: Die gefundene TASKCard: (jetzt installiert) ist unterschiedlich von der zuletzt benutzen: (vorherige TASKCard) WECHSELN DER TASKCARDS KANN SPEICHER LÖSCHEN!	Betätigen Sie eine Taste, um fortzufahren oder schalten Sie die Einheit aus und installieren Sie die zuletzt benutzte TASKCard erneut.
Any of the following: •I/O Processor Download Failed •ACP Processor Download Failed •I/O Processor Will Not Respond •ACP Processor Will Not Respond	TASKCard download problem. Notify Dranetz-BMI for further assistance.

When to boot from ROM

Boot from ROM under the following conditions:
- you have a problem loading the TASKCard, or
- you want to operate the Power Platform without the TASKCard.

Booting from ROM

To boot from ROM proceed as follows:

Step	Action
1	From the error message screen, press any key. The following screen is displayed. 
2	Press EXIT to display the Meter Mode Menu.

Available Functions

When you boot from ROM, only the following functions are available.

Function	See Page
Scope Mode	4-52
One Channel, All Parameters Meter Mode All Channels, One Parameter Meter Mode	4-54
Voltage and Current Phasors	4-54
Set Time and Date	5-4

Note

No further monitoring or displaying of parameter data is possible without having a TASKCard installed.

Section B

Voltage and Current Cable Connections

Overview

Introduction

This section covers topics related to the connection of the various voltage and current devices that can be used when making measurements. For specific circuit applications, refer to Section C.

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 70-1996) 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 familiar with the construction and operation of the equipment and the hazards involved.”

ADVERTEN-CIA

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 debe ser hecha de acuerdo con las normas del Código Eléctrico Nacional (ANSI/NFPA 70-1996) de EE. UU., 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."

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 70-1996) 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".

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.

Der Anschluß dieses Instruments muß in Übereinstimmung mit den nationalen Bestimmungen für Elektrizität (ANSI/NFPA 70-1996) der Vereinigten Staaten, sowie allen weiteren, in Ihrem Fall anwendbaren Sicherheitsbestimmungen, vorgenommen werden.

Installation, Betrieb und Wartung dieses Instruments dürfen nur von Fachpersonal durchgeführt werden. In dem nationalen Bestimmungen für Elektrizität wird ein Fachmann als eine Person bezeichnet, welche "mit der Bauweise und dem Betrieb des Gerätes sowie den dazugehörigen Gefahren vertraut ist."

Safety precautions

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

- Connect the green 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.

Continued on next page

- Connections must be made to the instrument first, then connect to the circuit to be monitored.
- Wear 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 unit 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.

Medidas de seguridad

Las medidas de seguridad siguientes deberán observarse cuando se realice cualquier tipo de conexión al instrumento.

- Antes de hacer cualquier conexión, deberá enchufarse el conector de seguridad verde a tierra.
- Cuando se haga conexiones a circuitos eléctricos o a equipo de activación por pulso, deberá abrirse sus respectivas cajas de seguridad. NO deberá hacerse ninguna conexión del instrumento en líneas eléctricas bajo tensión.
- Las conexiones deberán hacerse primero al instrumento y, luego, al circuito a ser monitorizado.
- Al hacer conexiones a circuitos eléctricos, deberá utilizar anteojos y guantes protectores.
- Sus manos, zapatos y el piso deberán estar secos en todo momento en que se haga una conexión a un cable eléctrico.
- Verifique que la unidad esté DESACTIVADA antes de conectar sondas en el panel posterior.
- Previo a cada uso, deberá verificarse que los cables no estén rotos y que el material aislante no tenga rajaduras. Reemplace de inmediato cualquier parte defectuosa.

Mesures de Sécurité

Les mesures de sécurité suivantes doivent être prises chaque fois qu'un type de connexion quelconque est effectué sur l'instrument.

- Connecter d'abord la prise de terre de sécurité verte (terre) avant d'effectuer toute autre connexion.
- Ouvrir les disjoncteurs correspondants lors d'une connexion à des circuits électriques ou à des équipement de génération d'impulsions. NE PAS effectuer de connexion d'instrument sur des lignes électriques sous tension.
- Une fois toutes les connexions de l'instrument effectuées, connecter au circuit à contrôler.

Continued on next page

- Porter des lunettes de protection et des gants isolants pour effectuer des connexions aux circuits électriques.
- S’assurer que les mains, les chaussures et le sol soient secs lors de connexions à une ligne électrique.
- S’assurer que l’unité est ÉTEINTE avant de connecter les sondes au panneau arrière.
- Inspecter tous les câbles, avant chaque utilisation, pour s’assurer que les isolants ne sont pas coupés ou fendus. Remplacer immédiatement tous les équipements défectueux.

Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen sind immer dann zu befolgen, wenn eine Verbindung zum Instrument hergestellt wird.

- Schließen Sie zuerst die grüne Sicherheits-/Erdleitung an, bevor Sie eine andere Verbindung herstellen.
- Öffnen Sie beim Anschluß an elektrische Stromkreise oder Impulsauslösungseinrichtungen die entsprechenden Unterbrecher. Es dürfen KEINE Anschlüsse an das Instrument unter stromführenden Spannungsleitungen montiert werden.
- Die Verbindungen müssen zuerst am Instrument und danach an der zu überwachenden Schaltung hergestellt werden.
- Tragen Sie Schutzbrillen und Isolierhandschuhe, wenn Sie Anschlüsse an den Stromkreisen vornehmen.
- Hände, Schuhe und Fußboden müssen trocken sein, wenn Sie Anschlüsse an den Stromkreisen durchführen.
- Stellen Sie sicher, daß das Gerät AUSgeschaltet ist, bevor Sie an der rückwärtigen Konsole Meßfühler anschließen.
- Prüfen Sie vor jedem Gebrauch alle Kabel auf Bruchstellen und Risse in der Isolierung. Wechseln Sie schadhafte Kabel sofort aus.

In this section

The following topics are covered in this section.

Connecting a Voltage Probe

Safety precautions

Follow the safety precautions listed on page 4-12 when making all voltage probe connections.

Medidas de seguridad

Siga las medidas de seguridad listadas en la página 4-13 cuando efectúe todas las conexiones potenciales del transformador.

Mesures de sécurité

Suivez les mesures de sécurité données en page 4-13 lors de la réalisation de toutes les connexions du transformateur de tension.

Sicherheitsvork-ehrungen

Folgen Sie den auf Seite 4-14 augeführten Sicherheitsvorkehrungen, wenn Sie an potentiellen Trafo-Verbindungen arbeiten.

Measurement cable set

Description: Voltage probes, jumpers, and power cord are provided as standard accessories and are stored in a cable pallet as part of the measurement cable set, part number 115815-G1 (Domestic), 115815-G2 (Euro), or 115815-G3 (UK).

Voltage Rating: Direct connection of all voltage probes for measurement are rated at 600 Vrms max. For measuring voltages greater than 600 Vrms, Potential Transformers (PT's) must be used.

Contents: The voltage cables are shown in the figure on the next page (positioned relative to their actual use) and consist of the following:

- Eight, 8-foot channel measurement cable assemblies (probes), each with a detachable, crocodile jaw, safety clip assembly. The safety clip assemblies are red (+) and black (-) for each of the four channels. One probe assembly each of red (channel A), yellow (channel B), and blue (channel C) and five each of black are provided.
- Four 1-foot blue jumpers for input connector jumpering.
- A shielded power cord.

A pallet for storage of the cables and the input power cord are included in the contents of the measurement cable set but are not shown in the figure.

Continued on next page

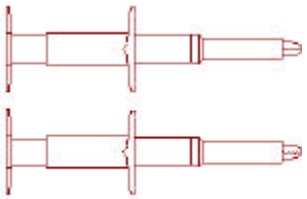
Connecting a Voltage Probe, Continued

Voltage Safety Clip Assemblies

Voltage safety clips, shown below, are supplied as four sets of the standard accessory measurement cable set. Each clip is a detachable, crocodile jaw type voltage probe that connects to a slip-on end connector of the channel measurement cables.

Voltage Safety Clip, Red
(Fluke, Model AC20-2)

Voltage Safety Clip, Black
(Fluke, Model AC20-0)



WARNING

Do not exceed 600 Vrms for the safety clip assemblies. The safety clip assemblies supplied are intended for use with Dranetz-BMI products only and we do not authorize them for any other use.

ADVERTEN-CIA

No supere los 600 V, valor eficaz, en los conjuntos de pinzas de seguridad. Los conjuntos provistos están diseñados para ser usados con productos Dranetz-BMI únicamente y no están autorizados para ningún otro uso.

AVERTISSE-MENT

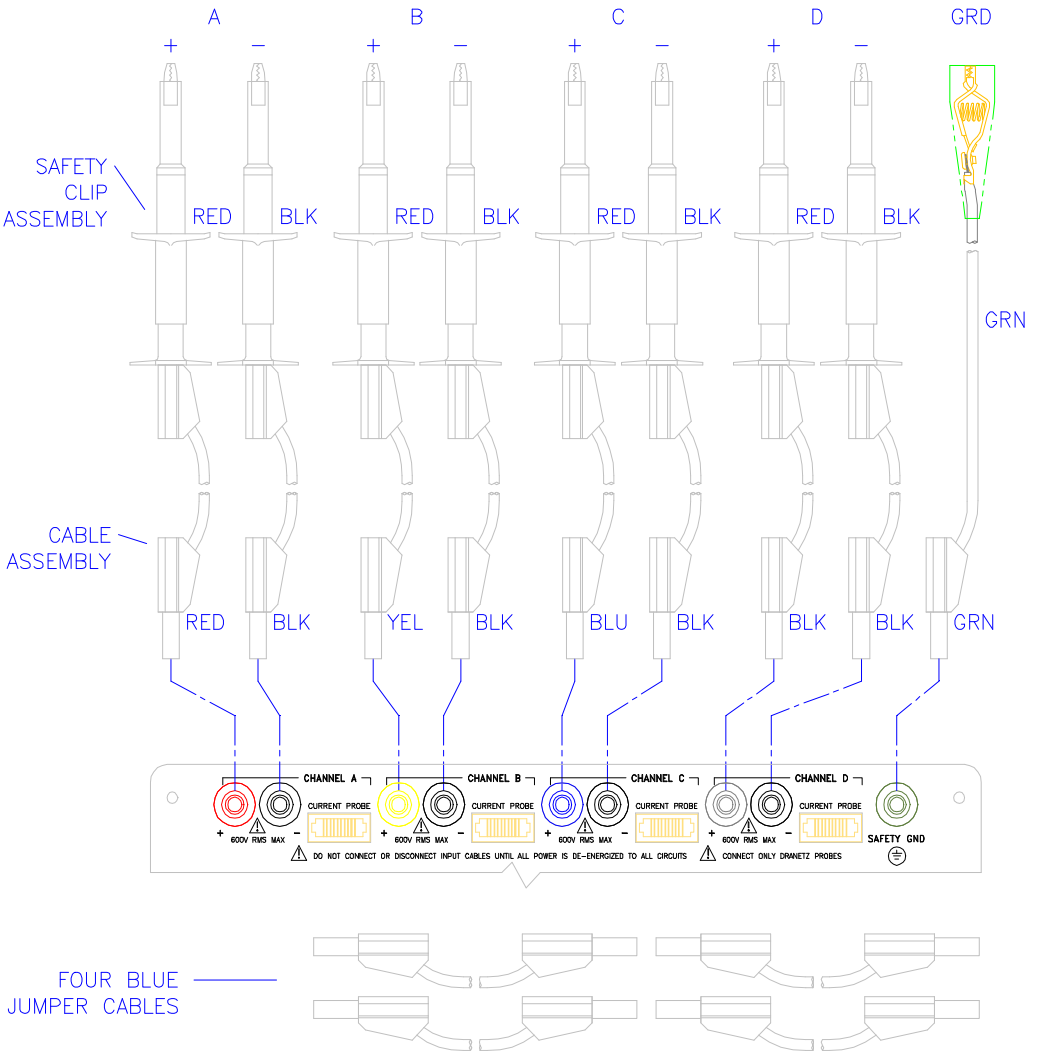
Ne dépassez pas 600 Veff pour les assemblages de clips de sécurité. Ces assemblages ont été conçus pour être utilisés avec les produits Dranetz-BMI seulement; nous n'autorisons aucune autre utilisation.

WARNUNG

Die Effektivspannung für die Sicherheitsklammern darf 600 Volt nicht überschreiten. Die mitgelieferten Sicherheitsklammern dürfen nur mit Produktenvon Dranetz-BMI benutzt werden. Eine Verwendung auf einer anderen Art und Weise ist nicht gestattet.

Connecting a Voltage Probe, Continued

Measurement cable set



NOTE: Pallet and input power cable not shown.

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Connecting a Voltage Probe, Continued

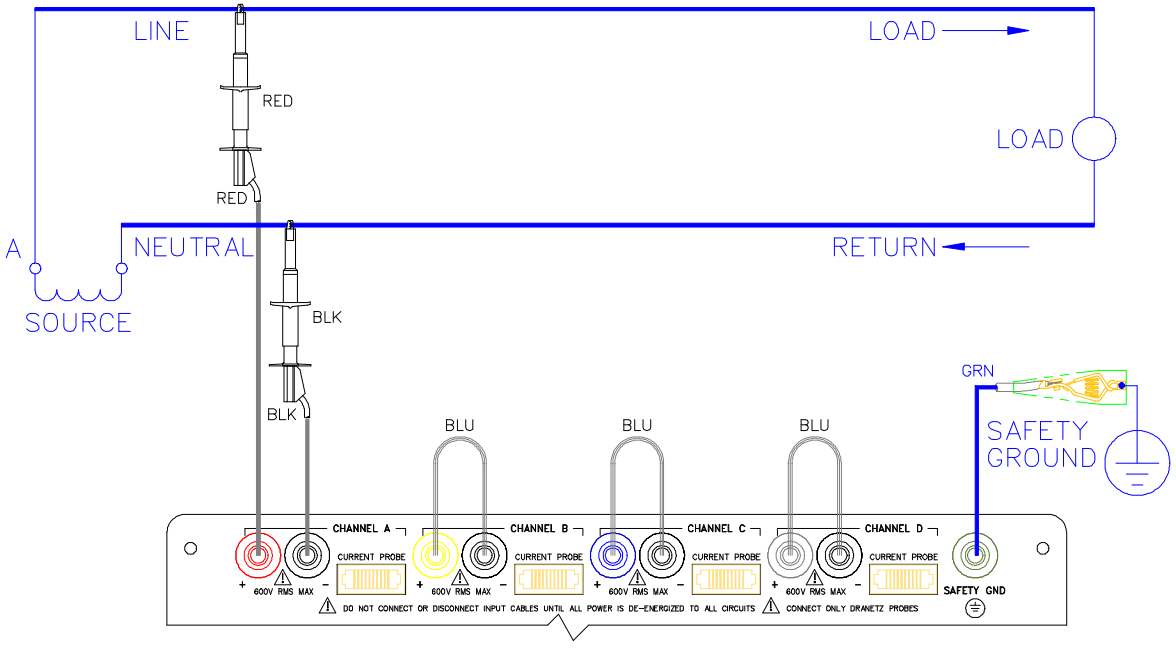
Connection guidelines

Follow these guidelines when making voltage connections.

- Refer to the measurement test set figure for color coding of probes that connect to input channel connectors A, B, C, and D.
- Each channel input has plus (+) and minus (-) differential inputs of 60 to 600Vrms max. Unused voltage channel differential inputs must be jumpered together using the blue jumpers provided.
- Channel D has an additional low voltage range of 0 to 60 Vrms max. for low voltage measurements.

Single phase connection example

The following figure shows a voltage connection to a single phase circuit for channel A. Jumpers are used to connect the differential inputs of channels B, C, and D together as shown to prevent erroneous data. The green cable is always connected to a secure ground (earth) connection as a safety ground.



8600-18

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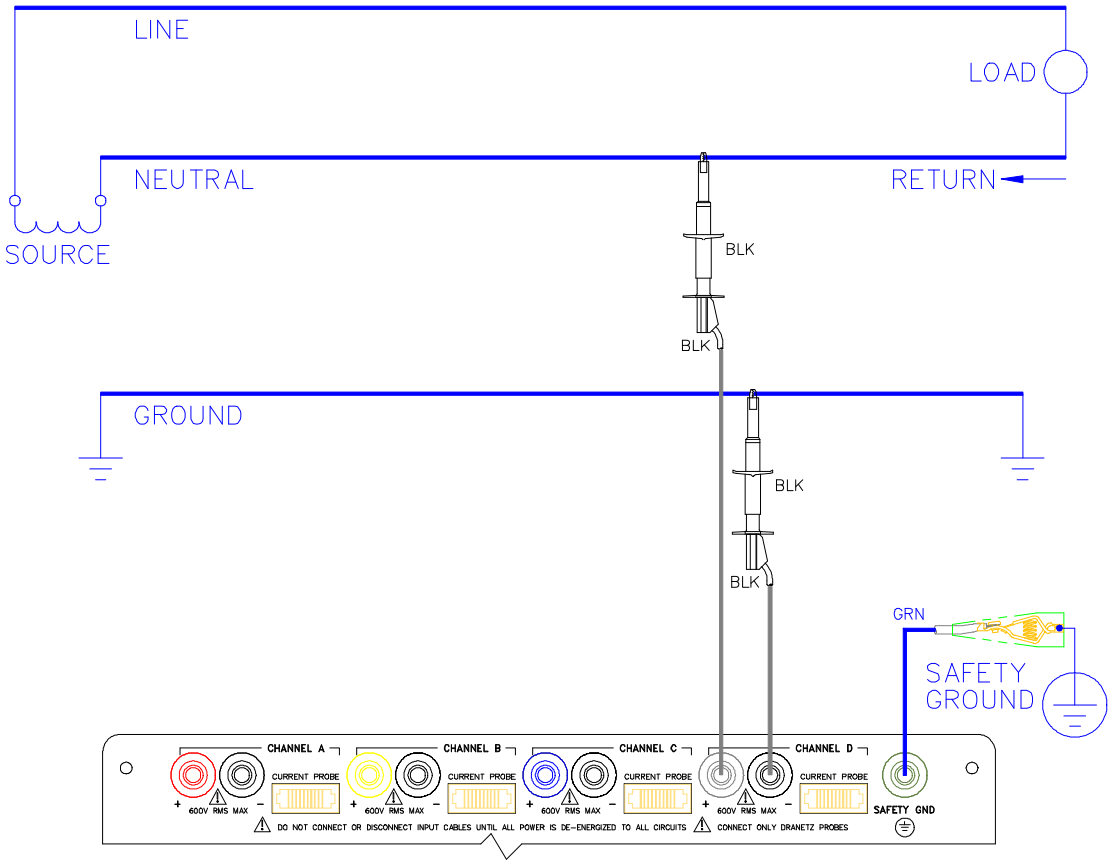
Connecting a Voltage Probe, Continued

Neutral to ground connection example

The following figure shows a voltage connection using channel D as a differential input for a single phase connection. Connections are identical for split phase, delta, and wye configurations. One probe connects the source neutral line to the D+ input. Another probe connects the safety ground to the D- input. Any channel input may be used to perform this measurement but Channel D is usually used because it provides a low voltage range of 0 to 60 Vrms.



8600-19

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Connecting to a Potential Transformer (PT)

Safety Precautions	Follow the safety precautions listed on page 4-12 when making all potential transformer connections.
Medidas de seguridad	Siga las medidas de seguridad listadas en la página 4-13 cuando efectúe todas las conexiones potenciales del transformador.
Mesures de sécurité	Suivez les mesures de sécurité données en page 4-13 lors de la réalisation de toutes les connexions du transformateur de tension.
Sicherheitsvork-ehrungen	Folgen Sie den auf Seite 4-14 augeführten Sicherheitsvorkehrungen, wenn Sie an potentiellen Trafo-Verbindungen arbeiten.
Note	**Potential Transformers are not manufactured by Dranetz-BMI and are discussed here for informational purposes only.**
Definition	A potential transformer (PT), also referred to as a voltage instrument transformer, provides the necessary step-down ratio to reduce the high voltage of circuits above 600Vrms to a level for safe measurement. A PT also provides isolation and proper connections for instrument attachment.
Connections	PT's are usually fixed in position and require that the voltage probe(s) be connected to their terminal connections.
WARNING	**Refer to the manufacturer's instructions, related to the PT, for exact information for probe connection for voltage monitoring. Do not exceed 600Vrms input to the PP1 Voltage inputs**.
ADVERTEN-CIA	**Consulte las instrucciones del fabricante referentes a TP (transformador potencial), para la información exacta de la conexión de sonda a fin de monitorear el voltaje. No supere la entrada de 600 Vrms a las entradas de voltaje de PP1**.

Continued on next page

Connecting to a Potential Transformer (PT), Continued

AVERTISSEMENT

Se reporter aux instructions du fabricant relatives au transformateur de tension (Potential Transformer - PT) pour obtenir les renseignements exacts sur la connexion de sonde utilisée pour la surveillance du courant. Ne pas dépasser l'entrée de tension efficace de 600 RMS dans les entrées de tension de PP1.

WARNUNG

Genaue Informationen zur Meßfühlerverbindung für die Spannungsüberwachung entnehmen Sie bitte den Anleitungen des Herstellers (siehe Spannungsteilertransformator). Die Eingangsspannung von 600 V (Effektivwert) in die PP1 Spannungseingänge sollte nicht überschritten werden.

Procedure

Follow these steps to connect voltage probes to a potential transformer.

Step	Action
1	Turn off power to the PT.
2	Connect the green ground connector to the Safety Gnd connector on the rear panel of the Power Platform.
3	Connect the green ground connector to a solid ground point at or near the PT in accordance with the PT manufacturer's instructions.
4	Connect the colored voltage probes to the PT's connections in accordance with the manufacturer's instructions.
5	Connect the colored voltage probes to the channel inputs designated for monitoring.
6	Turn on power to the PT.

Connecting a Current Probe

Safety precautions

The following safety precautions apply to current probe connections in addition to those safety precautions stated on page 4-12.

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

Medidas de seguridad

Las siguientes precauciones de seguridad se aplican a las conexiones de la sonda actual además de las precauciones de seguridad que aparecen en la página 4-13.

- NO deberá intentar medir la corriente eléctrica en ningún circuito en que el voltaje del mismo a tierra sea mayor al promedio de aislamiento de la sonda eléctrica (600 Vrms máx).
- Verifique que la mordaza de la sonda eléctrica esté bien apretada. Mantenga las superficies de fusión limpias y libres de materia extraña.

Mesures de sécurité

Les consignes de sécurité suivantes doivent être respectées en plus des consignes de sécurité données en page 4-13 lors de la réalisation de connexions de sondes.

- NE PAS essayer de mesurer le courant dans un circuit où la tension est supérieure au régime d’isolation de la sonde (600 Vrms max.).
- S’assurer que les mâchoires de la sonde sont bien serrées. S’assurer que la surface de contact est propre et exempte de corps étrangers.

Sicherheitsvorkehrungen

Die folgenden Sicherheitsmaßnahmen treffen auf derzeitige “Probe”-Verbindungen zu und gelten zusätzlich zu den Sicherheitsmaßnahmen auf Seite 4-14.

- Versuchen Sie NICHT, den Strom in einem Schaltkreis zu messen, in dem der Durchgang zur Erdspannung den Isolierwert des Spannungsmeßfühlers (600 Volt Effektivwert) übersteigt.
- Stellen Sie sicher, daß die Klemmbacken des Spannungsmeßfühlers fest geschlossen sind. Halten Sie die zusammengehörigen Oberflächen sauber und frei von Fremdteilen.

Continued on next page

Connecting a Current Probe, Continued

Types of current probes

Several types of current probes (clamp-on current transformers) are available as optional accessories. These probes are shown in the figure on the next page and consist of the smallest current probe (Dranetz-BMI model CT10), used to monitor up to 10 amps rms max, to the largest current probe (Dranetz-BMI model CT3000) for measurements up to 3000 amps rms max.

Refer to the the Specifications Appendix for additional probe information.

WARNING

When using either the CT-10 or CT-150 current probe, DO NOT connect the probe jaws around a non-insulated wire. These probes are to be used to monitor current of insulated wire only.

ADVENTEN-CIA

Cuando use la punta de prueba de corriente CT-10 o CT-150, NO sujete las mandíbulas de la punta alrededor de un cable sin aislación. Esta punta se usa para mediciones en cables aislados solamente.

AVERTISSE-MENT

Lorsque vous utilisez la sonde de courant CT-10 ou CT-150, NE FERMEZ PAS les mâchoires de la sonde sur un fil non isolé. Cette sonde ne doit être utilisée qu'avec des fils isolés.

WARNUNG

Der Stromfühler CT-10 oderCT-150 DARF NICHT an ein unisoliertes Kabel angeschlossen werden. Dieser Stromfühler darf nur für die Überwachung von isolierten Kabeln benutzt werden.

Description

Each probe has a polarized plug to fit any one of the four current input connectors (A, B, C, or D) on the rear panel of the Power Platform.

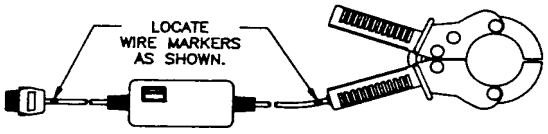
Maximum jaw openings are described in the specifications in Appendix F.

An arrow marking on the handle is a guide to ensure that you position the probe with the arrow pointing towards the load. Correct position of the probe is necessary for correct power measurements.

Wire marker kit

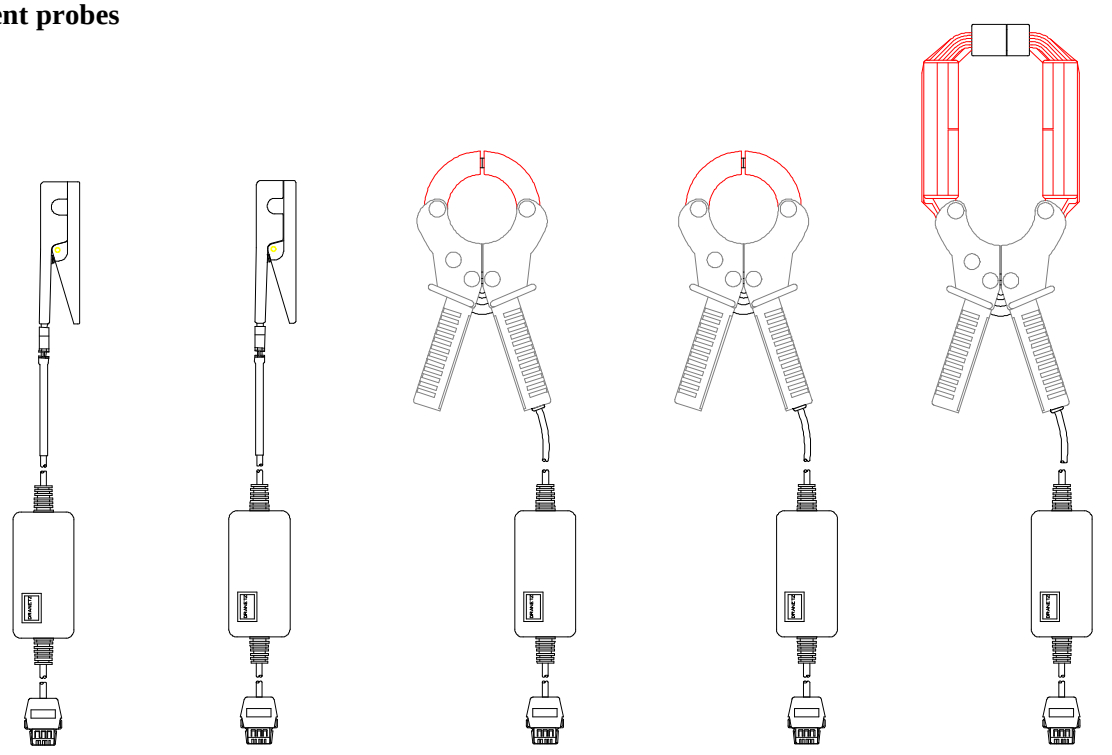
The wire marker kit, supplied as a standard accessory, helps you identify which current probe is connected to each current channel input. This kit, part number 155520, contains adhesive backed color-coded marker labels to attach to the probe handle and the plug end of the probe. Use red label for channel A, yellow for B, and blue for C. Channel D is left unmarked. See figure for proper wire marker placement.

Wire marker placement



8600-62

Dranetz-BMI current probes



8600-21

Connecting a Current Probe, Continued

Connection guidelines

Follow these guidelines when making current connections.

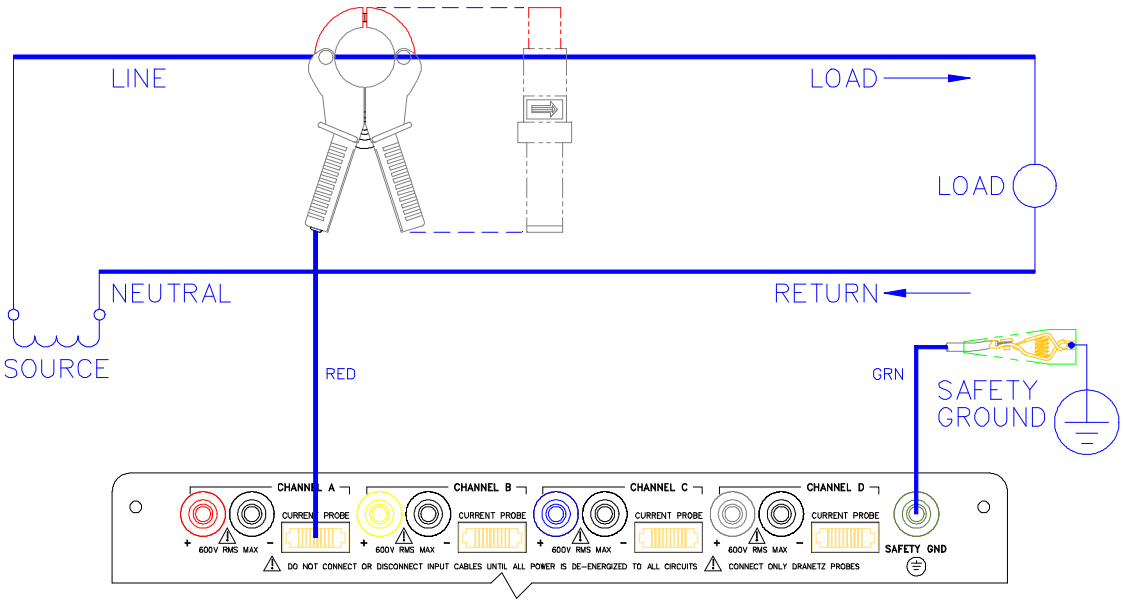
- Position the probe with the arrow on the handle facing the load.
- For greatest accuracy, use a probe that is rated at no more than twice the nominal value you expect to measure.

Example

The following figure shows how to connect a current probe to channel A for current monitoring of a single phase line.

The current probe may be connected to the return line if desired to measure the return current when checking for load current leakage, loop current relationships, etc.

Single phase current probe connection example



8600-20

Note

A voltage connection is required for flicker measurements and to ensure frequency synchronization. When using TASKCard Flicker, do not connect a current probe without a proper voltage connection to that channel.

Connecting to a Current Transformer (CT)

Safety precautions

The following safety precautions apply to current transformer (CT) connections in addition to those safety precautions stated on page 4-12.

- Never energize a CT with the secondary open.
- Never disconnect the secondary of a CT with primary energized.

Medidas de seguridad

Las medidas de seguridad siguientes corresponden a conexiones de transformadores eléctricos (CT) además de las medidas de seguridad que aparecen en la página 4-13.

- Nunca deberá poner bajo tensión un CT con el transformador secundario abierto.
- Nunca deberá desconectar el transformador secundario de un transformador eléctrico si el transformador primario está bajo tensión.

Mesures de sécurité

Les mesures de sécurité suivantes s'appliquent aux connexions de transformateurs de couranten plus des mesures de sécurité données en page 4-13.

- Un jamais mettre un transformateur sous tension lorsque la bobine secondaire est ouverte.
- Ne jamais déconnecter la bobine secondaire d'un transformateur lorsque la bobine primaire est sous tension.

Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen gelten für Anschlüsse an Transformatoren und gelten zusätzlich zu den Sicherheitsvorkehrungen auf Seite 4-14.

- Führen Sie einem Transformator niemals Strom zu, wenn die Niederspannungsseite geöffnet ist.
- Lösen Sie niemals die Verbindung der Niederspannungsseite eines Transformators, wenn die Oberspannungsseite unter Strom steht.

WARNING

Refer to the manufacturer's instructions related to the CT for exact information for connections for current monitoring. Do not exceed manufacturer's ratings.

ADVERTEN-CIA

Consulte las instrucciones del fabricante referentes a TC (transformador de corriente) para la información exacta de las conexiones a fin de monitorear la corriente. No exceda las capacidades nominales del fabricante.

Connecting to a Current Transformer (CT), Continued

ADVERTISSE-MENT	**Se reporter aux instructions du fabricant relatives au transformateur de courant (Current Transformer - CT) pour obtenir les renseignements exacts sur les connexions utilisées pour la surveillance du courant. Ne pas dépasser la puissance recommandée par le fabricant.**
WARNUNG	**Genaue Informationen zu Verbindungen für die Stromüberwachung entnehmen Sie bitte den Anleitungen des Herstellers (siehe Stromumwandler). Die Grenzwerte des Herstellers sollten nicht überschritten werden.**
Note	Current Transformers are not manufactured by Dranetz-BMI and are discussed here for informational purposes only.
Description	Current transformers, also known as instrument transformers, reduce high level currents to low level currents so they can be safely monitored. These devices are similar to PT's used for voltage measurements in that both reduce values for safe measurement. The reduction, or step-down ratio, is stated as a scale factor that is used by the PP1-Flicker to step-up the measured value to its original value.
Types of CT's	There are single-phase CT's and polyphase CT's dependent on the source transformer used. Current reduction ratios vary widely and are also dependent on the source transformer used. Rating plates attached to the CT provide information as to the ratio and current limitations.

Connecting to an Isolated Current Transformer (ISO)

Safety precautions

The following safety precautions apply to isolated current transformer connections in addition to those safety precautions stated on page 4-12.

- Never energize a CT with the secondary open.
- Never disconnect the secondary of a CT probe with primary energized.

Medidas de seguridad

Las medidas de seguridad siguientes corresponden a conexiones de transformadores eléctricos (CT).

- Nunca deberá poner bajo tensión un CT con el transformador secundario abierto.
- Nunca deberá desconectar el transformador secundario de un transformador eléctrico si el transformador primario está bajo tensión.

Mesures de sécurité

Les mesures de sécurité suivantes s'appliquent aux connexions de transformateurs de courant.

- Un jamais mettre un transformateur sous tension lorsque la bobine secondaire est ouverte.
- Ne jamais déconnecter la bobine secondaire d'un transformateur lorsque la bobine primaire est sous tension.

Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen gelten für Anschlüsse an Transformatoren.

- Führen Sie einem Transformator niemals Strom zu, wenn die Niederspannungsseite geöffnet ist.
- Lösen Sie niemals die Verbindung der Niederspannungsseite eines Transformators, wenn die Oberspannungsseite unter Strom steht.

Description

Low current monitoring devices made by Dranetz-BMI are called isolated current transformers or ISO boxes for short. Dranetz-BMI makes two types of ISO boxes; one model (ISO-1A) monitors up to 1 amp rms of current maximum, the other model (ISO-5) up to 5 amps rms maximum. Both are available as optional accessories.

WARNING

Physical injury or equipment damage could result if ISO boxes are improperly connected. Do not connect an ISO box between two conductors which are at different voltage potentials.

Continued on next page

Connecting to an Isolated Current Transformer (ISO), Continued

ADVERTEN-CIA

Podrían producirse lesiones físicas o daños al equipo si se conectan indebidamente las cajas del transformador aislado de corriente (ISO). No conecte una caja del ISO entre dos conductores que tengan distintos potenciales de voltaje.

AVERTISSE-MENT

Une mauvaise connexion des transformateurs d'intensité isolés (ISO) peut provoquer des blessures corporelles ou des dégâts matériels. Ne pas relier les transformateurs ISO entre deux conducteurs de tensions différentes.

WARNUNG

Falsch angeschlossene ISO-Kästen (Isolierte Stromumwandler) können zu körperlichen Verletzungen oder Geräteschäden fuehren. Schliessen Sie einen ISO-Kasten nicht zwischen zwei Leiter mit unterschiedlichem Spannungspotential.

Applications

ISO boxes can be used in a number of ways. These methods include connecting them to the secondary of CT's for metering by the PP1-Flicker, inserting them in series with the load current to measure low current values, and connecting them to a non-Dranetz-BMI clamp-on current transformer and using that CT to monitor current with the PP1-Flicker.

Scale factors

When making flicker measurements using PTs or CTs, the voltage of interest is the voltage seen by the bulb and not the actual voltage on the primary side of the transformer. This differs from power quality measurements, where a scale factor that corresponds to the ratio of the PT is used to reflect the actual voltage.

When monitoring voltage with a transformer, adjust the "Scale Factors" in the Monitoring Parameters menu so that the voltage matches the nominal. *The scale factor equals the Nominal Bulb Voltage divided by the Nominal PT Output Voltage.* Note that the use of scale factors is for the RMS, and does not affect the Pinst, Pst or Plt in any way.

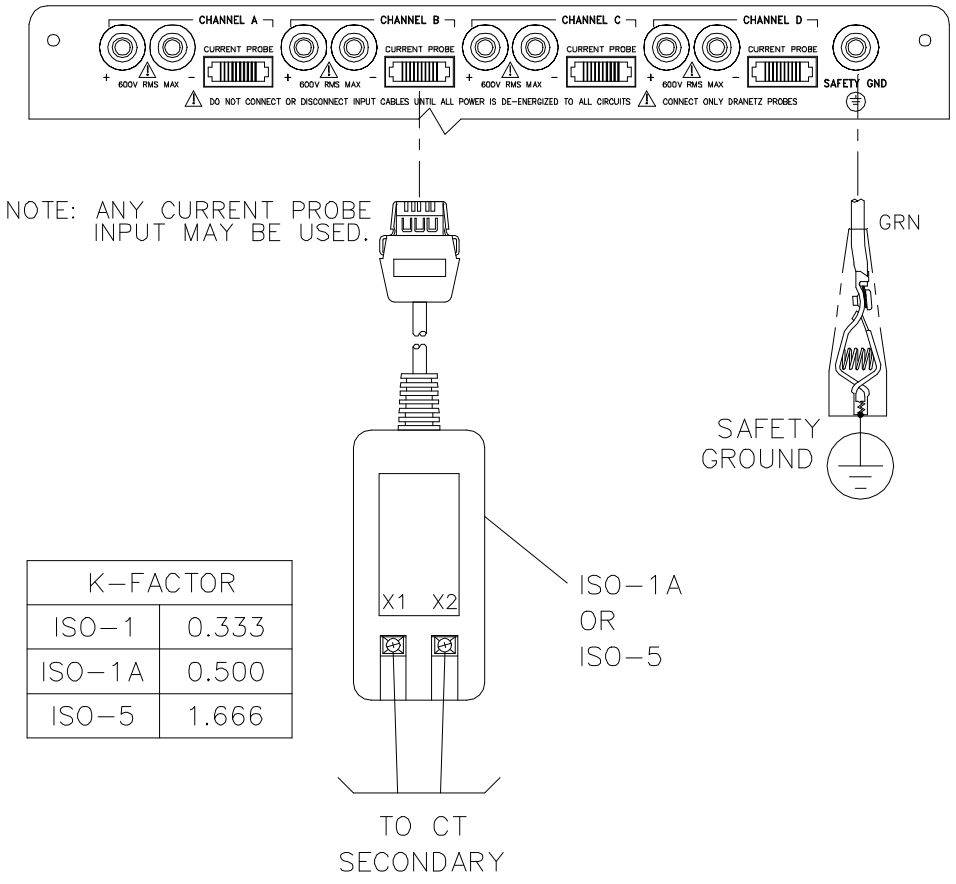
Example: A 60Hz high voltage line is being monitored using a PT with a 67 V output. Because the frequency is 60 Hz, the instrument will automatically select flicker measurements based on a 60 Hz, 120 V bulb. In order for the Vrms data to reflect that seen by the bulb, a scale factor of (120/67) =1.8 is used. The value of the high voltage is not used.

Continued on next page

ISO box connection to a current transformer

The figure below shows an ISO box connected from Channel B current input to a permanently installed CT. Polarities of the ISO box and CT are kept in-phase by matching markings. Scale factors of both devices must be multiplied together to get the resultant scale factor.

ISO box connection to a CT



K-FACTOR	
ISO-1	0.333
ISO-1A	0.500
ISO-5	1.666

8600-24

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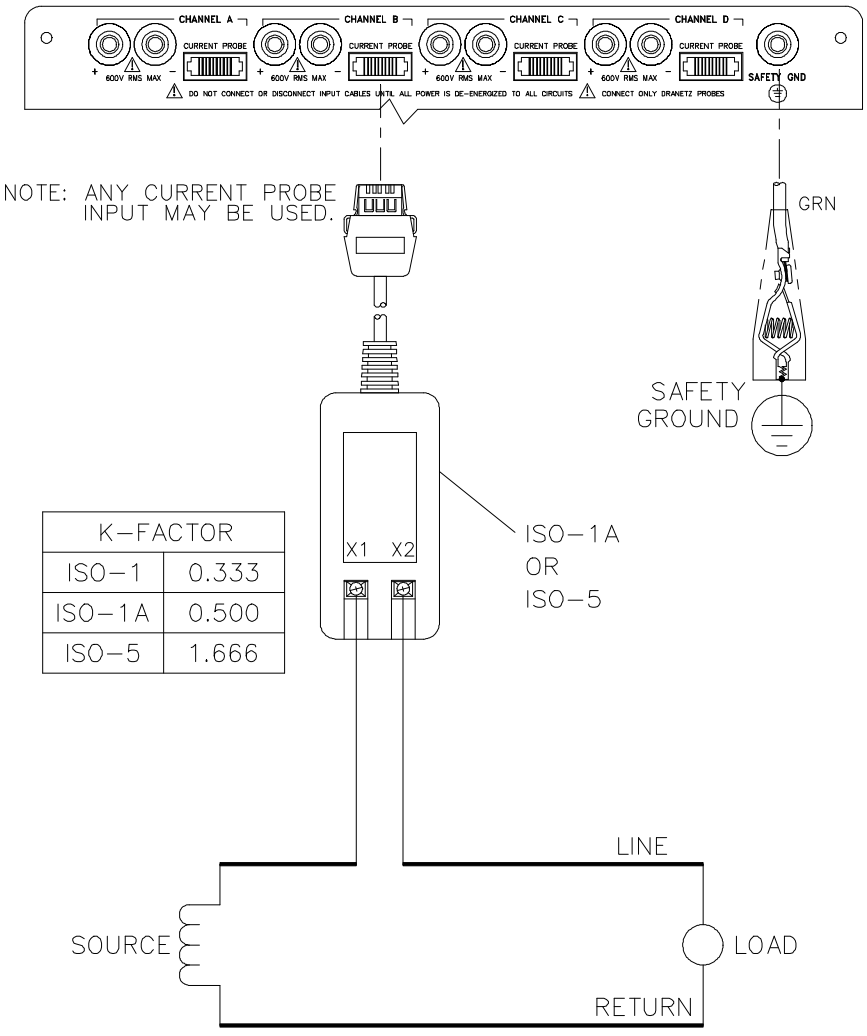
ISO box in-line connection

The figure below shows the ISO box connected in series with the load of a single-phase line. The connection is made with the X1 terminal connected to the source input line and X2 connected to the load line. The scale factor is that of the ISO box only.

ISO box connection in-line with a load



8600-25

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Connecting to an Isolated Current Transformer (ISO), Continued

Connecting to a non-Dranetz-BMI current probe

The figure below shows the ISO box connected to a non-Dranetz-BMI clamp-on current transformer. In this case the scale factor is the product of the ISO box and the CT. Refer to manufacturer's literature to determine the CT scale factor.

WARNING

Refer to the manufacturer's instructions related to the CT for exact information for connections for current monitoring. Do not exceed manufacturer's ratings.

ADVERTEN-CIA

Consulte las instrucciones del fabricante referentes a TC (transformador de corriente) para la información exacta de las conexiones a fin de monitorear la corriente. No exceda las capacidades nominales del fabricante.

ADVERTISSE-MENT

Se reporter aux instructions du fabricant relatives au transformateur de courant (Current Transformer - CT) pour obtenir les renseignements exacts sur les connexions utilisées pour la surveillance du courant. Ne pas dépasser la puissance recommandée par le fabricant.

WARNUNG

Genaue Informationen zu Verbindungen für die Stromüberwachung entnehmen Sie bitte den Anleitungen des Herstellers (siehe Stromumwandler). Die Grenzwerte des Herstellers sollten nicht überschritten werden.

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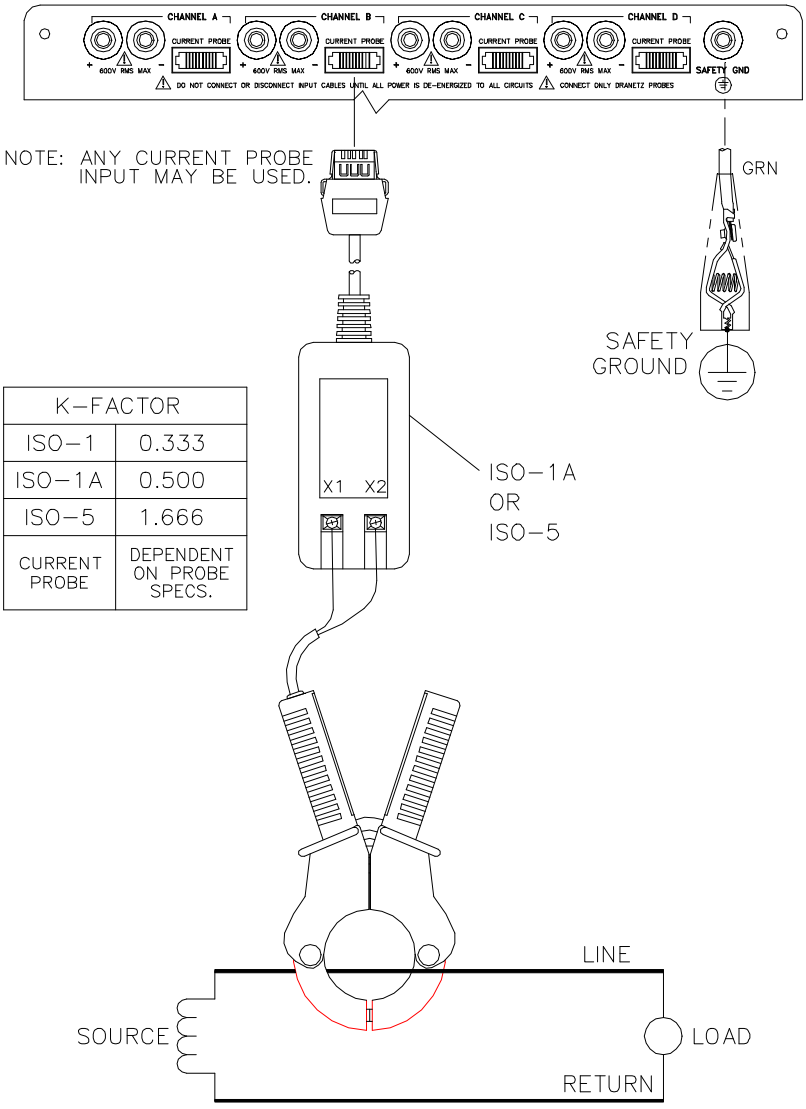
Connecting to an Isolated Current Transformer (ISO), Continued

Diagram



8600-26

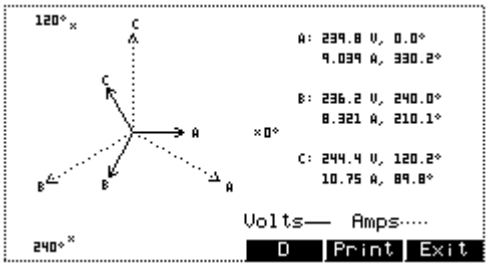
Verifying Voltage and Current Connections

Introduction

Correct voltage and current connection of single phase, split phase, or polyphase connections can be verified using phasor diagrams. Phasor diagrams are graphic representations that show the magnitude and angular relationship of each phase of a monitored connection.

Displaying the screen

Follow these steps to display the Voltage and Current Phasor screen.

Step	Action
1	From Main Menu, select Scope Mode.
2	From Scope Mode, press PHASOR.
3	The following screen will appear if 3-phase voltage inputs are present. See next page for actual inputs. 

Single phase

A single phase voltage or current phasor is displayed as a single line showing a channel reference at 0 degrees and a magnitude relative to its measured value. An arrowhead on the line indicates direction.

Split phase

Split phase vectors are displayed as dual lines showing channel references and magnitudes and opposite (180 degrees) directions.

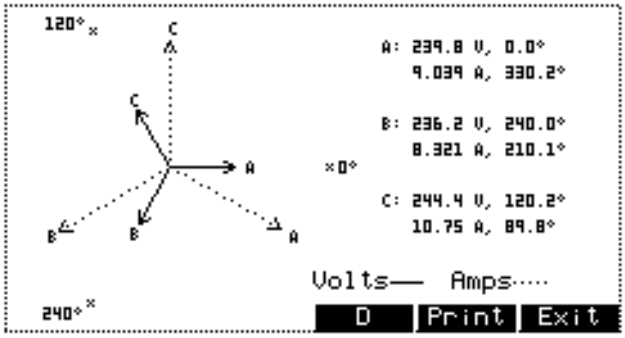
Three phase

Three phase vectors are displayed as three lines, 120 degrees apart in a resistive load (unity power factor). Phase displacement will occur in a reactive load.

Continued on next page

Correct 3-phase voltage and current phasor connections

The phasor display shown below is for a three phase, four wire wye connection.



The actual magnitudes and phase angles may differ from the diagram shown above. The correct voltage relationships should place ***A*** near 0° (if it is the sync channel), ***B*** near 240° and ***C*** near 120°. Departures from these relationships may indicate an error in probe connection. Check your connections and the proper orientation of the probe.

Additional phasor diagrams appear in Section C of this chapter.

Section C

Circuit Diagrams for Flicker Measurements

Overview

Introduction	These diagrams are included to show proper connection of the PP1 to various circuit types. Current connections are not required to measure flicker, but may be useful in diagnosing the source of the flicker.
Safety Precautions	Follow the safety precautions listed on page 4-12 when making connections.
Medidas de seguridad	Siga las medidas de seguridad listadas en la página 4-13 cuando efectúe todas las conexiones potenciales del transformador.
Mesures de sécurité	Suivez les mesures de sécurité données en page 4-13 lors de la réalisation de toutes les connexions du transformateur de tension.
Sicherheitsvorkehrungen	Folgen Sie den auf Seite 4-14 augeführten Sicherheitsvorkehrungen , wenn Sie an potentiellen Trafo-Verbindungen arbeiten.
Voltage and current connections	This section contains numerous drawings of both voltage and current probe connections that are required when power measurements are to be made. Voltage: Voltage probes are connected to the individual source or load line and are referenced to the return (common) line voltage probe connection for greatest accuracy. Current: 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 power measurement.

Continued on next page

In this section

The following power connection diagrams are shown in this section.

Single Phase

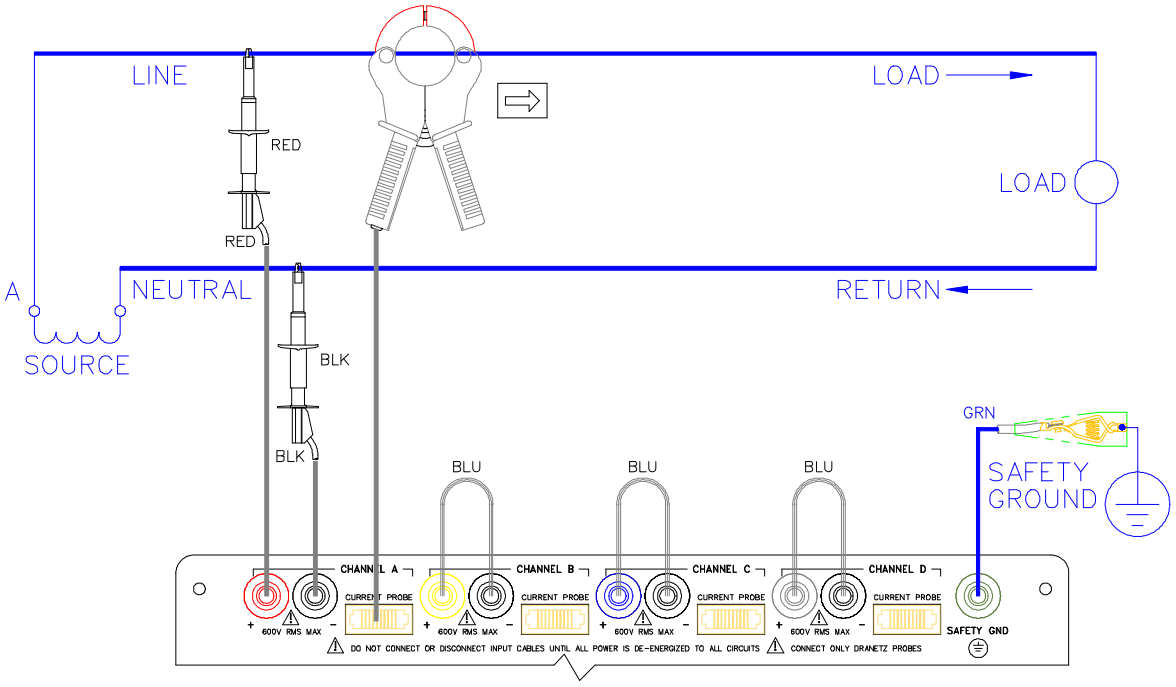
Introduction

When making voltage connections to a single phase circuit use channel A differential inputs as shown below. Connect both terminals of channels B, C, and D together to prevent erroneous data. Channel D should be turned off if not used.

Note

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

Diagram



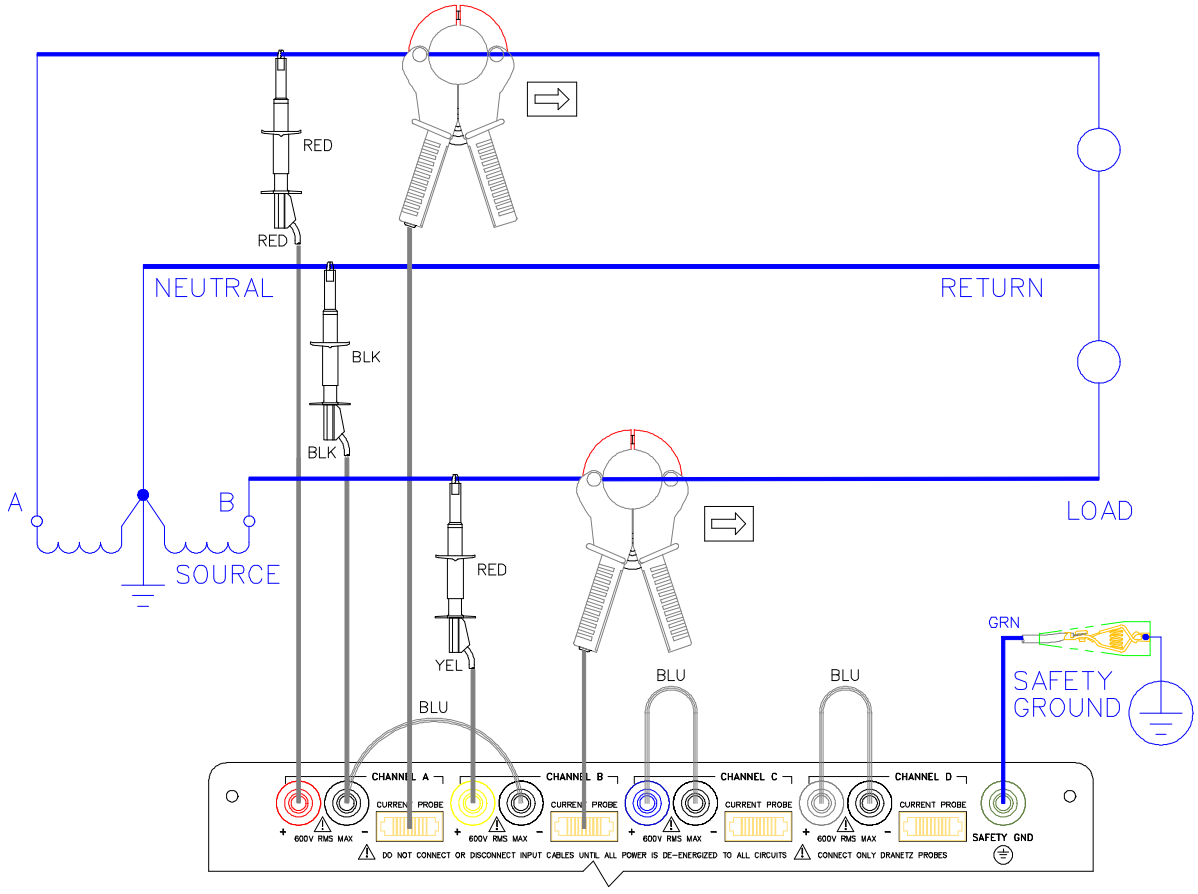
8600-6

Split Phase

Introduction

When making split phase measurements use both channels A and B for voltage and current connections. Connect both terminals of Channels C and D together to prevent erroneous data. The neutral is chosen as the reference for measurement purposes.

Diagram



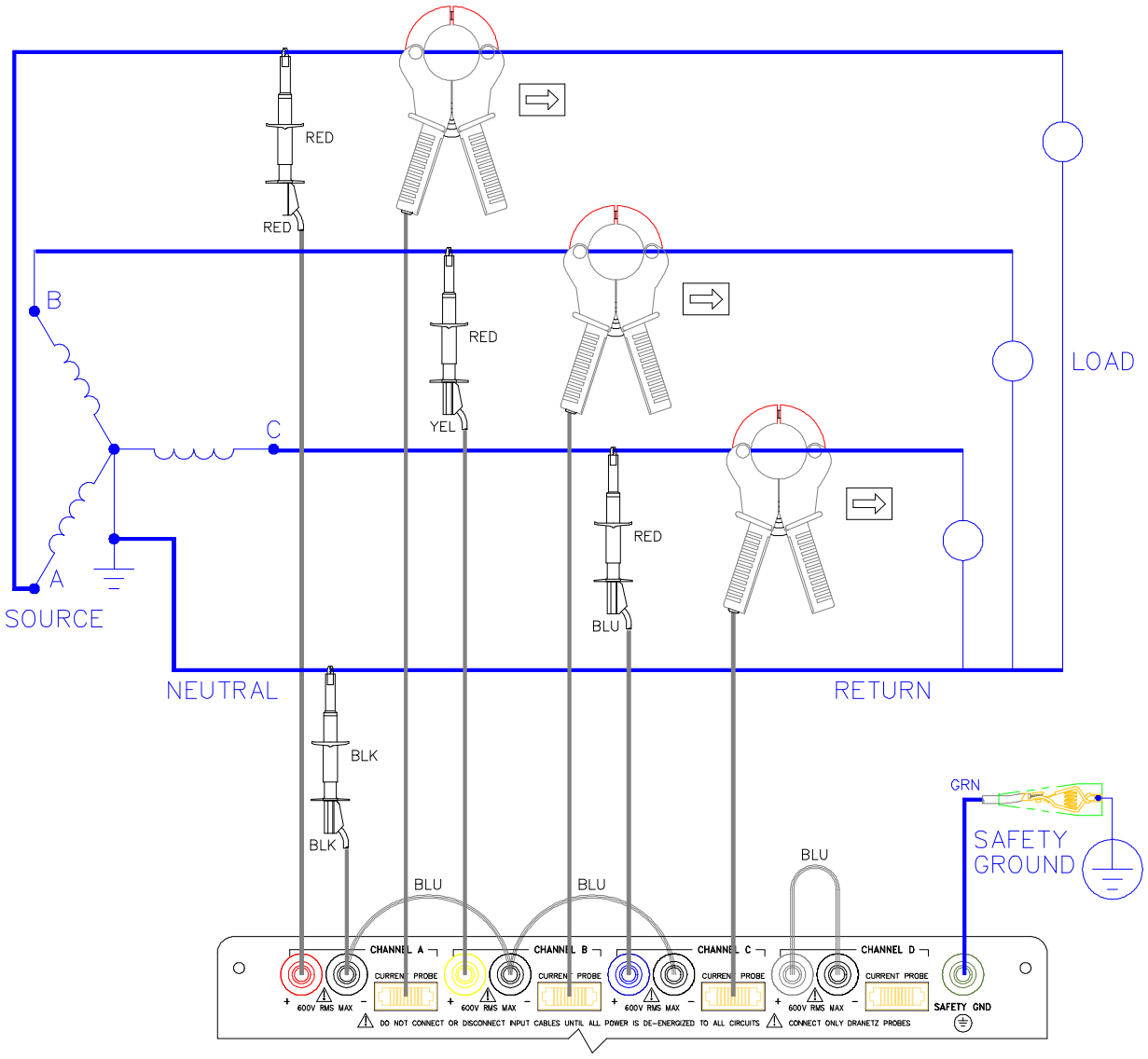
8600-7

Four Wire Wye

Introduction

Channels A, B, and C are connected to voltage and current probes. The neutral is connected to common and is the reference for the three channels. Connect both terminals of Channel D together to prevent erroneous data.

Diagram



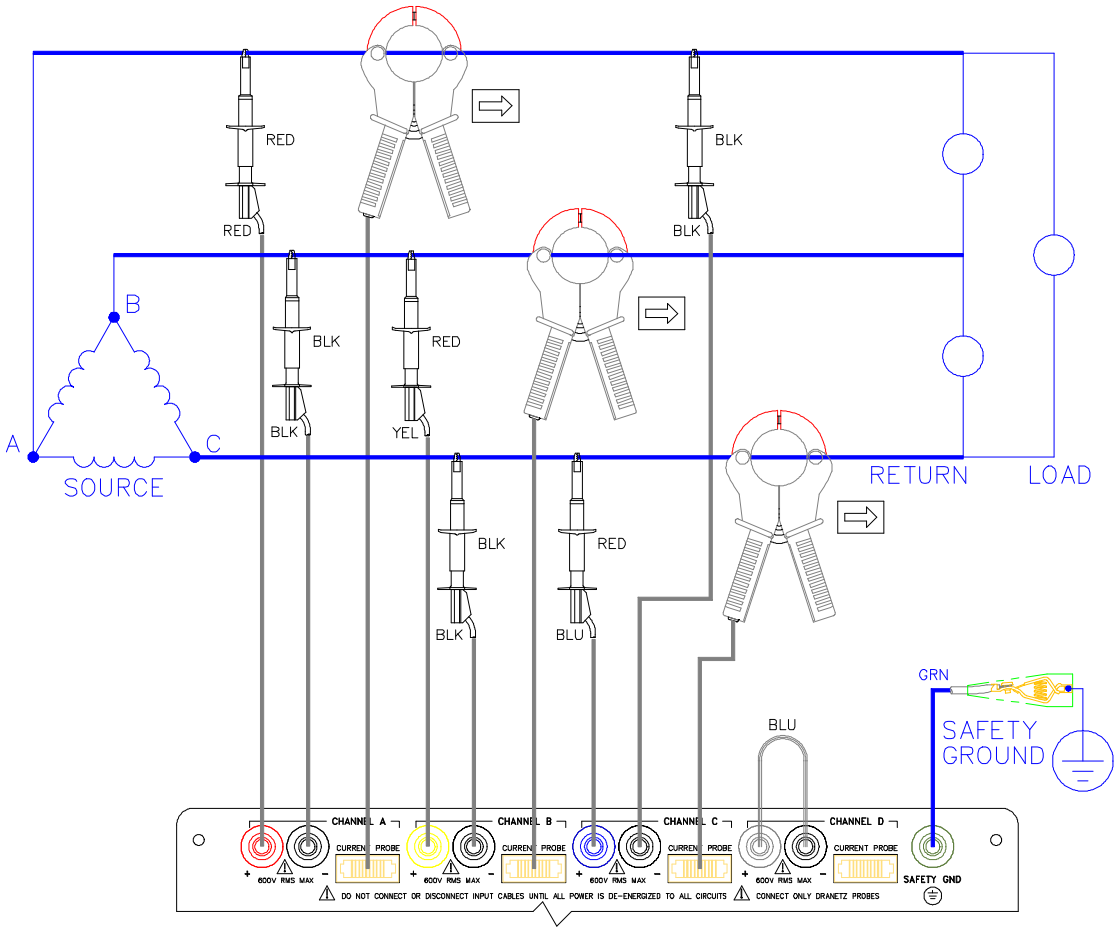
8600-12

Floating Delta

Introduction

In this power connection, the PP1 uses voltage channels A, B, and C as differential inputs with channel A using source voltage A-B, channel B using B-C, and channel C using C-A as the reference. Current probes are connected to channels A, B, and C. Connect both terminals of Channel D together to prevent erroneous data.

Diagram



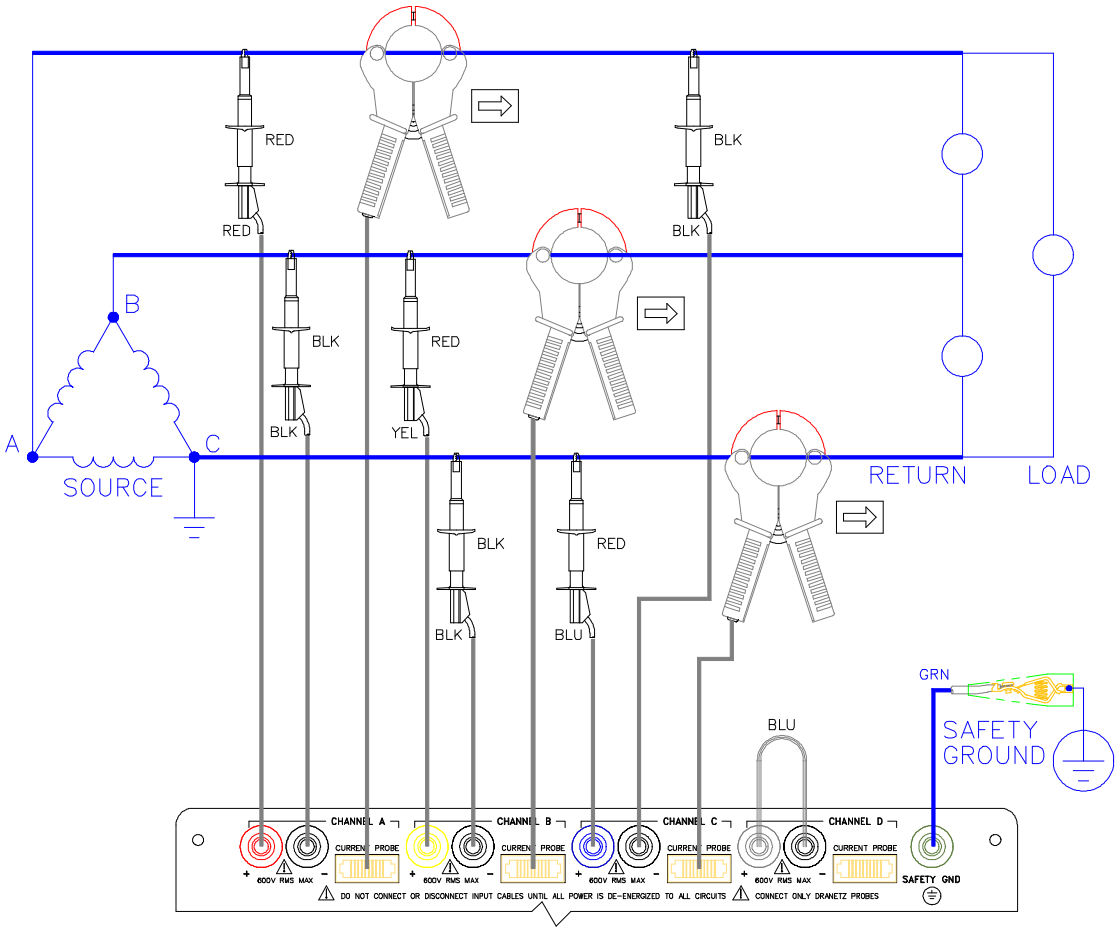
8600-9

Delta, One Leg Grounded

Introduction

In this power connection, the PP1 uses voltage channels A, B, and C as differential inputs with channel A using source voltage A-B, channel B using B-C, and channel C using C-A as the reference. Current probes are connected to channels A, B, and C. Connect both terminals of Channel D together to prevent erroneous data.

Diagram



8600-8

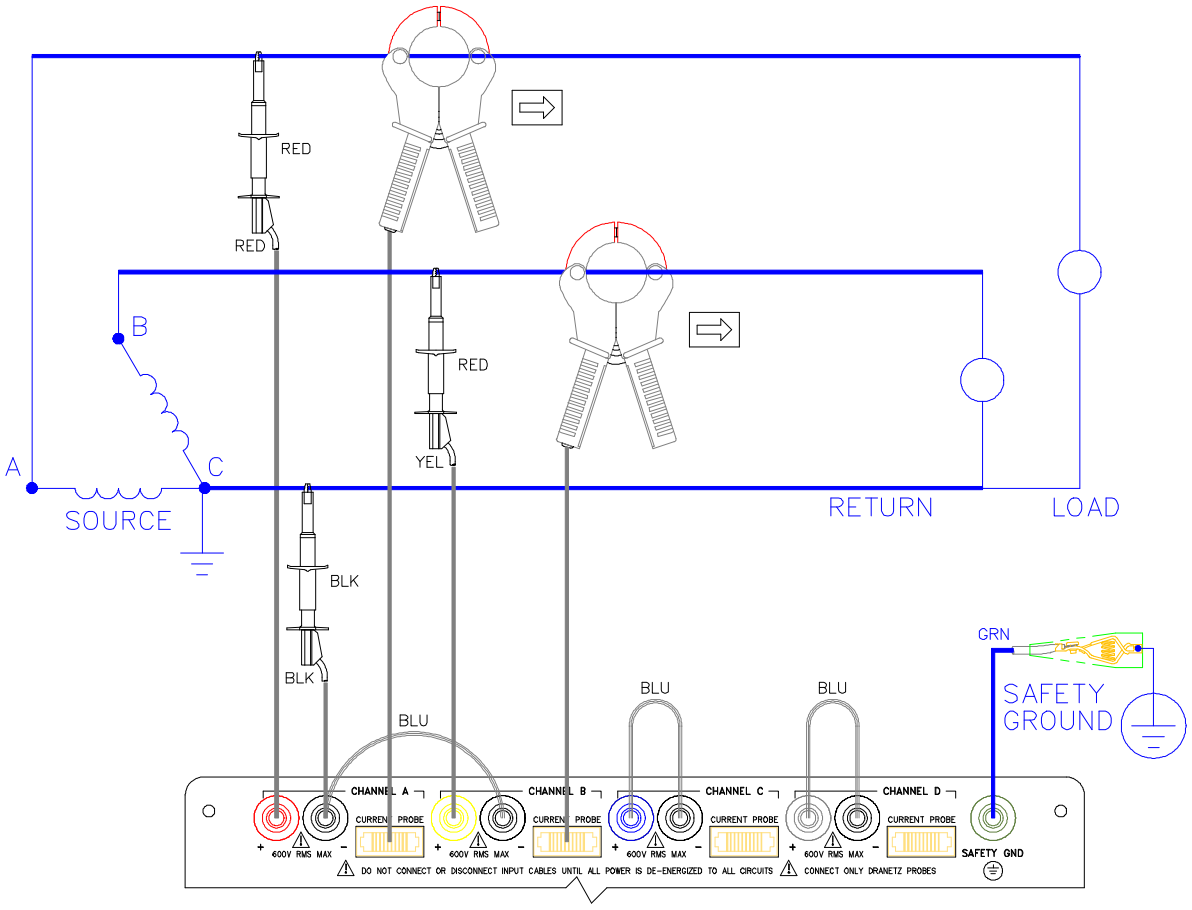
Open Leg Delta

Introduction

The figure below shows the open leg delta with phase A-C connected to channel A and phase B-C connected to channel B. A jumper connects the A- and B- terminal. Current probes are connected to channels A and B.

For the Flicker TASKCard, set the circuit type to *Single Phase*.

Diagram



8600-10

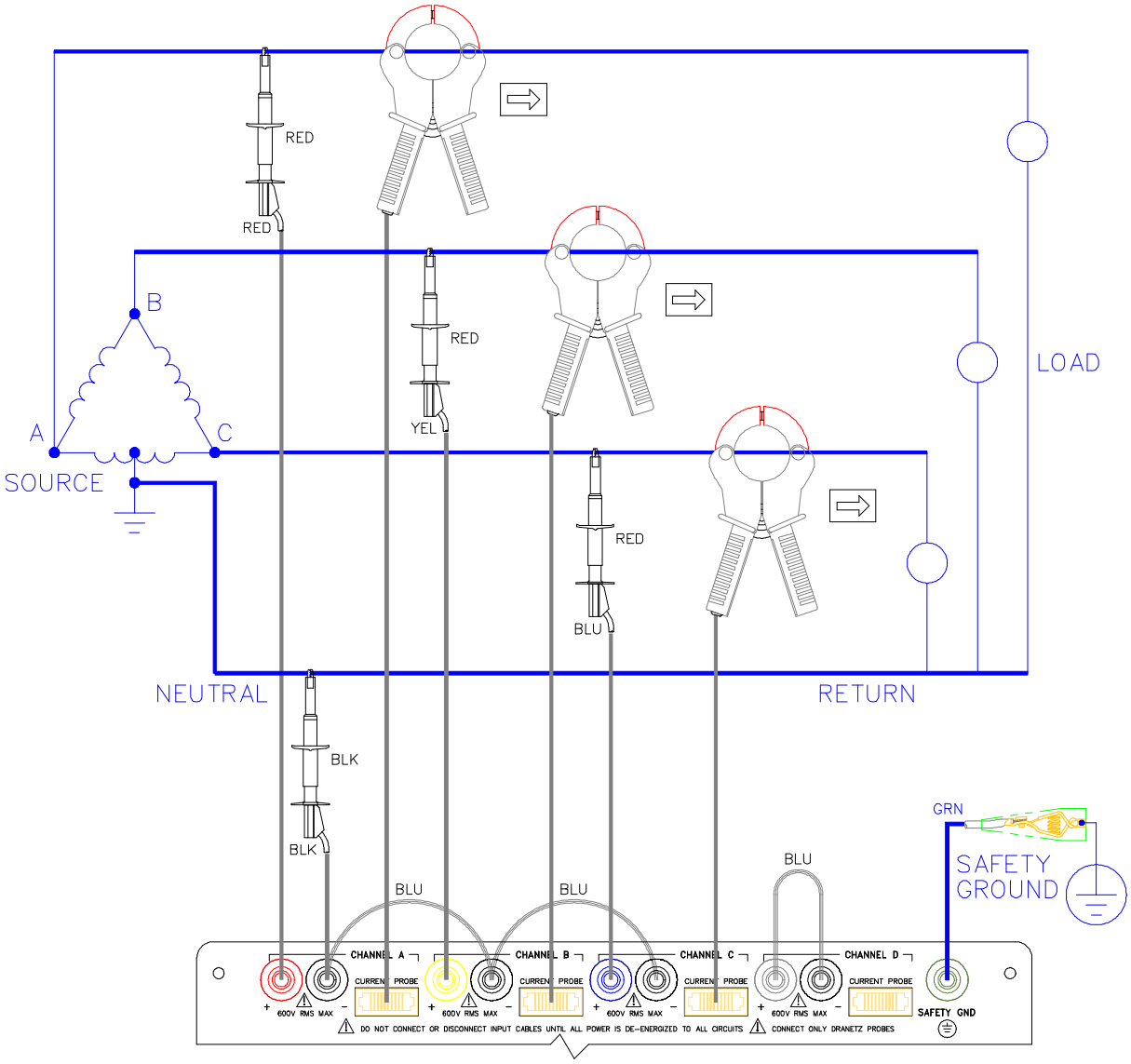
High-Leg Delta

Introduction

The 4-wire delta connected 120/240V source shown in the figure on the next page is connected with one phase connected to ground at mid-point. This phase provides 120V at phases A and C to ground. Phase B is designated the high-leg connection and is measured at 208V (120V x 1.73 = 208V) to ground. The National Electrical Code (NEC 215-8) identifies the high-leg phase as the Orange colored line.

For the Flicker TASKCard, set the circuit type to *Single Phase*.

Diagram

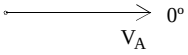
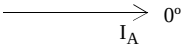
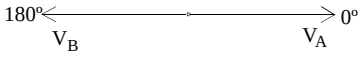
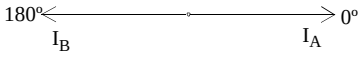
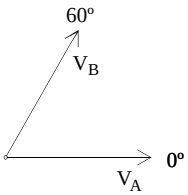
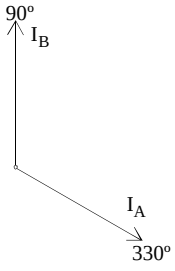


8600-11

Phasor Diagrams for Standard Power Connections

Diagrams

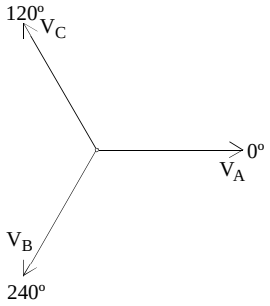
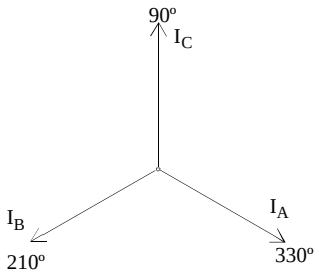
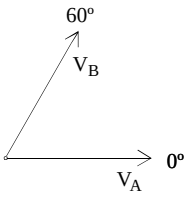
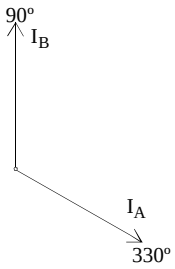
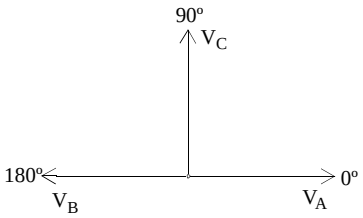
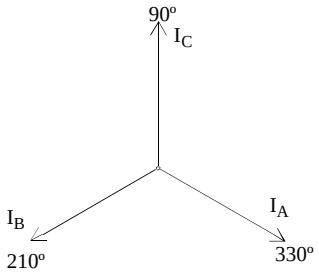
The following diagrams describe the voltage and current phasors (for resistive loads) for the standard type of power connections when selected for viewing in meter mode. The page number for the related power connection diagram is given in the left column. Refer to Chapter 4, Section E, for information about viewing voltage and current phasors.

Power Connection Diagram	Voltage Phasor	Current Phasor
Single Phase (See page 4-38)		
Split Phase (See page 4-39)		
Delta, One Leg Grounded (See page 4-42)		

Continued on next page

Phasor Diagrams for Standard Power Connections, Continued

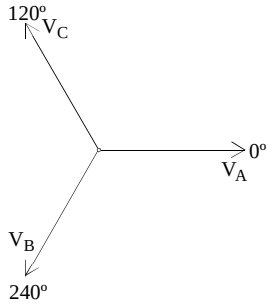
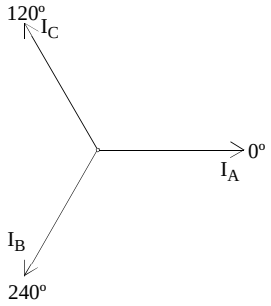
Diagrams
(continued)

Power Connection Diagram	Voltage Phasor	Current Phasor
Floating Delta (See page 4-41)		
Open Leg Delta (See page 4-43)		
High Leg Delta (See page 4-44)		

Continued on next page

Phasor Diagrams for Standard Power Connections, Continued

Diagrams
(continued)

Power Connection Diagram	Voltage Phasor	Current Phasor
Four Wire Wye (See page 4-40)		

Section D

Monitoring Setup Procedures

Overview

Introduction

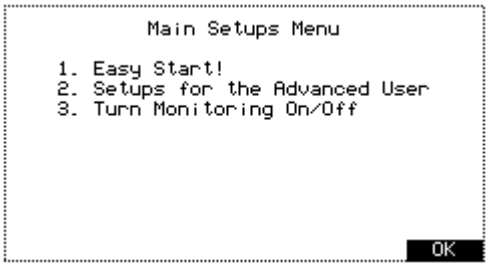
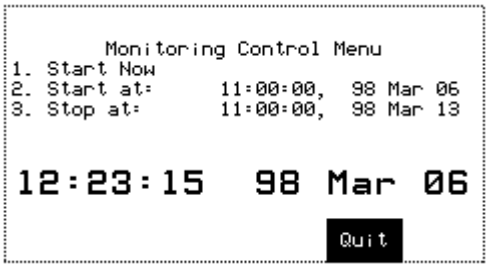
This section describes the procedures required to select and activate a monitoring setup and start the monitoring process.

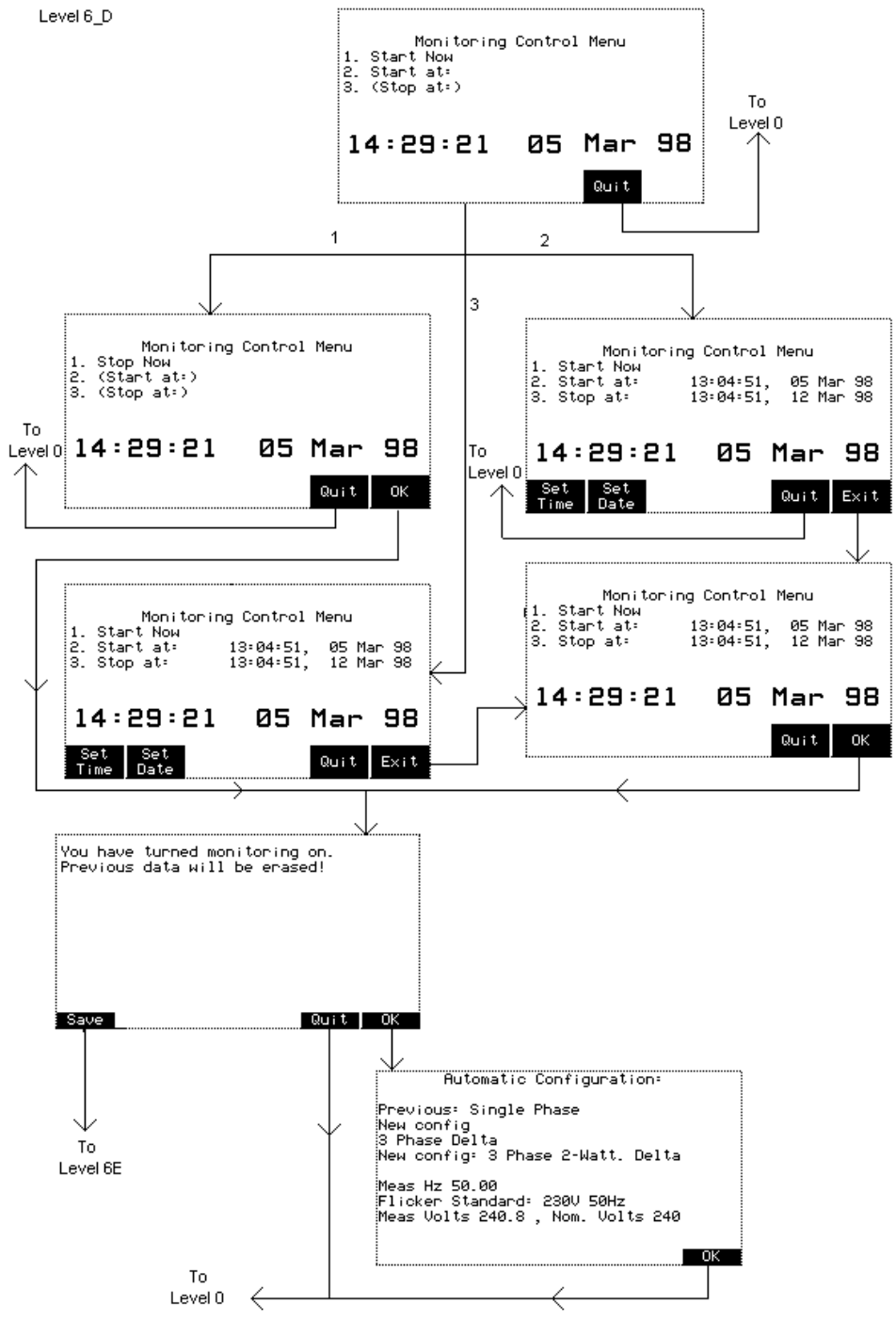
In this section

The following topics are covered in this section.

Turning On Monitoring

Procedure Follow these steps to turn on monitoring.

Step	Action
1	Select Setup from the Main Menu. Result: The following screen will appear. 
2	Press 3, Turn Monitoring On/Off. Result: The following screen will appear. 
3	Press 1 to start monitoring now. Press 2 to set a start time. Press 3 to set a stop time. **Note:** For selection 2 or 3: Press Set Time to set the time. Press Set Date to change date if necessary. Press OK when finished. See flow diagram on next page.


Level 6_D
Monitoring Control Menu
1. Start Now
2. Start at:
3. (Stop at:)
14:29:21 05 Mar 98
Quit
To Level 0
1
2
3
Monitoring Control Menu
1. Stop Now
2. (Start at:)
3. (Stop at:)
14:29:21 05 Mar 98
Quit
OK
To Level 0
Monitoring Control Menu
1. Start Now
2. Start at: 13:04:51, 05 Mar 98
3. Stop at: 13:04:51, 12 Mar 98
14:29:21 05 Mar 98
Set Time
Set Date
Quit
Exit
To Level 0
Monitoring Control Menu
1. Start Now
2. Start at: 13:04:51, 05 Mar 98
3. Stop at: 13:04:51, 12 Mar 98
14:29:21 05 Mar 98
Set Time
Set Date
Quit
Exit
Monitoring Control Menu
1. Start Now
2. Start at: 13:04:51, 05 Mar 98
3. Stop at: 13:04:51, 12 Mar 98
14:29:21 05 Mar 98
Quit
OK
You have turned monitoring on.
Previous data will be erased!
Save
Quit
OK
To Level 6E
Automatic Configuration:
Previous: Single Phase
New config
3 Phase Delta
New config: 3 Phase 2-Watt. Delta
Meas Hz 50.00
Flicker Standard: 230V 50Hz
Meas Volts 240.8 , Nom. Volts 240
OK
To Level 0

Section E

Scope Mode

Overview

Introduction

This section describes the operation of scope mode, which allows you to view real-time parameter data.

In this section

The following topics are covered in this section.

Viewing Scope Mode

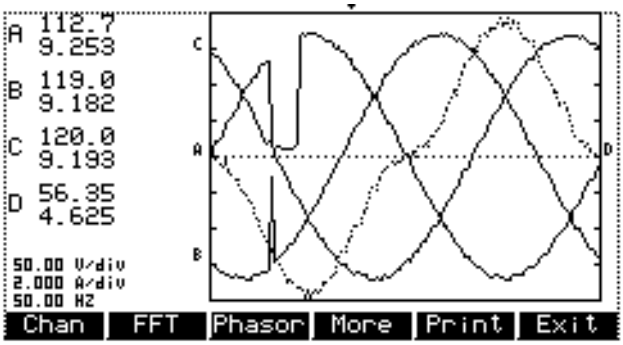
Introduction

Scope Mode allows you to view the present voltage and current waveforms for up to four channels.

Displaying the screen

From Main Menu, select Scope.

Result: A screen similar to that shown below is displayed.



Screen description

Waveform labels: Voltage waveforms are labeled on the left at the point where they cross the vertical axis. Current waveforms are labeled on the right at the point where they cross the vertical axis.

When more than one waveform crosses the vertical axis at the same point (same phase angle), the channel identifier for the waveform with the highest amplitude is placed first, and the lower values follow below. If the amplitudes are also identical then the A-B-C order is used.

Vertical scale: Scaled relative to the waveform with the largest peak value. Voltage and current are scaled separately.

Horizontal scale: Scaled to display one cycle.

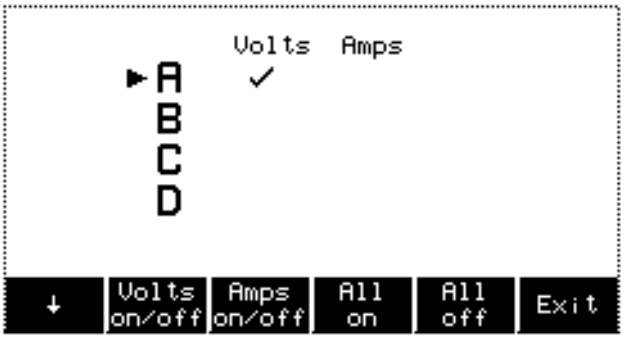
Update rate: The display is updated approximately once every two seconds.

Continued on next page

Viewing Scope Mode, Continued

How to select channels for display

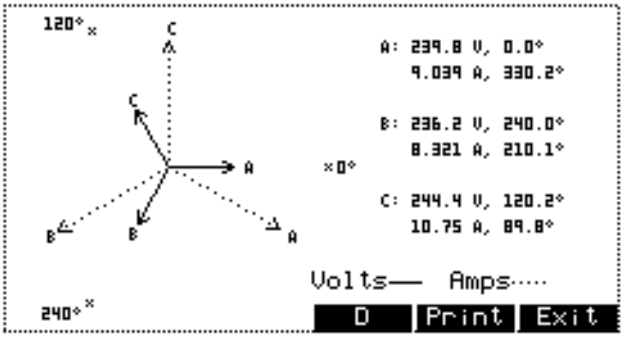
Follow these steps to select channels for the Scope Mode display.

Step	Action
1	In Scope Mode display, press CHAN. The Channel Selection screen is displayed as shown below. Result: The following screen will appear. 
2	Press VOLTS ON/OFF to toggle selected channel On or Off for voltage waveform display.
3	Press AMPS ON/OFF to toggle selected channel On or Off for current waveform display.
4	Press the Down button to select channels A, B, C, or D.
5	Repeat steps 2 through 4 for each channel to be selected. Note: Use the ALL ON or ALL OFF buttons to set or clear all input channels simultaneously.
6	Press EXIT to display the channels selected.

Viewing Voltage and Current Phasors

Procedure

Follow these steps to view the current and voltage phasors displays.

Step	Action
1	From Scope Mode display select PHASOR.
2	The following screen will appear. 

Phasor display

The graph indicates the phase relationships between the voltage and current based on the angles of the fundamentals, as determined by Fourier analysis. In order to show multiple channels of voltage and current phasors neatly on the same set of axes, two fixed lengths are used. (The voltage phasors are smaller since they usually do not vary as much as the current does). Channel D is displayed separately, since it is typically used to measure an auxiliary parameter. The arrow is not shown for channels below the normal measurement range.

Viewing Voltage and Current Harmonics

Screen description

Viewing the voltage and current harmonics permits you to display harmonics in the form of a graph.

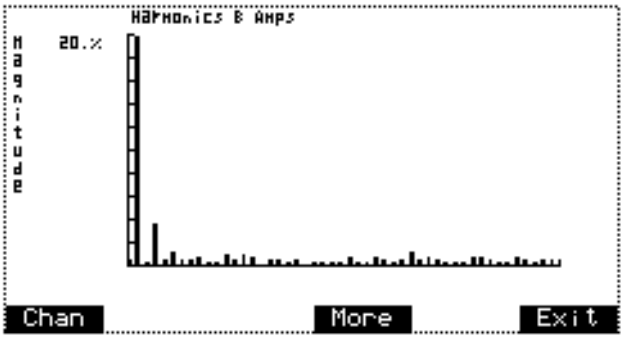
Graph: The graph displays the magnitude of each harmonic as a percentage of the fundamental.

Update rate: All displays are updated approximately once every four seconds.

Harmonics displayed: The number of harmonics displayed is up to the 50th for 50 or 60Hz.

Displaying the graph screen

Follow theses steps to view the harmonics graph display.

Step	Action
1	From Main Menu select Scope.
2	From Scope Mode display press DFT.
3	Result: A screen similar to the following will appear. 

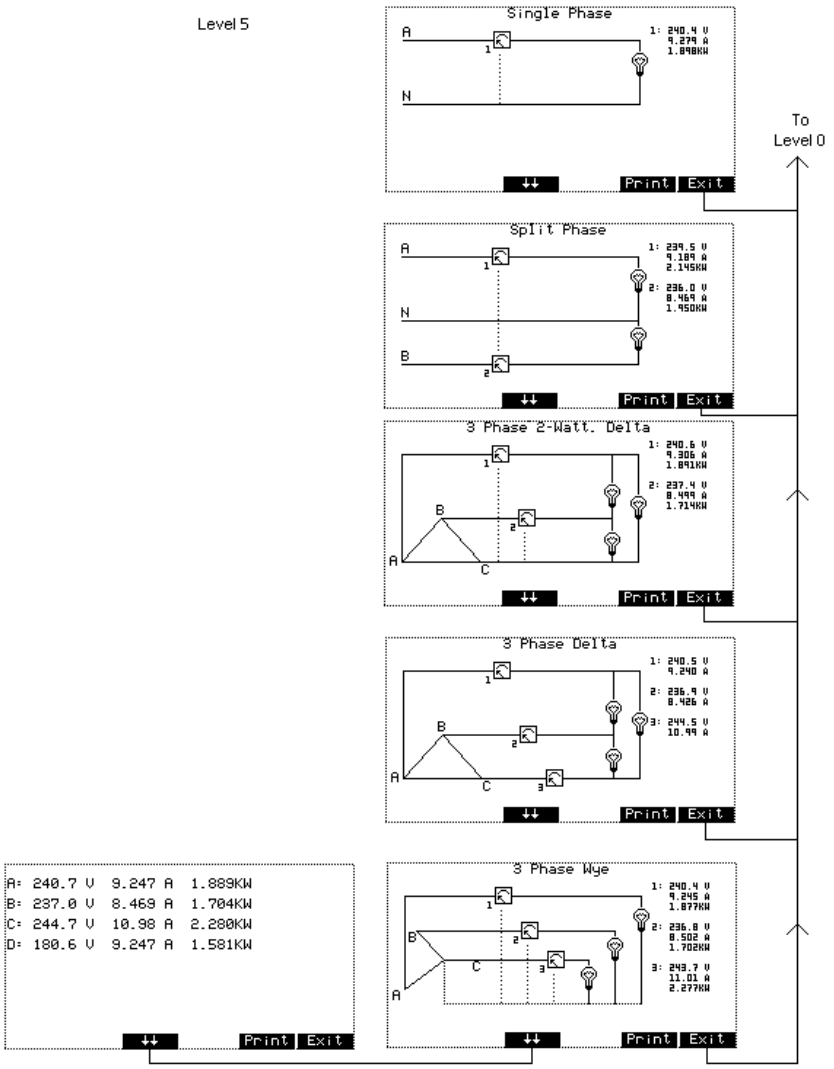
Section F

Meter Mode

Overview

Introduction

The Meter Mode emulates a digital volt meter (DVM). It displays numerical data for measured parameters, along with a graphical display of the circuit type being monitored. Select Meter Mode from the Main Menu screen. Use the [↓↓] double arrow button to toggle between the graphical display and the numerical data.



Chapter 5
Housekeeping Functions

Overview

Introduction

Housekeeping functions are miscellaneous tasks performed to keep the PP1-Flicker running in an efficient and organized way. Generally, these tasks are performed only occasionally.

Printing options

Refer to Chapter 10, *Printer Operation*, for additional information on printing options and using the print functions described in this chapter.

In this chapter

The following topics are covered in this chapter.

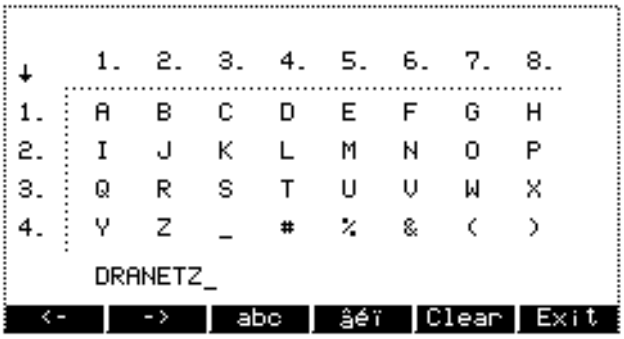
Entering a Site Name

Introduction

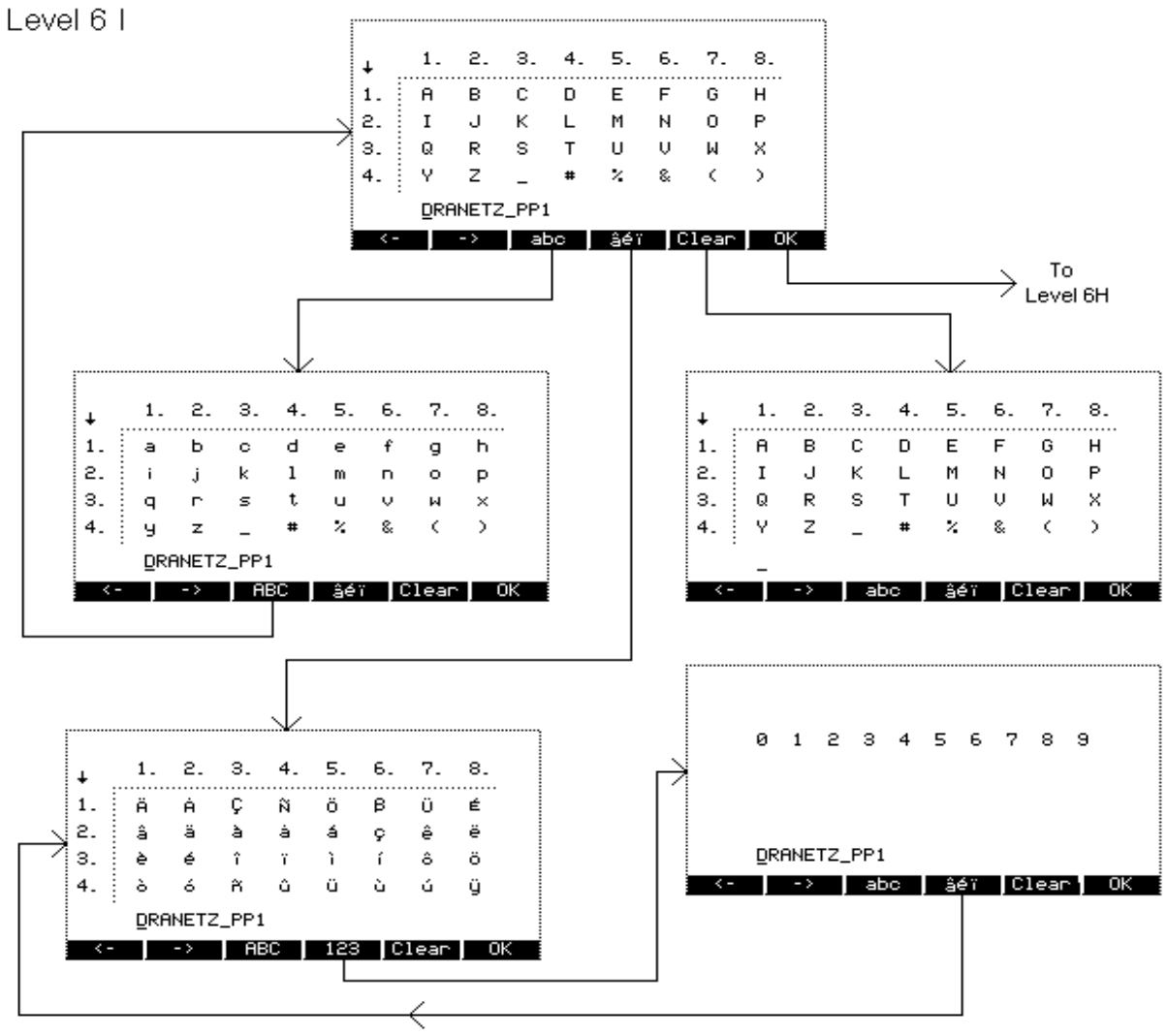
This function allows you to enter a site name of up to 20 characters. The site name appears on printouts and is included with reports sent to the fax/modem, RS-232, printer, PC, or memory card. The site name is also used for file names on the memory card.

Procedure

Follow these steps to enter a site name.

Step	Action
1	Select Setup from the Main Menu.
2	Select item #2, Setups for the Advanced User.
3	Select item #1, Set Analyzer Parameters.
4	Select item #1, Set Site/File Name. The following screen will appear. 
5	Press CLEAR to erase the current name.
6	Press the digit corresponding to the row number that the desired character occupies, then press the corresponding column number. The character will appear on the screen.
7	Repeat the above step until the entire name has been entered. Note: There is a 20 character limit.
8	Use the [abc] button to toggle between upper and lower case letters. See flow diagram on next page.
9	Use the [aei] button to toggle between the international character set and numbers. Enter numbers with the numeric keypad. See flow diagram on next page.
10	Press OK when finished.

Entering a Site Name, Continued



Setting the Time and Date

Displaying the screen

Follow these steps to display the time and date screen.

Step	Action
1	Select Setup from the Main Menu.
2	Select item #2, Setups for the Advanced User.
3	Select item #1, Set Analyzer Parameters.
4	Select item #2, Time & Date. The following screen will appear. 

Setting the time

Follow these steps to set the time.

Step	Action
1	Press the SET TIME button.
2	Enter the hours, minutes, and seconds, by pressing the number on the numeric keypad.

Continued on next page

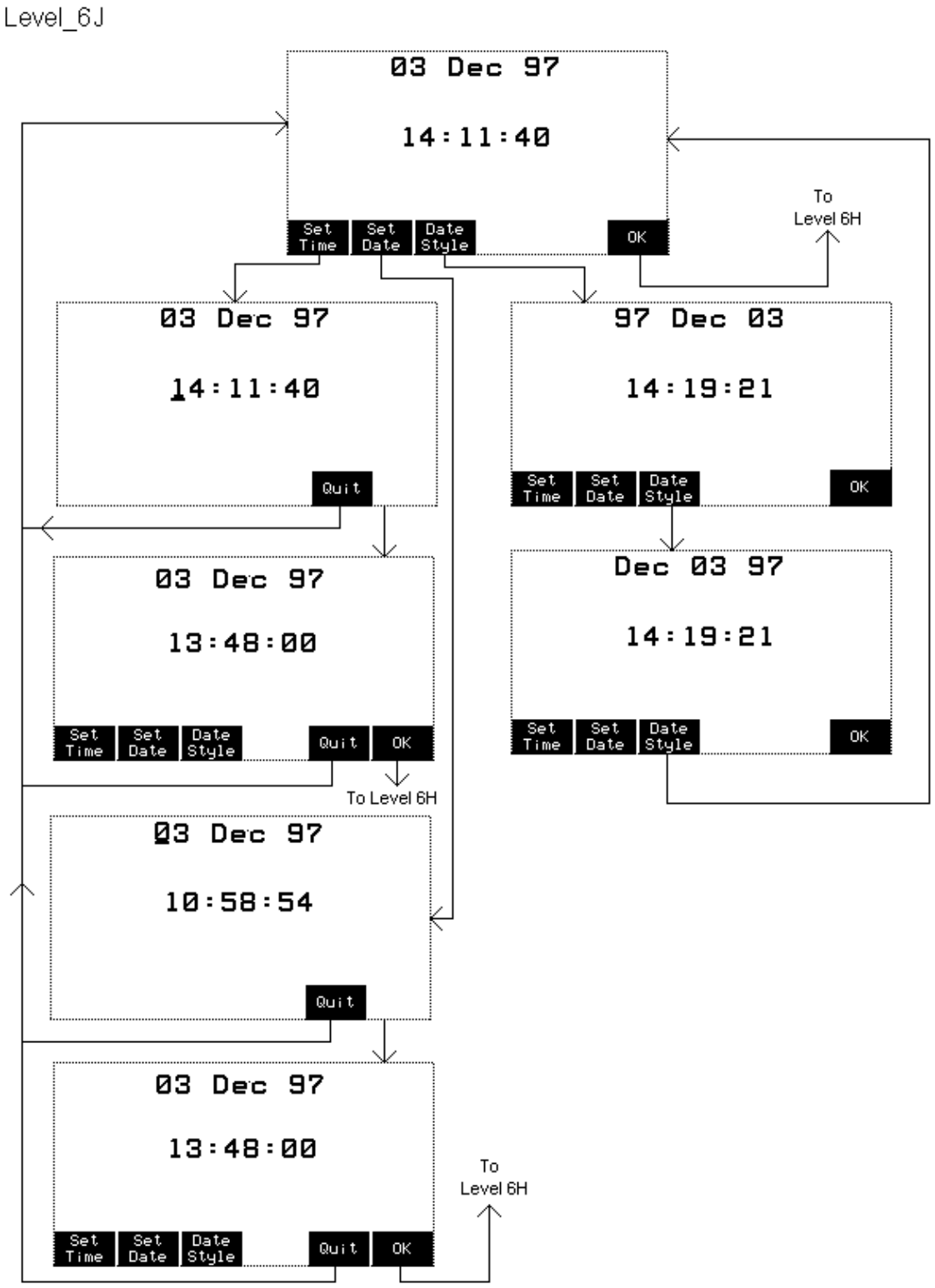
Setting the Time and Date, Continued

Setting the date Follow these steps to set the date.

Step	Action
1	Press the SET DATE button. Note: Pressing the Date Style button will toggle between the different date formats available. See flow diagram.
2	Enter the number of the month using the numeric keypad. Example: Enter 1 for January, 2 for February, etc.
3	Month number is displayed and the cursor moves to the day number for selection.
4	Enter the day. The day number is displayed and the cursor is placed under the year.
5	Enter the four digits of the year. The new date will be displayed on the screen.
6	Press OK when finished.

Continued on next page

Setting the Time and Date, Continued



Selecting the Language

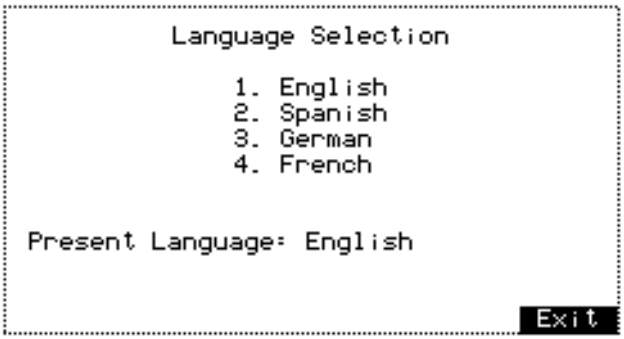
Introduction

The Flicker TASKCard can be displayed in one of four languages: English, Spanish, French, or German.

Procedure

Follow these steps to select a new language.

Step	Action
1	Select Setup from the Main Menu.
2	Select item #2, Setups for the Advanced User.
3	Select item #1, Set Analyzer Parameters.
4	Select item #3, Select Language. Result: The following screen will appear: .
5	Press the keypad number that corresponds to the desired language.
6	Press EXIT to enable language selected. Result: All screens will be displayed in the selected language.



Setting Auto-transfer to Memory Card

Introduction

The auto-transfer function allows you to set the PP1 to automatically copy events from internal memory to a file on a memory (data) card. This allows you to take advantage of the larger storage capacity of a memory card (for 1 Mbyte or larger cards).

Settings: There are two auto-transfer settings: Update Continuously (enabled) and Do Not Auto-transfer (disabled).

Update continuously

When the auto-transfer mode is set to *Enabled*, the PP1-Flicker will continuously store new event data to the memory card as well as to internal memory.

Do not auto-transfer

When the auto-transfer mode is set to *Disabled*, events will be saved to internal memory only.

Auto-transfer file

Size: The file will be as large as the available free space on the memory card.

Filename: The filename for the auto-transfer file is *filename*.evt. Where *filename* is the first eight characters of the Site/File Name. See page 5-2.

Procedure

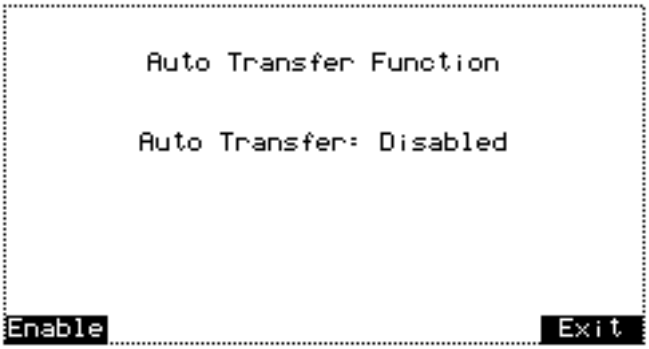
Follow these steps to change the auto-transfer setting.

Step	Action
1	Select Setup from the Main Menu.
2	Select item #2, Setups for the Advanced User.

Continued on next page

Setting Auto-transfer to Memory Card, Continued

Procedure
(continued)

Step	Action
3	Select item #4, Memory Functions.
4	From the Memory Management menu, select item #2, Auto-transfer Options. Result: The following screen will appear. 
5	Press ENABLE to change the auto-transfer mode.
6	Press EXIT to enable auto-transfer.

Chapter 6

Reports

Overview

Introduction

The Reports function of the PP1-Flicker allows you to view data formatted in different report types. Select REPORTS from the Main Menu screen to display the various reports available, described below. Also see flow diagram.

All Channels Summary

Provides a summary of the three voltage channels. The 95%, 50% and 5% Pst values show the percentage of time spent at each level. This indicates the value of Pst has been less than or equal to the value displayed for the percentage of the time shown.The Min and Max represent their respective values during the measurement interval.

All Channels Max/Min

Displays the maximum and minimum values for each channel and the time and date they occurred.

All Channels Event List

Provides a tabular listing of the different flicker values during the survey period. The softkeys are described below.

[↓] single arrow cycles through the events on the displayed page.
[↓↓] double arrow cycles through the pages.
PARAM selects either the Pst, V rms, A rms or Pinst values for display.
DETAIL displays pertinent detailed data for that measurement interval.
PRINT prints the screen displayed.
EXIT returns to Reports Menu screen.

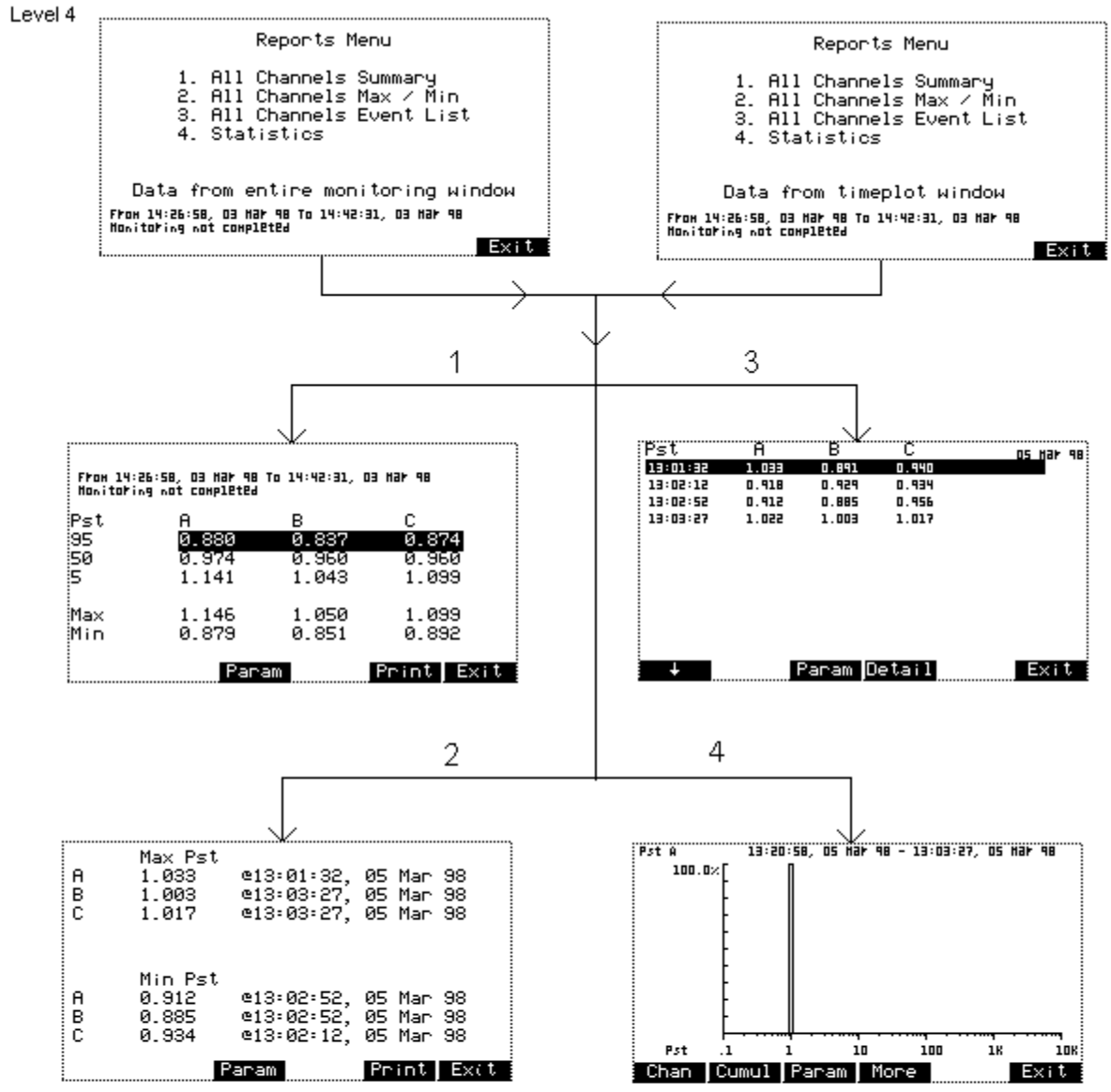
Statistics

Provides the distribution and cumulative probability graph for the various parameters.The softkeys are described below.

CHAN selects either channel A, B or C.
CUMUL displays the cumulative probability graph.
PARAM selects either the Pst, V rms, A rms or Pinst values for display.
MORE displays the cursor control keys.
PRINT prints the screen displayed.
EXIT returns to Reports Menu screen.

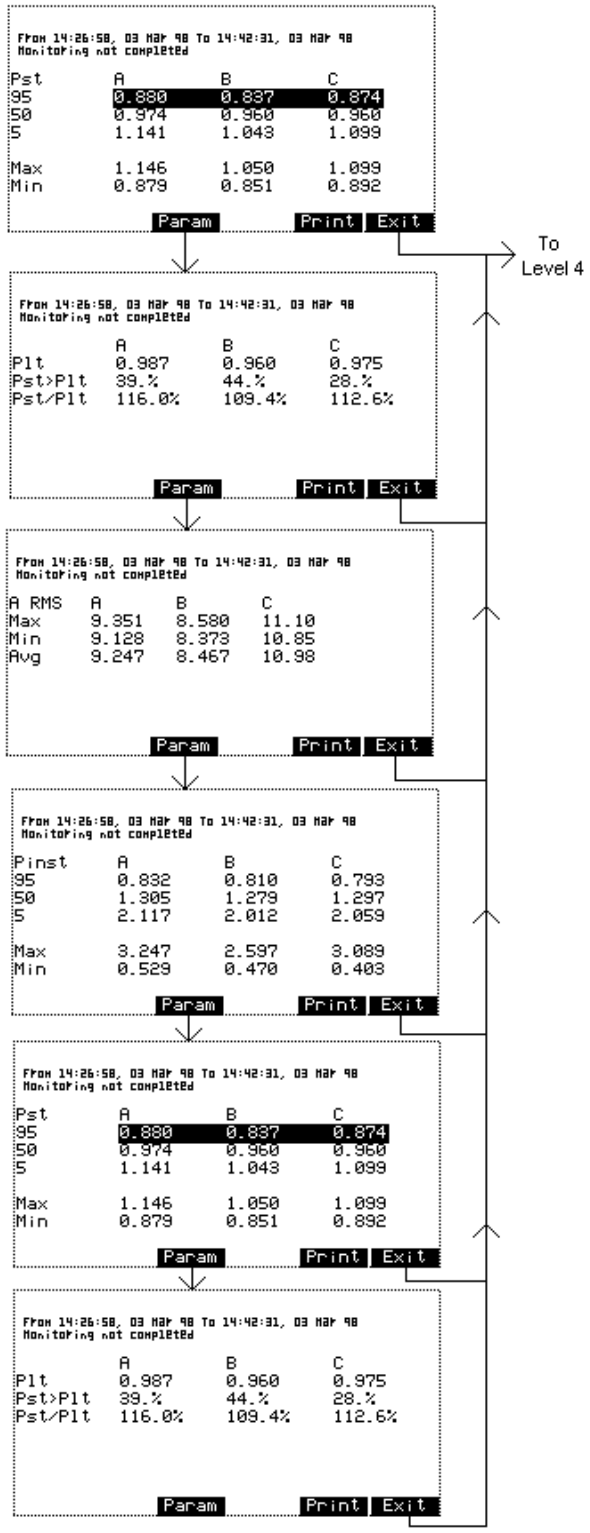
Continued on next page

Overview-Flow Diagram

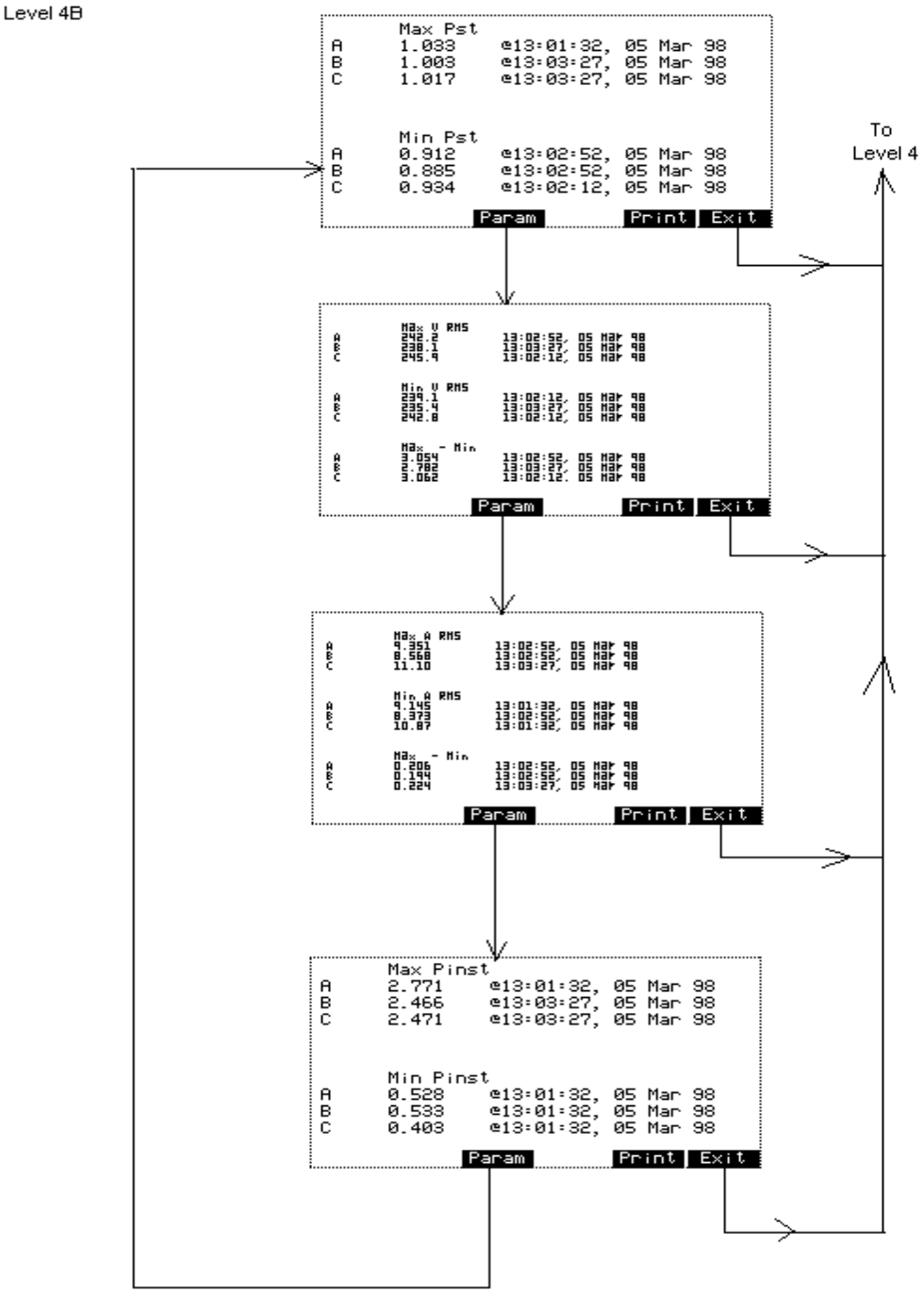


All Channels Summary

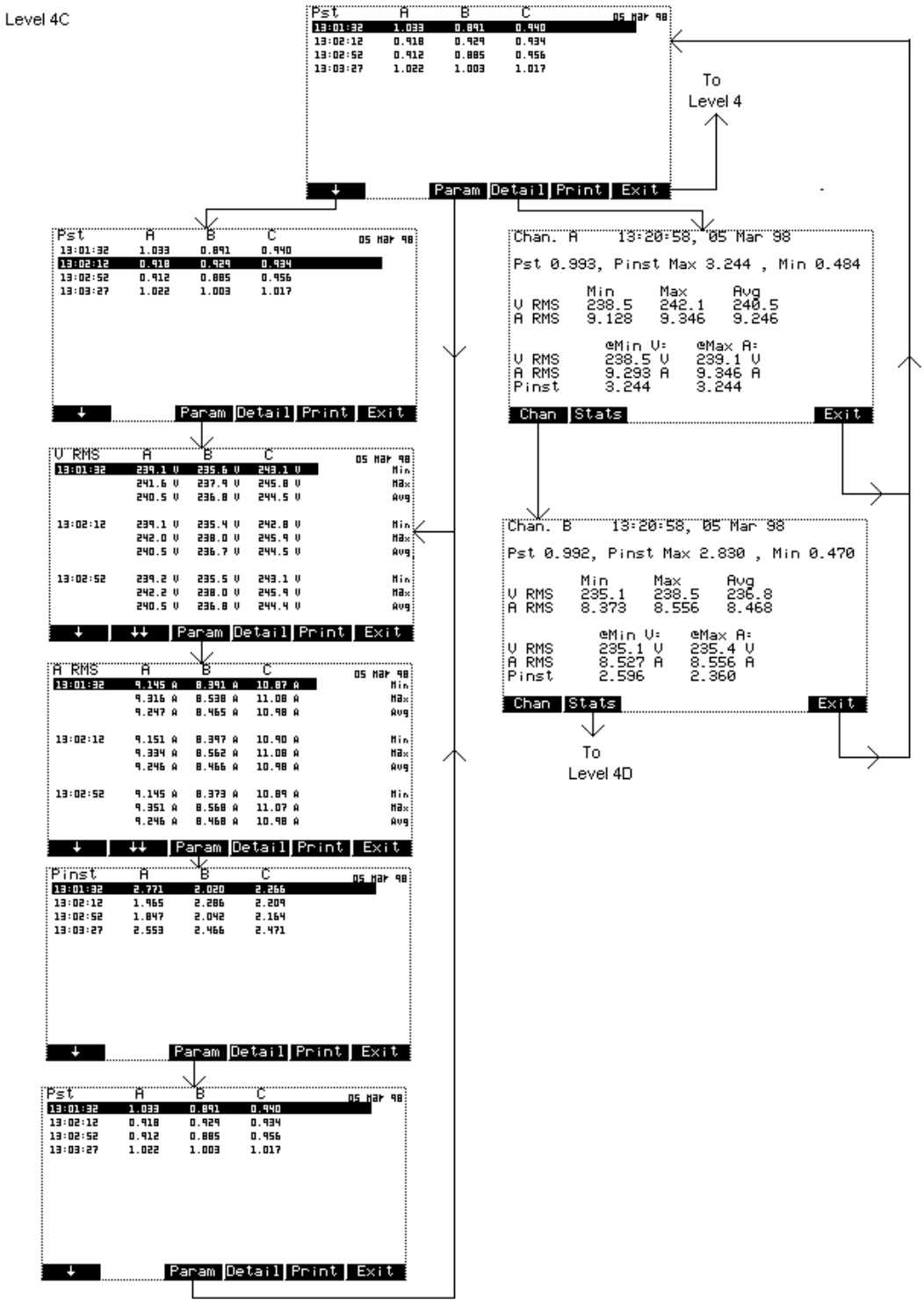
Level 4A



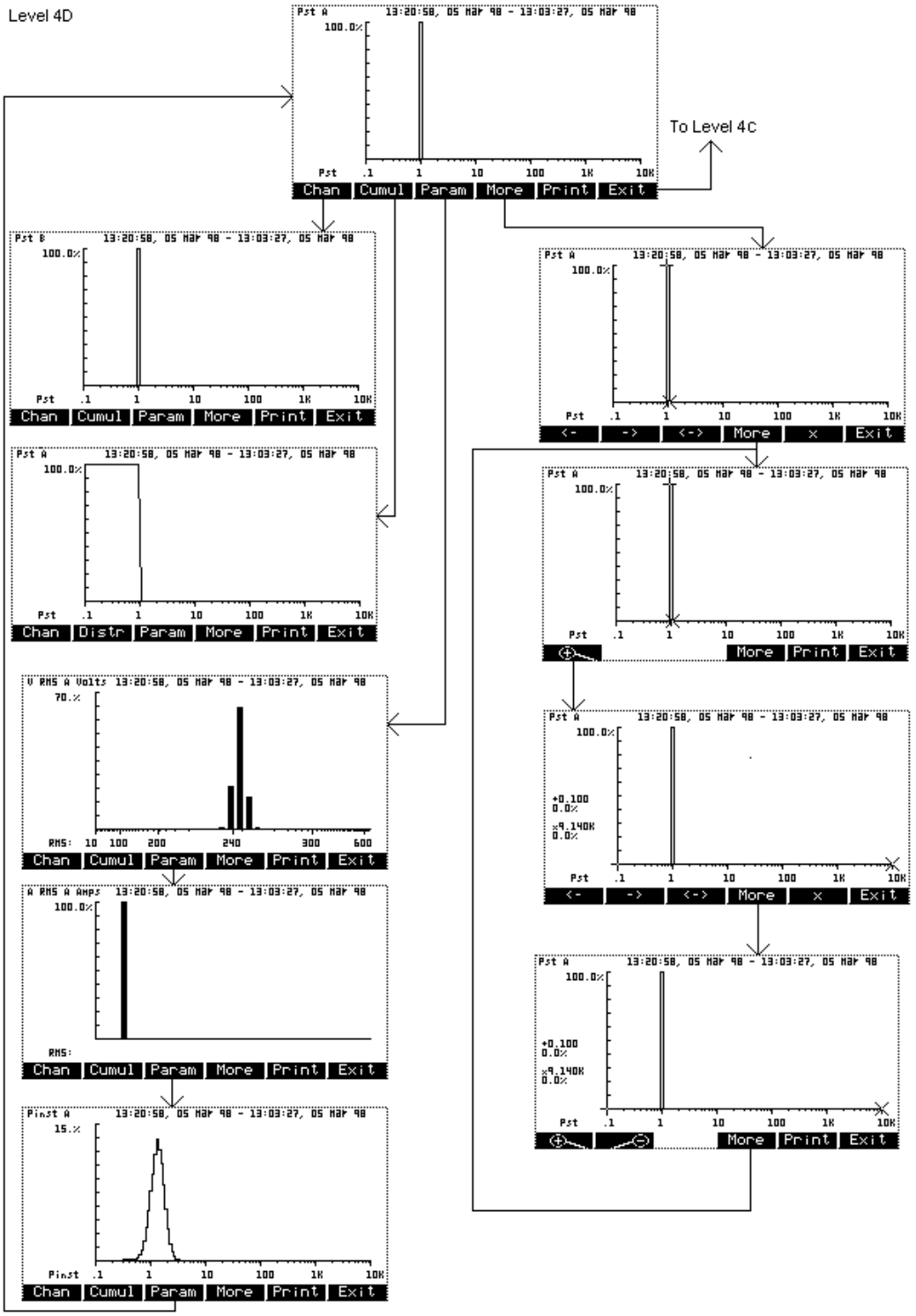
All Channels Max/Min



All Channels Event List



Statistics

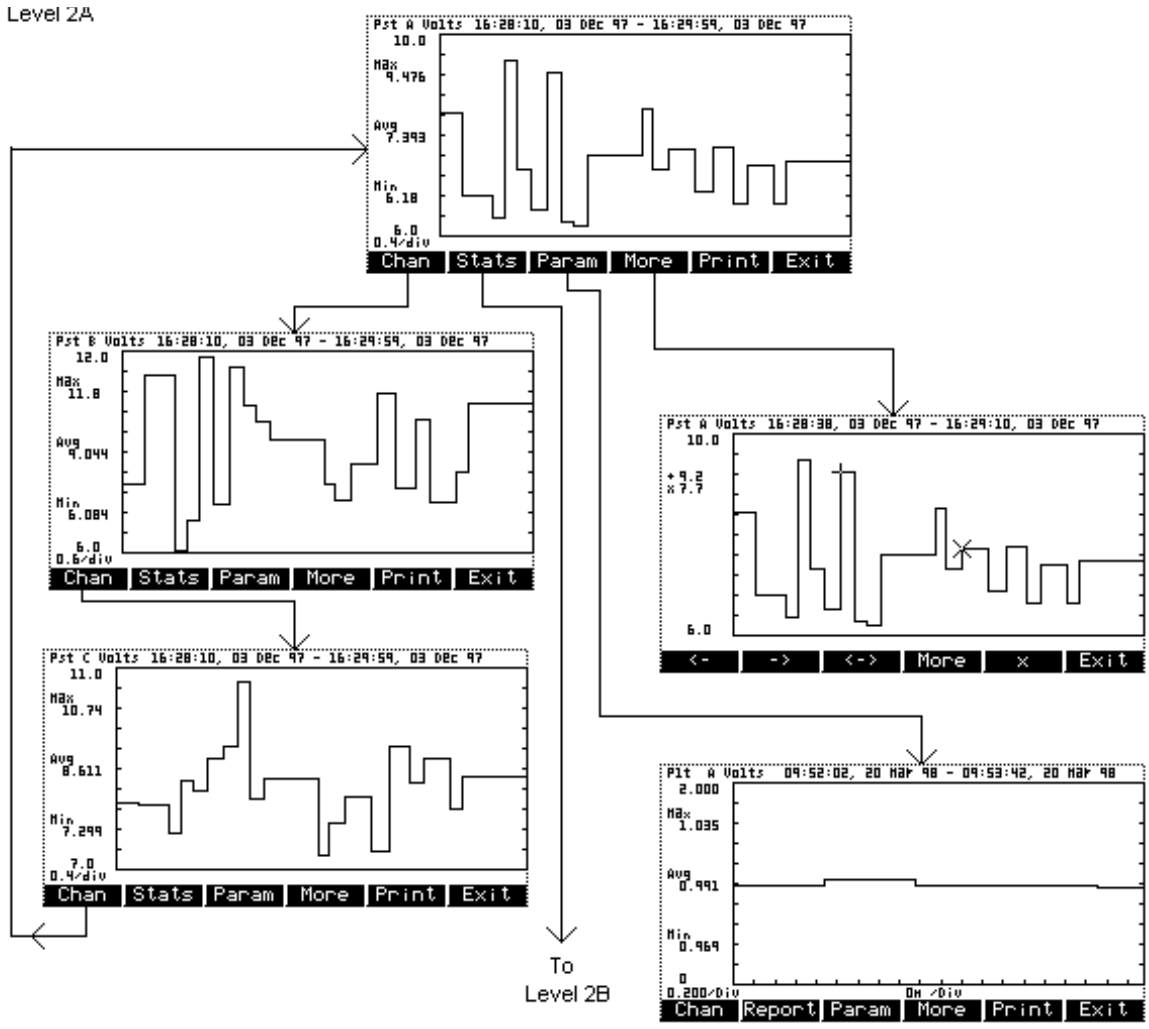

Level 4D
To Level 4C
Chan
Cumul
Param
More
Print
Exit
Distr
Pst
Pinst
RMS:

Chapter 7
Viewing Time Plots

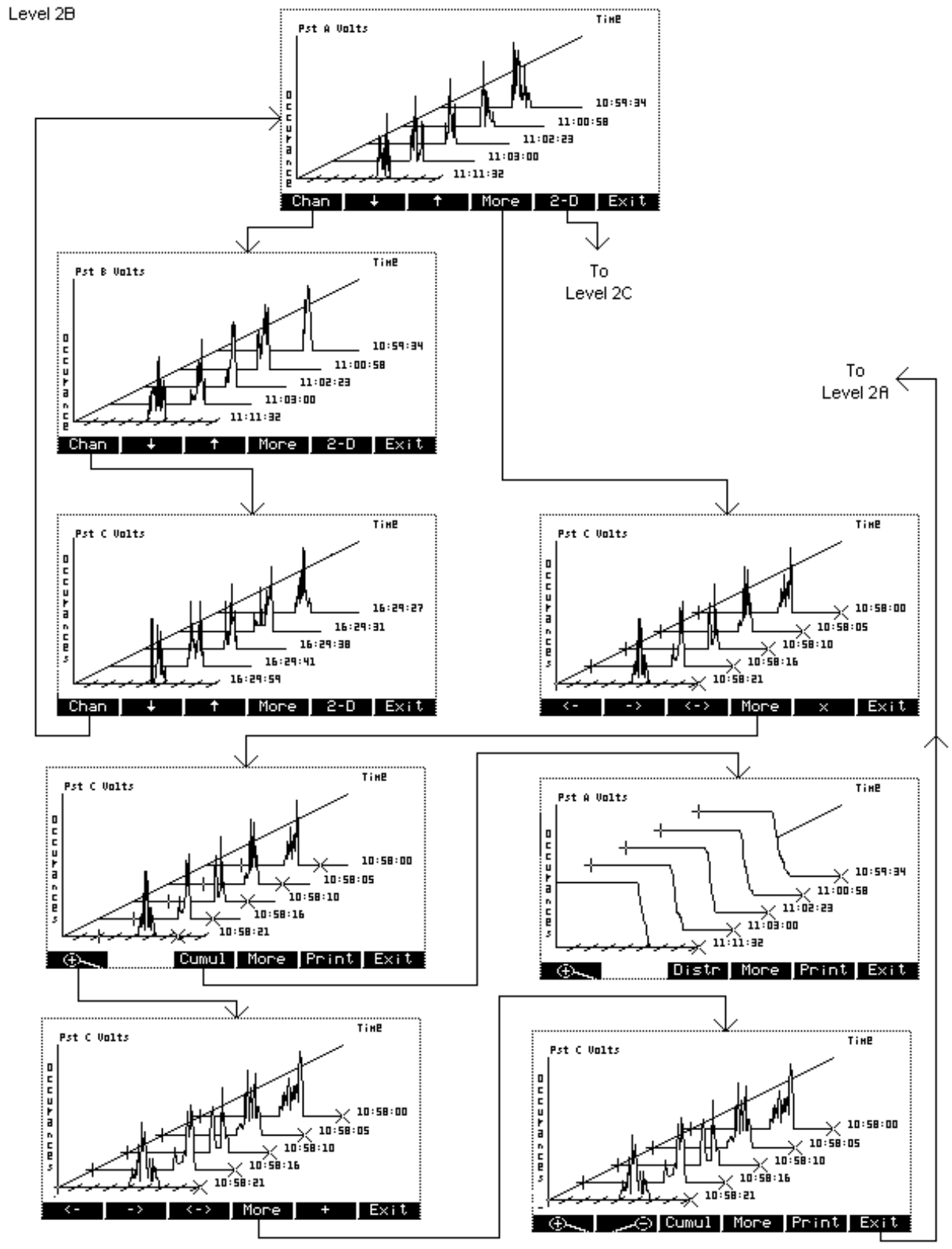
Overview

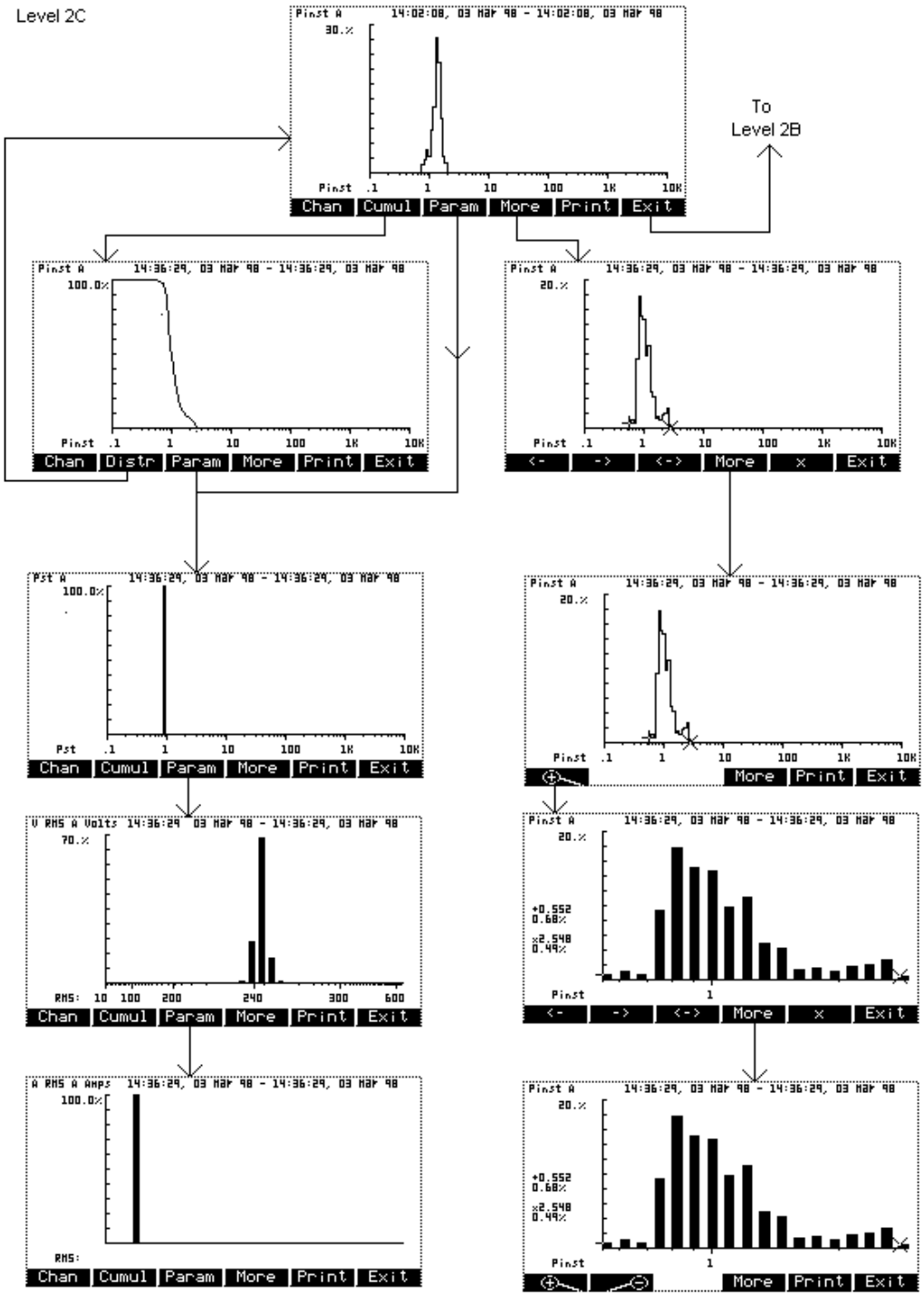
Introduction	A time plot is a graph of a particular parameter over time. The Time Plots menu presents the various flicker data sets in graphical format. Select TIME PLOTS from the Main Menu Screen. The softkeys are described below. Also see flow diagram.
Chan	Selects which channel (A, B or C) to display.
Stats/Report	Press the STATS button to display a 3-D “waterfall” plot of the distribution of the selected parameter during the measurement interval (Pst, Voltage or Current). If the Plt or Pinst parameter is selected, this button changes to REPORT. Selecting REPORT returns to the Reports Menu screen described previously.
Param	Selects which parameter will be displayed.
More	Displays the cursor control keys.
Print	Prints the screen displayed.
Exit	Returns to the previous screen level.

Continued on next page

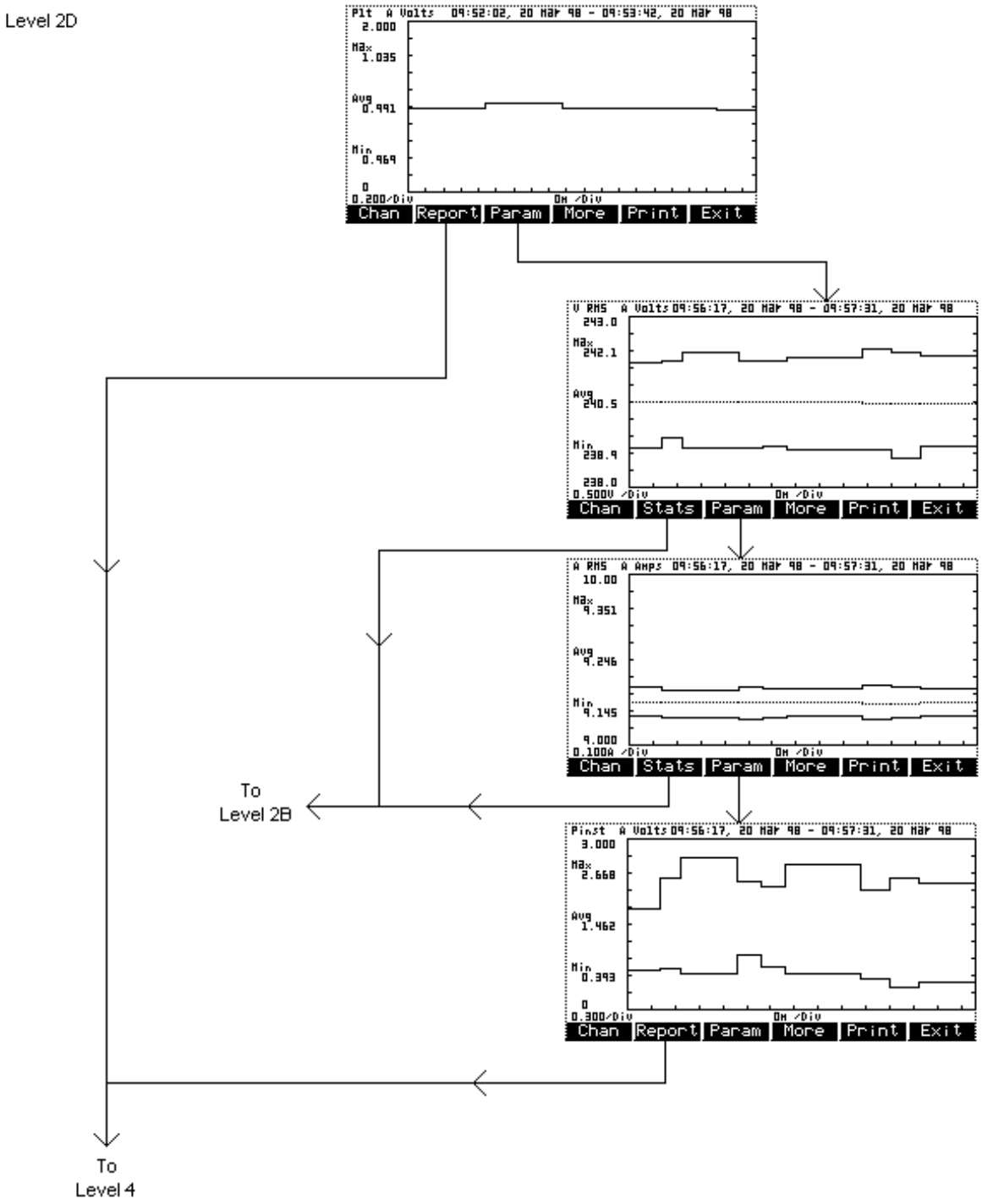

Level 2A
Pst A Volts 16:28:10, 03 DEC 97 - 16:29:59, 03 DEC 97
10.0
Max 9.476
Avg 7.393
Min 6.18
6.0
0.4/div
Chan Stats Param More Print Exit
Pst B Volts 16:28:10, 03 DEC 97 - 16:29:59, 03 DEC 97
12.0
Max 11.8
Avg 9.044
Min 6.084
6.0
0.6/div
Chan Stats Param More Print Exit
Pst A Volts 16:28:38, 03 DEC 97 - 16:29:10, 03 DEC 97
10.0
+ 9.2
x 7.7
6.0
<- -> <-> More x Exit
Pst C Volts 16:28:10, 03 DEC 97 - 16:29:59, 03 DEC 97
11.0
Max 10.74
Avg 8.611
Min 7.299
7.0
0.4/div
Chan Stats Param More Print Exit
Plt A Volts 09:52:02, 20 MAR 98 - 09:53:42, 20 MAR 98
2.000
Max 1.035
Avg 0.991
Min 0.969
0
0.200/Div
0H /Div
Chan Report Param More Print Exit
To
Level 2B

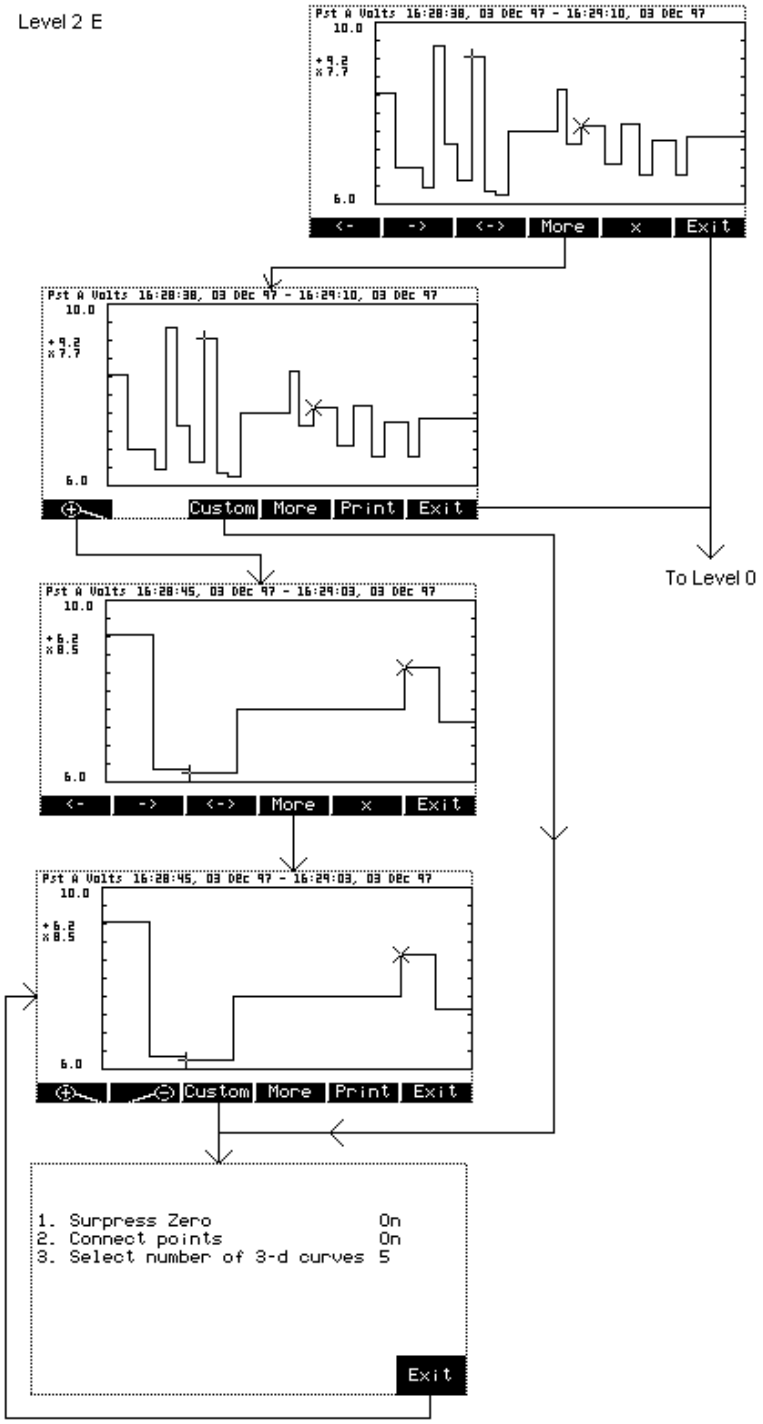
Viewing Time Plots, continued




Level 2C
To
Level 2B
Chan
Cumul
Param
More
Print
Exit
Chan
Distr
Param
More
Print
Exit
<-
->
<->
More
x
Exit
Chan
Cumul
Param
More
Print
Exit
More
Print
Exit
Chan
Cumul
Param
More
Print
Exit
More
Print
Exit
Chan
Cumul
Param
More
Print
Exit
More
Print
Exit

Viewing Time Plots, continued




Level 2 E
Pst A Volts 16:28:38, 03 DEc 97 - 16:29:10, 03 DEc 97
10.0
+9.2
x7.7
6.0
<-
->
<->
More
x
Exit
Custom
Print
To Level 0
Pst A Volts 16:28:45, 03 DEc 97 - 16:29:03, 03 DEc 97
+6.2
x8.5
1. Surpress Zero On
2. Connect points On
3. Select number of 3-d curves 5

Cursor Control

Introduction	Cursors are used both to select a region to view in more detail (using the Zoom function) or to determine the value of a particular point. Refer to the screens on the previous page for examples of cursor and zoom control function. The softkeys are described below.
Cursors	There are two cursors: Left [+] and right [-]. Press the appropriate softkey to select the active cursor.
Cursor increment	Cursor movement is selectable by pressing the *fine* [<->] or *coarse* [<--->] softkeys.
Zoom	Zoom-in (+) and zoom-out (-) are selected using the *magnifying glass* icons. When zoom magnification is very high, individual data points are indicated by small crosses.
Scroll	To scroll the data left or right, first zoom-in to the area of interest. Move the cursor until it hits the vertical axis. Each addition press of the cursor key will scroll by the selected increment.

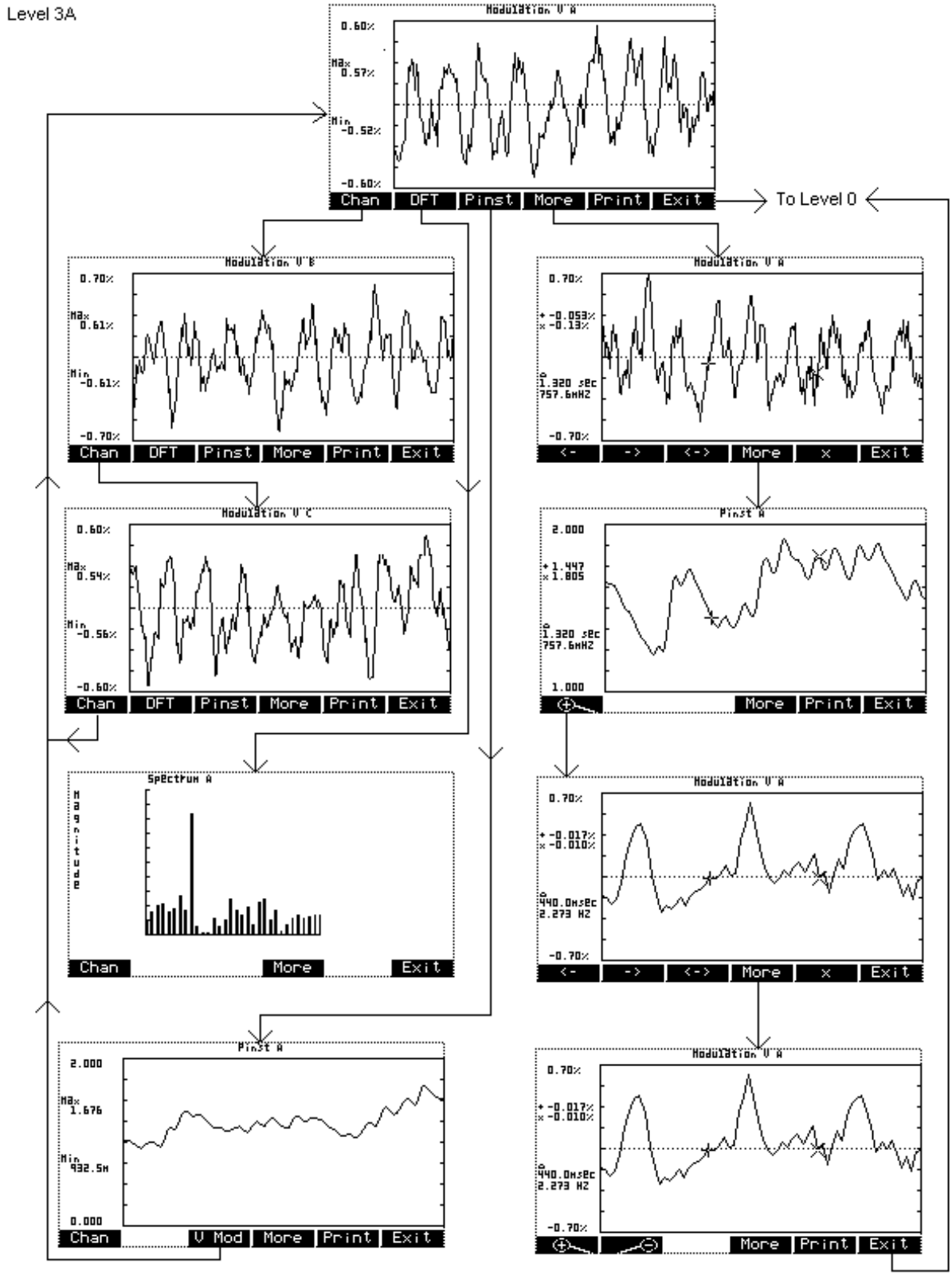
Chapter 8

Modulation

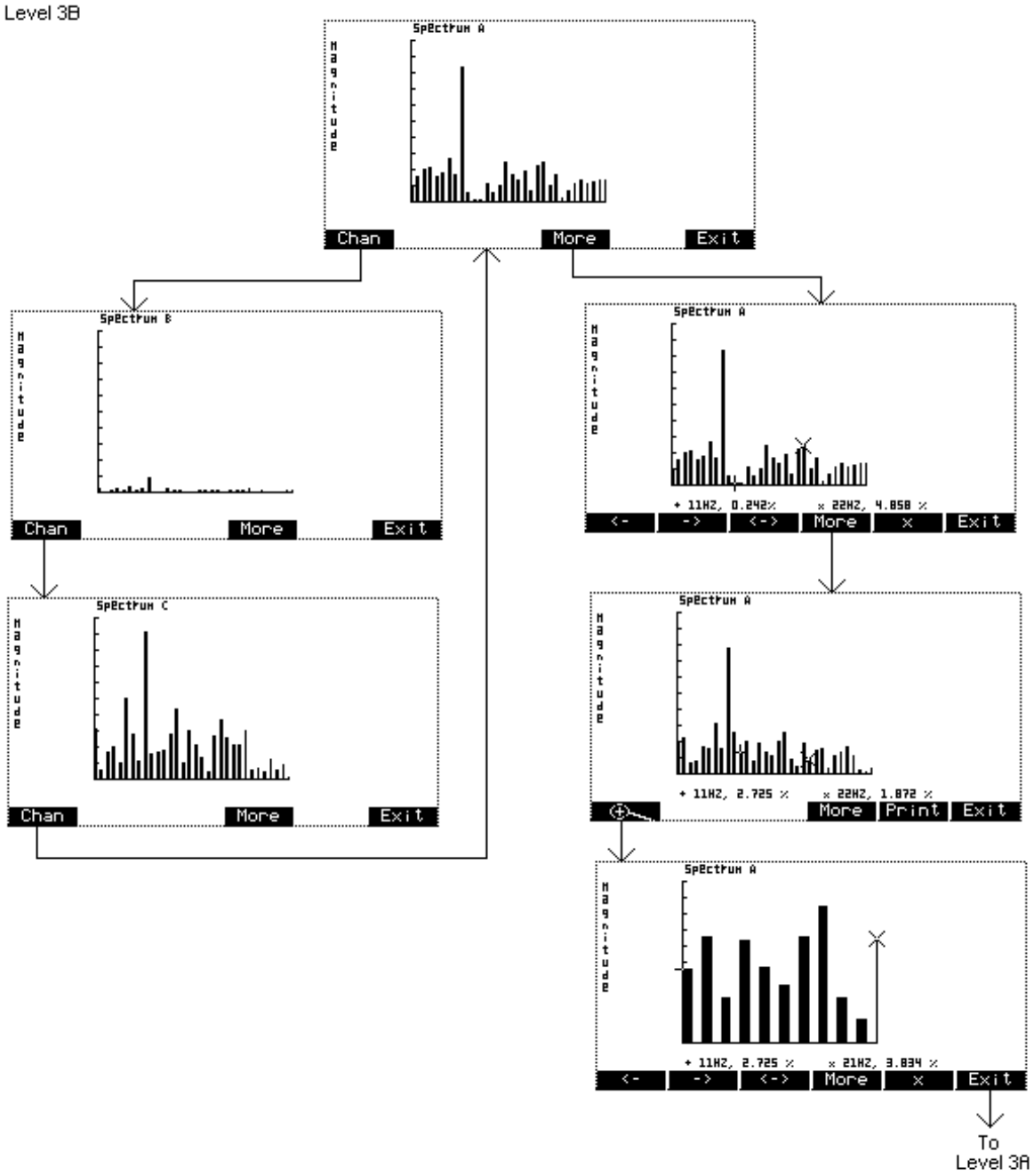
Overview

Modulation Menu	This menu displays the actual flicker voltage shown as a percent of the steady state voltage. This signal has been mathematically extracted from the input voltage. Select MODULATION from the Main Menu screen. The softkeys are described below. Also see flow diagram.
Chan	Selects which channel (A, B or C) to display.
DFT	Displays the DFT screen which shows the Discrete Fourier Transform of the modulating voltage. The frequency range is from 0.5 to 32 Hz.
Pinst	Displays the instantaneous flicker values, from which the Pinst is extracted.
More	Displays additional cursor control keys.
Print	Prints the screen displayed.
Exit	Returns display to Main menu.

Modulation, continued



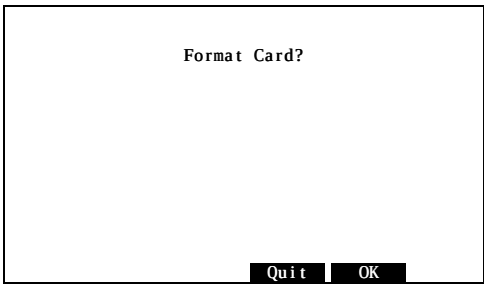
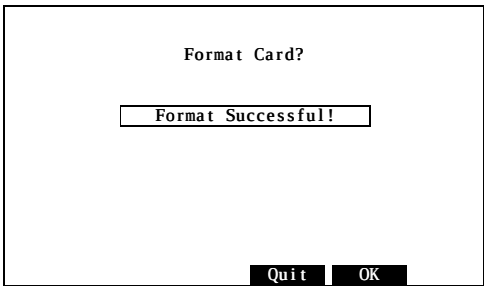
Modulation, continued



Chapter 9
Transferring Data

Formatting a Memory Card

Procedure Follow these steps to format a card.

Step	Action
1	Insert memory card.
2	Select Setup from the Main Menu.
3	Select item #2, Setups for the Advanced User.
4	Select item #4, Memory Functions.
5	Select item #1, Memory Card Functions.
6	Press FORMAT. The following screen will appear. 
7	Press OK. Result: The message “Formatting Card” will be displayed until formatting is complete. The time it takes to format the card depends on the card size. When card has been formatted, the following screen will appear. 
8	Press any key to quit or exit this screen.

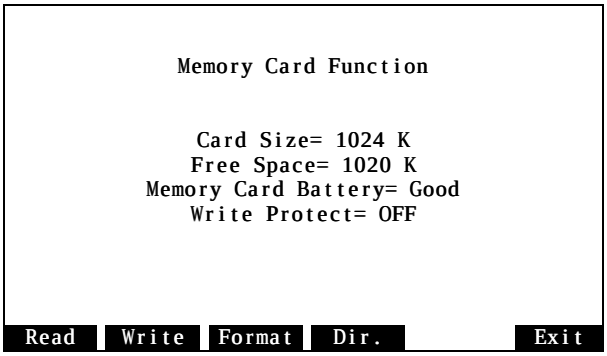
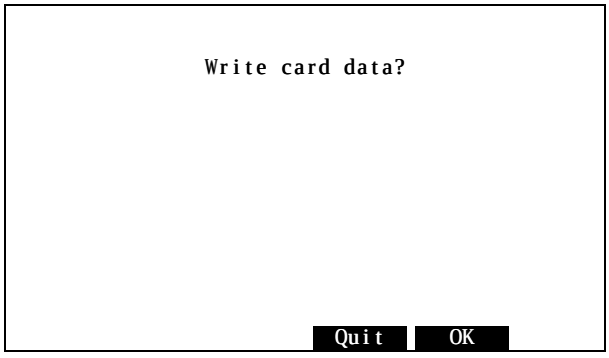
Writing to a Memory Card

Introduction

Events and setups can be written to a memory card. Information about the card size, card free space, whether the card is write protected or not, and the condition of the memory card battery, is displayed.

Procedure

To write to a memory card perform the following steps.

Step	Action
1	Insert memory card
2	Select Setup from the Main Menu.
3	Select item #2, Setups for the Advanced User.
4	Select item #4, Memory Functions.
5	Select item #1, Memory Card Functions. The following screen will appear. 
6	Press WRITE. The following screen will appear. 

Continued on next page

Writing to a Memory Card, Continued

Procedure (continued)

Step	Action
7	Press the desired write key. The following message will appear during write operations. **Writing data into the memory card. Please wait.**

Error messages and warning

The following error message will be displayed if there is insufficient space on the memory card.

Not enough free space on the memory card.
Data can not be written.

Note

The name of the files are taken from the first eight characters of the site ID.

Files that don't exist

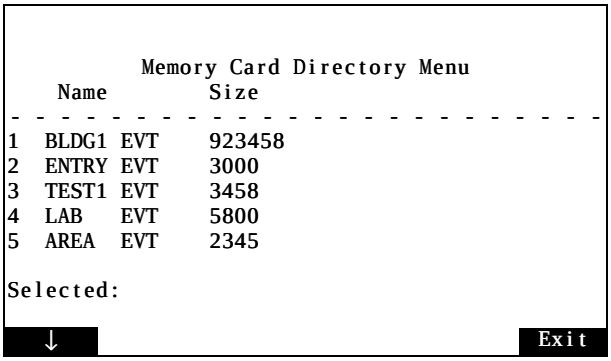
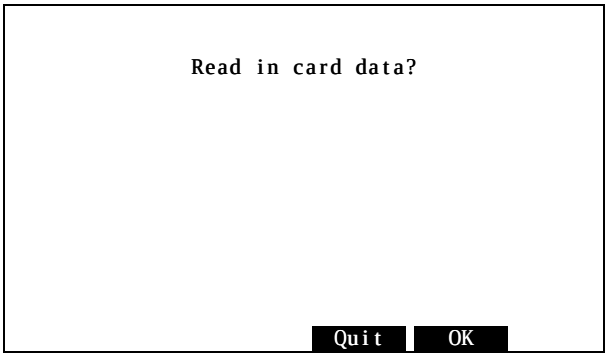
If a file selected to be written does not exist, it will be created. If the file already exists it will be overwritten.

Writing events

Selecting WRITE will write all events in internal memory to the card.

Reading a Memory Card

Procedure To read a memory card, perform the following steps.

Step	Action
1	Insert memory card
2	Select Setup from the Main Menu.
3	Select item #2, Setups for the Advanced User.
4	Select item #4, Memory Functions.
5	Select item #1, Memory Card Functions.
6	Select READ. A typical directory menu screen appears below. 
7	Use the numeric keypad to select the desired file by number.
8	Press Exit when the desired file is selected. The following screen will appear. 
9	Press OK to read the file. Press QUIT to exit without reading.

Chapter 10

Printer Operation

Overview

Introduction

The Power Platform with a built-in thermal printer produces high resolution graphic or text output of 320 dots per line at one inch per second. Printing is done either automatically or manually. Automatic printing occurs when error messages are generated. Manual printing is operator controlled with the PRINT key located on various screens or by pressing the period key [**.**] on the numeric keypad.

In this chapter

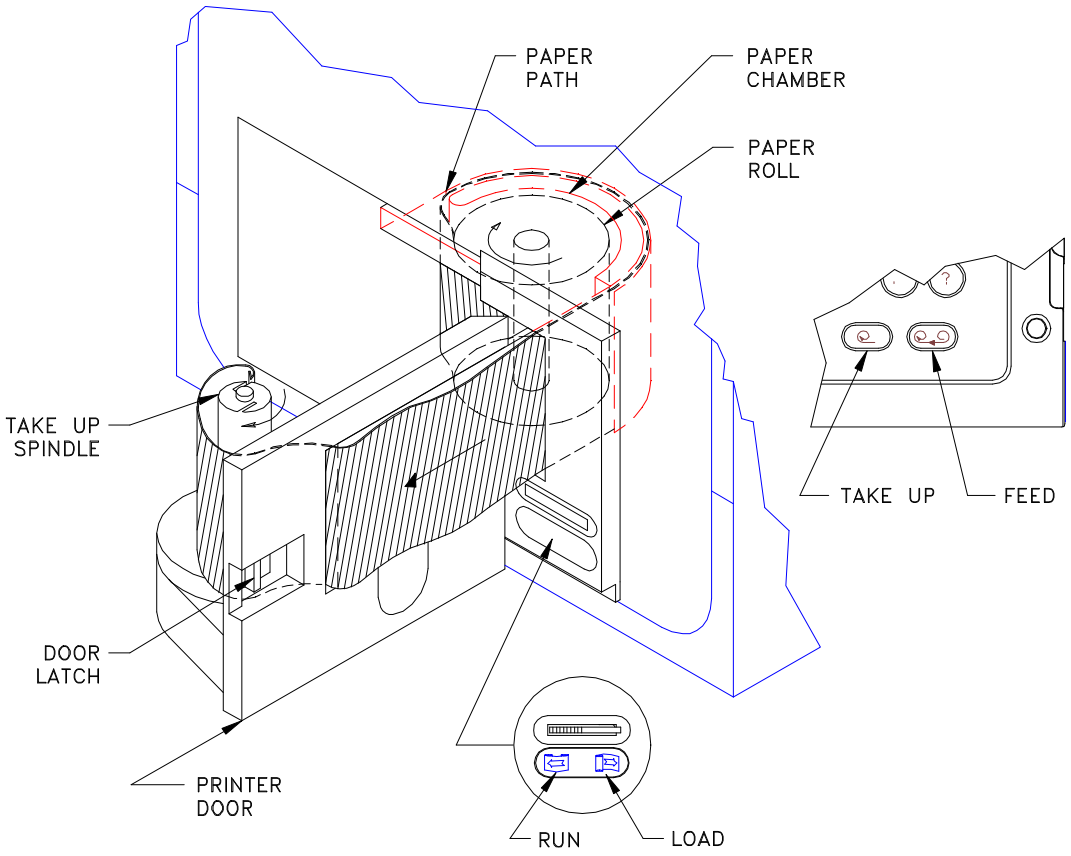
The following topics are covered in this chapter.

Printer Controls

Introduction

Printer controls are located on the front panel as well as in software. The printer assembly and its front panel controls are shown below.

Printer assembly



8000-13

Continued on next page

Printer Controls, Continued

Front panel controls

The following table provides a description of the front panel printer controls.

Part	Function
Run/Load lever	Used to raise and lower the printhead. • In normal operation the lever is left in the RUN position. • With the lever in the LOAD position, printing is disabled and the printer paper may be removed or loaded.
Take-up button	Removes slack in the printer paper when pressed. The take-up feature stops under the following conditions: • when there is some paper resistance, or • within ten seconds if the paper is torn or disconnected from the take-up spindle and the RUN/LOAD lever is in the RUN position.
Feed button	Advances the paper when pressed.

Normal Operation

Introduction

To operate the printer normally (not running off the internal battery), the following conditions must be met:

- The printer must be turned on
- The RUN/LOAD lever must be in the RUN position.
- The printer must have paper.

Manual control of the printer from the function keys or the keypad and automatic printing of reports and error messages can now take place.

Manual printing

Any screen displayed can be printed by pressing the period key [.] located on the numeric keypad. Manual operation of the printer can also be achieved by selecting PRINT from the menu bar at the bottom of a screen, where applicable.

Automatic printing

Automatic printing occurs when error messages are generated.

Printout storage

During printing, the paper is collected on the internal take-up spindle for storage and future review. Stored printouts can be viewed by inserting a finger into the finger groove, so that it is behind the paper tape, and pulling the paper tape straight out from the printer door. When finished viewing the earlier data, press the TAKE-UP pushbutton to remove the slack. If long lengths of paper are outside the Power Platform, be sure to keep paper from being twisted when using the paper take-up feature.

Continued on next page

CAUTION	**Never grasp the printer paper and try to pull it out from the printhead with the RUN/LOAD lever in the RUN position. Damage to the printhead will result.**
PRECAUCION	**Nunca tire del papel de impresora desde el cabezal de impresión con la palanca RUN/LOAD en la posición RUN. Puede ocasionar daños al cabezal de impresión.**
MISE EN GARDE	**Ne jamais tirer le papier de la tête d'impression lorsque le levier RUN/LOAD est en position RUN. La tête d'impression serait endommagée.**
VORSICHT	**Greifen und ziehen Sie nie das Druckpapier vom Druckkopf, wenn der "RUN/LOAD"-Hebel (Laufen/Laden-Hebel) sich in der RUN-Position (Laufen) befindet. Der Druckkopf kann beschädigt werden.**

Paper Replacement

Paper low condition

The last 40 inches of paper is marked with a red stripe on the top and bottom edges. When the printer is out of paper, or the print head is up, the PP1 will buffer the printouts until it can print again or until it runs out of memory.

CAUTION

To avoid damage to the printhead when loading or removing paper, the RUN/LOAD lever must be in the LOAD position.

PRECAUCION

Para evitar daños al cabezal de impresión cuando cargue o retire papel, la palanca RUN/LOAD debe estar en la posición LOAD.

MISE EN GARDE

Pour éviter d'endommager la tête d'impression lors de la mise en place et du retrait du papier, le levier RUN/LOAD doit être en position LOAD.

VORSICHT

Um während des Ladens oder Entfernens von Papier Beschädigung am Druckkopf zu verhindern, muß der "RUN/LOAD"-Hebel sich in der "LOAD"-Position (Laden) befinden.

Removing paper roll

Follow these steps to remove paper roll.

Step	Action
1	If paper is low, but not out, press the paper FEED pushbutton until only blank paper is showing.
2	Pull the paper out for slack and tear the paper on the right edge of the printer window.
3	Set the RUN/LOAD lever to the LOAD position.
4	Press the printer door latch to the right and open the door until it locks in place.
5	Remove the paper from the take-up spindle by tightly grasping the paper on the spindle, turning it clockwise, and gently pulling the paper up and off the spindle.
6	If there is paper remaining in the paper path, gently pull this paper out of the printer mechanism.
7	Remove the empty paper spool and any remaining paper from the paper chamber.

Paper Replacement, Continued

CAUTION **Using thermal paper other than that supplied by Dranetz Technologies, Inc. or its authorized representatives may damage the printhead.**

PRECAUCIÓN **El uso de papel térmico que no sea el suministrado por Dranetz Technologies o sus representantes autorizados puede causar daños a la impresora.**

MISE EN GARDE **L'utilisation d'un papier thermosensible différent de celui fourni par Dranetz Technologies ou par ses représentants autorisés peut endommager l'imprimante.**

VORSICHT **Nur das von Dranetz Technologies oder seinen Vertretungen gelieferte Thermopapier benutzen. Anderes Papier kann den Drucker beschädigen.**

Before loading new paper roll

Follow these steps before you load a new paper roll.

Step	Action
1	Remove the new paper roll from its box and remove any wrapping.
2	If the end of the paper roll is glued down, cut off and remove any glued portion.
3	Unroll approximately 12 inches of paper.
4	Verify that the RUN/LOAD lever is in the LOAD position.

Loading new paper roll

Follow these steps to load a new paper roll.

Step	Action
1	Center the paper roll on the white nub on the bottom of the paper chamber with the loose end coming out clockwise from the back of the roll. See page 10-2 for paper routing.
2	Insert the end of the paper into the paper path slot to the left of the paper roll.
3	Feed the paper through the path until it comes out the front of the printer door.

Continued on next page

Loading new paper roll (continued)

Step	Action
4	Hold the paper against the spindle while rotating the bottom of the spindle at least two turns clockwise.
5	Move the end of the paper across the front of the printer door (from right to left) and guide it through the slot near the take-up spindle.

After loading new paper roll

Follow these steps after loading a new paper roll.

Step	Action
1	Set the RUN/LOAD lever to the RUN position. Note: Printer will not work if this lever is in the LOAD position.
2	Press the paper take-up pushbutton and note that all slack in the printer paper is removed, the paper is taut and the take up motor stops.
3	If the take up motor continues to spin, the paper is not engaged correctly. Repeat step 5 of the previous procedure.
4	Press the paper FEED pushbutton to ensure the paper advances freely across the printer door without slipping or stopping.
5	If the paper does not feed smoothly, remove the paper and repeat "Loading new paper roll" procedure on the previous page.
6	Close the printer door.

Ordering thermal paper

Contact Dranetz-BMI or your authorized Dranetz-BMI representative to order thermal paper (P/N 115323-G1) for the Power Platform thermal printer.

Appendix A
Optional Accessories

In this appendix The following topics are covered in this appendix.

Optional Accessories List

Accessory	Part Number
TASKCard PQ Plus, (English)	TASK-PQPlus-E
TASKCard PQ Plus, (Spanish)	TASK-PQPlus-S
TASKCard PQ Plus, (French)	TASK-PQPlus-F
TASKCard 8000	TASK-8000
TASKCard Inrush,	TASK-Inrush
Communications and Analysis Software	PCPP1
DRAN-VIEW w/PP1 (PQ Plus) Utility Driver	
DRAN-VIEW *Pro* for PP1 PQPlus	
DRAN-VIEW Report Writer	
Electrical Energy Management Handbook	HB114415
Power Quality Analysis Handbook	HB114414
Service Manual	SM-PP1
Clamp-on Current Probe, 1 to 10 A	CT-10
Clamp-on Current Probe, 15 to 150 A	CT-150
Clamp-on Current Probe, 30 to 300 A	CT-300
Clamp-on Current Probe, 100 to 1000 A	CT-1000
Clamp-on Current Probe, 300 to 3000 A	CT-3000
Isolated Current Transformer Box, 1 A	ISO-1A
Isolated Current Transformer Box, 5 A	ISO-5
Memory Card Reader, RS-232	
Memory Card Reader, RS-232, 230 V	
Memory Card Reader, Parallel Port	
Memory Card Reader, Parallel Port, 230 V	
Memory Card Reader, Data Bus Plug-in	
Memory Card, 512k	CARD-512
Memory Card, 1M	CARD-1M
Memory Card, 2M	CARD-2M
Box of Thermal Paper (16 rolls)	CTP-16

Continued on next page

Optional Accessories List, Continued

List (continued)

Accessory	Part Number
External DC Battery Filter	XBF-12
External Battery Charger	
External Modem Interface Cable	XMC-8
RS-232 Cables, 25-pin M to 25-pin F, and a 25-pin M to 9-pin F adapter cable. *Not used with Flicker TASKCard.*	RSCOM
Soft Carrying Case (with probe pallet)	SCC-8
Reusable Shipping Case	RSC-8
Battery Pack, Field Replaceable	FBP-8
Adapter Cable, 808 Probe to PP1 (see page A-6) (not available with PP1E)	115551-G1
Adapter Cable, 658 Probe to PP1 (see page A-6)	115552-G1

Note Specifications subject to change without notice. Contact Dranetz-BMI Customer Service for the latest information on options and accessories.

Optional Accessories Descriptions

Current probes and isolation current transformers

Current Probes: There are five clamp-on current probes, models CT 10, CT150, CT300, CT1000, and CT3000 used to measure AC currents up to a maximum of 10Arms, 150Arms, 300Arms, 1000Arms, and 3000Arms, respectively.

Isolation Current Transformers: Two isolation current transformers (ISO boxes), models ISO-1A (2Arms max) and ISO-5 (10Arms max) provide low level isolation nominal currents of 1Arms and 5Arms, respectively, for connection to low current devices or for connection to current probes of other manufacturers.

Either the clamp-on current probes or the isolation transformers can be connected to any one of the four current jacks on the Power Platform rear panel. A decal sheet is provided to allow color coding of the probes and transformers that correspond to the rear panel jacks.

TASKCard-8000

The TASKCard 8000 changes the Power Platform to a power quantity monitor so that is measures, records, and displays electric power parameters to help you find inefficiencies in your electric system.

RSCOM cables

Not used with Flicker TASKCard. The RSCOM cables consist of two RS232 cables, one 10’ long, the other 1’ long. The ten foot cable has a 25-pin male connector and a 25-pin female connector. The one foot adapter cable has a 25-pin female connector and a 9-pin male connector for serial data connections. The cables permit the PP1 to communicate with a terminal, computer, external printer, or external modem.

Memory cards

Several types of memory cards are available, from 512 kilobytes to 2 megabytes. A memory card is read by your PC with a memory card reader, also available as an option.

Memory card readers

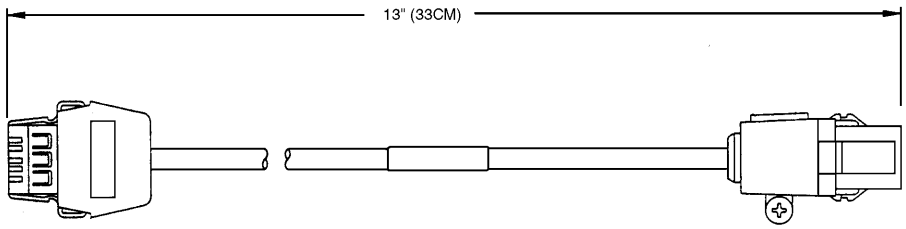
Three types of memory card readers are available as options. Each reader provides a different means of communications with an IBM compatible computer. The three types are: RS232 port, parallel port, and data bus plug-in.

Continued on next page

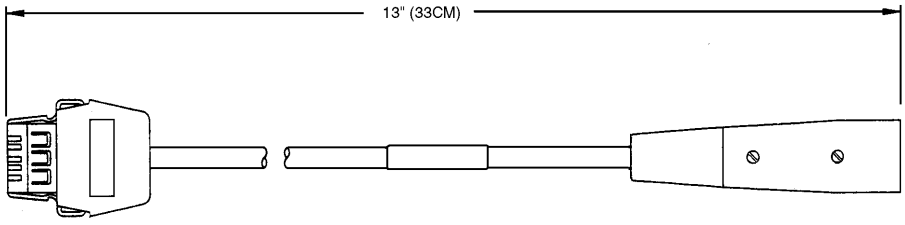
Optional Accessories Descriptions, Continued

External battery charger	The optional external battery charger provides an alternate means for charging the FBP-8 battery pack or additional battery packs.
PCPP1	This is a Windows based program that is used to access and retrieve data from single or multiple remote Power Platforms. Other features include totalization of demand and energy data from multiple units, manipulation of time plot data, and the ability to read data from a memory card if your PC is equipped with a memory card reader.
DRAN-VIEW®	This PC analysis software provides easy access to data gathered by the PP1 and other Dranetz-BMI instruments. It reads data directly from data card, floppy disk or interfaces your PC directly to the monitor using DRAN-LINK® communications software (*DRAN-LINK does not support the Flicker TASKCard.*) Compatible with windows 3.x, Windows 95 and NT.
Electrical Energy Management Handbook	A comprehensive guide for conducting a thorough energy audit, power distribution analysis, and methods of remedying inefficiencies of energy management.
Power Quality Analysis Handbook	Contains step-by-step instructions for discovering and solving power quality problems. Includes example waveforms and case studies.
Adapter cables	Two types of adapter cables are available to permit connecting current probes of Dranetz-BMI models 808 and 658 to the PP1 current input jacks. These adapter cables are shown on the following page. Supplied with these cables is an information sheet (P/N 899009) that describes the cables and the scale factors of the respective current probes used with the cables.
Ordering information	To order accessories, contact Dranetz-BMI Customer Service. **Telephone:** 1-800-372-6832 or 732-287-3680 **Fax:** 732-248-1834 **Web site:** www.dranetz-bmi.com

Adapter cable, 808 to PP1, P/N 115551-G1 (not available on PP1E)



Adapter cable, 658 to PP1, P/N 115552-G1



Appendix B

Repacking for Return Shipment

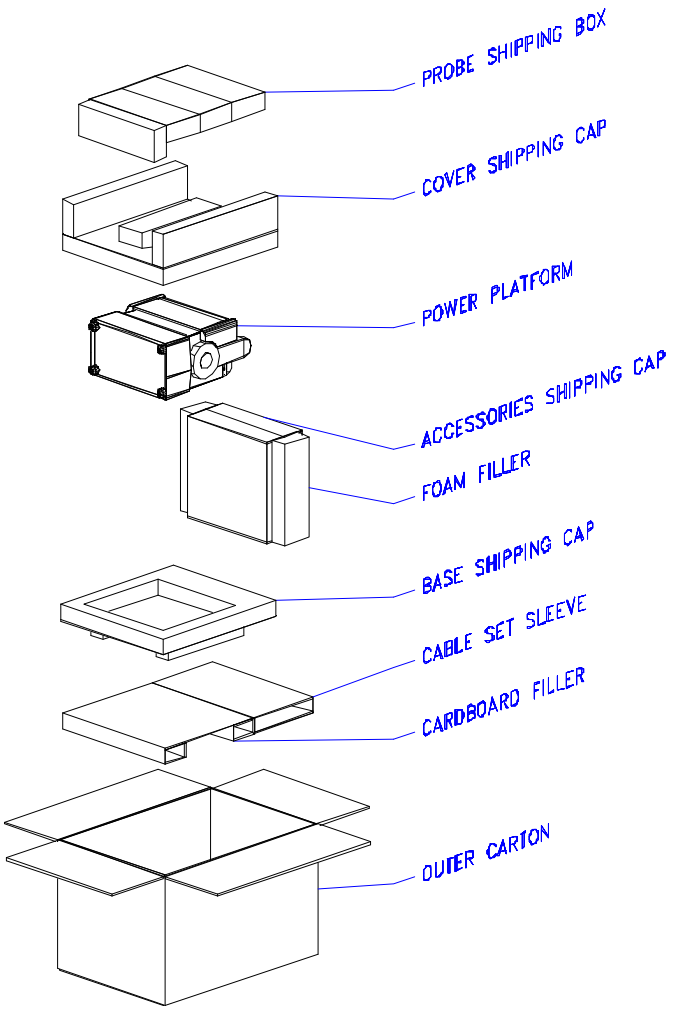
Introduction

If the unit must be returned to Dranetz-BMI for service or repair, repack the unit in its original shipping carton as shown below. Do not return the Power Platform in an unpacked box. Dranetz-BMI will not be responsible for damage incurred during transit due to inadequate packing on your part.

Return notice

Notify Dranetz Customer Service of your intention to return the unit. Do not return the unit without prior instructions from Dranetz-BMI Customer Service, telephone 732-287-3680 or 1-800-372-6832.

Original shipping carton (typical)



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Appendix C

Battery Specifications and Replacement Procedure

Overview

Introduction

The internal battery pack used in the Power Platform functions as the uninterruptible power supply (UPS) in the event of AC power loss. It can also function as the primary power source when no AC power source is available.

The Power Platform also contains a lithium battery for memory backup.

In this appendix

The following topics are covered in this appendix.

Battery Specifications

Battery Pack

Location: battery compartment on the top front of the unit

Number of cells: 10

Type: sealed, rechargeable NiCad cells

Voltage: 12 V DC

Capacity: 2.5 Ah

Length of operation: One hour of monitoring only operation when fully charged, or up to 15 minutes of continuous printer operation.

Suggested replacement interval: two years.

Note

The length of time that the Power Platform can operate on the battery pack degrades over the life of the batteries and the number of charge/discharge cycles.

Lithium Battery Power Module

A Lithium Battery Power Module is mounted on the CPU board and is used for memory backup of the PP1-Flicker configurations and setups.

3 V, 1000 mAhrs Lithium battery for data retention with an estimated life of 2 years (operational), 1 1/2 years (storage). Replaced during each Dranetz-BMI calibration procedure.

The Lithium battery is not operator replaceable. Refer to the Power Platform service manual, SM-PP1, for replacement procedures by qualified service personnel.

Battery Pack Safety Precautions

WARNING

DO NOT intentionally short circuit the battery pack. The batteries are capable of producing hazardous output currents if short circuited. The Power Platform is equipped with an internal battery charger circuit. Do not attempt to charge the batteries with an external charger other than the Dranetz-BMI battery charger, since improper charging could cause battery explosion.

ADVERTEN-CIA

NO ponga intencionalmente la batería en cortocircuito. Las baterías son capaces de proporcionar corrientes de salida peligrosas si están en cortocircuito. La Power Platform está equipada con un circuito interno cargador de baterías. No intente cargar las baterías con un cargador externo que no sea el cargador de baterías Dranetz-BMI, puesto que la carga indebida podría hacer que explote la batería.

AVERTISSE-MENT

NE PAS court-circuiter délibérément le bloc-batterie. Lors d'un court-circuit, les batteries risquent d'émettre des courants effectifs dangereux. "Power Platform" possède un circuit de chargeur de batterie intégré. Ne pas tenter de charger les batteries au moyen d'un chargeur externe autre que le chargeur de batterie Dranetz-BMI, car un rechargement fautif pourrait entraîner l'explosion de la batterie.

WARNUNG

Die Batterien dürfen NICHT kurzgeschlossen werden. Im Falle eines Kurzschlusses können die Batterien lebensgefährliche Ausgangsströme leiten. Power Platform ist mit einem internen Batterieladegerät ausgestattet. Die Batterien sollten nur mit dem Ladegerät von Dranetz-BMI geladen werden. Die Verwendung eines externen Ladegeräts kann zu einer Explosion der Batterien führen.

Battery Safety Precautions

The following safety precautions must be adhered to.

- Keep batteries away from children. Never permit a child to play with a battery as an ornament or toy.
- Do not disassemble battery or battery pack.
- Do not dispose of battery in fire.
- Dispose of a used battery promptly in accordance with local Environmental Protection Agency (EPA) regulations.

Continued on next page

Battery Pack Safety Precautions, Continued

Battery Safety Precautions (continued)

- Visually inspect the battery pack for corrosion.

Medidas de seguridad de la batería

Deberán observarse las medidas de seguridad siguientes:

- No deberá mantenerse las baterías al alcance de los niños. No deberá permitirse que un niño juegue con una batería.
- No deberá desensamblarse ninguna batería ni el compartimiento de la misma.
- No deberá prenderse fuego a una batería.
- Toda batería agotada deberá desecharse de manera rápida según las normas locales de la Agencia de protección del medio ambiente (EPA).
- Deberá verificarse que el compartimiento de las baterías no esté corroído.

Mesures de sécurité relatives aux batteries

Il est très important de suivre les mesures de sécurité suivantes.

- Ne pas laisser les batteries à la portée des enfants. Ne jamais laisser un enfant jouer avec une batterie.
- Ne pas démonter de batterie ou de bloc-batterie.
- Ne pas jeter de batterie dans le feu.
- Se débarrasser rapidement des batteries usagées en se conformant aux règlements de l'EPA (Agence américaine pour la protection de l'environnement).
- Inspecter le bloc-batterie à l'oeil nu pour rechercher les signes de corrosion.

Batterie-Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen müssen beachtet werden.

- Halten Sie Batterien von Kindern fern. Erlauben Sie einem Kind unter keinen Umständen, eine Batterie als Verzierung oder Spielzeug zu benutzen.
- Nehmen Sie Batterien oder Batteriepackungen nicht auseinander.
- Entsorgen Sie Batterien nicht durch Verbrennen.
- Entsorgen Sie verbrauchte Batterien umgehend nach den gesetzlichen Umweltschutzbestimmungen.
- Prüfen Sie die Batteriepackung optisch auf Korrosion.

Note

The batteries have a safety pressure vent to prevent excessive gas build-up and corrosion indicates that venting has occurred. Possible causes of venting are: a defective charger, excessive temperature, excessive discharge rate, or a defective cell.

If corrosion is excessive, the battery pack may require replacement (contact Dranetz-BMI Customer Service Department).

Battery Pack Replacement

Introduction

The Power Platform contains an easily replaceable internal battery pack. Replacement is recommended when the battery pack can no longer maintain a charge. Depleted battery packs may be charged outside the PP1 by using the optional battery charger. See Appendix A for battery pack ordering information.

Note

During normal operation, the battery pack will be slightly warm to the touch.

Procedure

Follow these steps to replace the battery pack.

Step	Action
1	Set the Power Platform's power switch to OFF.
2	On the top front section of the Power Platform, release the two slide fasteners holding the cover in place by pressing them inward.
3	Remove the cover.
4	Gently lift the battery pack from the battery compartment and disconnect the battery pack connector from the unit's mating connector.
5	Remove battery pack.
6	Connect the replacement battery pack connector to the unit's mating connector and place the new pack into the compartment.
7	Replace the cover and press down until it latches closed.
8	Discard the old battery pack in accordance with Environmental Protection Agency (EPA) regulations.
9	Set the Power Platform's power switch to ON.
10	Allow 8 hours to ensure a full charge. The Power Platform can be operated normally, using AC power, during this time.

Memory Card Battery Replacement

Introduction

Replacement of the 3-volt lithium battery in the memory card is performed when the battery message in the Memory Card Function screen states the battery is depleted. Replacement is simple and requires no special tools. Two physically different types of batteries are used due to different manufacturers of the memory card. The correct replacement type must be used.

WARNING

The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, or dispose of in fire. Replace battery with Panasonic BR2325 or CR2025 only. Use of another type battery may present a risk of fire or explosion.

ADVERTEN-CIA

La batería empleada en este dispositivo puede presentar un peligro de incendio o quemadura química si se manipula indebidamente. No recargue, desarme ni deseche en el fuego. Cambie la batería por una Panasonic BR2325 o CR2025 solamente. El uso de cualquier otro tipo de batería puede presentar un peligro de incendio o explosión.

AVERTISSE-MENT

La batterie utilisée dans cette unité peut présenter des risques d'incendie ou de brûlures chimiques par suite d'une utilisation abusive. Ne pas recharger, démonter, ni jeter au feu. Remplacer uniquement la batterie par une batterie Panasonic BR2325 ou CR2025. L'utilisation d'un tout autre modèle de batterie peut entraîner des risques d'incendie ou d'explosion.

WARNUNG

Die in diesem Gerät verwendete Batterie kann im Falle einer unsachgemäßen Behandlung zu Bränden oder chemischen Verätzungen führen. Sie sollte nicht wiederaufgeladen, auseinandergenommen oder verbrannt werden. Ersetzen Sie die Batterie nur mit Batterien vom Typ Panasonic BR2325 oder CR2025. Die Verwendung eines anderen Batterietyps kann Brände oder Explosionen hervorrufen.

Continued on next page

Memory Card Battery Replacement, Continued

Battery check

To check the condition of the memory card battery, perform the following steps.

Step	Action
1	Insert questionable memory card in memory card slot on Power Platform and press card in firmly.
2	Select Setup from the Main Menu.
3	Select item #2, Setups for the Advanced User.
4	Select item #4, Memory Functions.
	Select item #1, Memory Card Functions.
5	Read Memory Card Battery = Good. If good, do not replace the battery. If not good, proceed to replacement procedure.
6	If message says Good, but the memory card is faulty, try a different memory card for operation. If the replacement memory card operates OK, the original memory card is faulty and should be replaced.

Battery types

There are two types of physically different memory card batteries. Both batteries are 3-Volt, lithium, wafer type.

Part Number	Diameter	Thickness
Panasonic CR2025	0.79” (20mm)	0.1” (2.5mm)
Panasonic BR2325	0.9” (23mm)	0.1” (2.5mm)

Battery Safety Precautions

The following safety precautions must be adhered to.

- Keep batteries away from children. Never permit a child to play with a battery as an ornament or toy.
- Do not disassemble battery or battery pack.
- Do not dispose of battery in fire.
- Dispose of a used battery promptly in accordance with local Environmental Protection Agency (EPA) regulations.

Continued on next page

Memory Card Battery Replacement, Continued

Medidas de seguridad de la batería

Deberán observarse las medidas de seguridad siguientes:
- No deberá mantenerse las baterías al alcance de los niños. No deberá permitirse que un niño juegue con una batería.
- No deberá desensamblarse ninguna batería ni el compartimiento de la misma.
- No deberá prenderse fuego a una batería.
- Toda batería agotada deberá desecharse de manera rápida según las normas locales de la Agencia de protección del medio ambiente (EPA).

Mesures de sécurité relatives aux batteries

Il est très important de suivre les mesures de sécurité suivantes.
- Ne pas laisser les batteries à la portée des enfants. Ne jamais laisser un enfant jouer avec une batterie.
- Ne pas démonter de batterie ou de bloc-batterie.
- Ne pas jeter de batterie dans le feu.
- Se débarrasser rapidement des batteries usagées en se conformant aux règlements de l'EPA (Agence américaine pour la protection de l'environnement).

Batterie-Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen müssen beachtet werden.
- Halten Sie Batterien von Kindern fern. Erlauben Sie einem Kind unter keinen Umständen, eine Batterie als Verzierung oder Spielzeug zu benutzen.
- Nehmen Sie Batterien oder Batteriepackungen nicht auseinander.
- Entsorgen Sie Batterien nicht durch Verbrennen.
- Entsorgen Sie verbrauchte Batterien umgehend nach den gesetzlichen Umweltschutzbestimmungen.

Continued on next page

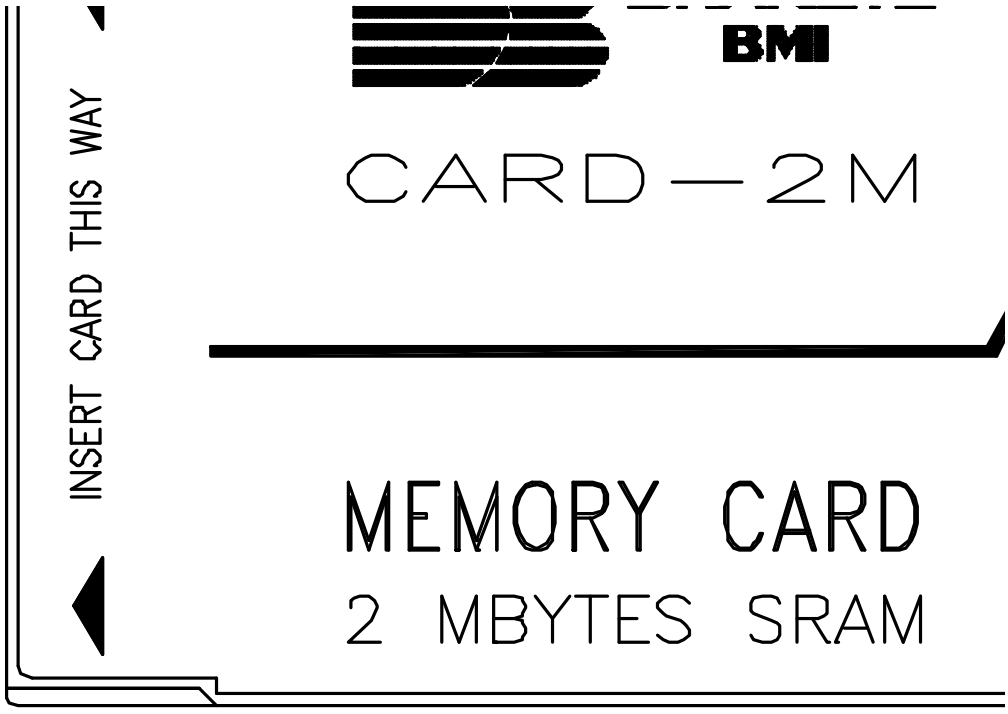
Memory Card Battery Replacement, Continued

Replacement procedure

To remove and replace a memory card battery, proceed with the following steps.

Step	Action
1	Remove memory card from Power Platform.
2	Refer to figure below. Gently press in battery release with pencil point and remove battery holder
3	Remove battery from holder and identify the type battery used. If type is not identified on body of battery refer to preceding page for battery dimensions.
4	Insert the exact type replacement battery in holder with plus (+) terminal facing up.
5	Insert battery holder into memory card and press in until locked in position.
6	Dispose of battery promptly. See safety precautions above.

Battery replacement diagram (typical)



Appendix D

Fuse Replacement

Overview

Introduction

Operator replaceable fuses consist of the main power fuses and the battery fuse. One of each type replacement fuse is located in the battery compartment and all fuses are accessible from the rear panel. Both types of replacement are covered in this appendix.

WARNING

For continued protection against risk of fire or shock replace only with the same type and rating of fuse.

ADVERTEN-CIA

Para la protección continua contra el peligro de incendio o descarga, cambie sólo por fusibles del mismo tipo y capacidad nominal.

AVERTISSE-MENT

Pour assurer une protection continue contre les risques d'incendie ou de choc, ne remplacez que par un fusible du même type et de la même valeur nominale.

WARNUNG

Zum anhaltenden Schutz gegen Brand oder einen elektrischen Schlag nur gegen eine Sicherung desselben Typs und mit demselben Nennwert austauschen.

In this appendix

The following topics are covered in this appendix.

Main Power Fuses

Main Power Fuses

Follow these steps to remove and replace the two main power fuses. Refer to the diagram on the following page.

Step	Action
1	Set the Power Platform's power switch to OFF.
2	Turn off all power to monitoring circuits. Disconnect all Power Platform monitoring cables from power sources.
3	Disconnect the power cord plug from its wall or power receptacle, then remove the power cord from the AC power input module on the rear panel.
4	Place a small screwdriver blade into the notch next to the release arm of the fuse drawer.
5	Push the release to the right and pivot the screwdriver to the left to release the fuse drawer.
6	Remove the fuse drawer by pulling it straight out of the housing.
7	Replace blown fuse(s) with the exact replacement of slow-blow (time-delayed) fuse(s). See Main Power Fuse table.
8	Insert fuse drawer and press in until it snaps into position.
9	Reconnect power cord to the AC power input module, then reconnect power cord plug to its wall or power receptacle.
10	Before powering the unit on, refer to Chapter 4, Section A for operating precautions.
11	Set the Power Platform's power switch to ON.
12	Verify that the unit is operational.

WARNING

Do not replace fuse again if failure is repeated. Repeated failure indicates a defective condition that will not clear with replacement of the fuse. Refer condition to a qualified technician.

ADVERTEN-CIA

No reemplace el fusible nuevamente si se repite la falla. La repetición de las fallas indica una condición defectuosa que no se subsanará con el cambio del fusible. Acuda a un técnico calificado para evaluar la condición.

Continued on next page

Main Power Fuses, Continued

AVERTISSEMENT

Ne remplacez pas le fusible une nouvelle fois si la défaillance se répète. Une défaillance répétée indique une condition défectueuse qui ne disparaîtra pas avec le remplacement du fusible. Consultez un technicien qualifié.

WARNUNG

Die Sicherung nicht erneut austauschen, wenn der Fehler noch einmal auftritt. Ein wiederholtes Auftreten des Fehlers weist auf einen Defekt hin, der sich nicht durch Austauschen der Sicherung beheben läßt. Den Defekt einem qualifizierten Techniker mitteilen.

Main Power Fuse table

Use this table to determine the type of fuse required.

	Main Power Fuse	Dranetz-BMI P/N
Model PP1	Slow blow, 250V, T2A, 3AG, glass tube 1/4 x 1 1/4	113204-G2
Model PP1E	Slow blow, 250V, T1.25A glass tube 5 x 20 mm (standard IEC127, type T, sheet III)	900387

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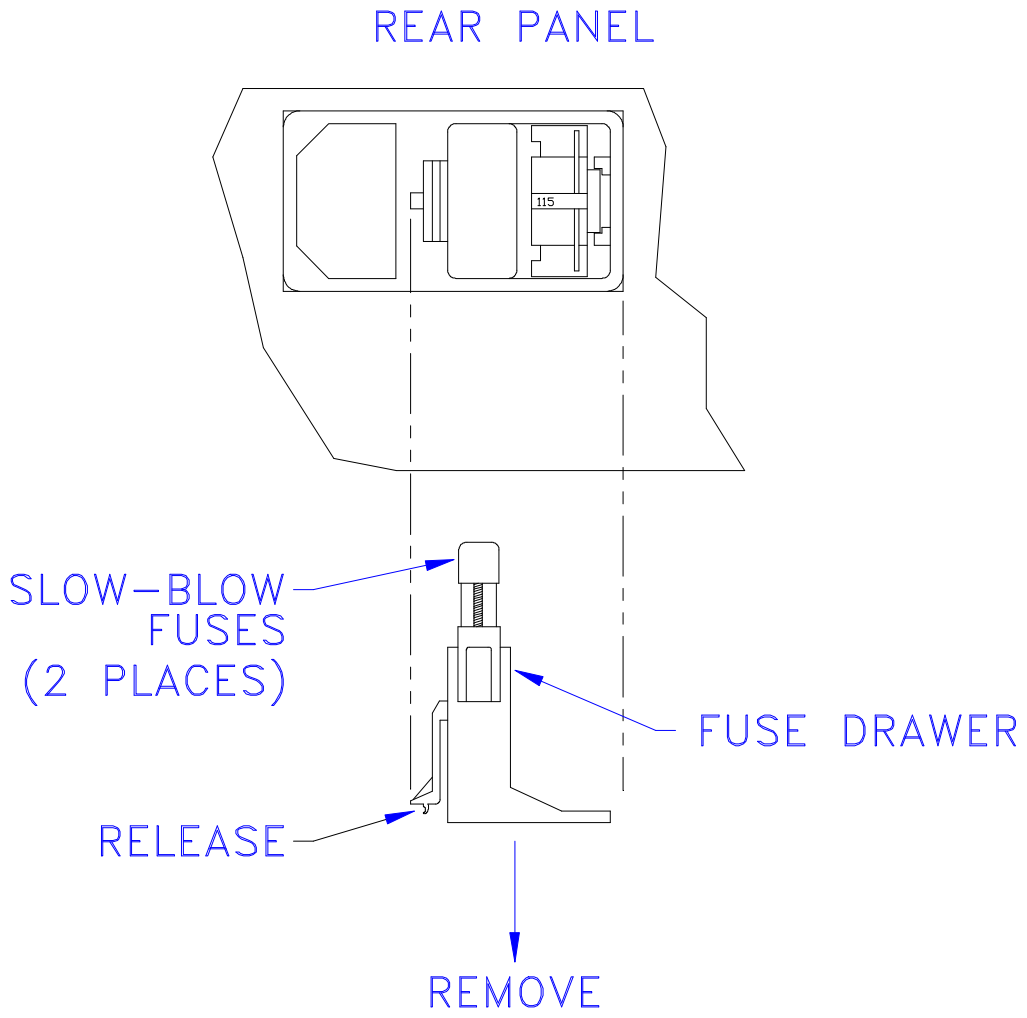
Main Power Fuses, Continued

Diagram



Battery Fuse

Introduction

The battery fuse is used for fusing the internal battery pack, as well as an external DC source that is connected to the DC power source jack on the rear of the unit.

Procedure

Follow these steps to replace the battery fuse.

Step	Action
1	Set the Power Platform's power switch to OFF.
2	Turn off all power to monitoring circuits. Disconnect all Power Platform monitoring cables from power sources.
3	If external DC source is being used, disconnect it or turn it off. If using an external DC battery, disconnect the negative terminal and then the positive terminal.
4	Disconnect external DC power source plug from external DC power source input jack on the rear panel of the Power Platform.
5	Insert the blade of a small screwdriver into the slot on the fuse cap and rotate a quarter turn counter clockwise.
6	Test fuse for continuity with an ohmmeter and replace fuse if blown. Replace blown fuse with the exact replacement of slow-blow (time delayed) fuse. See Battery Fuse table.
7	Reinsert the fuse cap and tighten securely.
8	Reconnect external DC source (if external DC source is being used).
9	Before powering the unit on, refer to Chapter 4, Section A for correct operating precautions.
10	Set the Power Platform's power switch to ON.

WARNING

Do not replace fuse again if failure is repeated. Repeated failure indicates a defective condition that will not clear with replacement of the fuse. Refer condition to a qualified technician.

ADVERTEN-CIA

No reemplace el fusible nuevamente si se repite la falla. La repetición de las fallas indica una condición defectuosa que no se subsanará con el cambio del fusible. Acuda a un técnico calificado para evaluar la condición.

Continued on next page

Battery Fuse, Continued

AVERTISSEMENT

Ne remplacez pas le fusible une nouvelle fois si la défaillance se répète. Une défaillance répétée indique une condition défectueuse qui ne disparaîtra pas avec le remplacement du fusible. Consultez un technicien qualifié.

WARNUNG

Die Sicherung nicht erneut austauschen, wenn der Fehler noch einmal auftritt. Ein wiederholtes Auftreten des Fehlers weist auf einen Defekt hin, der sich nicht durch Austauschen der Sicherung beheben läßt. Den Defekt einem qualifizierten Techniker mitteilen.

Battery Fuse table

Use this table to determine the type of fuse required.

	Main Power Fuse	Dranetz-BMI P/N
Model PP1	Slow blow, 250V, T10A, 3AB, ceramic tube 1/4 x 1 1/4	113204-G3
Model PP1E	Slow blow, 250V, T6.3A glass tube 5 x 20 mm. (standard IEC127, type T, sheet III)	900396

Appendix E

Operator Replaceable Parts List

Introduction

The following parts are readily replaceable by the operator and do not require special tools or access to the interior of the unit.

To order parts

Call Dranetz-BMI Customer Service to order any of the following parts, telephone 1-800-372-6832 or 732-287-3680.

Parts List

Part Description	Part Number
Rubber Foot (Rear Panel)	115284-G1
Screw for above, 6-32 x 5/8” Long	113200-G15
Keylock keys (2)	115282-G1
Label, RUN/LOAD	115117-G1
Fuse, Slow blow, 250V, T2A, 3AG, glass tube 1/4 x 1 1/4 (AC power input) for PP1	113204-G2
Fuse, Slow blow, 250V, T1.25A glass tube 5 x 20 mm (standard IEC127, type T, sheet III) (AC power input) for PP1E	900387
Fuse, Slow blow, 250V, T10A, 3AB, ceramic tube 1/4 x 1 1/4 (Internal/External Battery) for PP1	113204-G3
Fuse, Slow blow, 250V, T6.3A glass tube 5 x 20 mm (standard IEC127, type T, sheet III) (Internal/External Battery) for PP1E	900396
Battery Pack	FBP-8
Battery Cover, without latches	115110-G1
Latch for Battery Cover (2 req’d)	115341-G1
Rubber Foot (Display Assembly)	113304-G1
Measurement Cable Set, complete (See next page for separate parts.)	115815-G1

Continued on next page

Measurement Cable Set, Parts List

Part Description	Part Number		
	Domestic	**Euro**	**UK**
Measurement Cable Set	115815-G1	115815-G2	115815-G3
Cable Pallet	115816-G1	115816-G1	115816-G1
Interconnecting Cable Assy, Blue, 12 in. (30.5 cm)	114013-G1	114013-G1	114013-G1
Interconnecting Cable Assy, Red, 96 in. (243.8 cm)	114013-G2	114013-G2	114013-G2
Interconnecting Cable Assy, Black, 96 in. (243.8 cm)	114013-G3	114013-G3	114013-G3
Interconnecting Cable Assy, Blue, 96 in. (243.8 cm)	114013-G4	114013-G4	114013-G4
Interconnecting Cable Assy, Yellow, 96 in. (243.8 cm)	114013-G5	114013-G5	114013-G5
Safety Ground Cable Assy	114014-G5	114014-G5	114014-G5
Safety Clip Set Assy (Consists of 1 red and 1 black safety clip with attached caution label)	114890-G1	114890-G1	114890-G1
Power Cord, shielded, 115 VAC (Domestic)	110893-G1		
Power Cord, Shielded, 230 VAC (Euro)		115369-G1	
Power Cord, Shielded, 230 VAC (UK)			115368-G2

Appendix F
Specifications

Overview

In this appendix The following specifications are covered in this appendix.

Note Specifications subject to change without notice.

General

Dimensions	Size: 7” Height x 13” Width x 10” Depth (17.8 x 33 x 25.4 cm) Weight: 20.8 pounds (9.4 kg)
Environmental	Operating: 5 to 45° Celsius (41 to 113° F) Storage: -20 to 55° Celsius (-4 to 131° F). Humidity: 10% to 90% non-condensing.
System Time Clock	Crystal controlled. 1 second resolution. Event time clock displays to 10msec resolution time displayed in 24 hour format HH:MM:SS. Accurate to 60 seconds per month.
Memory	750 kbytes of standard non-volatile data RAM (event storage). 256 kbytes of standard volatile data RAM (system memory). 768 kbytes of program RAM. (system memory) 256 kbytes of program EPROM. (system memory)
Memory Card	512Kbytes to 2Mbytes depending on the optional card memory capacity.
Note	A 15 minute warm up period is required to ensure that all performance specifications are met.
Power Requirements	Voltage: Switch selectable 90-130 or 180-250 V RMS. Frequency: 47-450 Hz. Consumption: 100 watts max. Unit will also operate using a 12 Vdc, 10 A external battery with filtering.
Installation Categories	Mains supply: Installation Category II, Pollution Degree 2 Measurement inputs: Installation Category III, Pollution Degree 2

Interfaces

Display

Type: Negative Transmissive Liquid Crystal Display (LCD) with Electroluminescent (EL) backlighting.

Resolution: 240 x 128 dot matrix.

Size: 4.25 x 2.27 inches.

Printer

Type: High resolution thermal graphics printer.

Resolution: 320 dots per line.

Speed: 1 inch per second.

Paper: 2.36 inches by 98 feet thermal paper.

Report size: Approximately 4 inches wide.

Serial Port

One RS232D female 25-pin D-type connector.

Configuration: DCE

Data rate: 300 to 9600 baud

Stop bits: 1

Parity: Odd, even, or none

Internal Modem/Fax

Not used with Flicker TASKCard.

Compatible with: Bell 103, Bell 212A, V.22, V.22 bis Responds to "AT" command set, FAX is group III compatible.

Modem data rate: 300, 1200, 2400 baud (automatic)

Fax data rate: 9600

Phone jack (USOC): RJ-11C

FCC registration: B46USA-65156-FA-E

Ringer equivalence: 0.2 A

Interfaces, Continued

Relay outputs	*Not used with Flicker TASKCard.* One relay for external access rated 120 V AC or 30 V DC at 1 amp max. Rated as pilot relay.
Alarm	Audible alarm of short duration (approximately 0.1 second) indicates an error condition. Audible alarm of long duration (approximately 1 second) indicates an event trigger.

Measured Parameters

Voltage	Four fully differential voltage channels. Channels A,B,C range: 10-600 Vrms max Crest factor: Maximum of 2 at full scale Accuracy: ±0.5% of reading ±0.05% full scale
Current	Four independent current input channels. Channels A,B, C range: 10%-200% of full scale CT rating Channels A,B,C crest factor: Maximum of 3 at full scale Accuracy: ±0.5% of reading ±0.05% of full scale, at fundamental frequency, using Dranetz-BMI CT-10, CT-150, CT-300, CT-1000, CT-3000 probes only.
Flicker accuracy	Pst=1.0 within 5% measured at 50 Hz, 240 V, per *IEC 868:1986 Amendment 1, Section A4, Table A1*.

Continued on next page

Measured Parameters, Continued

Phase	Each voltage/current pair (i.e. Channel A voltage, Channel A current) are sampled simultaneously to preserve phase relationship.
Input resistance	Voltage input: 8 M ohms Current input: 200 K ohms
Frequency	Fundamental range: 30Hz - 450Hz Accuracy: ±0.2% of reading
Environmental	All specifications are met at 25 degrees Celsius (77° F) Temperature coefficient for measured parameters is approximately 200 ppm of full scale per degree Celsius.

Current Probes

Guidelines

To achieve the rated accuracies, follow theses guidelines:

- The conductor must be at a right angle to the probe
- The conductor must be centered in the probe core
- The jaw contact surfaces must be clean and properly aligned.

Specifications

The following table lists the operating specifications for optional Dranetz-BMI current probes.

	CT10	**CT150**	**CT300**	**CT1000**	**CT3000**
Current Range for Amplitude Accuracy (Arms) of 0.5%	1 to 10	3 to 125	10 to 300	50 to 1000	200 to 3000
Current Range for Phase Accuracy of 0.2° (Arms) at Calibration Point (*x*)	2 to 10 (5)	5 to 125 (30)	15 to 300 (200)	100 to 1000 (200)	300 to 3000 (300)
Frequency Range (Hz)	45 to 10,000	45 to 10,000	15 to 10,000	30 to 50,000	30 to 5000
Impulse Width	Typically -3dB at 1 µsec at one-half sine wave.				
Output Signal of 3 Vrms at	10 Arms	150 Arms	300 Arms	1000 Arms	3000 Arms
Maximum Conductor Size	0.47" (12mm)	0.47" (12mm)	2.13" (54mm)	2.17" (55mm)	2.56" (65mm) or 1.97" x 5.3" (50 x 135 mm) or 2.56" x 3.94" (65 x 100 mm)

Environmental

Operation:5 to 45 degrees Celsius (41 to 113° F)

Storage: -20 to 55 degrees Celsius (-4 to 131° F)

Isolated Current Transformer Boxes

Specifications

The following tables list the operating specifications for Dranetz-BMI isolated current transformers.

	ISO-1	ISO-1A	ISO-5
Current Range (Arms)	0.02 to 1.0 2.0 Arms max	0.02 to 1.0 2.0 Arms max	0.10 to 5.0 10.0 Arms max
Frequency Response (Hz)	50 to 3000	50 to 3000	50 to 3000
Output signal	3 Vrms @1 Arms	2 Vrms @ 1 Arms	3 Vrms @ 5 Arms
Accuracy	±1% 0.2 to 1 Arms	±1% 0.2 to 1 Arms	±1% 0.5 to 5 Arms
Scale Factor	0.333	0.500	1.666

Environmental

Operation: 5 to 45 degrees Celsius (41 to 113° F)

Storage: -20 to 55 degrees Celsius (-4 to 131° F)

Appendix G

Connecting an External DC Power Supply

Overview

Introduction

An external DC source of power can be connected to the Power Platform for normal operation without having to rely on local AC power. An external stand-alone automotive battery (installed in or out of the vehicle) or a regulated DC power supply of at least 10 amps capacity may be used. Connection is made to the DC external source jack in the lower left corner of the rear panel.

WARNING

Physical injury or damage to the instrument could result from incorrect connections. Always observe correct polarity. Make connections to the PP1 first and then make connections to the external DC power source.

ADVERTEN-CIA

Podrían producirse lesiones físicas o daños al instrumento debido a conexiones incorrectas. Siempre observe la polaridad correcta. Efectúe primero las conexiones al PP1 y luego haga las conexiones a la fuente de energía de corriente continua externa.

AVERTISSE-MENT

Des connexions incorrectes risquent de causer des blessures aux personnes ou l'endommagement du matériel. Observez toujours la polarité correcte. Faites les connexions au PP1 en premier, puis branchez sur la source d'alimentation c.c. externe.

WARNUNG

Falsche Verbindungen können zu Verletzungen oder Schäden am Gerät führen. Immer auf richtige Polarität achten. Zuerst Anschlüsse mit dem PP1 und dann Anschlüsse mit der externen Gleichspannungsquelle vornehmen.

CAUTION

The internal battery of the Power Platform must be installed and charged before connecting an external power source to prevent possible damage to the Power Platform and/or the external power source.

Continued on next page

PRECAUTION **Debe estar instalada y cargada la batería interna del PP1 antes de conectar a una fuente de energía externa, a fin de prevenir posibles daños al PP1 y a la fuente de energía externa. Si se desconoce la condición cargada de la batería interna, cargue la batería por lo menos durante 16 horas.**

MISE EN GARDE **La batterie interne du PP1 doit être installée et chargée avant toute connexion à une source d'alimentation externe afin d'éviter tout risque d'endommagement du PP1 et de la source d'alimentation externe. Si l'état de charge de la batterie interne n'est pas connu, chargez la batterie pendant un minimum de 16 heures.**

VORSICHT **Zur Vermeidung möglicher Schäden am PP1 und der externen Spannungsquelle muß die interne Batterie des PP1 vor dem Anschluß an eine externe Spannungsquelle installiert und aufgeladen werden. Ist der Ladezustand der internen Batterie nicht bekannt, die Batterie mindestens 16 Stunden lang aufladen.**

Standard Accessory A DC connector, P/N 107506, is supplied with the Power Platform to permit you to make your own external power connecting cable.

Optional Accessories Optional connecting cables and a DC filter are available as accessories to connect external DC sources.

In this appendix The following topics are covered in this appendix.

Making and Connecting the DC Input Cable

Description

A connector plug is supplied with the Power Platform for making a cable for connection to a stand alone battery or DC supply.

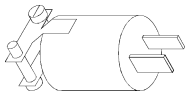
Connection to Power Platform: External DC power source jack (10-16V) on the rear panel

Maximum cable length: 6 feet

Minimum wire size: 16 AWG

Connector plug

The connector plug shown below (P/N 107506) is supplied as a standard accessory with the Power Platform.



8000-15

Restrictions

If the cable will be longer than 6 feet, or if the internal battery is to be connected to any other device (including a charging system), use the optional battery filter (Option XBF-12) and recommended optional cables. See page C-3.

Making the DC cable

Follow these guidelines when making the DC cable.

- Connect a 16 AWG black colored wire (6 feet max) to pin 1 (wide prong) of connector plug. This is the negative (-) terminal.
- Connect a 16 AWG red colored wire (6 feet max) to pin 2 of the connector plug. This is the positive (+) terminal.

WARNING

Physical injury, or equipment damage could result if the cable is wired incorrectly. Verify all connections are correct before proceeding.

ADVERTEN-CIA

Podrían producirse lesiones físicas o daños al equipo si se conecta incorrectamente el cable. Compruebe que todas las conexiones estén correctas antes de proceder.

Continued on next page

AVERTISSEMENT

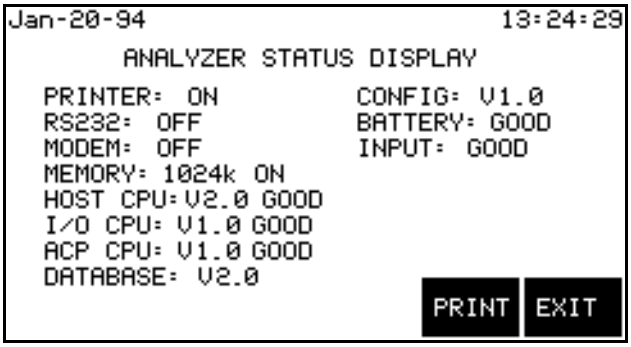
Une connexion incorrecte du câble risque de causer des blessures aux personnes ou l'endommagement du matériel. Vérifiez que toutes les connexions sont correctes avant de poursuivre.

WARNUNG

Bei einem falschen Anschluß des Kabels kann es zu Verletzungen oder Schäden am Gerät kommen. Vor dem Fortfahren überprüfen, ob alle Anschlüsse ordnungsgemäß vorgenommen wurden.

Internal battery check

TASKCard Flicker continuously monitors the condition of the internal battery and will display a screen warning if the condition of the internal battery is bad. When using TASKCards other than Flicker, follow the steps below to check the status of the internal battery before connecting an external DC source.

Step	Action
1	From the Main Menu, select item 5, View Status.
2	Press ANLYZR STATUS. Result: A screen similar to the following will appear. 
3	Verify that the Battery=Good statement is displayed.

Continued on next page

Making and Connecting the DC Input Cable, Continued

CAUTION **Do not connect an external DC source if the battery statement is other than GOOD. Determine cause of battery fault before continuing.**

PRECAUCION **No conecte una fuente de CC externa si el estado de la batería no es GOOD (BUENO). Determine la causa de la falla de la batería antes de continuar.**

MISE EN GARDE **Ne pas connecter une source d'alimentation c.c. si l'état affiché de la batterie n'est pas GOOD (BON). Il est important de déterminer pourquoi la batterie est faible avant de continuer.**

VORSICHT **Schließen Sie keine externe DC-Stromversorgungsquelle an, wenn der Zustand der Batterie anders als "GOOD" (Gut) ist. Bestimmen Sie die Ursache des Batteriefehlers, bevor Sie fortfahren.**

Connecting the cable

Follow these steps when connecting the DC cable to the Power Platform.

Step	Action
1	Turn off power to Power Platform.
2	Turn off power to the external power source.
3	Disconnect cable wires from battery terminals, if connected.
4	Connect plug of DC cable to Power Platform 10-16V external power input jack on rear panel.
5	Connect DC cable wires to external power source (battery or power supply).
6	Turn on external power supply, if connected.
7	Turn on power to the Power Platform.

External Battery Filter

Introduction

Battery Filter, Model XBF-12, hereinafter referred to as the filter, provides external DC filtering for an external power source connected to the Power Platform. The filter provides a filtered DC input to the external power input jack on the Power Platform. The filter suppresses automotive ignition noise and discriminates against voltage transients greater than 18 VDC peak.

External power source

The external power source can consist of a 12V stand-alone battery or charging circuit of 12-16 VDC. If an automotive battery is used, it is recommended that the automotive engine be operating so that the battery is charging during usage.

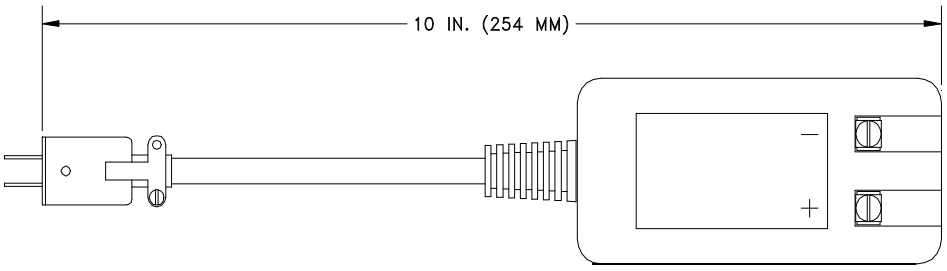
If using own cable

If using the battery filter with your own cable, maximum cable length cannot exceed 25 feet. The minimum wire size to use is 16 AWG. Use black colored wire to connect to the negative terminal on the battery filter. Use red colored wire to connect to the positive terminal.

Filter description

The filter, Model XBF-12, shown below, consists of a two-terminal enclosure connected to an eight inch cable assembly, which is terminated by a two-pin plug. The two-pin polarized plug is connected to the rear panel connector jack, labeled 10-16VDC, on the Power Platform. Polarity indicators are provided on the cover for the terminal connections.

Filter diagram



8600-32

Extension Cables

Introduction

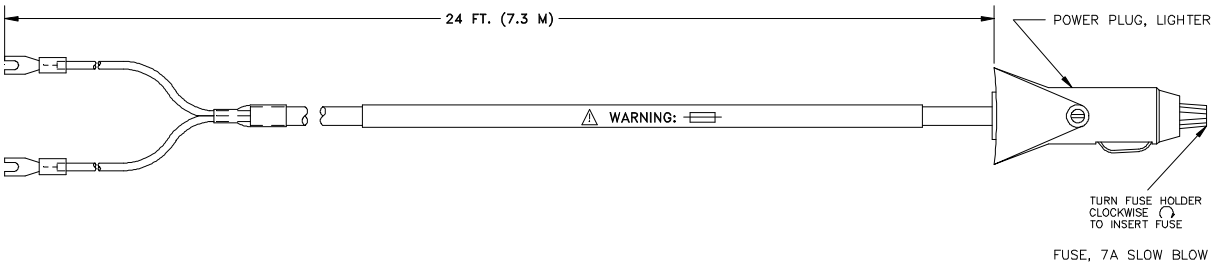
Two types of accessory extension cables, shown below, permit connection of the filter to either an automotive cigarette lighter jack (also referred to as an accessory outlet) or to the terminal posts of a stand-alone battery. Both cables are 24 feet (7.3M) long and have spade lugs for connection of the two wires to the filter assembly terminals (+ Red, - Black).

Lighter cable description

The lighter cable assembly plug contains an internal 7 amperes slow blow fuse to protect the automotive circuitry.

Lighter cable diagram

The battery extension lighter cable assembly, P/N 115586-G1, is shown below.



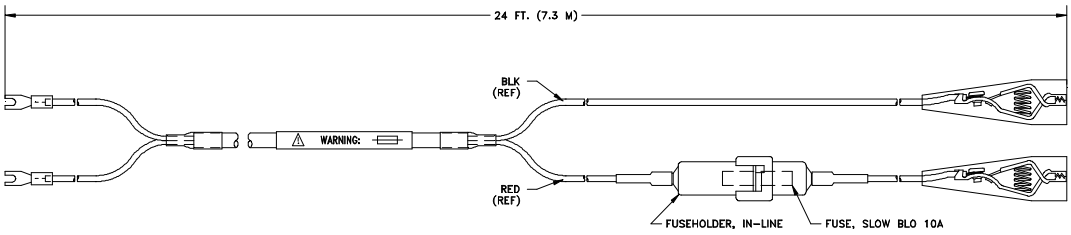
8600-33

Clip cable description

The clip cable assembly provides direct connection to the battery with crocodile clips and contains a 10 amp slow blow fuse in an in-line fuse holder of the red lead.

Clip cable diagram

The battery extension clip cable assembly, P/N 115587-G1, is shown below.



8600-34

Installing the Battery Filter

Before you begin

Before you install the filter, perform the internal battery check that is detailed on page G-4.

Connect cable assembly to filter

Follow these steps to connect either cable assembly to the filter.

Step	Action
1	Turn off the Power Platform and disconnect the AC input power plug from the rear panel input connector.
2	Select the type of extension cable to use depending on the voltage source. Note: Do not connect extension cable to source at this time.
3	Connect the extension cable spade lugs to the Filter assembly terminal connections. Red wire lug to plus (+) terminal and Black wire lug to negative (-) terminal.

CAUTION

Damage to the Power Platform and/or the external power source may occur if the lugs are reversed. Verify the proper color wires are connected to the correct polarity terminals; red wire to positive (+), black wire to negative (-).

PRECAUCION

Pueden ocurrir daños a la Plataforma de energía y/o a la fuente de energía externa si se invierten las patas. Verifique si están conectados los alambres de color correcto a los terminales de la polaridad correcta; alambre rojo a positivo (+), alambre negro a negativo (-).

MISE EN GARDE

L'inversion des languettes peut endommager la plate-forme d'alimentation et/ou la source d'alimentation externe. Assurez-vous que les fils de couleur sont connectés aux bornes appropriées ; le fil rouge sur le positif (+) et le fil noir sur le négatif (-).

VORSICHT

Beschädigung an der "Power Platform" und/oder der externen Stromversorgungsquelle kann auftreten, wenn die Drähte vertauscht werden. Prüfen Sie die Farben der Drähte und ob diese an den richtigen Polaritäts-Terminals angeschlossen sind; roter Draht an Positiv (+), schwarzer Draht an Negativ (-).

Installing the Battery Filter, Continued

Connecting filter to Power Platform

Connect polarized plug of the filter assembly into Power Platform rear panel jack (10-16 VDC).

CAUTION

Before connecting or disconnecting directly to a stand-alone battery, place a damp cloth over the battery cell vent holes.

PRECAUCION

Antes de conectar o desconectar directamente a una batería autónoma, coloque un paño húmedo sobre el agujero de ventilación de la célula de la batería.

MISE EN GARDE

Avant la connexion ou la déconnexion directe d'une batterie autonome, placez un linge humide sur les orifices de ventilation de l'élément de batterie.

VORSICHT

Legen Sie vor dem Anschluß oder Abklemmen direkt an eine "Stand-Alone"-Batterie einen feuchten Lappen über die Batteriezellen-Ventilationslöcher.

Connecting cable to external DC power source

Step	Action
1	If vehicle mounted battery is being used, turn off vehicle ignition.
2	If clip cable is used, go to step 3. If cigarette lighter plug cable is used, go to step 5.
3	Connect the positive (+) red clip to the positive (+) battery terminal.
4	Connect the negative (-) black clip to a negative common connection other than directly to the battery terminal.
5	Connect the cigarette lighter plug to vehicle lighter jack. The external source can be in its normal charging operation after connection (for instance; the automotive engine may be running).
6	(Optional) Replace ac power plug to Power Platform power input jack if ac power is available.
7	Turn on vehicle ignition and start engine, if vehicle battery is being used.

Disconnecting cables

Follow these steps when disconnecting an external DC power source.

Step	Action
1	Shut off power to Power Platform.
2	Turn off ignition at vehicle or disconnect power source connectors at power source.
3	Disconnect plug from DC input on Power Platform.
4	Return to normal Power Platform operation.

Appendix H

Flicker Menu Structure

Overview

The menu structure for Flicker is shown on the following pages. The Main Menu is the origin for most menus once TASKCard operation begins. Other menus return to the Main Menu upon completion of their tasks.

Menu structure aids

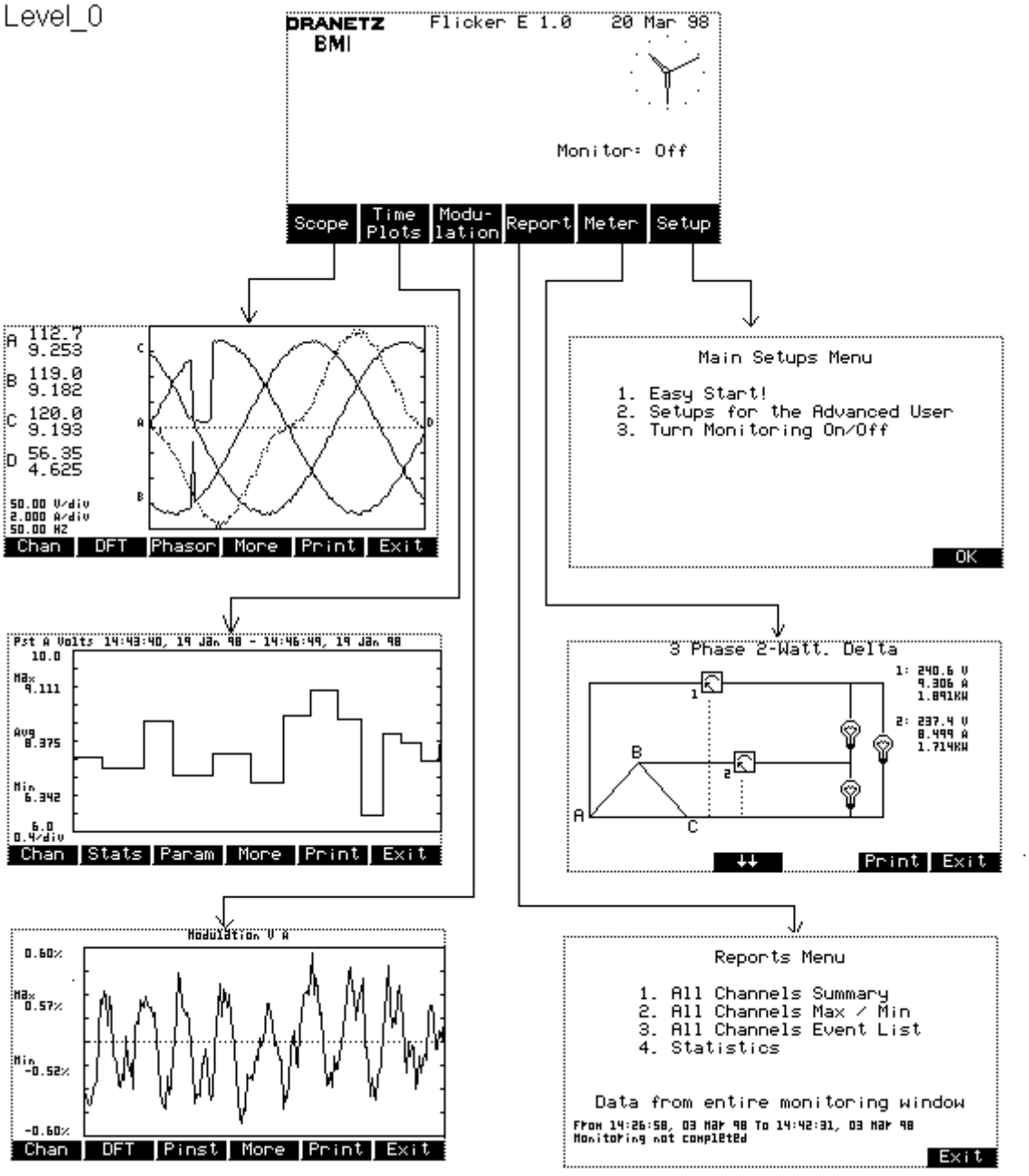
The function keys at the bottom of all screens permit selection of multiple functions. The Menu Structure displays the functions available under each function key. Scanning the listing under a major function can help you find a related function and its access.

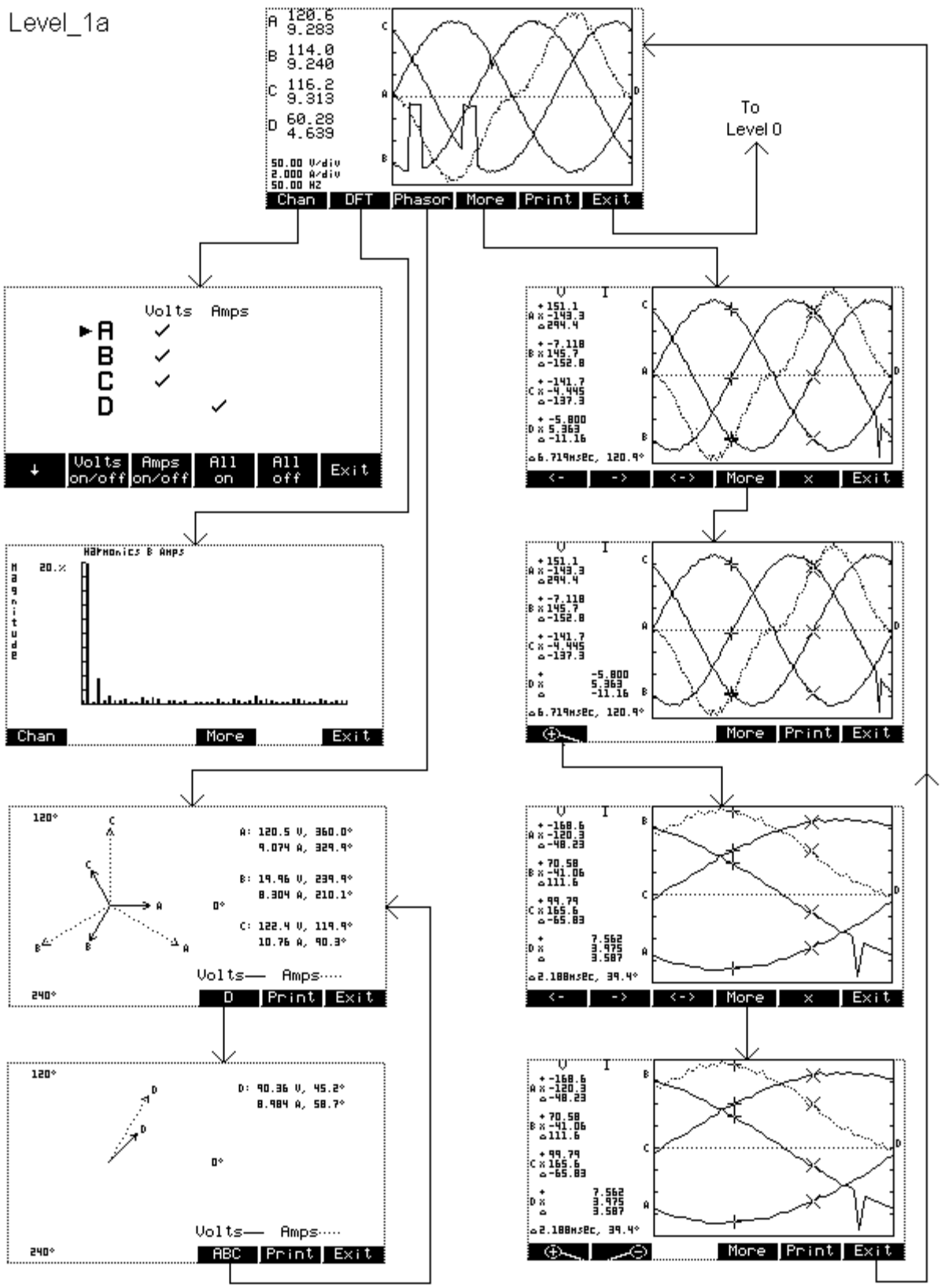
How to use these diagrams

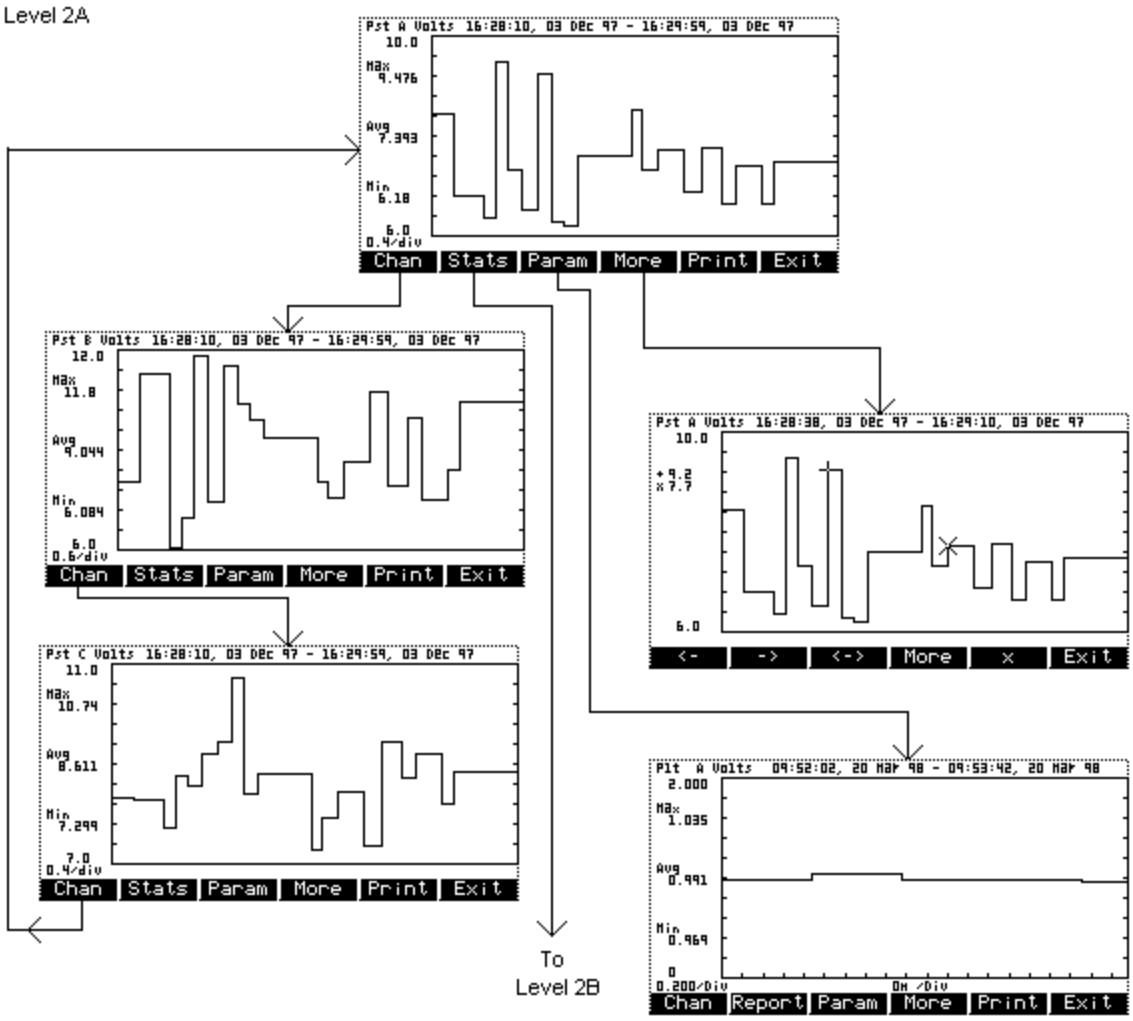
The following pages are organized by Levels 0 through 6. The top Main Menu screen is defined as Level 0. The function keys on the Main Menu screen are defined from left to right as Level 1 through Level 6 as shown:

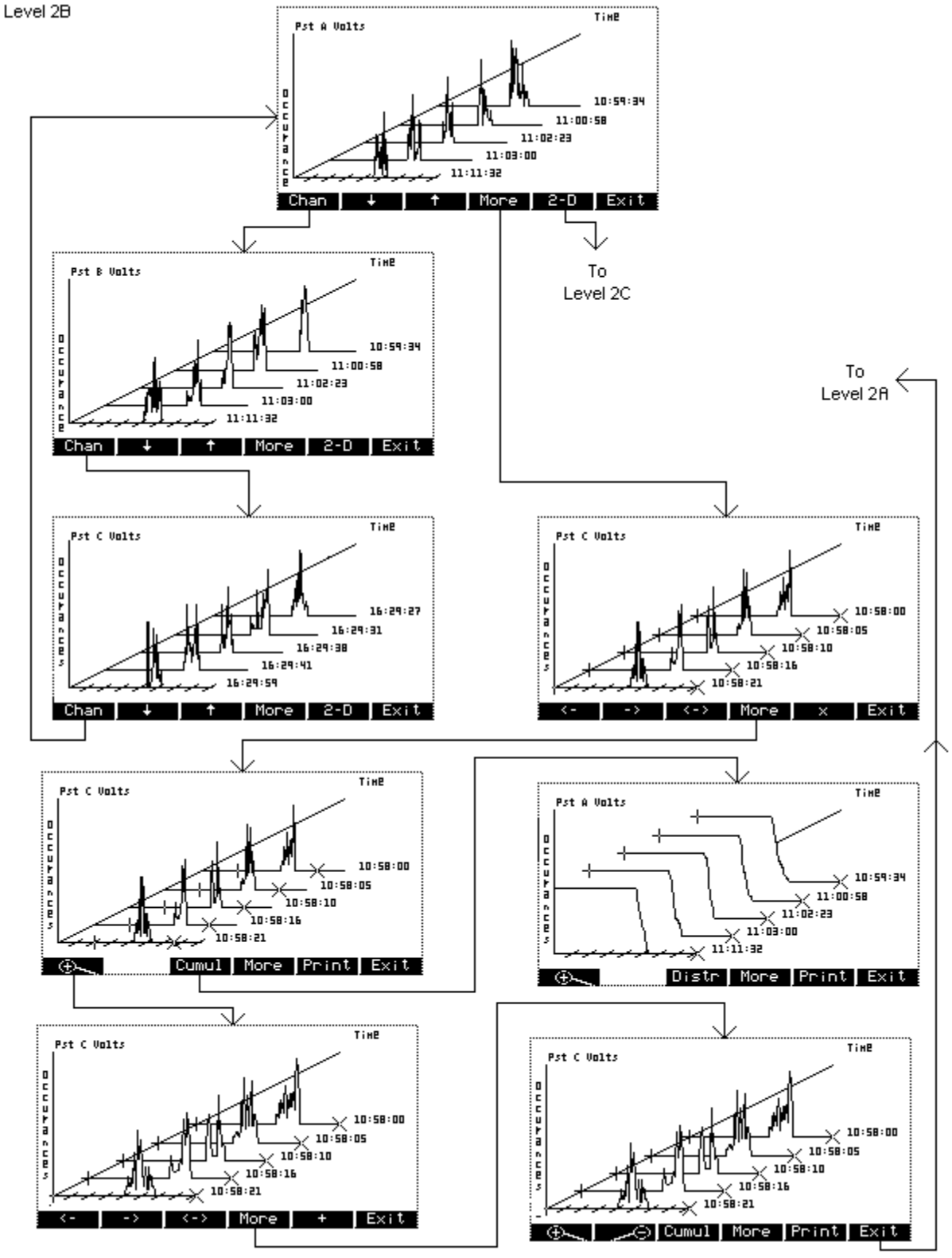
Scope	Time Plots	Modu-lation	Report	Meter	Setup
Level 1	Level 2	Level 3	Level 4	Level 5	Level 6

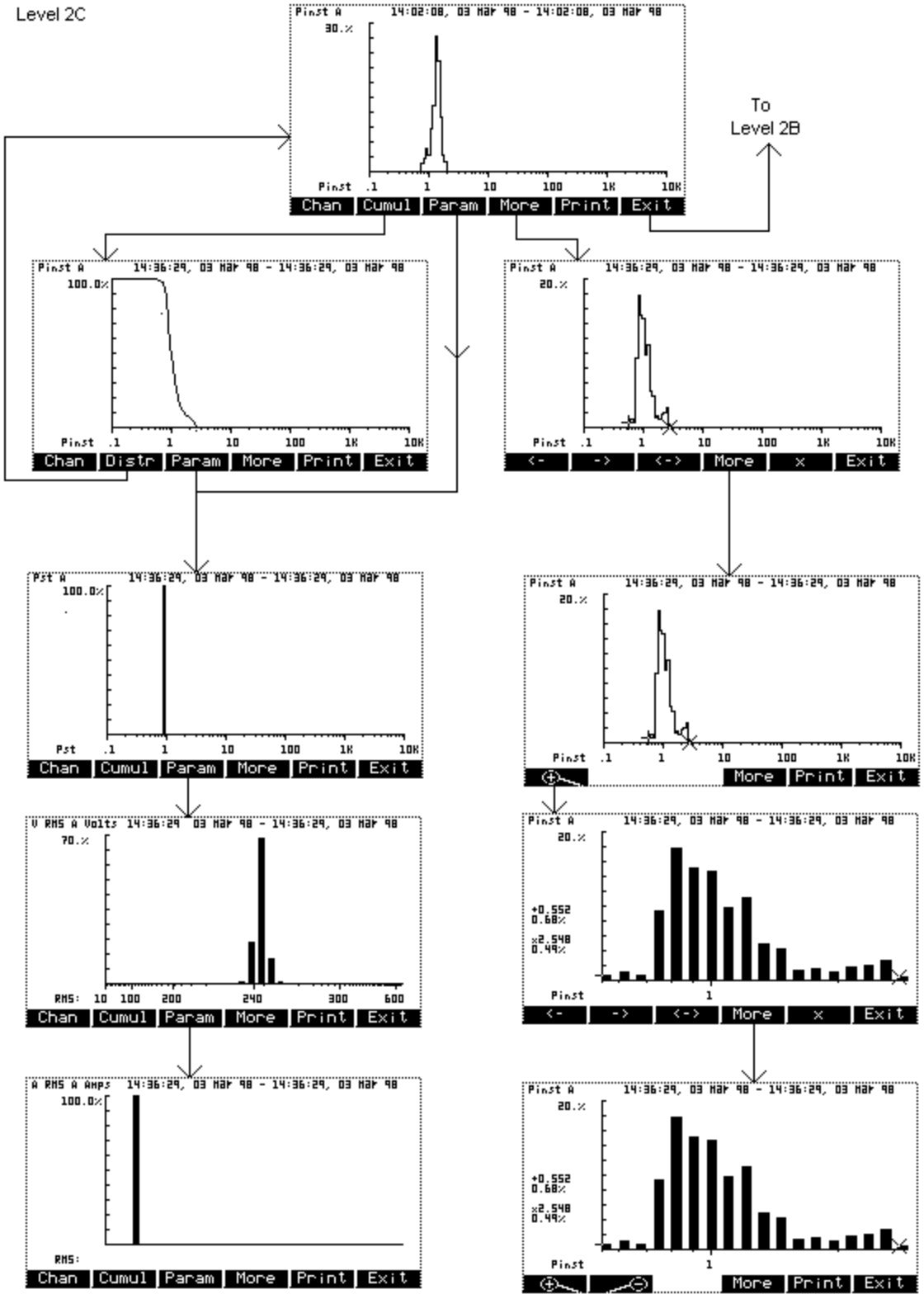
Some functions have multiple screen levels, which are defined (for example) as Level 4A, Level 4B, etc.


Level_0
DRANETZ BMI
Flicker E 1.0
20 Mar 98
Monitor: Off
Scope
Time Plots
Modu-lation
Report
Meter
Setup
A 112.7 9.253
B 119.0 9.182
C 120.0 9.193
D 56.35 4.625
50.00 V/div
2.000 A/div
50.00 HZ
Chan
DFT
Phasor
More
Print
Exit
Main Setups Menu
1. Easy Start!
2. Setups for the Advanced User
3. Turn Monitoring On/Off
OK
Pst A Volts 14:43:40, 19 Jan 98 - 14:46:49, 19 Jan 98
10.0
Max 9.111
Avg 8.375
Min 6.342
6.0
0.4/div
Chan
Stats
Param
More
Print
Exit
3 Phase 2-Watt. Delta
1: 240.6 V
9.306 A
1.891KW
2: 237.4 V
8.499 A
1.714KW
A
B
C
Print
Exit
Modulation V A
0.60%
Max 0.57%
Min -0.52%
-0.60%
Chan
DFT
Pinst
More
Print
Exit
Reports Menu
1. All Channels Summary
2. All Channels Max / Min
3. All Channels Event List
4. Statistics
Data from entire monitoring window
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Exit

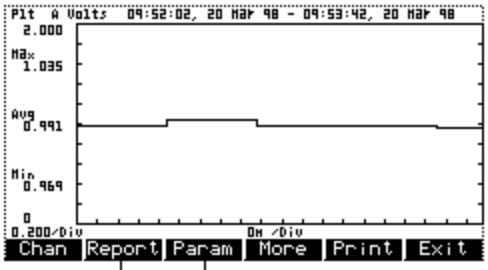

Level_1a
A 120.6
9.283
B 114.0
9.240
C 116.2
9.313
D 60.28
4.639
50.00 V/div
2.000 A/div
50.00 HZ
Chan
DFT
Phasor
More
Print
Exit
To
Level 0
Volts Amps
A
B
C
D
Volts on/off
Amps on/off
All on
All off
Exit
Harmonics B Amps
Magnitude
20.%
Chan
More
Exit
120°
240°
A: 120.5 V, 360.0°
9.074 A, 329.9°
B: 19.96 V, 239.9°
8.304 A, 210.1°
C: 122.4 V, 119.9°
10.76 A, 90.3°
0°
Volts— Amps·····
D
Print
Exit
D: 90.36 V, 45.2°
8.984 A, 58.7°
ABC
<-
->
<->
x
+151.1
A x -143.3
Δ294.4
+-7.118
B x 145.7
Δ-152.8
+-141.7
C x -4.445
Δ-137.3
+ -5.800
D x 5.363
Δ -11.16
Δ6.719mSec, 120.9°
+-168.6
A x -120.3
Δ-48.23
+70.58
B x -41.06
Δ111.6
+99.79
C x 165.6
Δ-65.83
+ 7.562
D x 3.975
Δ 3.587
Δ2.188mSec, 39.4°

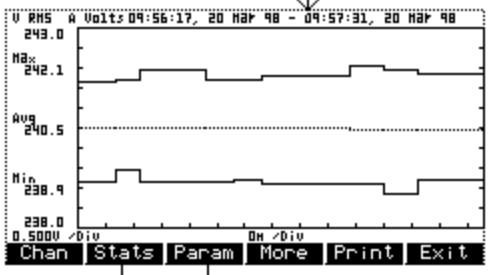

Level 2A
Pst A Volts 16:28:10, 03 DEc 97 - 16:29:59, 03 DEc 97
10.0
Max 9.476
Avg 7.393
Min 6.18
6.0
0.4/div
Chan Stats Param More Print Exit
Pst B Volts 16:28:10, 03 DEc 97 - 16:29:59, 03 DEc 97
12.0
Max 11.8
Avg 9.044
Min 6.084
6.0
0.6/div
Chan Stats Param More Print Exit
Pst A Volts 16:28:38, 03 DEc 97 - 16:29:10, 03 DEc 97
10.0
+ 9.2
x 7.7
6.0
<- -> <-> More x Exit
Pst C Volts 16:28:10, 03 DEc 97 - 16:29:59, 03 DEc 97
11.0
Max 10.74
Avg 8.611
Min 7.299
7.0
0.4/div
Chan Stats Param More Print Exit
Plt A Volts 09:52:02, 20 Mar 98 - 09:53:42, 20 Mar 98
2.000
Max 1.035
Avg 0.991
Min 0.969
0
0.200/Div
OH /Div
Chan Report Param More Print Exit
To
Level 2B

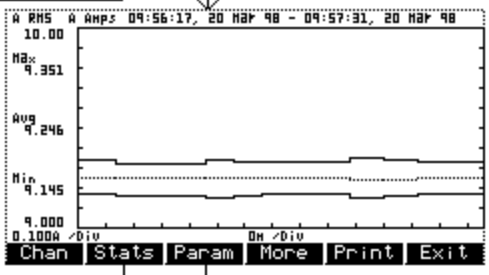

Level 2B
Pst A Volts
Time
Occurances
10:59:34
11:00:58
11:02:23
11:03:00
11:11:32
Chan
↓
↑
More
2-D
Exit
To
Level 2C
Pst B Volts
Time
Occurances
10:59:34
11:00:58
11:02:23
11:03:00
11:11:32
Chan
↓
↑
More
2-D
Exit
To
Level 2A
Pst C Volts
Time
Occurances
16:29:27
16:29:31
16:29:38
16:29:41
16:29:59
Chan
↓
↑
More
2-D
Exit
Pst C Volts
Time
Occurances
10:58:00
10:58:05
10:58:10
10:58:16
10:58:21
<-
->
<->
More
x
Exit
Pst C Volts
Time
Occurances
10:58:00
10:58:05
10:58:10
10:58:16
10:58:21
Cumul
More
Print
Exit
Pst A Volts
Time
Occurances
10:59:34
11:00:58
11:02:23
11:03:00
11:11:32
Distr
More
Print
Exit
Pst C Volts
Time
Occurances
10:58:00
10:58:05
10:58:10
10:58:16
10:58:21
<-
->
<->
More
+
Exit
Pst C Volts
Time
Occurances
10:58:00
10:58:05
10:58:10
10:58:16
10:58:21
Cumul
More
Print
Exit


Level 2C
To
Level 2B
Pinst A 14:02:08, 03 Mar 98 - 14:02:08, 03 Mar 98
30.%
Pinst .1 1 10 100 1K 10K
Chan Cumul Param More Print Exit
Pinst A 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
100.0%
Pinst .1 1 10 100 1K 10K
Chan Distr Param More Print Exit
Pinst A 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
20.%
Pinst .1 1 10 100 1K 10K
<- -> <-> More x Exit
Pst A 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
Chan Cumul Param More Print Exit
Pinst A 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
20.%
Pinst .1 1 10 100 1K 10K
More Print Exit
V RMS A Volts 14:36:29 03 Mar 98 - 14:36:29, 03 Mar 98
70.%
RMS: 10 100 200 240 300 600
Chan Cumul Param More Print Exit
Pinst A 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
20.%
+0.552
0.68%
x2.548
0.49%
Pinst 1
<- -> <-> More x Exit
A RMS A Amps 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
100.0%
RMS:
Chan Cumul Param More Print Exit
Pinst A 14:36:29, 03 Mar 98 - 14:36:29, 03 Mar 98
20.%
+0.552
0.68%
x2.548
0.49%
Pinst 1
More Print Exit

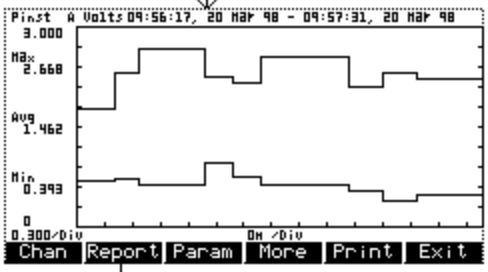
Level 2D



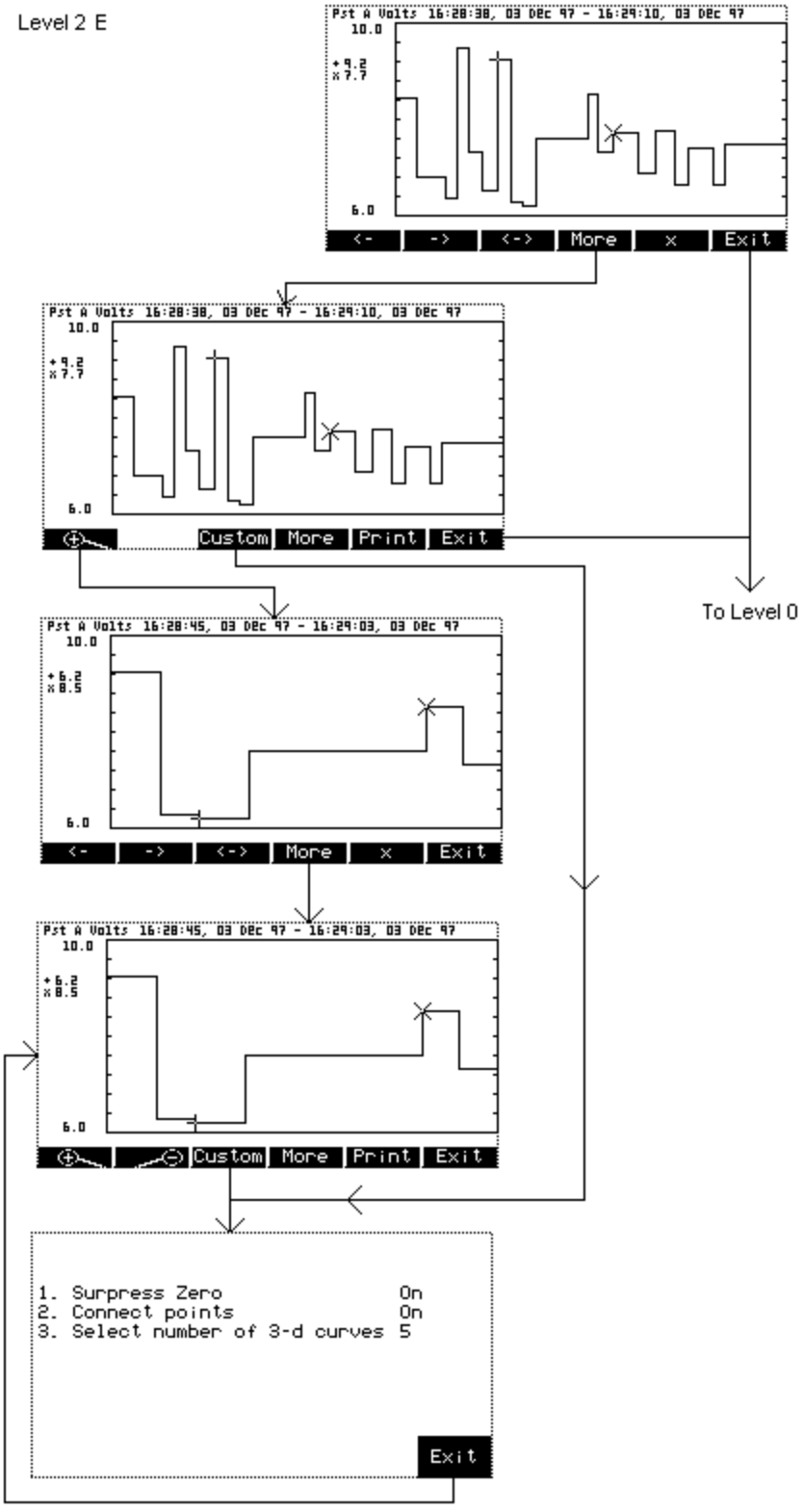


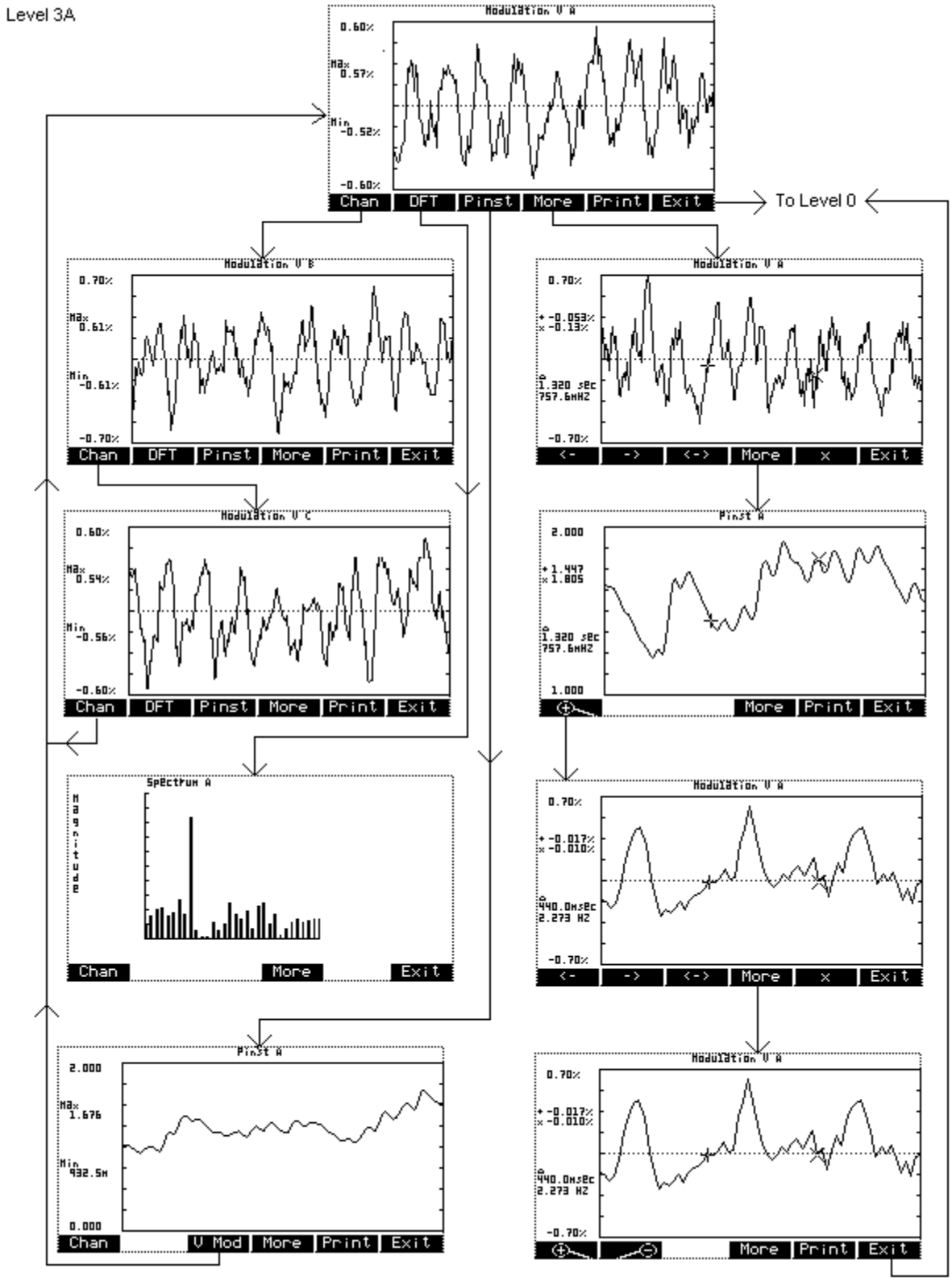


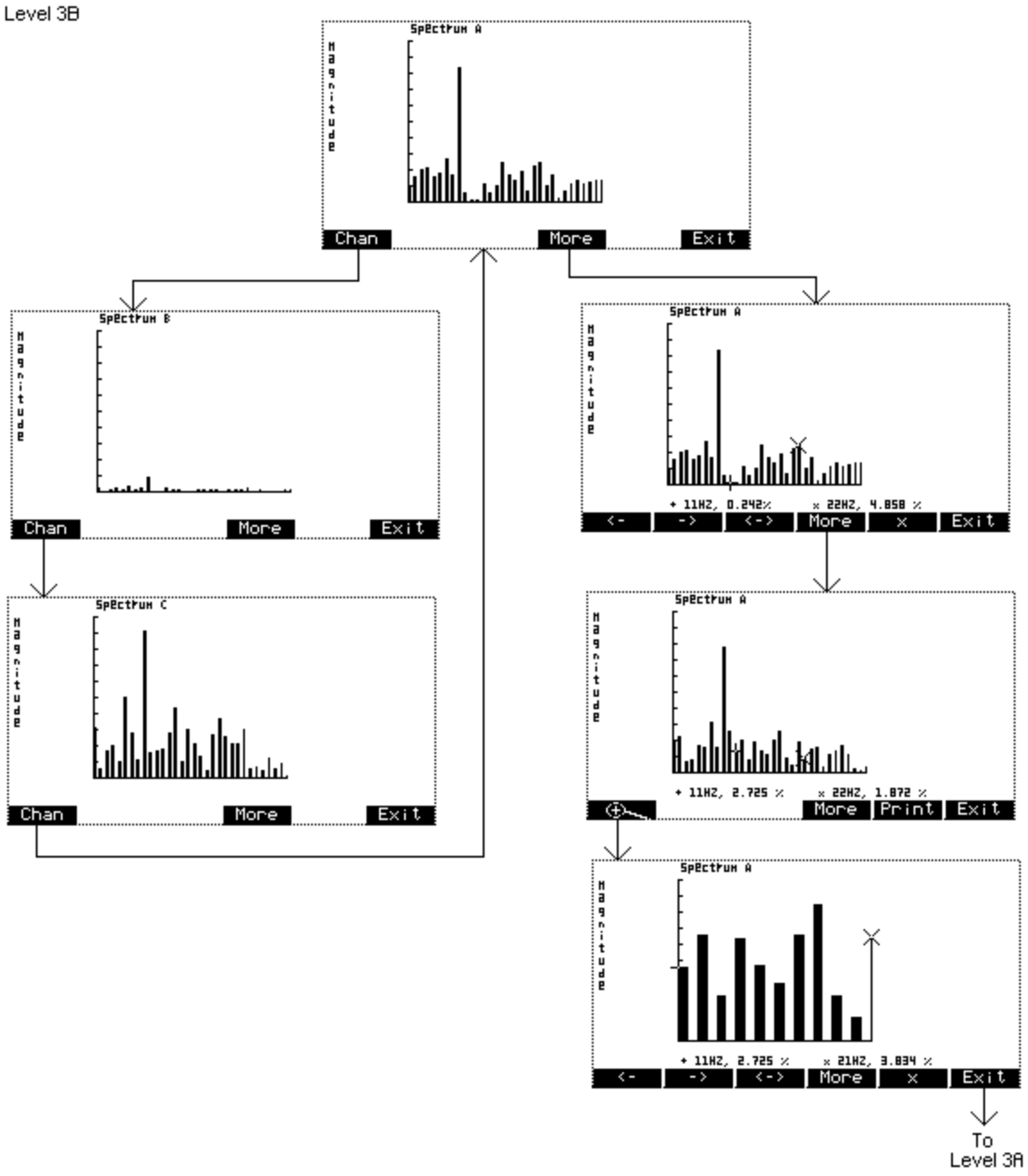
To
Level 2B

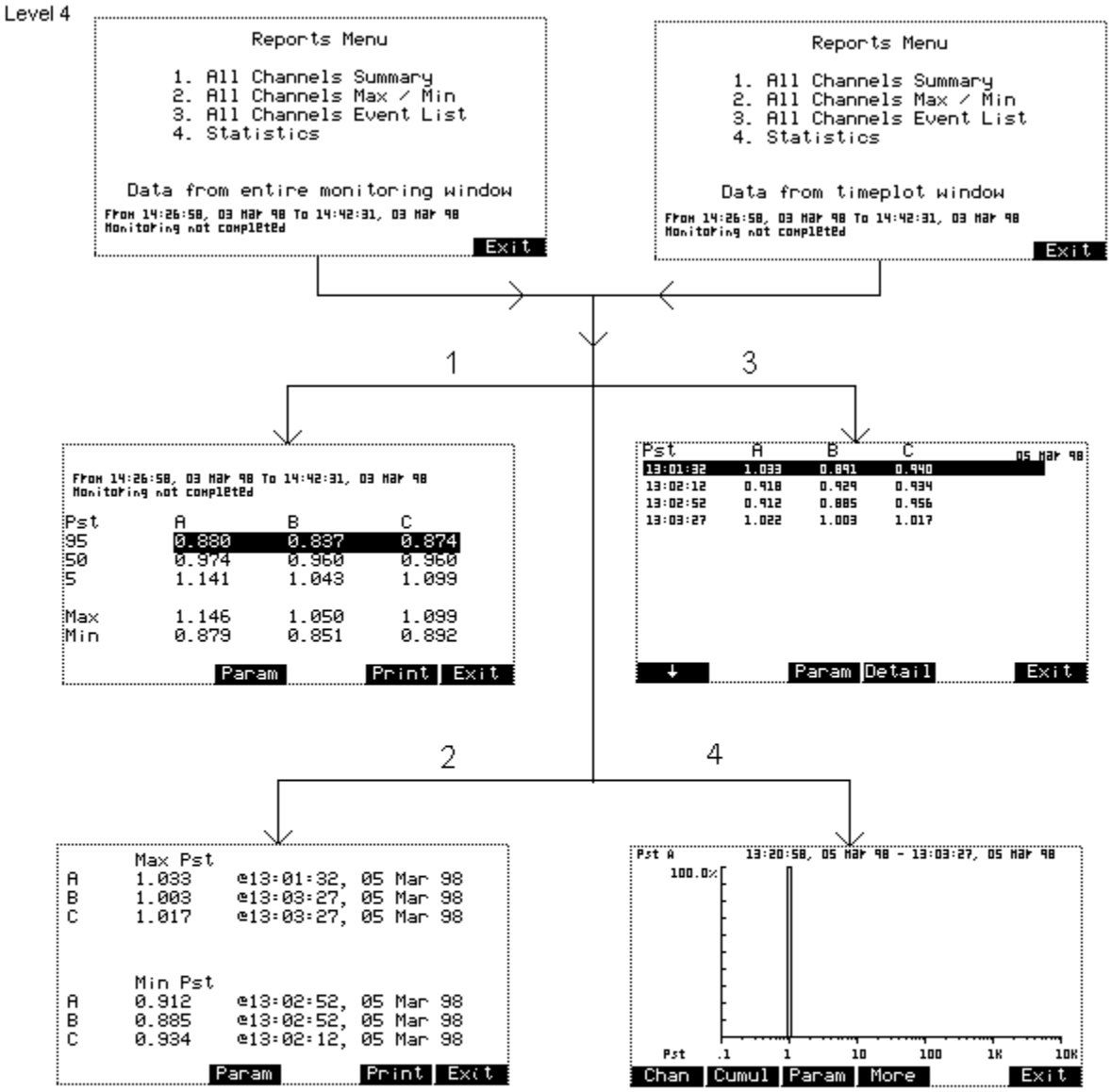


To
Level 4

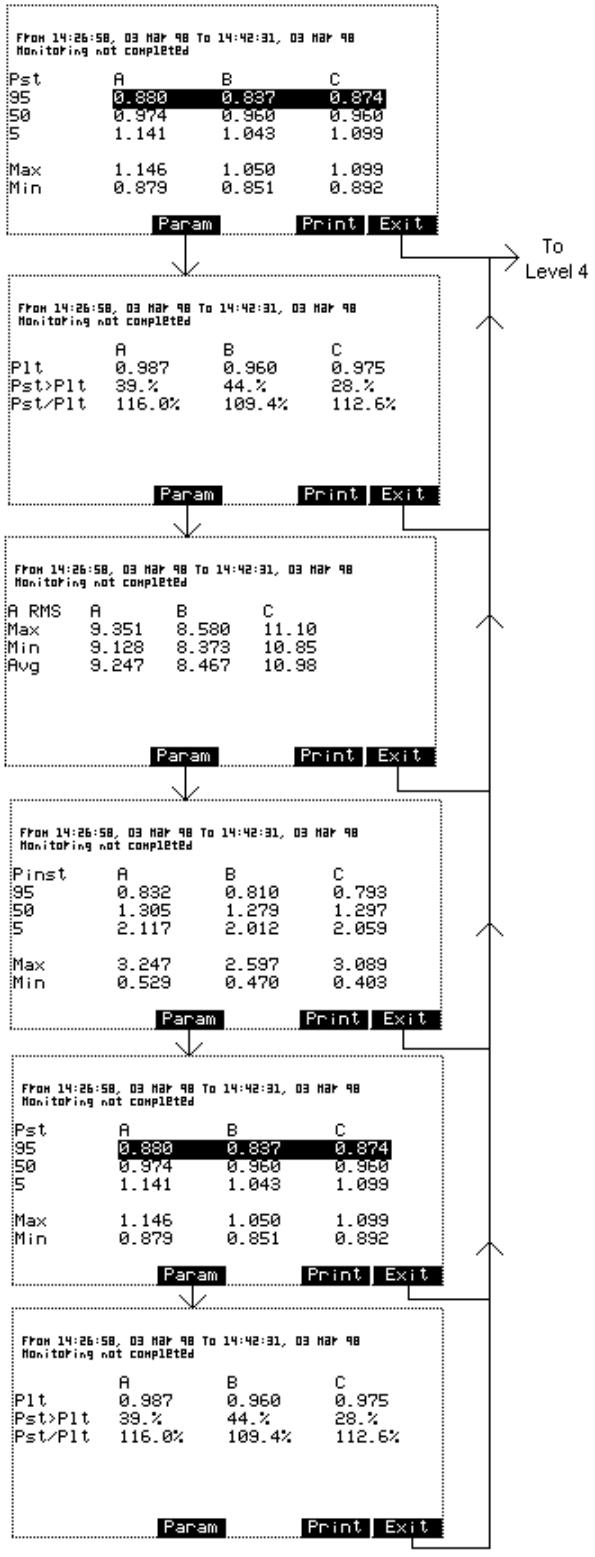

Level 2 E
Pst A Volts 16:28:38, 03 Dec 97 - 16:29:10, 03 Dec 97
10.0
+9.2
x7.7
6.0
<- -> <-> More x Exit
Pst A Volts 16:28:38, 03 Dec 97 - 16:29:10, 03 Dec 97
10.0
+9.2
x7.7
6.0
Custom More Print Exit
To Level 0
Pst A Volts 16:28:45, 03 Dec 97 - 16:29:03, 03 Dec 97
10.0
+6.2
x8.5
6.0
<- -> <-> More x Exit
Pst A Volts 16:28:45, 03 Dec 97 - 16:29:03, 03 Dec 97
10.0
+6.2
x8.5
6.0
Custom More Print Exit
1. Surpress Zero On
2. Connect points On
3. Select number of 3-d curves 5
Exit

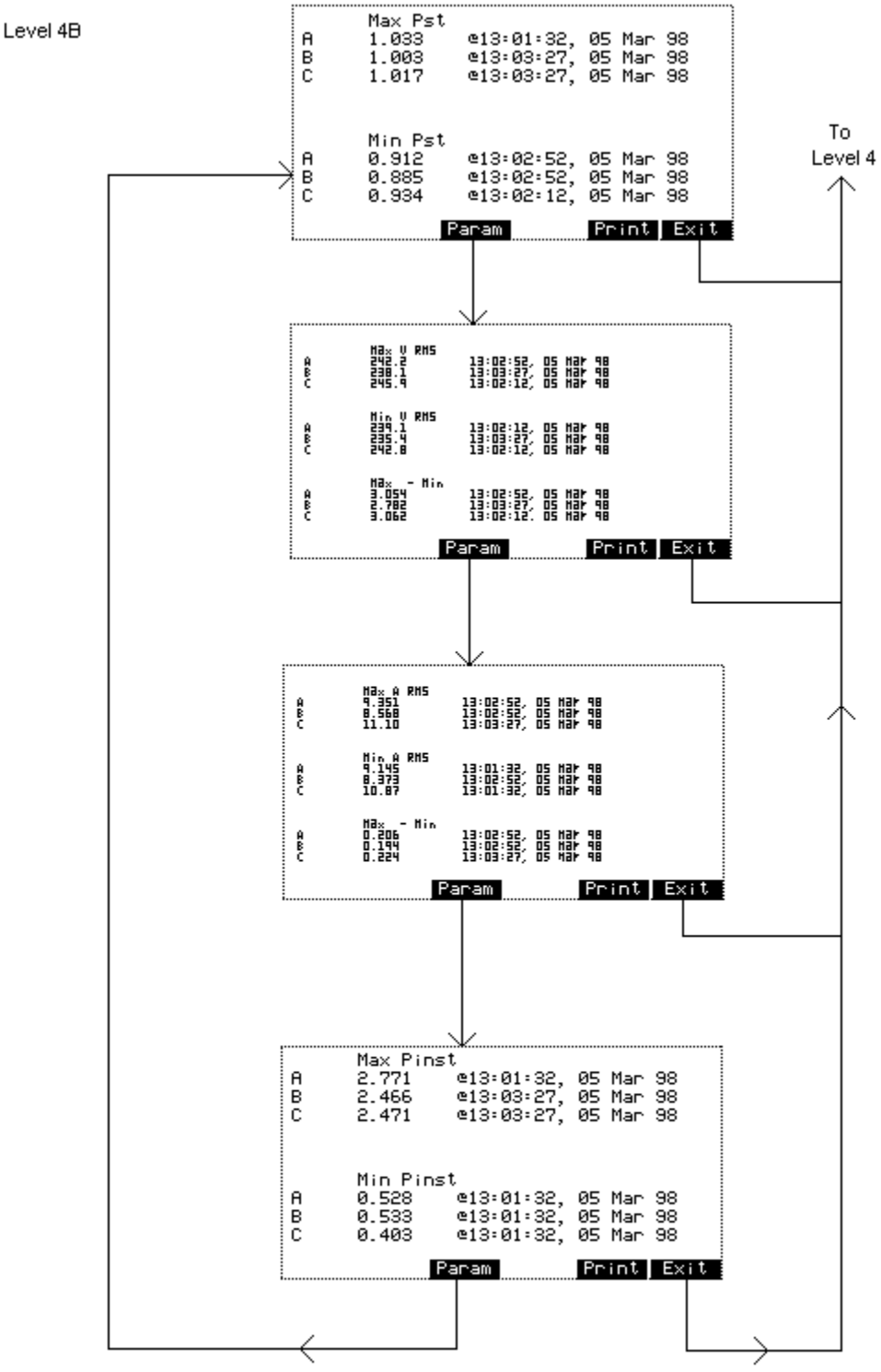

Level 3A
Modulation V A
0.60%
Max 0.57%
Min -0.52%
-0.60%
Chan DFT Pinst More Print Exit
To Level 0
Modulation V B
0.70%
Max 0.61%
Min -0.61%
-0.70%
Chan DFT Pinst More Print Exit
Modulation V A
0.70%
+ -0.053%
x -0.13%
Δ 1.320 sec
757.6mHz
-0.70%
<- -> <-> More x Exit
Modulation V C
0.60%
Max 0.54%
Min -0.56%
-0.60%
Chan DFT Pinst More Print Exit
Pinst A
2.000
+ 1.447
x 1.805
Δ 1.320 sec
757.6mHz
1.000
More Print Exit
Spectrum A
Magnitude
Chan More Exit
Modulation V A
0.70%
+ -0.017%
x -0.010%
Δ 440.0mSec
2.273 Hz
-0.70%
<- -> <-> More x Exit
Pinst A
2.000
Max 1.676
Min 932.5m
0.000
Chan V Mod More Print Exit
Modulation V A
0.70%
+ -0.017%
x -0.010%
Δ 440.0mSec
2.273 Hz
-0.70%
More Print Exit

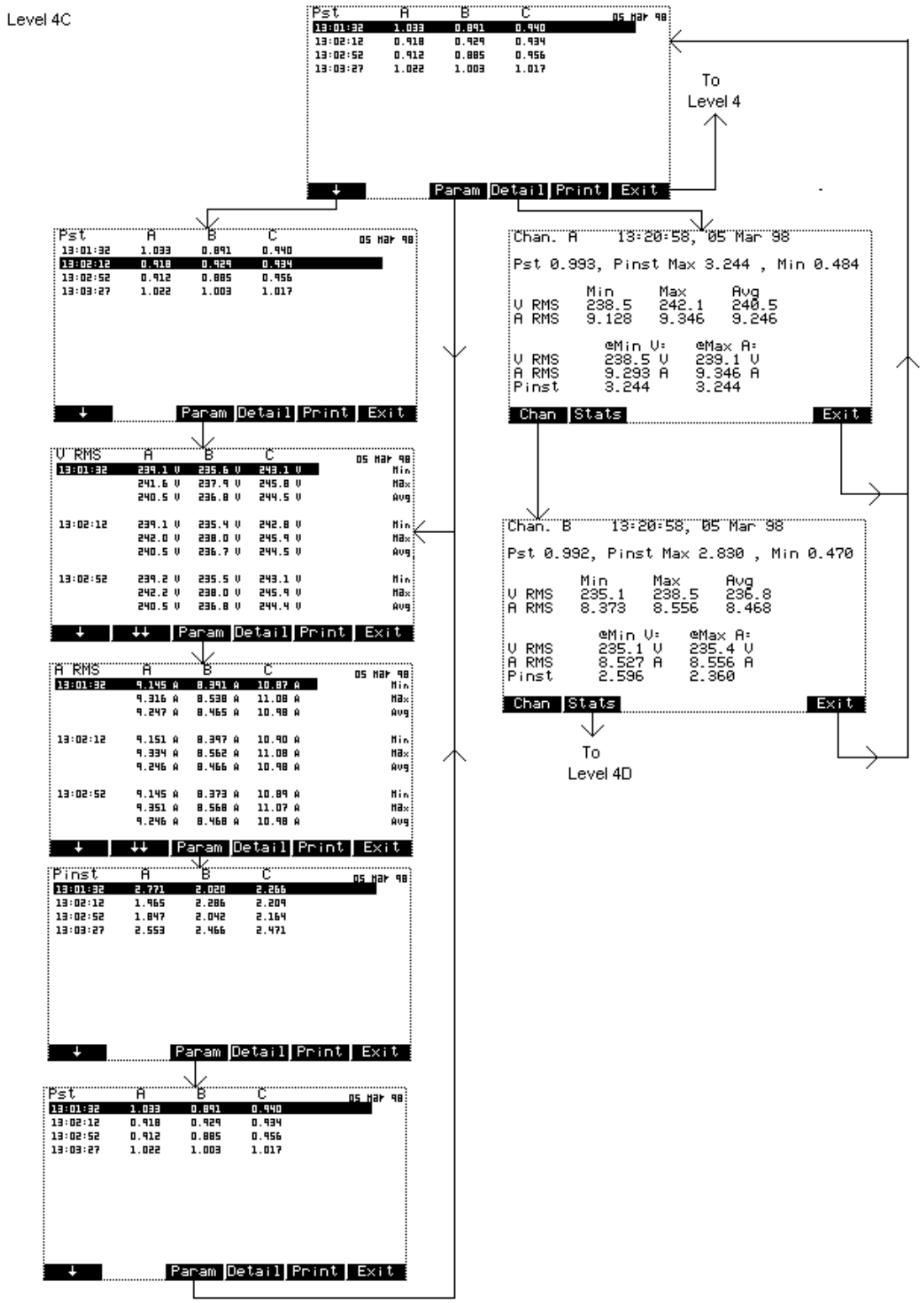

Level 3B
Spectrum A
Magnitude
Chan
More
Exit
Spectrum B
Magnitude
Chan
More
Exit
Spectrum A
Magnitude
+ 11Hz, 0.242%
x 22Hz, 4.858 %
<-
->
<->
More
x
Exit
Spectrum C
Magnitude
Chan
More
Exit
Spectrum A
Magnitude
+ 11Hz, 2.725 %
x 22Hz, 1.872 %
More
Print
Exit
Spectrum A
Magnitude
+ 11Hz, 2.725 %
x 21Hz, 3.834 %
<-
->
<->
More
x
Exit
To
Level 3A

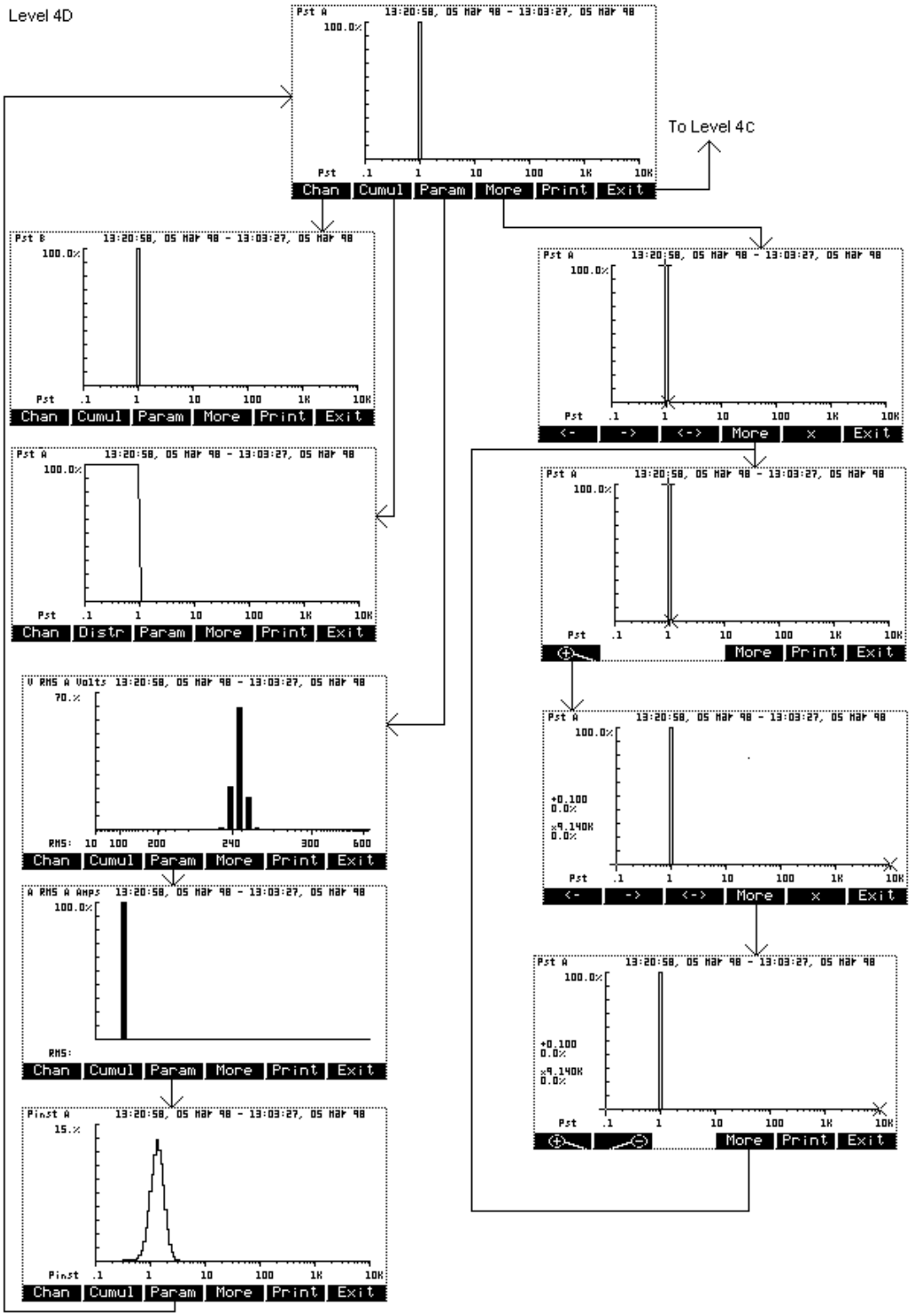

Level 4
Reports Menu
1. All Channels Summary
2. All Channels Max / Min
3. All Channels Event List
4. Statistics
Data from entire monitoring window
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Exit
Reports Menu
1. All Channels Summary
2. All Channels Max / Min
3. All Channels Event List
4. Statistics
Data from timeplot window
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Exit
1
3
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Pst A B C
95 0.880 0.837 0.874
50 0.974 0.960 0.960
5 1.141 1.043 1.099
Max 1.146 1.050 1.099
Min 0.879 0.851 0.892
Param Print Exit
Pst A B C 05 Mar 98
13:01:32 1.033 0.841 0.940
13:02:12 0.918 0.929 0.934
13:02:52 0.912 0.885 0.956
13:03:27 1.022 1.003 1.017
↓ Param Detail Exit
2
4
Max Pst
A 1.033 @13:01:32, 05 Mar 98
B 1.003 @13:03:27, 05 Mar 98
C 1.017 @13:03:27, 05 Mar 98
Min Pst
A 0.912 @13:02:52, 05 Mar 98
B 0.885 @13:02:52, 05 Mar 98
C 0.934 @13:02:12, 05 Mar 98
Param Print Exit
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
Chan Cumul Param More Exit

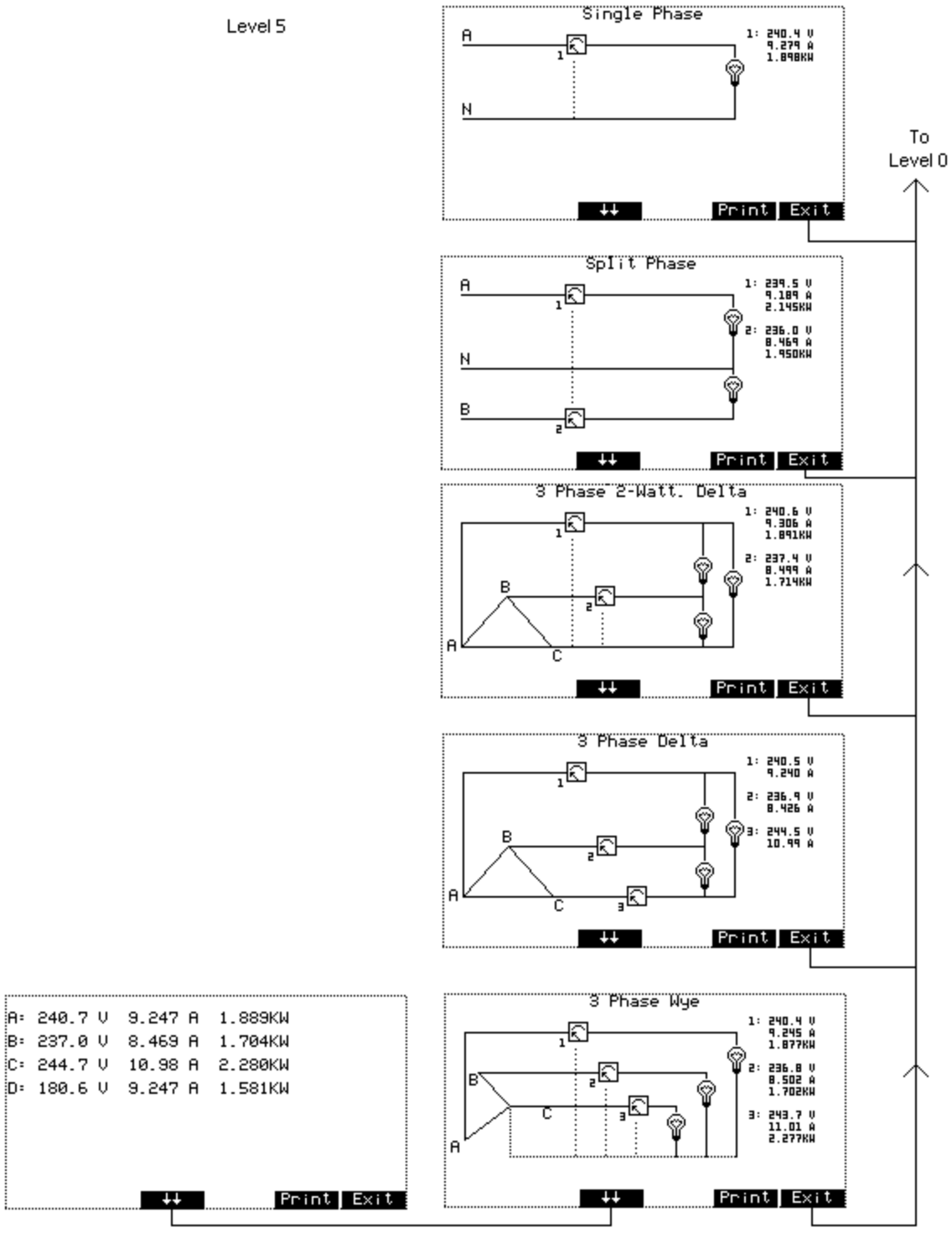
Level 4A


From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Pst A B C
95 0.880 0.887 0.874
50 0.974 0.960 0.960
5 1.141 1.043 1.099
Max 1.146 1.050 1.099
Min 0.879 0.851 0.892
Param Print Exit
To Level 4
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
A B C
Plt 0.987 0.960 0.975
Pst>Plt 39.% 44.% 28.%
Pst/Plt 116.0% 109.4% 112.6%
Param Print Exit
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
A RMS A B C
Max 9.351 8.580 11.10
Min 9.128 8.373 10.85
Avg 9.247 8.467 10.98
Param Print Exit
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Pinst A B C
95 0.832 0.810 0.793
50 1.305 1.279 1.297
5 2.117 2.012 2.059
Max 3.247 2.597 3.089
Min 0.529 0.470 0.403
Param Print Exit
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
Pst A B C
95 0.880 0.887 0.874
50 0.974 0.960 0.960
5 1.141 1.043 1.099
Max 1.146 1.050 1.099
Min 0.879 0.851 0.892
Param Print Exit
From 14:26:58, 03 Mar 98 To 14:42:31, 03 Mar 98
Monitoring not completed
A B C
Plt 0.987 0.960 0.975
Pst>Plt 39.% 44.% 28.%
Pst/Plt 116.0% 109.4% 112.6%
Param Print Exit

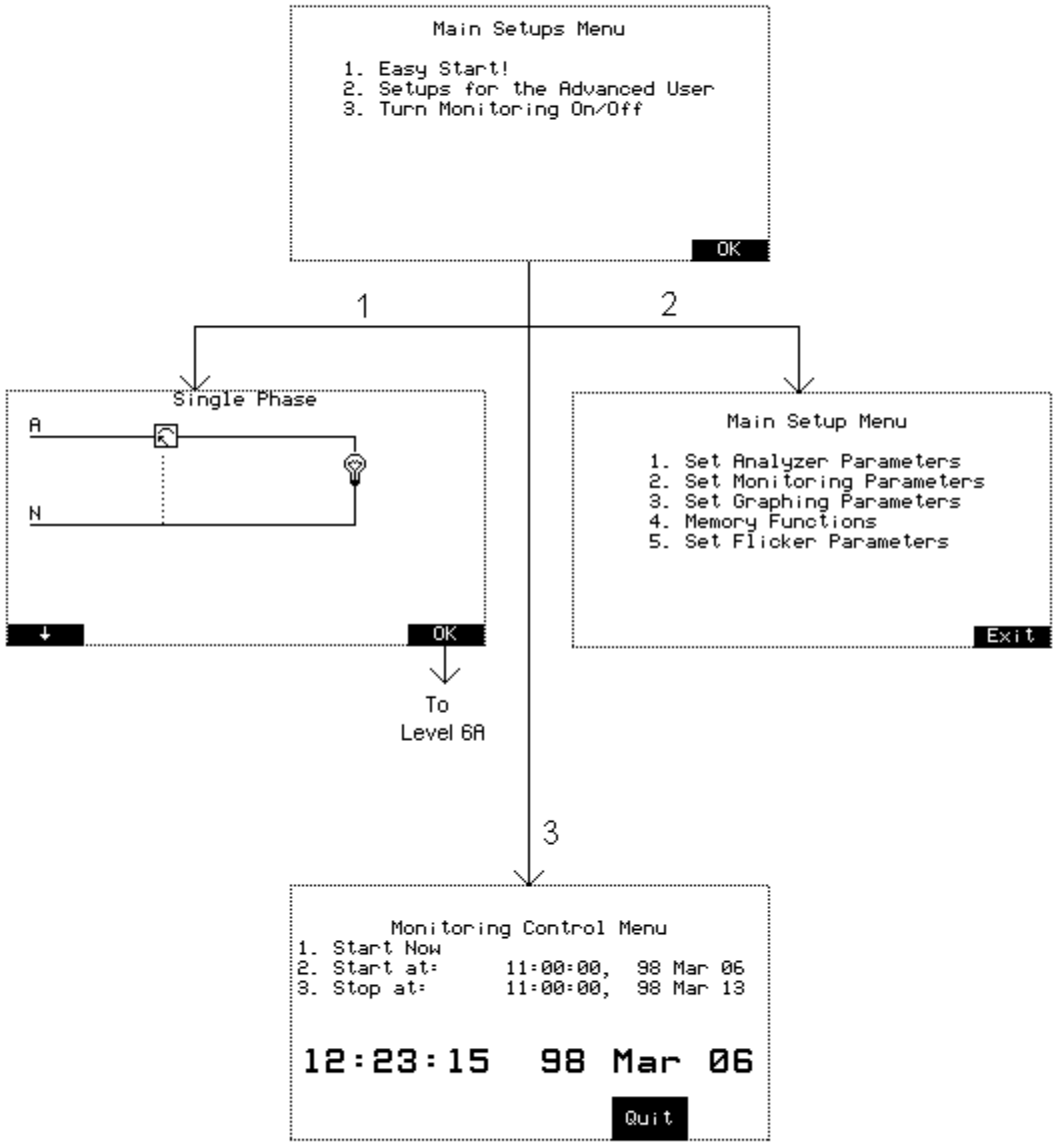

Level 4B
Max Pst
A 1.033 @13:01:32, 05 Mar 98
B 1.003 @13:03:27, 05 Mar 98
C 1.017 @13:03:27, 05 Mar 98
Min Pst
A 0.912 @13:02:52, 05 Mar 98
B 0.885 @13:02:52, 05 Mar 98
C 0.934 @13:02:12, 05 Mar 98
Param
Print
Exit
To
Level 4
Max V RMS
A 242.2 13:02:52, 05 Mar 98
B 238.1 13:03:27, 05 Mar 98
C 245.9 13:02:12, 05 Mar 98
Min V RMS
A 239.1 13:02:12, 05 Mar 98
B 235.4 13:03:27, 05 Mar 98
C 242.8 13:02:12, 05 Mar 98
Max - Min
A 3.054 13:02:52, 05 Mar 98
B 2.782 13:03:27, 05 Mar 98
C 3.062 13:02:12, 05 Mar 98
Param
Print
Exit
Max A RMS
A 9.351 13:02:52, 05 Mar 98
B 8.568 13:02:52, 05 Mar 98
C 11.10 13:03:27, 05 Mar 98
Min A RMS
A 9.145 13:01:32, 05 Mar 98
B 8.373 13:02:52, 05 Mar 98
C 10.87 13:01:32, 05 Mar 98
Max - Min
A 0.206 13:02:52, 05 Mar 98
B 0.194 13:02:52, 05 Mar 98
C 0.224 13:03:27, 05 Mar 98
Param
Print
Exit
Max Pinst
A 2.771 @13:01:32, 05 Mar 98
B 2.466 @13:03:27, 05 Mar 98
C 2.471 @13:03:27, 05 Mar 98
Min Pinst
A 0.528 @13:01:32, 05 Mar 98
B 0.533 @13:01:32, 05 Mar 98
C 0.403 @13:01:32, 05 Mar 98
Param
Print
Exit


Level 4C
Pst A B C 05 Mar 98
13:01:32 1.033 0.891 0.940
13:02:12 0.918 0.929 0.934
13:02:52 0.912 0.885 0.956
13:03:27 1.022 1.003 1.017
To Level 4
Param Detail Print Exit
Chan. A 13:20:58, 05 Mar 98
Pst 0.993, Pinst Max 3.244 , Min 0.484
Min Max Avg
V RMS 238.5 242.1 240.5
A RMS 9.128 9.346 9.246
@Min V: @Max A:
V RMS 238.5 V 239.1 V
A RMS 9.293 A 9.346 A
Pinst 3.244 3.244
Chan Stats Exit
V RMS A B C 05 Mar 98
13:01:32 239.1 V 235.6 V 243.1 V Min
241.6 V 237.9 V 245.8 V Max
240.5 V 236.8 V 244.5 V Avg
13:02:12 239.1 V 235.4 V 242.8 V Min
242.0 V 238.0 V 245.9 V Max
240.5 V 236.7 V 244.5 V Avg
13:02:52 239.2 V 235.5 V 243.1 V Min
242.2 V 238.0 V 245.9 V Max
240.5 V 236.8 V 244.4 V Avg
↓ ↓↓ Param Detail Print Exit
Chan. B 13:20:58, 05 Mar 98
Pst 0.992, Pinst Max 2.830 , Min 0.470
Min Max Avg
V RMS 235.1 238.5 236.8
A RMS 8.373 8.556 8.468
@Min V: @Max A:
V RMS 235.1 V 235.4 V
A RMS 8.527 A 8.556 A
Pinst 2.596 2.360
Chan Stats Exit
To Level 4D
A RMS A B C 05 Mar 98
13:01:32 9.145 A 8.391 A 10.87 A Min
9.316 A 8.538 A 11.08 A Max
9.247 A 8.465 A 10.98 A Avg
13:02:12 9.151 A 8.397 A 10.90 A Min
9.334 A 8.562 A 11.08 A Max
9.246 A 8.466 A 10.98 A Avg
13:02:52 9.145 A 8.373 A 10.89 A Min
9.351 A 8.568 A 11.07 A Max
9.246 A 8.468 A 10.98 A Avg
Pinst A B C 05 Mar 98
13:01:32 2.771 2.020 2.266
13:02:12 1.965 2.286 2.209
13:02:52 1.847 2.042 2.164
13:03:27 2.553 2.466 2.471

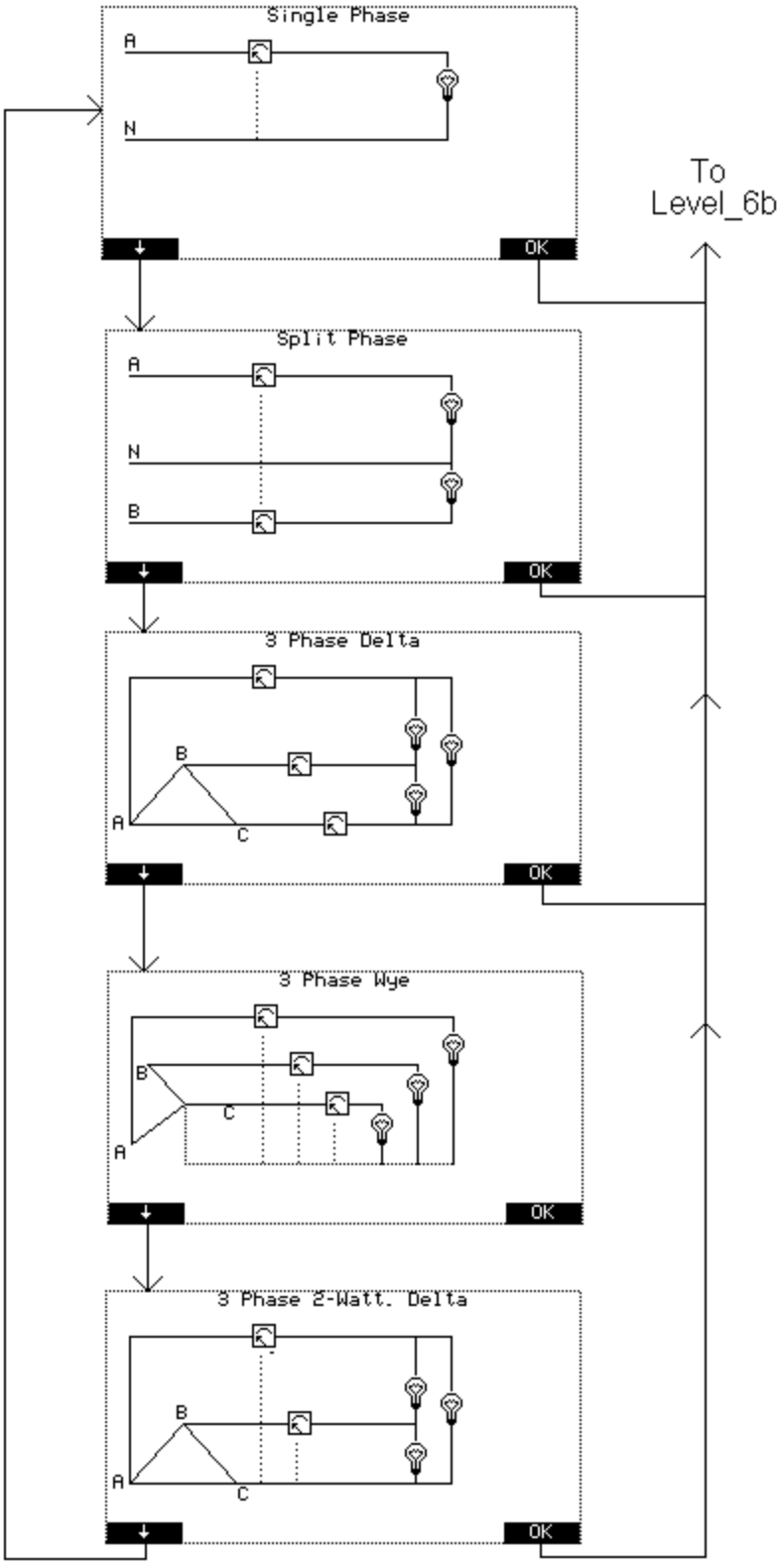

Level 4D
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
Chan Cumul Param More Print Exit
To Level 4c
Pst B 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
Chan Cumul Param More Print Exit
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
<- -> <-> More x Exit
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
Chan Distr Param More Print Exit
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
Pst .1 1 10 100 1K 10K
More Print Exit
V RMS A Volts 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
70.%
RMS: 10 100 200 240 300 600
Chan Cumul Param More Print Exit
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
+0.100
0.0%
+9.140K
0.0%
Pst .1 1 10 100 1K 10K
<- -> <-> More x Exit
A RMS A Amps 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
RMS:
Chan Cumul Param More Print Exit
Pst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
100.0%
+0.100
0.0%
+9.140K
0.0%
Pst .1 1 10 100 1K 10K
More Print Exit
Pinst A 13:20:58, 05 Mar 98 - 13:03:27, 05 Mar 98
15.%
Pinst .1 1 10 100 1K 10K
Chan Cumul Param More Print Exit


Level 5
Single Phase
A
N
1
1: 240.4 V
9.279 A
1.898KW
Print
Exit
To
Level 0
Split Phase
A
N
B
1
2
1: 239.5 V
9.189 A
2.145KW
2: 236.0 V
8.469 A
1.950KW
Print
Exit
3 Phase 2-Watt. Delta
A
B
C
1
2
1: 240.6 V
9.306 A
1.891KW
2: 237.4 V
8.499 A
1.714KW
Print
Exit
3 Phase Delta
A
B
C
1
2
3
1: 240.5 V
9.240 A
2: 236.9 V
8.426 A
3: 244.5 V
10.99 A
Print
Exit
A: 240.7 V 9.247 A 1.889KW
B: 237.0 V 8.469 A 1.704KW
C: 244.7 V 10.98 A 2.280KW
D: 180.6 V 9.247 A 1.581KW
Print
Exit
3 Phase Wye
A
B
C
1
2
3
1: 240.4 V
9.245 A
1.877KW
2: 236.8 V
8.502 A
1.702KW
3: 243.7 V
11.01 A
2.277KW
Print
Exit

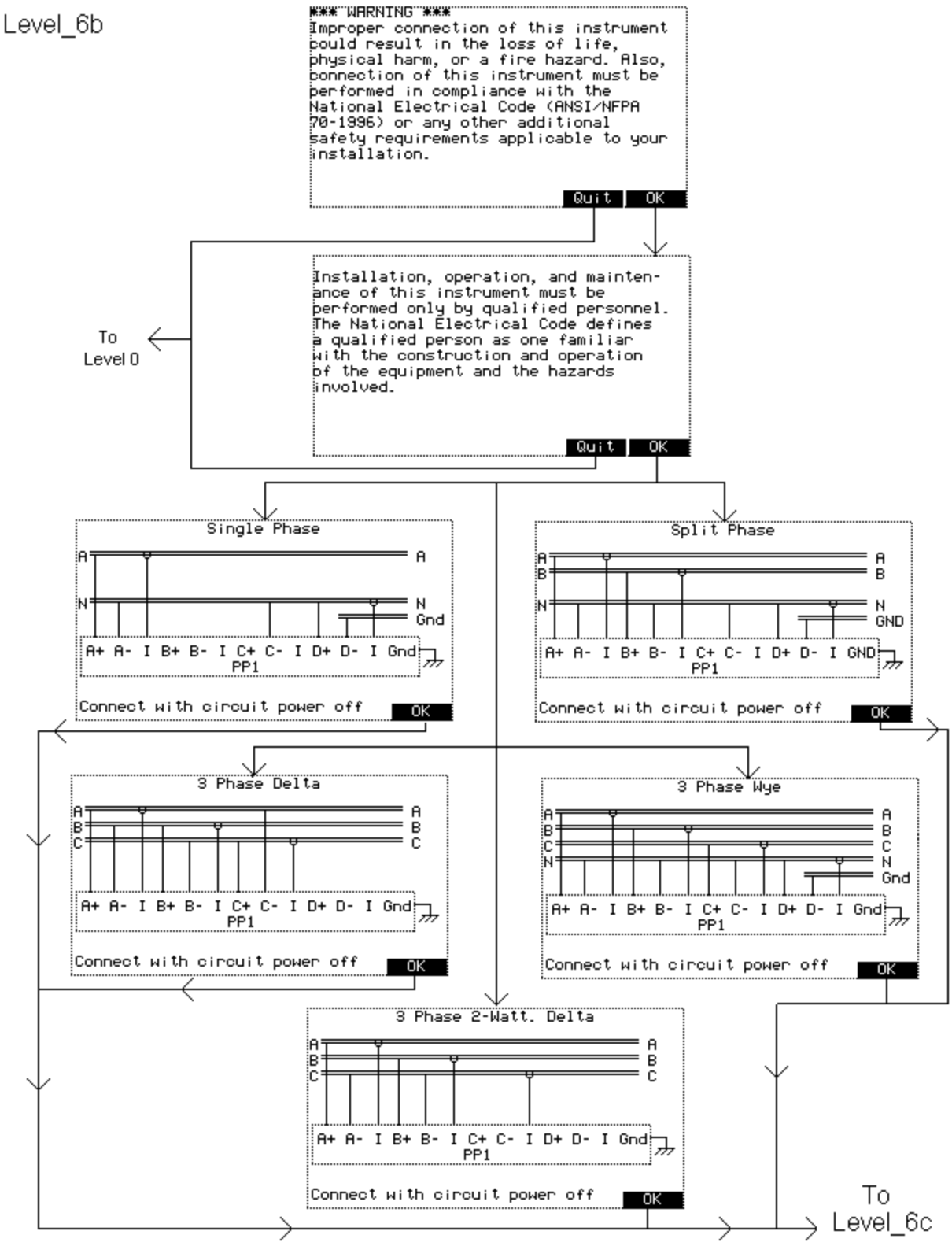
Level 6

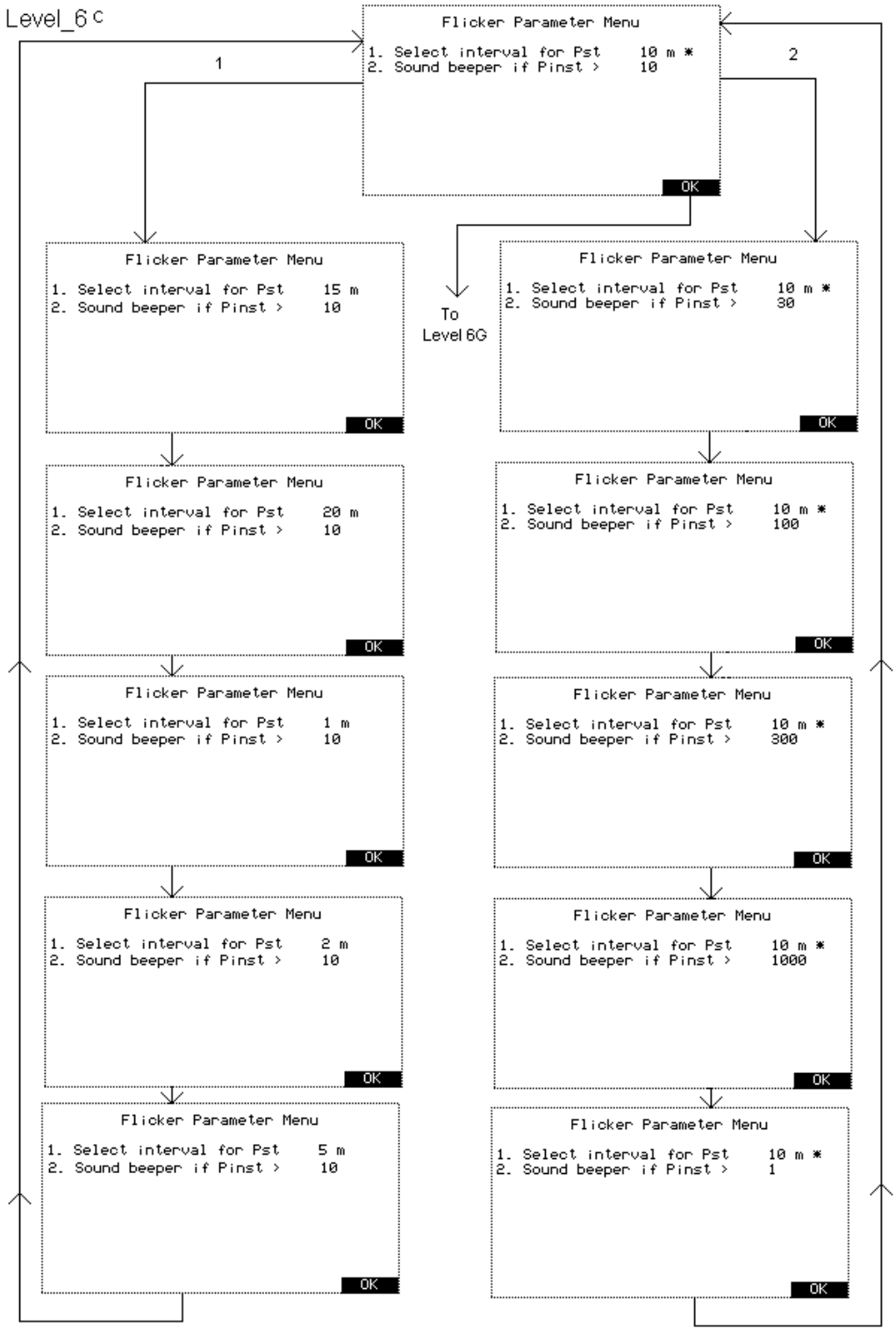

Main Setups Menu
1. Easy Start!
2. Setups for the Advanced User
3. Turn Monitoring On/Off
OK
1
2
Single Phase
A
N
OK
To
Level 6A
Main Setup Menu
1. Set Analyzer Parameters
2. Set Monitoring Parameters
3. Set Graphing Parameters
4. Memory Functions
5. Set Flicker Parameters
Exit
3
Monitoring Control Menu
1. Start Now
2. Start at: 11:00:00, 98 Mar 06
3. Stop at: 11:00:00, 98 Mar 13
12:23:15 98 Mar 06
Quit

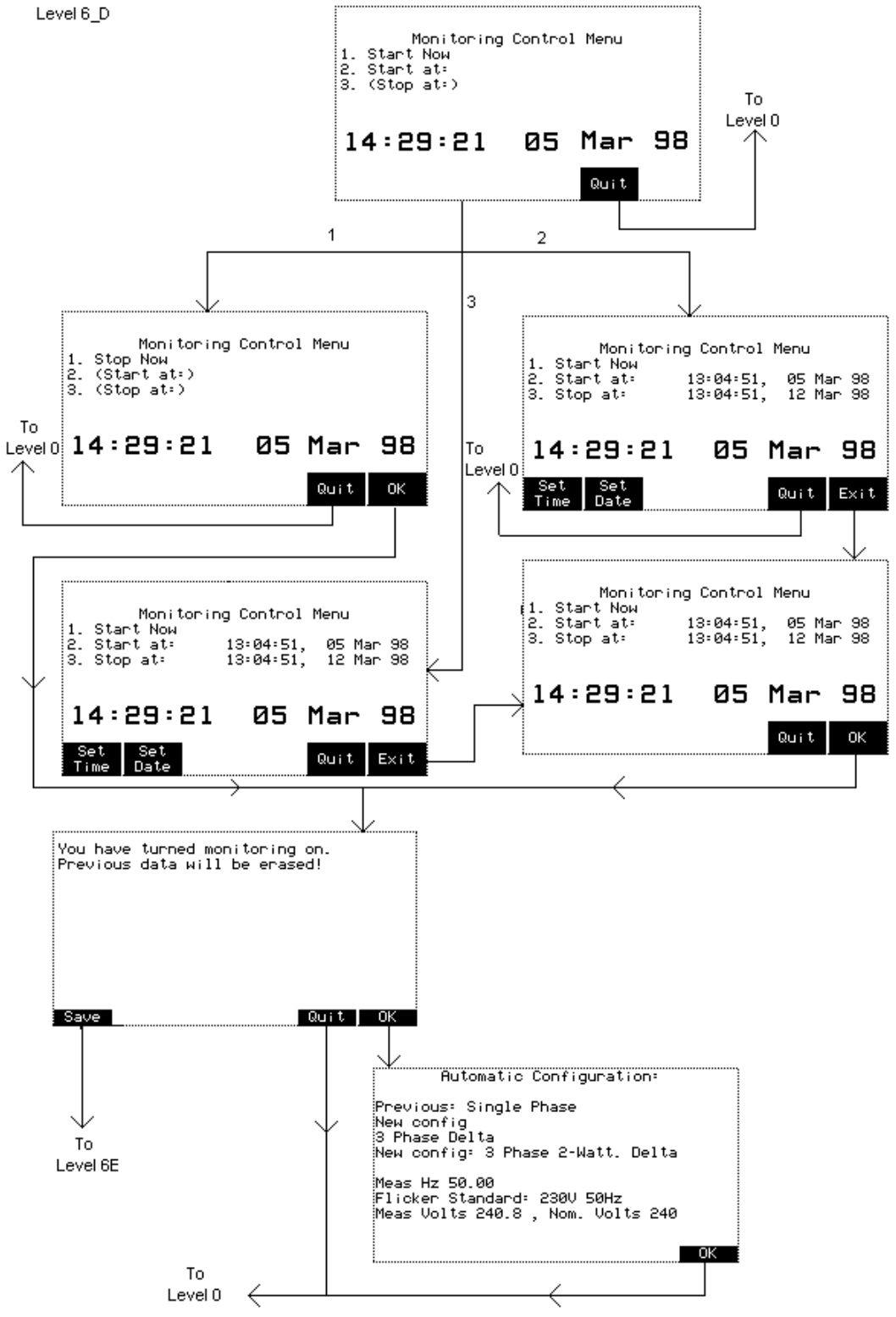
Level_6a

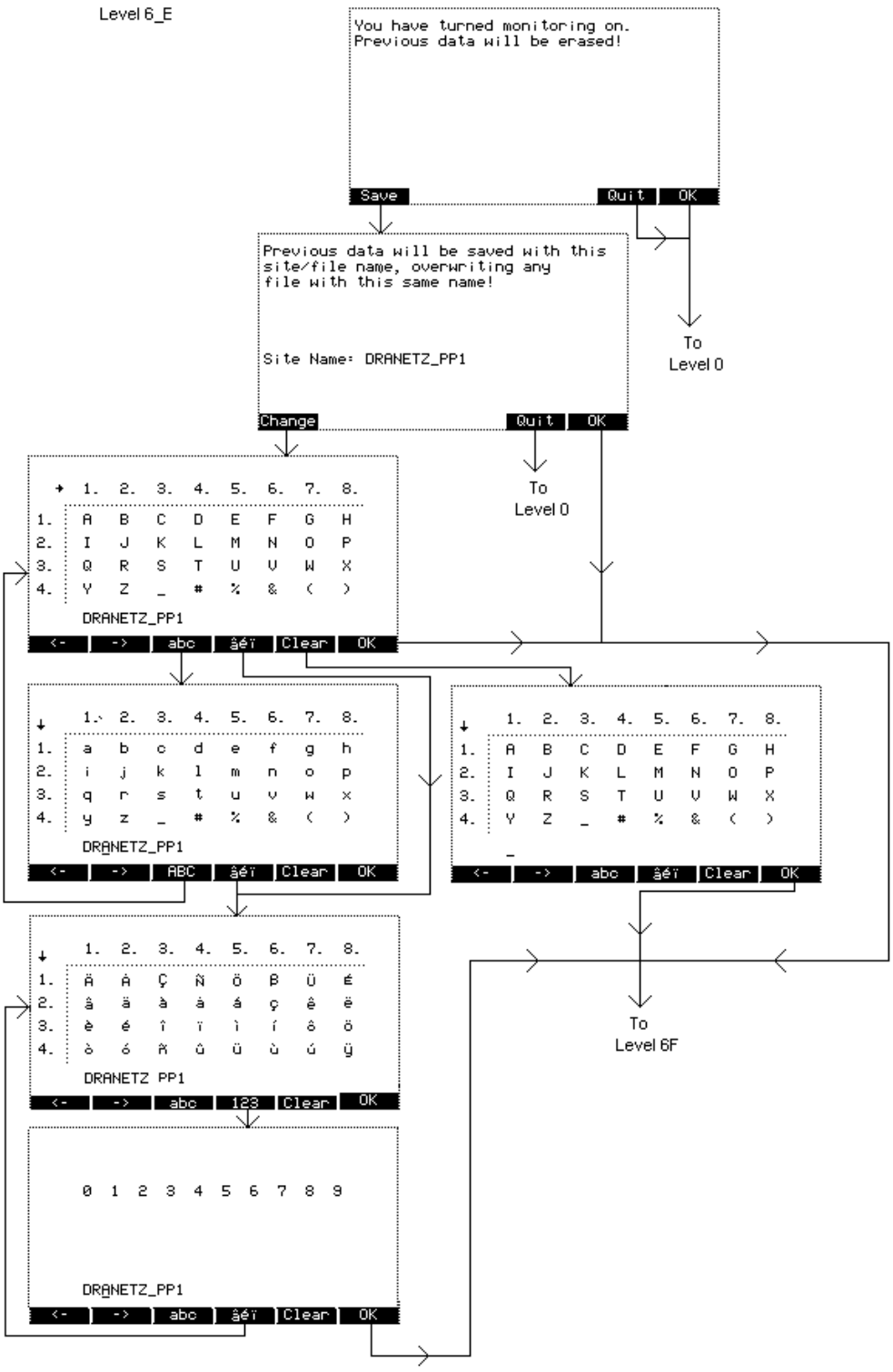

Single Phase
A
N
OK
To
Level_6b
Split Phase
A
N
B
OK
3 Phase Delta
B
A
C
OK
3 Phase Wye
B
C
A
OK
3 Phase 2-Watt. Delta
B
A
C
OK

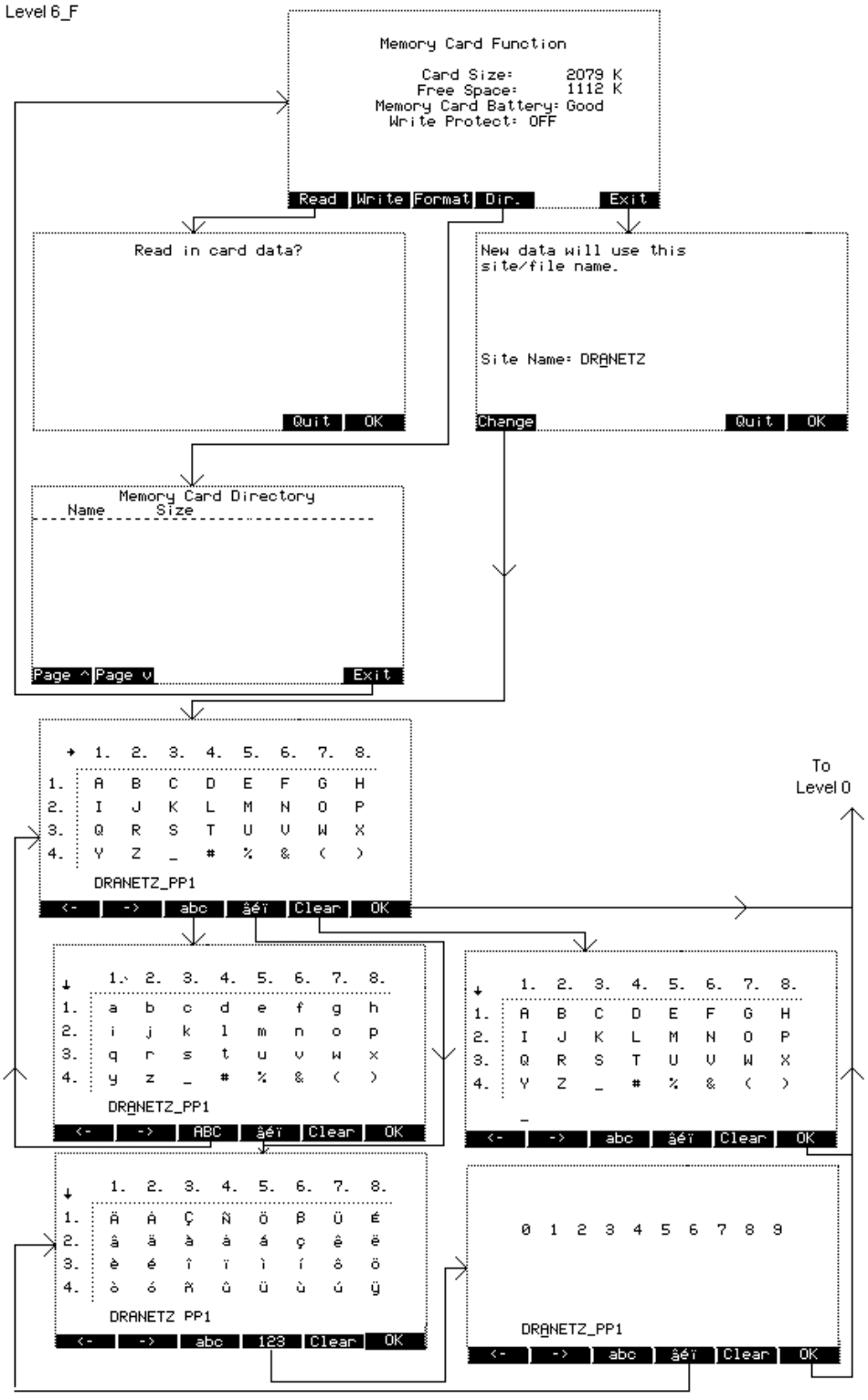
Level_6b


*** WARNING ***
Improper connection of this instrument could result in the loss of life, physical harm, or a fire hazard. Also, connection of this instrument must be performed in compliance with the National Electrical Code (ANSI/NFPA 70-1996) or any other additional safety requirements applicable to your installation.
Quit
OK
To Level 0
Installation, operation, and maintenance of this instrument must be performed only by qualified personnel. The National Electrical Code defines a qualified person as one familiar with the construction and operation of the equipment and the hazards involved.
Quit
OK
Single Phase
A
N
A
N
Gnd
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
Split Phase
A
B
N
A
B
N
GND
A+ A- I B+ B- I C+ C- I D+ D- I GND
PP1
Connect with circuit power off
OK
3 Phase Delta
A
B
C
A
B
C
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
3 Phase Wye
A
B
C
N
A
B
C
N
Gnd
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
3 Phase 2-Watt. Delta
A
B
C
A
B
C
A+ A- I B+ B- I C+ C- I D+ D- I Gnd
PP1
Connect with circuit power off
OK
To Level_6c

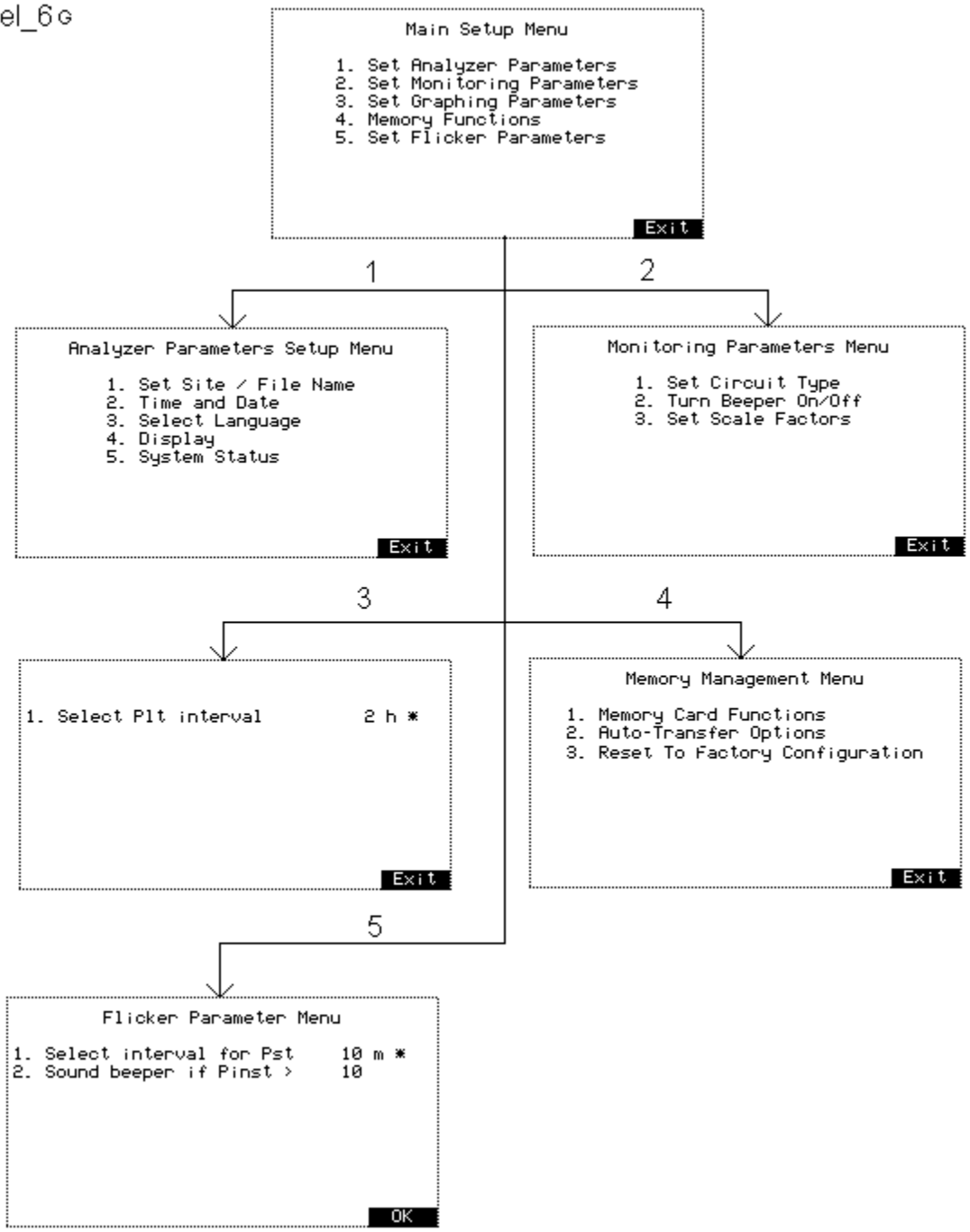

Level_6 c
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 10
OK
1
2
To
Level 6G
Flicker Parameter Menu
1. Select interval for Pst 15 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 30
OK
Flicker Parameter Menu
1. Select interval for Pst 20 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 100
OK
Flicker Parameter Menu
1. Select interval for Pst 1 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 300
OK
Flicker Parameter Menu
1. Select interval for Pst 2 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 1000
OK
Flicker Parameter Menu
1. Select interval for Pst 5 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 1
OK


Level 6_D
Monitoring Control Menu
1. Start Now
2. Start at:
3. (Stop at:)
14:29:21 05 Mar 98
Quit
To Level 0
1
2
3
Monitoring Control Menu
1. Stop Now
2. (Start at:)
3. (Stop at:)
14:29:21 05 Mar 98
Quit
OK
To Level 0
Monitoring Control Menu
1. Start Now
2. Start at: 13:04:51, 05 Mar 98
3. Stop at: 13:04:51, 12 Mar 98
14:29:21 05 Mar 98
Set Time
Set Date
Quit
Exit
To Level 0
Monitoring Control Menu
1. Start Now
2. Start at: 13:04:51, 05 Mar 98
3. Stop at: 13:04:51, 12 Mar 98
14:29:21 05 Mar 98
Set Time
Set Date
Quit
Exit
Monitoring Control Menu
1. Start Now
2. Start at: 13:04:51, 05 Mar 98
3. Stop at: 13:04:51, 12 Mar 98
14:29:21 05 Mar 98
Quit
OK
You have turned monitoring on.
Previous data will be erased!
Save
Quit
OK
To Level 6E
Automatic Configuration:
Previous: Single Phase
New config
3 Phase Delta
New config: 3 Phase 2-Watt. Delta
Meas Hz 50.00
Flicker Standard: 230V 50Hz
Meas Volts 240.8 , Nom. Volts 240
OK
To Level 0

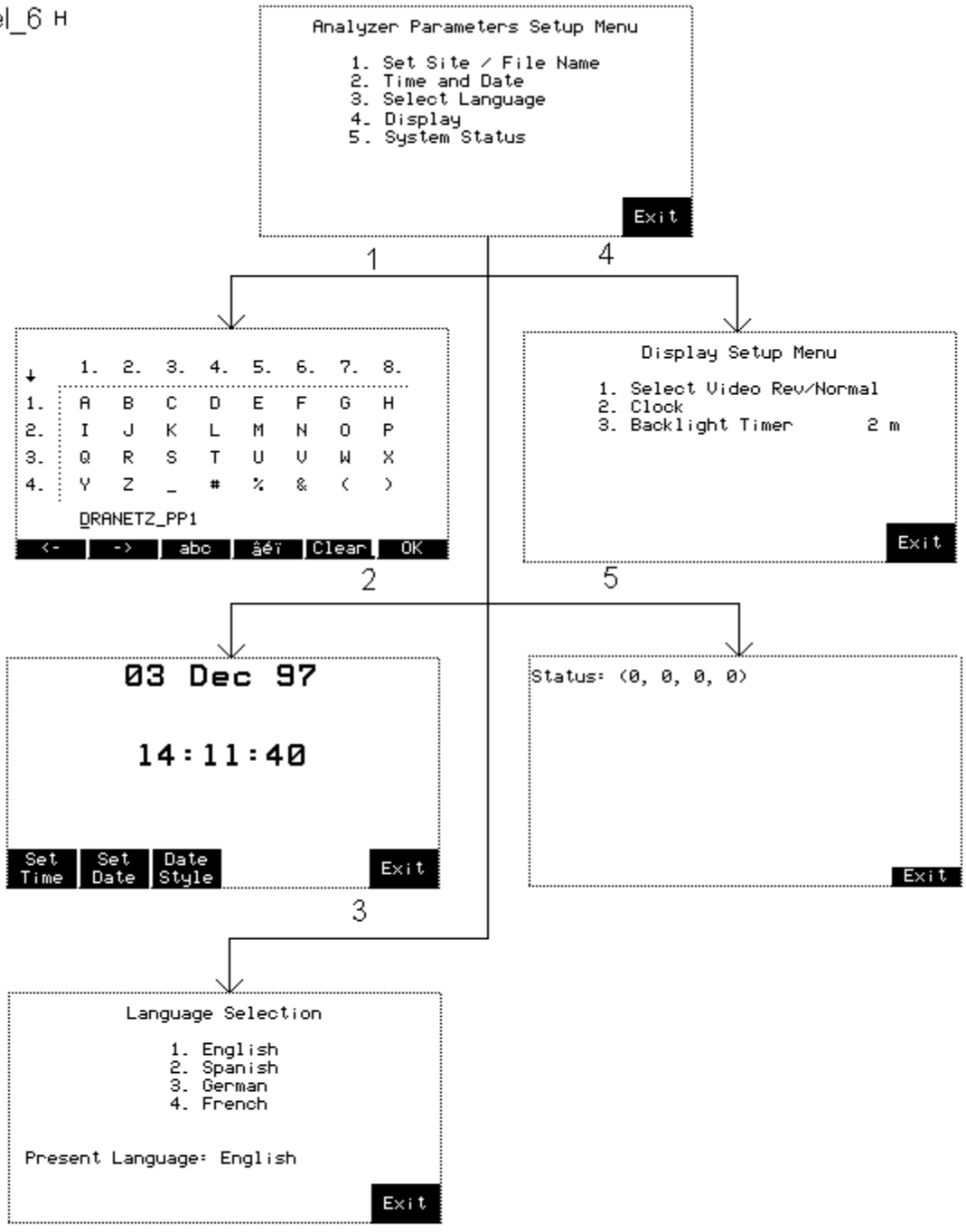

Level 6_E
You have turned monitoring on.
Previous data will be erased!
Save
Quit
OK
To
Level 0
Previous data will be saved with this
site/file name, overwriting any
file with this same name!
Site Name: DRANETZ_PP1
Change
Quit
OK
To
Level 0
1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
DRANETZ_PP1
<- -> abc âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. a b c d e f g h
2. i j k l m n o p
3. q r s t u v w x
4. y z _ # % & ( )
DRANETZ_PP1
<- -> ABC âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
<- -> abc âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. Ä Á Ç Ñ Ö ß Ü É
2. â ä à á ç ê ë
3. è é î ï ì í ô ö
4. ò ó ñ û ü ù ú ÿ
DRANETZ PP1
<- -> abc 123 Clear OK
0 1 2 3 4 5 6 7 8 9
DRANETZ_PP1
<- -> abc âéï Clear OK
To
Level 6F


Level 6_F
Memory Card Function
Card Size: 2079 K
Free Space: 1112 K
Memory Card Battery: Good
Write Protect: OFF
Read
Write
Format
Dir.
Exit
Read in card data?
Quit
OK
New data will use this site/file name.
Site Name: DRANETZ
Change
Quit
OK
Memory Card Directory
Name
Size
Page ^
Page v
Exit
1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
DRANETZ_PP1
<- -> abc âéï Clear OK
To Level 0
1. 2. 3. 4. 5. 6. 7. 8.
1. a b c d e f g h
2. i j k l m n o p
3. q r s t u v w x
4. y z _ # % & ( )
DRANETZ_PP1
<- -> ABC âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
_
<- -> abc âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. Ä Å Ç Ñ Ö ß Ü é
2. â ä à à á ç ê ë
3. è é î ï ì í ô ö
4. ò ó Ø û ü ù ú ÿ
DRANETZ PP1
<- -> abc 123 Clear OK
0 1 2 3 4 5 6 7 8 9
DRANETZ_PP1
<- -> abc âéï Clear OK

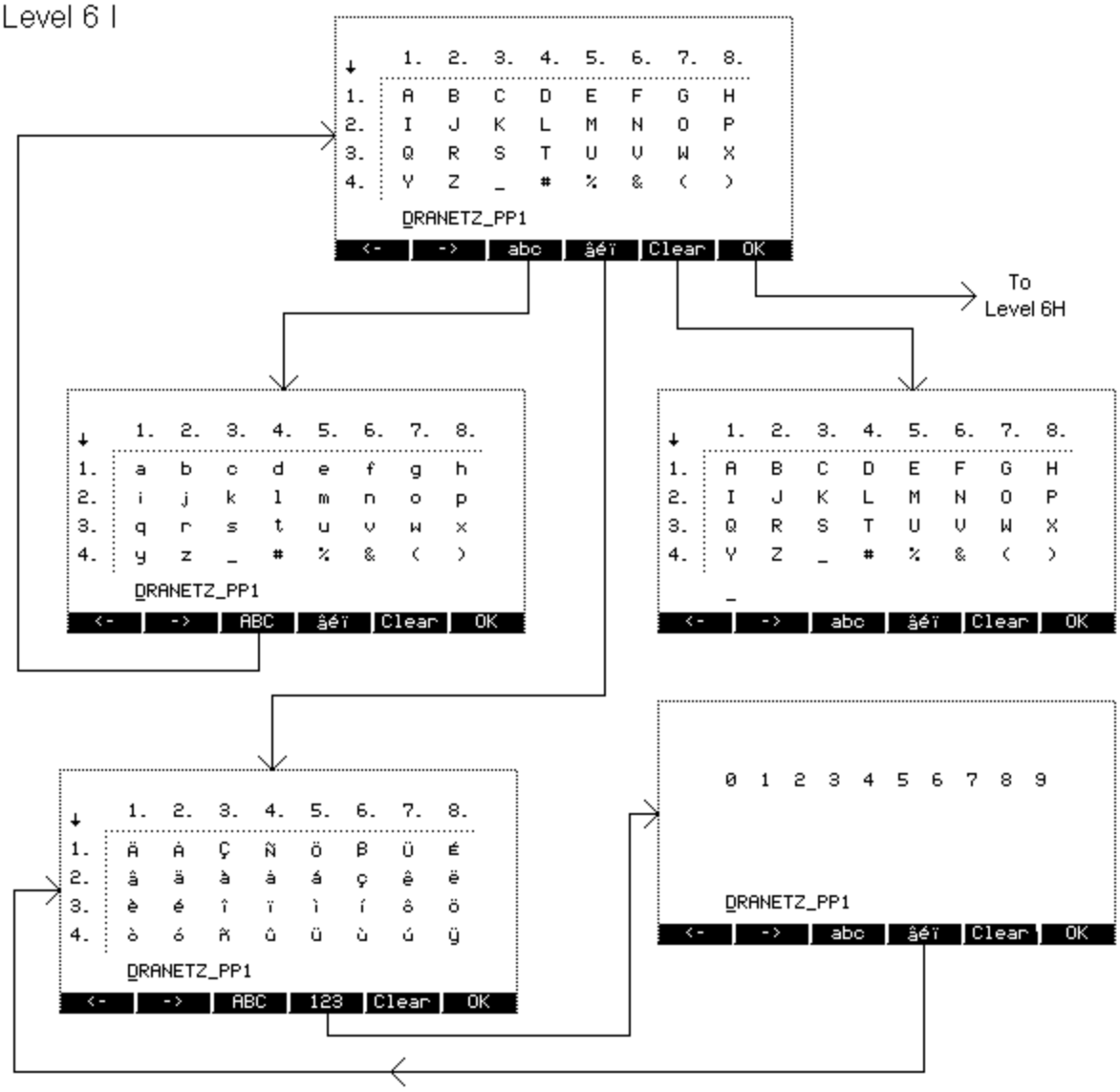
Level_6c


Main Setup Menu
1. Set Analyzer Parameters
2. Set Monitoring Parameters
3. Set Graphing Parameters
4. Memory Functions
5. Set Flicker Parameters
Exit
1
2
Analyzer Parameters Setup Menu
1. Set Site / File Name
2. Time and Date
3. Select Language
4. Display
5. System Status
Exit
Monitoring Parameters Menu
1. Set Circuit Type
2. Turn Beeper On/Off
3. Set Scale Factors
Exit
3
4
1. Select Plt interval 2 h *
Exit
Memory Management Menu
1. Memory Card Functions
2. Auto-Transfer Options
3. Reset To Factory Configuration
Exit
5
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 10
OK

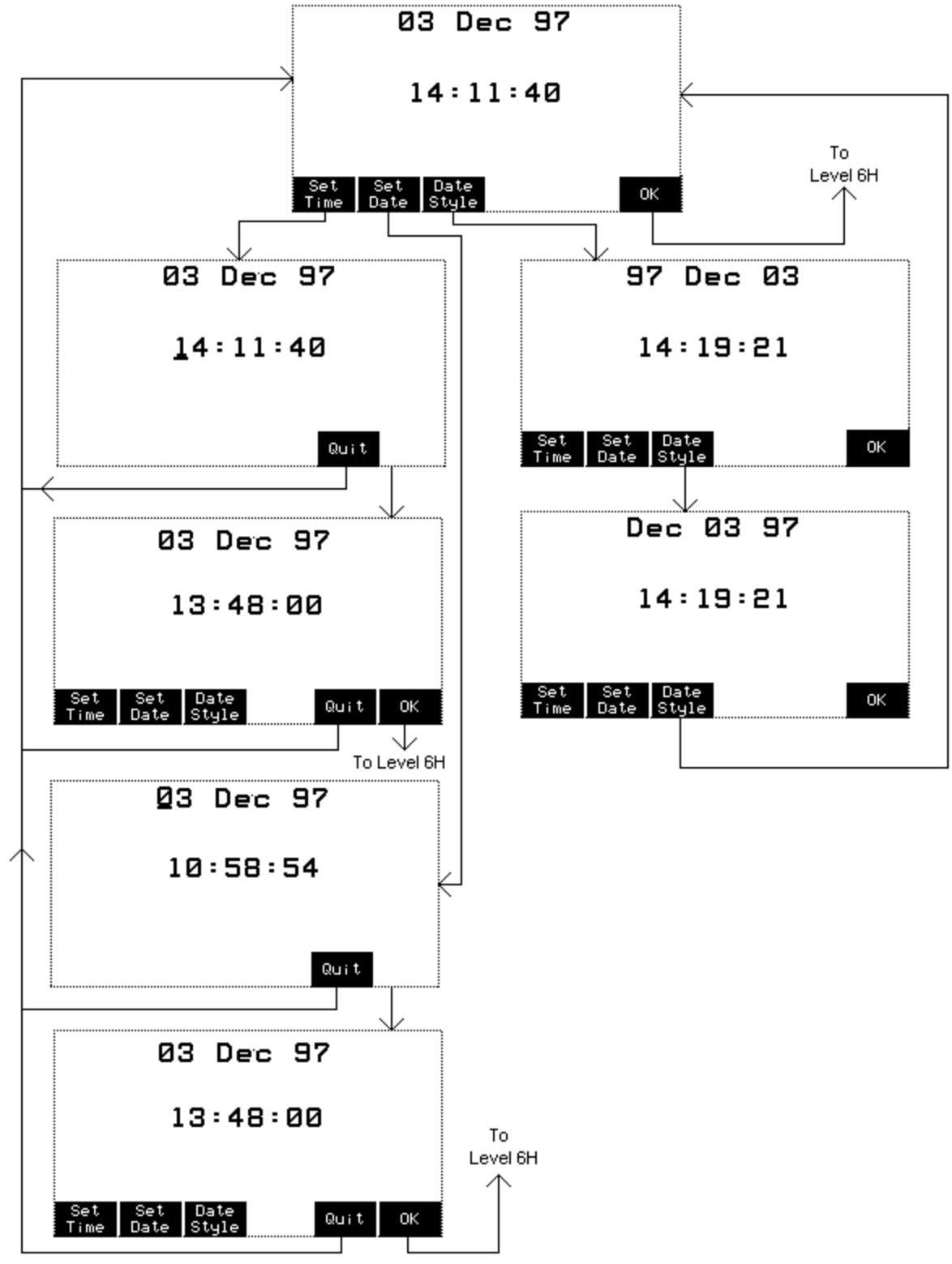
Level_6 H

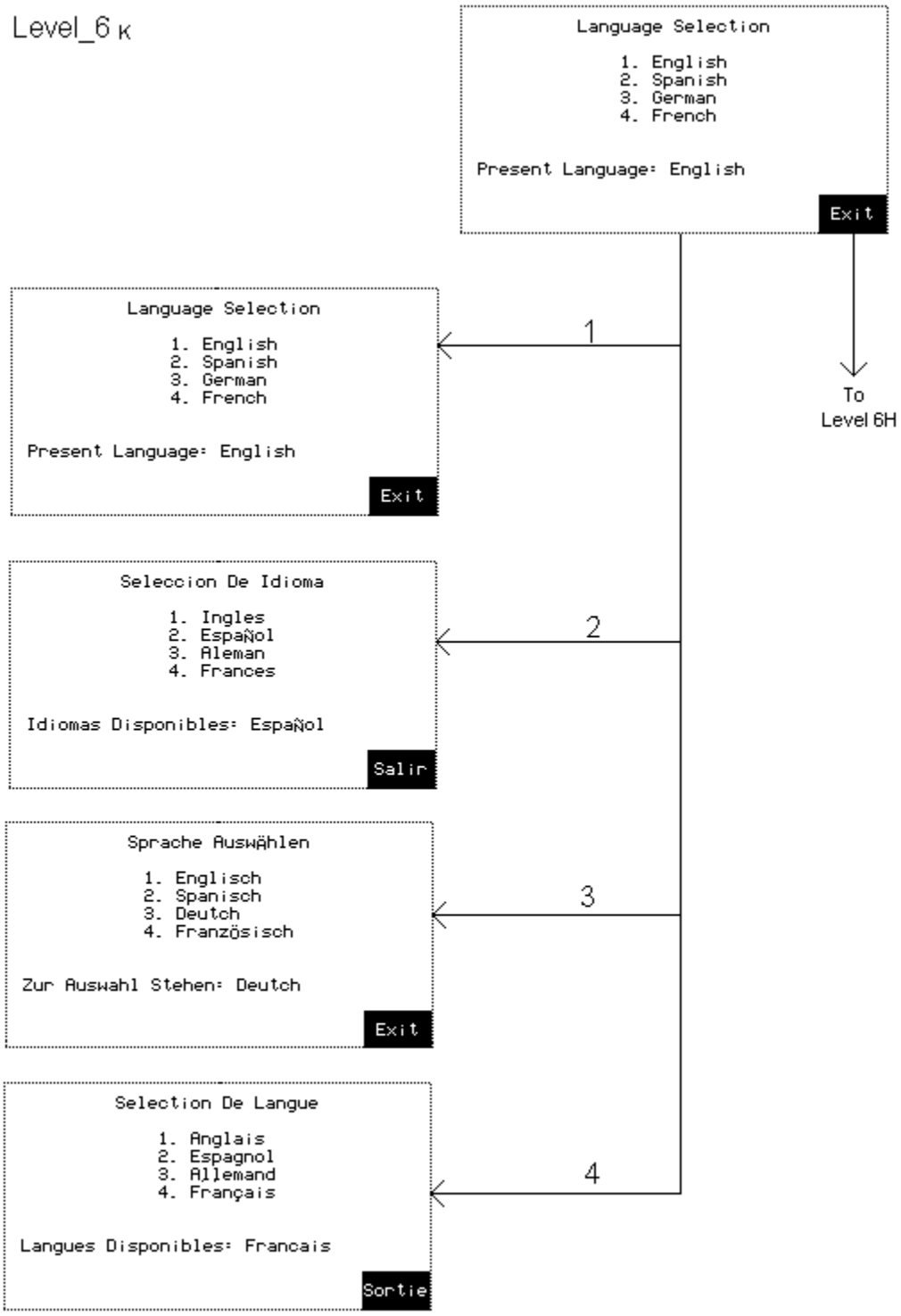

Analyzer Parameters Setup Menu
1. Set Site / File Name
2. Time and Date
3. Select Language
4. Display
5. System Status
Exit
1
4
1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
DRANETZ_PP1
<- -> abc äéï Clear OK
2
Display Setup Menu
1. Select Video Rev/Normal
2. Clock
3. Backlight Timer 2 m
Exit
5
03 Dec 97
14:11:40
Set Time
Set Date
Date Style
Exit
3
Status: (0, 0, 0, 0)
Exit
Language Selection
1. English
2. Spanish
3. German
4. French
Present Language: English
Exit

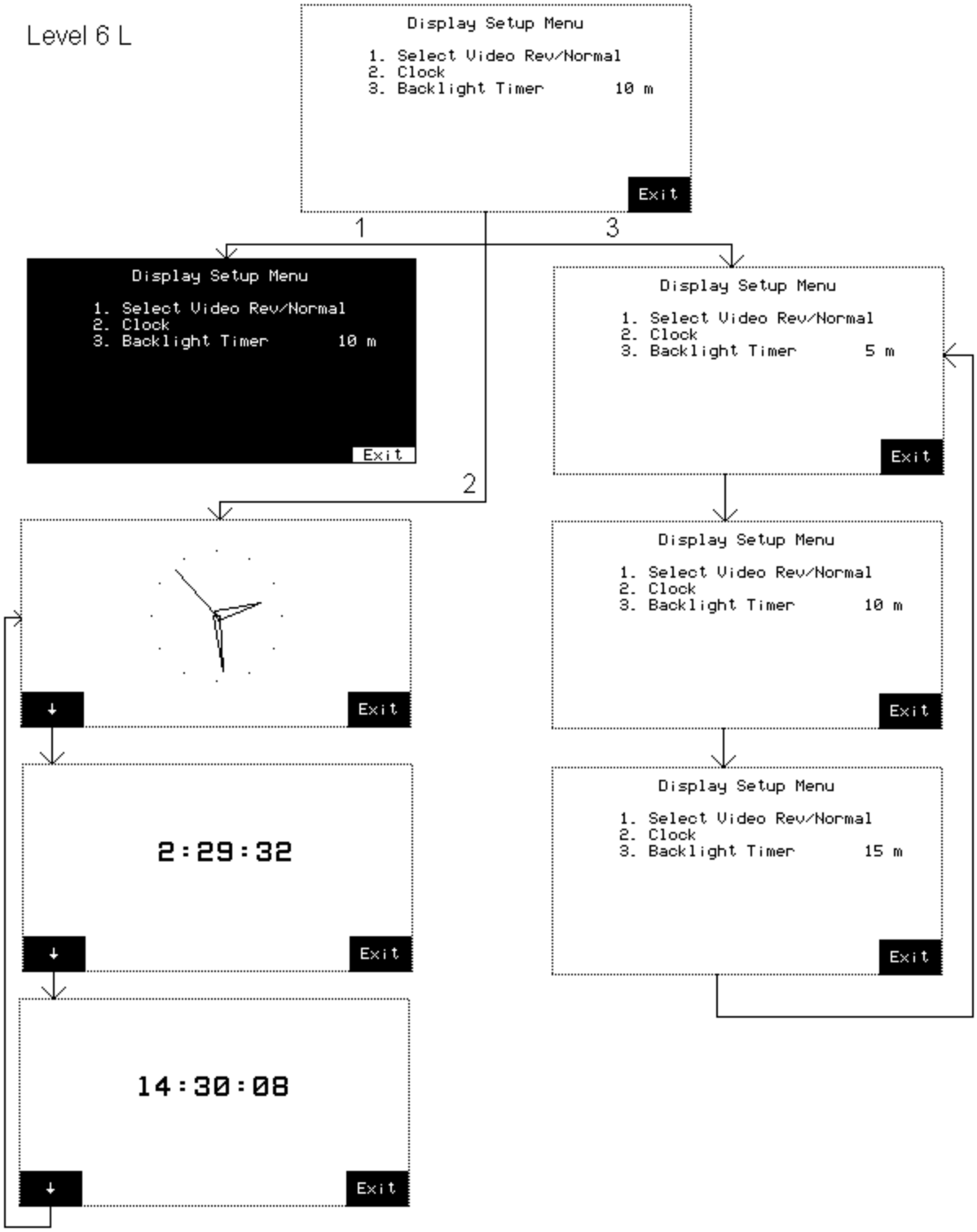
Level 6 I

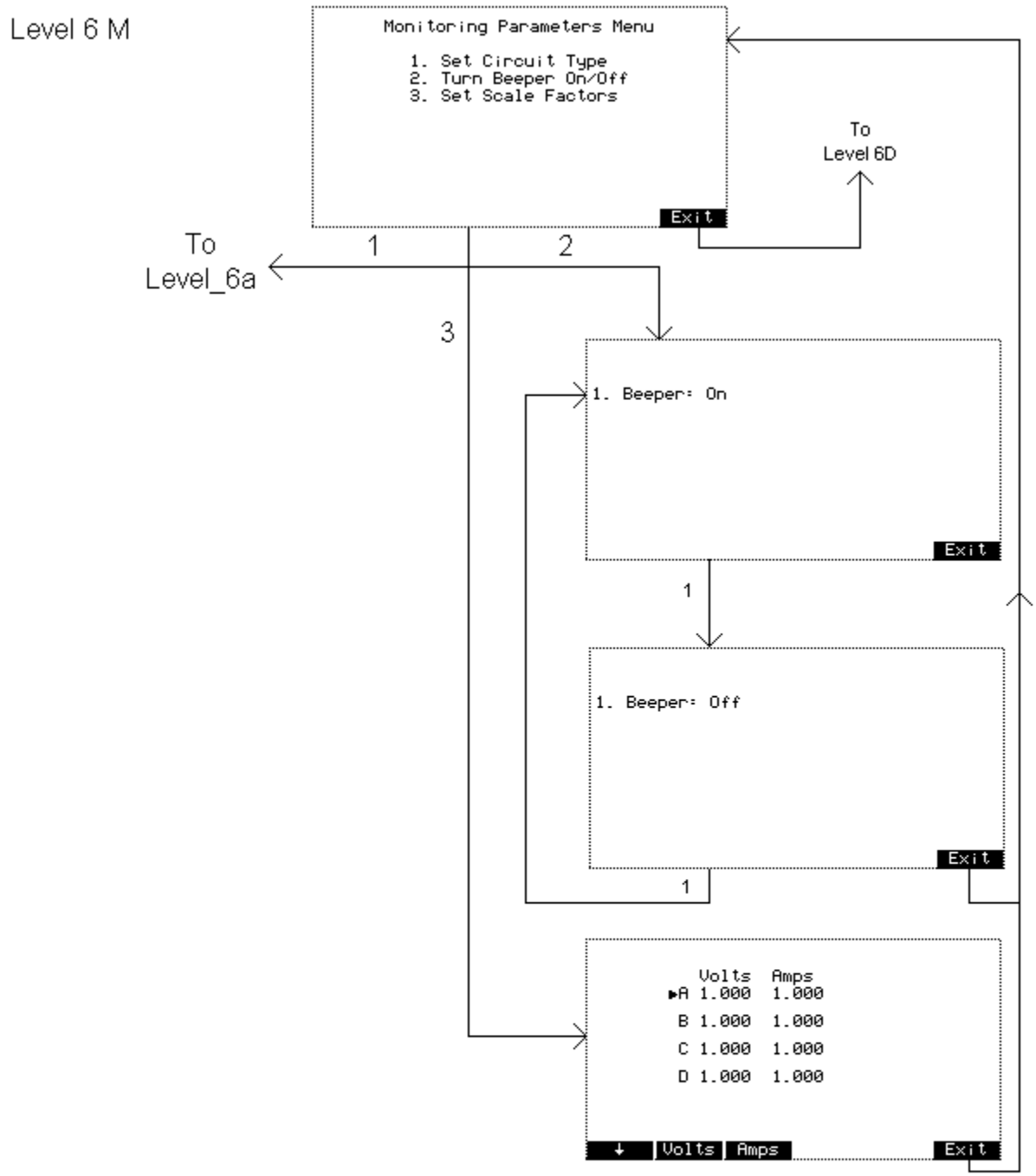

1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
DRANETZ_PP1
<- -> abc âéï Clear OK
To
Level 6H
1. 2. 3. 4. 5. 6. 7. 8.
1. a b c d e f g h
2. i j k l m n o p
3. q r s t u v w x
4. y z _ # % & ( )
DRANETZ_PP1
<- -> ABC âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. A B C D E F G H
2. I J K L M N O P
3. Q R S T U V W X
4. Y Z _ # % & ( )
_
<- -> abc âéï Clear OK
1. 2. 3. 4. 5. 6. 7. 8.
1. Ä Á Ç Ñ Ö ß Ü É
2. â ä à á ç ê ë
3. è é î ï ì í ô ö
4. ò ó Ä û ü ù ú ÿ
DRANETZ_PP1
<- -> ABC 123 Clear OK
0 1 2 3 4 5 6 7 8 9
DRANETZ_PP1
<- -> abc âéï Clear OK

Level_6J

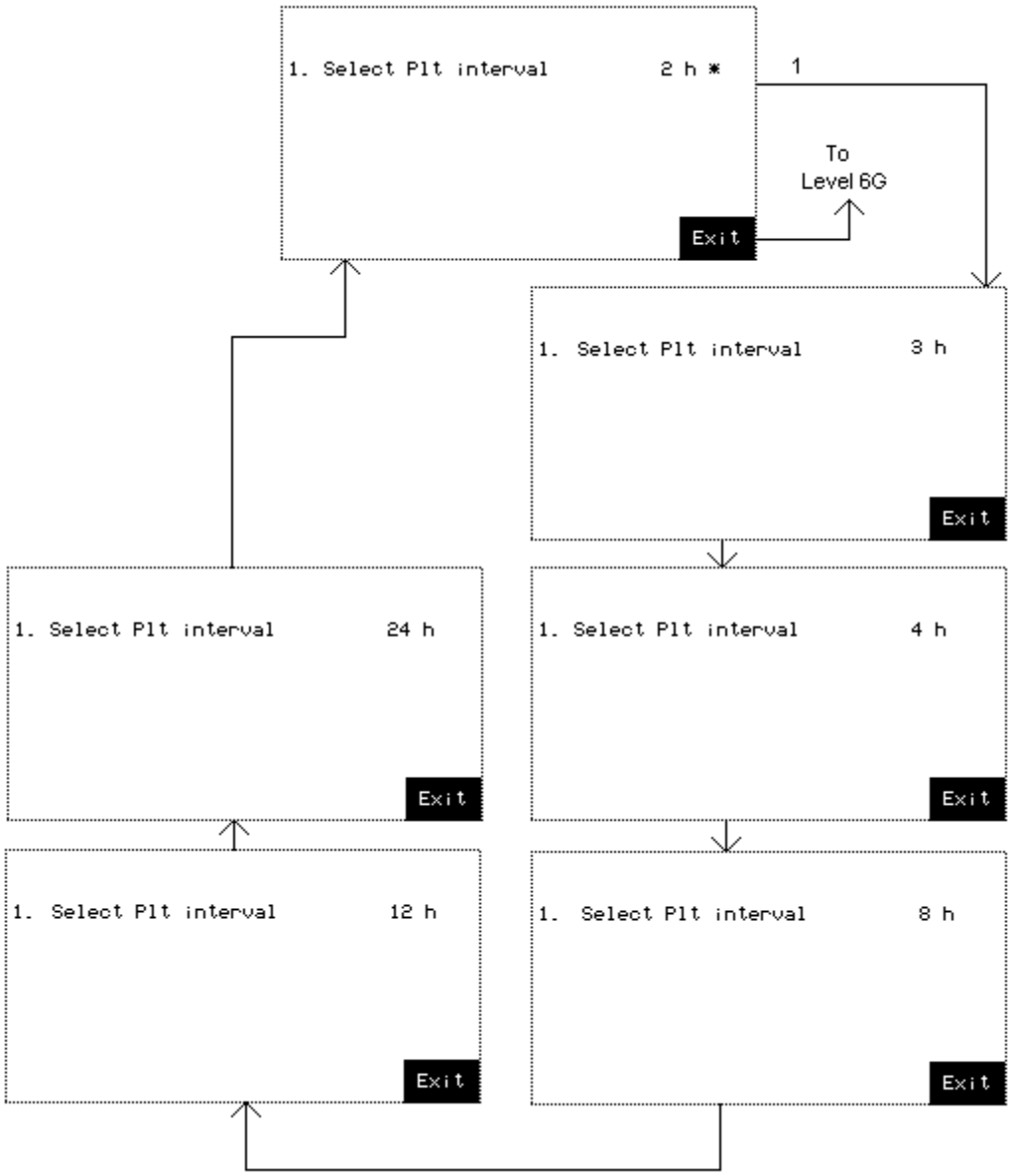

03 Dec 97
14:11:40
Set Time
Set Date
Date Style
OK
To Level 6H
03 Dec 97
14:11:40
Quit
97 Dec 03
14:19:21
Set Time
Set Date
Date Style
OK
03 Dec 97
13:48:00
Set Time
Set Date
Date Style
Quit
OK
To Level 6H
Dec 03 97
14:19:21
Set Time
Set Date
Date Style
OK
03 Dec 97
10:58:54
Quit
03 Dec 97
13:48:00
Set Time
Set Date
Date Style
Quit
OK
To Level 6H

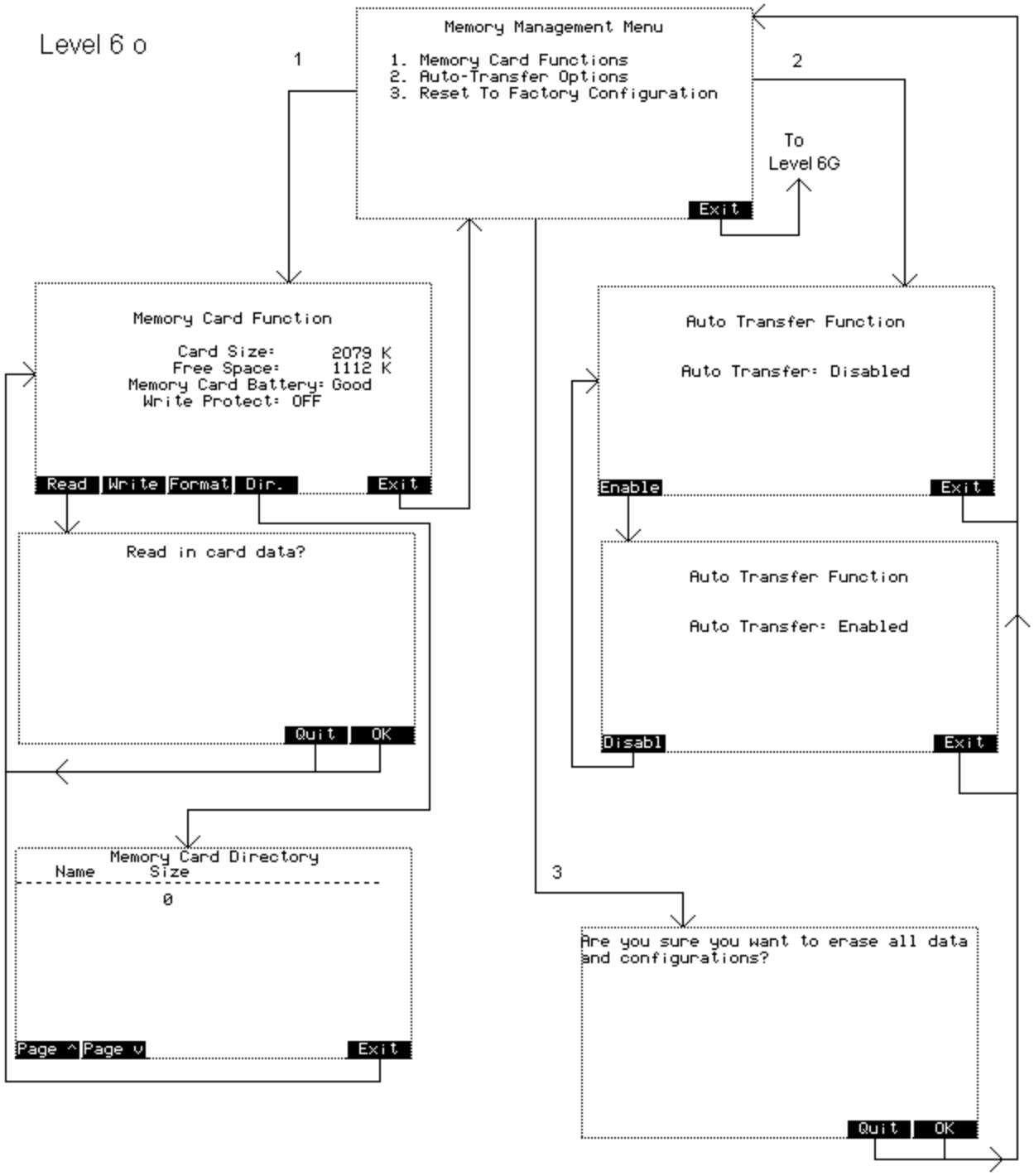

Level_6 K
Language Selection
1. English
2. Spanish
3. German
4. French
Present Language: English
Exit
To
Level 6H
1
Language Selection
1. English
2. Spanish
3. German
4. French
Present Language: English
Exit
2
Seleccion De Idioma
1. Ingles
2. Español
3. Aleman
4. Frances
Idiomas Disponibles: Español
Salir
3
Sprache Auswählen
1. Englisch
2. Spanisch
3. Deutch
4. Französisch
Zur Auswahl Stehen: Deutch
Exit
4
Selection De Langue
1. Anglais
2. Espagnol
3. Allemand
4. Français
Langues Disponibles: Francais
Sortie

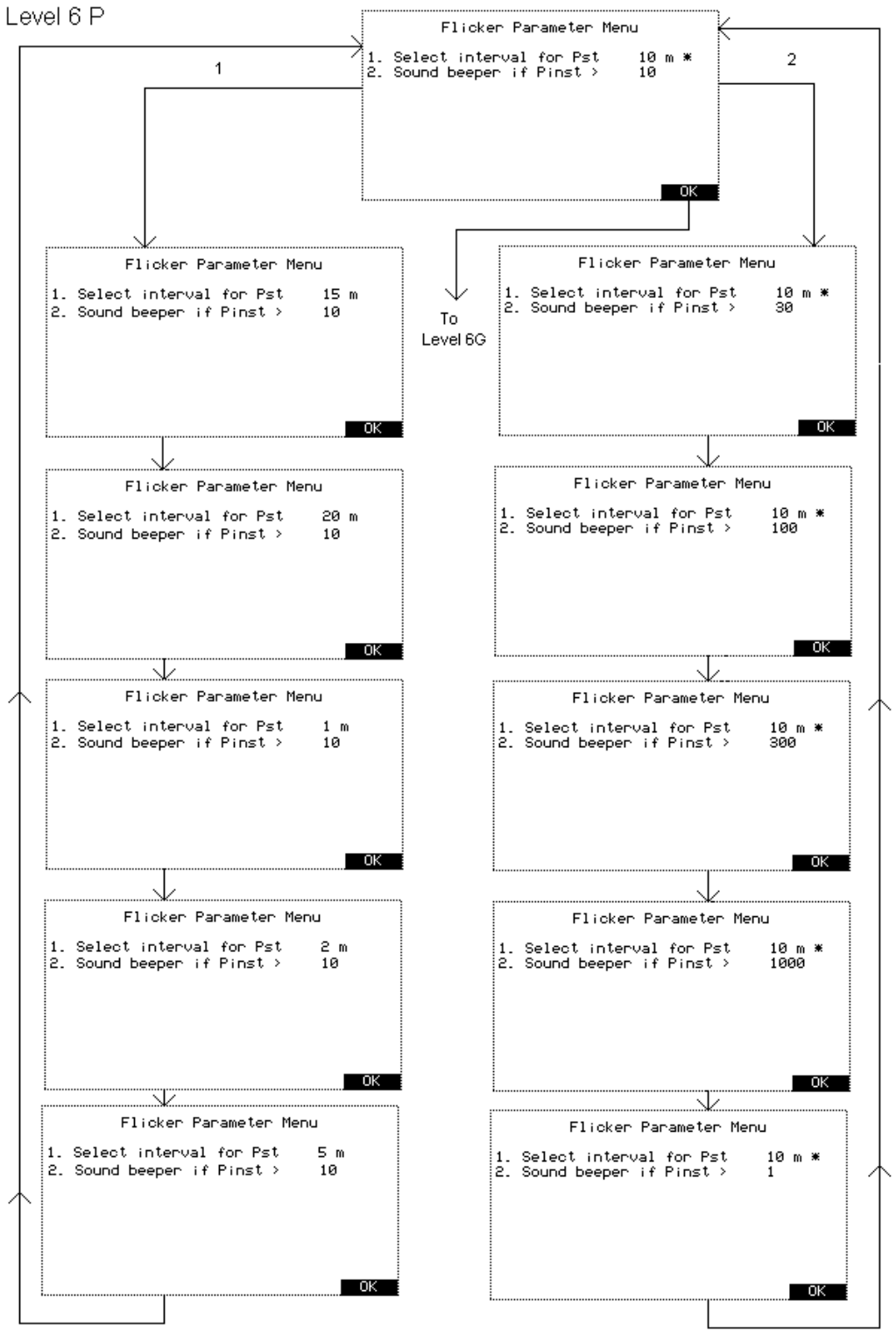

Level 6 L
Display Setup Menu
1. Select Video Rev/Normal
2. Clock
3. Backlight Timer 10 m
Exit
1
3
Display Setup Menu
1. Select Video Rev/Normal
2. Clock
3. Backlight Timer 10 m
Exit
Display Setup Menu
1. Select Video Rev/Normal
2. Clock
3. Backlight Timer 5 m
Exit
2
Exit
Display Setup Menu
1. Select Video Rev/Normal
2. Clock
3. Backlight Timer 10 m
Exit
2:29:32
Exit
Display Setup Menu
1. Select Video Rev/Normal
2. Clock
3. Backlight Timer 15 m
Exit
14:30:08
Exit

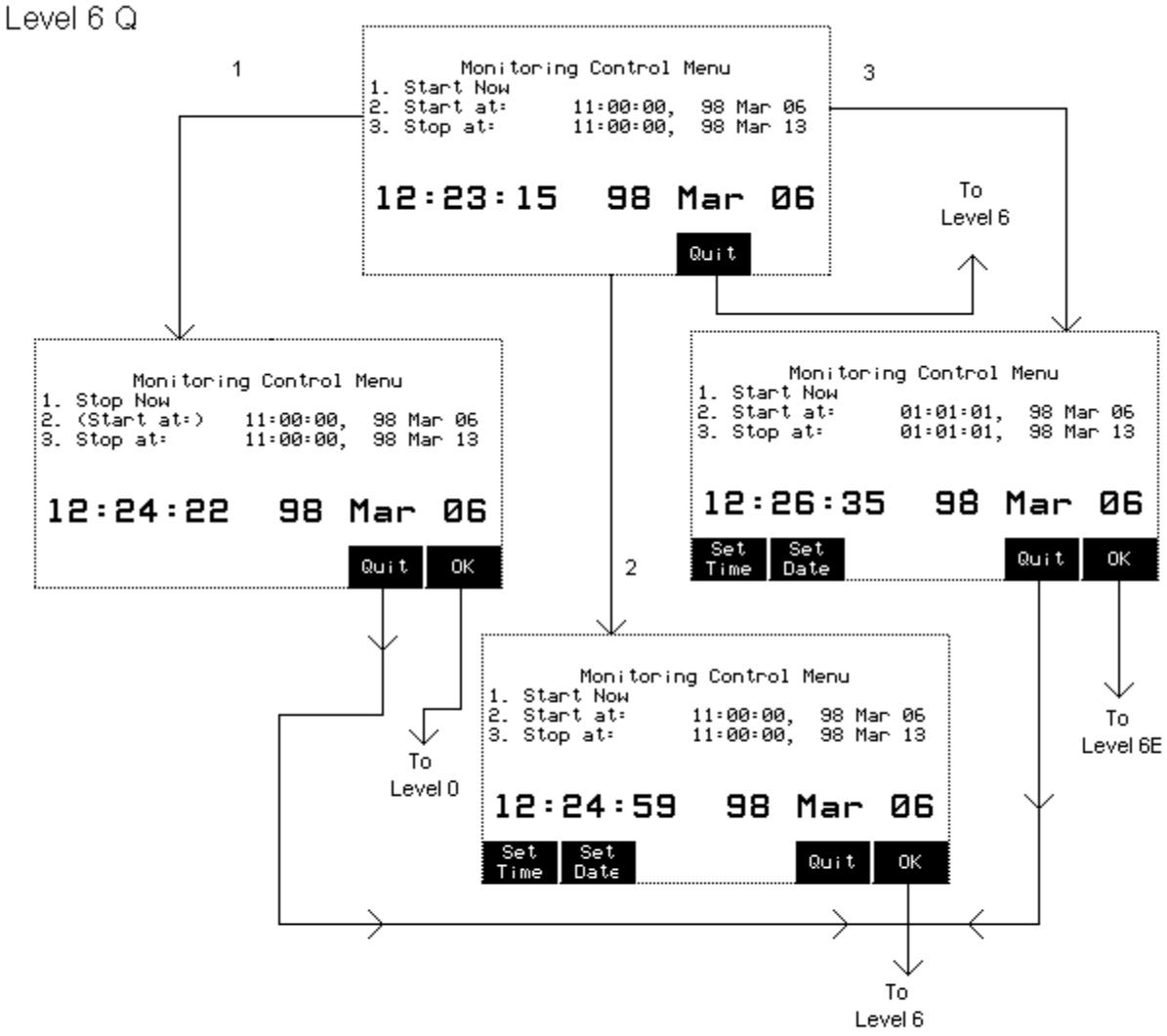

Level 6 M
Monitoring Parameters Menu
1. Set Circuit Type
2. Turn Beeper On/Off
3. Set Scale Factors
Exit
To
Level 6D
To
Level_6a
1
2
3
1. Beeper: On
Exit
1
1. Beeper: Off
Exit
1
Volts Amps
▸A 1.000 1.000
B 1.000 1.000
C 1.000 1.000
D 1.000 1.000
↓
Volts
Amps
Exit

Level 6 N


1. Select Plt interval 2 h *
1
To
Level 6G
Exit
1. Select Plt interval 3 h
Exit
1. Select Plt interval 24 h
Exit
1. Select Plt interval 4 h
Exit
1. Select Plt interval 12 h
Exit
1. Select Plt interval 8 h
Exit


Level 6 o
Memory Management Menu
1. Memory Card Functions
2. Auto-Transfer Options
3. Reset To Factory Configuration
1
2
To
Level 6G
Exit
Memory Card Function
Card Size: 2079 K
Free Space: 1112 K
Memory Card Battery: Good
Write Protect: OFF
Read
Write
Format
Dir.
Exit
Read in card data?
Quit
OK
Memory Card Directory
Name
Size
0
Page ^
Page v
Exit
Auto Transfer Function
Auto Transfer: Disabled
Enable
Exit
Auto Transfer Function
Auto Transfer: Enabled
Disabl
Exit
3
Are you sure you want to erase all data
and configurations?
Quit
OK


Level 6 P
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 10
OK
1
2
To Level 6G
Flicker Parameter Menu
1. Select interval for Pst 15 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 30
OK
Flicker Parameter Menu
1. Select interval for Pst 20 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 100
OK
Flicker Parameter Menu
1. Select interval for Pst 1 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 300
OK
Flicker Parameter Menu
1. Select interval for Pst 2 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 1000
OK
Flicker Parameter Menu
1. Select interval for Pst 5 m
2. Sound beeper if Pinst > 10
OK
Flicker Parameter Menu
1. Select interval for Pst 10 m *
2. Sound beeper if Pinst > 1
OK


Level 6 Q
1
Monitoring Control Menu
1. Start Now
2. Start at: 11:00:00, 98 Mar 06
3. Stop at: 11:00:00, 98 Mar 13
12:23:15 98 Mar 06
Quit
3
To
Level 6
Monitoring Control Menu
1. Stop Now
2. (Start at:) 11:00:00, 98 Mar 06
3. Stop at: 11:00:00, 98 Mar 13
12:24:22 98 Mar 06
Quit
OK
2
Monitoring Control Menu
1. Start Now
2. Start at: 01:01:01, 98 Mar 06
3. Stop at: 01:01:01, 98 Mar 13
12:26:35 98 Mar 06
Set Time
Set Date
Quit
OK
To
Level 6E
To
Level 0
Monitoring Control Menu
1. Start Now
2. Start at: 11:00:00, 98 Mar 06
3. Stop at: 11:00:00, 98 Mar 13
12:24:59 98 Mar 06
Set Time
Set Date
Quit
OK
To
Level 6

Glossary

Accumulated energy	Total energy consumed since beginning of billing month.
Ampere	A unit of electrical current or rate of flow of electrons. One volt across one ohm of resistance causes a current flow of one ampere. A flow of one coulomb per second equals one ampere.
Apparent power	The product of voltage and current in a circuit in which the two reach their peaks at different times, or, in other words, there is a phase angle between voltage and current. Units are VA or some multiple thereof.
Balanced load	An alternating current power system consisting of more than two current-carrying conductors in which these current-carrying conductors all carry the same current.
Billing date	The first date in the billing monthly.
Billing demand	The demand level which a utility uses to calculate the demand charges on the current month's bill. If the rate schedule includes a ratchet clause or minimum demand charge, billing demand may or may not be the actual peak average demand for the current month.
Capacitor	A device consisting essentially of two conducting surfaces separated by an insulating material or dielectric such as air, paper, mica, plastic film, or oil. A capacitor stores electrical energy, blocks the flow of direct current, and permits the flow of alternating current to a degree dependent upon the capacitance and frequency.
Connected load	The total load which a customer can impose on the electrical system if everything was connected at one time. Connected load can be measured in horse-power, watts, or volt-amperes. Some rate schedules establish a minimum demand charge by imposing a fee per unit of connected load.
Clamp-on CT	A current transformer which clamps around a current-carrying conductor so that the conductor does not have to be opened for insertion of the transformer primary. Particularly suited for making energy surveys where current must be sensed at many points for relatively short periods.
Current transformer (CT)	An instrument transformer, intended for measuring or control purposes, designed to have its primary winding connected in series with a conductor carrying the current to be measured or controlled. Also see clamp-on CT, where the conductor itself acts as the primary. CT's step down high currents to lower values which can be used by measuring instruments. They must be used with caution.

Current transformer ratio	The ratio of primary amperes divided by secondary amperes.
Day (Daily)	Begins at 00:00:00 and ends at 23:59:59.
Demand	A measure of the customer load connected to the electrical power system at any given time. Units are usually watts, volt-amperes, or volt-ampere-reactive.
Demand charge	The charge which utilities apply to the billing demand for the current month. Units are usually dollars per kilowatt or dollars per volt or kilo-volt-ampere.
Demand-hours	The equivalent number of hours in a month during which the peak average demand is fully utilized. In other words, if energy consumption for the current month is X KWH and the peak average demand is Y kw, then the demand hours is equal to X/Y hours. The higher the number of demand hours the better the demand leveling situation and the more efficiently demand is being used. Many rate schedules have demand-hour-based energy breaks with the higher the demand-hour figure the lower the energy consumption rate in dollars per KWH.
Demand interval	Demand charges are based on peak average demand over a utility-specified time interval, not on the instantaneous demand (or connected load) at any given moment. Typical demand intervals are 15, 20, and 30 minutes, although under certain circumstances they can drop to as low as 5 minutes.
Demand-utilization efficiency	Related to demand-hours and really a measure of how successful demand leveling procedures have been. Calculated by dividing demand hours by 720, the number of hours in a 30-day billing period. Although demand-utilization efficiency depends heavily on the type of facility, in general an efficiency of 50 percent is considered average, 40 percent and lower poor, and 60 percent and higher good.
Discretionary loads	Loads which exhibit a “flywheel” effect so that removing them from the line for short periods of time does not affect business or plant operation or personal comfort. Typical are HVAC systems, hot water heaters, and snow-melt systems. These types of load provide the shed/restore capability required in power demand controller systems.
Efficiency	In general, the ratio of output power to input power expressed as a percentage. For electromechanical equipment such as motors it is very difficult to determine true efficiency under plant-floor conditions. Electric input power can be easily measured, but accurately determining mechanical output power is difficult.
Energy consumption charges	The charges a utility imposes for the consumption of real power in watts. Units are usually dollars per kilowatt-hour.

Event	A type of report that is stored in memory when either a Hi/Lo Limits trigger or an external trigger generates a report. Events can be viewed through the VIEW REPORTS option from the MAIN MENU, or they can be sent to one of the other output devices (printer or communication ports) when a certain trigger condition is met.
Event memory	Stores events (which are created when an Hi/Lo Limits trigger or external trigger generate a report).
Fuel-adjustment charges	The charges a utility imposes for changes in the cost of the fuel they use and other utility-cost factors. Frequently these charges are based on complex formulas which include many variables related to the cost of delivering electrical energy. Units are usually dollars per KWH.
Frequency	The number of recurrences of a periodic phenomenon in a unit of time. In electrical terms, frequency is specified as so many Hertz (Hz) where one Hz equals one cycle per second.
Historical memory	Stores data that is automatically saved at the end of each demand interval.
Impedance	The total opposition (i.e., resistance and reactance) a circuit offers to the flow of alternating current at a given frequency. It is measured in ohms.
Induction motor	An alternating current motor in which the primary winding (usually the stator) is connected to the power source and induces a current into a polyphase secondary (usually the rotor). Induction motors are the principal source of poor power factor problems.
Inductor	Also called an inductance or retardation coil. A conductor, wound into a spiral or coil to increase its inductive intensity, is used for introducing inductance into a circuit. An inductor retards the change of current flow through it.
Initiator pulses	Electrical impulses generated by pulse-initiator mechanisms installed in utility revenue meters. Each pulse indicates the consumption of a specific number of watts. These pulses can be used to measure energy consumption and demand.
Installed load	Equivalent to connected load.
Kilowatt-hour (KWH)	A unit of electrical measurement indicating the expenditure of 1,000 watts for one hour. Higher quantities are expressed in megawatt-hours, or the expenditure of one-million watts for one hour.
Lagging current	The current flowing in a circuit which is mostly inductive. If a circuit contains only inductance the current lags the applied voltage by 90°. Lagging current means lagging power factor of less than unity.

Leading current	The current flowing in a circuit which is mostly capacitive. If a circuit contains only capacitance the current leads the applied voltage by 90°. Leading current means leading power factor of less than unity.
Load	Any device or circuit which consumes power in an electrical system.
Load factor	A quantity related to connected load, installed load, and contracted load capacity. Utilities use load factor to establish a minimum billing demand.
Load restoring	The energization of loads that were previously removed from the line to limit load and control demand level.
Load shedding	The removal of loads from the line to limit load and control demand level.
Month (Monthly), (Billing Month or Cycle)	If Billing Dates are programmed: Begins at 00:00:00 of first date in billing month ends at 23:59:59 of last date in billing month. If Billing Dates are NOT programmed: Begins at 00:00:00 of date memory is cleared. Subsequent billing months begin on the same date every calendar month.
Neutral	The conductor used as the return path for the current from the load to the source in power measurement procedures. The neutral is frequently, but not necessarily, grounded.
Ohm	The unit of electrical resistance. One ohm is the value of resistance through which a potential difference of one volt will maintain a current flow of one ampere.
Ohm's Law	The voltage across an element of direct current circuit is equal to the current in amperes through the element multiplied by the resistance of the element in ohms.
Overflow	Type of memory that stops collecting data once the memory is full. Must be cleared to begin data collection again. Also known as Fill and Stop.
Parameter	Refers to different types of characteristic elements. In general, parameter is used to refer to the various units or value types that can be measured by the Power Platform (such as Volts, Amps, frequency, etc.). The term parameter is also used to refer to the different programmable characteristics of the unit (such as time and date, site I.D., billing dates, etc.)
Peak average demand	The highest average load over a utility specified time interval during a billing period. If there is no ratchet clause in the rate schedule then the peak average demand is also the billing demand.
Polyphase	Having or utilizing several phases. A polyphase alternating current power circuit has several phases of alternating current with a fixed phase angle between phases.

Potential transformer (PT)	An instrument transformer, the primary winding of which is connected in parallel with the circuit whose voltage is to be measured or controlled. PT's are normally used to step down high voltage potentials to lower levels acceptable to measuring instruments.
Potential transformer ratio	The ratio of primary voltage divided by secondary voltage.
Power factor	The ratio of real power in watts of an alternating current circuit to the apparent power in volt-amperes. Also the cosine of the phase angle between the voltage applied to a load and the current passing through it.
Power factor correction	Steps taken to raise the power factor by bringing the current more nearly in phase with the applied voltage. Most frequently this consists of adding capacitance to increase the lagging power factor of inductive circuits.
Power factor penalty	The charge utilities impose for operating at power factors below some rate-schedule-specified level. This level ranges from a lagging power factor of 0.80 to unity. There are innumerable different ways by which utilities calculate power factor penalties.
Present demand	Instantaneous demand updated every second.
Projected demand	Average demand for the elapsed time of the demand interval.
Pulse initiator	A device added to a revenue meter which generates pulses proportional to meter disk rotation. Each pulse represents a discrete quantity of energy consumed. Frequently the pulses are generated photoelectrically and output through mercury-wetted relays.
Q	A phantom quantity used by power companies to calculate volt-ampere-reactive (var) when there are both leading and lagging power factors. A Q-hour meter will determine varhr's when the power factors vary from 30° leading to 90° lagging. A Q-hour meter is similar to a watt-hour meter except that the voltage applied to each potential coil lags by 60° the voltage supplied to the respective watt-hour meter potential coil. This can generally be accomplished by cross-phasing, thus eliminating the need for a phase-shifting transformer. The varhr information can be calculated as follows: varhr = (2Q hr -whr)/(3½)

Ratchet clause A rate schedule clause which states that billing demand may be based on current month peak average demand or on historical peak average demand, depending on relative magnitude. Usually the historical period is the past eleven months although it can be for the life of the contract. Billing demand is either the current month peak average demand or some percentage (75 percent is typical) of the highest historical peak average demand, depending on which is largest.

Reactance The opposition to the flow of alternating current. Capacitive reactance is the opposition offered by capacitors and inductive reactance is the opposition offered by an inductive load. Both reactances are measured in ohms.

Reactive power Also called wattless power and measured in volt-ampere-reactive. Reactive power increases with decreasing power factor and is the component of apparent power which does no real work in a system.

Real Power The component of apparent power that represents true work in an alternating current circuit. It is expressed in watts and is equal to the apparent power times the power factor.

Report A unit of information pertaining to one or more channels and parameters. Through the monitoring setups, a report can be programmed to be sent to the memory card, printer, to one of the communication ports, or to the report memory, when a certain trigger condition is met. Present values for all available report types, and any reports stored in memory, can be viewed through MAIN MENU option 2, VIEW REPORTS.

Report Memory Stores reports that have been programmed in the monitoring setup to be saved in memory.

Resistance The property of a substance which impedes current flow and results in the dissipation of power in the form of heat. The unit of resistance is the ohm. One ohm is the resistance through which a difference of potential of one volt will produce a current of one ampere.

Revenue meter A meter used by a utility to generate billing information. Many types of meters fall in this category depending on the rate structure.

Root mean square (RMS) The effective value of alternating current or voltage. The RMS values of voltage and current can be used for the accurate computation of power in watts. The RMS value is the same value as if continuous direct current were applied to a pure resistance.

Setup Consists of a number, title, and up to 32 reports. The types of reports programmed, and the conditions that must exist for the report to be generated, are all contained in a setup. A total of 32 setups can be programmed, although only one setup can be active at a given time.

Single-phase	An alternating current circuit in which only one phase of current is available in a two-conductor or three-conductor system where the load lines are 0° or 180° out of phase.
Sliding demand interval	A method of calculating average demand by averaging the average demand over several overlapping intervals. The intervals begin a short time span (step) apart, usually about five minutes. Updating average demand at short time intervals gives the utility a much better measure of true demand and makes it difficult for the customer to obscure high short-term loads.
Time-dependent clauses	Rate schedule provisions which vary rates depending on the time of day or time of year when energy is consumed. Frequently these clauses cover both demand and energy charges. There is money to be saved by operating high loads and consuming high amounts of energy during off-peak periods when rates are lower.
Telephone Influence Factor	Telephone Influence Factor (TIF) is a dimensionless quantity which describes the potential for interference by a power circuit on a communications circuit. TIF weighting factors take into account the relative interfering effects of various frequencies in the voice band Weighting factors are calculated under the assumption that coupling between the power and communications circuits is directly proportional to the frequency. There is no accounting for the physical orientation of the two systems.
Time-of-use period	Utility company charge rates at different times and/or dates. For example, they may charge lower rates on weekends or holidays. On weekdays, they might charge one rate between 8 am and 5 pm, another rate between 5 pm and 10 pm, and still another rate between 10 pm and 8 am.
Transformer Derating Factor (TDF)	Excessive harmonics can cause premature failure of distribution transformers. This results from high winding “hot spot” temperatures caused by power dissipation due to the presence of harmonic currents in the windings. To maintain operation of a transformer in the presence of harmonic content, a derating factor should be used. TDF is the suggested value to be used.
Trigger	A condition that causes a report to be generated. For example, reports can be programmed to be generated at certain times of the day, when a measured parameter exceeds a certain limit, or when an external impulse is received at the digital inputs.
True power	Same as real power.
Unbalanced loads	A situation existing in an alternating current system using more than two current-carrying conductors where the current is not equal in the current-carrying conductors due to uneven loading of the phases.
Volt-ampere (VA)	The unit of apparent power. It equals volts times amperes regardless of power factor.

Volt-ampere demand	Where peak average demand is measured in volt-amperes rather than watts. In this case the customer is automatically penalized for operating at any power factor less than unity.
Volt-ampere-reactive (var)	The unit of reactive power, as opposed to real power in watts. One var is equal to one reactive volt-ampere.
Volt-ampere-reactive demand	Measuring var demand is a method of penalizing for poor power factor. Multiplying total peak average var demand by some rate (dollars per var) penalizes for operating at any power factor less than unity. Frequently there is a quantity of “free” var which is determined as some percentage of the peak average watt demand. All excess var over this quantity is then billed at this dollars per var rate. Effectively this penalizes for operating below some specified power factor less than unity.
Volt-ampere-reactive-hour	The measure of the number of var's used in one hour. Var-hr and w-hr are frequently used to calculate average power factor during a billing period.
Voltage (v)	The force which causes current to flow through a conductor. One volt equals the force required to produce a current flow of one ampere through a resistance of one ohm.
Watt (w)	A measure of real power. The unit of electric power required to do work at the rate of one joule per second. It is the power expended when one ampere of direct current flows through a resistance of one ohm.
Watt demand	The usual demand billing factor where peak average demand is measured in watts or real power.
Watt-hour (wh)	A unit of electrical work indicating the expenditure of one watt of electrical power for one hour.
Wattmeter	An instrument of measuring the real power in an electric circuit. Its scale is usually graduated in watts, kilowatts, or megawatts.
Week (Weekly)	Begins at 00:00:00 on Sunday, ends at 23:59:59 on Saturday.
Wrap	Type of memory that continues to collect data when full by writing over the earlier (oldest) data it has collected. This process continues with data constantly writing over older data. Also known as Overwrite.

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