CLAIMS:

1. A welding connector in conjunction with an electrical power source for measuring welding parameters in real time, comprising:

- a primary conductor for connecting to a work piece;
- a unitary sheath housing the primary conductor for providing electrical insulation to the primary conductor, and
- a current transformer coupled to the primary conductor for measuring a current.

2. The electrical connector of claim 1, further comprising:

- a processor, and
- an encapsulated mechanism in electrical communication with the processor;

wherein the encapsulated mechanism comprises at least one of the following mechanisms:

- a mechanism for measuring the primary current available to a first electrical tool for electrically connecting the primary conductor to a work piece;
- a mechanism for measuring a primary voltage available to the first electrical tool;
- a mechanism for measuring a temperature at the work piece; and
- a mechanism for measuring a time duration of the primary current flow across the work piece.

3. The electrical connector of claim 2, wherein

the encapsulated mechanism comprises

- the mechanism for measuring the primary current available to the first electrical tool for electrically connecting the primary conductor to a work piece;
- a mechanism for measuring the primary voltage available to the first electrical tool; and
- a mechanism for measuring the time duration of the primary current flow across the work piece.

4. The electrical connector of any of the preceding claims, further comprising:

- a display for indicating values of the primary current or voltage available to the first electrical tool, or the temperature and time duration of the primary current flow across the work piece; and
- a data logging module for capturing and recording the values of the primary current and voltage available to the first electrical tool, the temperature or time duration of the primary current flow across the work piece,

wherein the display and the data logging module are enclosed in the unitary sheath.

5. The electrical connector of claim 4, wherein the primary conductor comprises a first connecting member for electrical communication with the electrical power source and a second connecting member for electrical communication with the first electrical tool, wherein the first electrical tool is configured to electrically connect the primary conductor to the work piece.

6. The electrical connector of claim 5, further comprising a second conductor extending outwardly from the primary conductor for electrical communication with a second electrical tool.

7. The electrical connector of claim 5, further comprising a secondary circuitry in electrical communication with the primary conductor for measuring the primary current at the second connecting member.

8. The electrical connector of claim 4, further comprising a DC power source in electrical communication with the processor, the at least one encapsulated mechanism, the data logging module and the display.

9. The electrical connector of claim 8, wherein the DC power source comprises one or more rechargeable or non-rechargeable disposable batteries.

10. The electrical connector of claim 8 or 9, wherein the DC power source is enclosed in a water resistant enclosure formed in the unitary sheath, the enclosure further having a cover to prevent ingress of water.

11. The electrical connector of claim 4, wherein the display comprises a digital LED display having a resettable multi-unit readings for indicating current, voltage, temperature or time duration.

12. The electrical connector of claim 5, wherein the current transformer is disposed at a portion of the second connecting member of the primary conductor.

13. The electrical connector of claim 12, wherein the current transformer is configured to induce a secondary current, and the secondary current is configured to electrically communicate with the processor for generating a value of the primary current at the display.

14. The electrical connector of claim 2 or 3, wherein the mechanism for measuring the primary voltage comprises a first measuring point located on the second connecting member and a second measuring point connectable to the work piece, and the mechanism for measuring the primary voltage is configured to electrically communicate with the processor for generating a value of the voltage at the display.

15. The electrical connector of claim 14, wherein the first measuring point comprises a socket located on the sheath of the connector, while the second measuring point is connected to the work piece via a cable.

16. The electrical connector of claim 2 or 3, wherein the mechanism for measuring the temperature at the work piece comprises a data acquisition device for electrical communication with the processor and a thermocouple detachably disposed on the work piece, wherein the thermocouple is configured to electrically communicate with the data acquisition device via a cable.

17. The electrical connector of claim 2 or 3, wherein the mechanism for measuring the time duration of the primary current flow across the work piece comprises an hour meter mounted within the connector and a relay for electrical communication with the processor.

18. The electrical connector of claim 8, wherein the mechanism for measuring the temperature and the mechanism for capturing the primary current across the work piece are configured to electrical communicate with the DC power source.

19. The electrical connector of claim 4, wherein the data logging module comprises:
a user interface for communicating with a computer via wire or wireless connections; and
a visual aid located at the display for indication of a stored memory capacity.

20. The electrical connector of claim 1, wherein the electrical power source comprises a welding machine.

21. The electrical connector of claim 2 or 3, wherein the first electrical tool comprises at least one of a welding electrode holder.

22. The electrical connector of claim 6, wherein the second electrical tool comprises at least one of a welding electrode quiver.

23. The electrical connector of claim 4, wherein the unitary sheath is in immovable close contact to provide a rigid encapsulation of the primary conductor and second conductor, the processor and the display.

24. A system for measuring and recording welding parameters comprising:

- an electrical power source;
- a welding tool; and
- a welding connector connecting the welding tool to the electrical power source for measuring the welding parameters in real time;
  wherein the welding connector comprises
  - a primary conductor for connecting to a welding piece;
  - a unitary sheath housing the primary conductor for providing electrical insulation to the primary conductor, and
  - a current transformer coupled to the primary conductor for measuring a current.

25. The system of claim 24, further comprising:

the unitary sheath for housing the primary conductor, a second conductor and an encapsulated mechanism in electrical communication with a processor, for measuring the welding parameters in real time,

wherein the encapsulated mechanism comprises at least one of the following mechanisms:

- a mechanism for measuring the primary current available to a first electrical tool for electrically connecting the primary conductor to a work piece;
- a mechanism for measuring a primary voltage available to the first electrical tool;
- a mechanism for measuring a temperature at the work piece; and
- a mechanism for measuring time duration of the primary current flow across the work piece.

26. The system of claim 24, wherein

the encapsulated mechanism comprises:

- the mechanism for measuring the primary current available to the first electrical tool for electrically connecting the primary conductor to a work piece;
- the mechanism for measuring the primary voltage available to the first electrical tool; and
- the mechanism for measuring time duration of the primary current flow across the work piece.

27. The system of any of the preceding claims 24 to 26, further comprising:

- ➢ a display for indicating values of the primary current and voltage available to the first electrical tool, and the temperature and time duration of the primary current flow across the work piece; and
- ➢ a data logging module for capturing and recording the values of the primary current and voltage available to the first electrical tool, and the temperature and time duration of the primary current flow across the work piece,

wherein the display and the data logging module are enclosed in the unitary sheath.

28. The system of claim 24, wherein the current transformer is disposed at a portion of a second connecting member connectable to the primary conductor.

29. The system of claim 28, wherein the mechanism for measuring the primary voltage comprises a first measuring point located on the second connecting member and a second measuring point connectable to the work piece.

30. The system of claim 25 or 27, wherein the mechanism for measuring the temperature at the work piece comprises a data acquisition device in electrical communication with a secondary circuitry and a thermocouple detachably disposed on the work piece, wherein the thermocouple is configured to in electrically communicate with the data acquisition device via a cable.

31. The system of claim 25, 26 or 27, wherein the mechanism for measuring the time duration of the primary current flow across the work piece comprises an hour meter mounted within the unitary sheath and a relay configured in electrical communication with the secondary circuitry.

32. The system of claim 25, wherein the mechanism for measuring the temperature and the mechanism for measuring the primary current across the work piece are configured to be in electrical communication with a DC power source housed within the unitary sheath.

33. The system of claim 27, wherein the data logging module comprises:
a user interface for communicating with a computer via wire or wireless connections; and
a visual aid located at the display for indication of a stored memory capacity.

34. The system of claim 24, wherein the unitary sheath is in immovable close contact to provide a rigid encapsulation of the primary conductor and second conductor, the processor and the display.

35. A method for measuring and recording welding parameters comprising:

- housing a primary conductor in a unitary sheath;
- connecting the primary conductor to a welding piece; and
- coupling a current transformer to the primary conductor for measuring welding parameters in real time.

36. The method of claim 35, further comprising the step of:

- housing a second conductor in a unitary sheath; and
- measuring the welding parameters in real time by an encapsulated mechanism in electrical communication with a processor,

wherein the step of measuring the welding parameters in real time comprises at least one of the steps of:

- measuring a primary current available to a first electrical tool for electrically connecting the primary conductor to the work piece;
- measuring a primary voltage available to the first electrical tool;
- measuring a temperature at the work piece; and
- measuring a time duration of the primary current flow across the work piece.

37. The method of claim 36, wherein:

the step of measuring the welding parameters in real time comprises the steps of:

- measuring a primary current available to a first electrical tool for electrically connecting the primary conductor to the work piece;
- measuring a primary voltage available to the first electrical tool; and
- measuring a time duration of the primary current flow across the work piece.

38. The method of any of the preceding claims 35 to 37, further comprising the steps of:

- indicating on a display values of the primary current and voltage available to the first electrical tool, and the temperature and time duration of primary current flow across the work piece; and
- capturing and recording values of the primary current and voltage available to the first electrical tool, and the temperature and time duration of primary current flow across the work piece by a data logging module,

wherein the display and the data logging module are enclosed in the unitary sheath.

39. The method of claim 37, wherein measuring the primary current comprises connecting the current transformer to a portion of a second connecting member, which is connectable to the primary conductor.

40. The method of claim 39, wherein measuring the primary voltage comprises connecting a first measuring point on the second connecting member and a second measuring point connectable to the work piece.

41. The method of claim 37, wherein measuring the temperature at the work piece comprises connecting a data acquisition device in electrical communication with the processor and a thermocouple detachably located on the work piece, wherein the thermocouple is in electrically communication with the data acquisition device via a cable.

42. The method of claim 37, wherein capturing the time duration of the primary current flow across the work piece comprises connecting an hour meter mounted within the unitary sheath and a relay in electrical communication with the processor.

43. The method of claim 37, wherein measuring the temperature and measuring the primary current across the work piece comprise connecting the at least one encapsulated mechanism in electrical communication with a DC power source housed within the unitary sheath.

44. The method of claim 38, further comprising:

connecting the data logging module to the processor for capturing a set of welding parameters;

providing a user interface for communicating with a computer via wire or wireless connections; and

providing a visual aid located at the display for indication of a stored memory capacity.