SECTION 1: INTRODUCTION/QUICK START 1-1

1-1 Preliminary Comments And Safety Precautions 1-1
1-1.1 Warranty And Liability Information..... 1-1
1-1.2 Safety Precautions..... 1-1
1-1.3 Factory Correspondence..... 1-1

1-2 Product Overview 1-1
1-2.1 Comprehensive Information..... 1-3
1-2.2 Harmonic Distortion Analysis 1-3
1-2.3 Extensive I/O And Communications Capabilities..... 1-3
1-2.4 Disturbance Information..... 1-3
1-2.5 High Accuracy 1-3
1-2.6 Operational Simplicity..... 1-3

1-3 Quick Start 1-4
1-3.1 Quick Start Steps..... 1-4

SECTION 2: HARDWARE DESCRIPTION..... 2-1

2-1 General 2-1

2-2 Operator Panel 2-1

2-3 Rear Access Area..... 2-2
2-3.1 Back of Chassis..... 2-2
2-3.2 Left Rear of Chassis 2-3
2-3.3 Right Rear of Chassis..... 2-3

2-4 External Hardware 2-4
2-4.1 Current Transformers..... 2-4
2-4.2 Potential Transformers 2-4
2-4.3 Power Supply Modules 2-4
2-4.4 Optional Communication Module..... 2-4

2-5 Specification Summary 2-5

SECTION 3: OPERATOR PANEL..... 3-1

3-2 LEDs 3-1

3-3 Display Window 3-1

3-4 Pushbuttons..... 3-2

SECTION 4: INSTALLATION..... 4-1

4-1 Introduction 4-1

4-2 Panel Preparation 4-1
4-2.1 Standard flush mounted Cutout..... 4-2
4-2.2 Standard flush Mounting..... 4-2
4-2.3 Optional Flange Mounted Cutout and Mounting..... 4-3

4-3 Wiring 4-3
4-3.1 Current and Potential Transformer Selection..... 4-5
4-3.2 Wiring Diagrams..... 4-5

4-4 Initial Startup..... 4-5
4-4.1 Before Power Application..... 4-5
4-4.2 Initial Power Application..... 4-5

4-5 Quick Start Metering..... 4-6

SECTION 5: OPERATION..... 5-1

5-1 General 5-1

5-2 Display Mode ("METER MENU")..... 5-1
5-2.1 Displayed Parameters..... 5-2
5-2.2 Displayed Sign Conventions 5-3
5-2.3 Display Manager..... 5-5

5-3 Help Mode 5-5

5-4 Programming MODE..... 5-6

5-5 GENERAL SETUP 5-8
5-5.1 System Type..... 5-8
5-5.2 Frequency..... 5-9
5-5.3 Incoming Line-to-Line Voltage 5-9
5-5.4 PT Primary Rating 5-9
5-5.5 CT Primary Rating..... 5-9
5-5.6 Ground CT Primary Rating 5-9
5-5.7 Programming Options..... 5-9
5-5.8 Power/Energy Options 5-10
5-5.9 Date and Time..... 5-10
5-5.10 Change Password..... 5-10
5-5.11 Communication Mode..... 5-11

5-6 Inputs/Outputs..... 5-11
5-6.1 Discrete Contact Inputs..... 5-11
5-6.2 Analog Input 5-11
5-6.3 Analog Outputs..... 5-13
5-6.4 Relay Output Contacts..... 5-16

5-7 Analysis Modes..... 5-18
5-7.1 Minimum/Maximum Trend Analysis 5-19
5-7.2 Event Analysis..... 5-20
5-7.3 Harmonic Analysis..... 5-24
5-7.4 Demand Analysis..... 5-24

5-8 Communications..... 5-25
5-8.1 IPONI 5-25
5-8.2 EPONI and EPONIF 5-25
5-8.3 PowerNet Software Suite..... 5-26
5-8.4 PowerNet Graphics..... 5-26
5-8.5 Connectivity..... 5-26

5-9 IQ Analyzer 6600 Series Graphic Displays 5-26
5-9.1 Graphic Waveform 5-26
5-9.2 Harmonic Spectrum..... 5-26

5-10 Reset Mode..... 5-27

5-11 Trend Data Operation (NEW!)..... 5-28
5-11.1 Organization of Data..... 5-28
5-11.2 Display of Trend Data 5-28
5-11.3 Programming of Trend Parameters..... 5-29
5-11.4 Applications of Trending 5-31

5-12 Event Log Operation (NEW!)..... 5-33

5-13 Time Of Use Energy & Demand (NEW!).... 5-34
5-13.1 Time of Use Displays..... 5-34
5-13.2 Programming Time of Use Schedules. 5-35

SECTION 6: PROGRAMMING 6-1

6-1 Introduction 6-1

6-2 Common Programming Procedures 6-1

6-2.1 Entering Program Mode 6-2
6-2.2 Password Entry 6-2
6-2.3 View Only Password 6-2
6-2.4 Movement to Previous Levels 6-2
6-2.5 Exiting Program Mode 6-3

6-3 PROGRAMMING EXAMPLE 6-3

6-3.1 Programming Example Input 6-3

6-4 Programming Categories 6-4

6-4.1 Use of F1-F4 Pushbuttons 6-4
6-4.2 Programming Category Screens Trees .. 6-5
6-4.3 Screens Tree Details 6-5

SECTION 7: TROUBLESHOOTING AND MAINTENANCE 7-1

7-1 Level of Repair 7-1

7-2 Troubleshooting (Table 7.1) 7-1

7-3 Replacement 7-1

7-4 Maintenance and Care 7-4

7-5 Calibration 7-4

7-6 Return Procedure 7-4

7-7 Replacement Parts 7-4

7-8 Technical Assistance 7-4

APPENDIX A

Startup Settings Sheet #1 ..... A-2
Startup Settings Sheet #2 ..... A-4
Startup Settings Sheet #3 ..... A-5
Startup Settings Sheet #4 ..... A-6
Startup Settings Sheet #5 ..... A-8
Startup Settings Sheet #6 ..... A-16
Startup Settings Sheet #7 ..... A-21
Startup Settings Sheet #8 ..... A-22
Startup Settings Sheet #9 ..... A-24
Startup Settings Sheet #10 ..... A-26
Glossary A-31

LIST OF FIGURES

Figure 1-1 IQ Analyzer (Front View) 1-2
Figure 1-2 IQ Analyzer (Rear View) with optional IPONI (INCOM Product Operated Network Interface) Communication Module Installed 1-2
Figure 2-1 IQ Analyzer Operator Panel 2-1
Figure 2-2 IQ Analyzer (Rear Views). See Figures 4-7 and 4-8 for detailed identifications 2-2
Figure 2-3 Separate Source Power Module (Shown Mounted) 2-3
Figure 2-4 Self-Powered Three-Phase Power Module (Unmounted) 2-3
Figure 2-5 Communications Module – IPONI – (Mounted) 2-5
Figure 3-1 Typical Programming Screen 3-4
Figure 3-2 Typical Meter Menu Screen 3-4
Figure 3-3 Typical TRND Min/Max Analysis Screen 3-4
Figure 3-4 Typical Event Analysis Screen 3-4
Figure 3-5 Typical Harmonic Analysis Screen 3-4
Figure 3-6 Typical Demand Analysis Screen 3-4
Figure 3-7 Typical Help Screen 3-4
Figure 3-8 Reset Screen 3-4
Figure 3-9 Typical Time of Use Energy Screen ... 3-5
Figure 3-10 Typical Time of Use Peak Demand 3-5
Figure 3-11 Trend Analysis Menu 3-5
Figure 3-12 Typical Trend Analysis Buffers 3-5
Figure 3-13 Energy Trend Example (Page 1) 3-5
Figure 3-14 Energy Trend Example (Page 2) 3-5
Figure 3-15 Energy Trend Example (Page 30) 3-5
Figure 4-1 IQ Analyzer Dimensions and Cutout (inches [mm]) 4-1
Figure 4-2 Flush Mounted Drilling Pattern 4-2
Figure 4-3 Power Module Dimensions 4-2
Figure 4-4 Flange Mounted Drilling Pattern 4-3
Figure 4-5 IQ Analyzer Shown Mounted Using a Mounting Flange 4-3
Figure 4-6 Typical Network Wiring Diagram 4-4
Figure 4-7 IQ Analyzer with Self-Powered Three-Phase Power Module (Rear View) 4-6
Figure 4-8 IQ Analyzer with Separate Source Power Module (Rear View) 4-7
Figure 4-9 3-phase 3-Wire (Up to 600 Volts) Wiring Diagram 4-8
Figure 4-10 3-phase 3-Wire (Above 600 Volts) Wiring Diagram 4-8
Figure 4-11 3-phase 3-Wire (Above 600 Volts) Wiring Diagram 4-9
Figure 4-12 3-phase 4-Wire (Up to 600 Volts) Wiring Diagram 4-9
Figure 4-13 3-phase 4-Wire (Above 600 Volts) Wiring Diagram 4-10
Figure 4-14 3-phase 4-Wire (96 to 600 Volts) Wiring Diagram 4-10
Figure 4-15 3-phase 3-Wire (Above 600 Volts) Wiring Diagram 4-11

Figure 4-16 3-phase 3-Wire (Above 600 Volts) Wiring Diagram 4-11
Figure 4-17 3-phase 4-Wire (96 to 600 Volts) Wiring Diagram 4-12
Figure 4-18 3-phase 4-Wire (Above 600 Volts) Wiring Diagram 4-12
Figure 4-19 3-phase 3-Wire (Up to 600 Volts) Wiring Diagram 4-13
Figure 4-20 3-phase 3-Wire (Above 600 Volts) Wiring Diagram 4-13
Figure 4-21 3-phase 4-Wire (Up to 600 Volts) Wiring Diagram 4-14
Figure 4-22 3-phase 4-Wire (Above 600 Volts) Wiring Diagram 4-14
Figure 4-23 3-phase 3-Wire (Up to 600 Volts) Wiring Diagram 4-15
Figure 4-24 3-phase 3-Wire (Above 600 Volts) Wiring Diagram 4-15
Figure 4-25 3-phase 4-Wire (Above 600 Volts) Wiring Diagram 4-16
Figure 4-26 3-phase 4-Wire (96 to 600 Volts) Wiring Diagram 4-16
Figure 4-27 3-phase 4-Wire (Above 600 Volts) Wiring Diagram 4-17
Figure 4-28 Single-phase 3-Wire (Up to 600 Volts) Wiring Diagram 4-17
Figure 4-29 Single-phase 2-Wire (Up to 600 Volts) Wiring Diagram 4-18
Figure 4-30 Analog Outputs....4-19
Figure 4-31 Analog Input (Auxiliary Current Input Connections) 4-20
Figure 4-32 Analog Input (Auxiliary Current Input Connections) 4-20
Figure 4-33 Discrete Contact Inputs....4-21
Figure 4-34 Control Relay Connections 4-21
Figure 5-1 Meter Menu Initial Current Screen 5-2
Figure 5-2 Second Meter Menu Current Screen.. 5-2
Figure 5-3 Typical Power Factor Minimum/Maximum Possibilities..... 5-3
Figure 5-4 Power Quadrants, Direct Mathematical..... 5-4
Figure 5-5 Power Quadrants, Power Engineers .. 5-4
Figure 5-6 Induction Motor Load..... 5-4
Figure 5-7 Power Distribution 5-4
Figure 5-8 Display Options Screen 5-7
Figure 5-9 First Help Menu..... 5-7
Figure 5-10 Second Help Menu 5-7
Figure 5-11 Faceplate Operation First Screen Selections..... 5-8
Figure 5-12 Faceplate Operation Second Screen Selections..... 5-8
Figure 5-13 Download Program Screen 5-10
Figure 5-14 Change Date and Time Screen..... 5-10
Figure 5-15 Connections for 4-20 or 0-20mA Input Signal 5-11
Figure 5-16 Connections for 0-5Vdc Input Signal 5-11
Figure 5-17 Analog Output Connections 4-20 or 0-20mA..... 5-13
Figure 5-18 Relay Contact with IQ Analyzer De-energized..... 5-16
Figure 5-19 Typical Relay Output Connections... 5-16
Figure 5-20 Pulse Output Connections 5-17
Figure 5-21 2-Wire Pulse Train..... 5-17
Figure 5-22 3-Wire Pulse Train..... 5-18
Figure 5-23 Typical Trend Analysis Screen (Ground Current maximum)..... 5-19
Figure 5-24 Typical Event #1 Screen..... 5-19
Figure 5-25 Typical Metered Event Voltage Screen..... 5-19
Figure 5-26 Event Trigger, Delay, and Reset Thresholds..... 5-21
Figure 5-27 Typical Event Voltage Disturbance Screen..... 5-22
Figure 5-28 Typical Transient Waveform Display on IQA6600 Series 5-23
Figure 5-29 Typical Amps Selection Phase Screen..... 5-24
Figure 5-30 Typical Volts A-B Screen..... 5-24
Figure 5-31 Demand Analysis #1 Screen..... 5-24
Figure 5-32 Typical Present Power Demand Screen..... 5-25
Figure 5-33 Sliding Demand Setpoints Screen.... 5-25
Figure 5-34 Typical Captured Waveform 5-26
Figure 5-35 Typical Harmonic Spectrum Display 5-26
Figure 5-36 Typical Harmonic Spectrum Display 5-27
Figure 5-37 Trend Data Screen 5-28
Figure 5-38 Trend Menu of 900 Byte Buffers..... 5-28
Figure 5-39 Trend Data Screen 5-29
Figure 5-40 Trend Programming Screen..... 5-29
Figure 5-41 Trend Items, Interval, and Memory.. 5-29
Figure 5-42 Trend Items..... 5-30

Figure 5-43 Selecting the Trend Time Interval 5-30
Figure 5-44 Maximum Memory Allocation..... 5-30
Figure 5-45 Voltage Sag Waveform & Analysis .. 5-31
Figure 5-46 Periodic Record of Min/Max Values 5-32
Figure 5-47 Timestamp Record of Input#1 Events 5-33
Figure 5-48 Page 1 of Event Log Screen 5-33
Figure 5-49 Page 168 of Event Log Screen 5-34
Figure 5-50 Time Of Use Energy Display..... 5-34
Figure 5-51 Time Of Use Demand Display..... 5-34
Figure 5-52 Time Of Use Programming Screen .. 5-35
Figure 5-53 Programming TOU Clock Adjustments..... 5-35
Figure 5-54 Programming 8 TOU Seasons 5-35
Figure 5-55 TOU Season Selection 5-35
Figure 5-56 Programming 32 TOU Schedules 5-36
Figure 5-57 Programming the Daily Schedule..... 5-36
Figure 5-58 TOU Season Selection 5-36
Figure 5-59 Selecting the TOU Default 5-36
Figure 5-60 Download Program Screen 5-37
Figure 5-61 Change Date and Time Screen..... 5-38
Figure 6-1 Top Level Screen Showing Password Entry Field 6-2
Figure 6-2 Programming Example Flow Chart 6-6
Figure 6-3 Programming Mode Top Level Menu (Choose Category) 6-13
Figure 6-4 General Setup Screens Tree..... 6-14
Figure 6-5 Analog Inputs Screens Tree..... 6-15
Figure 6-6 Analog Ouputs Screens Tree 6-15
Figure 6-7 Discrete Inputs Screens Tree 6-16
Figure 6-8 Event Triggers Screens Tree 6-17
Figure 6-9 Relay Outputs Screens Tree 6-18
Figure 6-10 Demand Screens Tree 6-19
Figure 6-11 Display Manager Screens Tree 6-19
Figure 6-12 Trend Settings Screens Tree..... 6-20
Figure 6-13 Time of Use Settings Screens Tree.. 6-21

LIST OF TABLES

Table 1.1 IQ Analyzer Order Information 1-5
Table 2-1 IQ Analyzer Specifications and Details Summary 2-6
Table 5.1 Meter Menu Displayed Information..... 5-2
Table 5.2 Custom Screen/Trend Parameters..... 5-5
Table 5.3 Display Options..... 5-6
Table 5.4 Analog Output Parameters..... 5-12
Table 5.5 Analog Output Combinations 5-14
Table 5.6 Typical Relay Application Possibilities..... 5-16
Table 5.7 Min/Max Trend Analysis Parameters 5-19
Table 5.8 Event Conditions..... 5-20
Table 6.1 Programming Categories 6-1
Table 6.2 F1-F4 Pushbutton Functions During Password Entry..... 6-2
Table 6.3 F1-F4 Pushbutton Functions During Programming..... 6-4
Table 6.4 Startup Settings Sheets Excerpts..... 6-5
Table 7.1 Troubleshooting Guide..... 7-2