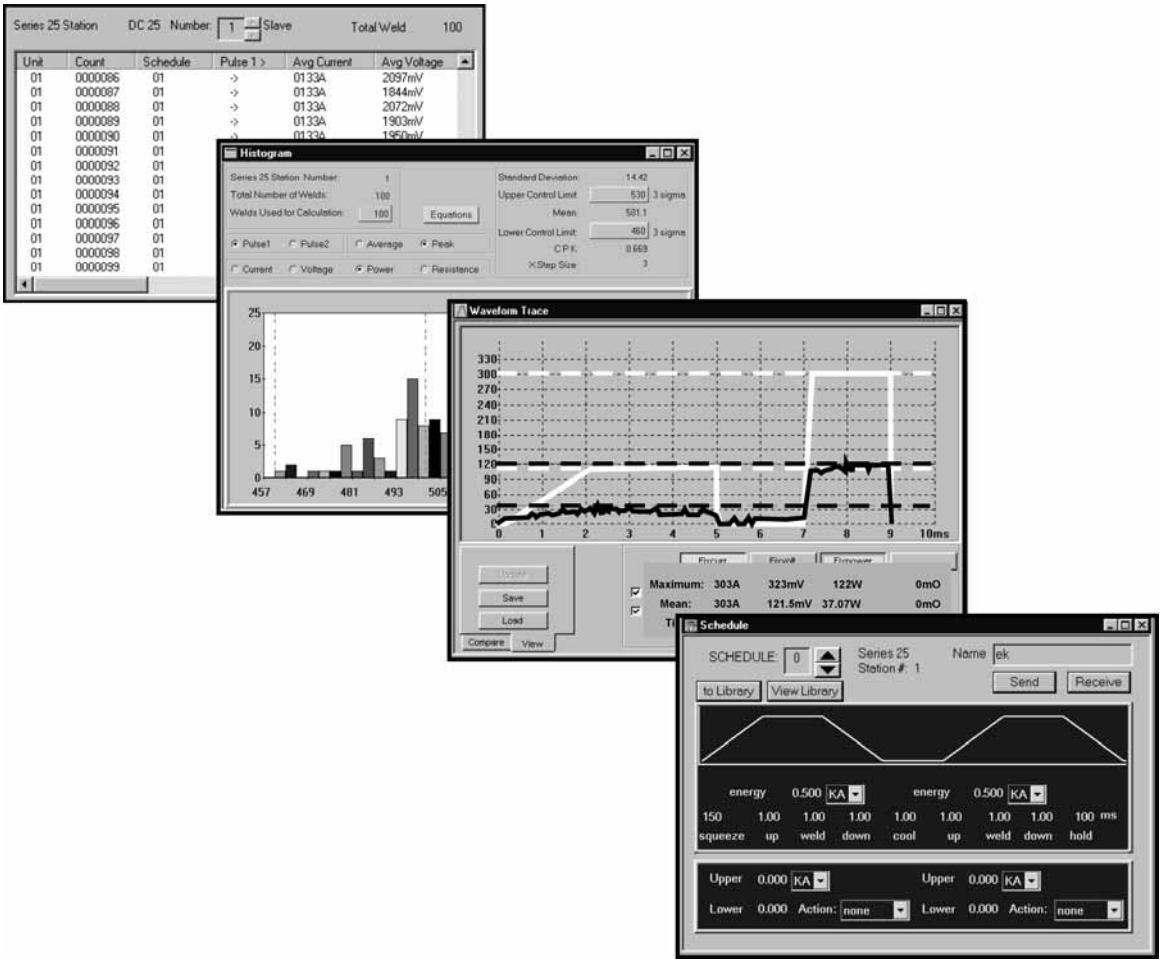
USER'S MANUAL 990-661
Revision B February 2002

UNITEK PECO
WORLD LEADER IN RESISTANCE WELDING

Operator Manual
DC25/UB25 Weld-Stat
Advanced Serial Datacom
Communications Interface
(Version 1.10, Revision B)



REVISION RECORD

Revision	EO	Date	Basis of Revision
A	18987	10/01	Original Release.
B	19214	2/02	Software Upgrade.

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Section I. Introduction

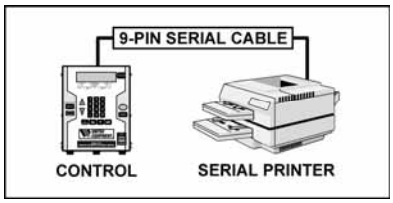
Overview

For the rest of this manual, the **DC25/UB25 Weld-Stat Advanced Serial Datacom Communications Interface** will be referred to simply as the ***Datacom***. For the rest of this manual, the **DC25** and **UB25 Linear DC Welding Control,** will be referred to simply as the ***Control.***

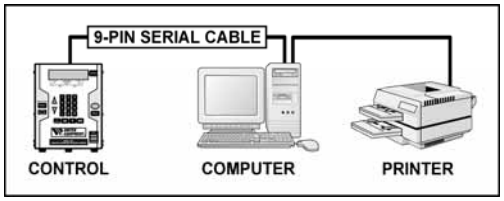
The Datacom Kit allows you to connect a single Control, or multiple Controls, to a printer or a computer in order to:

- Compile, store, view, and print weld history data for detailed analysis.
- Remotely program weld schedules on the Control(s).
- Remotely program menu items on the Control(s).

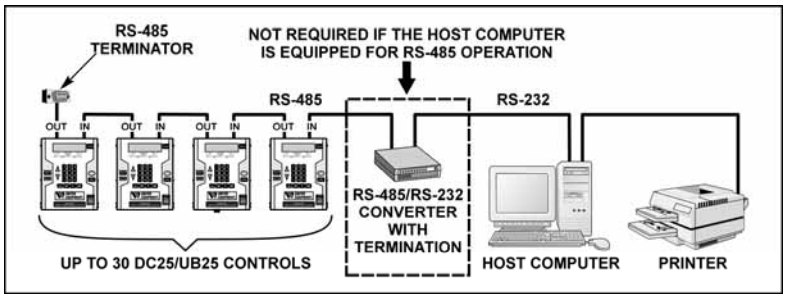
There are three types of Datacom connections:



RS-232 connection between a single Control and a printer. This is used to print out weld history data. No computer or Datacom software is required (see *Section II, RS-232 Control-To-Printer Operation).*



RS-232 connection between a single Control to a computer. This is used for weld history retrieval, storage, graphic displays and remote weld schedule programming (see *Section III, RS-232 Control-To-Computer Operation).*



RS-485 connection allows up to 30 Controls to be connected to a computer. This is used for weld history retrieval, storage, graphic displays and remote weld schedule programming (see *Section IV, RS-485 Operation).*

The only difference between RS-232 operation and RS-485 operation is that RS-485 can be "Daisy Chained" for multiple controls, and RS-232 cannot.

Datacom software is used to retrieve, store, import, and export weld history data, display weld history graphs, and to perform remote weld schedule programming. Installation instructions and software description are in *Section V, Datacom Software*.

Instructions on using Datacom functions are listed in *Section VII, Operating Instructions.*

Datacom Kit Contents

QTY	ITEM	QTY	ITEM
1	9-pin male to 9-pin female cable	1	Datacom software
1	Datacom Operator Manual 990-661		

Computer Requirements

General

- Operating System -- *Windows® 95, Windows 98, Windows NT 4* , or *Windows NT 2000 (NT 5)*
- Serial Port -- RS-232, RS-485, or both
- Available Hard Drive Space -- 1 Megabyte (minimum)
- RAM -- 64 Megabytes (minimum)
- Monitor Screen and Video Card capability -- 800 x 600 (or larger), 256 colors

RS-232 Operation

No special requirements. The Control is configured for a standard RS-232 serial port connection which is common on most printers and computers.

RS-485 Operation

Your computer must be equipped and configured for RS-485 operation using:

- An internal RS-485 circuit card installed in your computer

OR

- An external RS-232 ➜ RS-485 Converter such as the ***Telebyte Model 285 Superverter*** (or equivalent).

With the exception of **RS-232 Control-To-Printer Operation**, Datacom software must be installed in the host computer in order to match the Control(s) to the computer, and to perform Datacom functions. ***Before*** operation, see *Section V, Using Datacom Software* to familiarize yourself with the software features, and *Section VI, Setup* for the procedures to match the Control(s) to the computer.

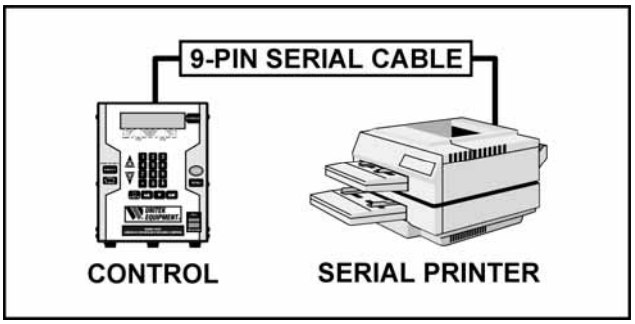
Remote Programming

Most users will find the Datacom software functions sufficient for collecting and using weld history information and remote schedule programming. However, advanced users may wish to perform additional programming for custom welding applications. The codes needed to perform remote programming are listed in *Appendix C, Datacom Program Codes*. Using these codes, users can write customized software for controlling all functions of the welding control and interfacing the unit to automation control systems.

Section II. RS-232 Control-To-Printer Operation

Equipment Connection and Setup

This connection allows you to print weld history data directly from the Control to a **serial** printer without using a computer or Datacom software. You can use an inexpensive impact printer, such as a Panasonic #1124/2124 with serial option (or equivalent), or a laser printer such as a Hewlett Packard LaserJet (or equivalent).



1 Turn the Control OFF.

2 Verify that your printer is set for serial port operation and note the **baud rate** (see the operator manual that came with the printer).

3 Connect the 9-pin to 9-pin cable to the RS-232 connector on the rear panel of the Control to the RS-232 connector on the printer. Use a 9-pin to 25-pin adapter if necessary. The cable and adapter are part of the Datacom kit.

4 Turn the Control ON.

5 Match the **Baud Rate** of the computer and the printer following the instructions in *Section VI, Setup.*

Operation

When ready, turn the printer ON, making sure you have enough paper and toner/ink to last for the number of welds you expect to make. In the **MASTER** mode, the Control sends a line of weld history data for ***each*** weld made. The data looks like this:

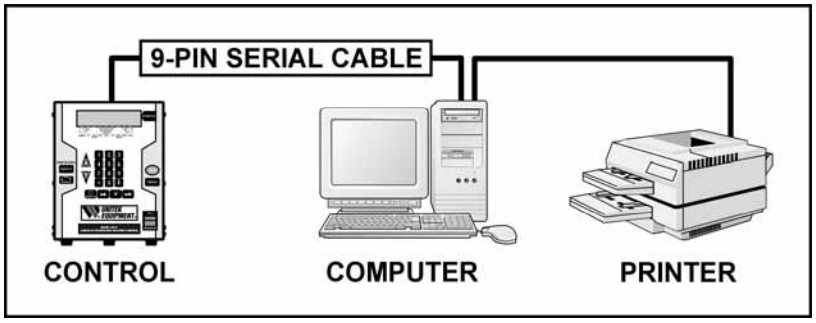
```
1,1,0,550,549,913,914,408,833,88,121,0,0,931,1246,1250,1941,1475,2427,124,17,0,0
```

This contains weld energy and other information, which is defined in *Appendix A, Weld History Data*. The printer will print continuously as long as it is connected to the Control, and the Control remains in the **MASTER** mode. To print a weld history for a specific time period (day, week, etc.), be sure to remove the previous weld history report from the printer ***before*** the next time period starts.

NOTE: Laser printers automatically make a page break between lines of data. If you are using fan-fold paper on an impact printer, there are no page breaks. Therefore, a line of weld history data may print on top of the perforated fold in the paper.

Section III. RS-232 Control-To-Computer Operation

Equipment Connection and Setup



1 Turn the Control OFF.

2 Verify your computer's **baud rate** (check the computer's settings).

3 Connect the 9-pin to 9-pin cable to the RS-232 connector on the rear panel of the Control to the RS-232 connector on the computer. Use a 9-pin to 25-pin adapter if necessary. The cable and adapter are part of the Datacom kit.

4 Turn the Control ON.

6 You ***must*** match the Control to the computer following the instructions in *Section VI, Setup.*

Operation

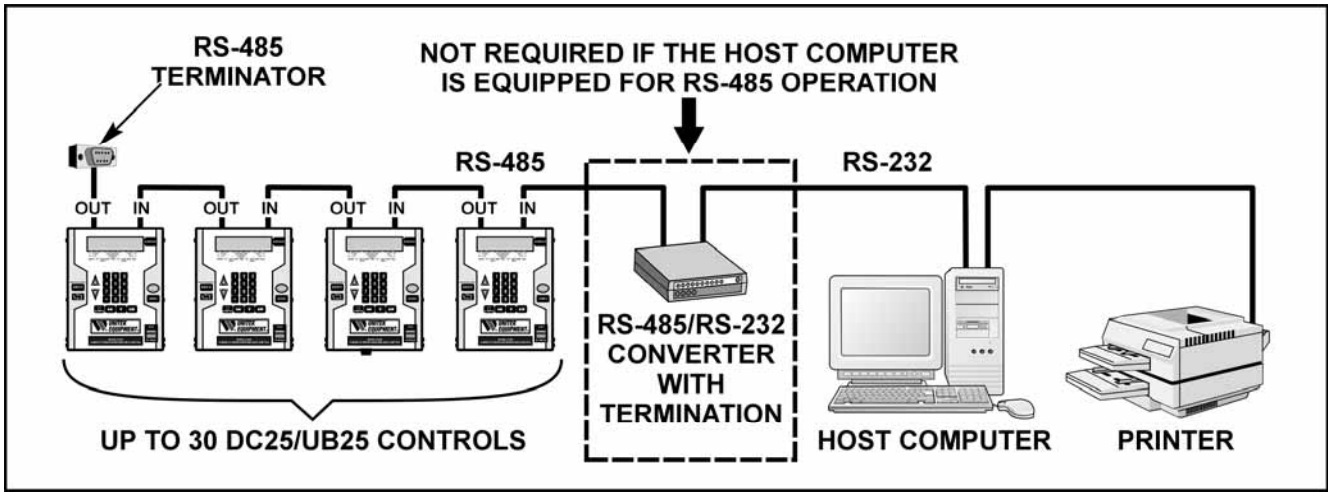
When connected to a computer equipped with Datacom software, you may use all of the Datacom functions:

- Collect and store Weld History Data from the Control(s).
- Print, export, and display Weld History Data in different graphic formats.
- Remotely select and modify Weld Schedules and System settings in the Control(s) connected to the host computer.

Follow the procedures in *Section VII, Operating Instructions.*

Section IV. RS-485 Operation

Equipment Connection and Setup



To connect a computer to multiple Controls (up to 30), the computer must be equipped for RS-485 operation using:

- An internal RS-485 circuit card installed in your computer.

  OR

- An external RS-232 ➜ RS-485 Converter such as the ***Telebyte Model 285 Superverter*** (or equivalent).

If the host computer ***does*** have an operating RS-485 communication port, you do ***not*** need to use an RS-232-To-RS-485 converter. If you do need to use a converter, there is no standard cable for RS-485 connection; therefore, special cabling is required. See *Appendix B, Connectors and Wiring Diagrams* for the Control's RS-232 and RS-485 connector pin assignments and RS-485 wiring diagrams

1 Turn all Controls OFF.

Without Converter:

A) Connect one end of the 9-pin to 9-pin custom cable to the RS-485 connector on the back of the computer. Use a 9-pin to 25-pin adapter if necessary.

B) Connect the other end of the cable to the **RS-485 IN** connector on the first Control.

C) Connect additional Controls in a "Daisy Chain" by connecting the **RS-485 OUT** connector on the first Control to the **RS-485 IN** connector on the next Control and so on until all the desired Controls are connected. Use custom 9-pin male to 9-pin male serial cables.

With Converter:

A) Connect a cable between the RS-232 connector on the back of the computer to the **Input** connector on the RS 232 to RS 485 converter as described in *Appendix B, Connectors and Wiring Diagrams.*

B) Connect the **RS-485 IN** connector on the rear panel of the first Control to the RS-485 connector on the RS-485 to RS-232 converter as described in *Appendix B, Connectors and Wiring Diagrams.*

C) Connect additional Controls (up to 30) in a "Daisy Chain" by connecting the **RS-485 OUT** connector on the first Control to the **RS-485 IN** connector on the next Control and so on until all the desired Controls are connected. Use standard 9-pin male to 9-pin male serial cables.

2 After the last Control of the chain is connected, plug the RS-485 Terminator plug supplied in the Datacom kit into the **RS-485 OUT** connector of the last Control. RS-485 communication will not work correctly ***unless*** the line is terminated.

3 Turn each Control ON.

4 You ***must*** match the baud rate for ***each*** Control in the "Daisy Chain" to the computer, and set the Communication Role to **SLAVE**, following the instructions in *Section VI, Setup.*

NOTE: The default setting for the Control is Baud rate = 9600, Data bits = 8, Parity = none and Stops Bits = 1.

Operation

When connected to a computer equipped with Datacom software, up to 30 Controls may use all of the Datacom functions (at one time):

- Collect and store Weld History Data from the Control(s).
- Print, export, and display Weld History Data in different graphic formats.
- Remotely select and modify Weld Schedules and System settings in the Control(s) connected to the host computer.
- Remote programming of menu items.

NOTE: Individual Controls can be given unique unit I.D. numbers so that the software knows which Control it is communicating with. To set the Control's ID number, follow the procedures listed in the Control's *Operator Manual, Section VII, Operating Instructions.*

Section V. Datacom Software

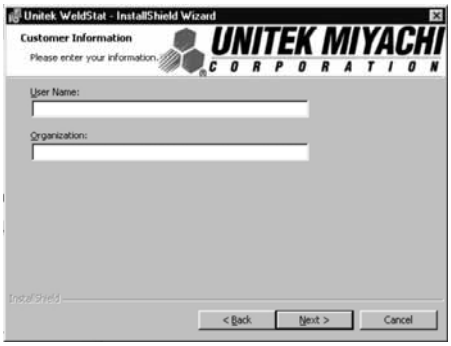
Installation

1 To begin installation, insert the Datacom disk into your computer's CD ROM drive.

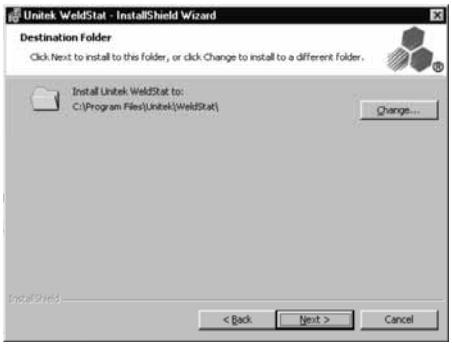
2 The *InstallShield Wizard* window will appear on the monitor, click on **Next** to continue.

3

4 Select **I accept...** then click on **Next** to continue. If you do ***not*** accept the license agreement, installation will **stop**.



5 When this screen appears, enter your **Name** and **Organization**, in the appropriate boxes, then click on **Next**.



6 Installation creates the folder **C:\Program Files\Unitek\WeldStat** for the software. Click on **Next** ***or*** click on **Change**, select a different folder, then click on **Next**.

7 If you need to make changes, click on **Back** until the desired screen appears, make the changes, then continue the installation. To complete installation, click on **Finish**.

8 When the **InstallShield Wizard Completed** screen appears, click on **Finish**.

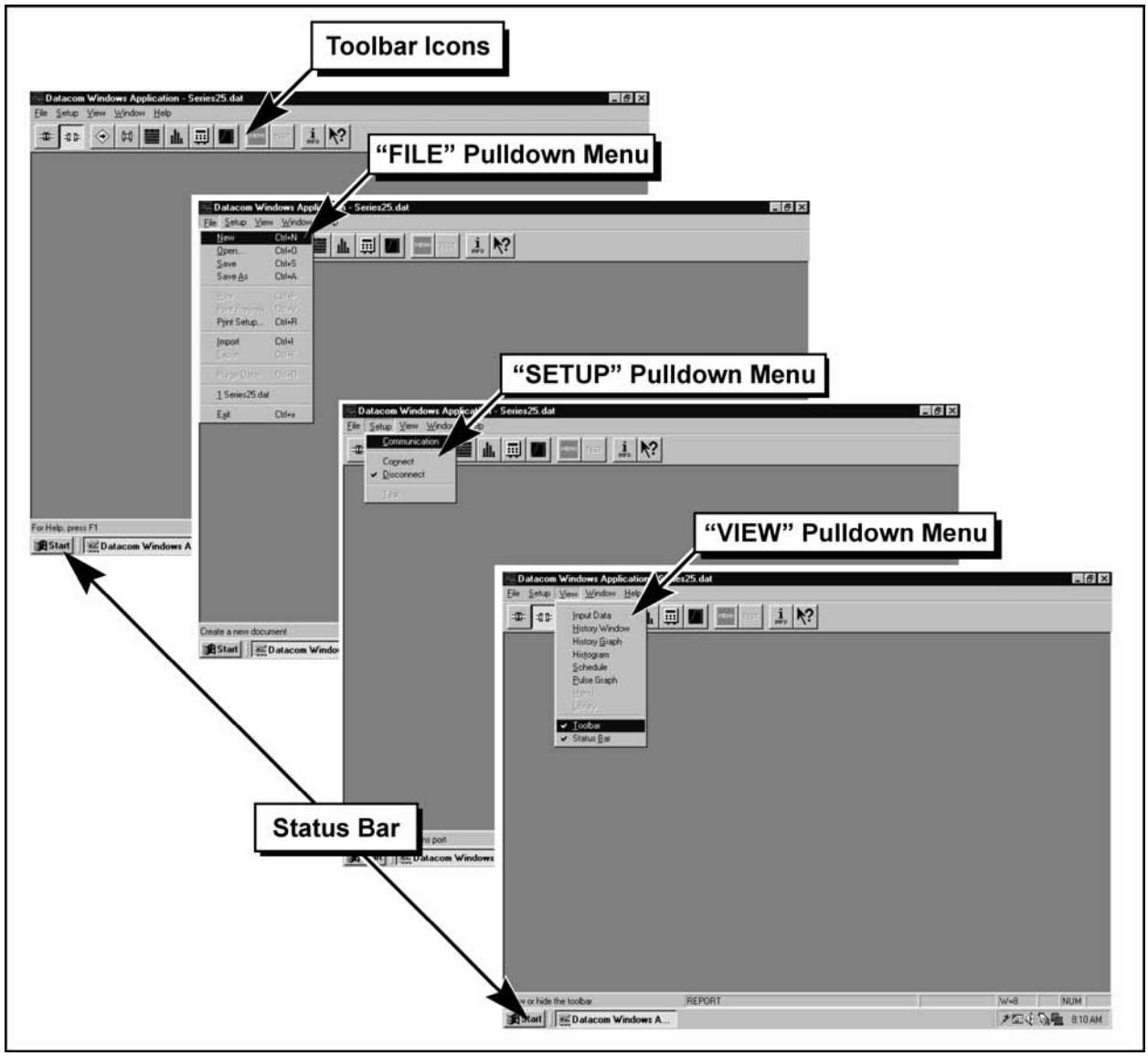
9 When installation is complete, the registration screen appears displaying the software **Serial Number** and a request for the **Release Key** which is a code number available from the E-Mail address shown on this window.

10 When the correct **Release Key** is entered the screen above appears. Click on **OK**.

11 If you did ***not*** register within 7 days, the screen above will appear showing the E-Mail address where you can get the information you need to complete installation.

Description

Datacom software uses standard *Windows* features, allowing you to display single, or multiple windows at the same time. Specific windows can be accessed using either pull-down menus or by clicking on Toolbar icons. The Toolbar at the top of the screen, and the Status bar at the bottom of the screen, can be turned ON or OFF using the **VIEW** pull-down menu.



Menu Bar Buttons

File File

The **File** button on the Menu Bar gives you the pull-down menu on the right that offers the **New**, **Open**, **Save**, and **Save As** options as described in *Section VII, Operating Instructions*.

Print, Print Preview and **Print Setup** are the standard *Windows* menus.

Print Preview allows you to see how a graph will print out before you actually print.

Procedures for **Import** and **Export** are described in *Section VII, Operating Instructions*.

File Purge Data

CAUTION: This feature deletes all data from any file that is open.

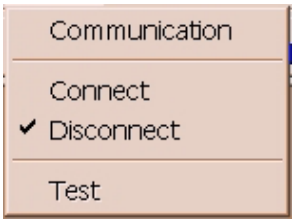
Save or **Save As** all files with data you want to keep before using this feature. ***Before*** you purge, make sure the ***only*** file that is open is the file with data you want to purge (delete).

1 From the Menu Bar, click on **File**.

2 From the **File** pull-down menu, click on **Purge Data**.

Setup

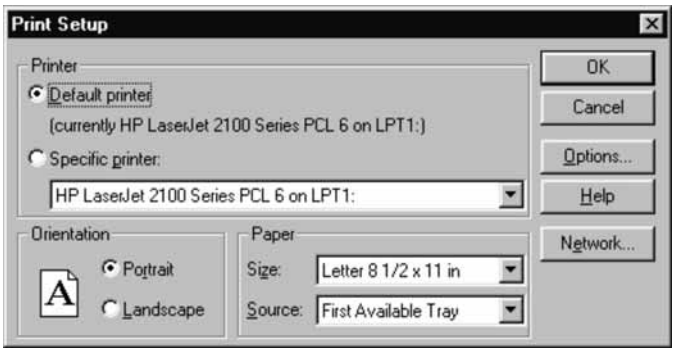
The **Setup** button on the Menu Bar gives you the pull-down menu on the right that offers the same **Connect, Disconnect**, and **Test** options as the Toolbar icons.



Setup procedures for **Communication** are described in *Section VII, Operating Instructions*.

Printer Setup

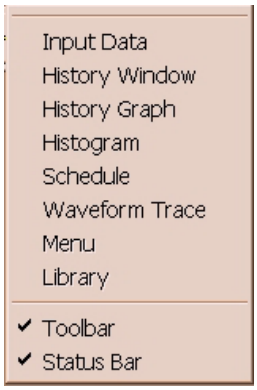
The Datacom software uses the standard *Windows* **Print Setup** window.



1. Before printing, verify that desired **Printer** is selected. If not, use the pull-down menu to select it.
2. Verify that the page **Orientation** is correct. If not, click on the Portrait or Landscape button.
3. Verify that the Paper **Size** and Source are correct. If not, use the pull-down menus to select what you want.

View

The **View** button on the Menu Bar gives you the pull-down menu on the right that offers the same **Input Data**, **History Window**, **History Graph**, **Histogram**, **Schedule, Waveform Trace**, **Menu** and **Library** options as the Toolbar icons.

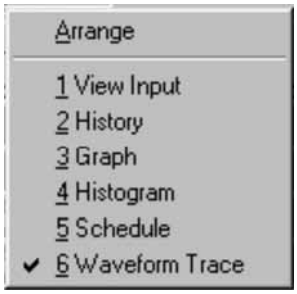


In addition, clicking on **Toolbar** and **Status Bar** turns them ON or OFF.

Window

The **Window** button on the Menu Bar allows you to select and bring to the front any of the windows you have open.

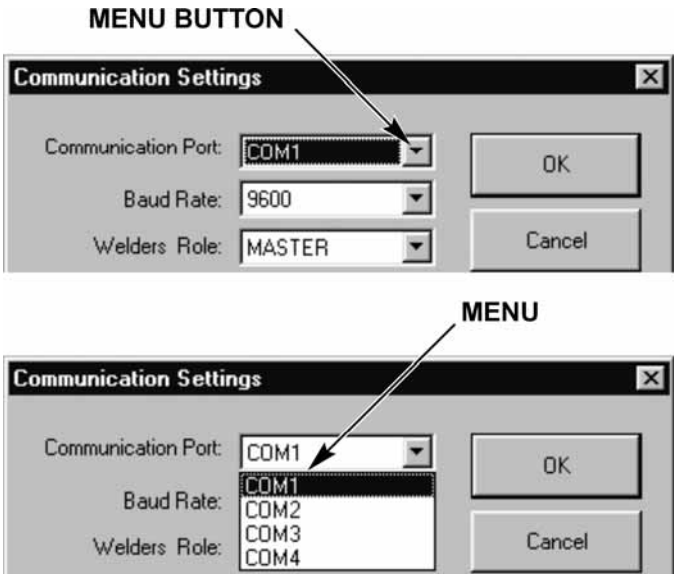
The pull-down menu on the right shows that six windows are open, and that **6 Waveform Trace** has been selected which brings that window to the front for viewing.



Pull-Down Menus

Many of the Datacom selections are offered on pull-down menus. To make a selection:

1. Click on the menu button.
2. When the pull-down menu appears, click on your selection, then click on **OK**.



Toolbar Icons

ICON	NAME	FUNCTION
	**Connect**	Electronically connects Datacom software to the serial communication port (RS-232 ***or*** RS-485) so the computer can communicate with the Control(s).
	**Disconnect**	Electronically disconnects Datacom software from the serial port so the computer cannot communicate with the Control(s), even though cables are still connected. This allows other devices to use the serial port, and allows display and graphic functions to be used without adding incoming data to existing files.
	**Communication View Input Window**	Displays incoming data from the Control(s) in real time. This window automatically opens when the program is started and will display the status of each Control connected to the computer.
	**Weld History Data**	Displays weld histories, listing the unit, weld count number, weld schedule, pulse one and two energy values and status of each weld performed in chronological order.
	**Weld History Graph**	Displays weld histories in graphical form, showing the average or peak data of either current, voltage, power or resistance for either pulse one or pulse two. Two graph windows are provided allowing the data between different pulses or energy values to be compared. Maximum and minimum visual control limits can be set for visual indication only.
	**Weld Histogram**	Displays weld histories in histogram form. Allows you to choose which values to display. Mean, plus and minus 3 sigma control limits, and CPK values can be seen.
	**Schedule**	Allows you to remotely program weld schedules in the Control(s) attached to the computer. Weld schedule and all monitoring functions are accessible.
	**Waveform Trace**	Displays the waveform traces for current, voltage, power and resistance. Waveforms can be saved. Compare function allows up to four waveforms to be displayed and compared.
	**System, Relay, Waveform Check Setup**	Allows you to remotely program **System** settings, **Waveform Check**, and **Relay** settings in the Control(s) connected to the computer. This button is inactive ["greyed-out"] if the computer is not **Connected**.
	**Test Communications**	Issues a "Status" command to all Controls connected to the computer (from zero to 30). Incoming status reports from each Control will be displayed in the **Communication View Window**. (**Test** is not active if the software is disconnected.)
	**About Datacom Information**	Displays Datacom software version and release date information.
	**Context Help**	Opens Datacom software instructions and information.

Section VI. Setup

Overview

Datacom allows you to monitor welding in real-time as each weld is made, or to collect weld history data at the end of a work period that was recorded by the Control(s) during welding. Datacom also allows you to monitor a single Control at a time, or to monitor all Controls at the same time. When monitoring in real-time, you may view data as alphanumeric text, a graph, or as a histogram. All of these choices are determined by the **Communication Role** you choose.

The descriptions below will help you decide which communication role to choose. Following the descriptions are the instructions on setting up the Control(s) and Datacom **Communication Settings**.

Communication Role

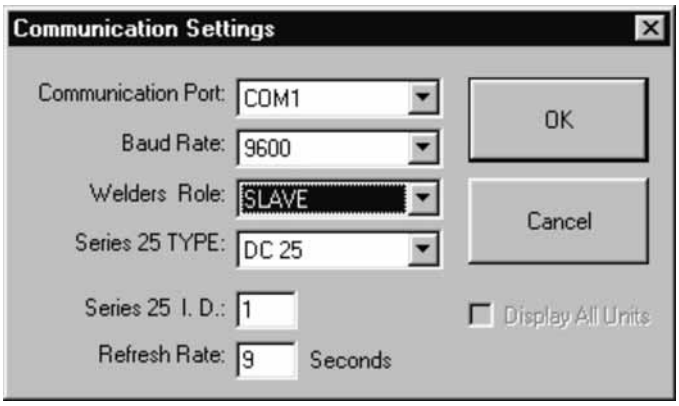
There are two different communication roles:

MASTER	SLAVE
The Control(s) automatically send weld history data to the computer as each weld is made. The only limit to how much weld data history can be collected and stored is the space available on the computer's hard drive. The **MASTER** role is automatic, faster, and collects data from up to 30 Controls. If multiple Controls are connected to the computer, all data is collected into a single file. This file can be exported to a spreadsheet such as *Excel*, then sorted to list welds made by individual Controls. **NOTE:** In this mode, only ***new*** data will be sent from the welder to the computer. Previously stored data will ***not*** be sent to the computer.	Each Control stores weld history data in its own memory and does not send data until requested by the computer. Each Control stores data for up to 1,500 welds. In the **SLAVE** role, you must manually collect data from each Control after welds have been made. Each file will be a separate weld history for that specific Control. **NOTE:** Memory on the Control is limited to 1,500 weld records. If ***fewer*** than 1,500 welds were made, all weld records will be sent to the computer. Ir ***more*** than 1,500 welds were made, only the last 1,500 weld records will be sent to the computer.

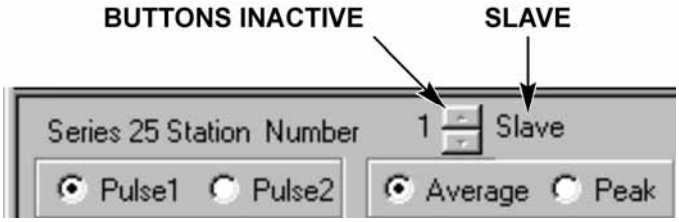
NOTE: ***All*** Controls must be set to the ***same*** communication role, either **MASTER** or **SLAVE**.

SLAVE Mode

The **SLAVE** mode only allows you to communicate with one Control at a time. Therefore, when **SLAVE** is selected in the Datacom **Communication Settings** window, the **Display All Units** feature is inactive (greyed-out").

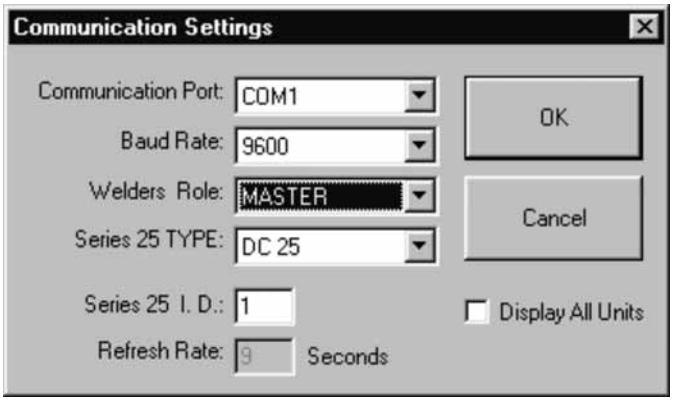


When monitoring welding in the **Weld History**, **Weld Graph**, or **Weld Histogram** mode, the top, left corner of each window will display the communication role you have selected. The word **SLAVE** appears and the ▲▼ (up/down) buttons are inactive.

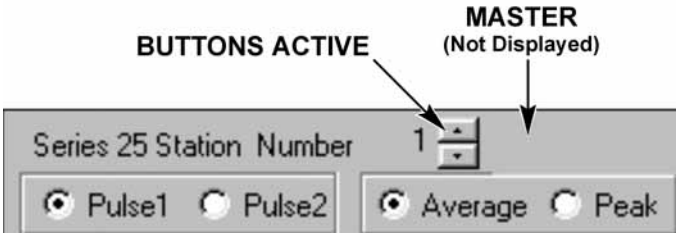


MASTER Mode, Monitor a Single Control

When **MASTER** is selected in the Datacom **Communication Settings** window, the **Display All Units** feature is active. To monitor a single Control, do ***not*** click on the **Display All Units** feature. If there is a ✓ in the box, click on **Display All Units** to remove the ✓.



Now, the top left corner of the **Weld History**, **Weld Graph**, or **Weld Histogram** will ***not*** display the word **SLAVE**, and the ▲▼ (up/down) buttons are active. You can use the ▲▼ (up/down) buttons to select any Control to monitor without having to return to the **Communications Setting** window.

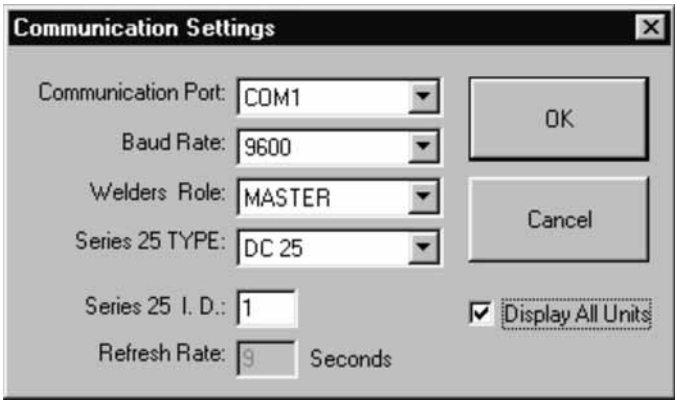


MASTER Mode, Monitor All Controls

To monitor all Controls, click on the **Display All Units** feature to put a ✓ in the box. Now, incoming data will be received from all Controls.

NOTE: In this mode, the only window that displays which Control is reporting is the **Weld History** window. If you see an anomaly and want to check a specific Control, go the **Communications Settings** window, click to remove the ✓ in the **Display All Units** box, and select the Control you want to monitor.

Now, the top left corner of the **Weld History**, **Weld Graph**, or **Weld Histogram** windows will show **Displaying ALL**. The ▲▼ (up/down) buttons are inactive.



NOTE: You may change the communication role any time you like, but the Datacom and ***all*** Controls must be set to the ***same*** communication role, either **MASTER** or **SLAVE**.

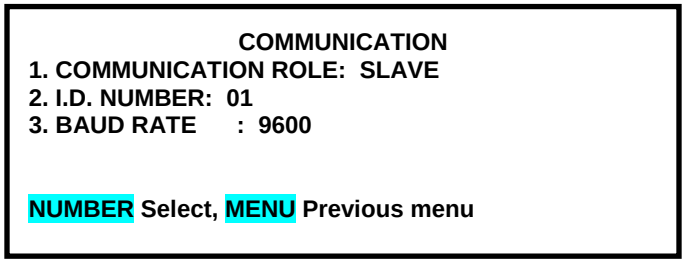
Control Setup

Before operation, the following settings on the Control and the computer ***must*** be matched:

Use the front panel controls and LCD menus to change the settings below. If you are using multiple Controls, this must be done for ***each*** Control.

1 From the **MAIN MENU,** press the **5** key to go to the **COMMUNICATION** menu (shown with default settings).

2 From the **COMMUNICATION** menu, toggle the **1** key to select **MASTER** or **SLAVE**. The **COMMUNICATION ROLE** line will now reflect your role selection.



I.D. Number

If multiple Controls are connected to the computer using an RS-485 communication line, ***each*** Control ***must*** have a different ID number (the default I.D. setting for each Control is **1**). The I.D. Number can be any number from **0** to **99.**

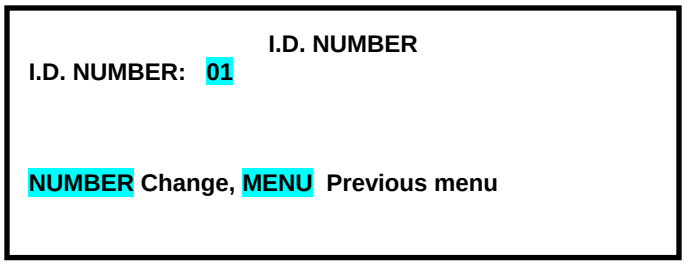
NOTES:

- The ***maximum*** number of Controls that can be connected and supported by the software at any single time is **30**, even though the I.D. numbers can go up to **99**.
- If communicating to a ***single*** Control, the software and the control unit I.D. ***must*** match in order to communicate and collect data.

1 From the **COMMUNICATIONS MENU** screen, press the **2** key to get the **I.D. NUMBER** entry screen.

2 Enter a two-digit number, from **01** to **99**, in the **I.D. NUMBER** field.

3 Press the **MENU** key to get the **COMMUNICATION** menu screen. This time the **I.D. NUMBER** line will display your I.D. number entry.

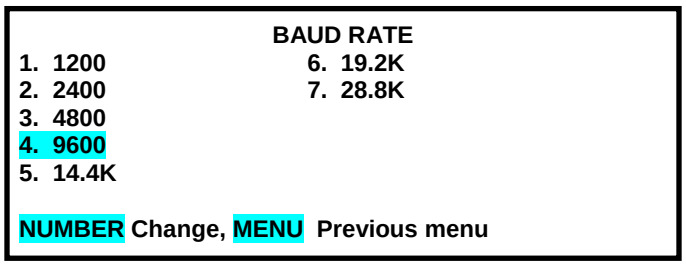


Baud Rate

1 From the **COMMUNICATION** menu, press the **3** key to get the **BAUD RATE** selection screen.

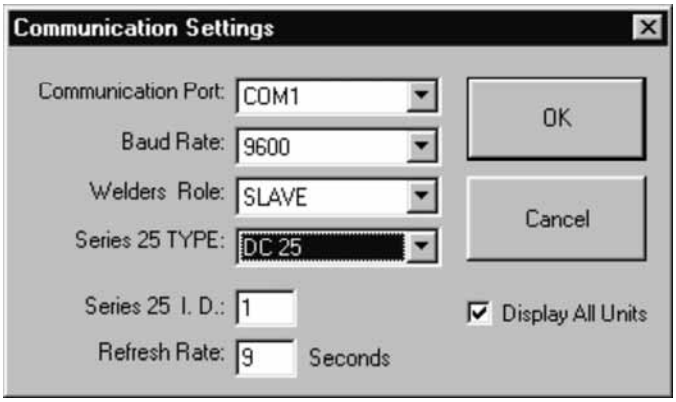
5 Use the numeric keypad to select the baud rate of the receiving device. The display automatically returns to the **COMMUNICATION** menu which shows the new baud rate.

6 Press **MENU** to return to the **MAIN MENU.**



Computer Setup

Use the Datacom software **Setup / Communication** menu to match each Control to the computer's settings (COM port and Baud Rate). If you are using multiple Controls, this must be done for ***each*** Control. After matching one Control to the computer, select the next Control in the "Daisy Chain" and repeat the following procedures.



1. From the **SETUP** pull-down menu, click on **COMMUNICATION.**
2. With the **Disconnect** button enabled, click on the **Communication Port** pull-down menu to select which port (COM1, COM2, etc.) the computer is using for the serial connection (check your computer's settings). Select the port, then click on **OK**.
3. Click on the **Series 25 I.D.** window, then enter the **I.D. Number** of the Control.
4. Click on the **Baud Rate** pull-down menu, click on the baud rate set on the Control. Click on the **Welder's Role** (Communication Role) pull-down menu, click on **MASTER** or **SLAVE**.
5. Click on the **Series 25 Type** pull-down menu, select the **DC25** or **UB25.**
6. If the **Refresh Rate** window is active, you may enter a new time value now or do it later. Refresh rate determines how often the computer will request data from the control when they are matched in slave mode.
7. When you have made all your selections, click on **OK** to save the new settings.
8. Repeat Steps **1** through **8** for each Control until ***all*** Controls are matched to the computer.

Section VII. Operating Instructions

Before You Start

It is important to know how the Datacom communication and memory system works so you can choose the best Datacom method for your documentation needs, and to make sure you do ***not*** accidentally delete or corrupt your weld history data.

Control Software

Each Control is operated by internal software which communicates with Datacom software. Older versions of Control software may not be able to perform all of Datacom's functions. The following instructions will note these software differences.

Before starting, press the **Info** button (right) on the front panel of the Control to see which version of software is installed in the Control.

Memory and Data

Datacom's memory was designed to collect data from multiple Controls and combine them into a single file. As a result, Datacom will add new data to any "open" file.

CAUTION: To avoid accidentally combining data files, or deleting data you want to save, ***follow the Operating Instructions carefully***. If you forget to **Purge Data** before you **Open A New File**, old data memory will be combined with new data. If you **Purge Data** before you **Save**, data will be deleted and can not be recovered.

Example #1: You have chosen to keep daily weld history files. If you start to weld on a Tuesday, the new weld data will be added to Monday's file ***unless*** you first **Save** Monday's file, then **Purge Data** to clear the Datacom memory, then **Open A New File** for Tuesday. Tuesday's file will be empty and will store incoming weld data from this point forward.

Example #2: You are welding on a Wednesday, but need to look at a file you saved on Monday. If you are communicating with operating Controls in the **MASTER** role, then **Open** Monday's file, incoming weld data will ***no longer*** be added to the file you opened for Wednesday. Instead, it will be added to the file you just opened (Monday). This will corrupt Monday's file and prevent Wednesday's file from being complete.

Communication: Connect / Disconnect

To collect weld data, you must **connect** the software to the computer's serial communication port. As noted above, if you are collecting data in the **MASTER** role, then **Open** an existing file, new data will be added to the old file. If you **Disconnect** the software from the serial port, you may open and view files without being corrupted by the addition of new data. However, if the Controls continue to weld, the computer will ***not*** receive incoming data and the current weld record will be incomplete due to the missing data.

A solution to this conflict comes from the fact that a serial port can only be used by one program at a time. To continue to collecting weld data, ***and*** to view existing files, you can open a ***second copy*** of the Datacom software using normal startup procedures. Copy #1 will still be connected to the

Control(s) and continue to collect incoming weld data. Copy #2 can ***not*** connect to the serial port because it is being used. Therefore, it is safe to **Open**, **Graph**, or **Save** files in copy #2 without being corrupted by incoming data.

Tip: To verify whether you working in copy #1 or copy #2, open the Communication View Window and check it regularly. If you are using copy #1, you can see incoming weld data in the window as it is received. Copy #2 will not display incoming data because it is not connected to the Control(s).

Software Startup

Datacom installation automatically puts a Datacom shortcut icon (right) on your desktop.

1 If the Datacom icon ***is*** on your desktop, double-click on it to start the software.

2 If the Datacom icon is ***not*** on your desktop, open the folder that contains the Datacom software, either the default directory (**C:\programfiles\unitek\datacom25**) or the custom folder you selected.

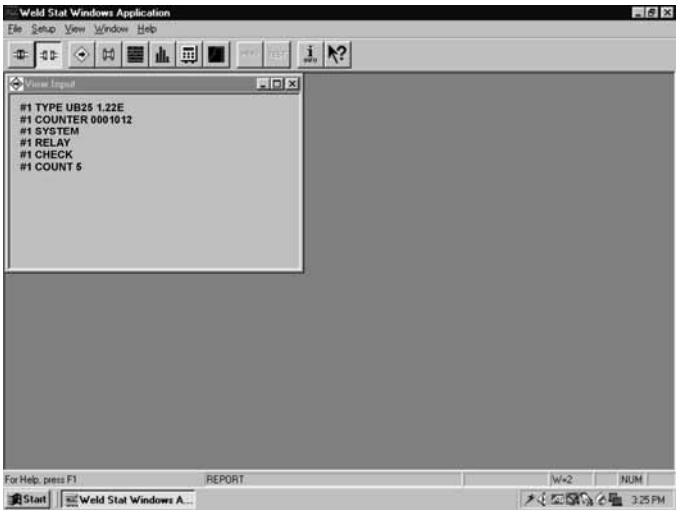
3 Locate the **datacom.exe** file, then double-click on it to start the software.

Connect Software to the Serial Port

Press the **CONNECT** icon on the Menu Bar. This connects the software to the serial port and automatically tests the status of the Control(s) connected to the computer to determine if a Control is connected properly.

Test results appear in the Communication View Window. If you do ***not*** see test results from a Control you believe is connected to the Control:

- Verify that the Control is turned ON.
- Verify that the Control is correctly connected to the computer.
- The Test icon will poll the serial port to identify any controls connected to the system.
- Verify that the Control and computer settings have been matched following the instructions in *Section VI, Setup.*



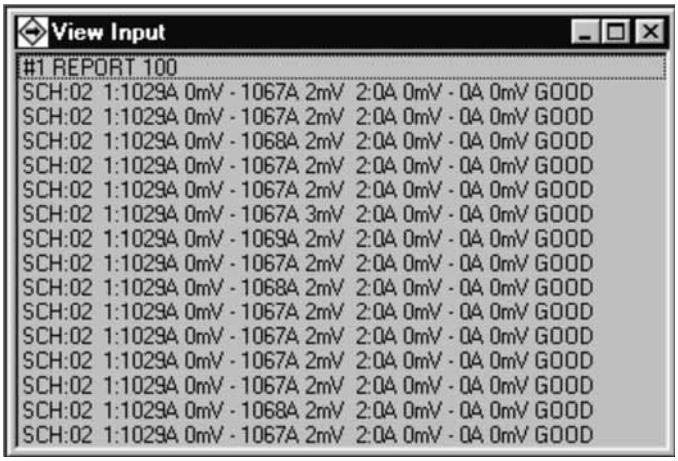
Disconnect Software from the Serial Port

Press the **Disconnect** icon on the Menu Bar to electronically disconnect the Datacom software from the serial port. All display and graphing functions of the Datacom software are still functional, but the computer is not able to communicate with the Control(s), even though cables are connected to the computer and the Control(s).

To resume normal communication between the computer and the Control(s), or to set new communication settings, press the **Connect** icon on the Menu Bar. The Status bar at the bottom of the screen provides information concerning the data that the software asks the control for to permit proper operation.

View Input

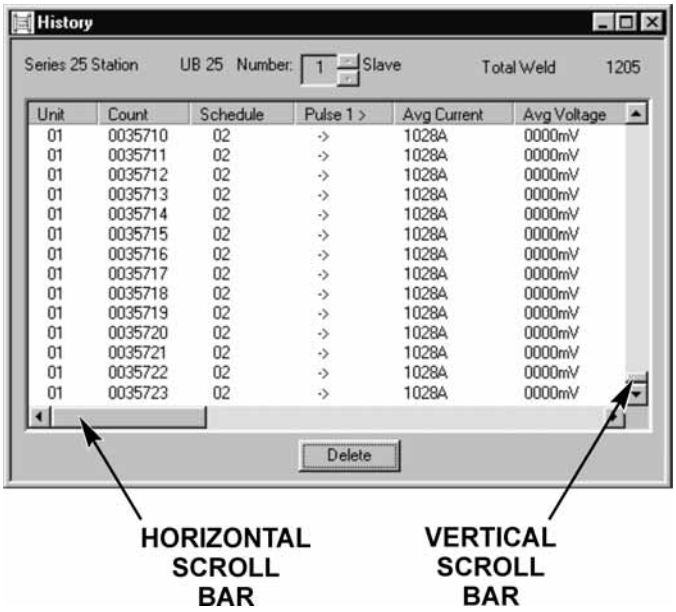
Press the **View Input** icon on the Menu Bar any time you want to see incoming data from the Control(s). The **View Input Window** displays incoming data in real time.



Weld History

If the computer is **Connected**, you may press the **History** icon on the Menu Bar any time you want to see the collected Weld Histories as they are being received. If the computer is **Disconnected** from the Control(s), this window can be used to view stored weld history files.

The Datacom software re-formats "raw" data and displays the weld count, schedule, peak and average values, and welds status as shown on the right. Weld data appears in the order the Control receives it.



- Use the **horizontal slider bar** to view the complete width of a data line.
- Use the **vertical scroll bar** to scroll up or down through the complete list of data.

To save a weld history, follow the **"SAVE" Data File** or **"SAVE AS" Data File** instructions below.

If you **Print** the weld history, you can select the pages you want printed, or select all welds to be printed, not just those shown in the window.

1 From the **Menu Bar**, click on **File**.

2 From the **File** pull-down menu, click on **Print**, select your print options, then click on **OK**.

NOTE: Each page can contain up to 50 weld histories.

"SAVE" Data File

This function saves the file that is currently open. To save data received from the Control(s) since the file was opened:

1 From the Menu Bar, click on **File**.

2 From the **File** pull-down menu, click on **Save**.

3 Close the window by clicking on the **X** on the top right of the window.

4 If you want to clear the open file, click on the **File** pull-down menu, then click on **Purge Data**.

File "SAVE AS" Data File

This allows you to save open data file with a new name, such as Day-Date, project name, etc. The original data file remains in memory, unchanged.

1 From the Menu Bar, click on **File**.

2 From the **File** pull-down menu, click on **Save As**.

3 Type in the new name in the **File name** window.

4 If you want to change the folder for the file, click on the **Menu** button next to the **Look In** window, then select a new folder.

5 If you want to change the file type, click on the **Menu** button next to the **Files of type** window, then click on a new file type.

6 When you have made your choices, click on the **Save** button.

7 Close the **History** window by clicking on the **X** on the top right of the window.

8 If you want to clear the open file, click on the **File** pull-down menu, then click on **Purge Data**.

File Create A New Data File

1 From the Menu Bar, click on **File**.

2 From the **File** pull-down menu, click on **New**.

3 Type in the new name in the **File name** window.

4 If you want to change the folder for the file, click on the Menu Button next to the **Look In** window, then select a new folder.

5 If you want to change the file type, click on the Menu Button next to the **Files of type** window, then click on a new file type.

6 When you have made your choices, click on the **Open** button. The screen will prompt you **Create the file?** Click on **Yes**.

File Open An Existing Data File

This allows you to open a saved file and view the data using the graph functions.

CAUTION: If you open a file while the Datacom software is **connected** to Controls and is receiving data, the new data will be added to the file you just opened.

1 From the Menu Bar, click on **File**.

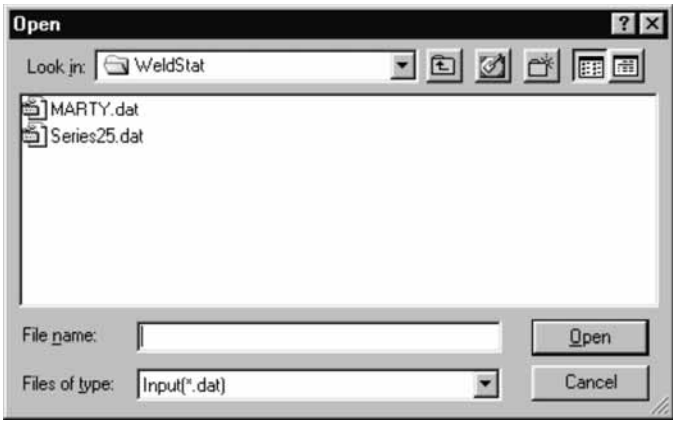
2 From the File pull-down menu, click on **Open**.

3 The default file type is **.DAT**. If you want another type of file, click on the **List files of type** menu button to display the pull-down menu.

4 Click on the type of file you want.

5 To open a file:

- Double-click on a displayed name
  OR
- Type a name in the **File name** box then click on **Open**.



- To look for files in other folders, click on the icon in the **Folders** column, then click on the folder you want.
- Select a file and click on the **Open** button.

File Import A File

This allows you to take a previously saved weld history file and import it (add it to) the file that is currently open.

1 From the Menu Bar, click on **File**.

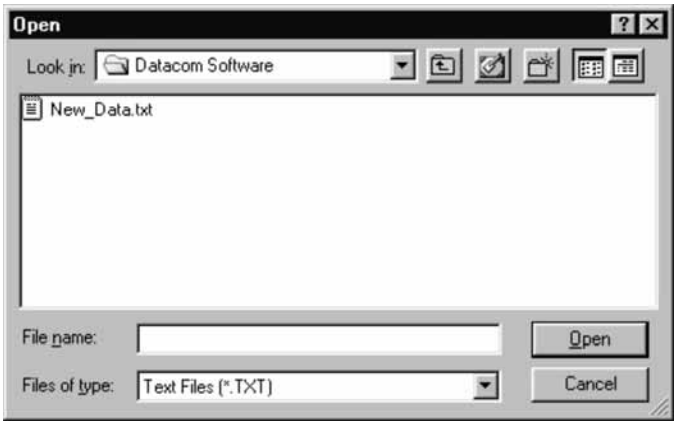
2 From the File pull-down menu, click on **Import**.

3 If you want another type of file, click on the **List files of type** menu button to display the pull-down menu, then click on the type of file you want.

4 To open a file:

- Double-click on a displayed name
  OR
- Type a name in the **File name** box then click on **Open**.

(Continued on next page)



- To look for files in other folders, click on the icon in the **Folders** column, then click on the folder you want.
- Click on the **Open** button (in the Import window, "Open" performs the **Import** function).

File Export A File

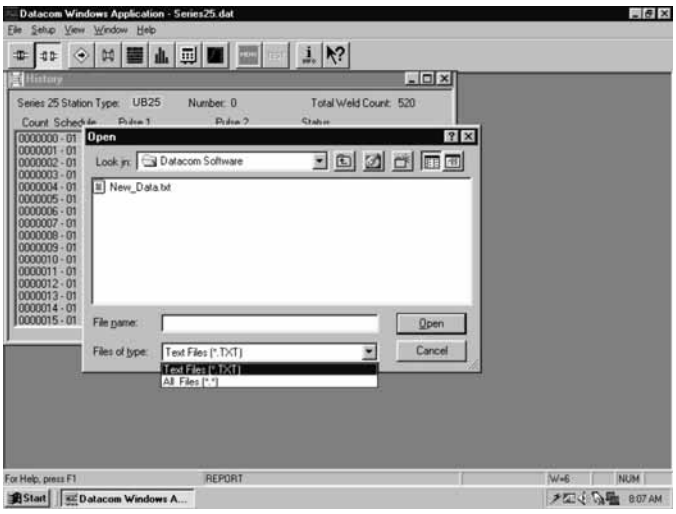
This allows you to take an existing weld data file and write it in the text (. **TXT)** format, which can then be, used by *Excel* or similar spreadsheet programs. This is useful if you have been collecting data from multiple Controls in the Master mode. Using *Excel*, you can sort the data by Control I.D. numbers in order to have a record of welds made by specific Controls.

1 From the **Menu Bar**, click on **File**.

2 From the **File** pull-down menu, click on **Export**. Type in the new name in the **File name** window.

3 To change the file type, click on the Menu Button next to the **Files of type** window, and then click on a new file type.

4 If you want to change the folder for the file, click on the Menu Button next to the **Look In** window, then select a new folder.



5 When you have made your choices, click on the **Open** button (this performs the "Export" function).

6 Close the **Export** window by clicking on the **X** on the top right of the window.

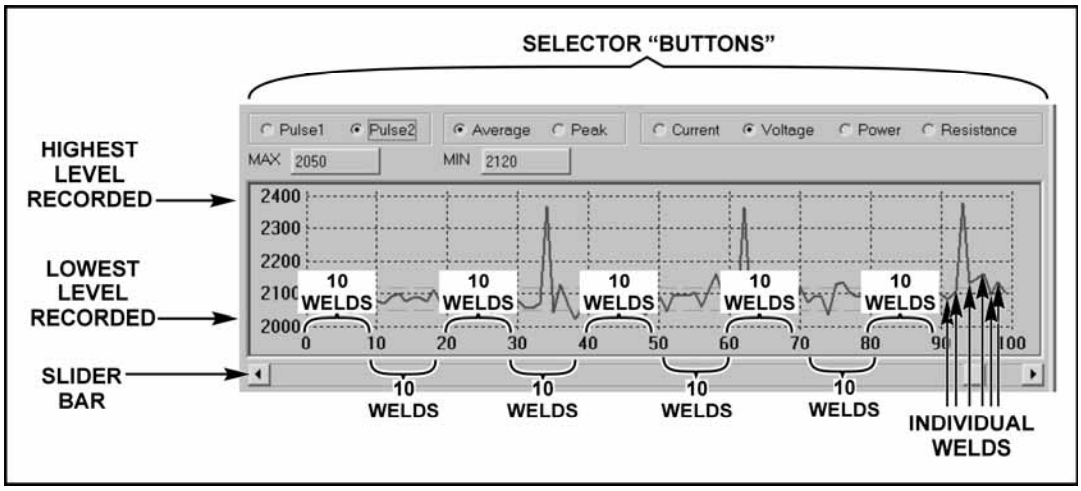
7 If you want to clear the open file, click on the **File** pull-down menu, then click on **Purge Data**.

Weld History Graph

This allows you to view weld histories in a graph format. If the computer is **Connected**, you may press the **Graph** icon on the Menu to see the collected Weld Histories as they are being received. The graph is automatically updated each time a weld is received. The History Graph serves as a Run chart for the process. If the computer is **Disconnected** from the Control(s), this window can be used to view stored weld history files.

1 Press the **Weld History Graph** icon on the Toolbar.

2 Use the selector buttons to choose the pulse and value to display.



Weld History Graph

Each point on the graph is a separate weld. Selector buttons allow you to choose which values to graph. The software automatically calculates the highest and lowest levels recorded, then plots those values on the graph. The bottom of the graph shows the actual weld count numbers in groups of ten. Selector buttons are provided to allow visual minimum and maximum limits to be set.

1 Highlight the default limit and enter a limit value.

2 Press the **Tab** to display a green "limit line" on the graph.

This feature is useful as a visual indictor when a monitor is used to view the data in a production environment.

To save a weld history graph, follow the **"SAVE" Data File** or **"SAVE AS" Data File** instructions.

If you **Print** the weld history graph, only the portion of the graph in the window will be printed, however you may move the slider bar on the bottom of the graph to move to any portion of the weld history (beginning, middle, end, etc.).

To **Preview** which part of the graph will be printed:

1 Move the slider to the point where you want the graph to start.

2 From the Menu Bar, click on **File**.

3 From the **File** pull-down menu, click on **Print Preview.**

4 Click on **Close**.

5 To **Print** the portion of the graph displayed in **Print Preview**:

- From the Menu Bar, click on **File**.
- From the **File** pull-down menu, click on **Print**, select your print options, then click on **OK**.

Weld History Histogram

This allows you to view weld history in a histogram format. If the computer is **Connected**, you may press the **Weld History Histogram** icon on the Menu to see the collected Weld Histories as they are being received. The graph is automatically updated each time a weld is received. If the computer is **Disconnected** from the Control(s), this window can be used to view stored weld history files.

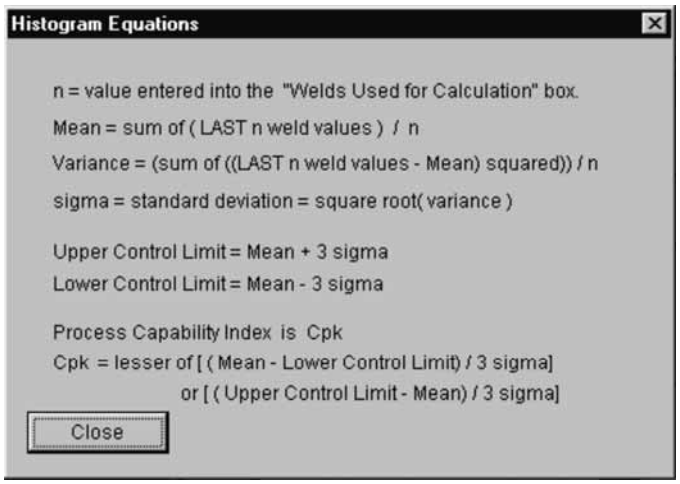
1 Press the **Histogram** icon on the Toolbar.

2 Use the selector buttons to choose the pulse and values to display.

3 To change the numbers for **Welds Used for Calculation, Upper Control Limit,** or **Lower Control Limit**:

A) **Highlight** the number you want to change.

B) Type in the new number.



NOTES:

- The default upper and lower control limits are calculated from the mean using plus and minus 3 sigma. Entering new values will change the CPK value.
- To see the calculations used in generating the default values, click on the **Equations** button.

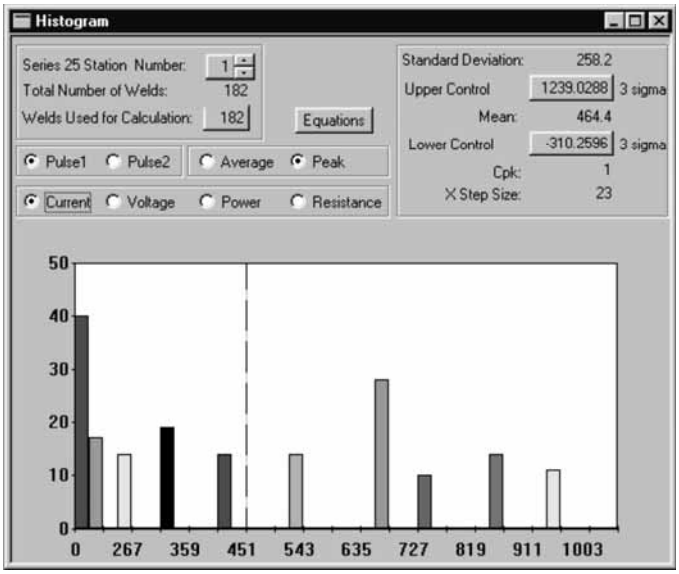
To **Print** the weld history histogram:

1 From the Menu Bar, click on **File**.

2 From the **File** pull-down menu, click on **Print**, select your print options, then click on **OK**.

NOTE: To preview what the histogram will look like before printing:

- Click on **File.**
- From the **File** pull-down menu, click on **Print Preview.**
- Click on **Close**.



Remotely Program Weld Schedules

This provides the same weld schedule programming features available on the front panel of the Control. For more information on weld schedule programming, see the *DC25 Operator Manual* or *UB25 Operator Manual*.

NOTE: To use this function, the Control(s) must be set in the **RUN** mode.

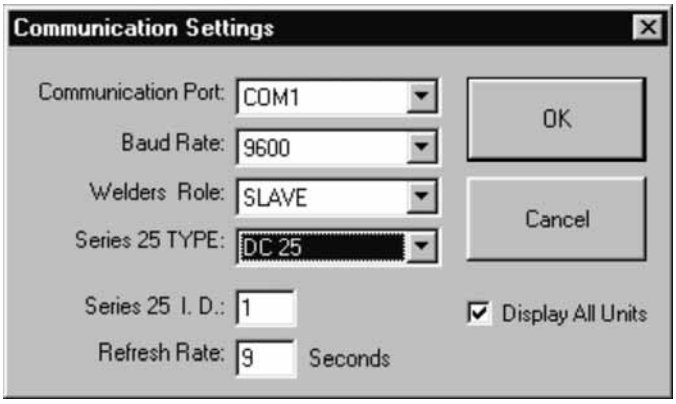
1 From the Menu Bar, click on **Setup**.

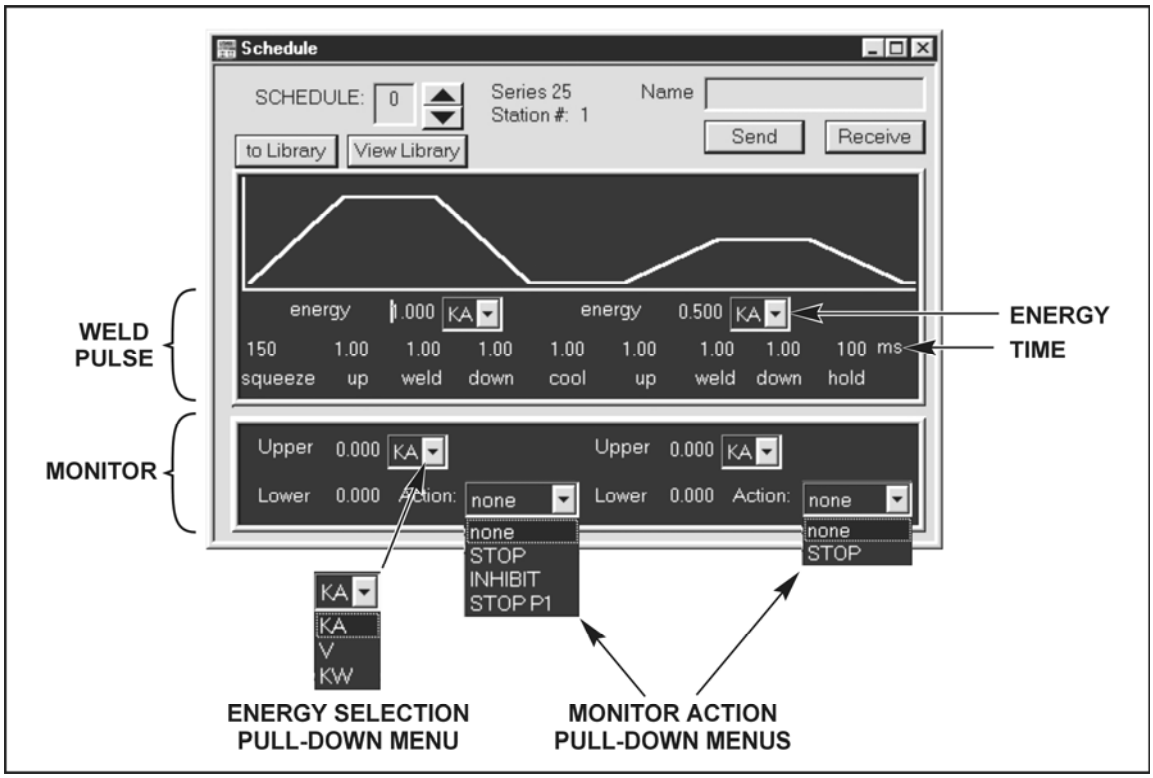
2 From the **Setup** pull-down menu, click on **Communication**.

3 Highlight the number in the **Series 25 I.D.** window.

4 Enter the I.D. number of the Control you want to program, then click the **OK** button.

5 Click on **Schedule** icon to get the **Schedule** window. After 1 second delay, the values will display from the schedule currently being used by the Control.





Datacom "Schedule" Window

6 Verify that the I.D. Number of the Control you want to program is displayed in the **Unit ID** window. If ***not***, repeat Steps 1 through 4 until it does.

NOTE: The waveform graph is for reference only, it changes as numerical values change.

7 Click on the **Receive** button to read the existing schedule in the Control.

8 Use the ▲▼ (Up, Down) scroll buttons next to the **Schedule:** window to select the schedule you want to program.

9 Change the **Weld Pulse** and **Monitor** values:

- Use the mouse to **highlight** a time or energy value number
- Type in the new time or energy value number
- Use the pull-down menus to select the **Upper** and **Lower** energy units, and **Monitor Action**.

10 Press the **Send** button to send the new schedules to the Control.

11 Repeat Steps 7 through 10 for each schedule you want to program.

How to Use Schedule Name and Schedule Library Functions

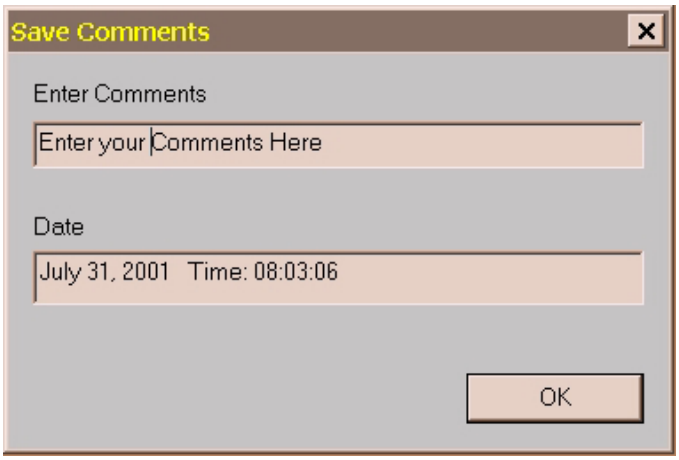
Name a Weld Schedule

Click the **Name** field to give a weld schedule a name.

Using the Schedule Library

Click the **To Library** button to transfer a weld schedule to the weld library. A **Save Comments** box appears where you can enter comments about the particular weld schedule.

NOTE: The weld library is a database. Each field in the Weld Schedule will be given it's own column in the database.



Restore a Weld Schedule from the Library

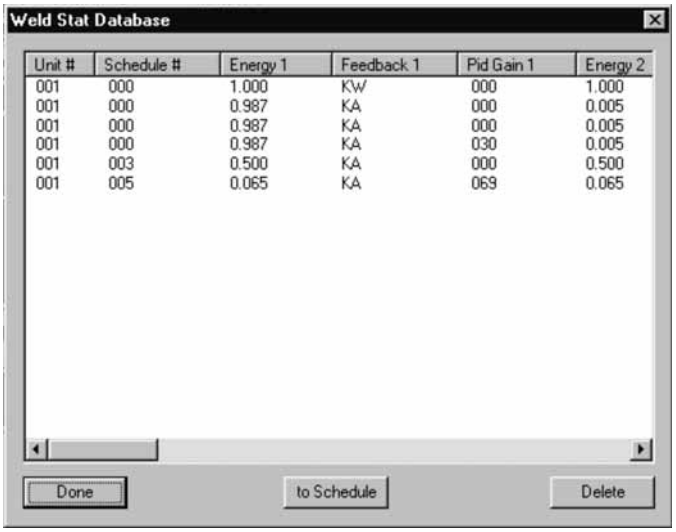
1 To view the Datacom database, click on **View Library.**

NOTE: To view the schedule database ***outside*** the Datacom software, use a database program like *Microsoft Access*®.

2 Click on a **Unit #** in the far left column to select an ***individual*** schedule.

3 Use the **Shift** or **Control** key on the PC keyboard to select ***multiple*** schedules.

4 Select a weld schedule or schedules to copy from the database to the Schedule programming menu.



5 Click on the **To Schedule** button. The **Copy To** dialog box pops up asking you to input the schedule from which to start copying.

NOTE: If you copy multiple schedules they will be copied in numerical order from the schedule number you select.

6 Now that you have the schedules from the database in the **Schedule** window, you can send them to a Control as described earlier.

Remotely Program System Settings

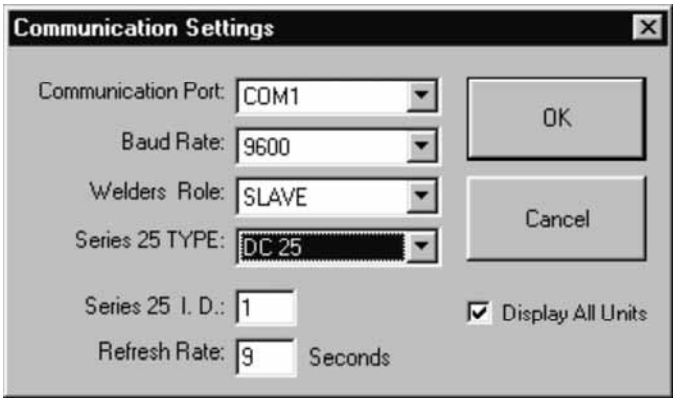
1 From the Menu Bar, click on **Setup**.

2 From the **Setup** pull-down menu, click on **Communication**.

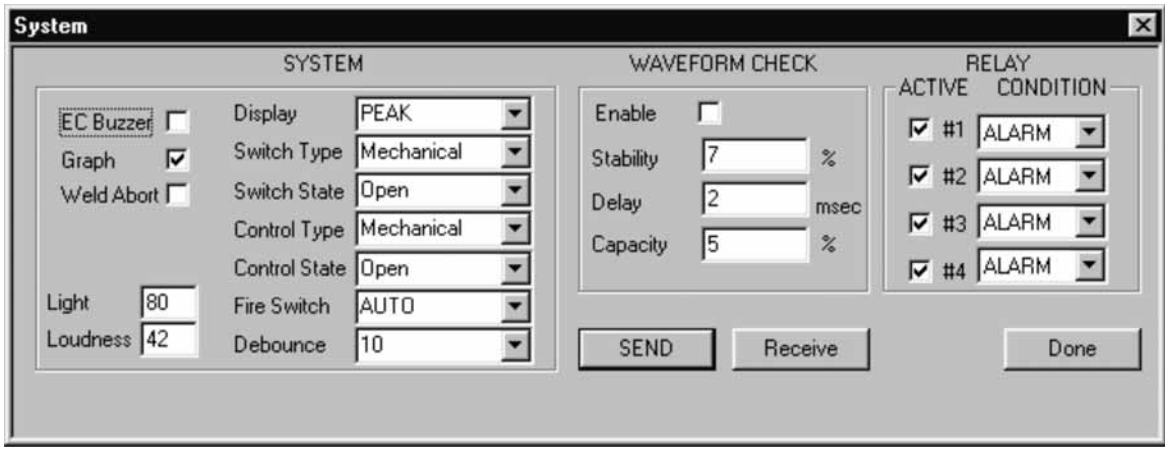
3 Highlight the number in **the Series 25 I.D.** window.

4 Enter the I.D. number of the Control you want to program, then click the **OK** button.

5 Verify that the ID number is correct.



6 Click on **Menu** icon to get the **System** menu window shown below.



Datacom System Menu

7 Click on the **Receive** button to read the existing settings in the Control.

NOTE: When either **SEND** or **RECEIVE** is pressed, the System menu will disappear. Click on the **MENU** icon again to continue.

8 To change the settings:

- Use the mouse to **highlight** a setting number, then type in the new number.
- Use the pull-down menus to select setting options.

Press the **SEND** button to send the new settings to the Control.

9 Repeat Steps 1 through 8 to change the settings on other Controls. For descriptions of the fields and their use refer to the UB25 or DC25 manual.

NOTE: Depending on the type of Control, and version of Control software, some of these options may not be available.

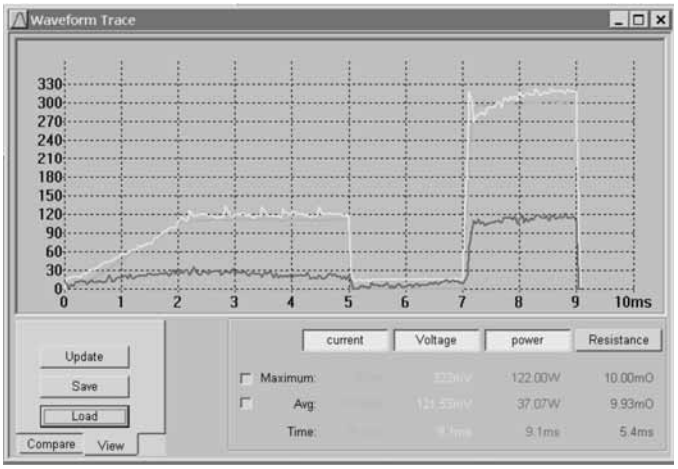
Waveform Trace

This feature works independently of the Weld History data. When **Connected** to the Control(s), this displays a waveform graph of the last weld made. When **Disconnected** from the Control(s), you may view and print stored weld pulses.

View Graph of Last Weld Made

1 Press the **Waveform** icon on the Toolbar.

2 To see the latest graph from the Control, click on the **View** button. The **Current**, **Voltage**, and **Power** waveforms will display as shown on the right.



3 To view the **Resistance** graph, click on the last button on the right.

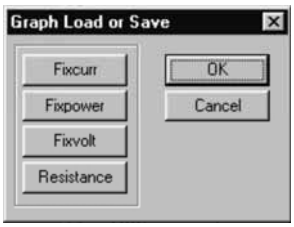
NOTE: You may click on the **Current**, **Voltage**, **Power,** or **Resistance** buttons at any time in order to hide or view specific waveforms.

4 If welds have been made since you went into the **View** mode, click on **Update** to view the waveform of the most recent weld.

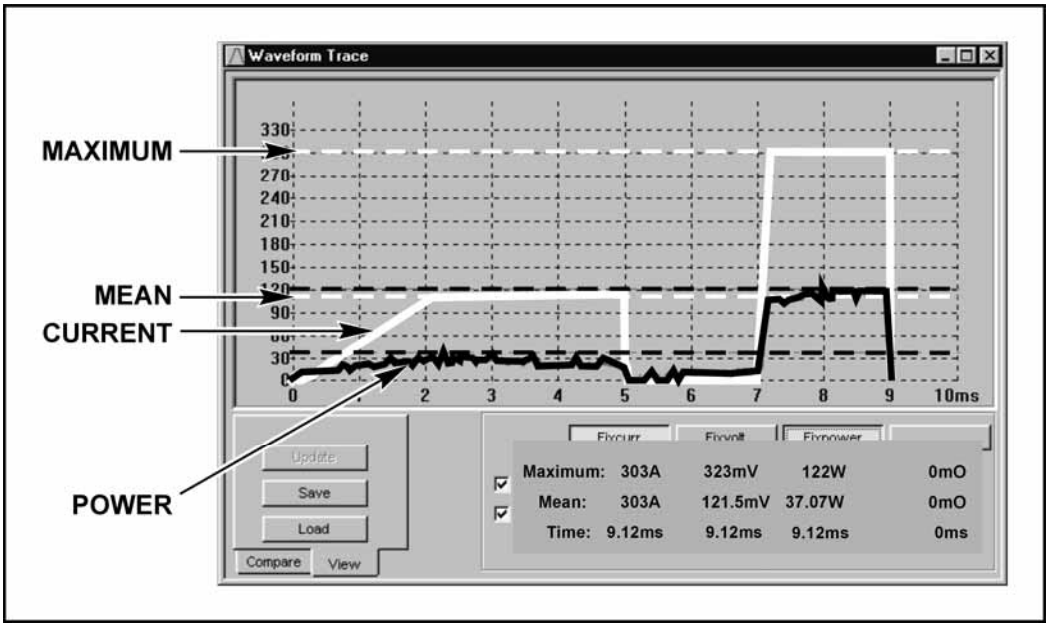
NOTES:

- The **Update** button will be inactive ("greyed-out") briefly while the software collects weld data.
- The scale of the graph may change, depending on the ranges of the data to be shown. The decimal point is not shown on the vertical axis of the graph.

5 To select parameters for the **Update**, click on the **LOAD** button, then click on the buttons in the pop-up window for the parameter(s) you want.

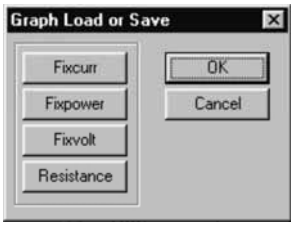


6 To turn a waveform ON or OFF, press the corresponding button on the bottom.



7 To display reference lines on the graph, place a ✓ next to **Maximum** and/or **Mean** by clicking on the appropriate box.

8 To save the waveform traces, click on the **Save** button. A pop up box will allow you to select the waveform traces that are to be saved.



NOTES:

- Clicking on all of the four boxes will select all the waveforms.
- A **Comments** box opens which allows you to enter one line of comments.
- After closing this window, the **File Open** window opens which allows you to name the file or files.

  When you name a file, the character "**C**" [for **current**], "**V**" [for **voltage**], "**P**" [for **power**], or "**R**" [for **resistance**] will automatically be added to the end of the name. **Example**: If you saved the current graph as "Unitek.GRF," the computer will save it as: **UNITEKC.GRF**.
- The **Compare** function allows you to compare ***up to four*** saved waveform traces.
- To store a weld pulse graph, follow the **SAVE AS** Data File procedures.

1 To print the weld pulse graph, click on the **File** icon on the toolbar.

2 From the **File** pull-down menu, click on **Print**, select your print options, then click on **OK**.

NOTE: To verify what the weld pulse graph will look like before printing, click on **File,** from the **File** pull-down menu, click on **Print Preview**, look at the histogram, then click on **Close**.

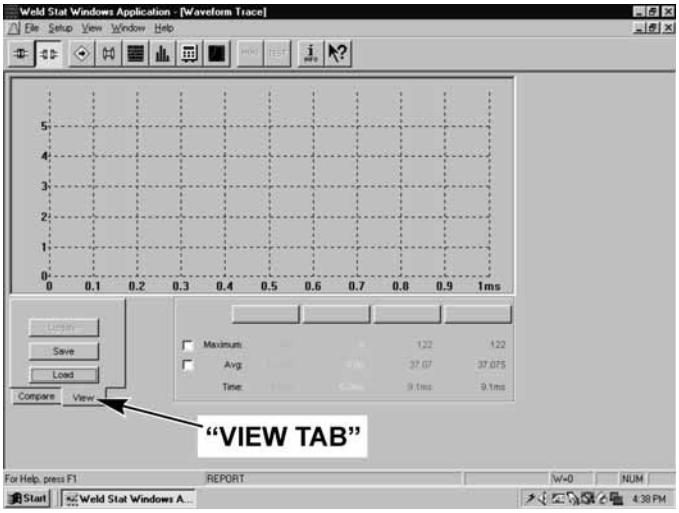
View Stored Weld Pulse Graphs

1 Click on the **Waveform Trace** icon on the toolbar.

2 Click on the **View** tab.

NOTES:

- In the **View** mode, the **Update, Save**, and **Load** buttons are active.
- In the screen on the right, the **Graph Display Buttons** are blank because no graphs were previously loaded. If old names appear on the buttons, they will be replaced when new graphs are selected.



3 Click on the **Load** button, the **Open** popup window will appear.

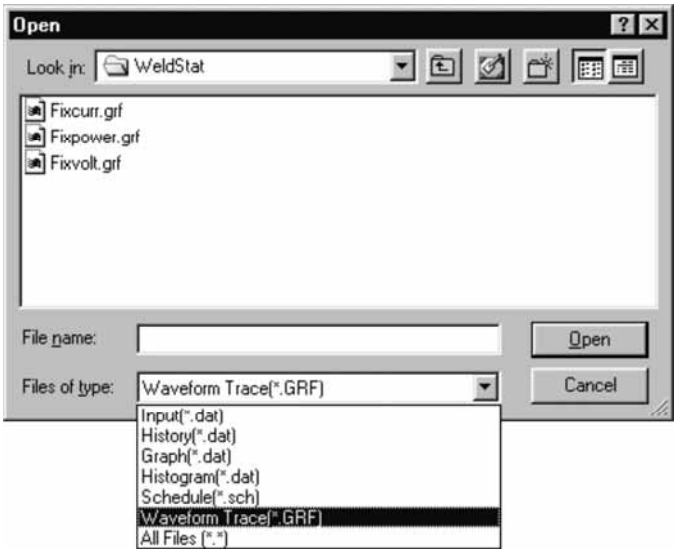
4 Click on the **List files of type** pull-down menu, select the **.GRF** format.

5 From the **File name** box, select the graph you want to open:

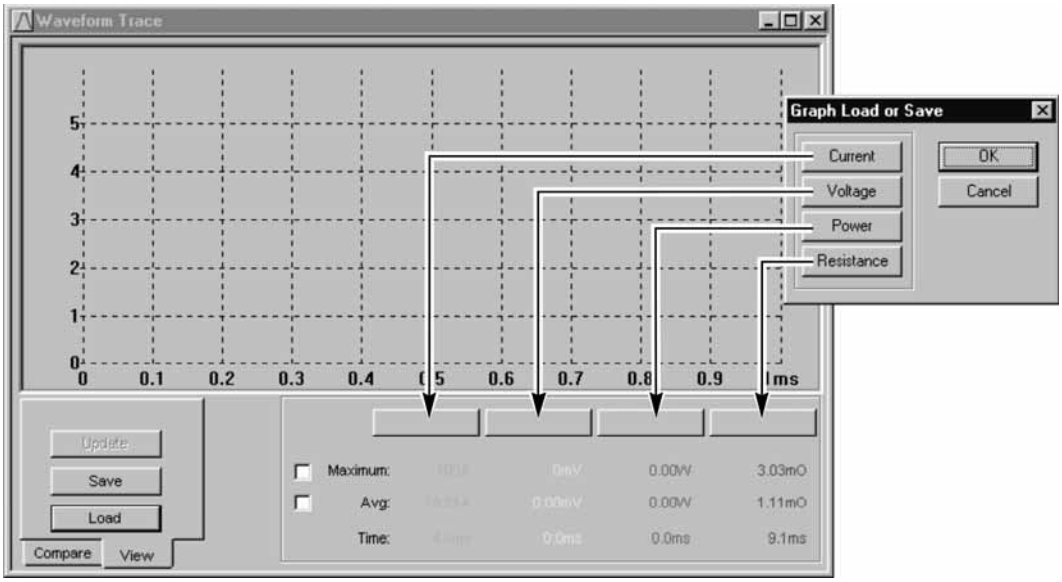
- Double-click on the file name

OR

- Type a name in the **File name** box then click on **Open**.

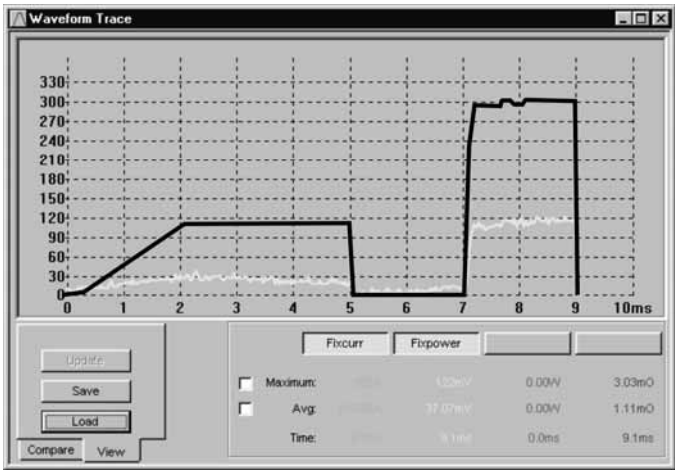


6 Click on the **Current**, **Voltage**, **Power**, or **Resistance** button to assign the loaded graph to a **Graph Display Button** under the display area. The **Current**, **Voltage**, **Power**, or **Resistance** buttons correspond to the Graph Display Buttons as shown below.



7 After you have selected a Graph Display Button, click on **OK**.

Example: In the screen on the right**, the Fixcurr** graph was loaded then the **Current** button was pressed to assign the graph to the first Graph Display Button, and the **Fixpower** graph was loaded then the **Voltage** button was pressed to assign the graph to the second Graph Display Button.



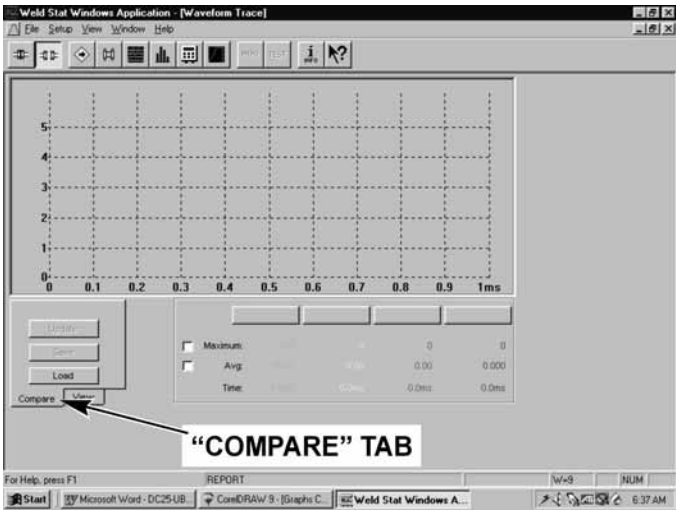
8 Repeat steps 1 ➜7 to load up to four graphs and assign them to the Graph Display Buttons.

NOTES:

- In the **View** mode, you may **Update** and **Save** any selected graph using the active buttons.
- You may turn each graph display ON or OFF by pushing the corresponding display button.

Compare Stored Weld Pulse Graphs

This is a quick, easy way to compare four stored graphs, although not all of the **View** functions are available.



1 Click on the **Waveform Trace** icon on the toolbar.

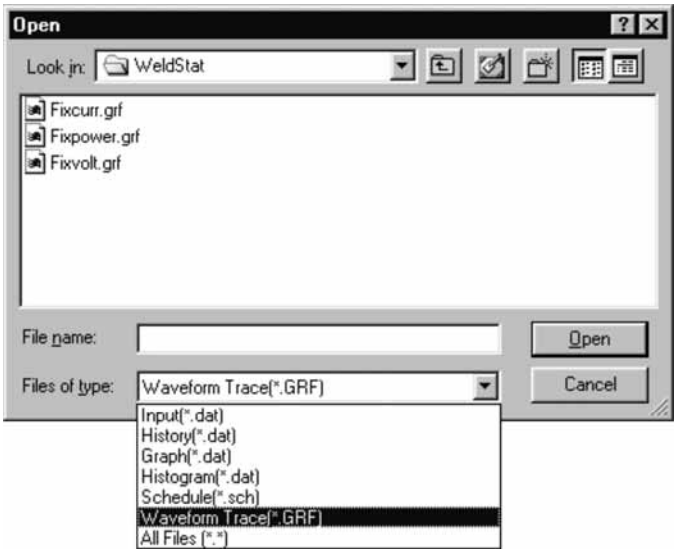
2 Click on the **Compare** tab.

NOTES:

- **Example:** In the screen on the right, the **Graph Display Buttons** are blank because no graphs were previously loaded. If old names appear on the buttons, they will be replaced when new graphs are selected.
- In the **Compare** mode, only the **Load** button is active, so you can ***not*** **Update** or **Save** selected graphs.

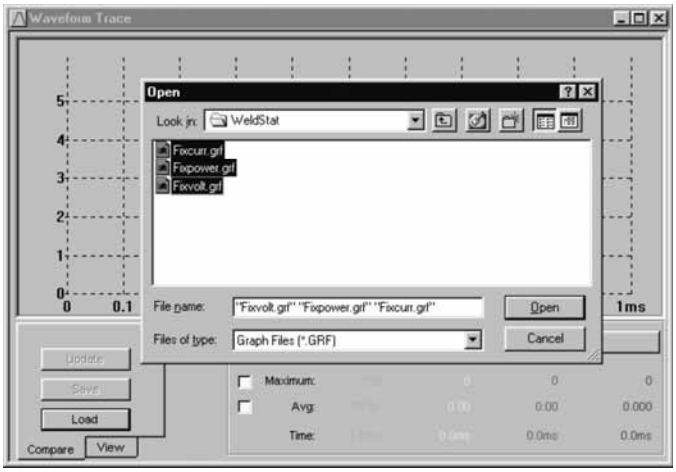
3 Click on the **Load** button, the **Open** popup window will appear.

4 Click on the **List files of type** pull-down menu, select the **.GRF** format.



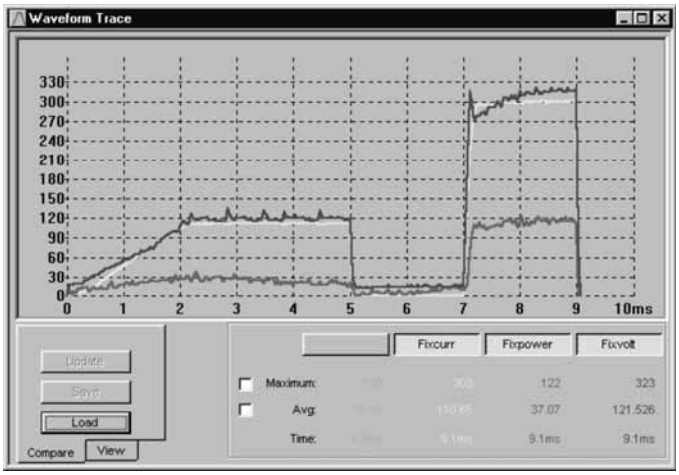
5 From the **File name** box, select the graph(s) you want to open. Use the standard *Windows* procedure of holding down the **Shift** or **Control** key while you click on each file name.

NOTE: You can select up to 4 files.



NOTE: You can ***not*** assign graphs to specific buttons like you can in the **View** mode. As shown in the screen on the right, the Datacom **Compare** function automatically assigns graphs to the **Graph Display Buttons** from right to left when you click on **Open**.

NOTE: You may turn each graph display ON or OFF by pushing the corresponding display button.



Test

This is used to test or verify that Controls are communicating properly with the computer. **Test** is ***only*** active if the software is connected and Controls are communicating with the computer. **Test** may be performed any time the computer is Connected to the Control(s). The computer issues a "Status" command to all Controls connected to the computer (from 0 to 30), then status reports from each Control will be displayed in the **Communication View Window**.

1 From the Menu Bar, press the **Communication View Window** icon so you will be able to see test results.

2 From the Menu Bar, press the **Test** icon, then watch the **Communication View Window** for test results.

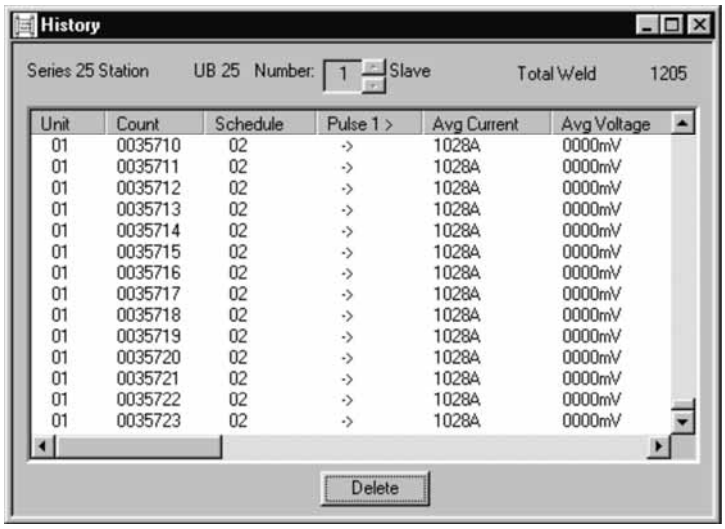
APPENDIX A
WELD HISTORY DATA

Data And Display Formats

The history of each weld is stored in two different files in different formats:

- Binary Data (**.DAT**) format
- Text Data (**.TXT**) format

Datacom software reads **.DAT** data and formats it for display like this:



Datacom Weld History Window

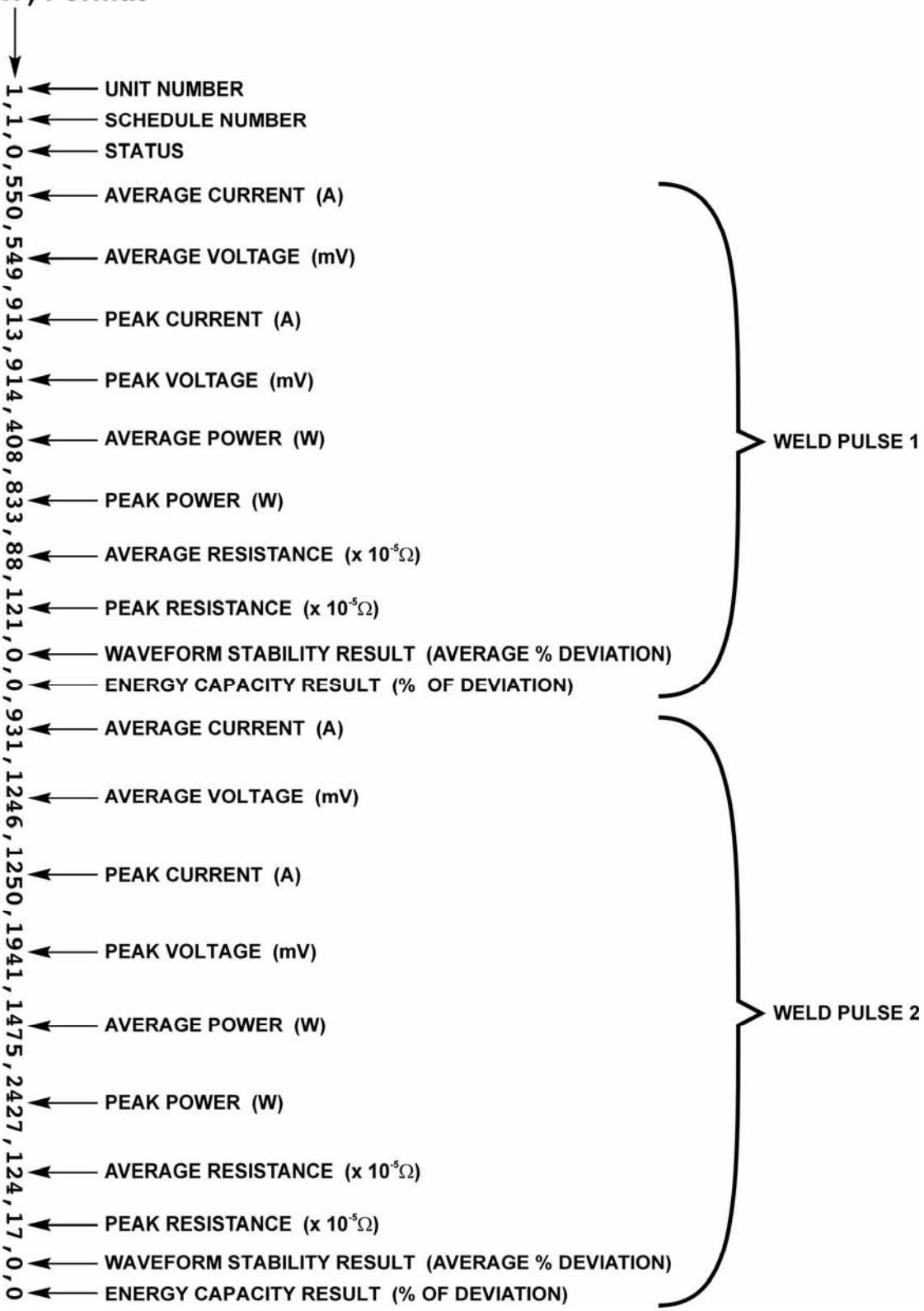
In the .TXT format, each line of data represents a single weld. Each value is separated by a comma, and the line ends with a "hard return." This allows the data to be used in *Microsoft Excel* and similar programs for sorting, grouping, and other data processing. When a Control is connected to a serial printer, weld histories are printed in the unformatted .TXT format which looks like this:

```
1,1,0,550,549,913,914,408,833,88,121,0,0,931,1246,1250,1941,1475,2427,124,17,0,0
1,1,0,551,552,908,920,410,835,89,123,0,0,931,1246,1250,1941,1476,2427,122,15,9,0
1,1,0,551,550,908,920,409,835,89,123,0,0,932,1248,1250,1941,1478,2427,122,15,9,0
1,1,0,551,550,912,914,410,829,89,121,0,0,932,1249,1250,1941,1479,2427,124,16,5,0
1,1,0,550,550,912,914,409,833,89,119,0,0,931,1246,1250,1941,1476,2427,122,16,1,0
```

Weld History Text (.TXT) Data

The top line of .TXT data shown above is described on the next page.

Weld History Data
Text (.TXT) Format



Status Message Codes

As shown on the previous page, the **Status** of the weld is the third entry in a line of text data, represented by a one or two-digit number. Status Messages are defined below.

NUMBER	STATUS MESSAGE
0	GOOD
1	CHECK CONTROL SIGNALS INPUT STATUS
2	CHECK INPUT SWITCH STATUS
3	FIRING SWITCH BEFORE FOOT SWITCH
4	STOP ON CONTROL SIGNALS INPUT
5	POWER TRANSISTOR OVERHEATED
6	EMERGENCY STOP - OPERATOR ACTIVATED
7	FIRING SWITCH DIDN'T CLOSE IN 10 SECOND
9	TEST WELD
10	VOLTAGE SELECTION PLUG IS MISSING
11	INHIBIT CONTROL SIGNALS ACTIVATED
13	NO CURRENT READING
14	NO VOLTAGE READING
15	LOAD RESISTANCE TOO HIGH
17	WELD SWITCH IN NO WELD POSITION
18	CHECK VOLTAGE CABLE & SECONDARY CIRCUIT
19	CALIBRATION RESET TO DEFAULT
20	LOWER LIMIT GREATER THAN UPPER LIMIT
21	COOL TIME ADDED FOR DIFFERENT FEEDBACK
22	ENERGY SETTING TOO SMALL
23	SYSTEM & SCHEDULE RESET TO DEFAULTS
24	NOT USED
25	CHAINED TO NEXT SCHEDULE
26	SAFE ENERGY LIMIT REACHED
27	NOT USED
28	NOT USED
29	NOT USED
30	NOT USED
31	UPSLOPE REQUIRED FOR LOWER LIMIT

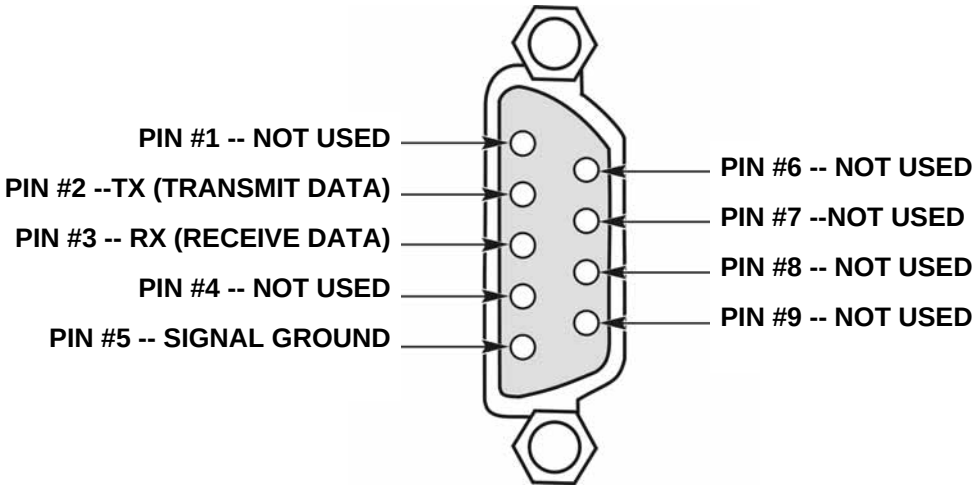
NUMBER	STATUS MESSAGE
32	INPUT TOO LARGE
33	INPUT TOO SMALL
34	PRESS RUN BEFORE WELDING
35	NOT USED
36	NOT USED
37	NOT USED
38	NOT USED
39	ACCESS DENIED! SYSTEM SECURITY ON
40	ILLEGAL SECURITY CODE ENTERED
41	NOT USED
42	NOT USED
43	NOT USED
44	NOT USED
45	NOT USED
46	NOT USED
47	ACCESS DENIED! SCHEDULE LOCK ON
48	NOT USED
49	NOT USED
50	NOT USED
51	NOT USED
52	NOT USED
53	NOT USED
54	NOT USED
55	CURRENT1 > UPPER LIMIT
56	CURRENT1 < LOWER LIMIT
57	VOLTAGE1 > UPPER LIMIT
58	VOLTAGE1 < LOWER LIMIT
59	POWER1 > UPPER LIMIT
60	POWER1 < LOWER LIMIT
61	RESISTANCE1 > UPPER LIMIT
63	NOT USED
64	NOT USED
65	SCHEDULES ARE RESET

NUMBER	STATUS MESSAGE
66	SYSTEM PARAMETERS ARE RESET
67	NOT USED
68	NOT USED
69	WELD TIME TOO SMALL
70	NOT USED
71	CURRENT2 > UPPER LIMIT
72	CURRENT2 < LOWER LIMIT
73	VOLTAGE2 > UPPER LIMIT
74	VOLTAGE2 < LOWER LIMIT
75	POWER2 > UPPER LIMIT
76	POWER2 < LOWER LIMIT
79	INHIBIT 2ND PULSE
80	WELD STOP - LIMIT REACHED
81	NOT USED
82	NOT USED
83	NOT USED
84	NOT USED
85	NOT USED
86	COOL TIME MINIMUM
87	TEST WELD?
88	CAPACITY EXCEEDED P1
89	CAPACITY EXCEEDED P2
90	STABILITY LIMIT EXCEEDED P1
91	STABILITY LIMIT EXCEEDED P2
92	WELD FIRE LOCKOUT
93	NOT USED

-

APPENDIX B
RS-232 and RS-485 CONNECTIONS

RS 232 Connector

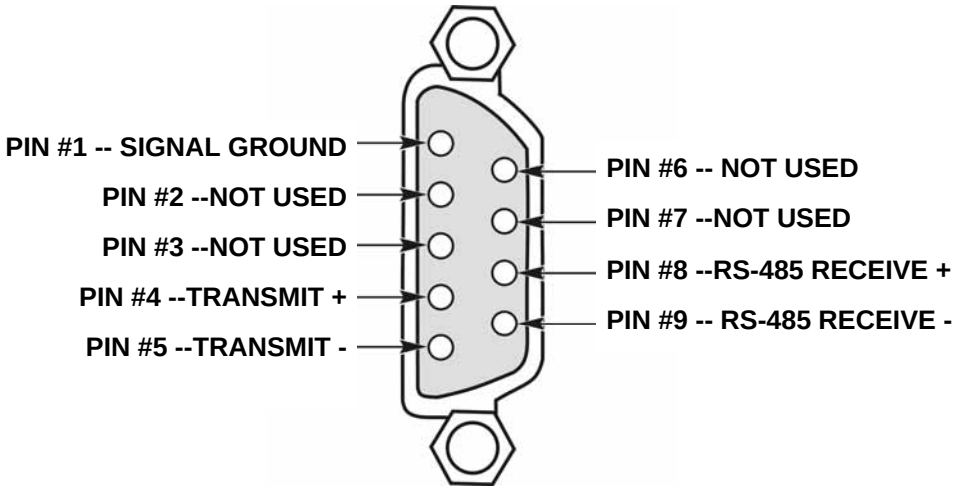


RS 232 CONNECTOR SPECIFICATIONS		
PIN NUMBER.	**DESCRIPTION**	**PIN TYPE**
1	Not Used	
2	TX (Transmit Data)	RS-232 Driver
3	RX (Receive Data)	RS-232 Receiver
4	Not Used	
5	Signal Ground	Analog Ground (ISOGND1)
6	Not Used	
7	Not Used	
8	Not Used	
9	Not Used	

NOTE: Use the Serial Extension Cable supplied in the Datacom Kit.

RS-485 IN and Out Connectors

NOTE: Pin connections and specifications for both **RS 485** connectors are identical.

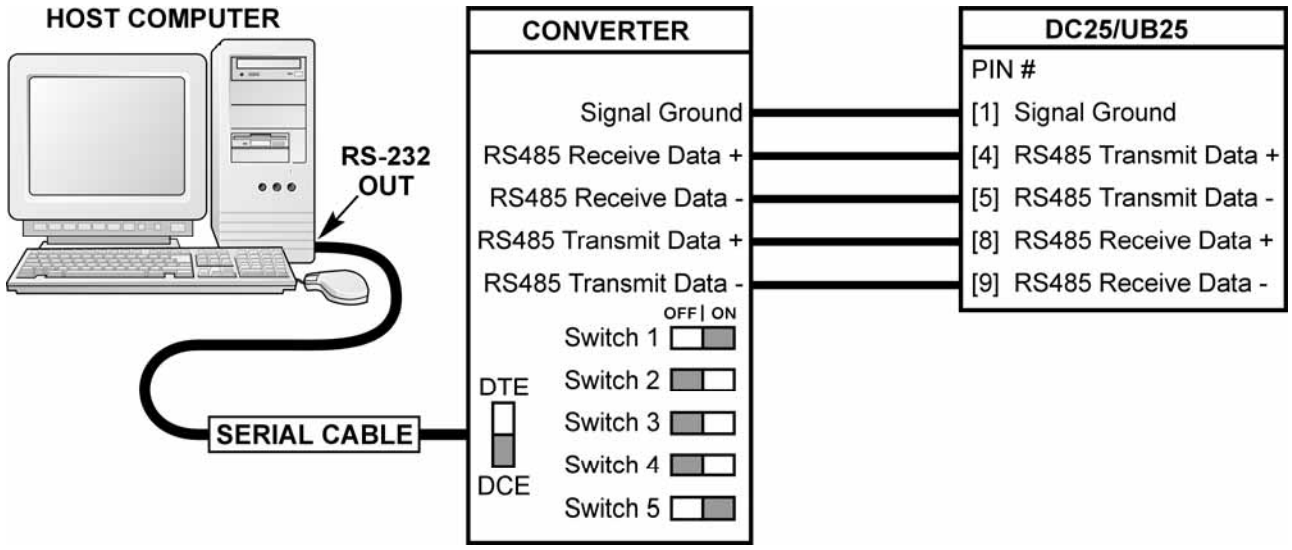


RS 485 IN/OUT CONNECTOR SPECIFICATIONS		
PIN NO.	**DESCRIPTION**	**PIN TYPE**
1	Signal Ground	Isolated ground (1kV dc Isolation)
2	Not used	
3	Not used	
4	Transmit +	RS-485 Driver +
5	Transmit -	RS-485 Driver -
6	Not used	
7	Not used	
8	Receive +	RS-485 Receive +
9	Receive -	RS-485 Receive -

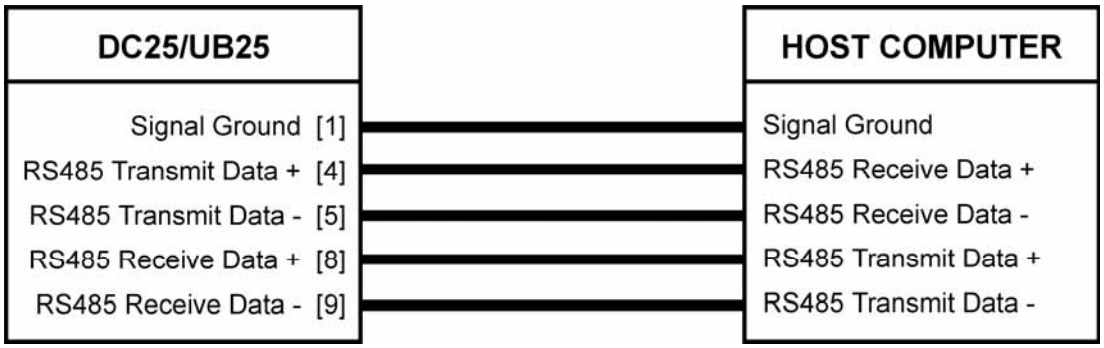
RS-485 Connections

The following illustrations show these RS-485 Datacom connections:

- RS-232-To-RS-485 Converter Connection
- RS-485 Full-Duplex Connection



RS-232-To-RS-485 Converter Connection



RS-485 Full-Duplex Connection

APPENDIX C

DATACOM PROGRAMMING CODES

Section I. Remote Data Collection and Programming

The Control data communication protocol includes the capability of collecting basic weld information for each individual weld. The Control stores weld information for the last 1,500 welds.

In order to do the simple data collection, the Control must be in the **SLAVE** mode. The host only needs to send an ASCII character string to the control. This allows ease of comprehension and debugging remote data collection development.

An example string would look like "*#ID* **REPORT NEW** *number<crlf><lf> "*. The string must begin with a " # ", then the *ID* or identification number of the Control you wish data from. The "**REPORT NEW**" is one command from the command list in Section III.

NOTES:

- The letters <***cr***> (13) represent "carriage return."
- The letters <***lf***> (10) represent "line feed."
- For additional remote data collection commands, see *Section III, Computer Originated Commands and Section IV, Control Originated Commands.)*

The "***number"*** is the quantity of welds you would like to acquire from the control. This number can be greater or lesser than the number of welds made since the last data collection. The carriage return line feed sequence *"***<*crlf*><*lf*>*"* terminates the command and is required.

The Control will then send the requested number of weld reports up to the amount stored into the control since the last data collection. The control erases all the weld data sent from the weld data buffer. Each weld report data is separated with a carriage return line feed sequence ***"<crlf>".*** The fields within the report are separated with a comma. This allows you to import this data into a spreadsheet program like *Microsoft Excel*.

The Host is requesting the Control with ***ID*** #1 to send the last 10 weld reports from the stored accumulated weld reports by sending the following command:

#1 REPORT OLD 10 <*crlf*><*lf*>

The weld data counter in the Control is decremented by 10. The corresponding Control the Control with ***ID*** #1 responses with:

#1 REPORT 10 <*crlf*>
1,1,0,551,552,908,920,410,835,89,123,0,0,931,1246,1250,1941,1476,2427,122,15,9,0,0 <*crlf*>
1,1,0,551,550,908,920,409,835,89,123,0,0,932,1248,1250,1941,1478,2427,122,15,9,0,0 <*crlf*>
1,1,0,551,550,912,914,410,829,89,121,0,0,932,1249,1250,1941,1479,2427,124,16,5,0,0 <*crlf*>
1,1,0,550,550,912,914,409,833,89,119,0,0,931,1246,1250,1941,1476,2427,122,16,1,0,0 <*crlf*>
1,1,0,551,552,912,914,410,833,89,121,0,0,932,1249,1250,1945,1480,2431,123,15,8,0,0 <*crlf*>
1,1,0,551,554,912,933,411,842,89,122,0,0,931,1248,1250,1948,1478,2435,123,15,6,0,0 <*crlf*>
1,1,0,551,554,908,927,412,839,89,120,0,0,932,1249,1250,1941,1480,2427,123,15,6,0,0 <*crlf*>
<*lf*>

When no information is being passed, the host passes an empty token, which is a packet consisting of the token followed by the end of packet sequence (<crlf><lf>). If the Control has a message to return, it sends the message along with the token to the host. Otherwise, if the Control has no message to return, it returns an empty token.

A message consists of any command and its parameters or other data accompanying the command. Each token-message packet must conclude with an end of packet sequence. The Control ignores any packet beginning with a unit ID that does not match it's programmed value, up to the point that an idle line is detected. Thus, at least one character time of idle line is required between packets to wake up all Control Weld Controls on the communication line in order to recognize any subsequent packet that may be addressed to them.

Section II. Command Format

#*ID* **KEYWORD** *parameters* <crlf><lf>

UNIT IDENTIFICATION: #*ID* (*ID* is any number from “00” to “30”, must be a two digit number).

COMMAND KEYWORDS: BOLD.

VARIABLE: *italics.*

REQUIRED PARAMETERS: {enclosed in braces} (one required and only one parameter allowed).

CHOICE OF PARAMETERS: separated by vertical bar "|" indicates one *OR* another of choices presented.

REQUIRED/OPTIONAL PARAMETERS: [enclosed in brackets] (one or more allowed, used in the **SET** parameter)(zero allowed in the **READ** parameter).

RANGE OF PARAMETERS: *low_end - high_end* (separated by hyphen).

END OF PARAMETER TERMINATOR: <crlf> (carriage return followed by linefeed).

TERMINATION OF COMMAND: <lf> (linefeed - must be preceded by the end of line terminator <crlf>).

Each unit identifier, command keyword, and parameters must be separated by one or more spaces except the termination of command <lf> must follow the end of parameter terminator<crlf> immediately. I. E. **“<crlf><lf>”**

Section III. Computer Originated Commands

These are the commands sent by the host computer, via RS-485 or RS-232 to a Control.

Command **STATUS**<crlf><lf>

Control State Any

Description Requests the Control to report the status of the weld data buffer. Control returns **STATUS** with either "**OK**" or "**OVERRUN.**"

Command **TYPE**<crlf><lf>

Control State Any

Description Requests the Control to return the type of welder, release number, and revision letters. **NOTE:** UB25 software lower than version 1.22 will not display release number or revision letter.

Command **COUNT**<crlf><lf>

Control State Any

Description Requests the Control to report the number of weld data accumulated since the last data collection. Control returns the COUNT even if there is no weld data available.

Command **ERASE**<crlf><lf>

Control State Any

Description Requests the Control to erase all the weld reports.

Command **SYNC**<crlf><lf>

Control State Any

Description Provides synchronization of the commands. The Control returns SYNC command back to the host computer.

Command **CURRENT**<crlf><lf>

Control State Any

Description Requests the Control to report the sampled Current data of the last weld. Control shall return with CURRENT report. See CURRENT command under Control Originating Commands section.

Command **VOLTAGE** <crlf><lf>

Control State Any

Description Requests the Control to report the sampled Current data of the last weld. Control shall return with VOLTAGE report. See VOLTAGE command under Control Originating Commands section.

Command **POWER** <crlf><lf>

Control State Any

Description Requests the Control to report the sampled Current data of the last weld. Control shall return with POWER report. See POWER command under Control Originating Commands section.

Command **COUNTER** {**TOTAL | HIGH | LOW | GOOD}**<crlf><lf>

Control State Any

Description Requests the Control to return the Control weld counter contents.

TOTAL returns the total number of weld counter.

HIGH returns the out of limits high counter.

LOW returns the out of limits low counter.

GOOD returns the within limits counter.

Command **REPORT** {**OLD** | **NEW**} *number* <crlf><lf>

Control State Any

Description Requests the Control to send the weld report.

OLD: requests to send the number of oldest weld reports since the last data collection. The reported weld data will be erased.

NEW: requests to send the number of newest weld reports. All the weld data will be erased after reported.

number: the number of weld data to be sent.

If the number is greater than the number of weld data in the buffer, less than the number of weld data will be sent. There must be a space between two fields.

Command **STATE {READ | RUN | MENU | MONITOR**}<crlf><lf>

Control State Any

Description Commands the Control to identify its current state ("READ" keyword, see STATE under CONTROL ORIGINATED COMMANDS section) or go to either RUN state or PROGRAM state.

Command **LOAD** {*schedule_number*}<crlf><lf>

Control State RUN state

Description Selects the schedule_number as the currently loaded schedule. schedule_number may be any number from 0 to 99. There must be a space between LOAD and schedule_number.

Command **COPY {***from_schedule_number***} {***to_schedule_number***}**<crlf><lf>

Control State Any

Description Allows one schedule to be copied to another schedule number. From_schedule_number and to_schedule_number may be any number from 0 to 99. Copying a schedule to itself has no effect other than to invoke a schedule printout when "PRINT SCHEDULES/PROGRAMS" is enabled.

Command **SCHEDULE**<crlf><lf>

Control State Any state ***except*** while welding.

Description Requests the Control to return the currently selected schedule number.

Command **SCHEDULE {READ | SET}** <crlf>
[*parameter_name value*<crlf>]

<lf>

Control State RUN state.

Description Provides control over the Control schedule parameters. When used with the "READ" keyword, all parameters pertaining to the currently loaded schedule are returned (see SCHEDULE under Control ORIGINATED COMMANDS). When the "SET" keyword is used, the host may set (change) the value of one or more of the parameters pertaining to the currently loaded schedule. The following is a list of valid literal substitutions for the parameter_name and value variables:

(Continued On Next Page)

Description (Continued)

ENG1	**{** *weld_energy* **}**	energy amount for pulse 1
FEEDBACK1	**{ KA | V | kW }**	feedback type for pulse 1
ENG2	**{** *weld_energy* **}**	energy amount for pulse 2
FEEDBACK 2	**{ KA | V | kW}**	feedback type for pulse 2
SQUEEZE	**{** *squeeze_time* **}**	squeeze time
UP1	**{** *weld_time* **}**	up slope time of pulse 1
WELD1	**{** *weld_time* **}**	weld time of pulse 1
DOWN1	**{** *weld_time* **}**	down slope time of pulse 1
COOL	**{** *weld_time* **}**	cool time
UP2	**{** *weld_time* **}**	up slope time of pulse 2
WELD2	**{** *weld_time* **}**	weld time of pulse 2
DOWN2	**{** *weld_time* **}**	down slope time of pulse 2
HOLD	**{** *hold_time* **}**	hold time
PIDG1	**{** *pid gain* **}**	PID Gain for Pulse 1 [Change in value is seen after a weld is made.]
PIDG2	**{** *pid gain* **}**	PID Gain for Pulse 2 [You will not be able to see this change.]

NOTES:

- If your UB25 Control has a software version ***lower*** than **1.22**, you will see **VMULT**. This parameter is not used, ignore.
- If your UB25 Control has a software version ***lower*** than **1.23**, you will not see either **PIDG1** or **PIDG2**.

squeeze_time and ***hold_time*** are the parameter that defines the time for the given period in 1 msec. Valid range is from 0 to 999.

weld_time is the parameter that defines the time for the given period. Valid ranges are shown below.

HOST		CONTROL	
Increments	**Range**	**Time Range**	**Increments**
1	0-100	0-0.1ms	0.01ms
10	110-1000	1.1-10ms	0.1ms
100	1100-9900	11-99ms	1.0ms
Weld Time for UB25 = 0-99 ms Weld Time for DC25 = 0-9.9 ms			

weld_energy is the parameter that specifies the amount of weld energy. In the current feedback mode, *weld_energy* is in unit of 0.001KA. In the voltage feedback mode, *weld_energy* is in units of 0.001V. In the power feedback mode, *weld_energy* is in units of 0.001kW.

pid gain is the PID gain. Setting this value to 0 will force the next weld to be a test weld.

Command **MONITOR {READ | SET}**<crlf>
[*parameter_name value*<crlf>]

<lf>

Control State Any except while welding

Description Provides control over the basic weld monitor settings of the Control schedule. When used with the "READ" keyword, the basic weld monitor settings of the currently loaded schedule are returned (see MONITOR under Control ORIGINATED COMMANDS). When the "SET" keyword is used, the host may set (change) the value of one or more of the parameters of the basic weld monitor settings pertaining to the currently loaded schedule. The following is a list of valid literal substitutions for the parameter_name and value variables:

MONTYPE1	**{ KA | V | KW }**	Monitor Type for pulse 1
UPPER1	**{** *limit_value* **}**	Upper Limit for pulse 1
LOWER1	**{** *limit_value* **}**	Lower Limit for pulse 1
ACTION1	**{ none | STOP | INHIBIT | APC }**	Out of Limit Action for pulse 1
MONTYPE2	**{ KA | V | KW }**	Monitor Type for pulse 2
UPPER2	**{** *limit_value* **}**	Upper Limit for pulse 2
LOWER2	**{** *limit_value* **}**	Lower Limit for pulse 2
ACTION2	**{ none | STOP }**	Out of Limit Action for pulse 2

NOTE: If your UB25 Control has a software version ***lower*** than **1.22**, you will ***not*** the parameters below.

P1LDLY1	{*delay_value*}	Pulse 1 Lower Delay Start Time For Lower Limit
P1LDLY2	{*delay_value*}	Pulse 1 Lower Delay End Time For Lower Limit
P1UDLY1	{*delay_value*}	Pulse 1 Upper Delay Start Time For Upper Limit
P1UDLY2	{*delay_value*}	Pulse 1 Upper Delay End Time For Upper Limit
P2LDLY1	{*delay_value*}	Pulse 2 Lower Delay Start Time For Lower Limit
P2LDLY2	{*delay_value*}	Pulse 2 Lower Delay End Time For Lower Limit
P2UDLY1	{*delay_value*}	Pulse 2 Upper Delay Start Time For Upper Limit
P2UDLY2	{*delay_value*}	Pulse 2 Upper Delay End Time For Upper Limit

limit_value is the parameter that specifies the range of the valid readings. If the reading was within the range of the *limit_value*, no alarm will occur. If the reading was out of the valid range, an alarm will occur. If the monitor type is KA, the *limit_value* is in unit of 1A. If the monitor type is V, the *limit*_value is in unit of 1mV. If the monitor type is kW, the *limit*_value is in unit of 1W. The valid number for *limit_value* is 1 through 9999 and 0 is for none.

The ***delay_value*** is the parameter that defines the time for the given period in 0.1ms. Valid range is from 0 to 99. Lower delay value is only valid during WELD time. Upper delay value is valid during UP time, WELD time, and DOWN time.

Command

CHECK {READ | SET}<crlf>
[*parameter_name value* <crlf>]

<lf>

Control State

Any except while welding.

Description

Requests the Control to return the waveform check values. When used with the "**READ**" keyword, all parameters pertaining to the waveform check values are returned (see **CHECK** under CONTROL ORIGINATED COMMANDS). When the "**SET**" keyword is used, the host may set (change) the value of one or more of the waveform check parameters. The following is a list of valid literal substitutions for the *parameter_name* and *value* variables:

ENABLE	**{OFF | ON}**	Enable waveform check
STABILITY	**{***stability_value***}**	Stability check % limit.
DELAY	**{***delay_value***}**	Stability check delay in ms.
CAPACITY	**{***capacity_value* **}**	Energy capacity % limit.

stability_value is the limit of the allowable average deviation from the set point for the weld pulse after the delay period.

NOTE: The valid number for the delay value is 0 through 99, representing 0.0 through 9.9ms delay time.

delay_value is the delay period, in milliseconds. This delay period, at the start of the pulse, will not be used when the average deviation is calculated.

capicity_value is the capacity % limit. This limit is the % below the set point the energy is allowed to be at the end of the weld pulse.

Command **RELAY {READ | SET}** <crlf>
[*parameter_name value*<crlf>]

<lf>

Control State Any except while welding

Description Provides control over the Control schedule parameters for relay settings. When used with the "**READ**" keyword, the relay settings of the currently loaded schedule are returned (see **RELAY** under Control ORIGINATED COMMANDS). When the "**SET**" keyword is used, the host may set (change) the value of one or more of the relay settings of the currently loaded schedule. The following is a list of valid literal substitutions for the *parameter_name* and *value* variables:

ACTIVE1	**{ HIGH | LOW }**	Relay 1 Active High or Active Low
CONDITION1	*condition_value*	Relay 1 Active Conditions
ACTIVE2	**{ HIGH | LOW }**	Relay 2 Active High or Active Low
CONDITION2	*condition_value*	Relay 2 Active Conditions
ACTIVE3	**{ HIGH | LOW }**	Relay 3 Active High or Active Low
CONDITION3	*condition_value*	Relay 3 Active Conditions
ACTIVE4	**{ HIGH | LOW }**	Relay 4 Active High or Active Low
CONDITION4	*condition_value*	Relay 4 Active Conditions
	condition_value is	**{ WELD | END | ALARM | LIMITS | P1HI | P1LOW | P2HI | P2LOW }**

Command **SYSTEM {READ | SET}**<crlf>
[*parameter_name value*<crlf>]

<lf>

Control State Any

Description
(Continued On Next Page)

Provides control over the Control's system parameters. When used with the "**READ**" keyword, all system parameters are returned (see **SYSTEM** under CONTROL ORIGINATED COMMANDS). When used with the "**SET**" keyword, the host may set (change) the value of one or more of the system parameters.

Description (Continued)

The following is a list of valid literal substitutions for the *parameter_name* and *value* variables:

LIGHT	**{ *light_value* }**	LCD contrast
LOUDNESS	**{ *loudness_value* }**	Buzzer Loudness
BUZZER	**{ OFF | ON }**	end of cycle buzzer
DISPLAY	**{ PEAK | AVG }**	Display mode
SWTYPE	**{ MECHANICAL | OPTO | PLC}**	Input Switch Type
SWSTATE	**{ OPEN | CLOSED }**	Input Switch State
CTTYPE	**{ MECHANICAL | OPTO | PLC}**	Control Signals Type
CTSTATE	**{ OPEN | CLOSED }**	Control Signals State
FIRESW	**{ AUTO | REMOTE | NONE }**	Firing Switch Type
GRAPH	**{ OFF | ON }**	Update Graph
WELDABORT	**{ OFF | ON }**	Footswitch weld abort
DEBOUNCE	**{ NONE | 10 | 20 | 30 }**	Switch debounce time in msec

These parameters pertain to the settings of the option menus available via the front panel user interface.

light_value is a number 0 to 100 for brightness of the LCD. 0 is dark and 100 is the brightest.

loudness_value is a number 0 to 100 for buzzer loudness. 0 is off and 100 is the loudest.

Command **ALARM {READ | CLEAR | SET** *error_number* **| DISPLAY** *alarm_message_string***}**<crlf><lf>

Control State Any

Description Provides access to the Control alarm logic. When used with the "READ" keyword, the current error condition value is returned. See Appendix A. for list of alarm messages. When the "CLEAR" keyword is used, all alarm conditions are canceled. When the "SET" keyword is used, the host may invoke an error identified by error_number. When the "DISPLAY" keyword is used, an error condition can be created with any message desired. The length of the error message must be limited to 40 characters or less. No help message will be available in connection with this created error message.

Command **SECURITY {OFF | SCHEDULE | SYSTEM | CALIBRATION}**<crlf><lf>

Control State Any

Description Allows control of the system security mode.

"OFF" sets all security status Control to "OFF."

"SCHEDULE" sets the schedule lock to "ON."

"SYSTEM" sets the system lock to "ON."

"CALIBRATION" sets the calibration lock to "ON."

Command **KEY {***key_code***}**<crlf><lf>

Control State Some key codes only function in certain states.

Description Process the key_code as if it was pressed from the front panel.

The followings are the key_code:

KEY	DEC	HEX	KEY	DEC	HEX
SQUEEZE	58	3A	5	53	35
UP 1	59	3B	6	54	36
WELD 1	60	3C	7	55	37
DOWN 1	61	3D	8	56	38
COOL	62	3E	9	57	39
UP 2	63	3F	PERIOD	46	2E
WELD 2	64	40	KA	4	04
DOWN 2	65	41	V	5	05
HOLD	66	42	kW	6	06
UP	30	1E	RUN	15	0F
DOWN	31	1F	MENU	23	17
0	48	30	ENERGY	10	0A
1	49	31	PEAK	3	03
2	50	32	OHMS MONITOR	47	2F
3	51	33	SCHEDULE	8	08
4	52	34	INFO	22	16

Section IV. Control Originated Commands

These are the commands sent from a Control to a host computer.

Command **STATUS** *state_name* <crlf><lf>

Control State Any

Description Identifies the current status of the weld data buffer. May be in response with "OK" or "OVERRUN." "OK" means that the Control weld buffer did not over-run since the last data collection and all the data are intact. "OVERRUN" means that the Control weld buffer did over-run since the last data collection and only the latest 1500 weld data are available to report.

Command **TYPE** *type, release numbers, revision letters*<crlf><lf>
NOTE: UB25 software ***lower*** than version **1.22** will not display release number or revision letter.

Control State Any

Description Returns "UB25 1.22E" for a UB25 and "DC25 1.22E" for a DC25.

Command **COUNT** *number* <crlf><lf>

Control State Any

Description Returns the number of weld data available in Control. The total number of weld data that the Control holds in the buffer is 1,500.

Command **SCHEDULE** *schedule_number* <crlf><lf>

Control State Any

Description Returns the current schedule number to the host. schedule_number may be any number from 0 to 99.

Command **REPORT** *number_of_reports* <crlf>
report <crlf> report <crlf> . . . . *report* <crlf><lf>

Control State Any

Description Returns the requested number of weld reports. First field is the number of reports to be sent. Then follows the packets of report. One report pack hold all the information about a weld. Each report packet is separated by <crlf> and this Command ends with <crlf><lf>.

number_of_reports: This is the number of reports that shall be included in this command. If the host computer requests more weld data than is available in the weld data buffer, the Control sends only the weld reports in the weld buffer and the *number_of_reports* is the number of weld reports available in the weld data buffer. After the report is sent to the host computer, the Control erases the weld data sent to the host from the weld data buffer.
report:{*unit_number, schedule_number , weld_status, average_current_1 , average_voltage_1, peak_current_1 , peak_voltage_1, average_power_1 , peak_power_1, average_resistance_1, peak_resistance_1, waveform_stability_1, energy_capacity_1, average_current_2 , average_voltage_2, peak_current_2 , peak_voltage_2, average_power_2 , peak_power_2, average_resistance_2, peak_resistance_2, waveform_stability_2, energy_capacity_2}*

The fields in the report packet are separated with a comma and all fields are in integer format. There are always 23 fields in a report packet.

unit_number:	The unit number assigned to the unit.
schedule_number:	The schedule number of the weld.
weld_status:	The status of the weld.
average_current_1:	The average current of pulse 1 (in A).
average_voltage_1:	The average voltage of pulse 1(in mV).
peak_current_1:	The peak current of pulse 1 (in A).
peak_voltage_1:	The peak voltage of pulse 1 (in mV).
average_power_1:	The average power of pulse 1 (in W).
peak_power_1:	The peak power of pulse 1 (in W).
average_resistance_1:	The average resistance of pulse 1 (in $10^{-5}\Omega$).
peak_resistance_1:	The peak resistance of pulse 1 (in $10^{-5}\Omega$).
waveform_stability_1:	The waveform stability result (% average devation).
energy_capacity_1:	The energy capacity result (% of devation).

Description (Continued)

average_current_2:	The average current of pulse 2 (in A).
average_voltage_2:	The average voltage of pulse 2(in mV).
peak_current_2:	The peak current of pulse 2 (in A).
peak_voltage_2:	The peak voltage of pulse 2 (in mV).
average_power_2:	The average power of pulse 2 (in W).
peak_power_2:	The peak power of pulse 2 (in W).
average_resistance_2:	The average resistance of pulse 2 (in $10^{-5}\Omega$).
peak_resistance_2:	The peak resistance of pulse 2 (in $10^{-5}\Omega$).
waveform_stability_2:	The waveform stability result (% average devation).
energy_capacity_2:	The energy capacity result (% of devation).

Command **STATE** *state_name*<crlf><lf>

Control State Any

Description Identifies the current state of operation of the Control. May be in response to the **STATE READ** Command sent by the host, or may be sent as a result of a state change from the Control front panel.

state_name may be "**RUN",** "**MENU**" or "**MONITOR**".

Command **COUNTER** *number* <crlf><lf>

Control State Any

Description Returns the requested current Control weld counter number.

Command **CURRENT** *number_of_data* <crlf>
data <crlf> data <crlf> . . . . *data* <crlf><lf>

Control State Any

Description Returns the Current reading of the last weld. First field is the number of data to be sent. Then follows the packets of data. Each data is separated by <crlf> and this command ends with <crlf><lf>.

number_of_data: This is the number of data that shall be included in this command. The Control samples current every 40 μs. For a weld less than 80 ms weld time, the number of data will be approximately: *total weld time ÷ 40 μs.* This number will be always less than 2000.

data: an integer number in unit of A.

Command **VOLTAGE** *number_of_data* <crlf>
data <crlf> data <crlf> . . . . *data* <crlf><lf>

Control State Any

Description Returns the Voltage reading of the last weld. First field is the number of data to be sent. Then follows the packets of data. Each data is separated by <crlf> and this command ends with <crlf><lf>.

***number_of_data**:* This is the number of data that shall be included in this command. The Control samples Voltage every 40 μs. For a weld less than 80 ms weld time, the number of data will be approximately: *total weld time ÷ 40 μs.* This number will be always less than 2000.

***data**:* An integer number in unit of mV.

Command **POWER** *number_of_data* <crlf>
data <crlf> data <crlf> . . . . *data* <crlf><lf>

Control State Any

Description Returns the Power reading of the last weld. First field is the number of data to be sent. Then follows the packets of data. Each data is separated by <crlf> and this command ends with <crlf><lf>.

***number_of_data**:* This is the number of data that shall be included in this Command. The Control samples Current and Voltage every 40 μs. For a weld less than 80 ms weld time, the number of data will be approximately: *total weld time ÷ 40 μs.* This number will be always less than 2000.

***data**:* An integer number in unit of W.

Command

CHECK<crlf>	
ENABLE	**{ OFF | ON }**<crlf>
STABILITY	*stability_value*<crlf >
DELAY	*delay_value* <crlf>
CAPACITY	*capicity_value*<crlf>
<lf>	

Control State Any except while welding.

Description Returns the parameters for the waveform check.

stability_value is the limit of the allowable average deviation from the set point for the weld pulse after the delay period.

delay_value is the delay period, in milliseconds. This delay period, at the start of the pulse, will not be used when the average deviation is calculated.

capicity_value is the capacity % limit. This limit is the % below the set point the energy is allowed to be at the end of the weld pulse.

Command

SCHEDULE	***schedule_number*** <crlf>
ENG1	***weld_energy*** <crlf>
FEEDBACK1	**{ KA | V | kW }** <crlf>
ENG2	***weld_energy*** <crlf>
FEEDBACK2	**{ KA | V | kW }** <crlf>
SQUEEZE	***squeeze_time*** <crlf>
UP1	***weld_time*** <crlf>
WELD1	***weld_time*** <crlf>
DOWN1	***weld_time*** <crlf>
COOL	***weld_time*** <crlf>
UP2	***weld_time*** <crlf>
WELD2	***weld_time*** <crlf>
DOWN2	***weld_time*** <crlf>
HOLD	***hold_time*** <crlf>
PIDG1	***pid gain***<crlf>
PIDG2	***pid gain***<crlf>
<lf>	

NOTES:

- If your UB25 Control has a software version ***lower*** than **1.22**, you will see **VMULT**. This parameter is not used, ignore.
- If your UB25 Control has a software version ***lower*** than **1.23**, you will not see either **PIDG1** or **PIDG2**.

Control State Any

Description **(Continued Next Page)**

Description

Reports the settings of the currently loaded Control schedule parameters. The ***schedule_number:*** variable identifies which schedule is currently loaded, and may be any value from 0 to 99.

squeeze_time and ***hold_time*** are the parameter that defines the time for the given period in 1 msec. Valid range is from 0 to 999.

weld_time is the parameter that defines the time for the given period in 0.01 msec. For the UB25, the valid range is from 0 to 9900 (0 to 99.00ms). For the DC25, the valid range is from 0 to 990 (0 to 9.90ms).

HOST		CONTROL	
Increments	**Range**	**Time Range**	**Increments**
1	0-100	0-0.1ms	0.01ms
10	110-1000	1.1-10ms	0.1ms
100	1100-9900	11-99ms	1.0ms
Weld Time for UB25 = 0-99 ms Weld Time for DC25 = 0-9.9 ms			

weld_energy is the parameter that specifies the amount of weld energy.

- **Current Feedback** mode: the *weld_energy* range for the UB25 is from 5 to 1,000A (5-1000). For the DC25, the range is from 100-4,000A (100-4000).
- **Voltage Feedback** mode: *weld_energy* for the UB25 is in units of 0.01V, and the range is from 0.1 to 4.9V (100 to 4900). For the DC25, the range is from 0.1 to 9.9V (100 to 9900) for the DC25.
- **Power Feedback** mode: *weld_energy* for the UB25 is in units of 10W, and the range for the UB25 is from 10 to 4900W (10-4900). For the DC25, the range is from 100W to 9900W (100-9900).

pid gain: is the PID gain of the last weld.

Command

RELAY <crlf>
ACTIVE1 **{ HIGH | LOW }** <crlf>
CONDITION1 **{ WELD | END | ALARM | LIMITS | P1HI | PILOW | P2HI |P2LOW }** <crlf>
ACTIVE2 **{ HIGH | LOW }** <crlf>
CONDITION2 **{ WELD | END | ALARM | LIMITS | P1HI | PILOW | P2HI |P2LOW }** <crlf>
ACTIVE3 **{ HIGH | LOW }** <crlf>
CONDITION3 **{ WELD | END | ALARM | LIMITS | P1HI | PILOW | P2HI |P2LOW }** <crlf>
ACTIVE4 **{ HIGH | LOW }** <crlf>
CONDITION4 **{ WELD | END | ALARM | LIMITS | P1HI | PILOW | P2HI |P2LOW }** <crlf>
<lf>

Control State Any

Description Reports the relay settings.

Command

MONITOR	*schedule_number*<crlf>
MONTYPE1	**{ KA | V | KW }**<crlf>
UPPER1	**{** *limit_value* **}**<crlf>
LOWER1	**{** *limit_value* **}**<crlf>
ACTION1	**{ none | STOP | INHIBIT | APC }**<crlf>
MONTYPE2	**{ KA | V | KW }**<crlf>
UPPER2	**{** *limit_value* **}**<crlf>
LOWER2	**{** *limit_value* **}**<crlf>
ACTION2	**{ none | STOP }**<crlf>

NOTE: If your UB25 Control has a software version ***lower*** than **1.22**, you will ***not*** the parameters below.

P1LDLY1	{*delay_value*}<crlf>
P1LDLY2	{*delay_value*}<crlf>
P1UDLY1	{*delay_value*}<crlf>
P1UDLY2	{*delay_value*}<crlf>
P2LDLY1	{*delay_value*}<crlf>
P2LDLY2	{*delay_value*}<crlf>
P2UDLY1	{*delay_value*}<crlf>
P2UDLY2	{*delay_value*}<crlf>

<lf>

Control State Any

Description Reports the settings of the weld monitor of the currently loaded Control schedule. The ***schedule_number*** variable identifies which schedule is currently loaded, and may be any value from 0 to 99. The possible value for all variables listed after their parameter name correspond to the values listed under **MONITOR** in *Host Originated Commands* of this manual.

Command **SYSTEM** <crlf>

LIGHT	**{ *light_value* }** <crlf>
BUZZER	**{ OFF | ON }** <crlf>
LOUDNESS	**{ *loudness_value* }** <crlf>
DISPLAY	**{ PEAK | AVG }** <crlf>
SWTYPE	**{ MECHANICAL | OPTO | PLC }** <crlf>
SWSTATE	**{ OPEN | CLOSED }** <crlf>
CTTYPE	**{ MECHANICAL | OPTO | PLC}** <crlf>
CTSTATE	**{ OPEN | CLOSED }** <crlf>
FIRESW	**{ AUTO | REMOTE | NONE }** <crlf>
FIRESW	**{ AUTO | OPTO | NONE }** <crlf>
GRAPH	**{ OFF | ON }** <crlf>
WELDABORT	**{ OFF | ON }** <crlf>
DEBOUNCE	**{NONE | 10 | 20 | 30 }** <crlf>

<lf>

Control State Any

Description Reports the current settings of the Control system parameters.

light_value is a number 0 to 99 for brightness of the LCD. 0 is dark and 100 is the brightest.

loudness_value is a number 0 to 99 for buzzer loudness. 0 is off and 100 is the loudest.

Command **ALARM** *error_message*<crlf><lf>

Control State Any

Description Identifies the current error condition of operation of the Control. May be in response to the **ALARM READ** command sent by the host, or may be sent as a result of an error condition occurring in the Control. ***error_message*** is a text string describing the error message, which is the same error message that is displayed to the screen.

Command **SYNC** <crlf><lf>

Control State Any

Description The Control return SYNC command back to the host computer when the SYNC command is received from the host computer.