DUKANE

iQ Series

ULTRASONIC POWER SUPPLIES

iQ Auto-Plus

AUTOMATED HAND PROBE PRESS

Features

Dukane ***iQ Auto-Plus*** Ultrasonic Power Supplies were specifically designed for automotive, aerospace, packaging and textile industries. To be used with automated systems, the panel mount units are compatible with ***iQLinQ***™ industrial communication protocol and Dukane's patented MPC (Multi-Point Control).

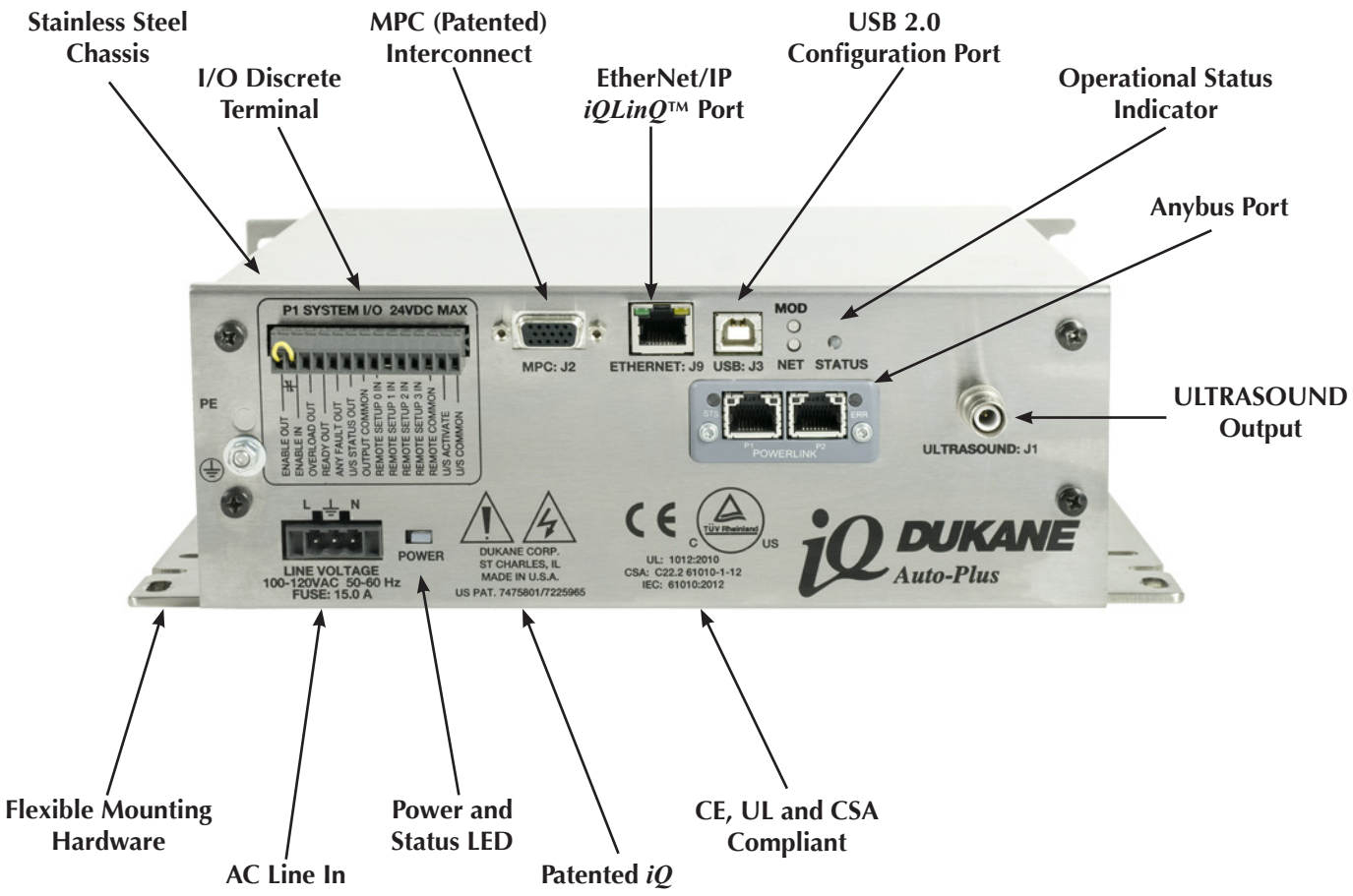
The ***iQ series*** generators incorporate our patented digital design. Compact in size, they provide the highest power density in the smallest package. Our industry leading 0.5 millisecond multi-core processing speed provides extreme accuracy and repeatability. The unique modular design allows for custom configurations and flexibility.

Available in: 20, 30, 35, and 40 kHz, 600 watts (100-240 VAC) and 1200 watts in 30 and 35 kHz, (240 VAC)

Features

- **100% digital control** of all power supply functions and parameters allows for unique configurations and future upgrades. Control includes digital frequency synthesis.
- **Industry leading data acquisition rate speed of 0.5 ms** due to advanced multi-core architecture provides for increased weld accuracy and repeatability.
- **EtherNet/IP or Modbus standard**
- **Optional Profibus, PowerLink, Profinet, EtherCAT, CC–Link, or Modbus TCP protocols** allow for flexibility in remote data acquisition and process control. A USB port is included for connection to the PC interface software program "***iQ Commander***".
- **Digi-Trac** tuning automatically tracks the resonant frequency digitally. Adjusts the output frequency to match the acoustic stack (horn, booster, and transducer). This is done for every weld cycle, and eliminates the need to manually tune the generator.
- **Ultrasonic Overload Protection**, with detailed fault description for ease of troubleshooting. The overload power limit is based on true RMS power output level.
- **Line and Load Amplitude Regulation** is maintained independent of load force and incoming line voltage variations. Through a closed-loop amplitude control, the amplitude regulation maintains output amplitude by correcting for fluctuations in line voltage and output power loading. Maintained within 1% to provide weld process consistency and shorter cycle times.
- **Highly efficient** (> 92%) power conversion with PFC
- **Universal AC power input** (240 VAC required for power level over 600 W)
- **System Safe Power-up sequence**:
  1) AC power inrush protection, 2) Supervisory System Monitor.
- **Optional Weld by Distance Feature** to monitor up to eight analog 0-10 VDC encoders when used with patented MPC (requires customer supplied encoders).
- **Weld by Distance/Energy/Peak Power/Time Limits** for each parameter are monitored to ensure quality and consistency.
- **Patented Trigger by Power** allows for repeatable Weld by Energy, or Collapse Distance modes
- **Common Chassis for 600 watt or 1,200 watt units. (1200 watt models include external heat sink)**

iQ Auto-Plus Interface and I/O



SYSTEM I/O

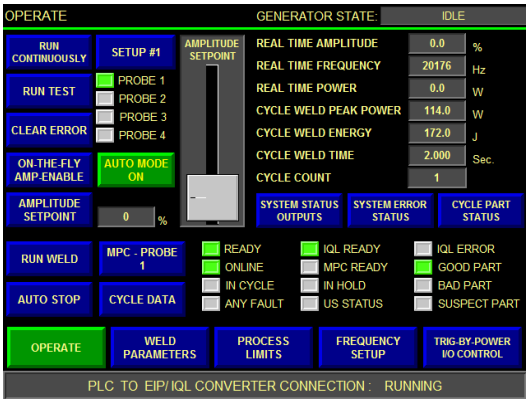
Pin	Signal Name
1	Enable Out (+22 V Current Limited)
2	Enable In (Jumper to Pin 1, without E-Stop switch)
3	Overload Out (System overload status output)
4	Ready Out
5	Any Fault Out
6	U/S Status Out
7	Output Common (Isolated)
8	Remote Setup 0 input
9	Remote Setup 1 input
10	Remote Setup 2 input
11	Remote Setup 3 input
12	Remote Common (Isolated)
13	U/S Activate
14	U/S Common (Isolated)

Indicator	Appearance	Indication
STATUS	Green – Steady	Ready
	White – Steady	Over Temperature Fault
	Yellow – Steady	E-STOP Active
	Yellow – Blinking	Power Fault
	Orange – Steady	In Cycle
	Orange – Blinking	Ultrasound Voltage Overload
	Red – Steady	Average Overload
	Red – Blinking	Peak Overload
	Blue – Steady	Frequency Overload 1
	Blue – Blinking	Frequency Overload 3
	Purple – Steady	Invalid Auto In
	Purple – Blinking	Cycle Start Rejected
	Red/Green - Blinking	Reduced Power Mode

Trigger by Power (U.S. Patent 7,475,801)

The feature provides more consistent welds by providing a sufficient and repeatable amount of pressure/force to be applied to the part before the weld cycle starts. Trigger by Power is a cost effective alternative to Trigger by Force. However, unlike Trigger by Force, Trigger by Power does not require additional, expensive components such as a load cell, amplifier board and cabling. The system uses the ultrasonic stack as a load cell. When the ultrasound is activated, the amplitude is ramped up to the Trigger Amplitude setting and held there until enough force is applied to the part to reach the Trigger Power settings. At that point the weld cycle begins and continues until the weld control parameter (Time, Energy or Power) is reached. For details see Dukane AN506 at: **http://www.dukane.com/us/Documents/AppNote/AN506.pdf**

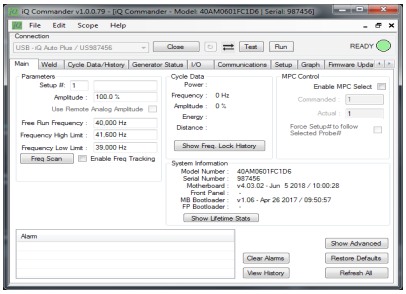
iQ LinQ™



PC User Interface

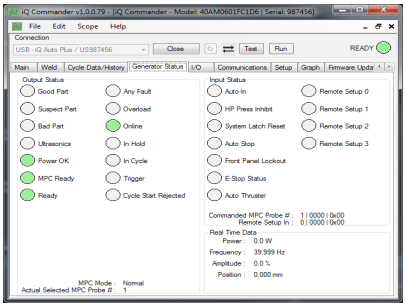
iQ Auto-Plus PC interface tool comes standard with all ***iQ Auto-Plus*** power supplies. This allows the user to easily connect a PC to the ***iQ Auto-Plus*** to perform product setup, custom I/O configuration and system diagnostics along with other system functions. The connection of the interface tool is done using the front panel USB connector and high speed USB communication protocol.

System Parameters



This window enables the user to set up Amplitude, Free Run Frequency and upper and lower Frequency limits.

System Status Monitor



This feature allows for quick troubleshooting and analysis of all system status in real time. Remote set up status used with Dukane's Patented MPC (Multi-Point Control) is also displayed.

Acoustic Stack Diagnostic

The user can perform an acoustic stack test and view real time data of Power Draw, and Frequency. The acoustic stack scan helps determine optimum frequency settings.

iQLinQ™ Connections

The built-in Ethernet/IP, POWERLINK, PROFINET, EtherCAT, CC-Link, Modbus TCP, and PROFIBUS port allows the ***iQ*** generator to connect to a variety of networks.

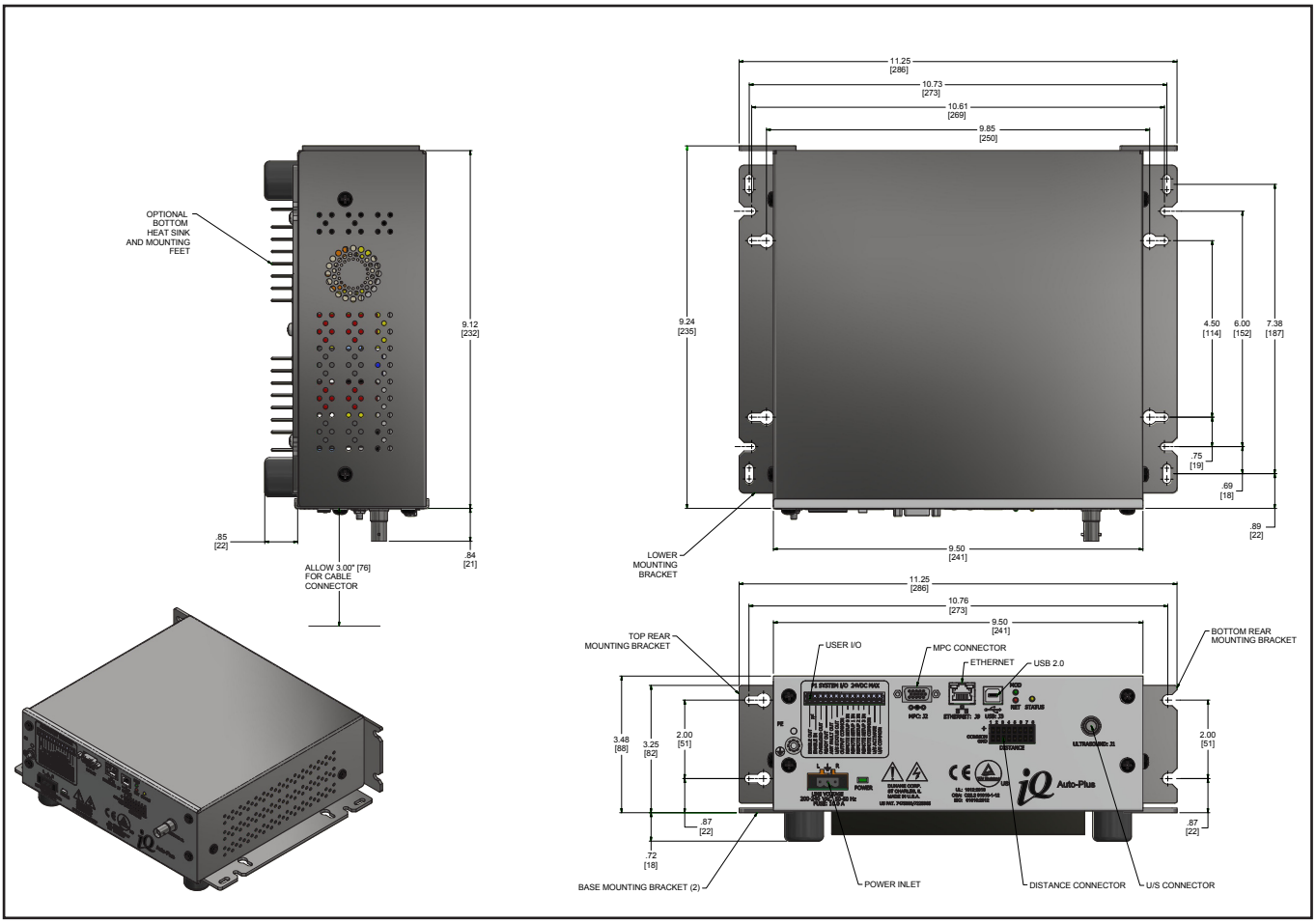
Control parameters available via *iQLinQ*™

1. Set weld method to Time, Energy, Peak Power, Distance, or Position. Set associated value in seconds, joules, watts, or millimeters.
2. Set Amplitude, Ramp Up Time, and Ramp Down Time.
3. Enable and set Trigger by Power parameters or trigger by position.
4. Enable and set Hold Time.
5. Enable and set Afterburst delay and duration.
6. Enable checking for Suspect Parts. Set maximum and minimum values for Time, Power and/or Energy.
7. Enable checking for Bad Parts. Set maximum and minimum values for Time, Peak Power and/or Energy.
8. Configure advanced hardware settings including, Free Run Frequency, Frequency Lock and Hold, Distance and Position, and Frequency Limits.

Parameters that can be obtained via *iQLinQ*™

1. All parameters that are configured via EtherNet/IP.
2. Real time data which includes welder state (ultrasound active or not), frequency, power, position, and amplitude.
3. Weld cycle data from previous weld which includes: Cycle Count; Good, Bad, and Suspect Part information; Process Limit setting exceeded or not reached if Bad or Suspect Part checking is enabled; Weld Time; Weld Energy; Peak Power; Weld Distance; Weld Position.

Dimensions



Approximate weight: 4.55 kg (10 lb).

https://documents.dukane.com/layouts/400-2384.PDF

MODELS

Operating Frequency	Generator Model Number	Overload Power Ratings (Watts)	Input AC Power Requirements Nominal AC Volt @ Maximum RMS Current
20 kHz	20AT060-UX-XX	600	100-240V 50/60 Hz @ 15 amps Max
30 kHz	30ATO60-UX-XX	600	100-240V 50/60 Hz @ 15 amps Max
30 kHz	30AT120-2X-XX	1200	200-240V 50/60 Hz @ 15 amps Max
35 kHz	35AT060-UX-XX	600	100-240V 50/60 Hz @ 15 amps Max
35 kHz	35AT120-2X-XX	1200	200-240V 50/60 Hz @ 15 amps Max
40 kHz	40AT060-UX-XX	600	100-240V 50/60 Hz @ 15 amps Max

Options

- **Patented MPC-Multi-Point Control (available in configurations of 2, 4, 6, 8, 10, 12, 14, and 16 points)**
- ***iQLinQ*™: EtherNet/IP, Profibus, PowerLink, Profinet, EtherCAT, CC–Link, or Modbus TCP protocols**
- **Eight point distance encoder module**

iQ Auto-Plus easily mounts vertically or horizontally with the flexible mounting hardware. (1200 watt unit must be mounted vertically for proper cooling)